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2004/ED-8(ST)
2004/SV-21

December 6, 2004

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OFC. OF ENVIRONMENTAL QUALITY CONTROL

Ms. Genevieve Salmonson, Director
Office of Environmental Quality Control
State of Hawaii
State Office Tower, Room 702
235 South Beretania Street
Honolulu, Hawaii 96813-2437

Dear Ms. Salmonson:

FINAL ENVIRONMENTAL ASSESSMENT
CHAPTER 343, HAWAII REVISED STATUTES (HRS)
Environmental Assessment (EA)/Determination
Finding of No Significant Impact (FONSI)

Recorded Owner/ Applicant	:	Elizabeth Grossman, Trust
Agent	:	PlanPacific
Location	:	1240 Mokulua Drive - Lanikai
Tax Map Key	:	4-3-5: 76
Request	:	Shoreline Setback Variance (SV)
Proposal	:	Modification of an existing concrete seawall and boat ramp, installation of low 3-foot fencing and rubble removal along the shoreline within the 40-foot shoreline setback.

Attached and incorporated by reference is the Final EA prepared by the applicant for the above project pursuant to Chapter 343, HRS. We have determined that the preparation of an Environmental Impact Statement (EIS) is not required. Enclosed is a 3-1/2" Floppy Disk with a "Summary" of the subject project, Publication Form, and four copies of the Final Environmental Assessment. We request publication of a notice of this document in The Environmental Notice.

If you have any questions, please contact Steve Tagawa of our staff at 523-4817.

Sincerely yours,

for ERIC G. CRISPIN, AIA
Director of Planning
and Permitting

EGC:pl
Attachments

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2004-12-23 FONSI
GROSSMAN SEAWALL RECONSTRUCTION AND BOAT RAMP REPAIR

Final Environmental Assessment

Improvement of Nonconforming Seawall

Lanikai, Oahu
TMK: 4-3-005: 076

Prepared by PlanPacific, Inc.

November 2004

Final Environmental Assessment

Improvement of Nonconforming Seawall

Lanikai, Oahu
TMK: 4-3-005: 076

Prepared by PlanPacific, Inc.

November 2004

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Appendices

1. Project Summary

PROPOSED ACTION:	Build foundation for nonconforming seawall and repair nonconforming boat ramp; remove protective rock blanket located seaward of the seawall.
PROPERTY:	1240 Mokulua Drive, Lanikai, O'ahu Tax Map Key 4-3-005: 076 35,175 square feet
OWNER/APPLICANT:	Elizabeth R. Grossman Family Trust
PLANNING & ZONING:	State Urban District Residential on Koolaupoko Sustainable Communities Plan *Zoned R-10 Residential District*
SPECIAL MANAGEMENT AREA, SHORELINE SETBACK:	Located within the SMA and the shoreline area, subject to the 40-foot shoreline setback
PERMITTING AGENCY:	Department of Planning and Permitting City & County of Honolulu
CONSULTED AGENCIES:	Department of Planning and Permitting, City & County of Honolulu; State Dept. of Land and Natural Resources
PERMITS REQUIRED:	Shoreline Setback Variance, Chapter 23, Revised Ordinances of Honolulu (ROH) Special Management Area Permit, Chapter 25, ROH Building Permit Sec. 10 Permit, Department of the Army
CHAPTER 343 ACTION:	Construction within the shoreline setback
ANTICIPATED DETERMINATION:	Finding of No Significant Impact (FONSI)

2. General Description of the Action

2.1 SITE DESCRIPTION AND BACKGROUND

The project site consists of two contiguous shoreline lots at 1240 Mokulua Drive, Lanikai, designated as TMK 4-3-005: 076. **Figure 1** shows the general location of the site. It is zoned R-10 Residential, which has a minimum lot size of 10,000 square feet. Consisting of two lots, the property totals 35,175 square feet in area and is owned by the Elizabeth R. Grossman Family Trust. The tax map in **Figure 2** also provides a key for photographs of the site (see **Photographs A and B**).

The shoreline is defined by a nonconforming seawall located along the seaward property boundary. A boat ramp is located at the Waimanalo end of the wall. The seawall was constructed in the early 1960s, prior to adoption of both the Zone of Wave Action Ordinance No. 2837 (8/19/66) and the Shoreline Setback Rules and Regulations (3/30/72). **Figure 3** is a survey map showing existing improvements in the shoreline area. As the map shows, certain structures encroach on the public shoreline.

Makai of the seawall is a "protective stone blanket" – a low sloping revetment – that extends about 10 feet seaward from the base of the seawall. The owners of parcel 76 and three adjacent parcels acted together to obtain permits and install the rock blanket in 1968. In granting a variance for the rock blanket on November 7, 1968, the City Zoning Board of Appeals explicitly recognized the seawall as a nonconforming structure (Findings of Fact, Conclusions of Law, Decision and Order, File No. 68/Z-124). The protective rock blanket was also duly authorized by the following State and federal approvals: the State Department of Transportation, Harbors Division, issued a Shore Waters Construction Permit on September 25, 1968 (Permit No. 1395); the Board of Land and Natural Resources granted a right-of-entry permit on October 14, 1968; and the U.S. Army Corps of Engineers issues a Section 10 authorization on October 2, 1968.

The seawall was undermined by severe and unusual storm surf that inundated the windward coast of Oahu during November 20-21, 2003. The seawall itself withstood the waves, but the undermining caused subsidence inland of the wall. Wave action pulled sand and topsoil from underneath the wall, leaving a hole in the yard. The storm waves also destroyed a low fence and dense naupaka bushes along the top of the seawall. Following the storm, the owner contracted to have the hole filled with sand and soil. The contractor also installed geotextile filter fabric to hinder further soil loss. Subsequent test excavations revealed that the foundation of the wall was very shallow.

The owner applied to the State Department of Land and Natural Resources (DLNR) for certification of the shoreline, based on a survey made on February 4, 2004 (see **Figure 4**). On October 25, 2004, the DLNR issued a letter stating that the State Land Surveyor had recommended certification. The shoreline survey reflects the owner's proposal to remove an old wall repair and the protective rock blanket, contingent upon the City's granting the proposed shoreline setback variance and the owner constructing the new seawall foundation as proposed herein. As noted on **Figure 4**, the owner is proposing to purchase easements over small portions of the original wall and boat ramp that encroach across the property boundary and that are integral to the wall.

The property is currently occupied by a garage, the above-described shoreline structures, and walls along the front and side boundaries. The owner plans to construct two dwellings – a main residence on the makai portion of the property and a guest residence and swimming pool on the mauka portion of the property.

2.2 TECHNICAL CHARACTERISTICS

The owner proposes to construct a new foundation for the existing seawall and to repair the existing boat ramp by rebuilding the ramp slab between the existing side walls. Plan drawings are shown in **Figure 5**.

The existing seawall is made of concrete. It is trapezoidal in section, with a base that extends to about 4.5 feet wide. The top of the wall is about 2 feet wide. The base of the seawall reaches only to approximately 0.0 Mean Sea Level (MSL), which explains why the storm surf drew soil from under the wall. The general elevation of the property varies between +6.5 and +7.5 MSL. Near the shoreline, it slopes slightly downward, and the top of the seawall sits at about +5.5 MSL.

As shown in **Figure 4**, the shoreline survey, the shoreline property boundary is 151 feet long in total. The seawall extends along the seaward property boundary about 137 feet from the Kailua boundary to a return wall about 15 feet short of the Waimanalo property boundary. The return wall extends about 18 feet landward and forms one side of the boat ramp. The opposing side of the boat ramp is a concrete bulkhead wall that lies entirely within the adjacent lot, Tax Map Key 4-3-005: 088 and extends inland from the property boundary about 25 feet. The ramp slab broke and fell without harming the side walls. Apparently built without a foundation, the slab was undermined as the soil underneath it gradually eroded during its 40-year life.

In order to reinforce the seawall and prevent further subsidence, the owner proposes to excavate to about –4.0 MSL and install a concrete rubble masonry (CRM) foundation. The foundation would extend seaward under the existing wall to the property line, remaining landward of the shoreline. It would consist of large basalt rocks grouted in place and would be constructed in sections.

To repair the boat ramp, the owner proposes to build a new ramp slab that would rest on a sloping bed of coarse gravel, with filter fabric and a drain system to prevent undermining. The toe of the slab would rest on the existing concrete foundation wall at the shoreline and would have steel rods doweled into the side walls for additional support.

The foundation would be constructed in sections using heavy equipment to excavate beneath the existing seawall and move basalt rocks into place. Soil would be excavated one section at

a time, stockpiled onsite, and used to backfill the construction trench after the section of foundation is completed. The project would result in a net amount of 170 cubic yards of excavated material, which would be disposed of offsite. The heavy equipment would operate entirely landward of the seawall. Because it would proceed in sections, the project would require only limited dewatering. Wastewater would be retained onsite and would not be discharged to State waters. Construction would take 3-6 weeks to complete.

Removal of the protective rock blanket would proceed in tandem with construction of the new seawall foundation. The contractor would position the excavating equipment on a completed section of foundation and reach over the seawall to remove rocks. To avoid taking sand, the contractor would employ a bucket-and-thumb assembly on the excavator. Rocks would be stockpiled and used in building the next section of the foundation.

The owner also plans to build a low chain-link or metal fence landward of the seawall, replacing the one destroyed in the November storm. As shown in **Figure 5**, the fence would be 3.5 feet in height above grade.

2.3 ECONOMIC AND SOCIAL CHARACTERISTICS

The proposed project would not generate any new jobs or increase the resident population of the area. It would provide short-term construction employment and related State tax revenues. The estimated cost of the proposed work is $90,000.

2.4 CULTURAL AND HISTORIC CHARACTERISTICS

The residential property is not currently used for cultural or religious practices. Public access to the shoreline from the public road would not be affected by this project. Upon completing the proposed seawall foundation and boat ramp repair, the owner would remove the protective rock blanket, which extends seaward into the State Conservation District. This would improve lateral access along the shoreline.

2.5 ENVIRONMENTAL CHARACTERISTICS

The shoreline of the property has had a seawall for about 40 years. It was built in the 1960s in response to coastal erosion occurring at the time. Subsequently, the beach accreted in this location; and for many years, the seawall was covered by sand. Since the 1980s, however, erosion in south Lanikai has progressively moved northward towards the central portion of the Lanikai shoreline. Shoreline surveys for the property certified in 1998 and 1999 show that the seawall and the protective rock blanket were still covered by sand and vegetation, but that the shoreline was gradually eroding. The 1999 certified survey shows the shoreline at the edge of vegetation, about 8 to 19 feet seaward of the then-submerged seawall. It also shows that the shoreline had eroded about 5 to 8 feet from the 1998 vegetation line. The two properties immediately to the south began experiencing severe erosion in 1998.

The presence of a seawall on the subject property did not prevent the beach from accreting and being covered by accreted sand for about 30 years. This phenomenon has recurred many times along various sections of the Lanikai shoreline. In fact, nearly every one of Lanikai's shoreline lots has a seawall. Currently, many seawalls in the center of Lanikai remain entirely covered by sand.

Seawalls do not foreclose the possibility of future restoration of the beach. In the future, it is possible that – either through natural littoral processes or through an engineered beach replenishment project – a wide dry beach will be restored to this section of the Lanikai shoreline. See Section 3.3 and the Coastal Engineering Evaluation for a more detailed discussion of environmental impacts of seawalls in Lanikai.

The subject property does not contain unique or endangered species of plants, nor does it have significant faunal habitat.

3. Description of the Affected Environment, Impacts and Mitigation

3.1 DESCRIPTION OF THE SURROUNDING AREA

Lanikai is a fully-developed residential community occupying a narrow coastal strip of land, bounded by the slopes of Kaiwa Ridge. Zoned R-10 Residential, the area is subdivided into residential lots which are generally 10,-20,000 square feet in size and developed with single-family dwellings. The area is characterized by warm temperatures and average annual rainfall of 40-50 inches.

To the north, the subject property abuts a large lot that is occupied by a residence (TMK 4-3-005: 57). This parcel is protected by a nonconforming seawall, as well as by the continuation of the protective rock blanket that was also permitted on parcel 57 as well as parcel 56 further to the north.

The southern edge of the property abuts a residential lot where a new seawall was recently constructed (TMK 4-3-005: 088). This parcel and the parcel further to the south (TMK 4-3-005: 059) jointly obtained shoreline setback variances and constructed new seawalls (DPP File Nos. 2004/SV-3 and 2004/SV-4).

3.2 SOILS, TOPOGRAPHY AND DRAINAGE

The soils are classified as Jaucas sand, according to the Soil Survey (USDA Soil Conservation Service, 1972). Jaucas soils consist of excessively drained, calcareous soils that occur as narrow strips on coastal plains, adjacent to the ocean. The permeability of Jaucas sand is described as rapid, and runoff is very slow to slow. The hazard of water erosion is slight, but wind erosion is a severe hazard where vegetation has been removed. The available water capacity is 0.5 to 1.0 inch per foot of soil. Workability is slightly difficult because the soil is loose and lacks stability for use of equipment. The topography is level, varying between +6.5 and +7.5 MSL.

Rainfall drains directly onto the ground and is quickly absorbed by the sandy soils. As shown on the Flood Insurance Rate Map, the seaward portions of the properties lie in the AE zone, with a regulatory flood elevation of +6.0 feet MSL.

3.3 SHORELINE CHARACTERISTICS AND COASTAL PROCESSES

This section summarizes information contained in a Coastal Engineering Evaluation (CEE) prepared by Edward K. Noda and Associates, Inc. (EKNA) in 1997 for a neighboring property, as well as a supplementary letter and attachments dated October 22, 2004 (see **Appendix A**). Prepared in 1997, the Coastal Engineering Evaluation (CEE) specifically addresses a property located 315 feet to the south of the subject property. The CEE contains a large amount of information that is relevant to the subject property – i.e., information about coastal processes, the history of shoreline changes in southern Lanikai, characteristics of alternative shore protection structures, and potential littoral impacts. The purpose of the October 22, 2004 letter report was to provide additional information about the history of erosion in the subject reach of shoreline, as well as to add specific analysis specific of the subject proposal.

Historical Shoreline Changes

Lanikai's beaches have been undergoing net long-term erosion for over 35 years. The coastal reaches at both the northern and southern end of Lanikai are devoid of dry beach, and beach erosion is progressing towards the middle section of this coastline. The coastal reach from Wailea Point northward for over half a mile is devoid of dry beach, and various types of seawalls and revetments protect the homes and properties along this shoreline.

The CEE discusses a 1989 report that analyzed shoreline erosion in south Lanikai. The map in **Attachment 1** to the EKNA October 22, 2004 letter shows the 2,500-foot reach of shoreline analyzed in the 1989 report. **Attachments 2a** and **2b** to this report present an Erosion Chronology and a Shore Protection Record, respectively, for a 1,200-foot shoreline reach that overlaps the earlier study area and extends north to the subject parcel. This

shoreline reach is also mapped in **Attachment 1** of the supplement letter report. (The 10/22/04 report and attachments may be found at the beginning of **Appendix A.**)

Conducted by Edward K. Noda and Associates, Inc. (now EKNA Services, Inc.), the 1989 study revealed that the southern end of Lanikai had experienced considerable accretion and subsequent erosion over a long-term period from 1950 to the 1980s. Figure 4 in the Coastal Engineering Evaluation depicts the average change of the vegetation line and beach toe line over this time period. Many of the property owners legally extended their property boundaries seaward by claiming the lands that accreted during the 1950s and 1960s.

From 1970 to the early 1980s, this shoreline reach eroded back to the approximate 1950s position. Most of the seawalls were constructed in response to this erosion cycle. This long-term erosion cycle was not unique to Lanikai. Similar shoreline movement occurred at Kailua Beach Park, as documented in the 1989 study.

Since the 1980s, erosion has progressively moved northward towards the central portion of the Lanikai shoreline. **Attachment 2a** chronicles the erosion damages to 16 properties northward of the public ROW near Pokole Way to the subject property. **Attachment 2b** chronicles the construction of permanent shore protection along this reach. Seawalls that were constructed 40 years ago or so have become exposed by erosion, damaged by winter storms, and repaired or reconstructed. Owners of the few properties that did not have shore protection were forced to install SEAbags for emergency protection. Subsequently, all but one have built permanent shore protection structures after obtaining the required permits. **Attachment 3** (to 10/22/04 letter report at beginning of **Appendix A**) is a recent aerial photo that reveals the extent of beach loss along this southern half of Lanikai. Of the five properties that are shown with SEAbags, four have since constructed permanent protective structures.

Potential Littoral Impacts

The erosion that is occurring along the Lanikai shoreline can be described as "passive" erosion (in contrast to "active" erosion which is induced or accelerated by shore protection structures). When a protective structure is built along an eroding shoreline and erosion continues to occur, the unprotected shoreline adjacent to the structure will continue to erode and eventually migrate landward beyond the structure. The result will be loss of beach in front of the shore protection structure as the water deepens and the shoreface profile migrates landward. This process is designated as passive erosion and is the result of fixing the position of the shoreline on an otherwise eroding stretch of coast. Passive erosion is independent of the type of shore protection constructed. This is the most common result of shoreline hardening in Hawaii, and is the probable long-term consequence of the existing and new seawalls at Lanikai.

The seawalls do not foreclose the possibility of future restoration of the beach, whether by natural or artificial means. In the 1960s and 1970s, seawalls were built along the central portions of Lanikai Beach which were then suffering erosion but subsequently experienced accretion through the 1980s. Along the middle part of Lanikai Beach, accreted sand had built up the beach in front of the seawalls, including the subject property's seawall, in some cases almost to the full height of the walls. As erosion is continuing to progress along this coastline, some of these walls are now becoming exposed. If major beach replenishment/ restoration is implemented along the Lanikai shoreline, the subject seawall and other shore protection structures will not adversely affect the design and performance of the restored beach. Periodic nourishment requirements cannot be predetermined with a high degree of assurance (because erosional forces are dependent on the wind/wave climate), and therefore severe erosion of the beach can result in damage to unprotected residential dwellings before renourishment can be implemented. However, if properties are already protected with a seawall or other shore protection measure, then this provides flexibility in the time frame for implementation of subsequent renourishment, without the worry of imminent erosion or

wave damage to residential improvements. Thus, a long-term beach replenishment/ restoration program can be designed for the sole purpose of maintaining recreational beaches, rather than to serve in the additional capacity of providing shore protection to dwellings.

None of the shore protection structures, including appurtenant features such as the "protective rock blanket" fronting the seawall on the subject property, have any influence on the ongoing erosion occurring along this coast. The purpose of the rock blanket was presumably to protect the base of the existing seawall, which was becoming scoured and undermined by the progressive erosion loss of the fronting beach during the cycle of erosion along this central portion of the Lanikai shoreline. This period of erosion in central Lanikai corresponds to the period of accretion to the southern end of Lanikai. When the cycle reversed, both the rock blanket and the seawall became buried by the beach.

The removal of the rock blanket following the completion of the new foundation for the seawall will have no influence on the littoral processes. However, because the rock blanket is unsightly and is somewhat of a hazard for persons traversing the shoreline, it will be beneficial to remove the rocks to the extent practicable.

3.4 FLOOD HAZARD

According to the Flood Insurance Rate Map, the seaward one-third of the property lies within Flood Zone AE. The Base Flood Elevation (BFE) is shown as six (6) feet. The ground elevation at the site varies between 6.5 and 7.5 feet elevation, which exceeds the BFE. The City's Flood Hazard ordinance does not regulate fences and walls, unless they lie within a Floodway or a Coastal High Hazard District. The inland two-thirds of the property lies in Flood Zone X, which is beyond the 500-year flood plain.

3.5 RECREATIONAL RESOURCES

There is a public beach right-of-way two lots to the south. Owned by the Lanikai Community Association, the beach access is located on TMK parcel 4-3-005: 087. This is

part of a system of rights-of-way that provide good public access to the Lanikai shoreline. There is no public beach park in Lanikai.

Erosion has reduced such activities as jogging and sunbathing along this section of Lanikai Beach. The waters off Lanikai are excellent for swimming, sailing, kayaking, and canoeing. There is also some use of motorboats and windsurfing, but Kailua Beach provides better conditions and access for these activities. There is some pole fishing from boats and from the shore, but reef fish populations have diminished over the years. Spear-fishing and snorkeling is practiced among the coral heads farther offshore. There are a few spots for board-surfing around the Mokulua Islands.

Construction of the new seawall foundation will enable the owner to remove the protective rock blanket and another smaller sheet-pile-and-concrete structure from the public beach. This will improve walking conditions, especially at low tide, and will eliminate the current hazards of climbing over the rocks.

3.6 FLORA AND FAUNA

Lanikai Beach is not a habitat for rare, threatened or endangered species, although Hawaiian Stilts occasionally forage along the waterline. Green Sea Turtles graze and loaf in the waters off Lanikai, as they do in Kailua Bay and Waimanalo Bay. The action is not expected to affect terrestrial or aquatic life.

3.7 VISUAL RESOURCES

The shoreline offers a 180-degree view up the beach to the north, towards the ocean and the Mokulua Islands, and south to Wailea Point. The appearance of the beach would be improved by the removal of the rock blanket from the shoreline.

3.8 ARCHAEOLOGICAL AND HISTORIC RESOURCES

No archaeological features exist on the subject property, and no negative impacts are anticipated. If any archaeological, cultural, or historic materials are discovered, construction work will be stopped and the State Historic Preservation Division will be notified.

3.9 WATER QUALITY

As stated in the Coastal Engineering Evaluation (see **Appendix A**), potential water quality impacts during construction of the seawall foundation would be temporary and minor because (a) the work would be conducted entirely landward of the shoreline and (b) the existing seawall would be left in place during construction, thereby minimizing potential discharge of material to the ocean. The project requires only limited dewatering. Wastewater would be retained onsite and would not be discharged to State waters.

Subsequent removal of the protective rock blanket will be accomplished by heavy equipment operating from behind the seawall. Only rocks will be excavated, using a bucket-and-thumb assembly. This action will not require dewatering.

3.10 NOISE

Construction of the foundation and repair of the boat ramp would generate noise from the use of heavy equipment, but the work would be confined to daylight hours and would be relatively short-term. Construction activities would comply with *Hawaii Administrative Rules, Chapter 11-46, Community Noise Control*, administered by the State Department of Health.

3.11 AIR QUALITY

Air quality impacts attributed to the proposed action would include exhaust emissions and dust generated by short-term, construction-related activities. These impacts would be minimal because of the limited extent of the project and sandy soils. Construction activities

would be conducted in compliance with State air pollution control regulations contained in *Hawaii Administrative Rules, Chapter 11-60.1-33, Fugitive Dust.*

3.12 ROADS AND UTILITIES

The proposed action would have no effect on existing roadways, traffic, or parking; except for short-term construction-related traffic. The action would also have no effect on water supply, wastewater systems, drainage facilities, solid waste disposal, electrical power, or communications services.

3.13 PUBLIC SERVICES

The proposed project would not result in any change in the demand or supply of public services, including police and fire protection and school, medical and recreation facilities.

3.14 SUMMARY OF SHORT-TERM AND LONG-TERM MITIGATION MEASURES

As indicated above, the project would cause no significant long-term impact to recreational, biological or scenic resources. The owners' contractor will take appropriate action to mitigate noise and dust impacts from short-term construction activities.

3.15 SUMMARY OF ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED

Installation of the foundation underneath the existing seawall would prevent further subsidence of the subject property and thus further limit the potential movement of sand seaward. Consistent with the findings stated in the Coastal Engineering Evaluation, the proposed project is not anticipated to create any significant long-term impact on littoral processes along Lanikai Beach.

3.16 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Resources to be committed are limited to rock, other construction materials, and human effort. The project would be paid for with private funds.

4. Consideration of Alternatives

The Coastal Engineering Evaluation and supplementary letter report (**Appendix A**) discuss various alternatives to the construction of a seawall, including beach nourishment, an offshore breakwater, and a sloping rock revetment. In the present case, a seawall already exists, is structurally sound, and is legally nonconforming. The owner intends to retain the seawall.

The discussion below reviews the "no action" alternative, as well as the theoretical possibilities of replacing the seawall with a sloping revetment and removing the seawall. The discussion is drawn from information presented in **Appendix A**.

Replacement with a Sloping Revetment

It is possible to remove the existing seawall and to replace it with a different type of shore protection, such as a sloping revetment. However, there is nothing to be gained from the replacement of the seawall with another type of shore protection. Seawalls exist on both sides of the subject property, located at approximately the same position along the shoreline. A sloping revetment would necessarily require the construction of flank walls to protect the adjacent properties. Since the revetment toe would be in line with the existing adjacent seawalls, the top of the revetment slope would be located about 16 feet landward of the adjacent seawalls (assuming a property grade elevation of about 8 feet above MSL and 1V:2H revetment slope). Replacing the seawall with a sloping revetment structure would not improve the existing shoreline access. Moreover, there is no reason to expect that a revetment would halt the ongoing erosion along this coast. South of the project site, revetments protect four lots and about 300 feet of shoreline. There is no difference in behavior of the beach fronting these existing revetments and the beach fronting seawalls along this coastal reach.

Removal of the Seawall

Removing the seawall, without constructing replacement shore protection, would result in immediate loss of at least 50 feet of property as the shoreline attempts to achieve a stable slope. Since the seawall acts as a retaining wall, its removal would result in erosion of approximately 750 cubic yards of soil and sand. Over the short term, this would cause substantial turbidity and poor water quality. The adjacent properties would be impacted as their existing seawalls become flanked by erosion. Removing the seawall and attempting to protect the property using vegetation is not a viable shore protection option. Though once prevalent along this coastal reach, naupaka is no match for wave forces that impact the Lanikai shoreline. Vegetation, no matter how hardy, will not prevent erosion and wave damage on an eroding coast.

No Action

If no action is taken, the owner will retain both the nonconforming seawall and the legally-permitted protective rock blanket. The latter would remain necessary to protect the toe of the seawall from severe undermining and to reduce the loss of soil to the ocean in heavy storms. Adopting the no-action alternative would therefore leave the rocks on the beach in front of the seawall, perpetuating an obstruction to lateral shoreline access. Moreover, adopting the no-action alternative could jeopardize the long-term stability of the seawall, thereby also jeopardizing the property and the planned residential improvements. If the seawall were to fail in the future, the owner would no doubt apply for permits to replace it with another shore protection structure.

5. Consistency with the Hawaii Coastal Zone Management (CZM) Objectives and Policies

HRS Chapter 205A sets forth objectives and policies for coastal zone management in Hawaii, as well as delegating regulatory authority over the Special Management Area (SMA) to the counties. Under SMA regulations, single-family residences and accessory structures are exempt from permit requirements.

Objectives and policies relevant to beaches and shore protection structures include the following (from HRS Section 205A-2):

> Provide recreational opportunities accessible to the public by:
>
> > "protecting unique coastal resources" (i.e., sand beaches); and
> >
> > "providing and managing adequate public access to and along the shoreline."
>
> Protect beaches for public use and recreation by "prohibiting construction of private erosion-protection seaward of the shoreline . . ."

Construction of a shore protection structure is a measure of last resort, usually undertaken when progressive coastal erosion threatens to destroy a home or other structure. Typically, the erosion has already taken the dry beach area and a portion of the homeowner's yard. A shore protection structure will prevent the further erosion of sediments from the private property and therefore the further nourishment of the beach from that property. In the present case, the property has had a shore protection structure for 40 years.

The CZM Act's policy to protect beaches and to prohibit shoreline structures is a statement of general public policy. The Act, however, also recognizes that shore protection is justified in certain instances where there is a hardship and therefore provides a variance procedure.

Under HRS Section 205A-46(9), a variance may be granted where shoreline erosion would cause hardship if the shore protection structure were not allowed.

The proposal calls for removing the protective rock blanket once the new seawall foundation has been constructed. Removal of the rocks from the beach would actually enhance public access.

6. List of Approvals and Permits Required

The primary land use approval required is a shoreline setback variance. Although the property is zoned for single-family residential use, the previous residence has been demolished; and the only existing building is a garage. The owner intends to build two residences and is in the process of obtaining building permits. Because the application for seawall improvements preceded the actual construction of a residence on the site, the seawall work is considered "development" under the Special Management Area Ordinance and therefore not exempt from SMA permit requirements. Since the cost of the seawall improvements is less than $125,000, the project qualifies for an SMA Minor Permit. A building permit will be needed in order to construct the seawall improvements.

In order to remove the protective rock blanket, the owner will need to obtain a Sec. 10 permit from the U.S. Army Engineer District, Honolulu.

7. Determination of Significance

According to the Department of Health Rules (11-200-12), an applicant or agency must determine whether an action may have a significant impact on the environment, including all phases of the project, its expected consequences both primary and secondary, its cumulative impact with other projects, and its short and long-term effects. In making the determination, the Rules establish "Significance Criteria" to be used as a basis for identifying whether significant environmental impact would result from the development. According to the Rules, an action shall be determined to have a significant impact on the environment if it meets any one of the criteria listed below.

