Dilks Seawall Construction

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97/SV-007 (AC)
97-09341

January 5, 1998

The Honorable Gary Gill, Director
Office of Environmental Quality Control
State of Hawaii
State Office Tower, Room 702
235 South Beretania Street
Honolulu, Hawaii 96813

Dear Mr. Gill:

CHAPTER 343, HRS
Environmental Assessment (EA)/Determination
Finding of No Significant Impact

Owners/Applicants	:	John and Patricia Dilks
Agent	:	PlanPacific, Inc.
Location	:	1286 and 1302 Mokulua Drive, Lanikai, Oahu
Tax Map Keys	:	4-3-04: 74 and 4-3-05: 61
Request	:	Shoreline Setback Variance
Proposal	:	Construction of a concrete-reinforced masonry (CRM) seawall
Determination	:	A Finding of No Significant Impact is Issued

Attached and incorporated by reference is the Final EA prepared by the applicant for the project. Based on the significance criteria outlined in Chapter 200, State Administrative Rules, we have determined that preparation of an Environmental Impact Statement is not required.

We have enclosed a completed OEQC Bulletin Publication Form and four copies of the Final EA. If you have any questions, please contact Art Challacombe of our staff at 523-4107.

Very truly yours,

JAN NAOE SULLIVAN
Director of Land Utilization

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Encls.

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Final Environmental Assessment and Coastal Engineering Evaluation

Shore Protection Structure Lanikai, O'ahu TMK 4-3-04: 74 and 4-3-05:61

Prepared by:

PlanPacific, Inc. and

Edward K. Noda and Associates

December 1997

Contents

Environmental Assessment

Summary Information

Proposed Project: Shore Protection Structure
1286 and 1302 Mokulua Drive, Lanikai, O'ahu

Fee Owner/Applicant: John and Patricia Dilks
1302 Mokulua Drive
Kailua, Hawaii 96734

Agent: Robin Foster, AICP
PlanPacific, Inc.
737 Bishop Street - Ste. 1520
Honolulu, HI 96813
Telephone 521-9418 ext. 13

Tax Map Key: 4-3-04: 74 20,317 square feet, less eroded area
4-3-05: 61 19,574 square feet, less eroded area

Zoning: R-10 Residential District

Permitting Agency: Department of Land Utilization
City & County of Honolulu

Consulted Agencies:

Department of Land Utilization, City & County of Honolulu

Dept. of Accounting & Gen'l Services - Survey Division, State of Hawaii

Dept. of Land and Natural Resources - Land Division, State of Hawaii

U.S. Army Engineer District, Honolulu - Operations Branch

Permits Required: Shoreline Setback Variance
Cons. District Use Permit (only with revetment)
Grading Permit
Building Permit

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1. Proposed Project

The project site is located on two contiguous shoreline parcels at 1302 and 1286 Mokulua Drive, Lanikai (TMKs 4-3-04: 74 and 4-3-05: 61, respectively). Figure 1 shows the general location of the site. The parcels are owned by John and Patricia Dilks and are occupied by single-family dwellings.

Ongoing erosion of the shoreline intensified during the winter of 1995-'96, when storm waves eroded the shoreline edge of the property to within 8-10 feet of the main residence. The owners sought and obtained emergency permission from the Department of Land and Natural Resources to install a SEAbag revetment as a temporary measure to protect the property from further erosion. (SEAbags are large sandbags designed for shore protection.) Permission was also obtained from the U.S. Army District Engineer. The SEAbag revetment was installed in April-May 1996. The revetment suffered damage both by beach users and from the winter 1996 storms. It was repaired in April 1997.

Because erosion is continuing along the southern end of Lanikai Beach, and because the sandbag revetment is only a temporary, emergency measure, the owners propose to construct a permanent shore protection structure.

The proposed shore protection structure is a CRM (concrete-reinforced masonry) seawall, sited landward of the certified shoreline along the 150-foot frontage of the two parcels, entirely within the 40-foot shoreline setback. Plans and a detailed description of the proposed structure may be found in Section 5.0 of the Coastal Engineering Evaluation and in Figures 5 and 6.

In addition, the EA also discusses the alternative of constructing a 2:1 sloping rock revetment instead of the seawall. The sloping revetment would likewise be sited along the 150-foot frontage but its width would extend into the Conservation District as well as into the shoreline setback. Plans and a detailed description of the revetment may also be found in Section 5.0 of the Coastal Engineering Evaluation and in Figures 7 and 8.

The shoreline survey was certified by the State Land Surveyor on June 12, 1997 and is included as Figure 3. It was based on a survey prepared prior to installation of the emergency SEAbag revetment. Construction of the proposed seawall requires a Shoreline Variance from the Department of Land Utilization. Construction of the alternative sloping revetment would require a Conservation

District Use Application from the Department of Land and Natural Resources, in addition to a Shoreline Variance.

2. Affected Environment

2.1 Description of the Site and the Surrounding Area

Lanikai is a fully-developed residential community occupying a narrow coastal plain bounded by the steep 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 Development Plan designation is Residential.

Parcel 74 (1302 Mokulua Drive) is developed with a house and a single-family dwelling. The house was constructed in 1974, in compliance with the 40-foot shoreline setback. Due to erosion, the current shoreline lies only 10 feet from the house at its most inland point.

Parcel 61 (1286 Mokulua Drive) is developed with a swimming pool, a single-family dwelling, and a garage. The house is 40-50 years old and smaller than the house on Parcel 74. The edge of the swimming pool's concrete deck lies about 18 feet from the most eroded point of the current shoreline.

The soils are Jaucas sand, according to the Soil Survey (USDA Soil Conservation Service, 1972). 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 feet MSL.

The property drops off sharply at the shoreline. The elevation at the top of the bank is about +8.0 MSL. The finished floor elevation of the residence is about +10.0 MSL.

The Coastal Engineering Evaluation provides description of the shoreline and coastal processes (Section 2.0) and discussion of historic beach and shoreline changes (Section 3.0).

The three parcels immediately south of the site (parcels 77, 76 and 98) have been severely eroded and are protected by SEAbags. Beyond these parcels, the shoreline has been hardened with shore protection structures extending south to Wailea Point.

The parcel immediately north of the site (parcel 60) is somewhat protected by piled rocks. The next two parcels to the north (parcels 63 and 62) are protected by older CRM walls at the shoreline.

2.2 Coastal Resources

There is a public beach right-of-way on either side of the group of shoreline residences described above. Owned by the Lanikai Community Association, the beach accesses are located along the southern boundary of parcel 77 and along the northern boundary of parcel 62. There is no public beach park in Lanikai.

The adjacent beach is used for walking and jogging. The waters 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 public boating and windsurfing. There is some pole fishing from boats and from the shore, but nearshore fish populations are relatively sparse. Spear-fishing and snorkeling is practiced among the coral heads farther offshore. There are a few spots for board-surfing around the Mokulua Islands.

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 adjacent beach offers a 180-degree view up the beach to the north, towards the ocean and the Mokulua Islands, and south to Wailea Point.

3. Consideration of Alternatives

The Coastal Engineering Evaluation discusses various alternatives to the proposed action, including beach nourishment, an offshore breakwater, and a sloping rock revetment (see Sections 4.0 and 5.0). Beach nourishment or construction of a permanent breakwater, if properly executed, are viable long-term solutions. However, both types of project need to be applied to an entire beach and require extensive federal and state permits. For these reasons, they are beyond the means of a single property owner.

The "no-action" alternative was also considered but rejected because of the continuing threat posed by chronic coastal erosion. The 3,000-square-foot custom-designed residence is slab-on-grade construction. Any further erosion

would eat into the soil supporting the foundation, undermine the foundation and cause it to crack. As erosion progressed and the crack became larger, the house would break up. Because of the slab-on-grade design, relocation of the house to a mauka location is infeasible.

The emergency SEAbag revetment has provided a measure of protection, but is not intended as permanent protection. During the 1996-'97 winter, it was overtopped by storm waves and sustained significant damage. At the point closest to the house, the SEAbags slumped, and soil eroded from the yard behind the SEAbags. In addition, bags are continually being damaged by punctures from fishermen's stakes and from other people using the beach. When punctured, a SEAbag gradually loses its contents. Damage to the SEAbags was repaired at considerable expense in April 1997, and additional repairs are anticipated.

Maintaining the SEAbag revetment over an extended period of time would be extremely expensive and would not provide the secure shore protection of a CRM seawall or a sloping rock revetment. Therefore, maintaining the SEAbag revetment in perpetuity is not a viable option.

4. Impacts

The Coastal Engineering Evaluation finds that the proposed structure would have no significant long-term impact on littoral processes (see Section 6.0).

The project will cause no long-term impact to recreational, biological or scenic resources. The project will improve the appearance of the beach, by replacing the bulky SEAbags with a more attractive rock wall.

During construction of the project, there may be short-term impacts on recreational use of the beach and on water quality. However, these will be minor, since the seawall will be constructed within the subject properties, landward of the certified shoreline.

A backhoe and possibly a crane will be used during construction and will cause some noise during workdays. If needed, the contractor will seek a Department of Health noise permit.

Run-off is expected to be minimal, since the existing SEAbags will remain in place during construction. They will protect the wall foundations from wave action, as well as trap any run-off of exposed soils.

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 are exempt from permit requirements.

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

1. 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."
2. 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. Therefore, a shore protection structure does not in and of itself advance the CZM objective and policies for recreational resources. However, it would be unreasonable to expect a family to sacrifice their home and property—typically their major financial asset—in order to nourish an eroding beach. Asking one or a few property owners to make such a sacrifice is particularly difficult to justify when the government has no comprehensive program for dealing with the chronic erosion problem or restoring the beach.

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.

Note that the Dilks' house was constructed in conformance with the 40-foot shoreline setback. In fact, when it was built in 1981, the house was sited 55 feet landward of the certified shoreline survey. In this as in many other cases, the shoreline setback mandated by the Act was insufficient to protect the house in a situation of chronic erosion.

In order to protect the remaining beach for public use, the proposed seawall would be constructed landward of the certified shoreline. As an alternative, the applicant proposes a sloping revetment. Revetments are generally believed to be less reflective of wave energy, to cause less scouring, and therefore to have lesser impact on littoral processes. However, the revetment would need to be constructed partly seaward of the certified shoreline.

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

The Dilks will suffer hardship if they are not allowed to construct permanent shore protection. Their application for a shoreline setback variance fulfills the three criteria for hardship set forth in ROH Sec. 23-1.8 (3)(A), as discussed below.

1. The applicants will be deprived of reasonable use of the land. If the shore protection structure is not allowed, the foundation of the house will be undermined by the combination of storm waves and ongoing beach erosion. Undermining of the slab foundation would cause serious damage to the house and would render it uninhabitable. Because it has a concrete slab foundation, the house can neither be elevated off the ground, nor moved to another location on the property.

   At present, the house is protected by SEAbags allowed under an emergency Conservation District Use Application. The SEAbags, however, are not a long-term solution. They require continual maintenance and have been

damaged by vandalism and by storm waves. In the first year of use, the owners have had to make substantial repairs in order to maintain this temporary protection.

2. The applicants' proposal is due to unique circumstances. The southern end of Lanikai Beach is known as a site of ongoing, long-term beach erosion. The same is not true for the middle portion of Lanikai Beach, which has had a protracted term of accretion. The sole reason for the variance request is the beach 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.

3. 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.

A sloping revetment would also be feasible to protect the Dilks' property, provided that the State Department of Land and Natural Resources permitted the lower portion to be constructed within the Conservation District. As shown in Figures 7 and 8 of the EA/CEE, a 2:1 sloping revetment would be 22 feet wide from toe to cap. According to the certified shoreline survey, there is only about 10 feet of Urban District land between the shoreline and the house. Building a revetment as described in Section 4.0 of the Coastal Engineering Evaluation would require using Conservation District lands to support the toe and lower portions of the structure. As shown in Figure 7, the revetment would extend from four feet to 26 feet seaward of the certified shoreline. This would require obtaining a CDUA from the Board of Land and Natural Resources, in addition to the shoreline setback variance. A sloping revetment is a viable alternative for protecting the Dilks property.

7. Mitigation Measures

Construction impacts will be minimized. The existing SEAbags will be utilized to curtail run-off of construction sediments into the ocean.

8. Reasons Supporting a Finding of No Significant Impact

Based on the criteria stated in Sec. 11-200-12, HAR, the proposed project will not have an impact significant enough to warrant preparation of an Environmental Impact Statement.

1. The proposed project will not involve irrevocable loss of a natural resource. As substantiated herein and in the Coastal Engineering Report, the proposed project will not prevent the rebuilding of dry beach to its previous state.

2. The proposed project will be constructed within private property and will not curtail beneficial use of the environment.

3. The proposed project is not inconsistent with the State's long-term environmental policies, inasmuch as the proposed structure will not significantly affect natural processes of coastal erosion on Lanikai Beach.

4. The proposed project will not affect the economic or social welfare of the community.

5. The proposed project will not affect public health.

6. The proposed project will have no substantial secondary impacts.

7. The proposed project will not involve a substantial degradation of environmental quality.

8. The proposed project will not have a substantial impact on the environment, nor is it part of a larger action that would cumulatively have a substantial impact.

9. No rare, threatened or endangered species are located on the project site.

10. The proposed project will not have any significant impact on water or air quality.

11. The proposed project may have an incremental, temporary impact on the shoreline, but will not significantly impede littoral processed including regeneration of dry beach area. The project is intended to prevent wave damage to structures on the property.

12. The proposed project will not substantially affect viewplanes.

13. The proposed project will not require substantial energy consumption.

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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:

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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.

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[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.

0000 0008 1131

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.

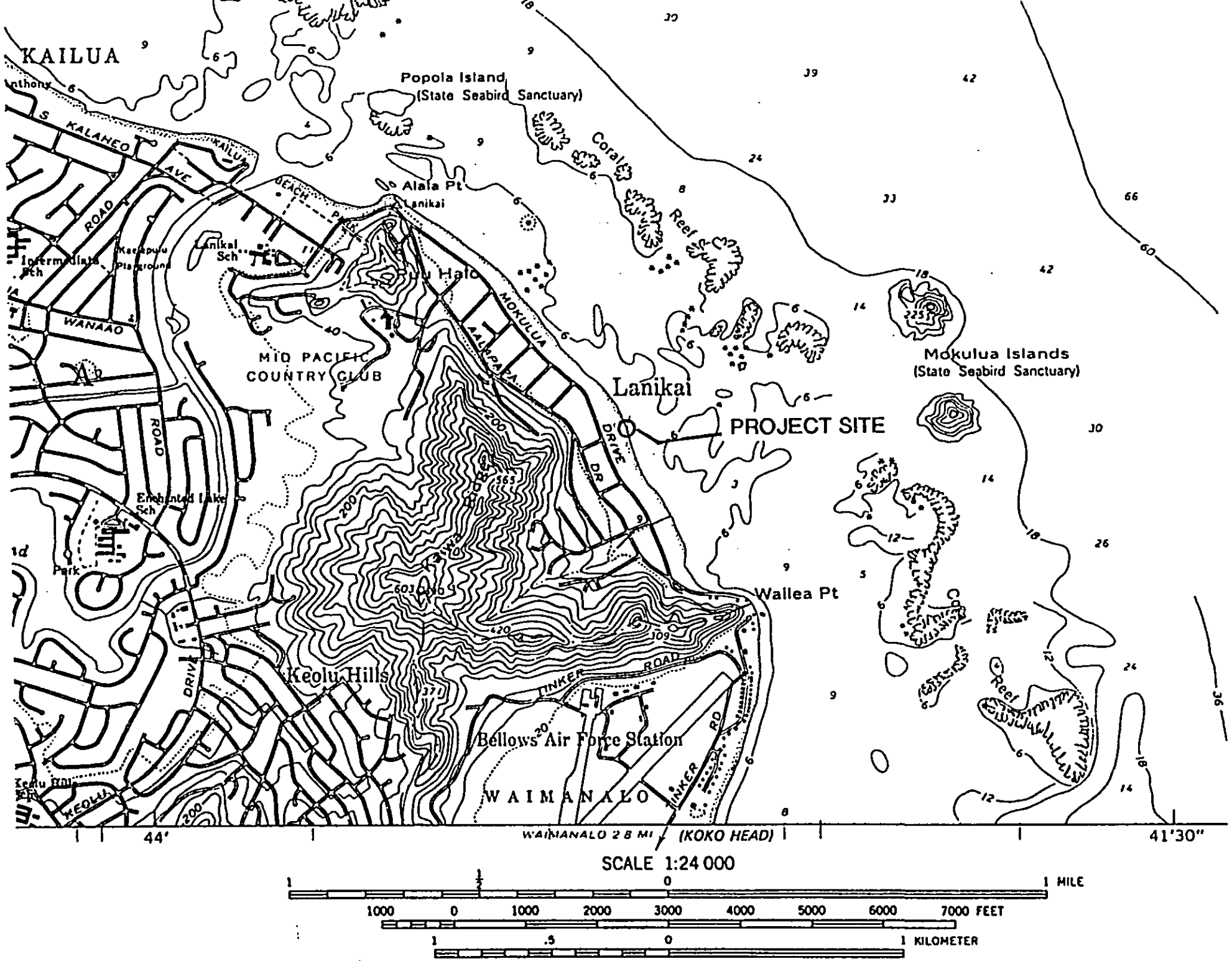
Griggs, G.B., J.F. Tait, W. Corona (1994), "The Interaction of Seawalls and Beaches: Seven Years of Monitoring, Monterey Bay, California", Shore and Beach 62:21-28.