1. **Involves an irrevocable commitment to loss or destruction of any natural or cultural resources.**

   The proposed construction would not affect littoral processes, nor would it change the pattern of continuing coastal erosion on the south end of Lanikai Beach. The construction would not affect public access to the shoreline. The subject property does not contain any known biological or cultural resources.

2. **Curtails the range of beneficial uses of the environment.**

   In accordance with its zoning, the subject property is committed to private residential use. The proposed project would preserve beneficial uses of the privately owned land. The project would affect beach resources inasmuch as it would extend the life and effectiveness of the existing seawall, thus continuing to prevent the erosion of sand from the property and corresponding nourishment of the public beach. Since there is currently no dwelling near the shoreline of the property, removing the seawall and allowing beach retreat is theoretically an alternative. This would result, however, in substantial loss of land from the subject property and would threaten the properties on either side with flanking erosion. Moreover, it would have no appreciable impact on littoral processes. If the cycle of erosion continues, then the area of dry beach in this

reach of the Lanikai shoreline would continue to decrease. If accretion occurs, then sand would accumulate seaward of the seawall, forming dry beach for public use.

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 development is consistent with the Environmental Policies established in Chapter 344, HRS. The proposed construction would not affect the State's natural resources and would not lower the total quality of life for Hawaii residents. While the project does not support the guideline of preserving shorelines free of manmade improvements, it is consistent with the longstanding history of government decisions approving shore protection structures in Lanikai. On the middle section of Lanikai Beach, the beach has accreted despite the presence of shore protection structures.

4. **Substantially affects the economic or social welfare of the community or state.**

The proposed project would have no effect on the socio-economic welfare of the community or state.

5. **Substantially affects public health.**

The proposed project would not affect public health.

6. **Involves substantial secondary impacts, such as population changes or effects on public facilities.**

The proposed project does not involve substantial secondary impacts.

7. **Involves a substantial degradation of environmental quality.**

It is not anticipated that the proposed project would degrade environmental quality.

8. **Is individually limited but cumulatively has considerable effect on the environment, or involves a commitment for larger actions.**

The proposed project is individually limited, would itself have an insignificant effect on the environment, and does not involve a commitment for larger actions. It

continues a 70-year history of episodic construction of shore protection along various reaches of Lanikai Beach. It is unclear whether or not the building of shore protection structures in Lanikai has had a considerable cumulative effect on the environment. Seawalls built 20-30 years ago in the central section of Lanikai have since been entirely covered by sand that extends to a wide dry beach.

9. **Substantially affects a rare, threatened or endangered species or its habitat.**

There are no endangered plant or animal species located on the subject property.

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

Construction may produce temporary impacts to air quality and noise levels, but these impacts would be negligible. Water quality may be temporarily affected by construction.

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, freshwater, or coastal waters.**

The proposed construction is expressly designed to preserve residential structures from the effects of coastal erosion and will also provide some protection from storm waves or tsunami. It is not expected to increase the flood hazard for the subject property or surrounding properties.

12. **Substantially affects scenic vistas and view planes identified in county or state plans or studies.**

The proposed project would not affect any public scenic vistas or view planes identified by the county or state.

13. **Requires substantial energy consumption.**

The proposed project and its construction are small-scale and would not require substantial energy consumption after construction is complete.

8. Anticipated Determination

Based on the findings of this Environmental Assessment, it is anticipated that the approving agency will determine that the proposed project will not have a significant environmental impact, and an Environmental Impact Statement (EIS) will not be required. Therefore, a Finding of No Significant Impact (FONSI) is anticipated.

FIGURES

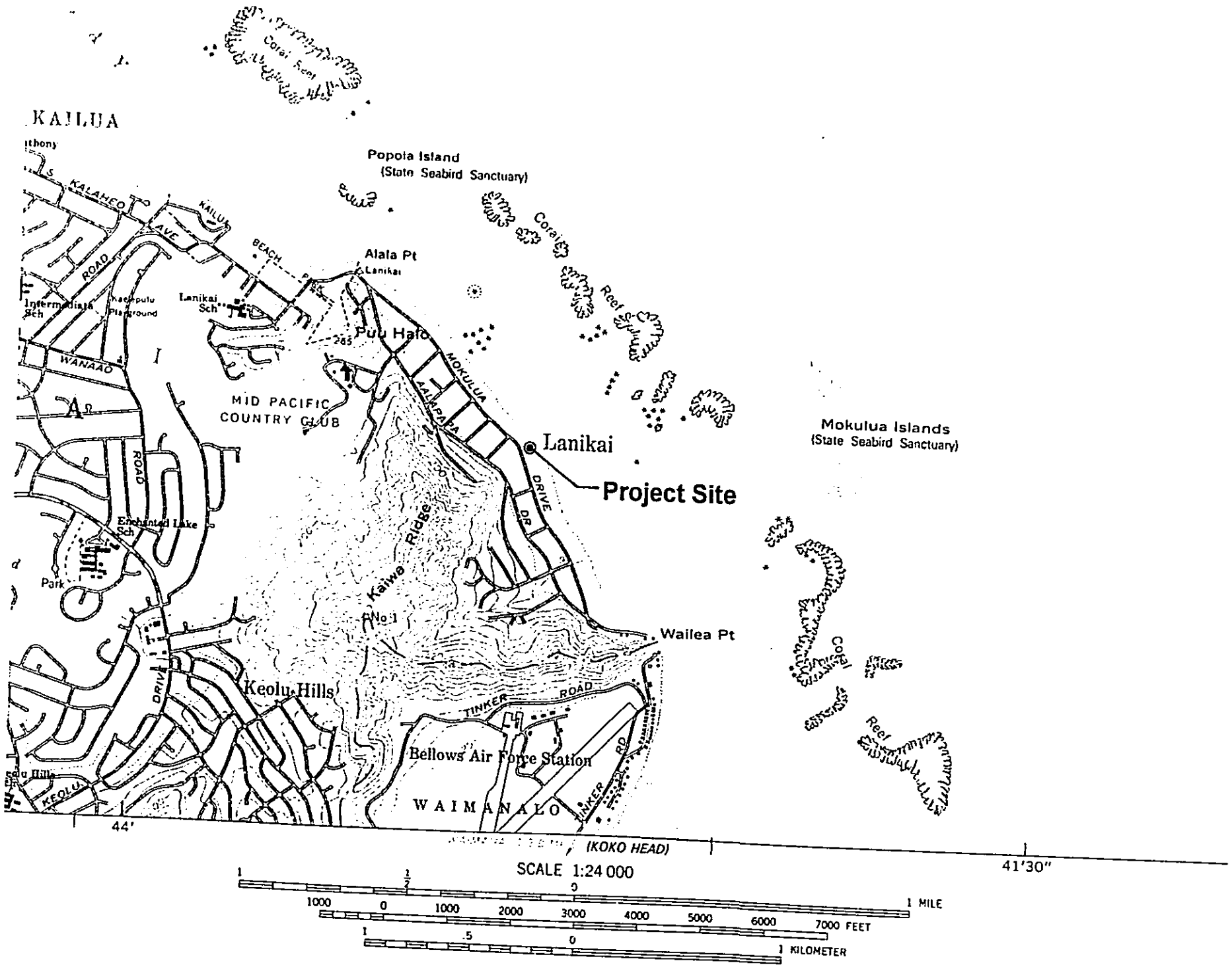


FIGURE 1
Location Map

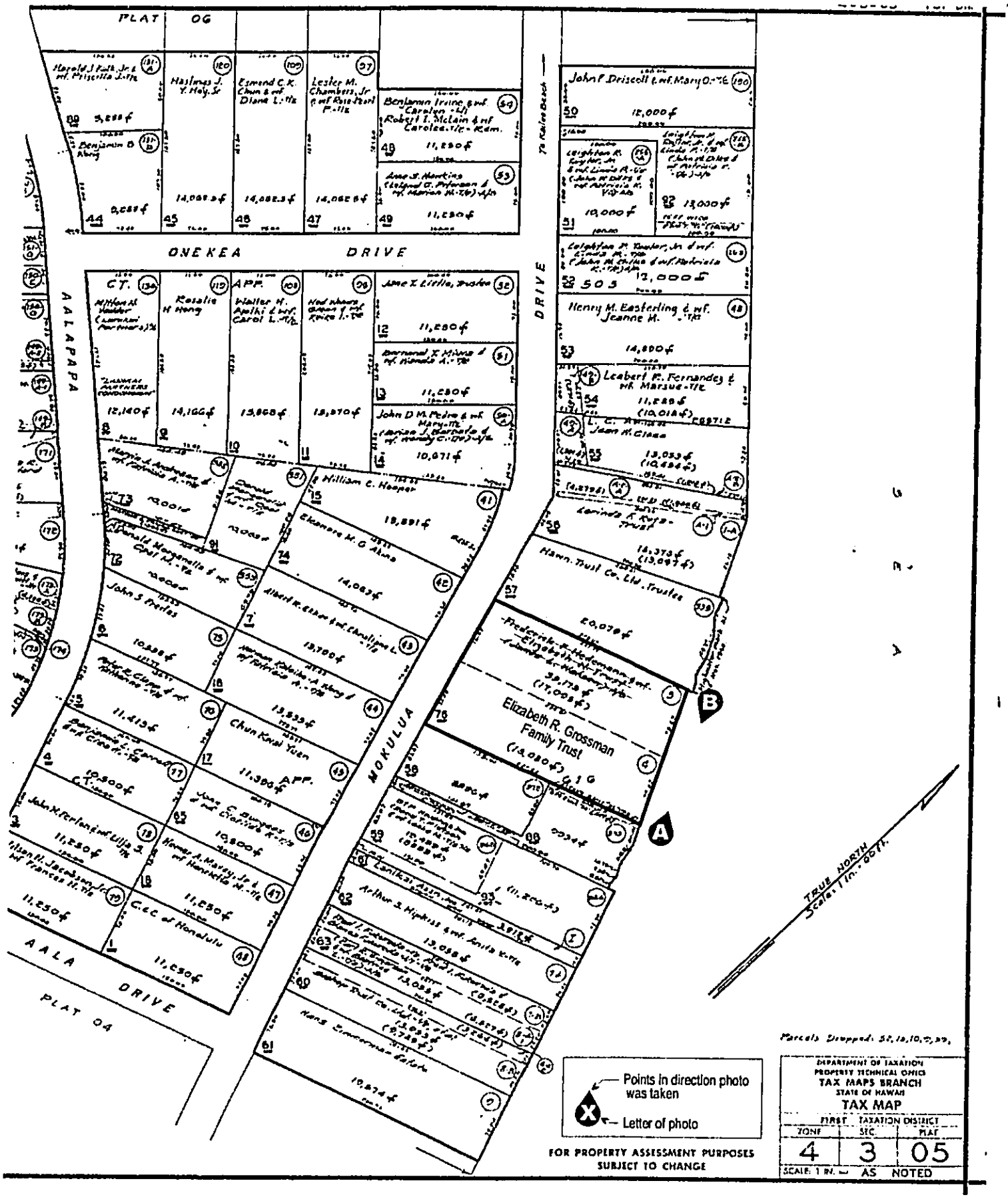


FIGURE 2a
Tax Map and Photo Key

RECEIVED AS FOLLOWS

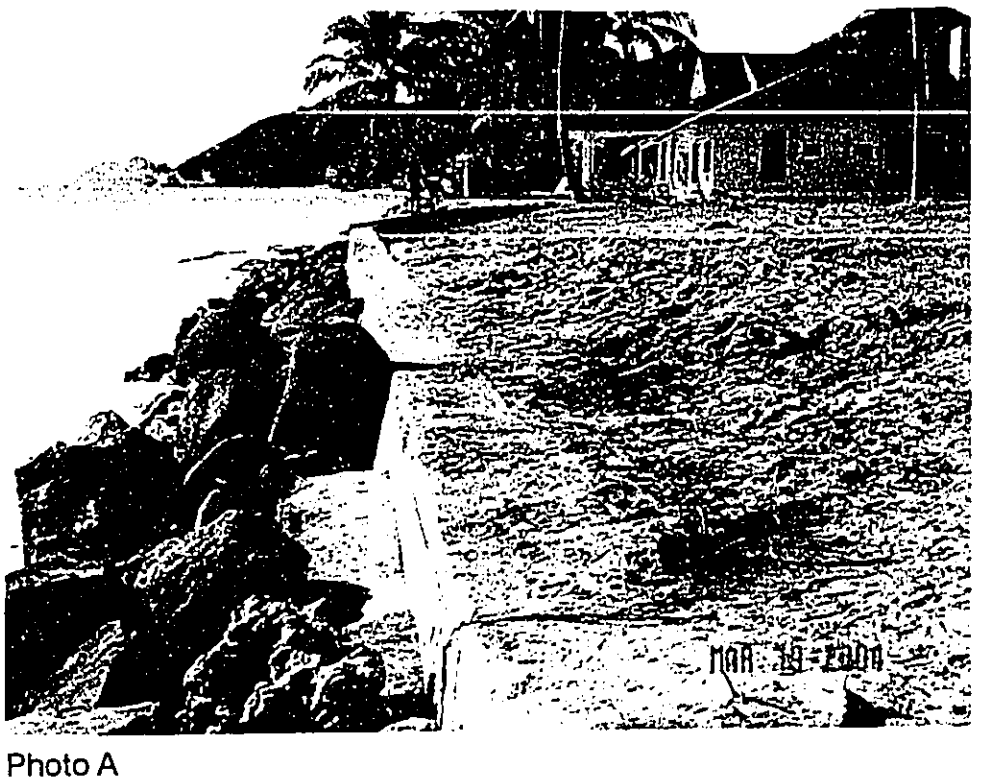


Photo A

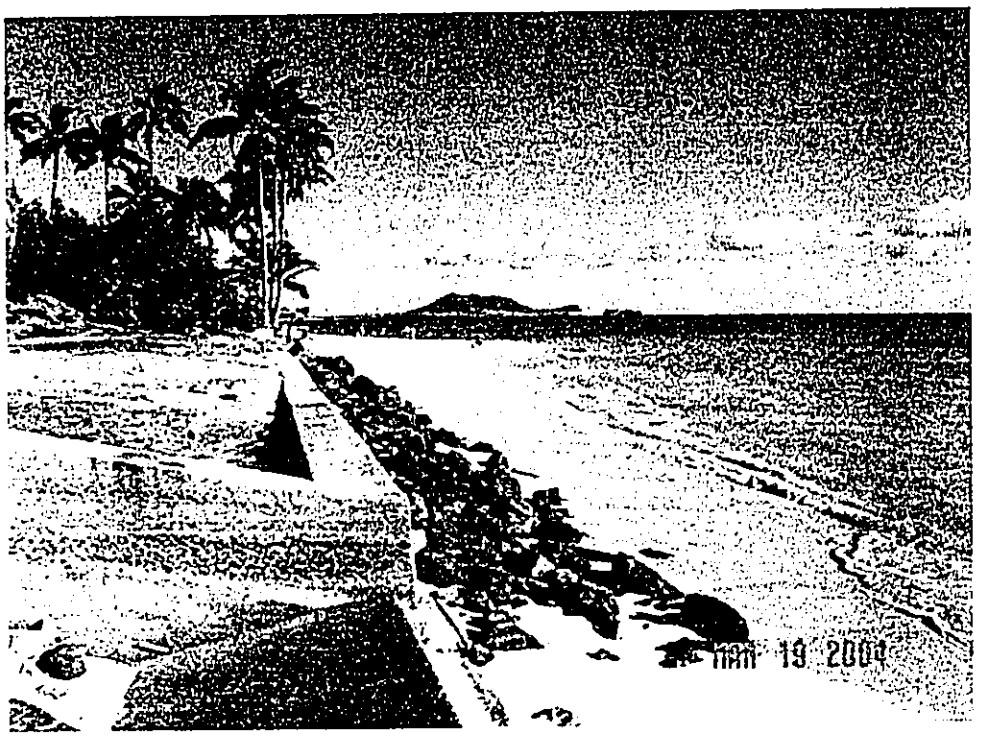


Photo B

FIGURE 2b
Photos

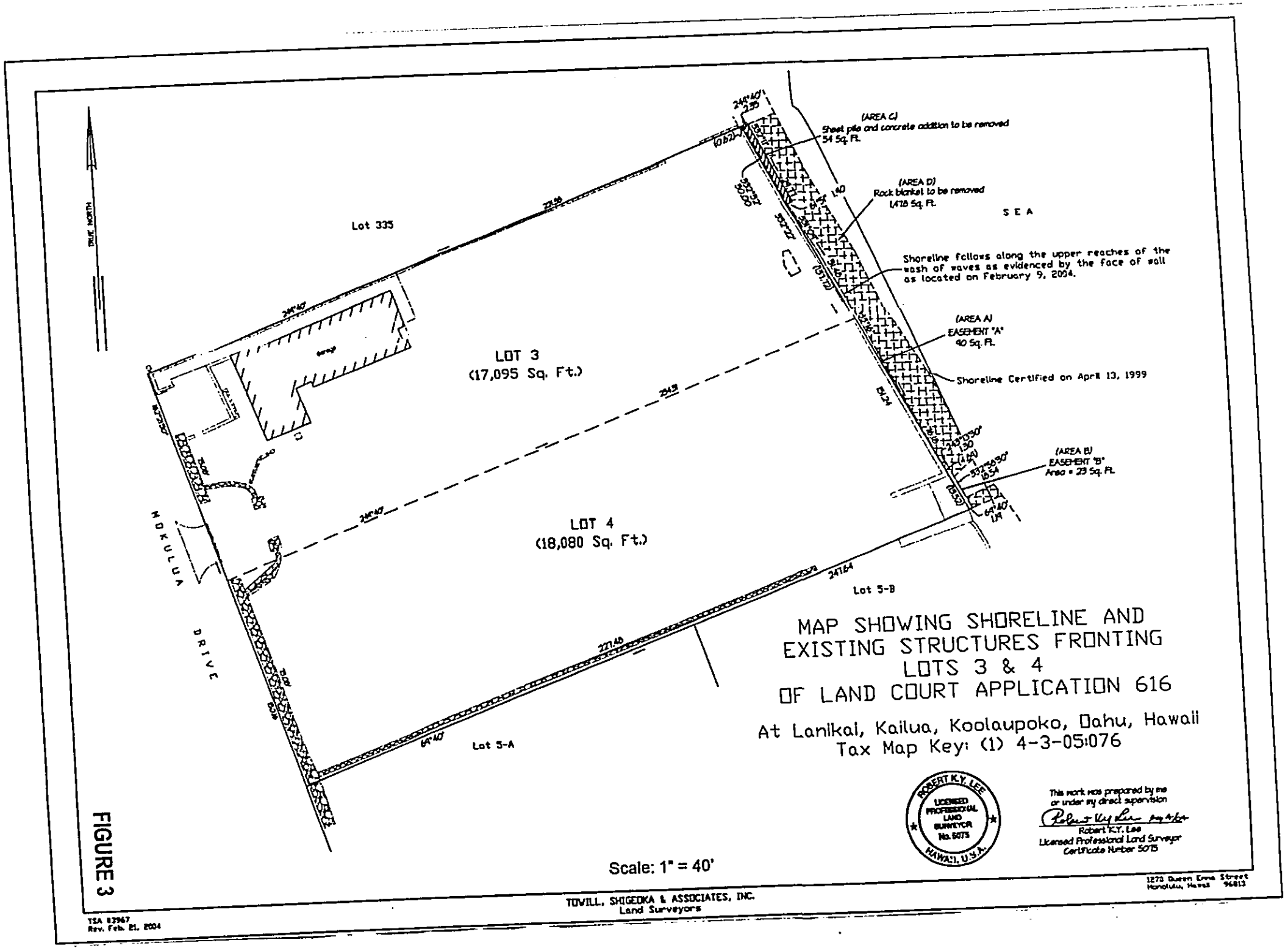

TRUE NORTH
Lot 335
245°40'
235
(AREA C)
Sheet pile and concrete addition to be removed
54 Sq. Ft.
(AREA D)
Rock blanket to be removed
1,478 Sq. Ft.
S E A
Shoreline follows along the upper reaches of the wash of waves as evidenced by the face of wall as located on February 9, 2004.
LOT 3
(17,095 Sq. Ft.)
(AREA A)
EASEMENT "A"
40 Sq. Ft.
Shoreline Certified on April 13, 1999
(AREA B)
EASEMENT "B"
Area = 23 Sq. Ft.
LOT 4
(18,080 Sq. Ft.)
MOKULUA
DRIVE
Lot 5-A
Lot 5-B
227.45
247.64
64°40'
245°40'
MAP SHOWING SHORELINE AND
EXISTING STRUCTURES FRONTING
LOTS 3 & 4
OF LAND COURT APPLICATION 616
At Lanikai, Kailua, Koolaupoko, Oahu, Hawaii
Tax Map Key: (1) 4-3-05:076
ROBERT K.Y. LEE
LICENSED PROFESSIONAL LAND SURVEYOR
No. 5075
HAWAII, U.S.A.
This work was prepared by me or under my direct supervision
Robert K.Y. Lee
Licensed Professional Land Surveyor
Certificate Number 5075
Scale: 1" = 40'
TOWILL, SHIGEOKA & ASSOCIATES, INC.
Land Surveyors
1273 Queen Emma Street
Honolulu, Hawaii 96813
TSA 82967
Rev. Feb. 21, 2004

FIGURE 3

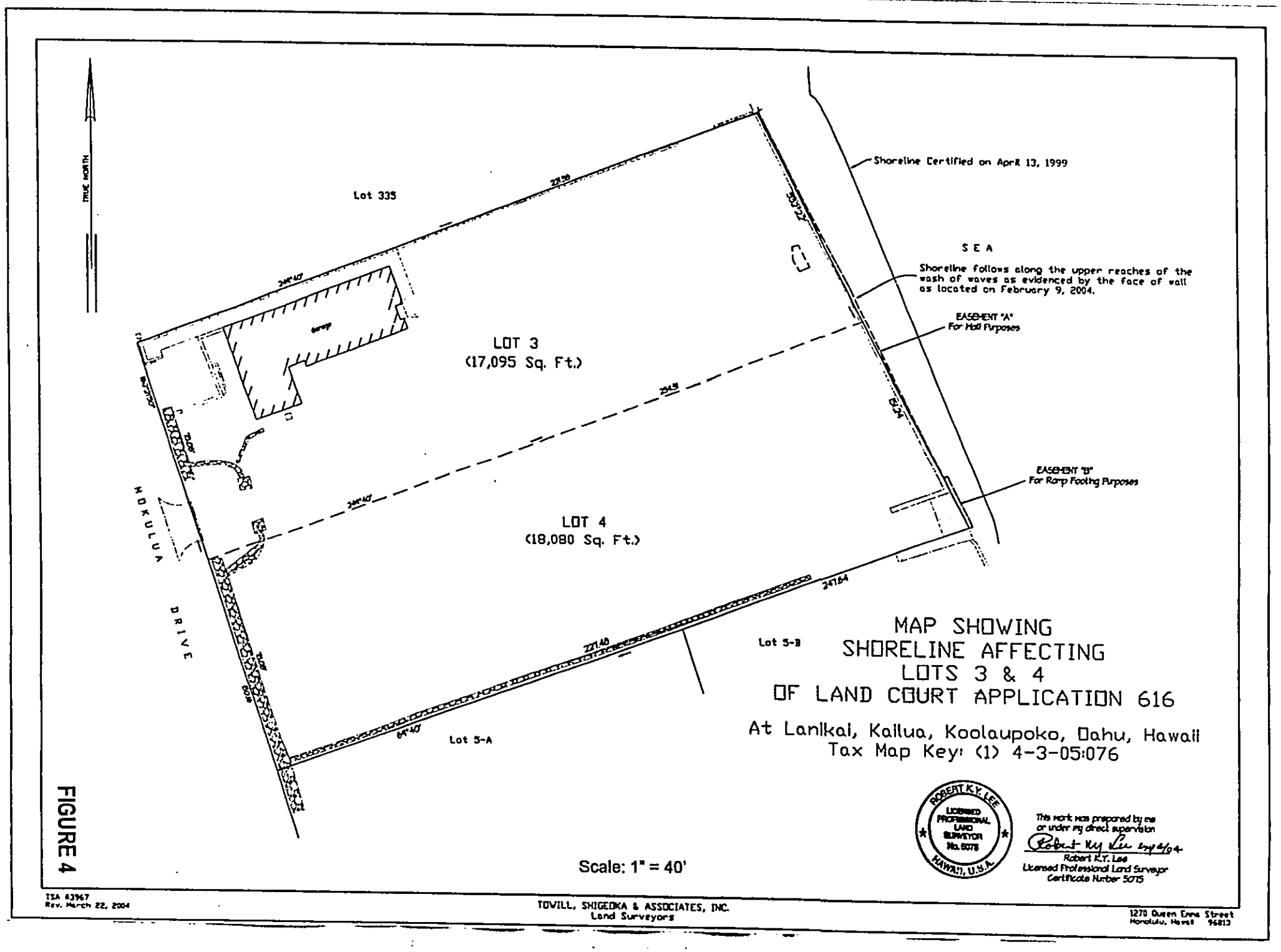
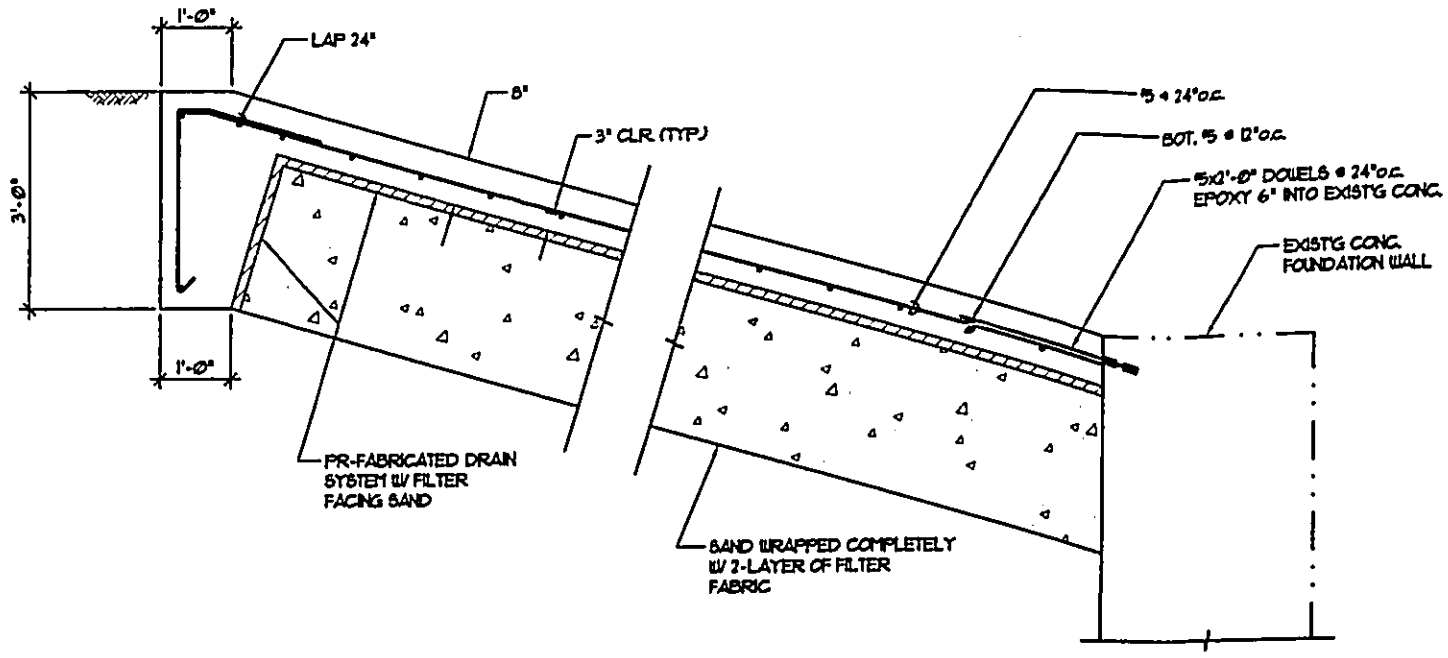
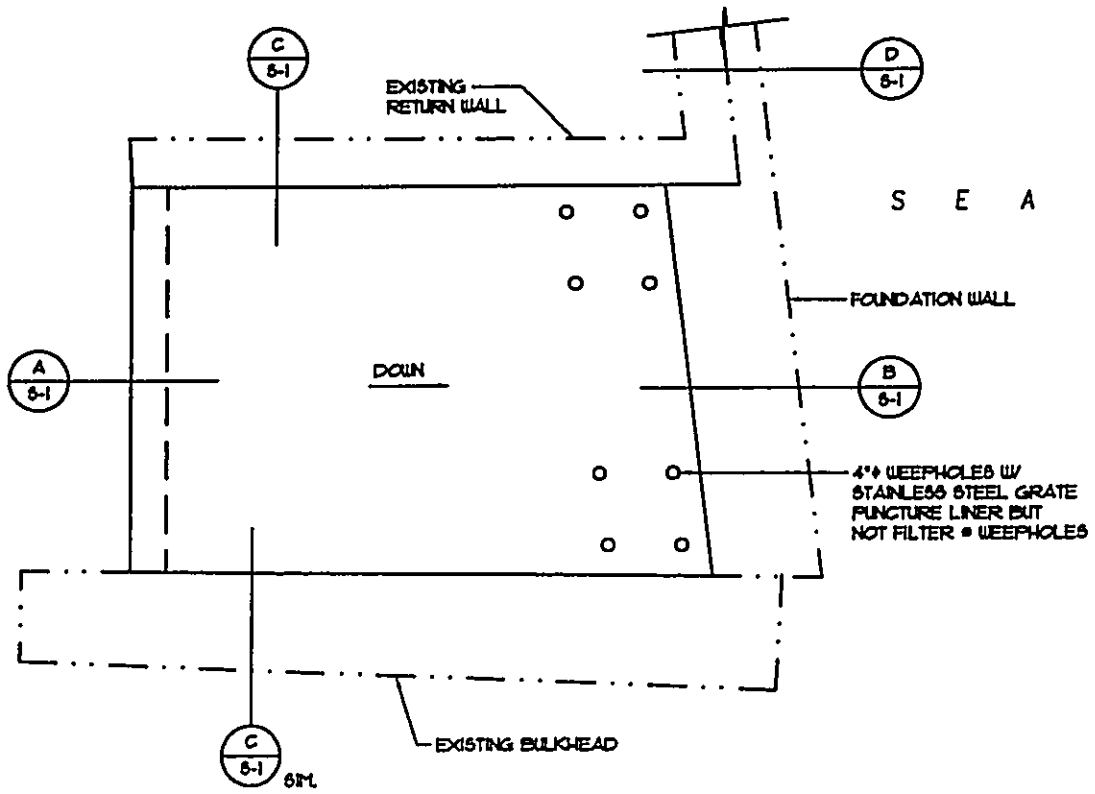

TRUE NORTH
Lot 335
LOT 3
(17,095 Sq. Ft.)
LOT 4
(18,080 Sq. Ft.)
Lot 5-A
Lot 5-B
MOKULUA DRIVE
Shoreline Certified on April 13, 1999
S E A
Shoreline follows along the upper reaches of the wash of waves as evidenced by the face of wall as located on February 9, 2004.
EASEMENT "A"
For Mall Purposes
EASEMENT "B"
For Ramp Footing Purposes
MAP SHOWING
SHORELINE AFFECTING
LOTS 3 & 4
OF LAND COURT APPLICATION 616
At Lanikai, Kailua, Koolaupoko, Oahu, Hawaii
Tax Map Key: (1) 4-3-05:076
ROBERT K.Y. LEE
LICENSED PROFESSIONAL LAND SURVEYOR
No. 5075
HAWAII, U.S.A.
This work was prepared by me or under my direct supervision
Robert K.T. Lee
Licensed Professional Land Surveyor
Certificate Number 5075
Scale: 1" = 40'
TSA 43967
Rev. March 22, 2004
TOVILL, SHIGEOKA & ASSOCIATES, INC.
Land Surveyors
1270 Queen Emma Street
Honolulu, Hawaii 96813

FIGURE 4

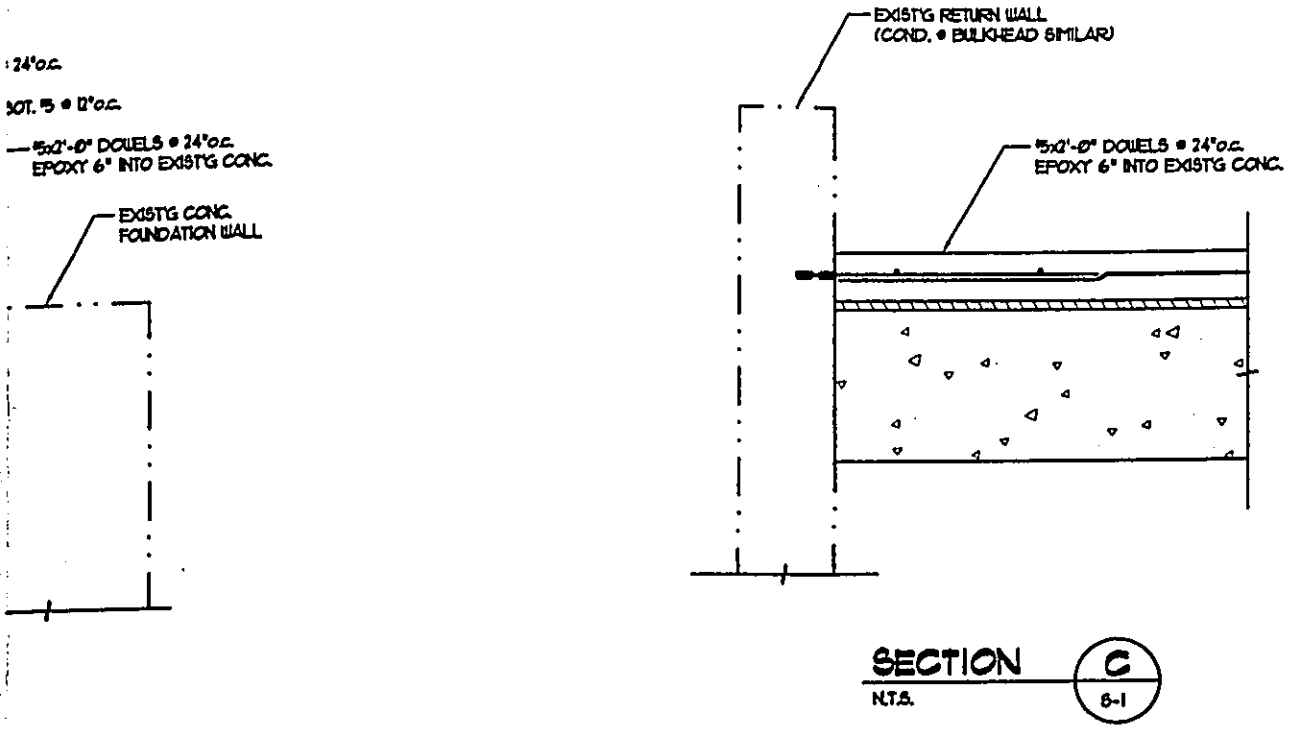


SECTION A
N.T.S.
S-1

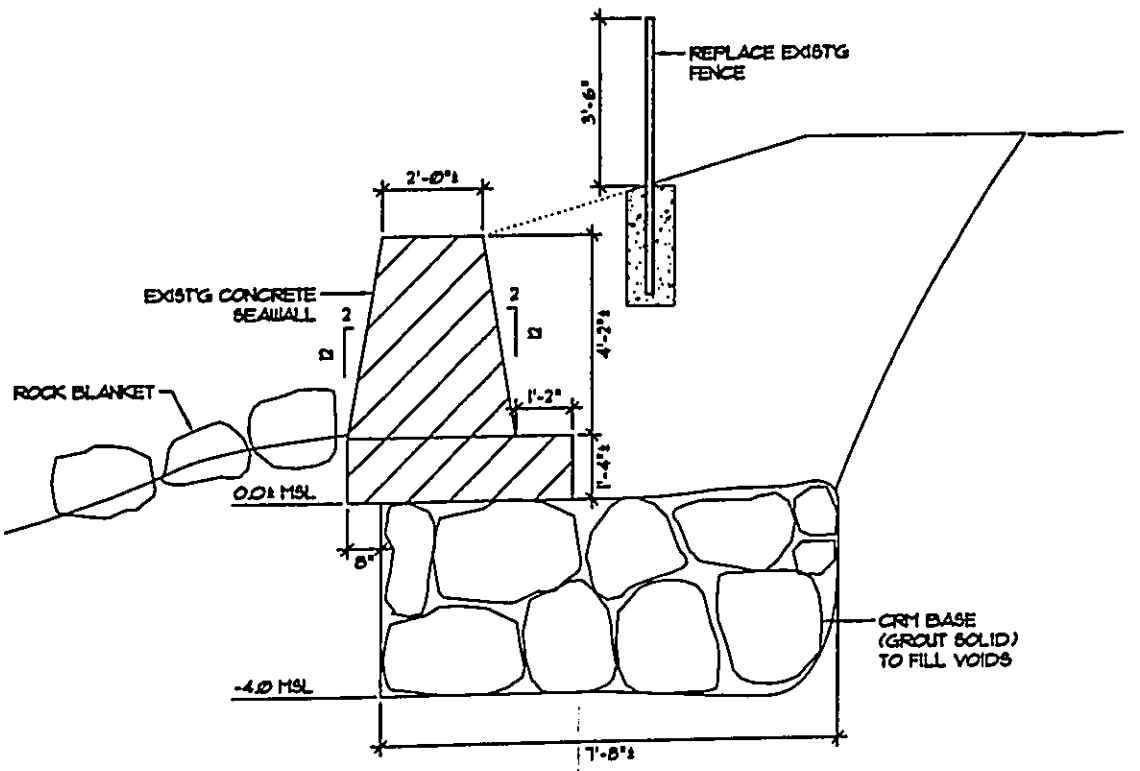
SECTION B
N.T.S.
S-1



PLAN - BOAT RAMP REPAIR
AT 1240 MOKULUA
N.T.S.



SECTION C
N.T.S.
S-1



1240 MOKULUA SEAWALL REPAIR
N.T.S.
D
S-1

FIGURE 5

Plan for Seawall Foundation and Boat Ramp Repair, 1240 Mokulua Drive, Lanikai

Appendix A

EKNA Services, Inc.

Engineers
and
Environmental
Consultants

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Planning
Surveys
Computer
Modeling

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CN 2437-00R#

October 22, 2004

Mr. Eric G. Crispin, AIA
Director of Planning and Permitting
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Subject: New Foundation and Repairs to Existing Seawall/Ramp
1240 Mokulua Drive, Lanikai, Oahu, Hawaii
TMK: 4-3-05:76

Dear Mr. Crispin:

This letter report provides an updated Coastal Engineering Evaluation of the littoral processes affecting the Lanikai coastline, and responds to relevant comments received on the Draft Environmental Assessment for improvements and repairs to the existing seawall and ramp on the subject parcel. It is intended to be included with the Coastal Engineering Evaluation in Appendix A of the Environmental Assessment.

Prepared in 1997, the Coastal Engineering Evaluation (CEE) specifically addresses a property located 315 feet to the south of the subject property. The CEE also contains a large amount of information that is relevant to the subject property – i.e., information about coastal processes, the history of shoreline changes in southern Lanikai, characteristics of alternative shore protection structures, and potential littoral impacts. The purpose of this letter report is to provide additional information about the history of erosion in this reach of shoreline as well as to add some analysis specific to the subject proposal.

Historical Shoreline Changes

Lanikai's beaches have been undergoing net long-term erosion for over 35 years. The coastal reaches at both the northern and southern end of Lanikai are devoid of dry beach, and beach erosion is progressing towards the middle section of this coastline. The coastal reach from Wailea Point northward for over half a mile is devoid of dry beach, and various types of seawalls and revetments protect the homes and properties along this shoreline.

The CEE discusses a 1989 report that analyzed shoreline erosion in south Lanikai. The map in Attachment 1 shows the 2,500-foot reach of shoreline analyzed in the 1989 report. Attachments 2a and 2b to this letter present an Erosion Chronology and a Shore Protection Record, respectively, for a 1,200-foot shoreline reach that overlaps the earlier study area and extends farther north.

Conducted by Edward K. Noda and Associates, Inc. (now EKNA Services, Inc.), the 1989 study revealed that the southern end of Lanikai had experienced considerable accretion and subsequent erosion over a long-term period from 1950 to the 1980s. Figure 4 in the Coastal

Engineering Evaluation depicts the average change of the vegetation line and beach toe line over this time period. Many of the property owners legally extended their property boundaries seaward by claiming the lands that accreted during the 1950s and 1960s. From 1970 to the early 1980s, this shoreline reach eroded back to the approximate 1950s position. Most of the seawalls were constructed in response to this erosion cycle. This long-term erosion cycle was not unique to Lanikai. Similar shoreline movement occurred at Kailua Beach Park, as documented in our 1989 study and shown in Figure 4.

Since the 1980s, erosion has progressively moved northward towards the central portion of the Lanikai shoreline. Attachment 2a chronicles the erosion damages to 16 properties northward of the public ROW near Pokole Way to the subject property. Attachment 2b chronicles the construction of shore protection along this reach. Seawalls that were constructed 40 years ago or so have become exposed by erosion, damaged by winter storms, and repaired or reconstructed. Owners of the few properties that did not have shore protection were forced to install SEAbags for emergency protection. Subsequently, all but one have built permanent shore protection structures after obtaining the required permits. Attachment 3 is a recent aerial photo that reveals the extent of beach loss along this southern half of Lanikai. Of the five properties that are shown with SEAbags, four have since constructed permanent protective structures.

Potential Littoral Impacts

The erosion that is occurring along the Lanikai shoreline can be described as "passive" erosion (in contrast to "active" erosion which is induced or accelerated by shore protection structures). When a protective structure is built along an eroding shoreline and erosion continues to occur, the unprotected shoreline adjacent to the structure will continue to erode and eventually migrate landward beyond the structure. The result will be loss of beach in front of the shore protection structure as the water deepens and the shoreface profile migrates landward. This process is designated as passive erosion and is the result of fixing the position of the shoreline on an otherwise eroding stretch of coast. Passive erosion proceeds independent of the type of shore protection constructed. This is the most common result of shoreline hardening in Hawaii, and is the probable long-term consequence of the existing and new seawalls at Lanikai.

The seawalls do not foreclose the possibility of future restoration of the beach, whether by natural or artificial means. In the 1960s and 1970s, seawalls were built along the central portion of Lanikai Beach that was then suffering erosion but subsequently experienced accretion through the 1980s. Along the middle part of Lanikai Beach, accreted sand had built up the beach in front of the seawalls, including the subject property's seawall, in some cases almost to the full height of the walls. As erosion is continuing to progress along this coastline, some of these walls are now becoming exposed. If major beach replenishment/restoration is implemented along the Lanikai shoreline, the subject seawall and other shore protection structures will not adversely affect the design and performance of the restored beach. Periodic nourishment requirements cannot be predetermined with a high degree of assurance (because erosional forces are dependent on the wind/wave climate), and therefore severe erosion of the beach can result in damage to unprotected residential dwellings before renourishment can be implemented. However, if properties are already protected with a seawall or other shore protection measure, then this provides flexibility in the time frame for implementation of subsequent renourishment, without the worry of imminent erosion or wave damage to residential improvements. Thus, a long-term beach replenishment/restoration program can be designed for the sole purpose of maintaining recreational beaches, rather than to serve in the additional capacity of providing shore protection to dwellings.

None of the shore protection structures, including appurtenant features such as the "protective rock blanket" fronting the seawall on the subject property, have any influence on the ongoing erosion occurring along this coast. The purpose of the rock blanket was presumably to protect the base of the existing seawall, which was becoming scoured and undermined by the progressive erosion loss of the fronting beach during the cycle of erosion along this central portion of the Lanikai shoreline. This period of erosion in central Lanikai corresponds to the period of accretion to the southern end of Lanikai. When the cycle reversed, both the rock blanket and the seawall became buried by the beach. The removal of this rock blanket following the completion of the new foundation for the seawall will have no influence on the littoral processes. However, because the rock blanket presently is unsightly and is somewhat of a hazard for persons traversing the shoreline, it will be beneficial to remove the rocks to the extent practicable.

Consideration of Alternatives

Removal of the existing seawall and replacing it with a different type of shore protection measure is possible for this property, since there is currently no building improvement on the seaward portion of the lot. However, there is nothing to be gained from the replacement of the seawall with another type of shore protection. Seawalls exist on both sides of the subject property. A sloping revetment would necessarily require the construction of flank walls to protect the adjacent properties. Since the revetment toe would be in line with the existing adjacent seawalls, the top of the revetment slope would be located about 16 feet landward of the adjacent seawalls (assuming a property grade elevation of about 8 feet above MSL and 1V:2H revetment slope). Replacing the seawall with a sloping revetment structure will not improve the existing shoreline access. As well, there is no reason to expect that a revetment would halt the ongoing erosion along this coast. Revetments protect about 300 feet of shoreline south of the project site. There is no difference in behavior of the beach fronting the existing revetments and seawalls along this coastal reach.

Removing the seawall (which is functioning as a retaining wall), without constructing replacement shore protection, would result in immediate loss of at least 50 feet of property as the shoreline attempts to achieve a stable slope. The adjacent properties would be impacted as their existing seawalls become flanked. Removal of the seawall and attempting to protect the property using vegetation is not a viable shore protection option. Naupaka, once prevalent along this coastal reach, is no match for wave forces that impact this shoreline. Vegetation, no matter how hardy, will not prevent erosion and wave damage on an eroding coast.

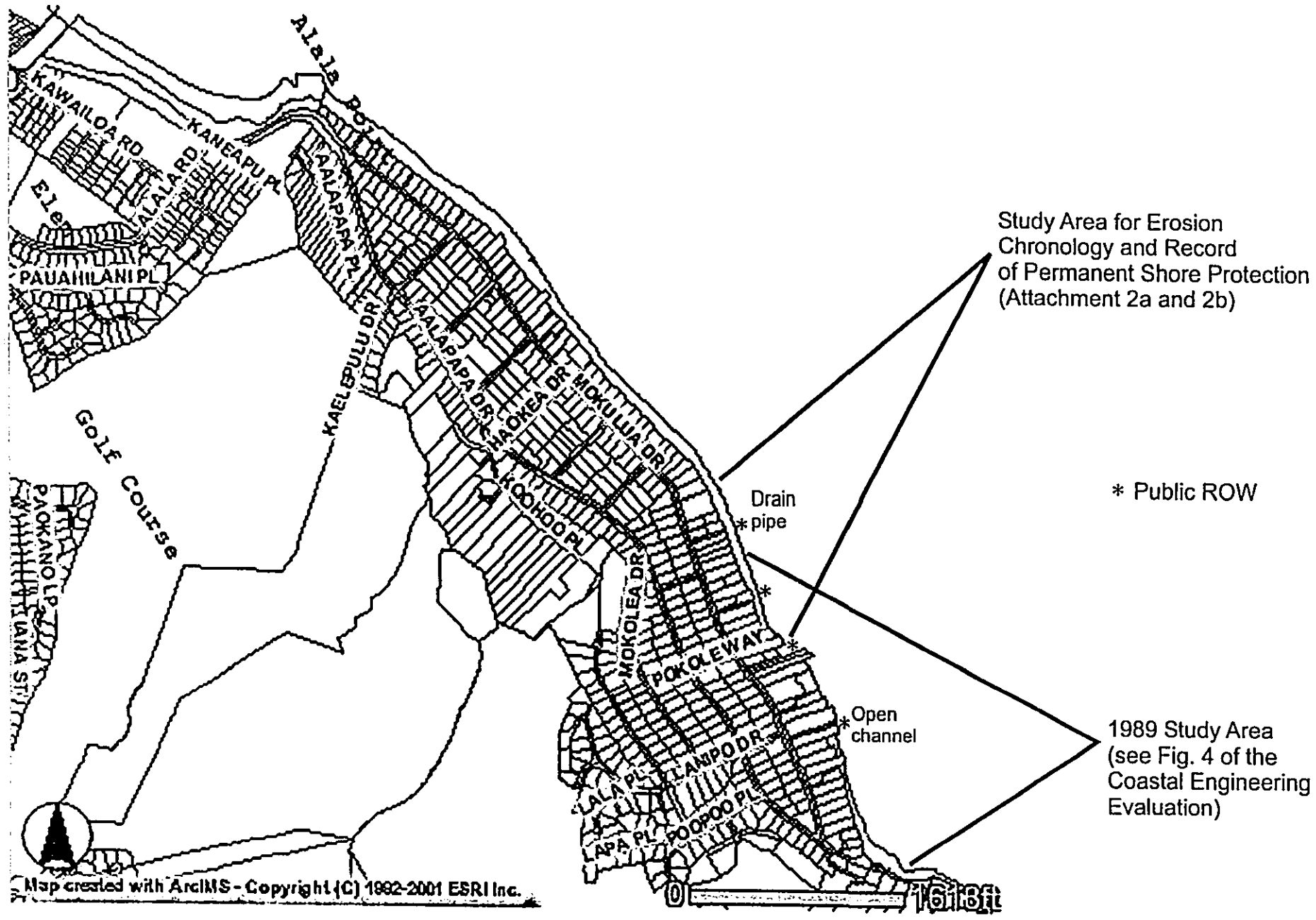
I trust that this letter report addresses the issues raised during the review of the Draft Environmental Assessment.

Very truly yours,

Elaine E. Tamaye
President

Attachments

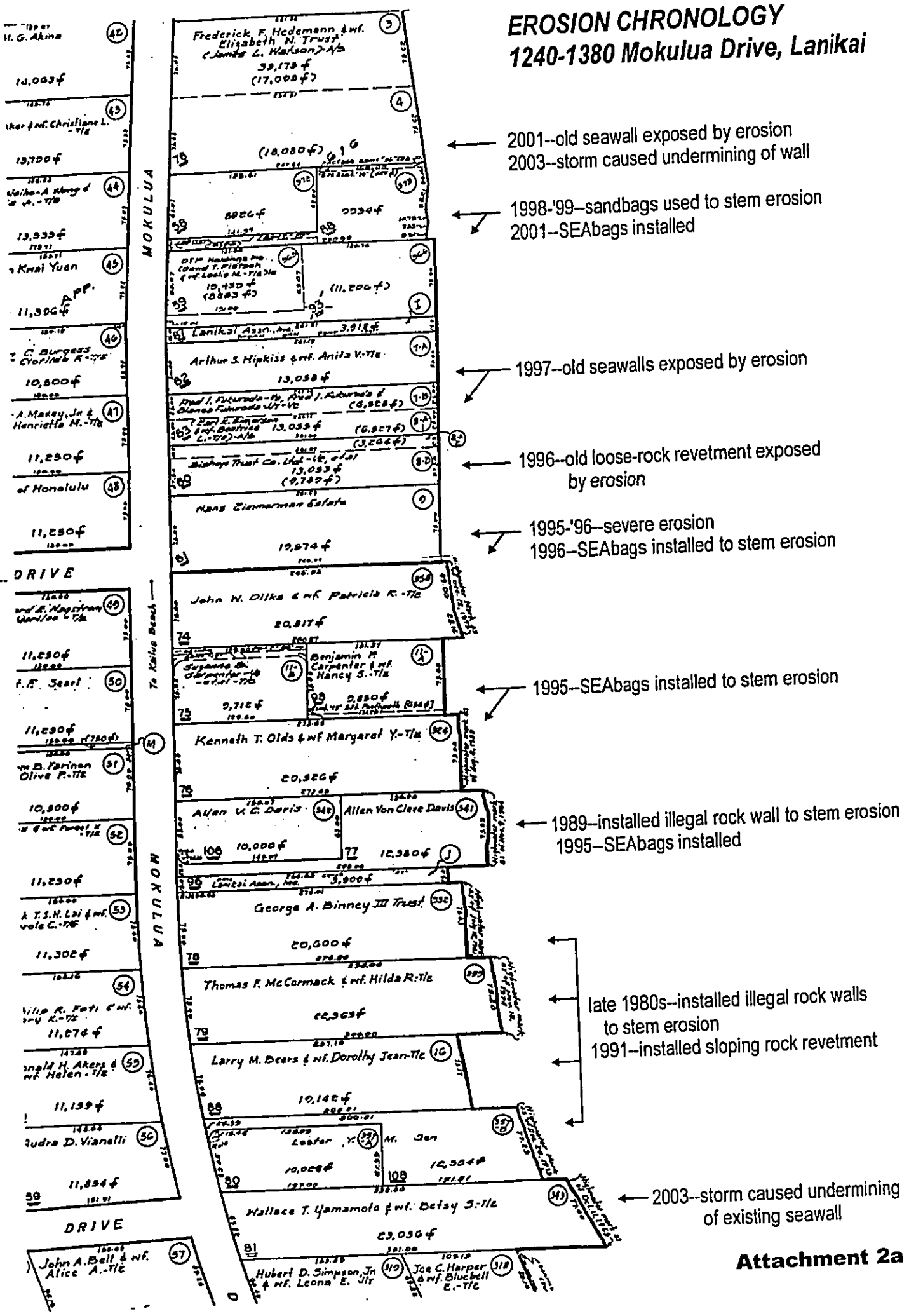
Cc: Mr. Robin Foster



Approx. Scale 1" = 1000'

Attachment 1

EROSION CHRONOLOGY
1240-1380 Mokulua Drive, Lanikai



2001--old seawall exposed by erosion
2003--storm caused undermining of wall

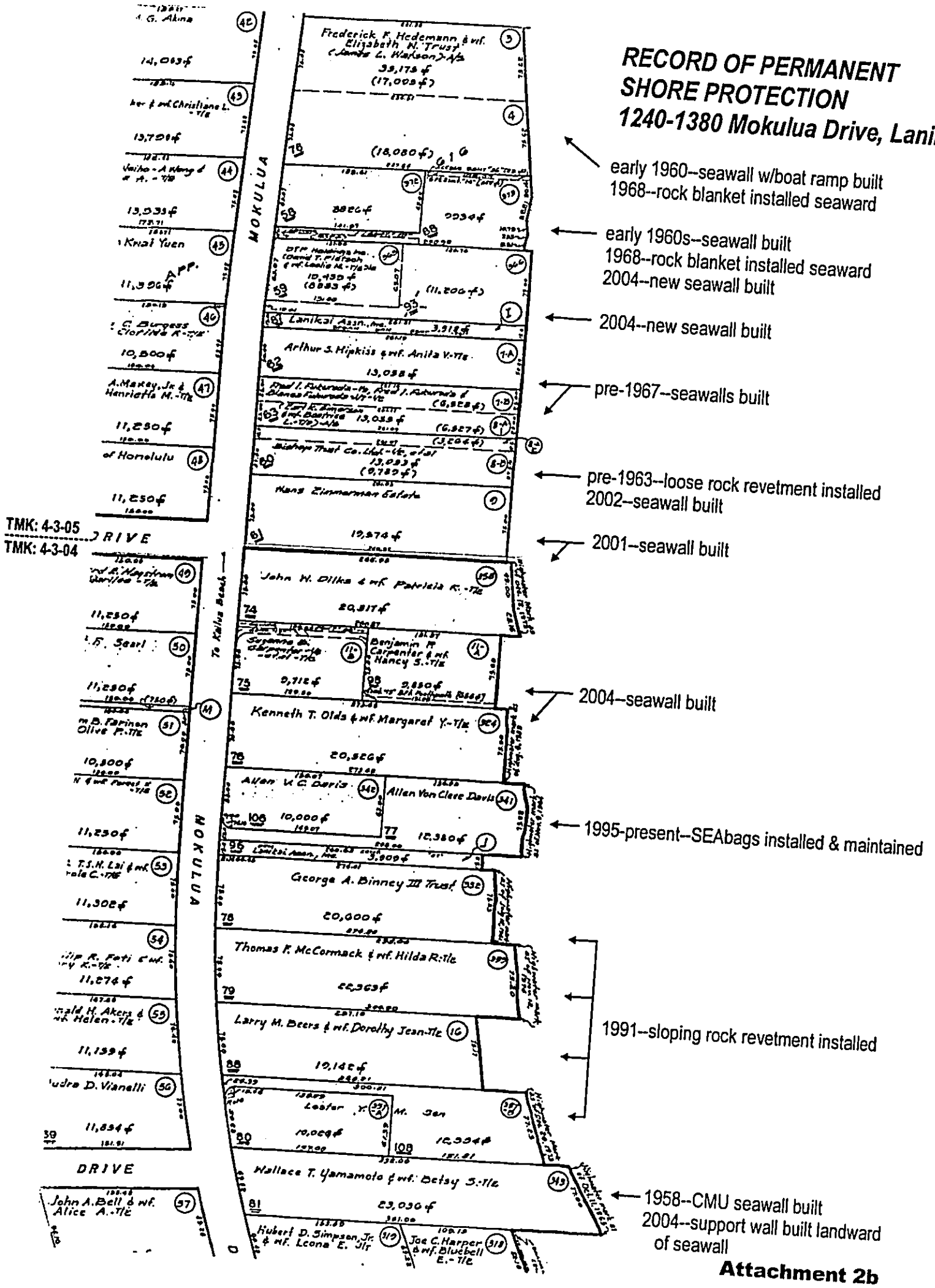
1998-'99--sandbags used to stem erosion
2001--SEAbags installed