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.



SCALE 1:24 000

1 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

FIGURE 1

0000 0008 1142

AALA DRIVE

PLAT 04

MOKULUA

TRUE NORTH
Scale: 1 in. = 80 ft.

Parcels Dropped: 52, 72, 73, 9,

DEPARTMENT OF TAXATION
PROPERTY TECHNICAL OFFICE
TAX MAPS BRANCH
STATE OF HAWAII
TAX MAP

FIRST TAXATION DISTRICT		
ZONE	SEC.	PLAT
4	3	05

SCALE 1 IN. = AS NOTED

FOR PROPERTY ASSESSMENT PURPOSES
SUBJECT TO CHANGE

4-3-04 1ST DIV.

PLAT 05

AALA DRIVE

POKOLE DRIVE

AALAPAPA

MOKULUA

To Kalia Beach

PROJECT SITE

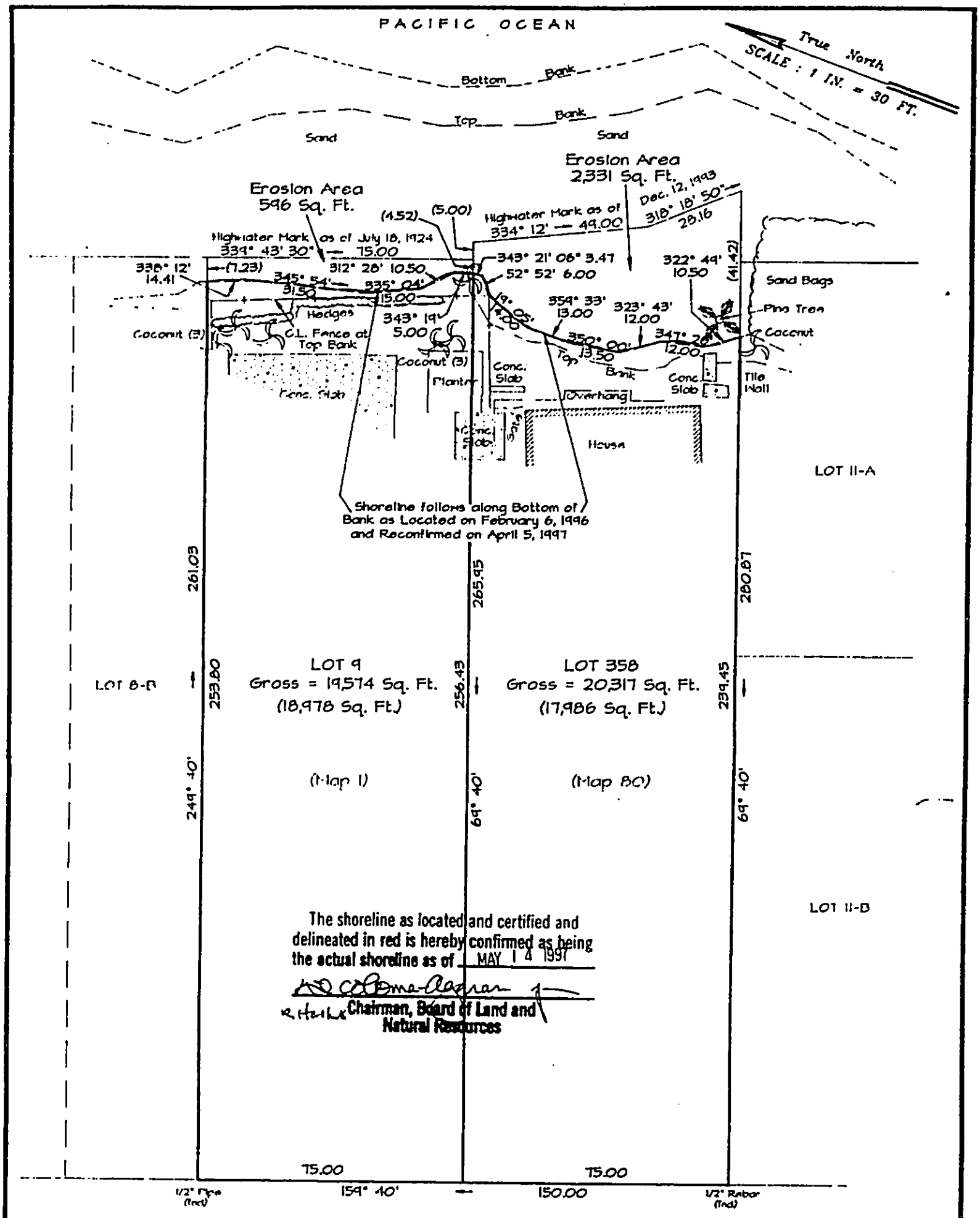
TRUE NORTH
Scale: 1 in. = 80 ft.

DEPARTMENT OF TAXATION PROPERTY TECHNICAL OFFICE TAX MAPS BRANCH STATE OF HAWAII TAX MAP		
FIRST TAXATION DISTRICT		
ZONE	SEC.	PLAT
4	3	04

SCALE 1 IN. = 80 FT.

FIGURE 2

0000 0008 1143



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

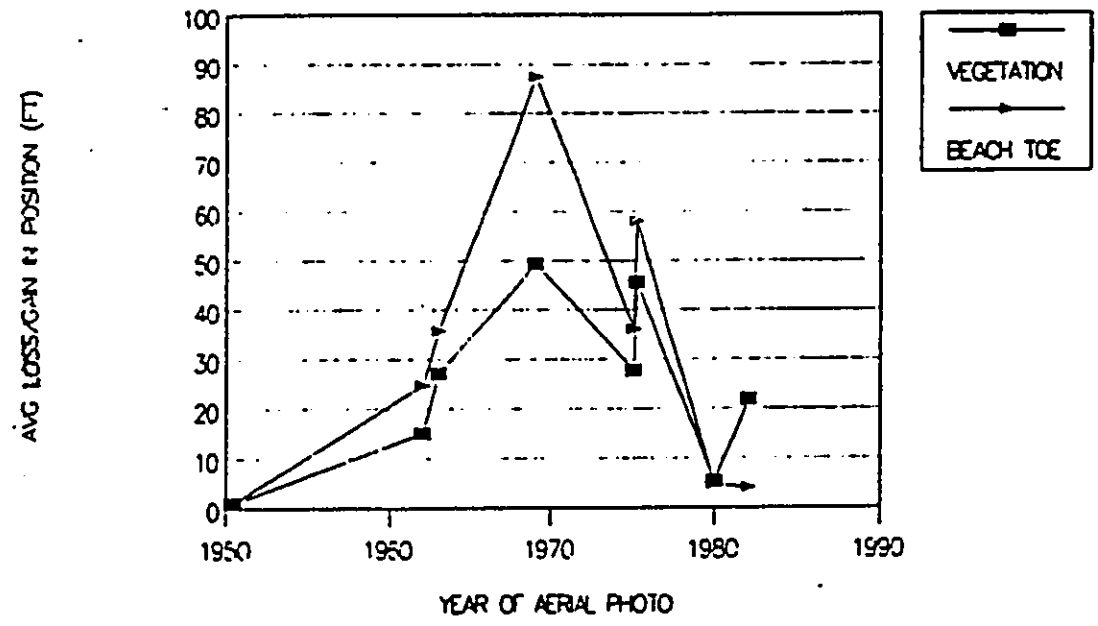


Figure 4a: Average cumulative movement for a 2,500-foot stretch of shoreline from Wailea Point northward to the project site.