1997--old seawalls exposed by erosion

1996--old loose-rock revetment exposed by erosion

1995-'96--severe erosion
1996--SEAbags installed to stem erosion

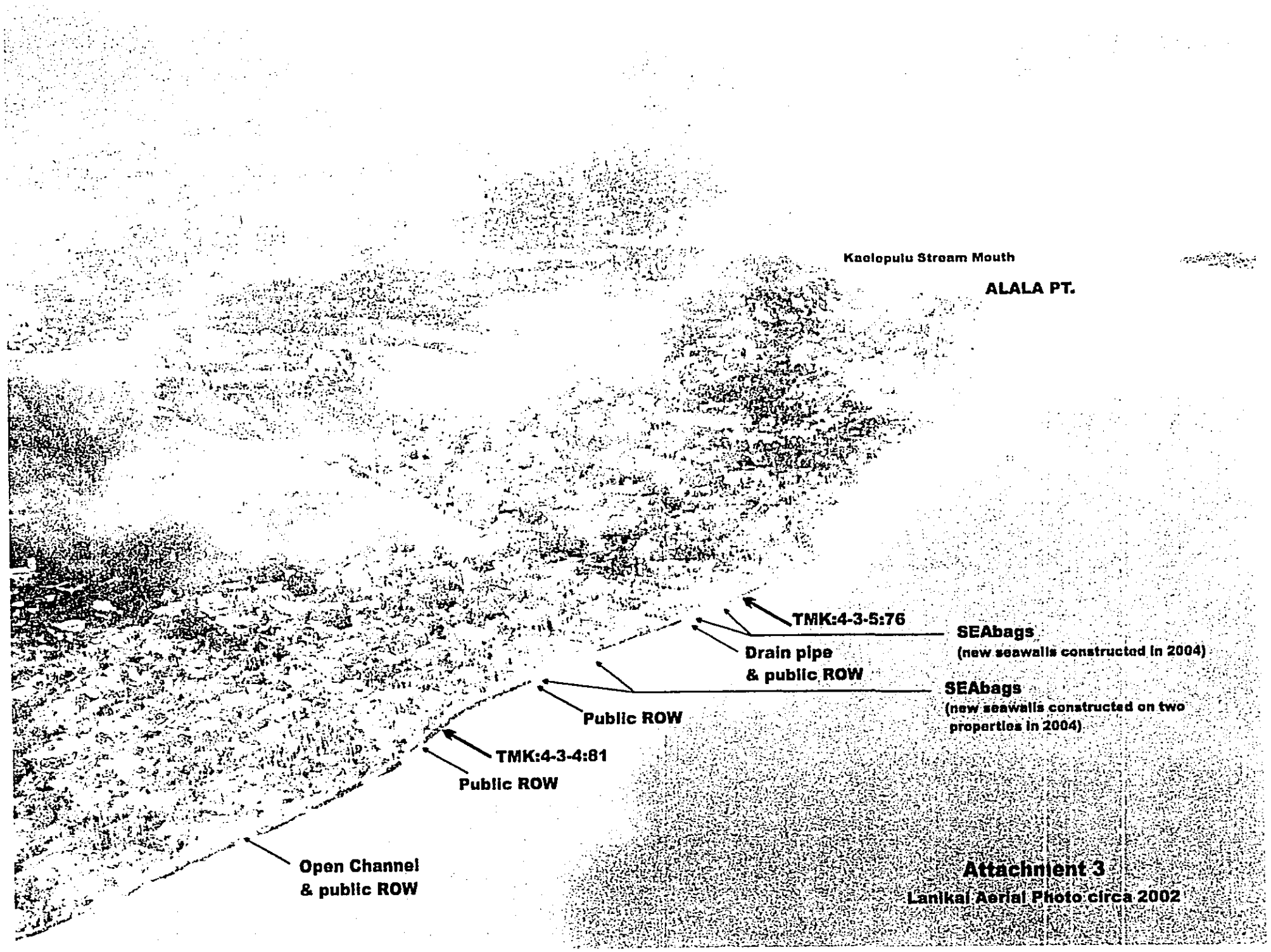
Attachment 2a



RECORD OF PERMANENT SHORE PROTECTION
1240-1380 Mokulua Drive, Lanikai

- early 1960--seawall w/boat ramp built
  1968--rock blanket installed seaward
- early 1960s--seawall built
  1968--rock blanket installed seaward
  2004--new seawall built
- 2004--new seawall built
- pre-1967--seawalls built
- pre-1963--loose rock revetment installed
  2002--seawall built
- 2001--seawall built
- 2004--seawall built
- 1995-present--SEAbags installed & maintained
- 1991--sloping rock revetment installed
- 1958--CMU seawall built
  2004--support wall built landward of seawall

Attachment 2b



Attachment 3
Lanikai Aerial Photo circa 2002

Edward K. Noda and Associates, Inc.

Engineers and Environmental Consultants

Engineering
Planning
Surveys
Computer Modeling

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CN 2437

March 22, 2004

Mr. Eric G. Crispin, AIA
Director of Planning and Permitting
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Subject: Draft Environmental Assessment (DEA)
Shoreline Setback Variance for Seawall and Ramp Repairs
1240 Mokulua Drive - Lanikai
TMK: 4-3-005:076

Dear Mr. Crispin,

At the request of Mr. Robin Foster of PlanPacific, Inc., I have reviewed the subject DEA and proposed repairs to the seawall and ramp on the subject property owned by the Elizabeth R. Grossman Family Trust at 1240 Mokulua Drive in Lanikai. Following are my comments:

1. Erosion is continuing to occur along this portion of Lanikai Beach. As you know, Edward K. Noda and Associates, Inc. (EKNA) is very familiar with the past history of shoreline changes, having provided coastal engineering services to numerous Lanikai homeowners, including Mr. John Dilks who owns two contiguous properties south of the applicants' lots (TMK: 4-3-04:74 and 4-3-05:61).

2. The Coastal Engineering Evaluation report prepared by EKNA for the Environmental Assessment to support the SSV for Mr. Dilks' seawall is also applicable and appropriate to the subject property. The property has an existing seawall that is becoming undermined due to the continuing erosion. The existing ramp has already collapsed due to leaching of sand from beneath the structure. Repairs to the foundation of the seawall and ramp will be performed from the landside. The work will have no significant impact on the existing coastal processes. I have recommended to Mr. Foster that our report be included in entirety as an Appendix in his Environmental Assessment to provide the required coastal engineering information to support his SSV application.

3. After the seawall foundation work and replacement ramp are completed, the existing rocks fronting the base of the existing seawall may be removed. The foundation support for the seawall will extend deep enough to mitigate scouring and undermining of the base of the seawall.

Very truly yours,

Elaine E. Tamaye
President

cc: Mr. Robin Foster

Edward K. Noda
and
Associates, Inc.

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and
Environmental
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COASTAL ENGINEERING EVALUATION FOR A SHORE PROTECTION STRUCTURE AT LANIKAI, OAHU, HAWAII (TMK:4-3-4:74 and 4-3-5:61)

Prepared by:

Edward K. Noda and Associates, Inc.
615 Piikoi Street, Suite 300
Honolulu, Hawaii 96814

(EKNA Control No. 1781)

December 1997
(Revised)

Coastal Engineering Evaluation
for a Shore Protection Structure at Lanikai, Oahu, Hawaii

1.0 LOCATION AND PROBLEM IDENTIFICATION

The project site is located along two (2) contiguous parcel shorefronts at Lanikai, at 1286 and 1302 Mokulua Drive (TMK: 4-3-4:74 and 4-3-5:61). Both parcels are owned by John Dilks. Figure 1 shows the general site location and Figure 2 provides portions of the Tax Map Key for both parcels.

Because of severe ongoing erosion to these two parcels, particularly during the 1995-1996 winter season, emergency sandbag protection was initiated in April 1996 and completed in May 1996. The SEAbags[1] were placed along the eroded escarpment to form a protective slope. Authorization for this work was obtained from the State of Hawaii Department of Land and Natural Resources (DLNR) and from the U.S. Army Corps of Engineers. Coordination with the City and County Department of Land Utilization was also undertaken.

Unusually large North Pacific swell during November 1996 caused severe shoreline erosion and wave overtopping damage to the windward Oahu coastline. While properties adjacent to the subject parcels suffered additional erosion damage, the emergency sandbag protection prevented significant additional damage to the shoreline embankment fronting the subject properties. However, damage and loss of individual SEAbags did occur, causing slumping of the protective structure and scouring at the crest. Significant wave overtopping also caused sand and water damage to the house and property.

Because the beach fronting this Lanikai coastline is continuing to erode, and because the SEAbag structure was intended as only a temporary emergency measure, the property owner desires to construct a permanent shore protection structure. In accordance with Ordinance No. 92-34 and the Shoreline Setback Rules and Regulations of the City and County of Honolulu, this coastal engineering evaluation is prepared in support of an application for a Shoreline Setback Variance for a permanent shore protection structure extending across the two subject parcels.

---

[1]Trade name for large sand bags from Bulk Lift International, designed for beach erosion protection.

2.0 SHORELINE CHARACTERISTICS AND COASTAL PROCESSES

Lanikai's beaches have been undergoing net long-term erosion over the past 30 years or so. The coastal reaches at both the northern and southern end of Lanikai are devoid of dry beach, and beach erosion is progressing towards the middle section of this coastline. Various types of seawalls and revetments protect about 2,500 feet of shoreline reach northward of Wailea Point (at the south end of Lanikai) and about 1,500 feet of shoreline reach southward of Alala Point (at the north end of Lanikai). A narrow beach remains along about 3,000 feet of shoreline in the middle segment, but erosional processes are continuing to affect this reach with the starving of sediment from the endpoints of the Lanikai coast.

The project site is located at the southern boundary between the "unprotected" middle segment and "armored" southern end of Lanikai. Beach and shoreline erosion has been steadily progressing northward into the "unprotected" middle segment. Where a narrow dry beach (above the limits of typical wave uprush during high tide) fronted the project site about 7 years ago, now there is no dry beach as well as additional loss of about 10-20 feet of shorefront property. The shoreline escarpment is within about 10 feet of the house foundation on parcel 74, which prompted the owner to construct emergency SEAbag protection.

Figure 3 is a shoreline survey that was performed in February 1996 just prior to the placement of the SEAbags. The SEAbags were stacked against the shoreline embankment to prevent further erosion of the property which could lead to damage to the house foundation. If not for the SEAbags, the large winter waves of November 1996 would certainly have caused more serious damage to the house. Although significant wave overtopping and wave splash carried sand and water onto the property and dwelling, the SEAbags prevented significant additional shoreline erosion and potential undermining of the house foundation. However, in preventing significant additional erosion of the shoreline, the SEAbag protective structure did suffer damage from these storm waves, compromising the integrity of the structure. Storm wave damage, coupled with the ongoing problem of vandalism (bags intentionally or unintentionally cut by beach users and fishermen), had resulted in significant damage and loss of individual SEAbags within a 6-month period following the initial placement of the emergency structure. The owner subsequently replaced the damaged bags to restore the SEAbag revetment structure to its approximate original configuration.

Although the wave climate along the Lanikai shoreline is relatively mild because of the protection afforded by the shallow offshore fringing reefs and islands, ongoing beach erosion threatens properties and homes that are not fronted by wave protective structures. Typical nearshore wave heights are 1 foot or less, with typical maximum wave heights less than 2 feet. Extreme breaking wave height at the shoreline is estimated to be less than 4.8 feet at the project site.

Beaches protect the shoreline by dissipating wave energy through wave breaking and runup processes. However, as beaches narrow because of ongoing erosion processes, more wave energy reaches the shoreline or "fastlands" mauka of the beach, causing erosion damage to the private properties. Property owners typically lose substantial property area and are faced with increasing danger of losing houses and other improvements to erosion damage before they are compelled to expend substantial amounts of money to erect shore protection measures. As in this case for the subject project, combined loss to erosion of almost 3,000 square feet has occurred for the two parcels, and erosion is threatening the foundation of the house and pool.

The nearshore wave approach patterns are complex due to interactions between the wave trains and the irregular offshore reefs and islands. In general, within the Lanikai littoral cell, net transport is predominantly northward from Wailea Point during summer months due to easterly tradewind-generated waves and southeasterly swell that may reach this coastal area, and southward from Alala Point during winter months due to North Pacific swell. This accounts for the greatest loss of beach at the endpoints of the Lanikai littoral cell, and the greater stability of beach area within the middle segment. Because there is a deficit of sand at the southern end of Lanikai, there is little sand transport towards the project site during predominant easterly tradewind wave conditions. During periods of more northerly tradewind waves and in winter months when northerly swell can occur, southward longshore transport of sand from the beaches in the middle segment of Lanikai can result in some buildup of sand along the project reach. However, because winter North Pacific swell can be more energetic than typical tradewind waves, they can also cause more wave damage to properties that are already vulnerable to erosion damage because of narrow or non-existent dry beach area.

3.0 HISTORIC BEACH AND SHORELINE CHANGES

Data from a prior study[2] indicates that the southern end of the Lanikai shoreline has experienced considerable accretion and subsequent erosion over a long-term period from 1950 to the 1980s, while the middle segment has been relatively more stable. It is evident that the erosion trend is continuing at present, and progressing into the middle segment.

Between 1950 and 1970, the southern end of Lanikai accreted substantially, a maximum of about 200 feet near the Lanipo Drive drainage channel. Over a 2,500 feet length of shoreline north of Wailea Point, average accretion of the vegetation line was 50 feet and about 90 feet for the beach toe line, over the 20-year period. From 1970 to the early 1980s, this shoreline reach eroded back to the approximate 1950s position. Most of the seawalls were constructed in response to this erosion cycle. This long-term accretion-erosion cycle was not unique to Lanikai, as similar shoreline movement occurred at Kailua Beach Park. Figure 4a shows the average cumulative movement of the shoreline at the southern end of Lanikai, and Figure 4b shows the historical shoreline movement at Kailua Beach Park at the location of two transects northward of the boat ramp. The long-term accretion-erosion cycle was a natural process, possibly caused by shifts in wind and wave patterns. In general, long-term cycles have been observed in meteorological trends and it has been postulated[3] that there is a cycle with an appropriate period involving the variation in mean direction of the tradewinds near the Hawaiian Islands.

The seawalls and revetments armoring the entire southern end of Lanikai were constructed in response to the erosion cycle to protect existing residential improvements, and were not the cause of the erosion. Their influence now, however, may be to discourage sand buildup because of the increase in reflectivity. Deficit of sand along this southern end of Lanikai is causing a gradual shift of the erosion trend northward into the middle segment of the Lanikai coast which historically has been relatively stable. The project site is in the transition zone between the armored

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[2]Based on analysis of historical aerial photos as described in the study report "HAWAII SHORELINE EROSION MANAGEMENT STUDY, Overview and Case Study Sites (Makaha, Oahu; Kailua-Lanikai, Oahu; Kukuiula-Poipu, Kauai)", prepared by Edward K. Noda and Associates, Inc. and DHM Inc., for the Hawaii Coastal Zone Management Program, Office of State Planning, June 1989.

[3]Wyrtki, K. and G. Meyers, (1975), "The Trade Wind Field Over the Pacific Ocean - Part 1. The Mean Field and the Mean Annual Variation", Hawaii Institute of Geophysics Report HIG-75-1.

southern end of Lanikai and the middle segment that has undergone relatively small fluctuations in the position of the shoreline and beach. Because there is no evidence that the long-term erosion cycle in the vicinity of the project site is likely to reverse, the subject property owner and others to the north will likely suffer progressive erosion damage, and have little recourse but to build shore protection structures to prevent erosion damage to their homes.

About seven years ago, four property owners with unpermitted seawalls were required to remove the walls and replace them with sloping revetment structures. The prevailing opinion at that time was that sloping revetment structures were less harmful to the beach than vertical seawalls. These four contiguous properties are located about 200 feet south of the project site, on the south side of the public right-of-way (TMK:4-3-4:96). The property on the immediate north side of the public right-of-way (TMK: 4-3-4:77) was the last armored property along this southern reach at that time, also with an unpermitted shore protection structure.

After lengthy litigation with the City and County, a settlement agreement was reached with the property owner of parcel 77. The settlement agreement required that the unpermitted rock slope be removed and a system of sand-filled bags would be used initially to construct a protective revetment structure. Because the Lanikai Community Association was considering pursuing a comprehensive plan for replenishment or restoration of sand along the Lanikai shoreline, the sand bag system would serve as interim protection until such time as the beach was restored. However, because of the uncertainty of the beach restoration program and the questionable long-term durability of the sand bag revetment under storm wave attack and continued beach erosion, the property owner would be permitted to construct a permanent rock revetment if and when the sand bag revetment does not serve to adequately prevent erosion and wave damage to the property. The settlement agreement also included the adjacent parcel 76 (on the north side of parcel 77) and parcel 96 (the public right-of-way on the south side of parcel 77).

The sand bag work was initiated in late 1995. By February 1996, SEAbags had been placed along parcels 77, 76 and 98 (parcel 98 is adjacent to subject parcel 74). SEAbags were not only stacked along the shoreline embankment, but were also placed seaward of the shoreline to form a somewhat protective breakwater berm seaward of the beach toe. The offshore berm was apparently intended to function by tripping the waves and, in the process, trapping suspended sand landward of the berm to rebuild

the beach. The SEAbags on the adjacent properties did not survive the 1995-1996 winter season very well. The SEAbag revetment on adjacent parcel 98 had to be rebuilt in February-March 1996, and by that time, the property owner of the two subject parcels had suffered extensive erosion damage. Photos 1 through 8 show the condition of the subject properties and adjacent properties in February-March 1996.

Whether the SEAbag work undertaken on the adjacent parcels aggravated the erosion on the subject parcels is speculative. However, the erosion that was experienced during that 1995-1996 winter season was particularly severe, prompting the subject property owner to also construct a SEAbag revetment as an emergency shore protection measure. The SEAbag revetment on the subject parcels was initiated in April 1996 and was substantially completed in May 1996. Photos 9 through 11 show the completed SEAbag revetment on the subject parcels and the condition of adjacent properties in June 1996. In November 1996, severe winter waves caused additional damage to the already deteriorated SEAbag system on the adjacent parcels, and also caused some damage to the SEAbag revetment on the subject parcels. Erosion damage to the adjacent unprotected property on the north side of the subject parcels also occurred. In early 1997, the subject property owner replaced the damaged SEAbags to restore the condition of his SEAbag revetment.

Photos 12 through 17, taken in May 1997, show the existing condition of the SEAbag revetment on the subject parcels and the condition of adjacent properties. Note that the shoreline fronting the adjacent properties to the south is continuing to be modified by placement of SEAbags, removal of prior SEAbags that were damaged, placement of additional beach sand obtained from offsite source(s), and possibly mechanical re-distribution of sand in the nearshore area. While the details are unclear, apparently the work is being done as part of a demonstration pilot project for beach replenishment by the Lanikai Beach Management Committee.[4] A Departmental Permit for use within the Conservation District was issued by the Board of Land and Natural Resources on June 3, 1996 for the demonstration beach replenishment project. A condition of the permit was the requirement to perform pre-, during-, and post-construction beach profile monitoring and topographic monitoring for at least a year. The first monitoring report for the "Pilot Research Project" was filed in September 1997 by David Lipp, the coastal engineer who is monitoring the project on a volunteer basis. The report

[4]Reference: Conservation District Use Application for a Demonstration Pilot Project for Beach Replenishment on State-owned Submerged Lands Identified as Offshore at Kailua, Oahu, File No. OA-2802, dated May 31, 1996, Department of Land and Natural Resources.

includes time series graphs of beach profiles for five transects along the shoreline. Each graph shows data from four observations made between September 1995 and June 1997. Attached as Appendix A, Lipp's report states that sand movement into the area over time is due to environmental conditions, not the SEAbags themselves. According to Lipp, *"What is important to note is that the sandbags did not prevent the beach from reforming."*

The monitoring report and its conclusions were reviewed in a memorandum dated September 8, 1997, which is attached as Appendix B. In summary, the review:

(1) concurred with Lipp's conclusions and commented on the seasonal movement of sand on Lanikai Beach;

(2) pointed out that there was no evidence of restoration of any dry beach area and that, without the SEAbags protecting the properties, there could have been greater loss of fastlands;

(3) observed that quarterly measurements would account for seasonal changes and provide more meaningful data; and

(4) observed that the monitoring report lacks any description of the work actually performed over the 21-month period, including the amounts of sand added to the littoral system and the various configurations of SEAbags tested.

In any event, the "Demonstration Pilot Project" is limited to a small portion of the Lanikai shoreline and is unlikely to benefit the Dilk's property or the adjacent properties to the north. As stated in the Conservation District Use application, it is experimental in nature. To date, there is no known plan to undertake a comprehensive beach replenishment/restoration program.

In Photo 17, note also that seawalls are now exposed on two parcels to the north of the subject parcels (TMK: 4-3-05:62 and 63). Located on the south side of a public right-of-way (TMK:4-3-05:87), these seawalls were probably built some time ago but were obscured with vegetative growth because this section of beach had accreted and was relatively stable until recent times. With this past winter storm wave damage to the shoreline area, the seawalls are now fully exposed.

In summary, the City and County of Honolulu has made concerted effort over the last ten years to enforce the shoreline setback rules and regulations in a way that would minimize potential impacts to the beach and shoreline at Lanikai. Unpermitted seawalls were required to be replaced with sloping rock revetments, and sand bags were required to be used in lieu of permanent shore protection as an interim measure in hopes that the erosion trend may diminish or reverse. As of this date, the long-term erosion trend is continuing, and there is no evidence of significance difference in beach response related to the types of shore protection structures that have been built. Construction of the proposed seawall would not foreclose the possibility of future restoration of a wide beach strand, whether by natural or artificial means. In the 1960's and 70's, seawalls were built along other portions of Lanikai Beach which were then suffering erosion but have subsequently experienced accretion. Along the middle part of Lanikai Beach, accreted sand has built up the beach in front of the seawalls, in some cases almost to the full height of the walls. The history along Lanikai Beach gives evidence that the presence of a seawall does not preclude natural beach accretion.

4.0 CONSIDERATION OF ALTERNATIVES

Beach restoration and nourishment would be the preferred alternative for the entire southern end of Lanikai. Unfortunately, this alternative is costly and not an economically viable alternative for individual residential property owners. Beach nourishment would be required for a long stretch of shoreline reach extending beyond the subject parcels, since wave energy will quickly redistribute small quantities of beach material unless beach containment structures (such as groins) are built to confine the beach fill fronting individual parcels or short stretches of shoreline. If no structural measures are built to stabilize the beach fill, periodic nourishment would likely be required. Beach restoration and nourishment, in general, is difficult to design and maintain as a "shore protection" alternative. For the beach to provide adequate protection during storm wave events, it must have adequate beach width, elevation, and length along the entire shoreline reach within the defined littoral cell. The large quantities of suitably coarse natural beach sand required for major beach restoration/nourishment projects are not readily available in Hawaii. In fact, sand is periodically barged to Hawaii from overseas locations (such as Australia) for commercial sale to golf courses at premium cost. For beach restoration programs, the actual "cost" of implementation includes the regulatory (EIS/permits), design, initial construction, and periodic nourishment costs. All phases involve substantial commitment of resources, clearly beyond the financial capability of individual residential landowners.

An offshore breakwater structure would be a suitable alternative to mitigate continued erosion damage. A low profile offshore breakwater would not significantly affect scenic views while still serving to dissipate the incoming wave energy, thereby forming a protective area in the lee of the structure. Since littoral sediment transport processes require breaking wave energy to transport the littoral materials at the shoreline, a reduction of the incident wave energy will directly reduce erosion in the lee of the breakwater. Access to the beach and nearshore waters would not be affected by the offshore structure. However, the breakwater must be properly designed to function adequately. For example, it must have adequate dimensions (length, width, height) to dissipate storm wave energy, it must be built with materials that will maintain its structural integrity under storm wave attack (large boulders or concrete armor units), and it must not affect nearshore circulation in a way that may cause water quality problems or dangerous currents. Offshore breakwater construction is costly and carries a higher risk than onshore construction. Repair or maintenance of the

structure, if damaged due to an extreme storm event, is also very costly due to difficulty in accessing the structure with conventional land equipment.

For individual residential property owners, seawalls and revetments are the most viable methods of protecting the shoreline from wave attack. Seawalls are vertical or near-vertical structures, typically concrete or grouted rock masonry walls. Revetments are sloping structures typically constructed using rock of sufficient size to remain stable under design wave attack, although there are a variety of manufactured systems and materials used to build sloping revetment structures. Seawalls are generally less costly to construct than revetments since they can be built using smaller building materials than rock revetments and require much less total quantity of building material. Near-vertical seawalls also occupy less space along the shore than sloping revetments, and their narrow footprint maximizes use of the backshore areas as well as minimizing encroachment into the public shorefront seaward of the structure.

For sandy shorelines, vertical impermeable seawalls are generally not as desirable as permeable rock revetments because of their high reflectivity, which can cause scouring of the sand in front of the structure and can lead to undermining at the base of the wall if the seawall is not founded on hard material. For beach environments, rock revetments are more effective in dissipating wave energy and are not prone to catastrophic damage due to its flexibility. However, revetments must be properly designed such that the armor layer is stable under design wave attack, and with proper provisions for underlayer(s) and filter material to prevent leaching of the foundation or backfill material through the voids in the rock layers. Revetments can also suffer scouring of sand in front of the structure, and the revetment toe must be designed to prevent undermining at the base of the rock slope, which can lead to slumping or unraveling of the rock slope. Because revetments occupy substantial space on the shoreline due to their sloping face and multiple rock layers, in some cases there is insufficient space between the certified shoreline and the dwelling to construct a revetment because of the substantial erosion that has already occurred.

To construct a sloping revetment on the Dilks' property would entail building a portion of the structure seaward of the certified shoreline, within the jurisdiction of the State Conservation District. This would necessitate applying for and obtaining a Conservation District Use Permit from the State Board of Land and Natural Resources. It could also require a permit from the U.S. Army Corps of Engineers.

The placement of SEAbags for interim shore protection, as has been used at the subject property to provide a protective revetment slope, is effective but cannot be considered a permanent measure. The bags are prone to damage from storm wave attack and vandalism, and can require frequent and continual maintenance. The cost of materials and labor to install the bags is less than $300 per linear foot of revetment (assuming that in-situ sand is used to fill the bags). But considering the potential long-term maintenance requirement, the total cost over 25 years can be greater than the cost of initially constructing a permanent shore protection structure. Sand bags are considered "environmentally benign" because the color and texture of the fabric blends in with the beach, and they can be easily removed by simply cutting the bags to release the sand contents. However, they are not "soft" structures in their as-built state. In fact, the large sand bags are solid, hard building materials when fully filled, and a sand bag revetment structure probably is more reflective than a rock revetment, for the same slope. Although the bag material is permeable (meaning that water will pass through the bag material), once the bags are filled and stacked to form a structure, the overall porosity (ratio of void space to hard surface) of the structure is very low on the time scale of wave impact. Therefore, because there are few voids between the stacked bags, wave energy is more readily reflected rather than dissipated within the structure slope as would be for a rock revetment. Another potential concern is that bags that are below the water line or within the tidal/swash zone become very slippery because of algal growth, and pose safety problems where people can slip and injure themselves. Even newly installed bags with no algal growth can be slippery because of the smooth surface of the bag material.

5.0 DESCRIPTION OF PROPOSED ACTION

Because of the severity of the shoreline erosion fronting the subject parcels, there is little space between the certified shoreline and the house and swimming pool structures. The only type of structure which can physically be constructed landward of the certified shoreline (county jurisdiction only) is a near-vertical seawall. As discussed in Section 4.0 above, constructing a sloping revetment would entail extending the structure seaward into the State Conservation District and would require obtaining a Conservation District Use Permit. Although the Department of Land and Natural Resources has stated that it favors a vertical seawall in this situation, a plan for a sloping revetment has been prepared and is provided as an alternative to the vertical seawall (see Section 5.2 below).

5.1 Proposed CRM Seawall

A concrete reinforced masonry (CRM) seawall is a practical and visually attractive type of shore protection which has been constructed on many lots throughout Lanikai Beach. The seawall would be built landward of the certified shoreline[5] fronting both subject parcels. The seawall would extend along approximately 150 feet of shoreline frontage, with short return sections at each end. Figure 5 shows the proposed layout plan for the seawall and Figure 6 shows a typical section prepared by the property owner's structural engineer.