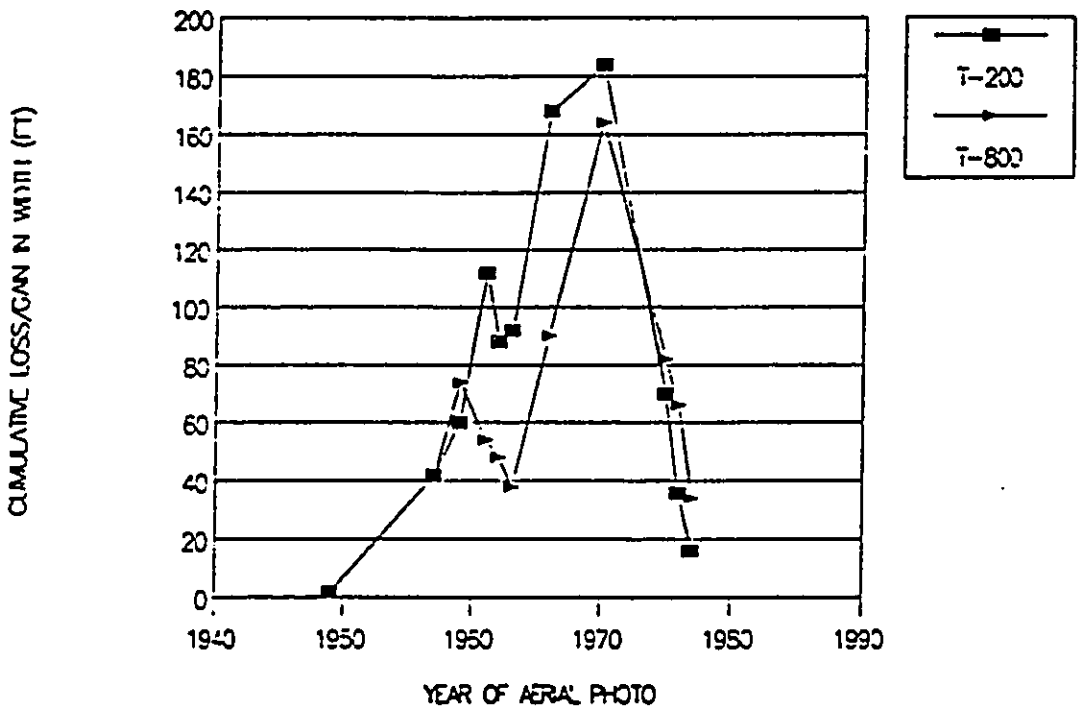
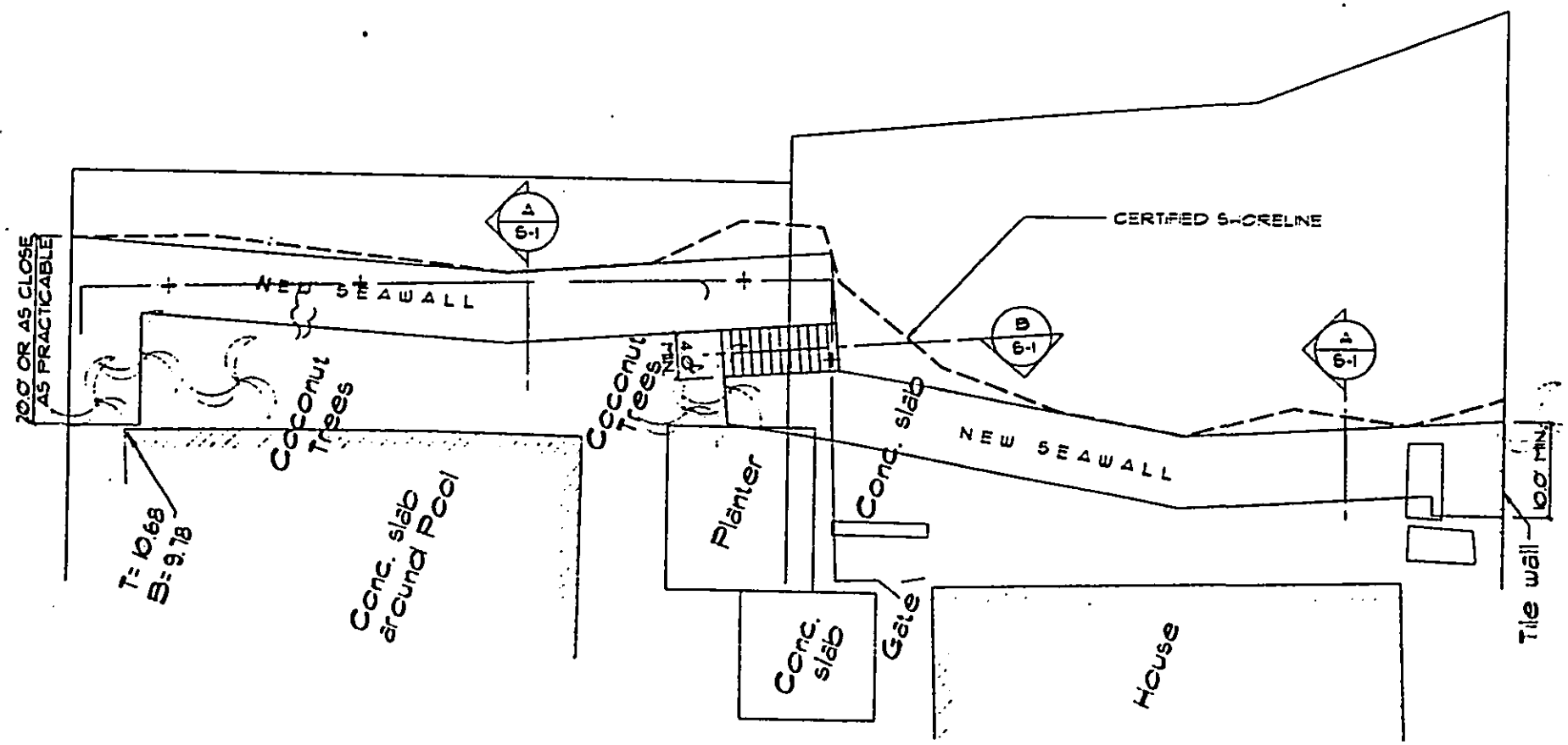


Figure 4b: Cumulative movement of the shoreline at Kailua Beach Park at locations 200' and 800' from the boat ramp.

(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.)

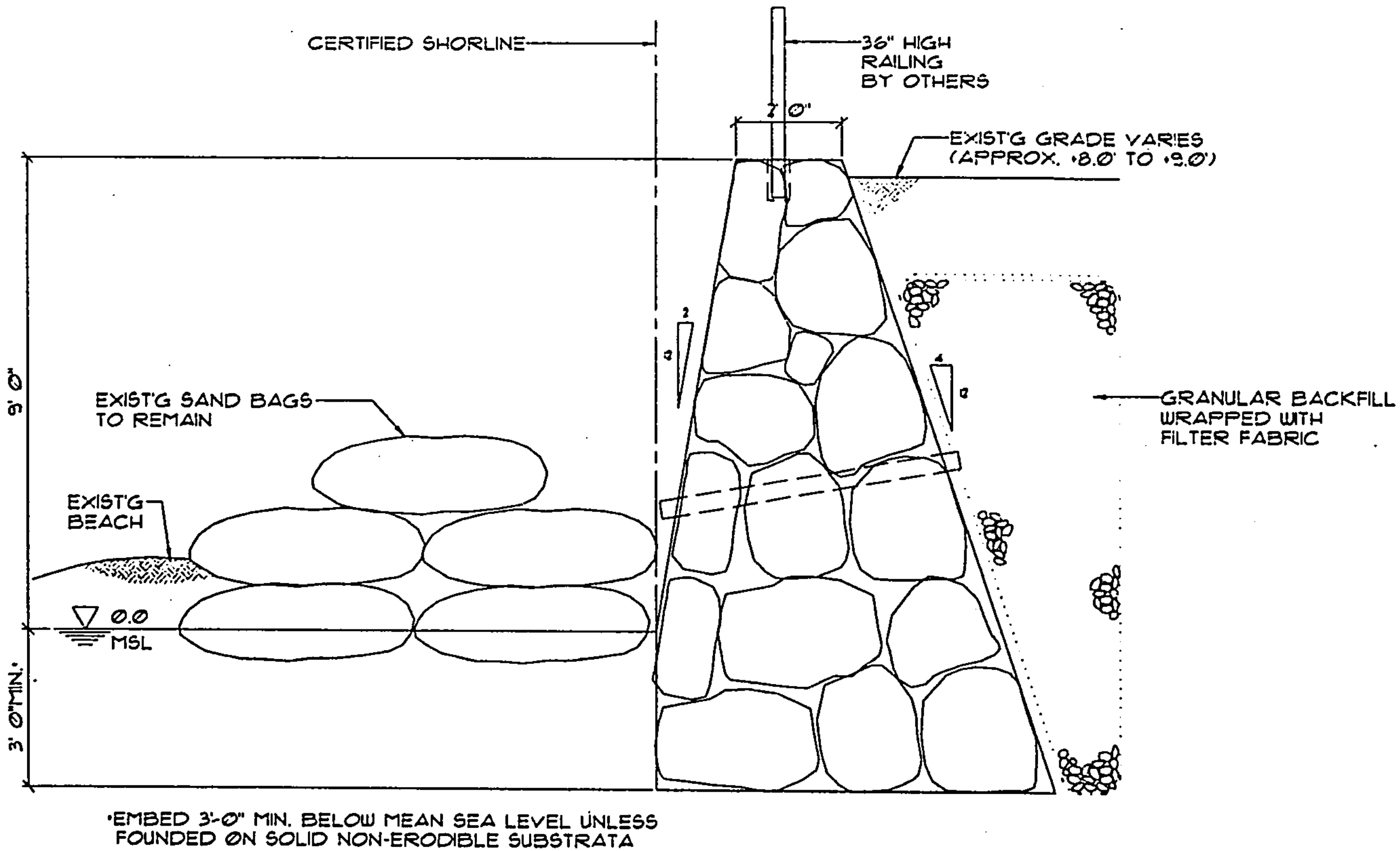
FIGURE 4



WALL LAYOUT PLAN

SCALE: 1" = 20'

FIGURE 5

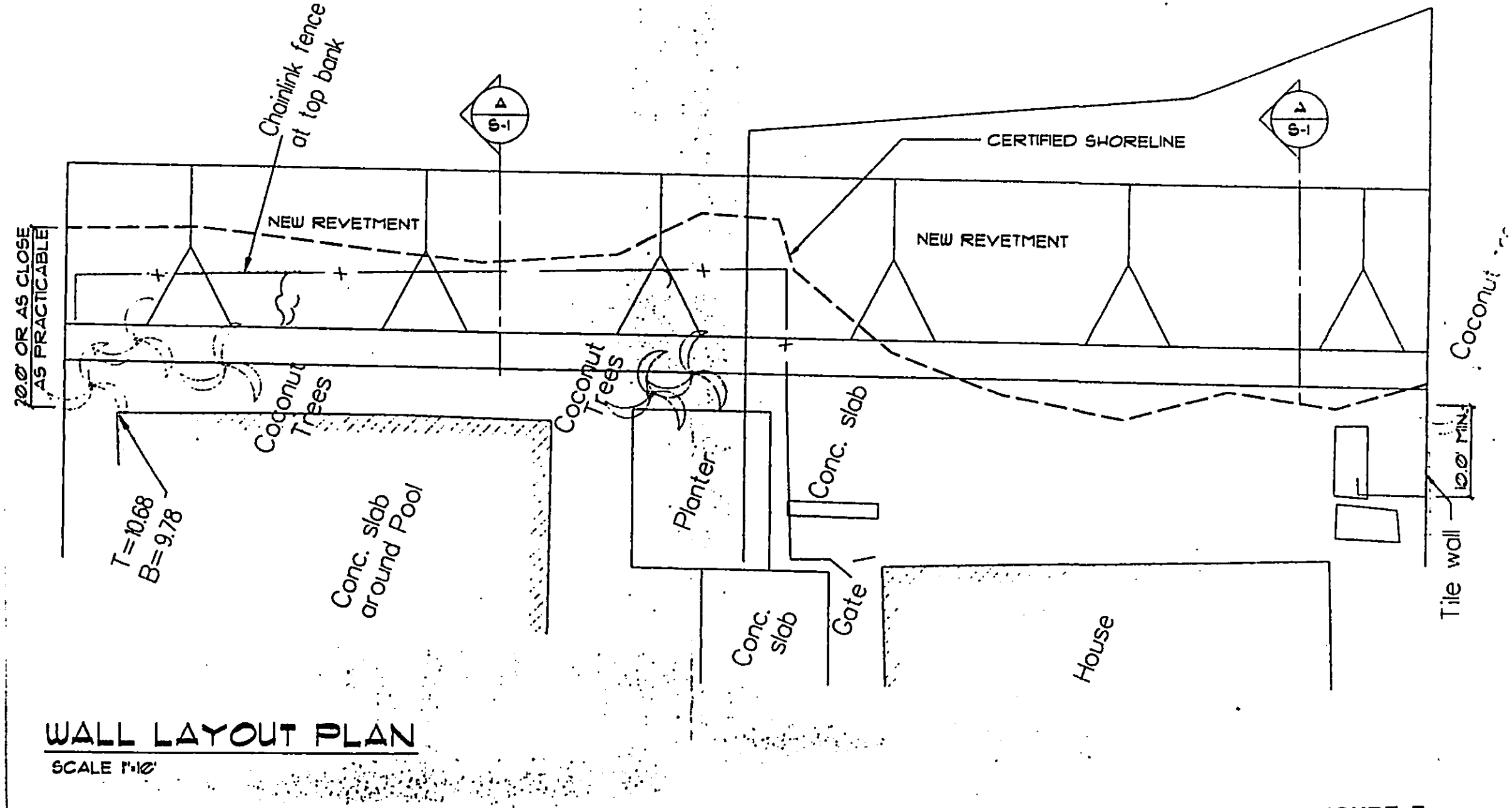


SECTION THRU NEW CRM SEAWALL

SCALE: 1" = 3'