The top of the seawall would be at elevation 9 feet above MSL, which is at or slightly above the existing grade of the property shoreline. The bottom of the wall would be placed 3 feet below MSL (or on hard material if encountered at shallower depth). Therefore, the total height of the wall is 12 feet. The existing SEAbags that are still intact would be left in place along the seaward base of the seawall, to the extent practicable, to provide additional scour protection and to facilitate construction of the wall. At present, there is little or no dry sand beach fronting the project site (i.e., waves reach the SEAbag revetment during high tide). Therefore, if not for the existing SEAbags, it would be very difficult to build the seawall because wave uprush would inundate the work area.

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[5]The February 12, 1996 shoreline survey was submitted for certification. The shoreline was certified by the State Land Surveyor on June 12, 1997.

The seawall would be constructed of rock set with cement mortar, using very large rocks at the base of the wall and smaller rocks near the top. The bottom width of the wall would be 7.5 feet. Because of the requirement to build the seawall entirely landward of the certified shoreline, the landward base of the wall would be within about 8 feet of the foundation of the house at its closest point, and within about 10 feet of the concrete slab of the pool. Temporary shoring may be required to stabilize the excavation side slope during construction.

Because the top of the wall would not extend much above the existing shoreline elevations, wave overtopping can occur during high tides and storm wave attack. Therefore, weepholes would be provided to relieve hydrostatic pressures that could result in damage to the wall or formation of sinkholes landward of the wall.

To facilitate access to the beach, stairs would be constructed at about midpoint near the boundary between the two subject parcels. No portion of the stairs would extend seaward of the certified shoreline.

At both ends, the seawall would turn mauka and extend approximately 20 feet landward along the side property boundaries. The flank sections of the wall would be virtually identical to the seaward section, except that the footing need not be extended as deep. Because wave crests are nearly parallel with the beach, the flank walls will not be subject to scouring problems. Their function is to prevent erosion on the back-side of the seawall in the event that the adjacent properties are not protected and are allowed to erode. Because the seawall must be built entirely within the Dilks' property, there is very little room to build the flank sections.

The top of the wall will have a green chainlink fence, bronze anodized railing or similar dark-colored fence or railing approximately 42 inches above grade. This is needed for safety.

5.2 Revetment Alternative

As a proposed alternative, a sloping rock revetment would be built along the certified shoreline fronting both parcels. It would extend along the 150 feet of shoreline frontage, with short return sections at each end. Figure 7 shows the proposed layout plan for the revetment, and Figure 8 shows a typical section.

The toe of the revetment would be placed 3 feet below MSL and would rise at a 2:1 slope—2 horizontal to 1 vertical—to an elevation approximately 9 feet above MSL, at or slightly above the existing grade at the property shoreline. The revetment would be approximately 18 feet wide from top to bottom, with a 4-foot crest at the top that would be level with the grade of the property.

As shown in the drawings, the revetment would be aligned in a straight line across the front of the properties and sited as far landward as possible. On the northern parcel, the toe of the revetment would extend to the seaward Land Court property boundary. On the southern parcel, the toe would be landward of the Land Court property boundary. On both parcels, the revetment would extend seaward of the certified shoreline, so that a portion would be in the Shoreline Setback, administered by the City, and a portion would be in the Conservation District, administered by the DLNR. Both a Shoreline Setback Variance and a Conservation District Use Permit would be required.

Based on the plans prepared by the applicant's structural engineer (Figure 8), the following describes the main elements of the revetment:

- Filter fabric and a bedding layer of spalls to 10-inch stones placed on a slope of 2H: 1V. The filter fabric/ bedding layer serves as a foundation for the armor stones to prevent differential settlement into the sand.

- A 2-stone-thick layer of armor stones 900-1,600 pounds in weight (stones of approximately 2-foot diameter), which are large enough to prevent dislocation by storm waves. The larger rocks would be placed on the outer surface. The ends of the filter fabric would be wrapped around large end stones at the crest and toe of the revetment.

The ends of the revetment would be armored to prevent erosion from waves wrapping around the structure, in the event that the adjacent properties are not protected and are allowed to erode.

The SEAbags currently protecting the shoreline of the property would be opened and the sand released. Alternatively, some or all of the SEAbags may be moved away from the Dilks' property and reused in the Lanikai Beach Management Committee's pilot project.

6.0 POTENTIAL LITTORAL IMPACTS

Neither the proposed seawall nor the alternative sloping rock revetment will alter the existing littoral processes affecting the site. The entire southern end of the Lanikai shoreline has been experiencing net long-term erosion since 1970, and erosion has been steadily progressing northward into the middle segment of the Lanikai coast. Unless permanent shore protection is constructed, there is a high risk of damage to the foundation of the house and pool in the near term.

The seawall will not affect longshore sediment transport processes, but there may be some concern that cross-shore transport may be affected because of wave reflection from the near-vertical impermeable face of the seawall. It has been a generally held presumption that the more reflective the structure, the greater the potential for adverse impacts by discouraging sand accumulation in front of the structure. However, given the fact that beach and shoreline erosion is continuing to occur along the Lanikai coastline where there are no shore protection structures, it can be concluded that the long-term erosion trend is a natural process that will certainly not reverse simply by constructing shore protection structures with a sloping porous surface. In fact, long-term field studies by the University of California at Santa Cruz[6], sponsored by the U.S. Army Corps of Engineers, found no significant difference in impact to the beach fronting a sloping rip-rap revetment and an adjacent vertical concrete seawall. Recent field studies conducted by Edward K. Noda and Associates, Inc. at Aliomanu, Kauai, also demonstrated that seasonal cross-shore transport is unaffected by an existing seawall. Monitoring of beach profiles over a four month period (July-October 1996) showed that seasonal beach accretion (increase in beach width) occurred in front of the near-

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[6]Because increased development in coastal areas has led to increased "hardening" of shorelines in response to net long-term shoreline erosion, there is an increased concern of coastal planners to the potential impacts of seawalls and/or revetments on beaches and shorelines. Even within the scientific and engineering community, controversy exists on whether seawalls and/or revetments are adverse and promote erosion. Because of the lack of sufficient field data to objectively resolve the controversy, the U.S. Army Corps of Engineers sponsored studies, beginning in the later 1980s, to monitor beach response to seawalls and revetments at several study sites. The following references describe the results of the monitoring:

U.S. Army Engineer Waterways Experiment Station, Coastal Engineering Research Center, Coastal Engineering Technical Note, CETN III-46 (3/92), CETN III-57 (6/95).

Griggs, G.B., J.F. Tait, K. Scott, N. Plant (1991), "The Interaction of Seawalls and Beaches: Four Years of Field Monitoring, Monterey Bay, California", Proceedings Coastal Sediments '91.

Griggs, G.B., J.F. Tait, W. Corona (1994), "The Interaction of Seawalls and Beaches: Seven Years of Monitoring, Monterey Bay, California", Shore and Beach 62:21-28.

vertical seawall as well as on the adjacent unprotected beach.

The erosion that is occurring along the Lanikai shoreline can be described as "passive" erosion (in contrast to "active" erosion which is induced or accelerated by shore protection structures). When a protective structure is built along an eroding shoreline and erosion continues to occur, the unprotected shoreline adjacent to the structure will continue to erode and eventually migrate landward beyond the structure. The result will be loss of beach in front of the shore protection structure as the water deepens and the shoreface profile migrates landward. This process is designated as passive erosion and is the result of fixing the position of the shoreline on an otherwise eroding stretch of coast, and is independent of the type of shore protection constructed. This is the most common result of shoreline hardening in Hawaii, and is the probable long-term consequence of building the proposed seawall at the Lanikai properties.

In the long-term, passive erosion will likely continue to affect adjacent unprotected properties. However, the consequence of not building the subject shore protection structure is the eventual loss of the house and other residential improvements to erosion damage. Because the existing improvements on the subject parcels (consisting of a 3,000 square feet slab-on-grade custom-designed house and adjacent pool) cannot feasiblely be relocated, the economic and environmental consequences of erosion damage to these improvements are very significant.

If and when a major beach replenishment/restoration program is implemented, the subject seawall and other shore protection structures will not adversely affect the design and performance of the restored beach. In fact, the existing shore protection structures will be beneficial to the long-term beach nourishment program. Periodic nourishment requirements cannot be predetermined with a high degree of assurance (because erosional forces are dependent on the wind/wave climate), and therefore severe erosion of the beach can result in damage to unprotected residential properties and improvements before renourishment can be implemented. However, if properties are already protected with a seawall or other shore protection measure, then this provides flexibility in the timeframe for planning and implementation of subsequent renourishment (for example, time to obtain the necessary funding, and to design and implement the renourishment), without the worry of imminent erosion or wave damage to residential improvements. Thus, a long-term beach replenishment/restoration program can be designed for the sole purpose of maintaining recreational beaches, rather than to serve in the additional capacity of providing shoreline protection.

Potential water quality impacts during construction of a seawall would be temporary and minor, since the seawall would be constructed entirely landward of the certified shoreline. To the extent practicable, the existing SEAbags would be left in place to form a protective berm, to protect the work area from wave uprush. This would minimize wave erosion and turbidity during the excavation to place the base of the seawall. Once the seawall is completed to a height of about 4 feet above MSL (above the height of normal wave uprush), there will be no potential water quality impacts during the remainder of the wall construction.

With respect to construction of a sloping revetment, there would be minor water quality impacts during excavation and placement of the stones. These impacts can be *mitigated by performing the excavation* during periods of low tide and using the larger stones to form a temporary berm that would protect the work area from wave action. This would minimize wave erosion and turbidity during excavation and would facilitate construction. There would be short-term impacts to beach access and use along this shoreline reach because, for safety reasons, public access within work limits may be restricted during the period of construction.

Photo 1: View southward showing eroded condition of subject property at TMK:4-3-4:74. (Note sand bags on beach south of subject property.)

Photo 2: View northward showing eroded condition of subject property.

Photo 3: View southward fronting subject property TMK:4-3-5:61.

DATE OF PHOTOS: FEBRUARY 6, 1996 (Tide approx. +1' MLLW)

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Photo 4: View northward showing damaged condition of sandbags *fronting adjacent parcel 98* (Carpenter).

Photo 5: View southward showing sandbags fronting parcels 76 (Olds) and 77 (Davis).

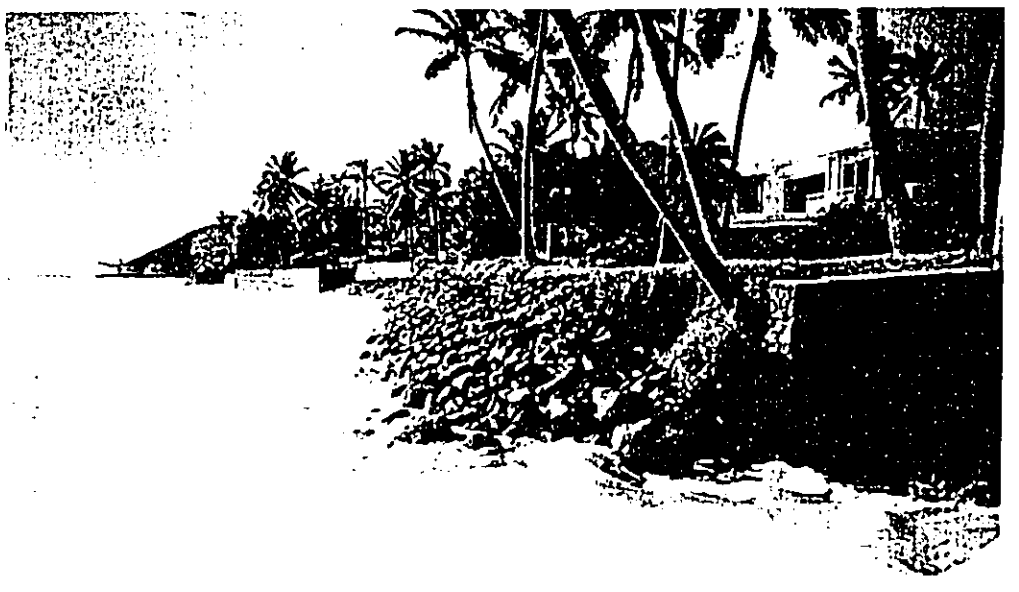


Photo 6: View southward showing condition of shoreline south of parcel 96 (public right-of-way).

DATE PHOTOS: FEBRUARY 6, 1996
(Tide approx. +1' MLLW)

Photo 7: Eroded condition of subject property at TMK:4-3-5:61. (Note erosion of shoreline vegetation and undermining/collapse of fence.)

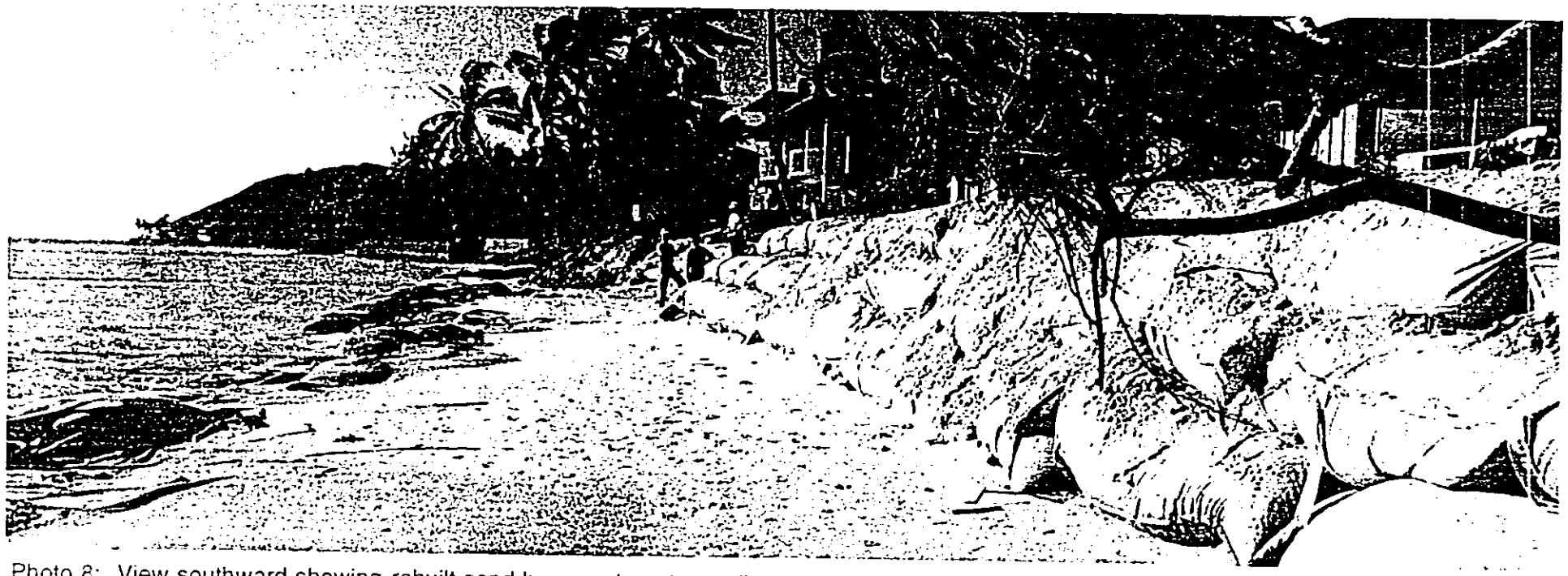


Photo 8: View southward showing rebuilt sand bag revetment on adjacent parcel 98 (Carpenter).

DATE OF PHOTOS: MARCH 14, 1996 (Tide approx. +0.3' MLLW)

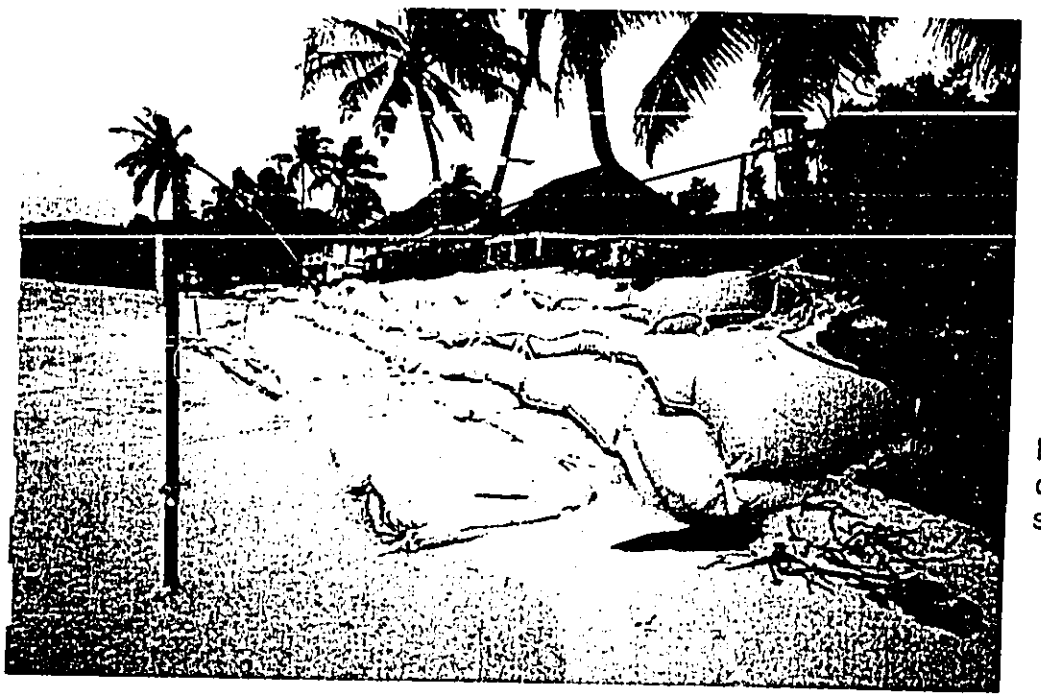


Photo 9: View southward showing completed sand bag revetment on subject property TMK:4-3-5:61.

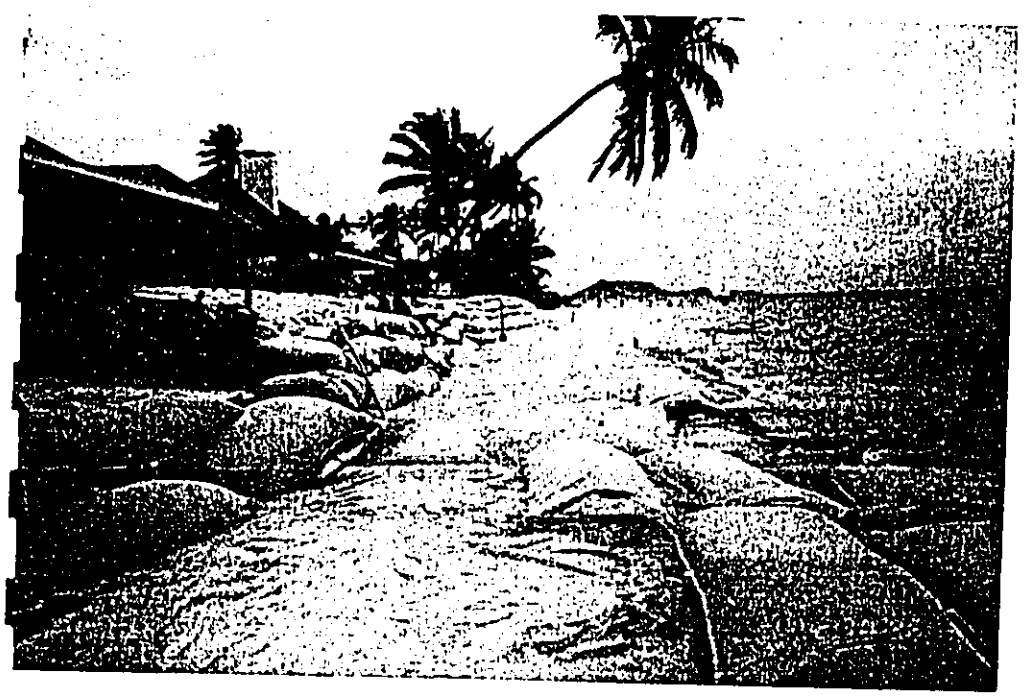


Photo 10: View northward from parcel 76 (subject property TMK:4-3-4:74 is in background).

Photo 11: View southward from parcel 76.

DATE PHOTOS: JUNE 30, 1996
(Tide approx. +2' MLLW)

Photo 12: View southward fronting subject property TMK:4-3-5:61 showing condition of sand bag revetment after repairs completed.

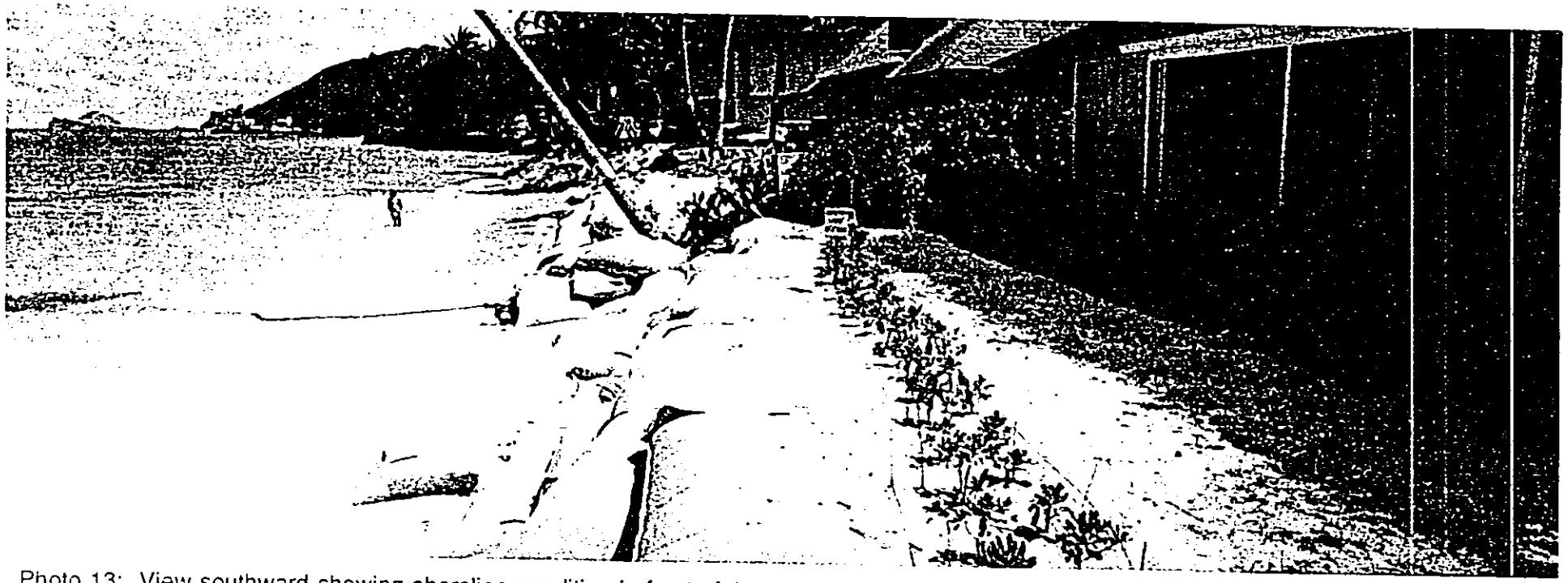


Photo 13: View southward showing shoreline condition in front of the house on subject parcel TMK:4-3-4:74.

DATE OF PHOTOS: MAY 9, 1997 (Tide approx. +1' MLLW)

Photo 14: View northward showing condition of shoreline fronting adjacent parcels 76 (Olds) & 98 (Carpenter). Subject parcel is in background.

Photo 15: View southward fronting parcel 77 (Davis). Note stockpiled sand and new sand bags on this property.

DATE OF PHOTOS: MAY 9, 1997 (Tide approx. +1' MLLW)

RECEIVED AS FOLLOWS

Photo 16: View northward from north end of subject parcel TMK:4-3-5:61 showing eroded condition of adjacent shoreline.

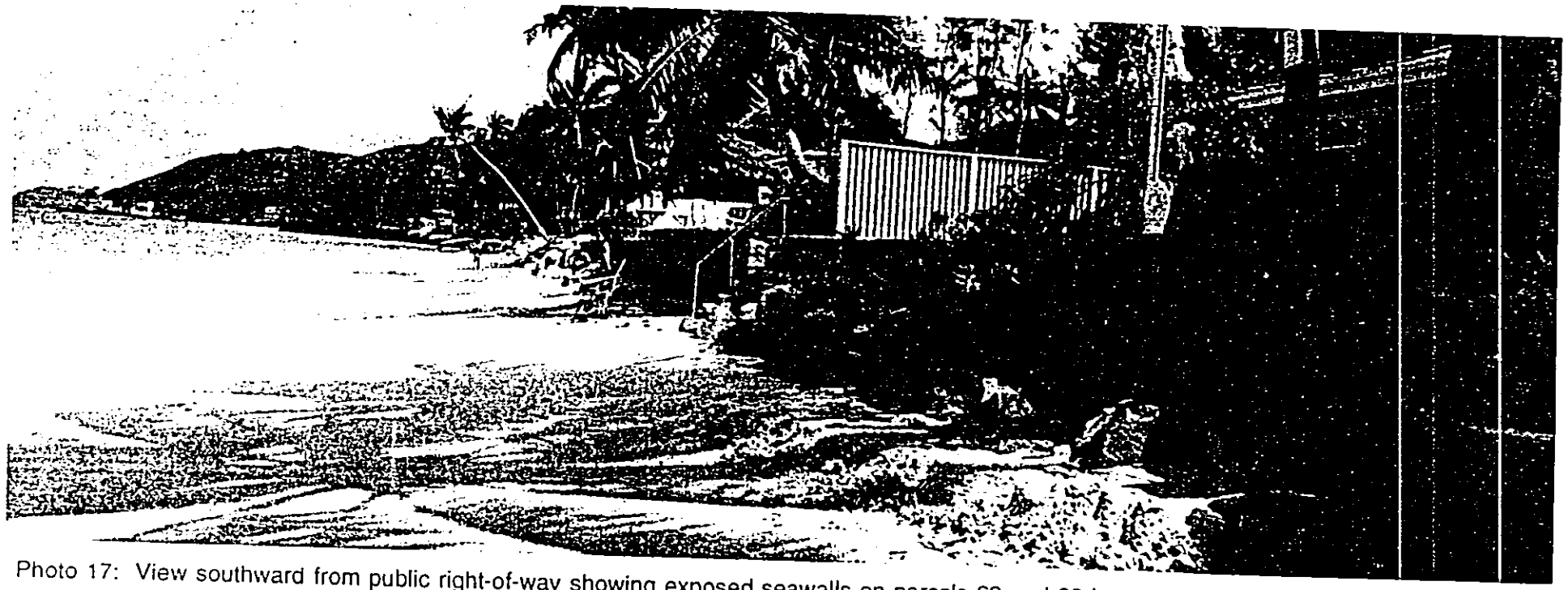


Photo 17: View southward from public right-of-way showing exposed seawalls on parcels 62 and 63 located north of subject parcel.