A
6-1

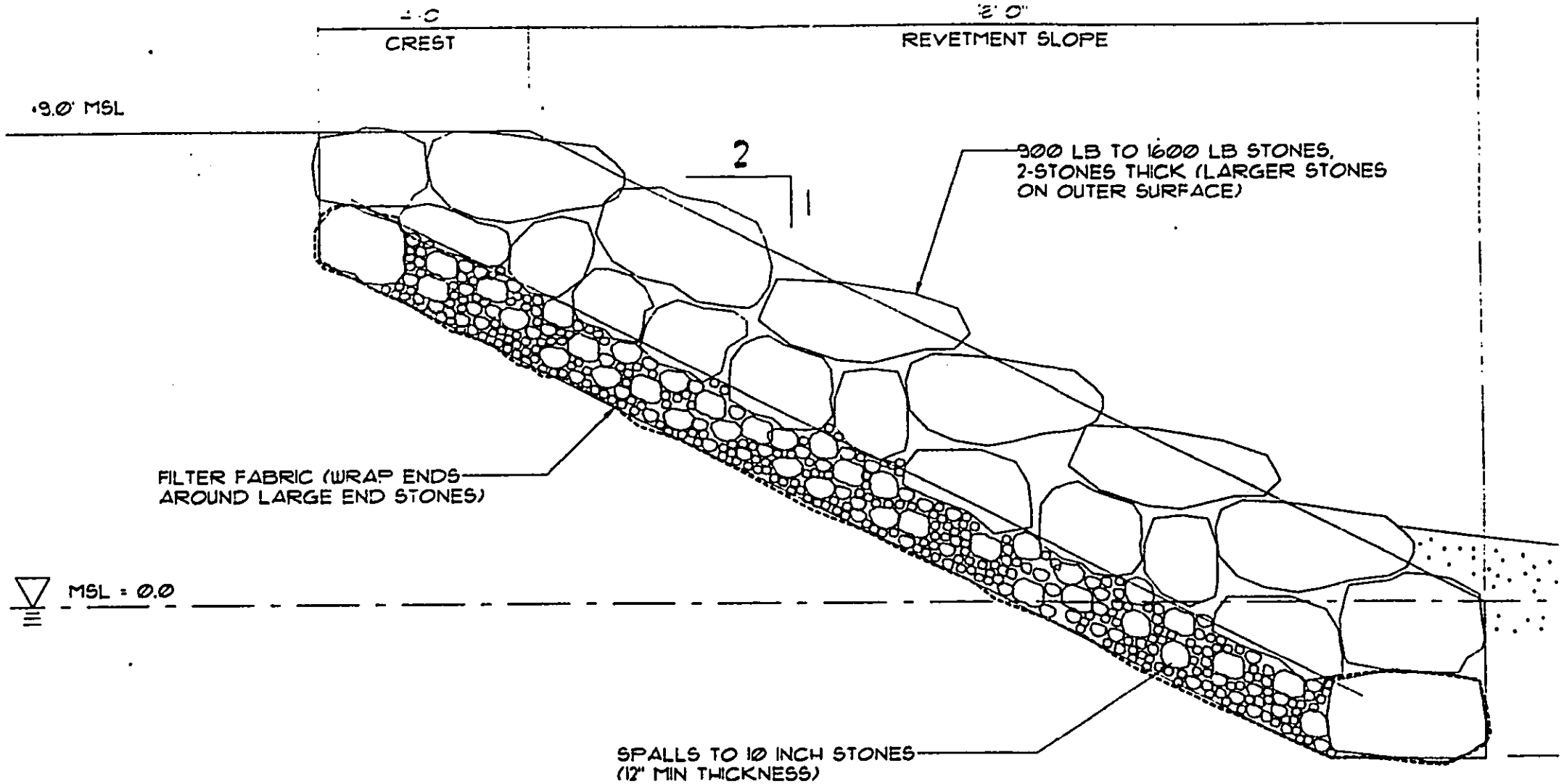
FIGURE 6



WALL LAYOUT PLAN

SCALE 1"=8'

FIGURE 7



TYPICAL SECTION THRU REVETMENT

SC 1/2" = 1-0"

FIGURE 8

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)

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 [illegible]

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)

0000 0008 1152

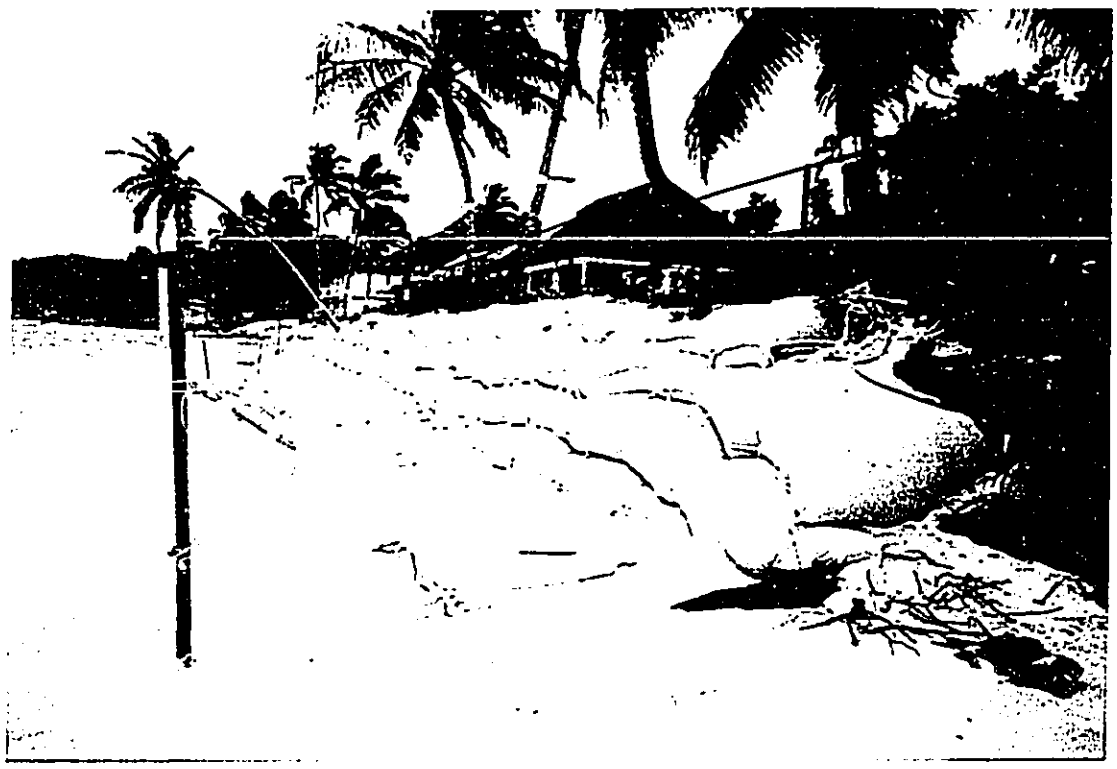


Photo 9: View southward showing completed sand bag revetment on subject property TMK:4-3-5:61.

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.

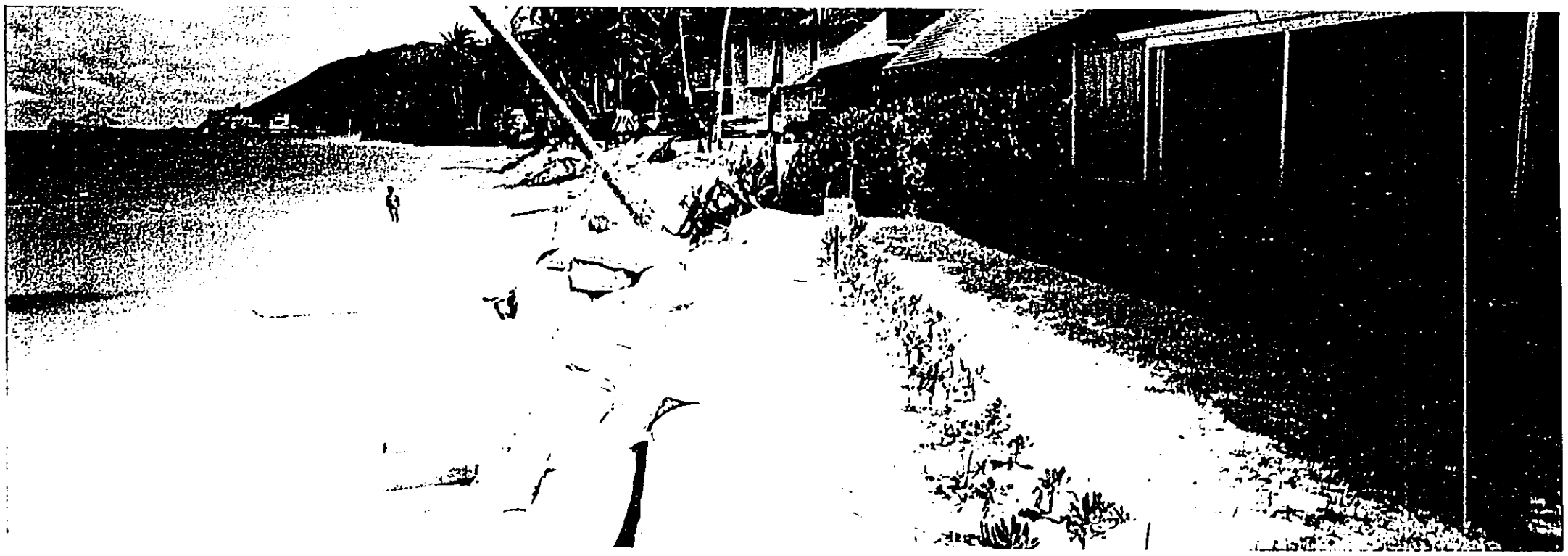


Photo 13: View southward showing shoreline condition in front of the house on subject parcel TMK:4-3-4:74.

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)

Photo 16 View northward from north end of subject parcel (APN 3-5-61) showing exposed seawalls on parcels of adjacent properties

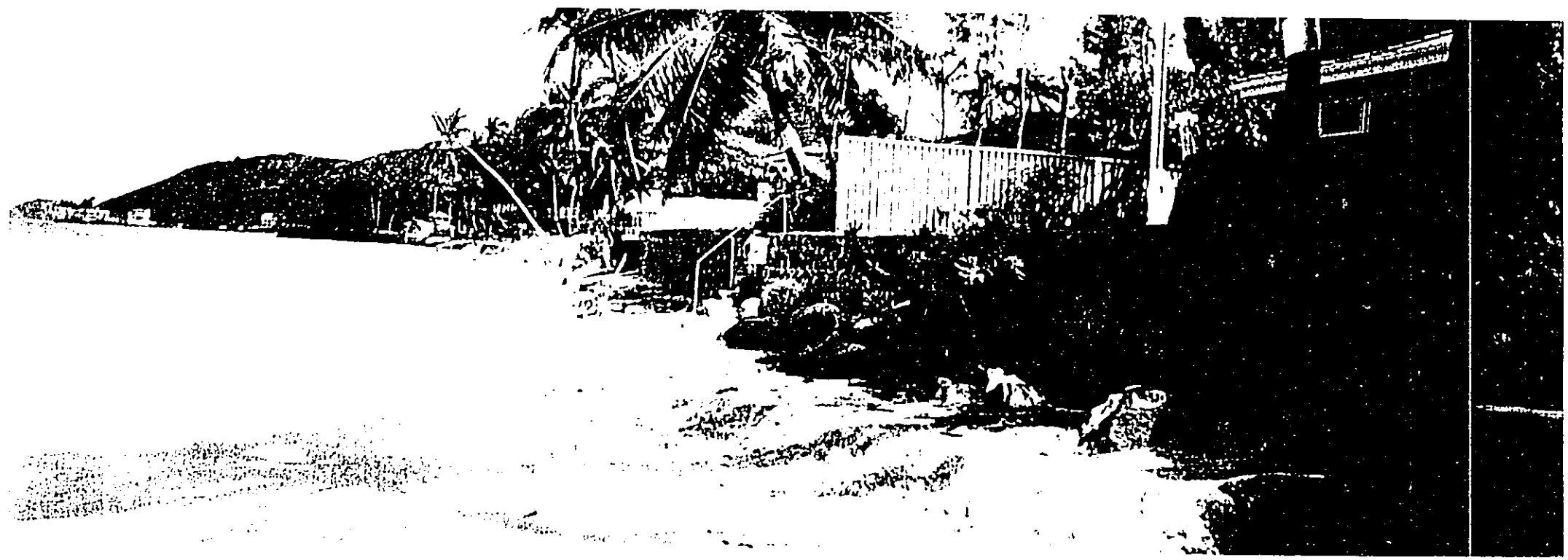


Photo 17 View southward from public right-of-way showing exposed seawalls on parcels 62 and 63 located north of subject parcel

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

Appendixes A and B

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

B. Review of Monitoring Report

0000 0008 1157

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

0000 0008 1158

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

0000 0008 1159

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

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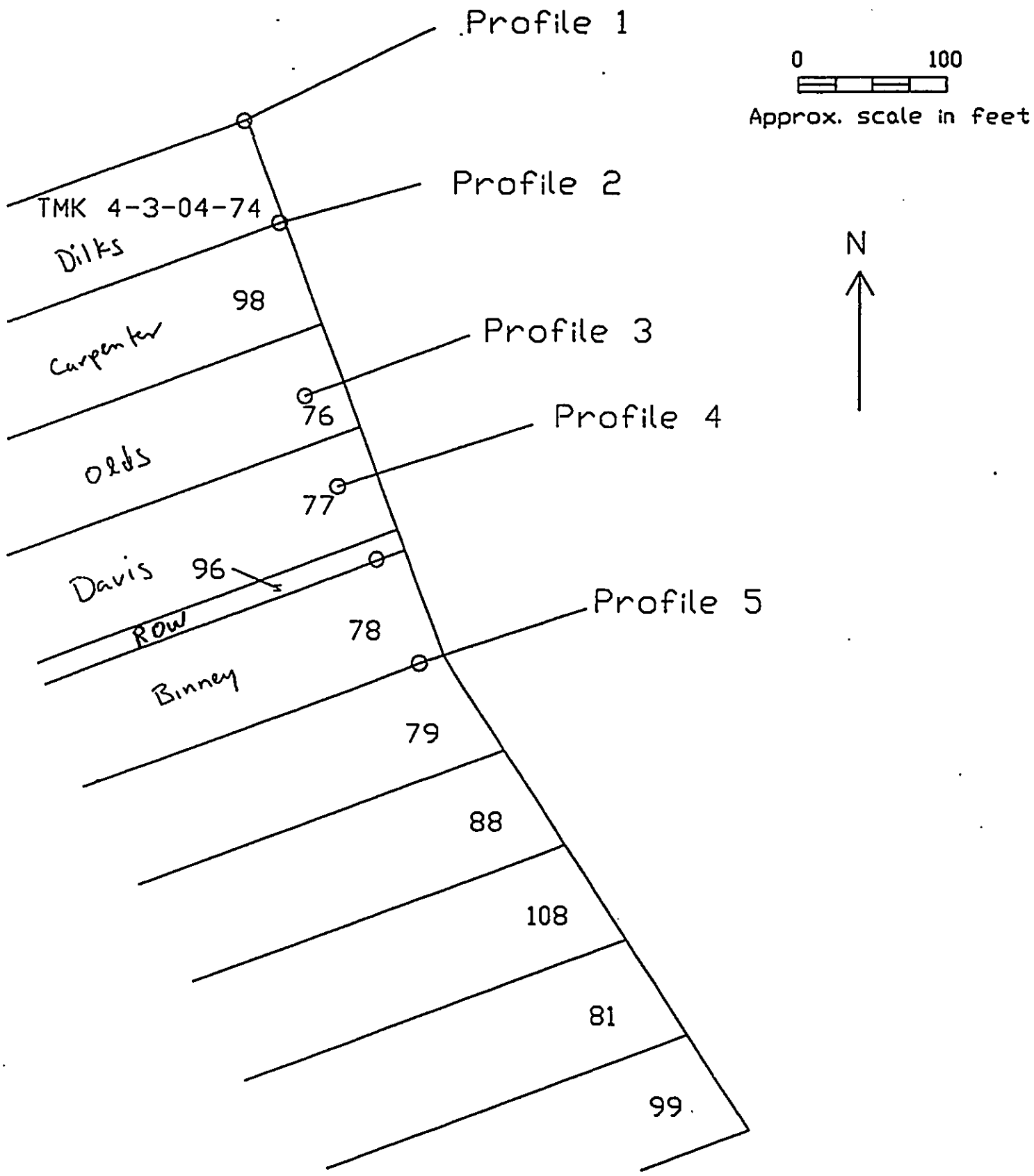
1997 SEP -8 AM 10: 11.