DATE OF PHOTOS: MAY 9, 1997 (Tide approx. +1' MLLW)

RECEIVED AS FOLLOWS

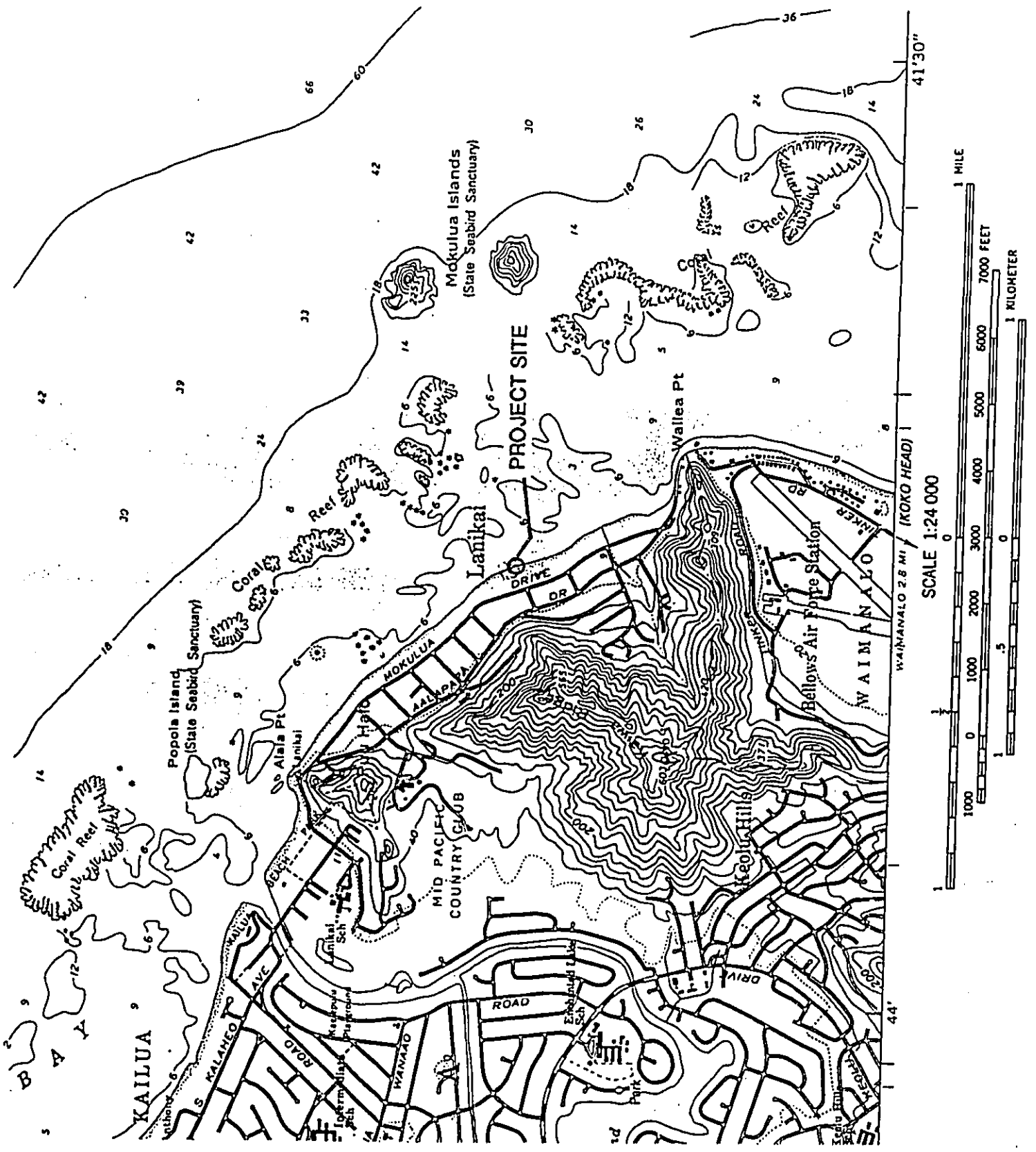


FIGURE 1

RECEIVED AS FOLLOWS

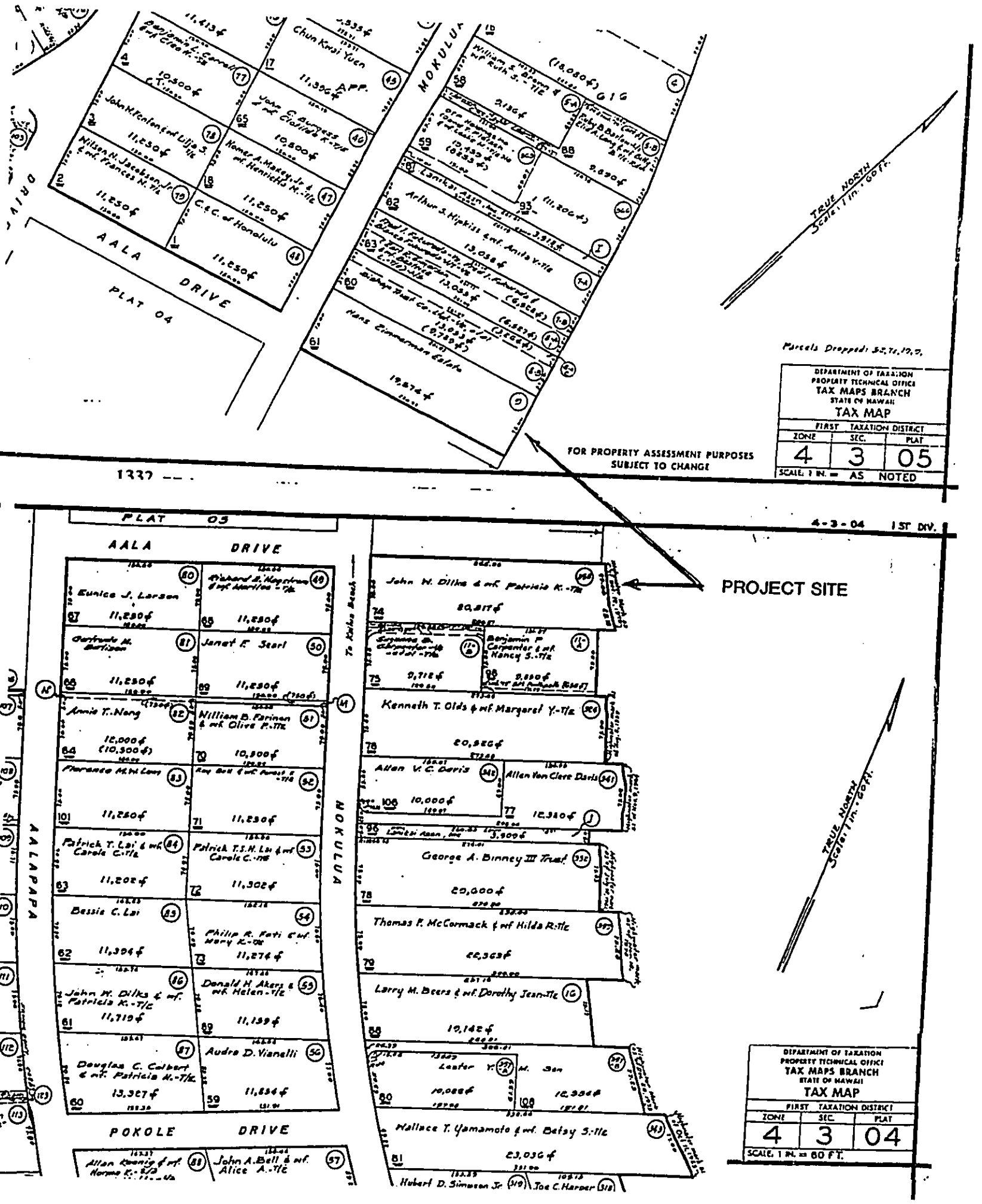
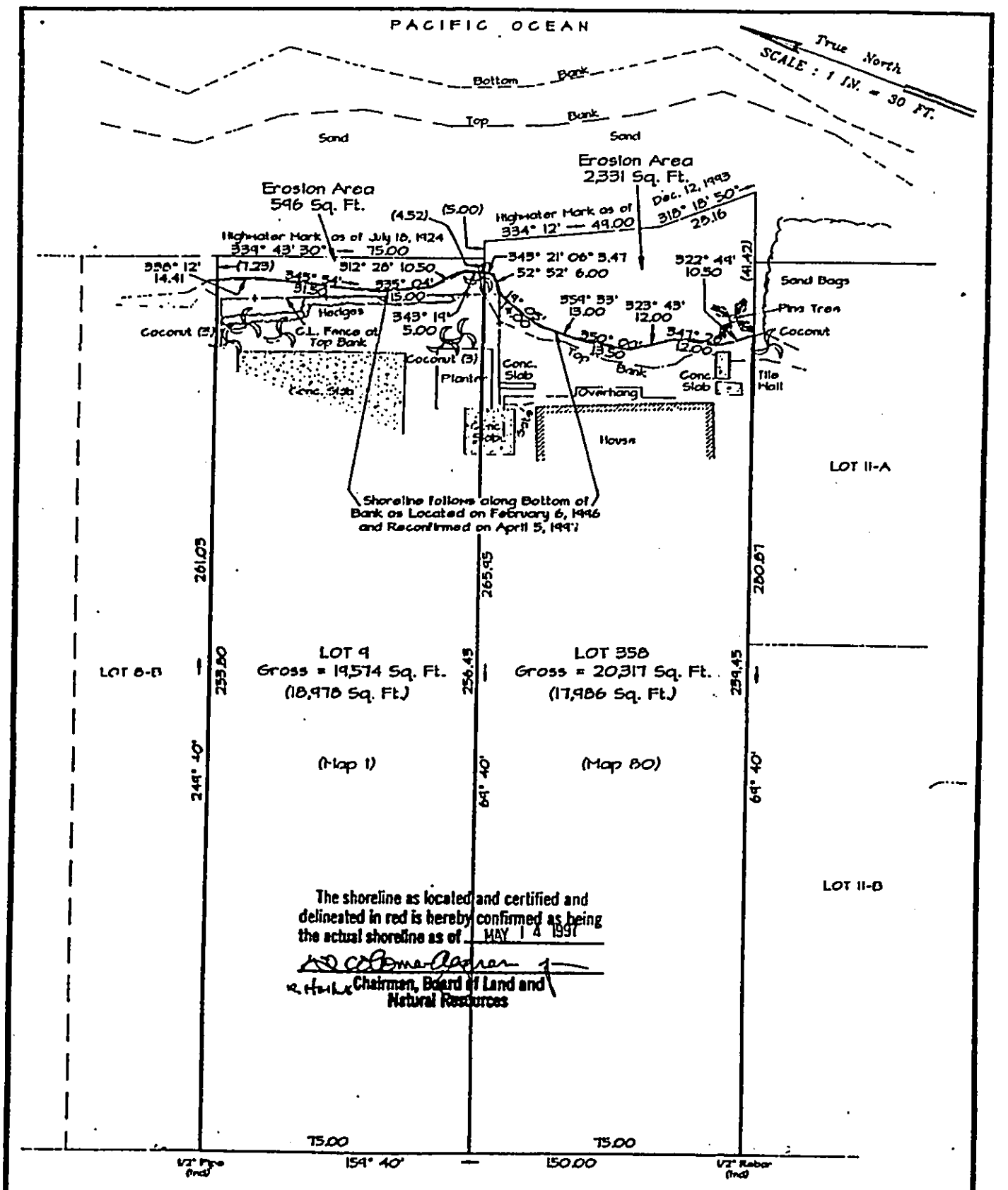


FIGURE 2

RECEIVED AS FOLLOWS



KENDALL N. H. HEE
LICENSED PROFESSIONAL LAND SURVEYOR
No. 5649
HAWAII, U.S.A.

This work was prepared by me or under my direct supervision.

Kendall N. H. Hee

Shoreline Certification

Lot 358 as shown on Map 80
and Lot 6 as shown on Map 1
of Land Court Application 616
at Lanikai Beach Tract, Kailua, Oahu, Hawaii
T.M.K. : 4-3-04 : 74 And 4-3-05 : 61

FIGURE 3

RECEIVED AS FOLLOWS

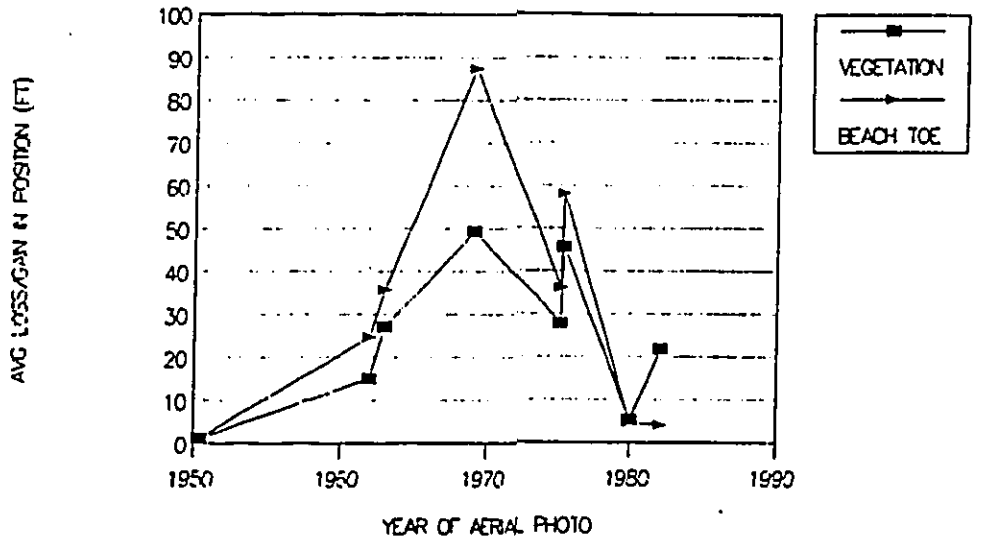


Figure 4a: Average cumulative movement for a 2,500-foot stretch of shoreline from Wailea Point northward to the project site.

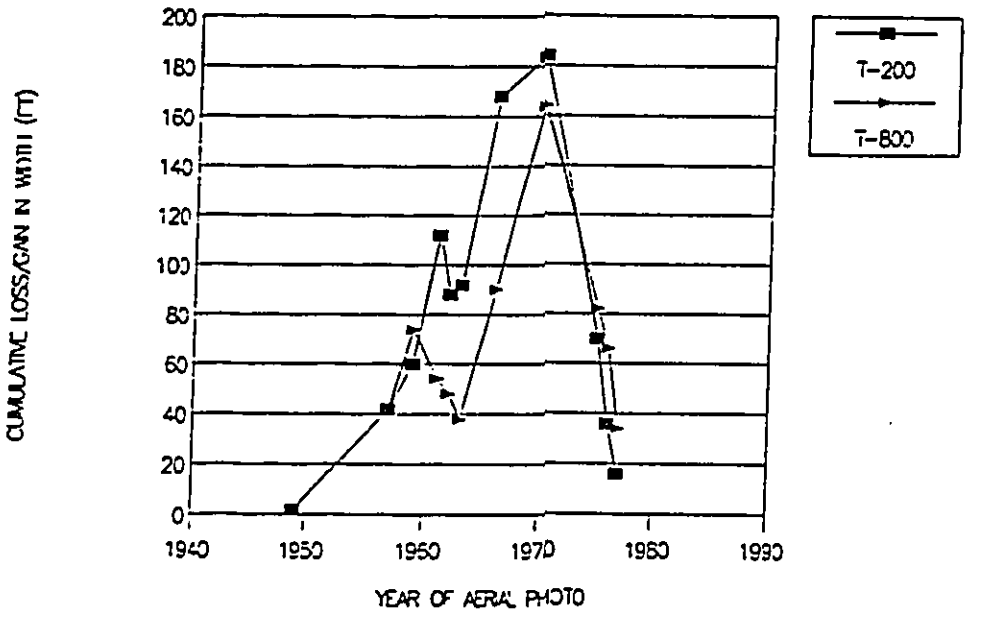
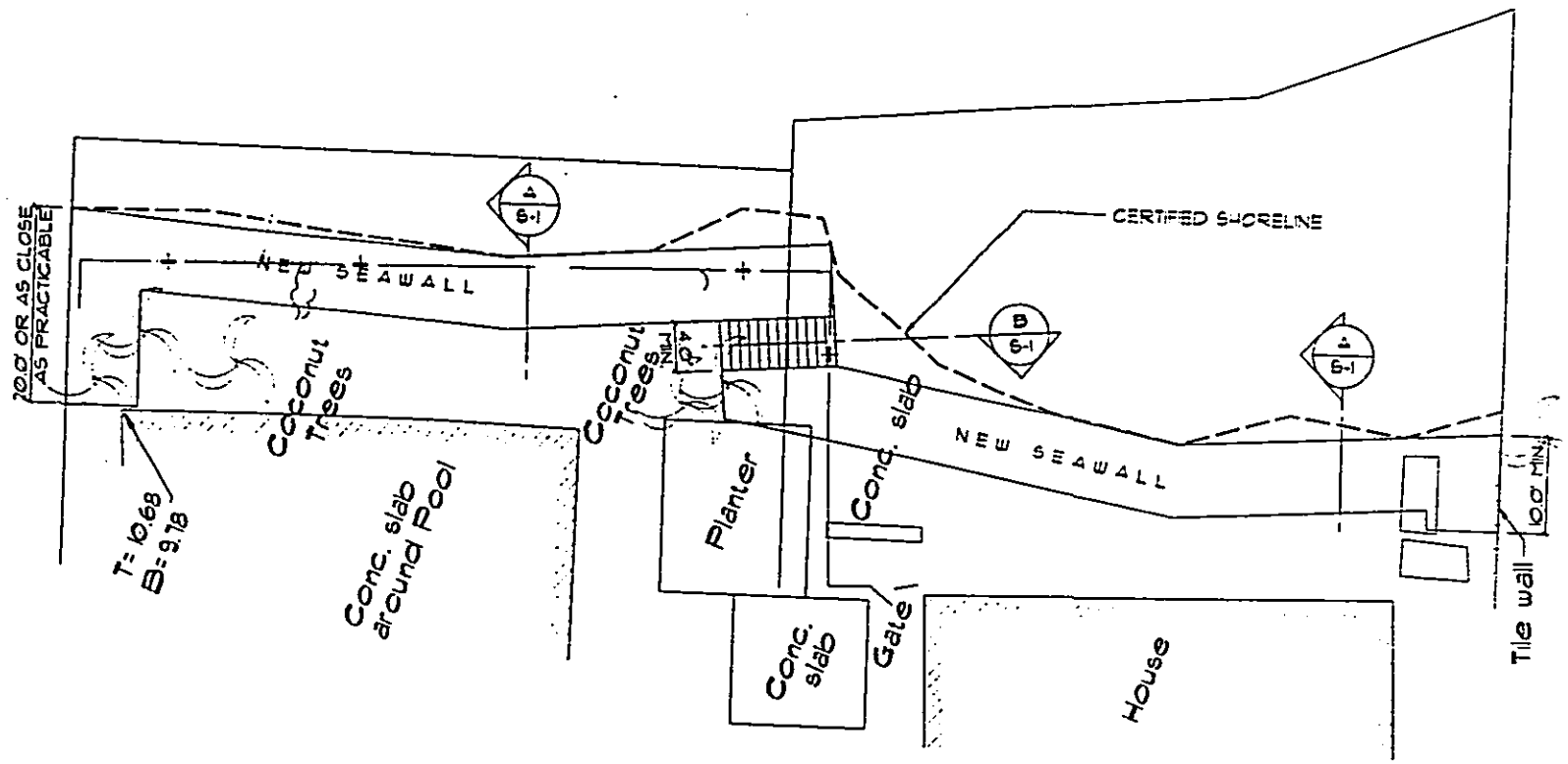


Figure 4b: Cumulative movement of the shoreline at Kailua Beach Park at locations 200' and 800' from the boat ramp.

(From "HAWAII SHORELINE EROSION MANAGEMENT STUDY, Overview and Case Study Sites - Makaha, Oahu; Kailua-Lanikai, Oahu; Kukuiula-Poipu, Kauai", by Edward K. Noda and Associates, Inc. and DHM, Inc., for the Hawaii Coastal Zone Management Program, June 1989.)

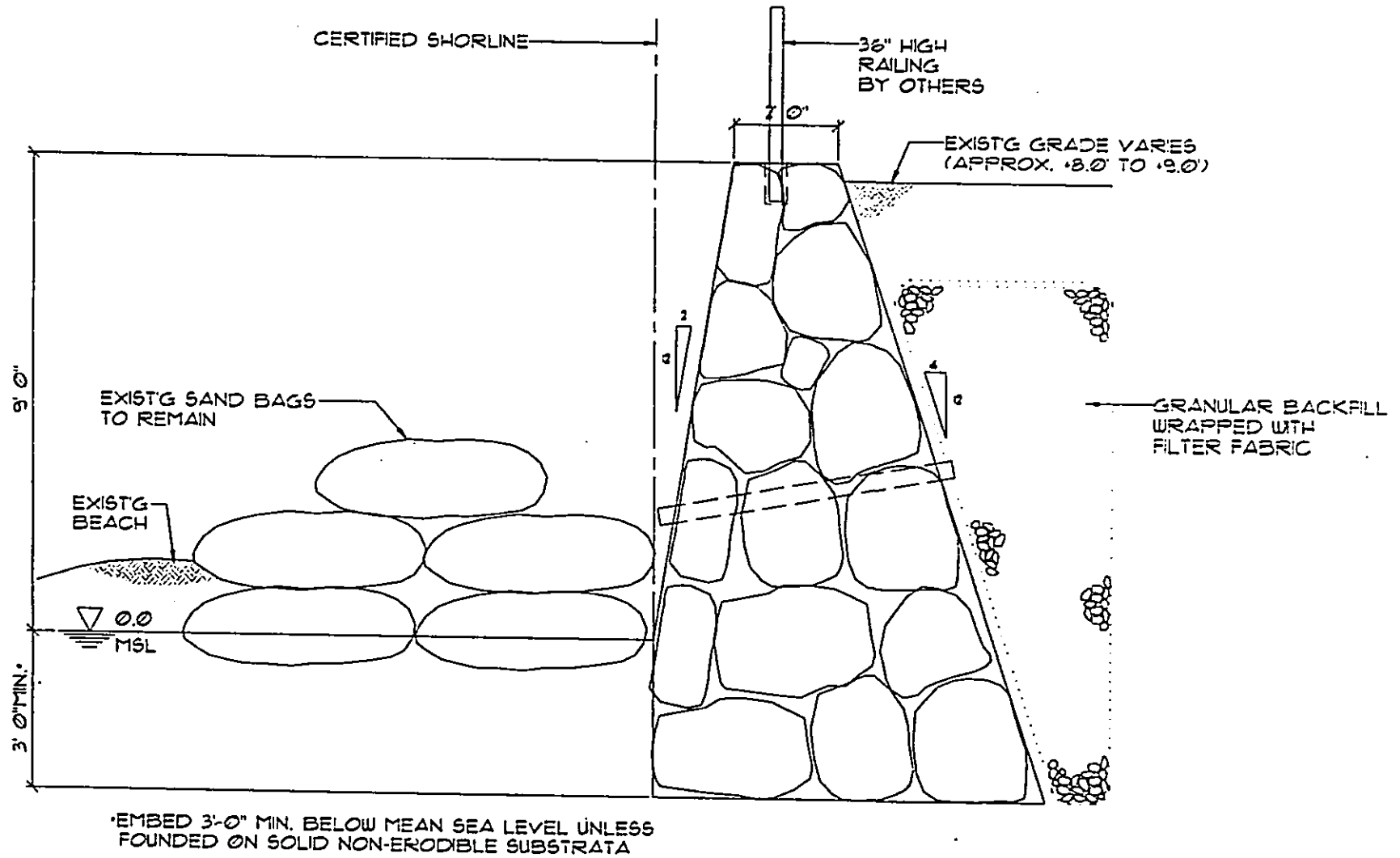
FIGURE 4



WALL LAYOUT PLAN

SCALE: 1" = 20'

FIGURE 5



SECTION THRU NEW CRM SEAWALL

SCALE: 1" = 3'

A
S-1

FIGURE 6

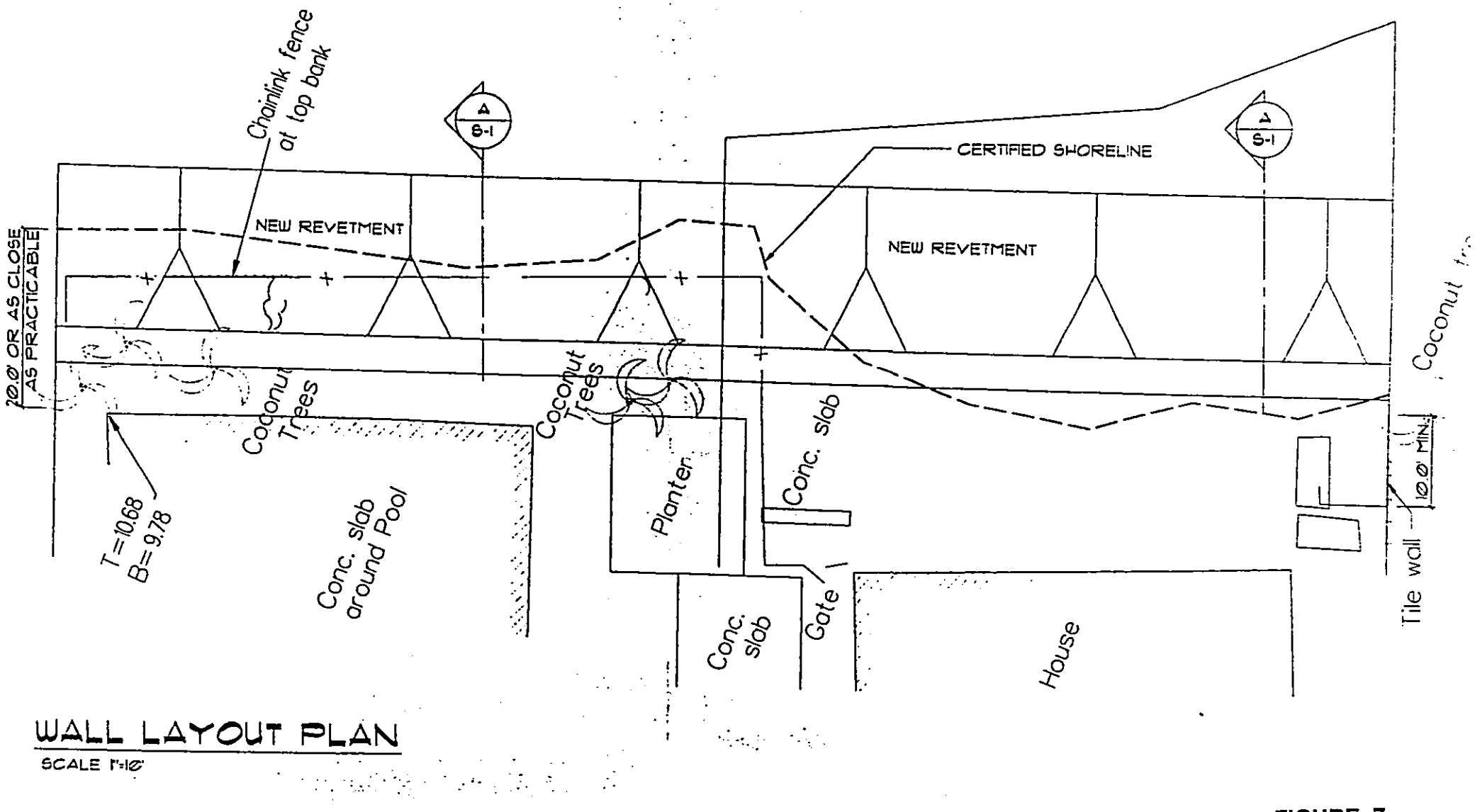
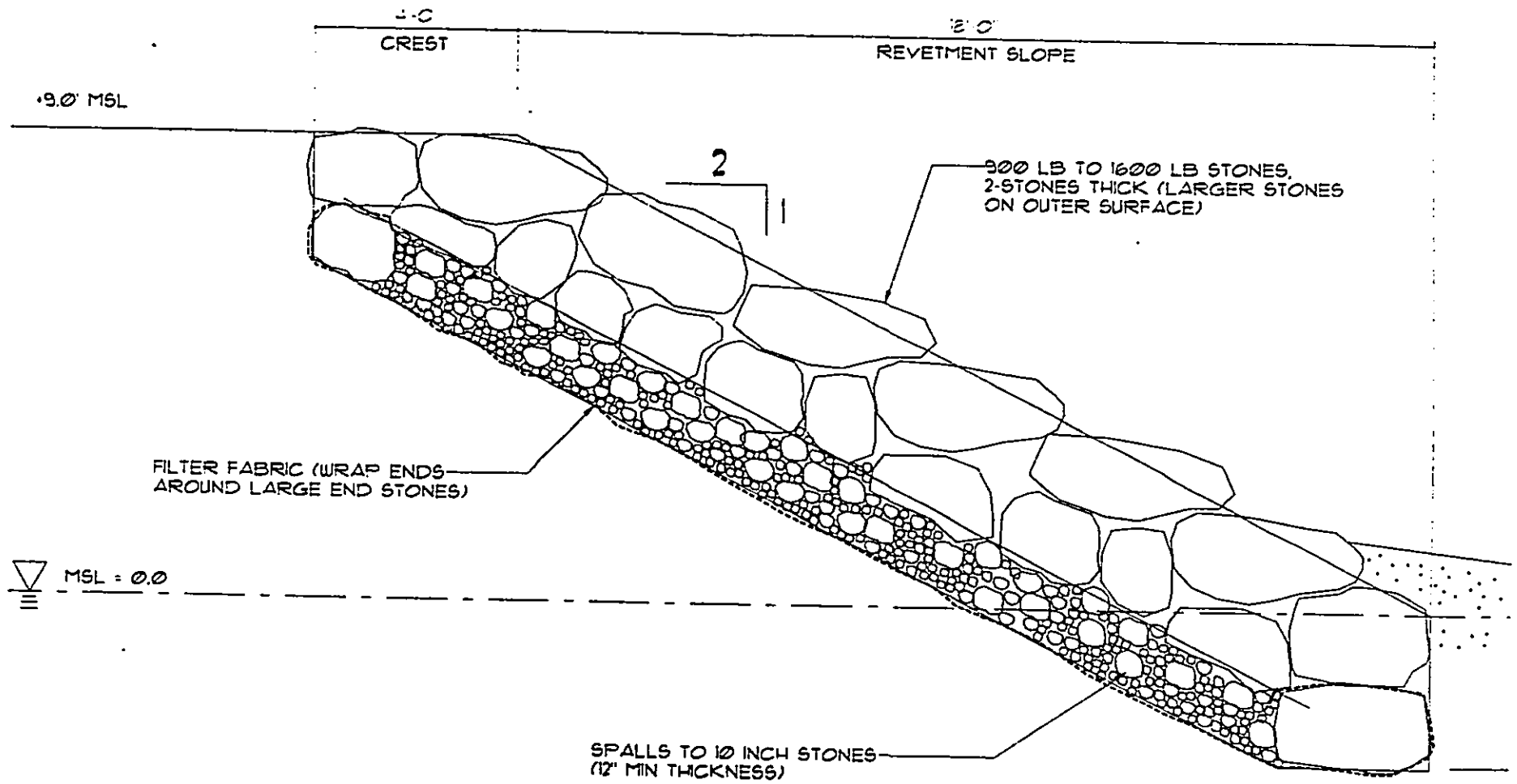

Chainlink fence at top bank
A
6-1
A
5-1
CERTIFIED SHORELINE
NEW REVETMENT
NEW REVETMENT
20.0' OR AS CLOSE AS PRACTICABLE
Coconut Trees
Coconut Trees
Planter
Conc. slab
Conc. slab around Pool
T=10.68
B=9.78
Conc. slab
Gate
House
Tile wall
10.0 MIN.
Coconut tr
WALL LAYOUT PLAN
SCALE 1"=10'

FIGURE 7

CORRECTION

THE PRECEDING DOCUMENT(S) HAS BEEN REPHOTOGRAPHED TO ASSURE LEGIBILITY
SEE FRAME(S)
IMMEDIATELY FOLLOWING



TYPICAL SECTION THRU REVETMENT

SC 1/2" = 1-0"

FIGURE 8

Appendixes A and B

A. Lanikai Beach Pilot Research Project
Monitoring Report - September 1997

B. Review of Monitoring Report

Lanikai Beach Management Committee

1343 Mokulua Drive
Kailua, Hawaii, 96734

July 24, 1997

Michael Wilson, Chairman
Department of Land and Natural Resources
P.O. Box 621
Honolulu, HI, 967809

The Lanikai Beach Management Committee has prepared this report as an informational update for the various City, State and Federal agencies that were involved in the planning and permitting of our pilot project.

David Lipp, our coastal engineering consultant, has provided a series of beach profiles covering the period from September, 1995 to June, 1997. He includes a brief written assessment.

A photographic record of the area has been kept since December, 1995. Views up and down the beach are taken once a month at low tide. Prior to December, 1996, the tide height for photographs was random. We are now trying to standardize the time for shooting a photo so that changes in beach profile are more apparent. We have included a few of these pictures as a visual record of the project. More are available upon request.

We have several observations on the use of the bags as experienced over the last months:

1. The sandbags placed along the escarpments fronting the subject properties have provided protection from further erosion of the fastland. They have been shored up in several spots, but no moreso than boulder revetments that line the area to the south of the experiment. They would appear to be working well as a means of protecting the private property they front.

2. The "perched beach" has provided continuous lateral access to the open beach from the public right of way. After the erosion became acute in 1994, such access was unavailable to the public until the sandbags were positioned in this format.

3. The sandbags are "user friendly". Children play on and around them, fishermen fish from them and sunbathers sit on them. Walking on them is not difficult, as opposed to walking on boulders at the water's edge.

4. Repositioning the bags can be done relatively quickly with the right equipment. Mr. Correa has developed a method of moving the bags from spot to spot and has reconfigured the layout several times in the course of the experiment. (See photo)

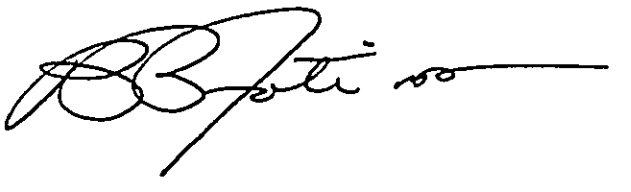
APPENDIX A

5. Since the bags have been in the water schools of halalu (young akule) have formed in the nearshore water where none were observed before. Sea turtles have also been seen grazing on the limu that grows over the submerged bags.

6. The smooth fabric bags become slippery when submerged, but the heavily textured bags, even though covered with limu, are not hazardous underfoot.

The project has another year to go under the terms of the permit. We would like to continue.

Sincerely yours,



Philip R. Foti

Summary of observations on the Lanikai Beach Revetment Alternative Pilot Research Project (9/95 to 7/96):

The sand movement in Lanikai is primarily longshore and its direction is dependant on the wind and wave directions. In the test area there is little sand transport during a mild wind and wave climate from any direction. Strong trade winds and associated wind waves produce a slight northwesterly transport (toward Kailua). Strong easterly winds and waves produced from a long duration easterly wind produce a strong northwesterly transport. North winds and north swells produce a southeasterly transport (toward Waimanalo). The trend is thus slow sand movement toward Kailua during the summer, increased sand movement toward Kailua during the fall (when the trades tend to turn easterly and increase in velocity), and variable movement during the winter dependant on wind and swell. The trend during the winter and spring is for sand movement towards Waimanalo.

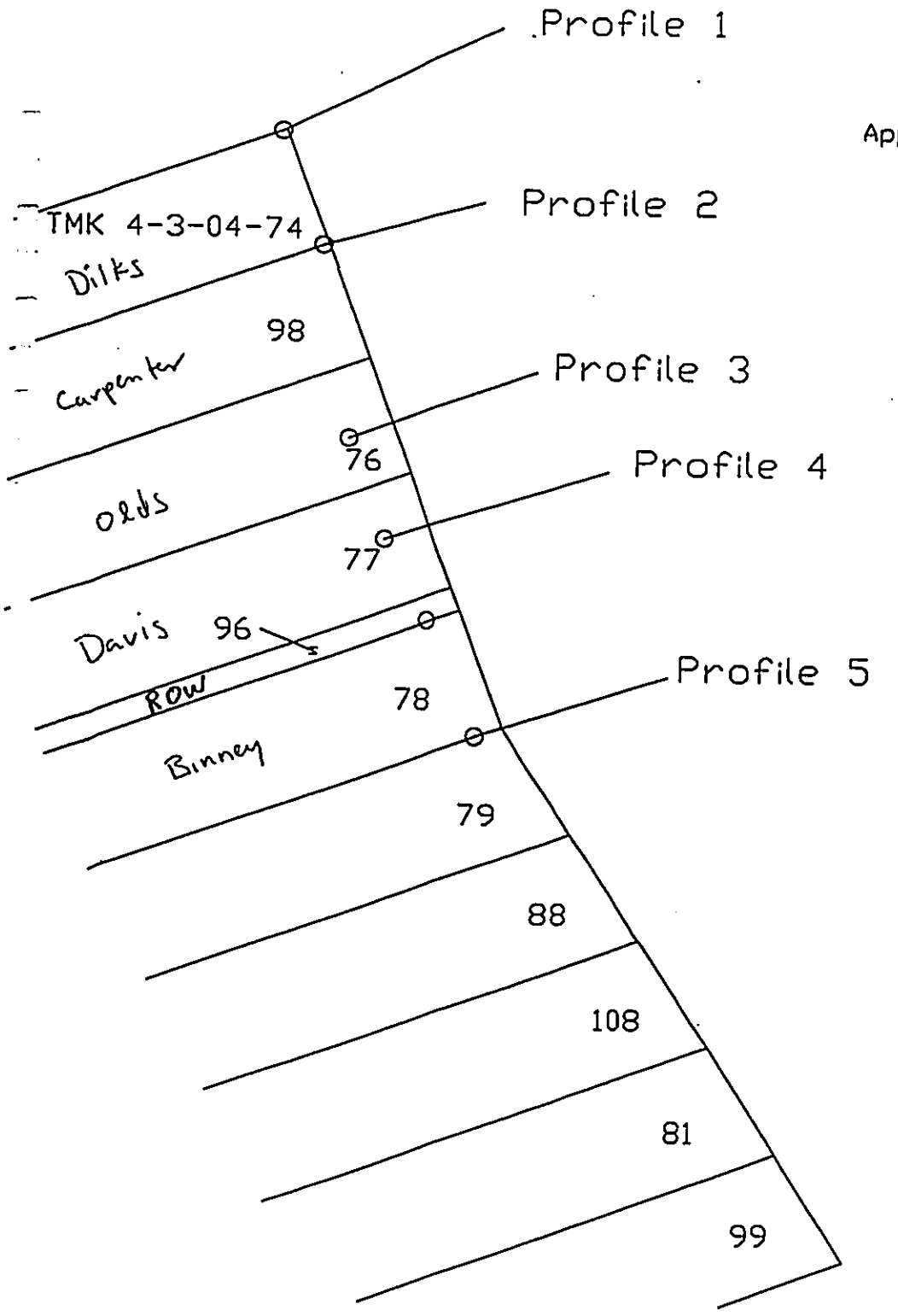
'Between the period of 9/2/95 when the first profile was taken, and 10/5/96, there was considerable loss of sand from the area fronting Dilks and Carpenter (profiles 1 and 2). During the period of 10/5/96 and 6/8/97, all the sand returned to this area, the 6/8/97 profile is very similar to the 9/2/95 profile. This sand movement into the project area during late '96 and early '97 is due to environmental factors and not the sandbags themselves. ***What is important to note is that the sandbags did not prevent the beach from reforming.***

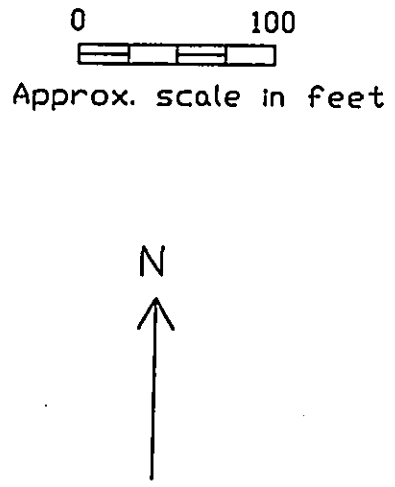
The profiles fronting the Olds property shows no real loss between 9/95 and 10/96, but does show an increase by 6/97. Again, mother nature moved the sand, but the bags did not prevent the beach from forming.

The Davis property bags jut out slightly from the neighboring bags, this has turned out to be beneficial to the beach fronting the neighboring properties. During the winter the sand accumulated fronting the Olds property, during the summer and spring the sand accumulates fronting the public right of way to the beach. The sand accumulates because a small longshore transport gradient is created due to the sandbags fronting the Davis property. This effect is shown in the Binney profile of 10/5/96. Binney is to the southeast of Davis, during tradewind weather the sand accumulates fronting the right of way between Binney and Davis. This has enhanced public access.

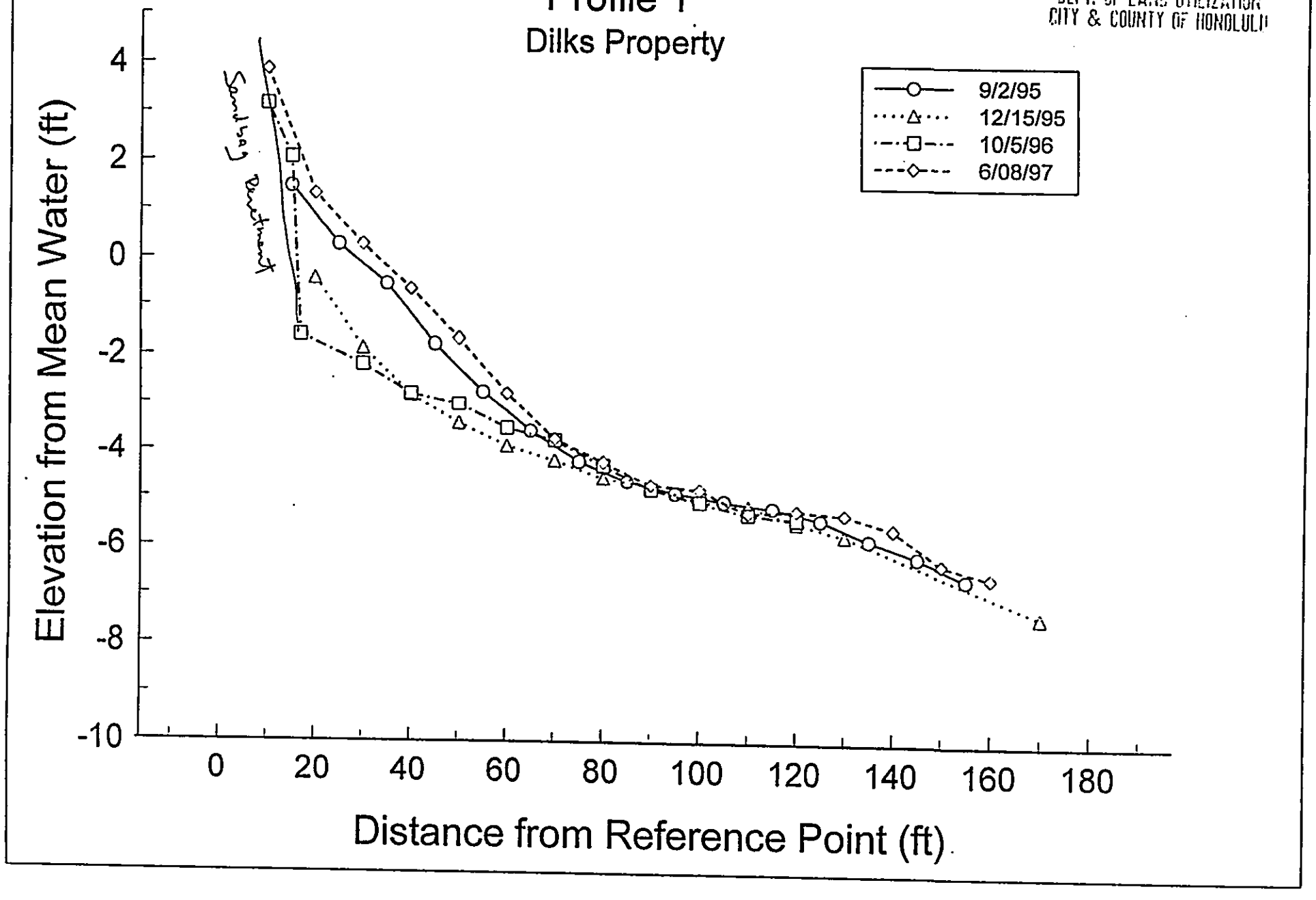
I recommend continuing the pilot program.

David Lipp
Coastal Engineer

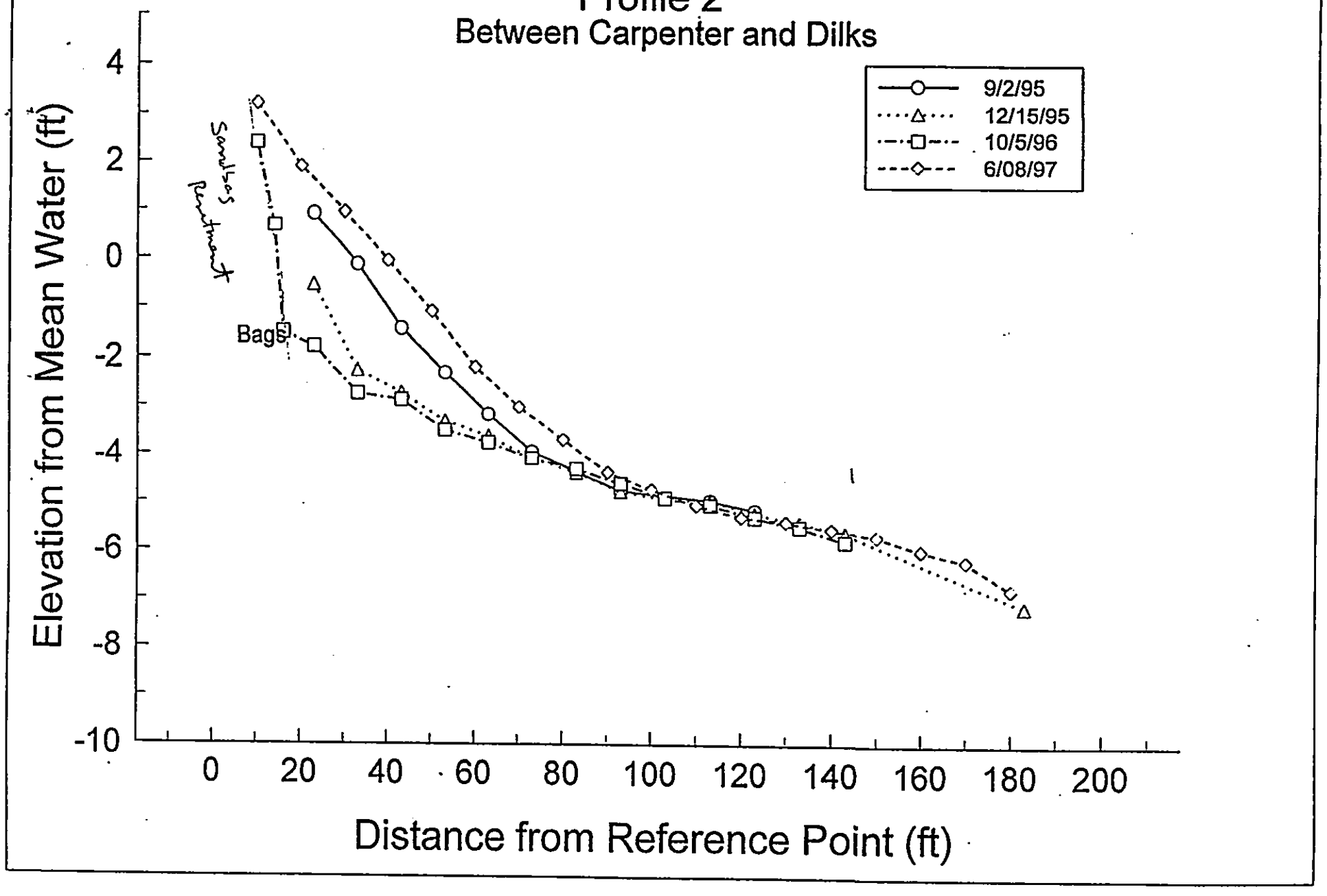




Profile 1
Dilks Property



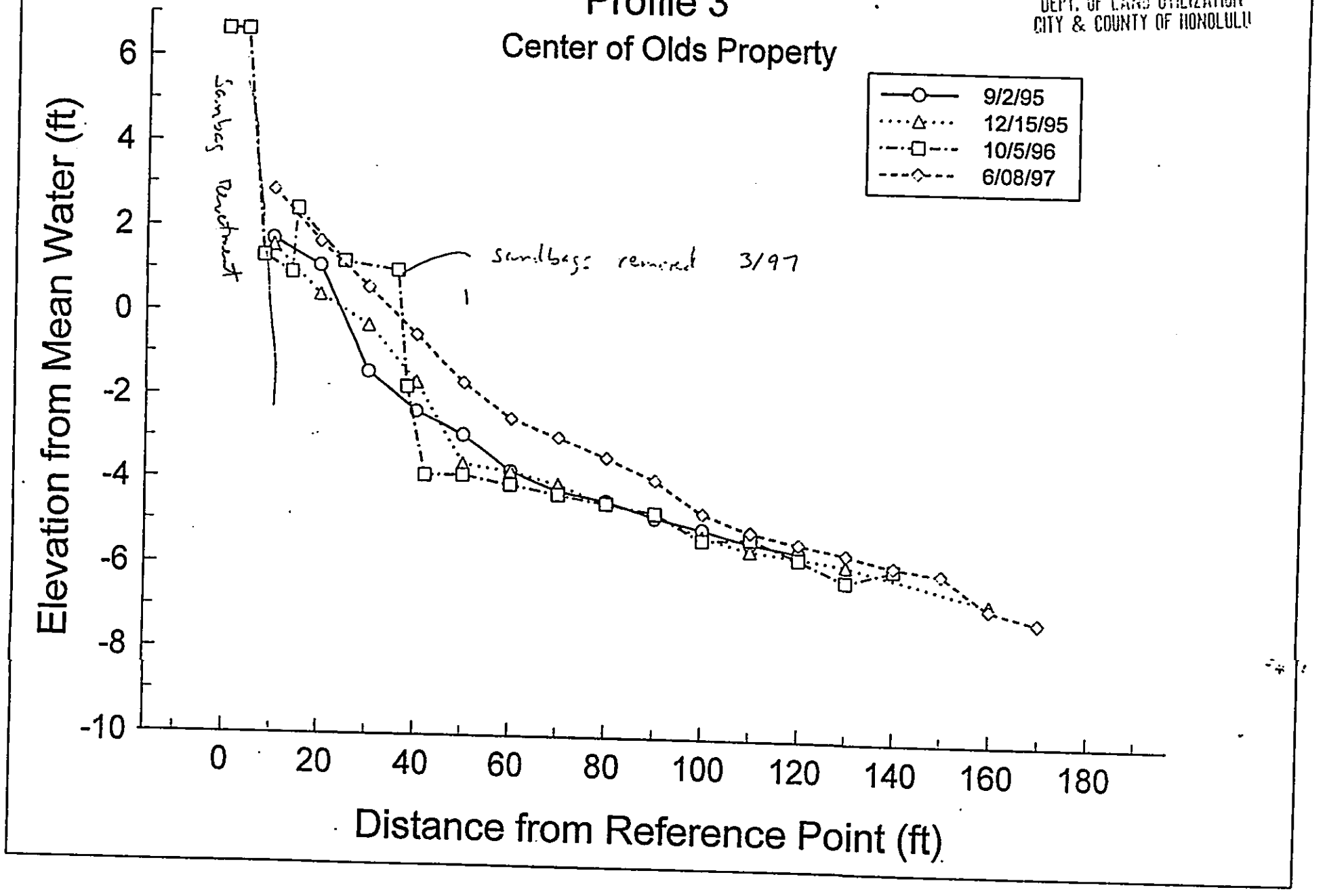
Profile 2
Between Carpenter and Dilks



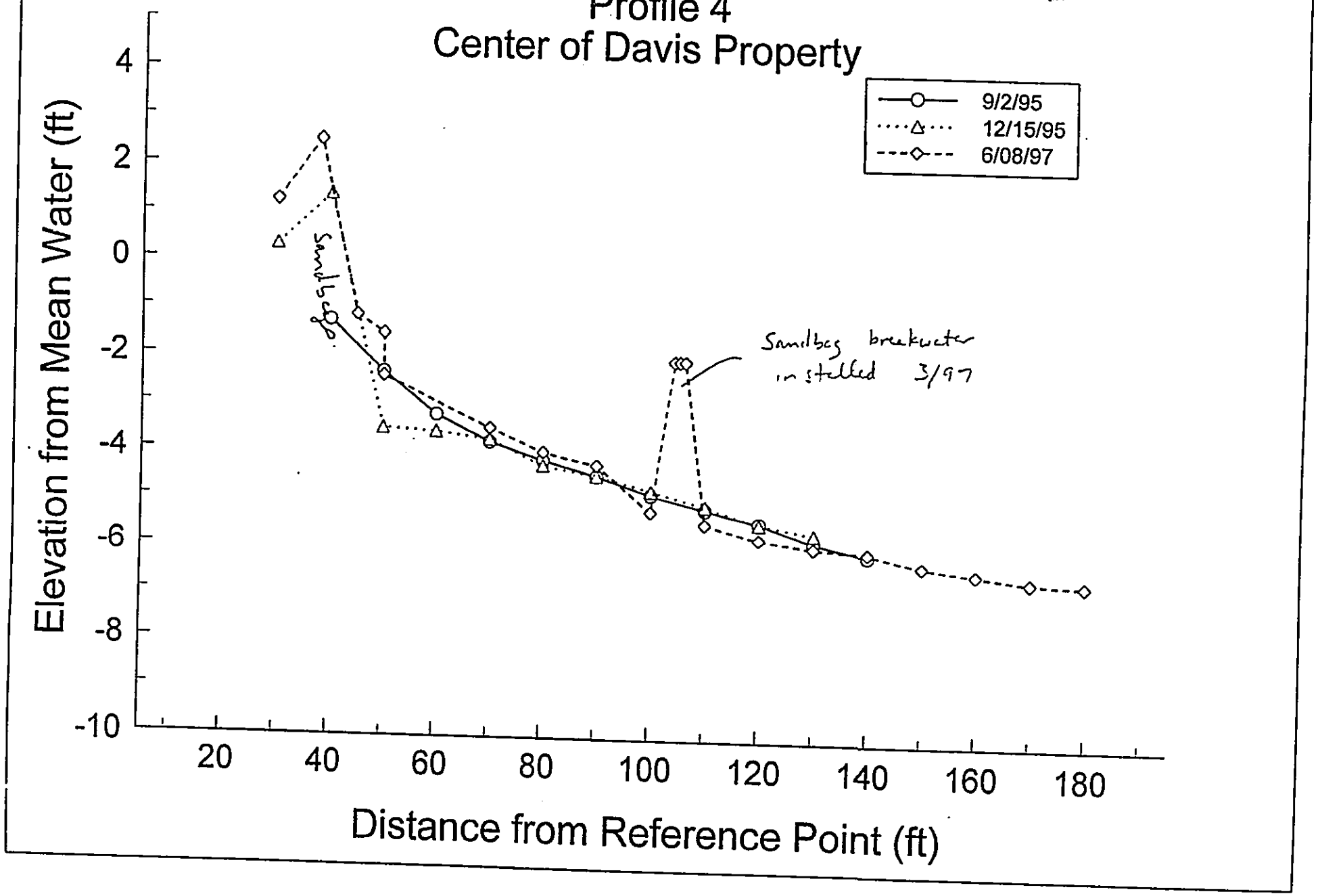
1997 SEP -8 AM 10: 11

DEPT. OF LAND UTILIZATION
CITY & COUNTY OF HONOLULU

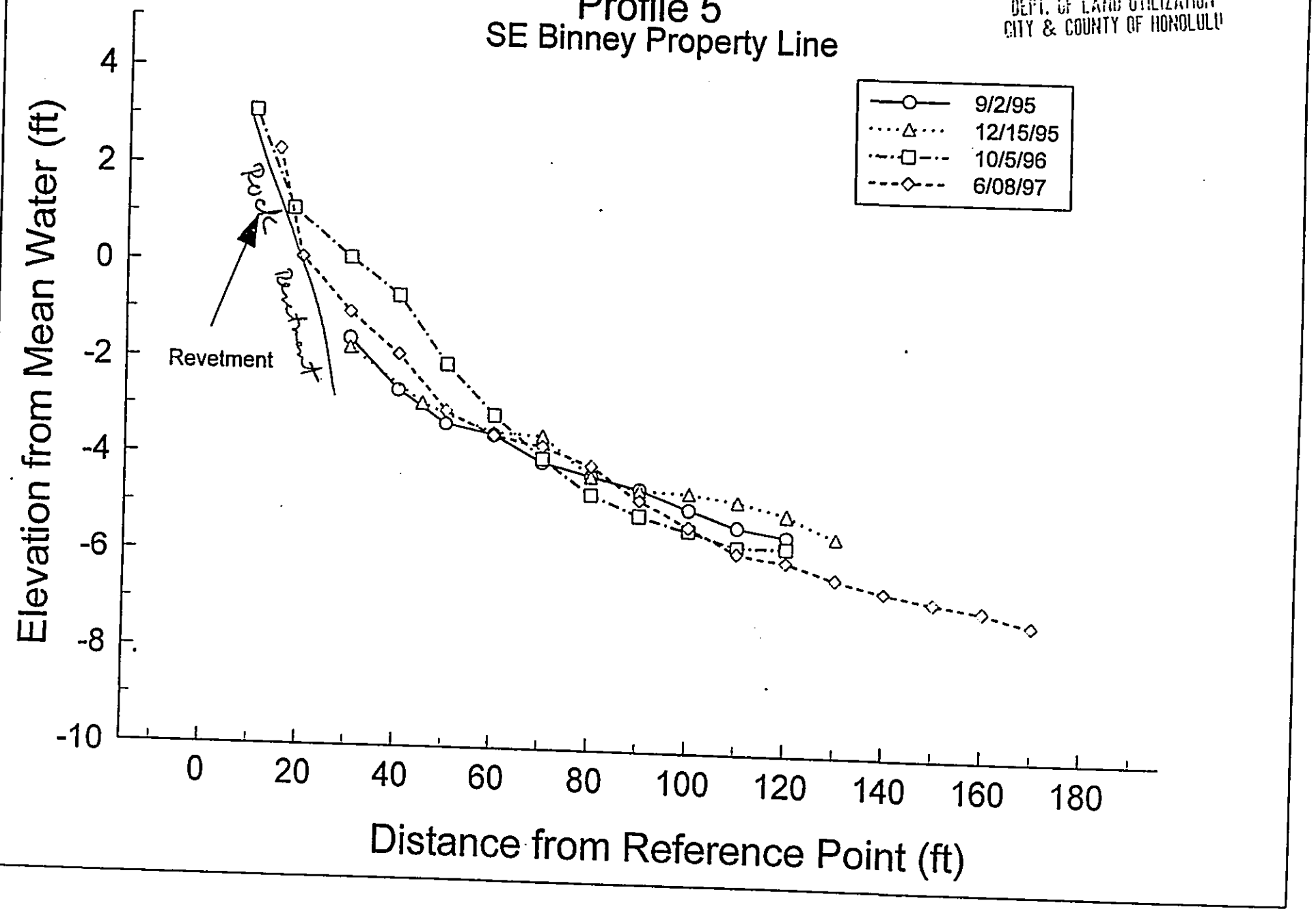
Profile 3
Center of Olds Property



Profile 4
Center of Davis Property



Profile 5
SE Binney Property Line



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CN 1781

September 8, 1997

MEMORANDUM

TO: Robin Foster

FROM: Elaine Tamaye

SUBJECT: Summary Report by David Lipp

I have reviewed the data and summary report by David Lipp and have the following comments:

(1) There is a significant seasonal movement of sand along this section of coastline. The beach profile data are not sufficient to define the extent of the seasonal variability versus long-term trend. Profiling was done only twice in 1995 (Sept and Dec), once in 1996 (Oct), and once in 1997 (Jun). Therefore, it is not possible to draw any conclusions from this data about the "effectiveness" of the pilot program. It is important to note that David Lipp's conclusion was that the sand movement is due to environmental factors and not the sandbags themselves. His only "conclusion" about the sandbags is that "the sandbags did not prevent the beach from reforming".

(2) Although the profiles indicate that the sand elevations on the beach have increased from Dec 1995 to June 1997, that is not to say that the beach has been "restored". The profiles extend seaward of the sandbag revetments, and there is no evidence of restoration of any dry beach area. The top of beach elevations (less than 4 feet above mean water level) are clearly below the wave runup level. Therefore, if not for the existing shore protection structures, there could very likely have been additional loss of fastlands (erosion of the shoreline as defined by the vegetation line), even though there may have been a slight gain in elevation of the beach foreshore.

(3) In order to provide meaningful data, the beach profiles need to be measured at least quarterly, and additional profiles should be established on the Kailua-side (across "dry" beach areas) to determine the pilot program's effect on adjacent shoreline areas and to obtain a better understanding of the

seasonal sand movement affecting this coastal reach.

(4) There is no mention about how much sand was "added" to the littoral system. How much of this sand fill contributed to the increase in beach elevations? There is also no description of what was done with the sandbags, such as what configurations were tested and for how long. There is simply insufficient information from the monitoring program to draw any valid conclusions about the pilot program.

Appendix B

Justification for a Shoreline Setback Variance under ROH Sec. 23-1.8(b)(3) "Hardship Standard"

The owner will suffer hardship if she is not allowed to construct a new foundation to reinforce the existing, nonconforming seawall. The application for a shoreline setback variance fulfills the three criteria for hardship set forth in ROH Sec. 23-1.8(b)(3), as discussed below.

The applicant will be deprived of reasonable use of the land. The property has a nonconforming seawall. If the new foundation were not allowed, future storm waves could undermine the seawall and cause it to break. This could in turn lead to severe erosion of the property due to storm waves and ongoing coastal erosion. Erosion of the property would eventually threaten the foundations of planned new residences on the property.

The applicants' proposal is due to unique circumstances. Lanikai Beach has been undergoing long-term coastal erosion, proceeding from the southern end of the beach toward the middle. The sole reason for the variance request is the erosion occurring at this particular section of beach. Many other property owners along the southern portion of Lanikai Beach have built seawalls or revetments to protect their homes from erosion. In the past several years, the Department has approved Shoreline Variances for seawalls on six lots within a 600-foot reach south of the subject property.

The proposal is the practicable alternative which conforms best to the purpose of the shoreline setback regulations. The Coastal Engineering Evaluation analyzes a number of alternative measures. The preferred alternative would be beach restoration by replenishment of sand, possibly augmented by construction of a low-profile offshore breakwater structure. To be effective, however, a beach restoration program must be designed, financed, permitted, and developed across an entire littoral cell. The littoral cell in this case would encompass the beach frontage of numerous residential properties. Typically, beach restoration projects are carried out by the U.S. Army Corps of Engineers or by an agency of state government. The scope of such a project places it beyond the capability of a single property owner.

The Department of Planning and Permitting has asked for review of two other alternatives: replacement of the seawall with a sloping revetment and removal of the wall and use of vegetation to protect the shoreline. As discussed in the Final Environmental Assessment (Sec. 4) and in the appended Coastal Engineering Evaluation (Appendix A, Final EA), a sloping revetment would not materially affect littoral processes – i.e., the ongoing erosion of this coastal reach; neighborhood would it improve shoreline access. Removal of the seawall would make this the one unprotected property in the area, and it would become victim to concentrated erosion. In addition, both alternatives would pose the eroding the flanks of adjoining seawalls that protect adjoining properties. Finally, because the property has an existing, nonconforming seawall, the owner would decline to undertake either alternative.

Reinforcing the nonconforming seawall by building a new foundation will not alter littoral processes, since the seawall itself has been in place for 40 years. Building the foundation will, however, allow the owner to remove the protective rock blanket from the public beach makai of the seawall, thus improving public access along Lanikai Beach. In fact, the owner has executed a specific agreement with the Department of Land and Natural Resources to undertake removal and has paid a substantial amount as a performance surety to DLNR. Removal of the rock blanket is, therefore, an integral part of the proposal. This action directly supports one of the main purposes of the shoreline setback regulations.

Appendix C

LIST OF COMMENTS RECEIVED – Draft Environmental Assessment, Improvement of Nonconforming Seawall, Lanikai

Agency/Organization	Comment Date	Response
City & County of Honolulu		
Department of Planning and Permitting	6/4/04	10/29/04
State of Hawaii		
Department of Health	---	
Department of Land and Natural Resources	5/12/04	10/27/04
Historic Preservation Division, DLNR	5/25/04	10/27/04
Land Use Commission	---	---
Office of Environmental Quality Control	5/21/04	10/27/04
Office of Hawaiian Affairs	---	---
University of Hawaii at Manoa Environmental Center	---	---
Federal Government		
U.S. Army Engineer District, Honolulu	5/24/04	11/1/04
U.S. Fish & Wildlife Service, Pacific	---	---
Community		
Kailua Neighborhood Board #31	---	---
Lanikai Association	---	---

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

JEREMY HARRIS
MAYOR

ERIC G. CRISPIN, AIA
DIRECTOR

BARBARA KIM STANTON
DEPUTY DIRECTOR

Kathy Sokugawa
Acting Deputy Director

June 4, 2004

2004/ED-8(ST)

Robin Foster, AICP
PlanPacific
345 Queen Street, Suite 802
Honolulu, Hawaii 96813

Dear Mr. Foster:

Subject: Draft Environmental Assessment (DEA)
Shoreline Setback Variance (SV) for
Seawall Modifications and Boat Ramp Repair
1240 Mokulua Drive - Lanikai
Tax Map Key 4-3-5: 76

We have reviewed the Draft Environmental Assessment (DEA) for the above-referenced project and offer the following comments:

Project Summary

This section should indicate that the Shoreline Setback Variance is required pursuant to Chapter 23, Revised Ordinances of Honolulu (ROH). In addition, since the property does not contain a single-family dwelling, the proposed work will require the approval of a Special Management Area (SMA) Use Permit pursuant to Chapter 25, ROH.

Section 2.1. Site Description and Background

The reference to the shoreline setback statute should indicate that the concrete seawall was built prior to the City's Shoreline Setback Rules and Regulations (3/30/72), and the Zone of Wave Action Ordinance No. 2837 (8/19/66). This section should also state that the "protective stone blanket" located beyond the seawall was: authorized by the State Department of Transportation Harbors Division, which issued a Shore Waters

Construction Permit (No. 1395) on September 25, 1968; granted a right-of-entry by the Board of Land and Natural Resources on October 14, 1968; and issued a Section 10 authorization by the U.S. Army Corps of Engineers (COE) on October 2, 1968.

The sand and soil hole left by storm surf last November is not evident in Figure 2b (photographs dated March 19, 2004). Please clarify the existing conditions at the site and whether backfilling of the property has already been completed.

Section 2.2 Technical Characteristics

Estimates on the amount of earthwork that is proposed for the seawall foundation should be provided. This information should include the type and source of fill material to be used.

Section 3.3 Shoreline Characteristics and Coastal Processes

The assessment in Section 2.5 that accretion has been the predominant condition at this site for the past 4 decades, appears to conflict with the assessment in this section. We note that as recently as three year ago (1999), this seawall was buried and presence of the "protective rock "blanket" was not even shown on a certified shoreline survey (4/13/99). Since the shoreline evaluation report referred to in this section (Appendix A) was done 7 years ago and did not specifically address the recent shoreline change from accretion to erosion at this site, please address whether those structures described by that report may have contributed to these recent shoreline changes.

Also, since the "protective rock blanket" will be removed following the completion of the proposed seawall foundation work, please expand on what effect that action may have on the current coastal process (i.e., is beach retreat expected to accelerate or slow, etc.).

Section 4 Consideration of Alternatives

The section should be expanded to discuss other alternative actions. Because there is no dwelling that is threatened and the lot is over 220 feet deep, options such as a sloping revetment or the removal of the seawall and use of hardy vegetative species, should be addressed.

Section 8 Determination of Significance

The findings and reasons supporting the anticipated Finding of No Significant Impact (FONSI), pursuant to the 13 significance criteria of Section 11-200-12, HAR, must be expanded to incorporate the additional information requested above.

Shoreline Setback Regulation

The Final EA should include a separate section that addresses the criteria under which a shoreline setback variance (SV) may be granted. This section must specifically address the three (3) tests of the Hardship Standard, pursuant to Section 23-1.8(b)(3), ROH. We strongly recommend that a more thorough discussion of alternatives considered, be provided in the context of these specific criteria.

Comment letters

Finally, we are forwarding copies of the comment letters received so far for the proposed project. In accordance with the procedural provisions of EIS regulations, all comment letters received during the 30-day comment period, which began with the initial publication of a notice of availability of the DEA in The Environmental Notice on March 23, 2004, require a response addressed directly to the commenter. The final EA must include all comment letters and responses to the letters, as well as appropriately revised text.

If you have any questions, please contact Steve Tagawa of our staff at 523-4817.

Sincerely yours,

ERIC G. CRISPIN, AIA
for Director of Planning
and Permitting

EGC:cs
Encls.

cc: DLNR-OCCL
OEQC

PLANPACIFIC

October 29, 2004

Mr. Eric G. Crispin, AIA, Director
Department of Planning and Permitting
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Dear Mr. Crispin:

Subject: Draft Environmental Assessment (Draft EA) for Improvement of Nonconforming Seawall, Lanikai; TMK 4-3-005: 076

Thank you for your comment letter dated June 4, 2004. Following is an itemized response to your comments.

Project Summary. In the Final EA, the Project Summary (Section 1) has been amended to reflect the requirement for a Special Management Area permit. Section 6, List of Approvals and Permits Required, has been similarly amended.

Section 2.1. Site Description and Background

a. This section has been amended to refer to the appropriate regulations, permits, and dates relating to the protective rock blanket.

b. In response to your question, the following information has been added: "Following the storm, the owner contracted to have the hole filled with sand and soil. The contractor also installed geotextile filter fabric to forestall future soil loss."

Section 2.2 Technical Characteristics. In response to your question about earth work, the following information has been added to this section of the EA: "Soil will be excavated one section at a time, stockpiled onsite, and used to backfill the construction trench after the section of foundation is completed. The project will result in a net amount of 170 cubic yards of excavated material, which will be disposed of offsite."

Section 3.3 Shoreline Characteristics and Coastal Processes

In order to address your questions about historical shoreline changes and littoral impacts, the consulting Coastal Engineer has prepared a letter report that supplements the Coastal Engineering Evaluation and is included at the front of Appendix A in the Final EA. Dated October 22, 2004, the supplemental report clarifies and updates the shoreline history of the subject property in relation to the cycle of erosion affecting southern Lanikai. It also provides additional

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Honolulu
Hawaii 96813

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analysis regarding potential littoral impacts and alternative actions. Among the attached exhibits are two maps that record the chronology of erosion and the development of permanent shore protection along the shoreline reach most impacted during the past 15-20 years.

Using information from the letter report, we have added material to Section 2.5 and have completely revised Section 3.3 of the EA. In answer to your specific questions, we offer the following:

a. With regard to the contribution of progressive shoreline hardening to continuing erosion in Lanikai, the Coastal Engineer's 10/22/04 supplemental report states in part:

> The erosion that is occurring along the Lanikai shoreline can be described as "passive" erosion (in contrast to "active" erosion which is induced or accelerated by shore protection structures). When a protective structure is built along an eroding shoreline and erosion continues to occur, the unprotected shoreline adjacent to the structure will continue to erode and eventually migrate landward beyond the structure. The result will be loss of beach in front of the shore protection structure as the water deepens and the shoreface profile migrates landward.

b. Also as stated in the Coastal Engineer's 10/22/04 report, removal of the rock blanket following the completion of the new foundation for the seawall will have no influence on littoral processes.

Section 4 Consideration of Alternatives. In response to your comment, we have amended Section 4 of the EA to address the alternatives of a sloping revetment and removal of the seawall.

Section 8 Determination of Significance. We have amended the response to Criterion 2, in order to reflect the expanded discussion of alternatives.

Shoreline Setback Regulation. Appendix B of the EA addresses the criteria under which a Shoreline Setback Variance may be granted. In response to your recommendation, we have augmented the discussion of alternatives in the Final EA.

Comment Letters. The Final EA includes responses to all comment letters received as well as substantial revisions to the text, as noted above. In addition to the sections noted above, a section on Flood Hazard has been inserted (Sec. 3.4), and changes have been made to Sec. 3.1 and Sec. 3.9, Water Quality.

Sincerely,

Robin Foster

Robin Foster, AICP

LINDA LINGLE
GOVERNOR OF HAWAII

PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

DAN DAVIDSON
DEPUTY DIRECTOR - LAND

ERNEST Y.W. LAU
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCE ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

RECEIVED
MAY 14 2004
DEPT. OF PLANNING AND PERMITTING
650 SOUTH KING ST.
HONOLULU, HI 96813

May 12, 2004
2004-ED-8.RCM

Honorable Eric G Crispin, AIA
Director of Planning and Permitting
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Crispin:

SUBJECT: Project Within the Shoreline Setback
File No.: 2004-ED-8
Address: 1240 Mokulua Drive - Lanikai, Oahu
Authority: C&CoH Department of Planning and Permitting
TMK: (1) 4-3-005: 076

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

A copy of the document pertaining to the subject matter was transmitted or made available to the following Department of Land and Natural Resources' Divisions for their review and comment:

- Division of Aquatic Resources
- Division of Forestry and Wildlife
- Division of State Parks
- Engineering Division
- Division of Boating and Ocean Recreation
- Office of Conservation and Coastal Lands
- Land-Oahu District Land Office
- Land-Planning and Development

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HONOLULU, HI 96813

Enclosed please find a copy of the Division of Aquatic Resources and Engineering Division comment.

Based on the attached responses, the Department of Land and Natural Resources has no other comment to offer on the subject matter.

Should you have any questions, please contact Nicholas A. Vaccaro of the Land Division Support Services Branch at 587-0384.

Very truly yours,

DIERDRE S. MAMIYA
Administrator

C: ODLO

Suspense Date: May 11, 2004

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
Division of Aquatic Resources
Honolulu, Hawaii

RECEIVED
MAY 14 2004
DEPT. OF PLANNING AND PERMITTING
650 SOUTH KING ST.
HONOLULU, HI 96813

MEMORANDUM

To: Bill Devick, Administrator
From: Richard Sixberry, Aquatic Biologist
Subject: Comments on Shoreline Setback Variance

Comments Requested By: Dierdre Mamiya, Administrator, Land Division

Date of Request: 4/28/04 Date Received: 4/29/04

Summary of Project

Title: Modify a nonconforming seawall & repair boat ramp

Proj. By: Elizabeth Grossman Family Trust

Location: Lanikai Beach, Oahu

Brief Description:

The applicants propose to build a foundation for a nonconforming seawall and repair a nonconforming boat ramp mauka of the certified shoreline along two beachfront parcels at Lanikai, Oahu. Ongoing erosion of the shoreline is intensifying and storm waves have eroded the shoreline edge of the property close to the main residence.

Comments:

Although some minor shoreline disturbance may occur near the high water line during construction of the seawall, no significant long-term adverse impact to aquatic resources are expected from the activities proposed.

Finally, control should be maintained by appropriate agencies to limit or prevent future structures or shoreline modifications that could adversely affect aquatic resource values by influencing cycles of accretion and erosion, as described in the "Coastal Erosion Management Plan for the State of Hawaii".

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LANAY

Ref.: 2004-ED-8 CMT

COMMENTS

() We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone ___.

(X) Please take note that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Zone X and AE.

() Please note that the correct Flood Zone Designation for the project site according to the Flood Insurance Rate Map (FIRM) is ___.

(X) Please note that the project must comply with the rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal Regulations (44CFR), whenever development within a Special Flood Hazard Area is undertaken. If there are any questions, please contact the State NFIP Coordinator, Ms. Carol Tyau-Beam, of the Department of Land and Natural Resources, Engineering Division at (808) 587-0267.

Please be advised that 44CFR indicates the minimum standards set forth by the NFIP. Your Community's local flood ordinance may prove to be more restrictive and thus take precedence over the minimum NFIP standards. If there are questions regarding the local flood ordinances, please contact the applicable County NFIP Coordinators below:

(X) Mr. Robert Sumimoto at (808) 523-4254 or Mr. Mario Siu Li at (808) 523-4247 of the City and County of Honolulu, Department of Planning and Permitting.
() Mr. Kelly Gomes at (808) 961-8327 (Hilo) or Mr. Kiran Emler at (808) 327-3530 (Kona) of the County of Hawaii, Department of Public Works.
() Mr. Francis Cerizo at (808) 270-7771 of the County of Maui, Department of Planning.
() Mr. Mario Antonio at (808) 241-6620 of the County of Kauai, Department of Public Works.

() The applicant should include project water demands and infrastructure required to meet water demands. Please note that the implementation of any State-sponsored projects requiring water service from the Honolulu Board of Water Supply system must first obtain water allocation credits from the Engineering Division before it can receive a building permit and/or water meter.

() The applicant should provide the water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update.

() Additional Comments: _____

() Other: _____

Should you have any questions, please call Mr. Andrew Monden of the Planning Branch at 587-0229.

Signed: Eric T. Hirano
ERIC T. HIRANO, CHIEF ENGINEER

Date: 5/5/04

PLANPACIFIC

October 27, 2004

Mr. Peter T. Young, Chairperson
State of Hawaii
Department of Land and Natural Resources
P.O. Box 621
Honolulu, HI 96809

Attn.: Deirdre Mamiya, Land Division

Dear Mr. Young:

Subject: Draft Environmental Assessment (Draft EA) for Improvement of Nonconforming Seawall, Lanikai; TMK 4-3-005: 076

Thank you for your letter dated May 12, 2004, transmitting comment memoranda from various divisions of DLNR. We offer the following responses:

Division of Aquatic Resources. We concur with your statement that no adverse impact to aquatic resources is expected.

Engineering Division. According to the Flood Insurance Rate Map, the seaward one-third of the property lies within Flood Zone AE. The Base Flood Elevation (BFE) is shown as six (6) feet. The ground elevation at the site varies between 6.5 and 7.5 feet elevation, which exceeds the BFE. The City's Flood Hazard Districts ordinance does not regulate fences and walls, unless they lie within a Floodway or a Coastal High Hazard district. The inland two-thirds of the property lies in Flood Zone X, which is beyond the 500-year flood plain. We have inserted a new Section 3.4 in the EA to describe flood hazards.

Sincerely,

Robin Foster

Robin Foster, AICP

345 Queen Street
Suite 802
Honolulu
Hawaii 96813

tel (808) 521 5418
fax (808) 521 9458

To Steve Tagawa	From
Co/Dept.	Co. SHPD
Phone #	Phone #
Fax # 527-6743	Fax #

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
HISTORIC PRESERVATION DIVISION
KAKUHIHEWA BUILDING, ROOM 555
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

May 25, 2004

Eric G. Crispin, Director
Department of Planning and Permitting
City & County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

LOG NO: 2204.1494
DOC NO: 0405EJ09

Dear Mr. Crispin:

SUBJECT: Chapter 6E-42 Historic Preservation Review – Draft Environmental Assessment Improvement of a Non Conforming Wall at 1240 Mokulua Drive, Lanikai
Lanikai, Ko'olaupoko, O'ahu
TMK: (1) 4-3-005:076

Thank you for the opportunity to comment on the draft Environmental Assessment prepared for the modification of a non-conforming seawall and repair to an existing boat ramp at 1240 Mokulua Drive in Lanikai, O'ahu. Our review is based on historic reports, maps, and aerial photographs maintained at the State Historic Preservation Division; no field inspection was made of the project areas. We received the DEA from your office on April 26, 2004.

The applicant proposes construction of a new foundation to an existing seawall; repair an existing boat ramp by rebuilding the ramp slab, and replacing a low chain-link or metal fence landward of the seawall. The project proposes improvements to existing facilities. No historic sites were identified during construction of the existing seawall or boat ramp and past disturbances during construction make it unlikely that historic sites would remain. Therefore, we believe that "no historic properties will be affected" by this action. However, in the unlikely event that historic sites, including human burials, are uncovered during routine construction activities, all work in the vicinity must stop and the State Historic Preservation Division must be contacted at 692-8015.

We have further comments regarding proposed future development actions on the subject parcel. The DEA notes, in section 2.1, that the owner plans future development of the property including the construction of two dwellings and a swimming pool. A review of our records indicates that human burials have been identified in Jaucas sand deposits in the general vicinity of this parcel. These sites were found during water main installation activities along Aalapapa Drive a little over 1/10th of a mile from this parcel. Because the parcel is underlain with Jaucas sand deposits, and human burials have been recovered from nearby locations, we believe that future development of the property has the potential to have an adverse effect on subsurface cultural deposits. Therefore we request that SHPD be given

the opportunity to comment on any future development of the parcel. We anticipate that our recommendations for historic preservation compliance, with regard to future developments, may include archaeological inventory survey of the Area(s) of Potential Effect, depending on the nature and extent of any ground-disturbing activities.

Should you have any questions about archaeology, please feel free to call Sara Collins at 692-8026 or Elaine Jourdane at 692-8027. Should you have any questions about burial matters please feel free to call Kai Markell at 587-0008. Should you have questions regarding cultural matters, please feel free to contact Nathan Napoka at 587-0192.

Aloha,

P. Holly McEldowney

P. Holly McEldowney, Administrator
State Historic Preservation Division

EJ:jen

c: Kai Markell, Director, Burials Site Program
Van Horn Diamond, Chair, Oahu Island Burial Council
Nathan Napoka, Branch Chief, History and Culture Branch

PLANPACIFIC

October 27, 2004

Ms. P. Holly McEldowney, Administrator
State Historic Preservation Division
Department of Land and Natural Resources
Kakuhihewa Building, Room 555
601 Kamokila Boulevard
Kapolei, Hawaii 96707

Dear Ms. McEldowney:

Subject: Draft Environmental Assessment (Draft EA) for Improvement of Nonconforming Seawall, Lanikai; TMK 4-3-005: 076

Thank you for your letter dated May 25, 2004. We recognize that human burials have been discovered during past construction projects in the area. In the event that an historic site or burial is discovered during construction, work will be halted and your office will be contacted.

Sincerely,

Robin Foster, AICP

345 Queen Street
Suite 802
Honolulu
Hawaii 96813

Tel (808) 521-9418
Fax (808) 521-9468

LINDA LINGLE
GOVERNOR OF HAWAII

GENEVIEVE SALMONSON
DIRECTOR

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

235 SOUTH BERETANIA STREET
SUITE 702
HONOLULU, HAWAII 96813
TELEPHONE (808) 586-4185
FACSIMILE (808) 586-4186
E-mail: oeqc@mail.state.hi.us

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25

May 21, 2004

Mr. Eric Crispin, Director
Department of Planning and Permitting
City and County of Honolulu
650 South King Street
Honolulu, Hawai'i 96813

Dear Mr. Crispin:

Subject: Draft Environmental Assessment for the Grossman Seawall and Boat Ramp Repair, O'ahu

Thank you for the opportunity to review and comment on the subject project. We have the following comments.

1. For assistance in completing the assessment, please review the "Shoreline Hardening Policy and Environmental Assessment Guidelines" available at http://www.state.hi.us/health/oeqc/guidance/shoreline.htm

2. Please consult with the adjacent neighbors and the Lanikai Community Association.

Sincerely,

Genevieve Salmonson
Director

c: Plan Pacific
E. Grosman Family Trust

PLANPACIFIC

October 27, 2004

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

Dear Ms. Salmonson:

Subject: Draft Environmental Assessment (Draft EA) for Improvement of Nonconforming Seawall, Lanikai; TMK 4-3-005: 076

Thank you for your comment letter dated May 21, 2004. In response, we offer the following:

1. We are familiar with the Shoreline Hardening Policy and Environmental Assessment Guidelines.
2. We have consulted with the adjacent neighbors and the Lanikai Association.

Sincerely,

Robin Foster, AICP

345 Queen Street
Suite 802
Honolulu
Hawaii 96813

Tel (808) 521 9418
Fax (808) 521 9469

DEPARTMENT OF THE ARMY
U. S. ARMY ENGINEER DISTRICT, HONOLULU
FT. SHAFTER, HAWAII 96858-5440

REPLY TO ATTENTION OF

May 24, 2004

Regulatory Branch

RECEIVED
MAY 27 9 56 AM '04
DEPT OF PLANNING & PERMITTING
CITY & COUNTY OF HONOLULU

Mr. Eric G. Crispin, Director
Department of Planning and Permitting
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96817

Dear Mr. Crispin:

This responds to your request for review of the Draft Environmental Assessment (DEA) for proposed shore protection for the Elizabeth R. Grossman Family Trust property at 1240 Mokulua Drive, Lanikai, Oahu (TMK 4-3-05: 076). We have reviewed the document with respect to the Corps' authority to issue Department of the Army (DA) permits under Section 10 of the Rivers and Harbors Act of 1899 (33 USC 403) and Section 404 of the Clean Water Act (33 USC 1344).

Based on the information provided in the DEA, I have tentatively determined that the proposed activity would involve work in waters of the United States subject to the regulatory authority of the Corps of Engineers and a DA permit will therefore be required. The applicants should contact Mr. Peter Galloway of my staff at (808) 438-8416 concerning DA permit requirements.

File No. 200400334 has been assigned to this project. Should you have questions concerning this preliminary determination, please contact Mr. Galloway by telephone at the above-listed number or by fax at (808) 438-4060. Mailed inquiries concerning this project should be addressed to: Regulatory Branch (CEPOH-EC-R/P. Galloway); U.S. Army Engineer District, Honolulu; Building 230; Fort Shafter, Hawaii 96858-5440.

Sincerely,

for George P. Young, P.E.
Chief, Regulatory Branch

PLANPACIFIC

November 1, 2004

Mr. George P. Young, P.E., Chief
Regulatory Branch (CEPOH-EC-R/P. Galloway)
U.S. Army Engineer District, Honolulu
Ft. Shafter, Hawaii 96858-5440

Dear Mr. Young:

Subject: Draft Environmental Assessment (Draft EA) for Improvement of Nonconforming Seawall, Lanikai; TMK 4-3-005: 076
(Your File No. 2004000334)

Thank you for your comment letter dated May 24, 2004, which states that you have tentatively determined that a Department of the Army (DA) permit would be required.

In consulting with your office, we confirmed that the owner will apply for a DA permit for removal of the protective rock blanket under Section 10 of the Rivers and Harbors Act of 1899 (33 USC 403). The rock blanket lies within DA jurisdiction, seaward of the nonconforming seawall. The DA granted a permit allowing installation of the rock blanket in 1968.

The proposed new seawall foundation, however, will be constructed inland of the nonconforming seawall. Since that site lies outside of the DA's jurisdiction, a Section 10 permit will not be required.

All dewatering will be retained onsite, and there will be no discharge to ocean waters. Therefore, a Section 404 permit will not be needed.

Sincerely,

Robin Foster, AICP

345 Queen Street
Suite 802
Honolulu
Hawaii 96813

Tel (808) 521-2418
Fax (808) 521-6463