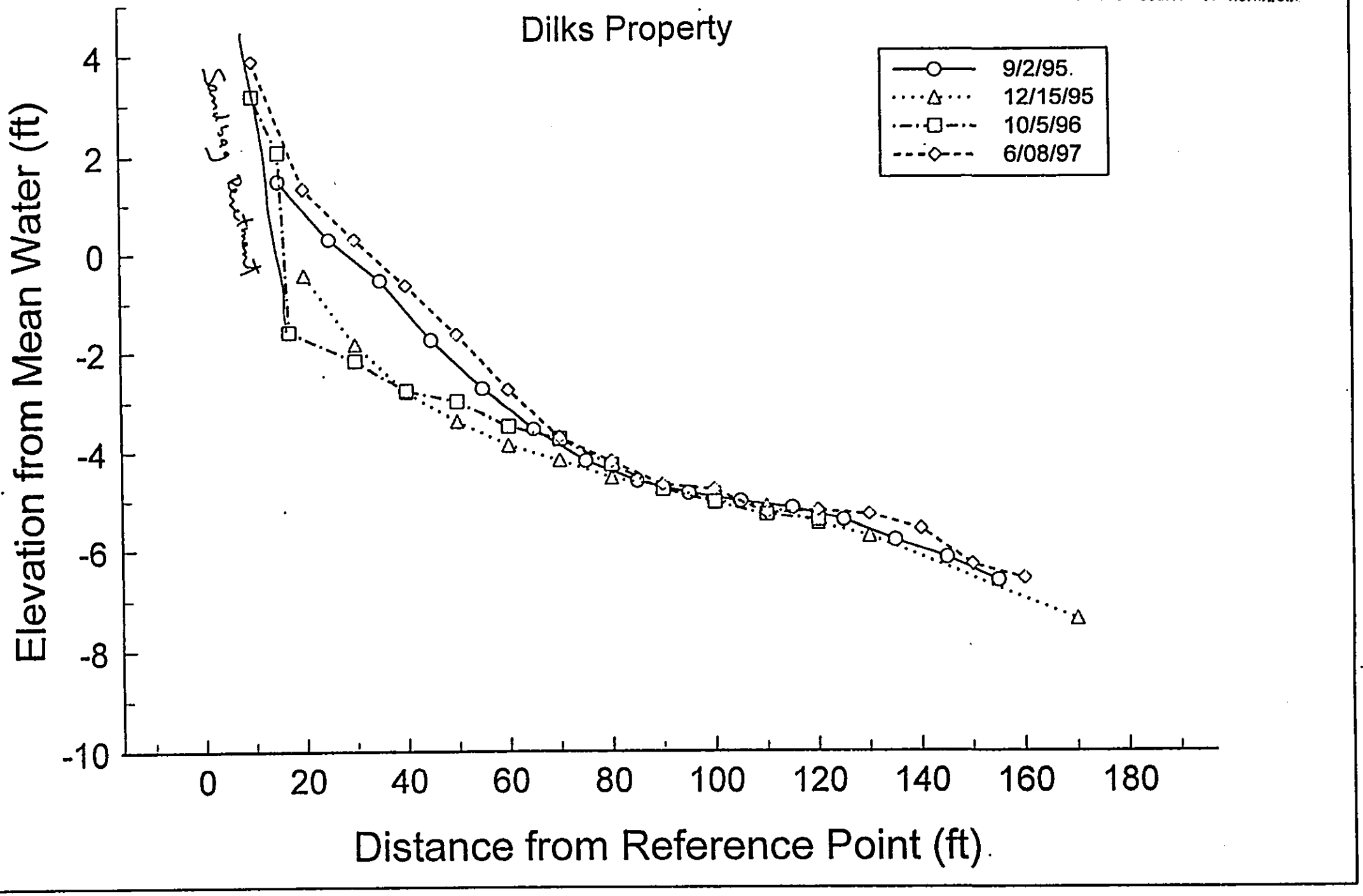
DEPT. OF LAND UTILIZATION
CITY & COUNTY OF HONOLULU



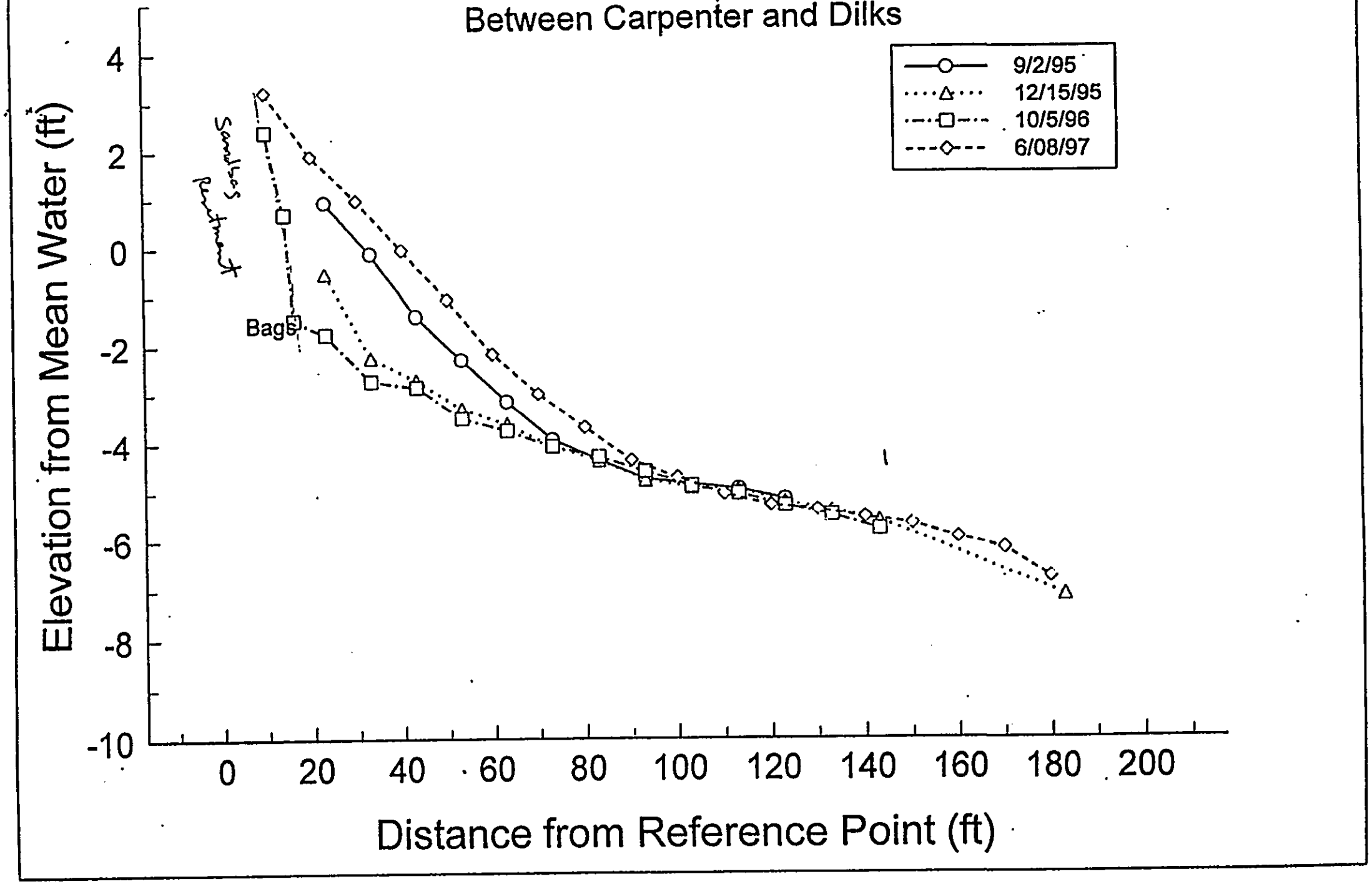
1997 SEP -8 AM 10: 11

DEPT. OF LAND UTILIZATION
CITY & COUNTY OF HONOLULU

Profile 1
Dilks Property



Profile 2
Between Carpenter and Dilks

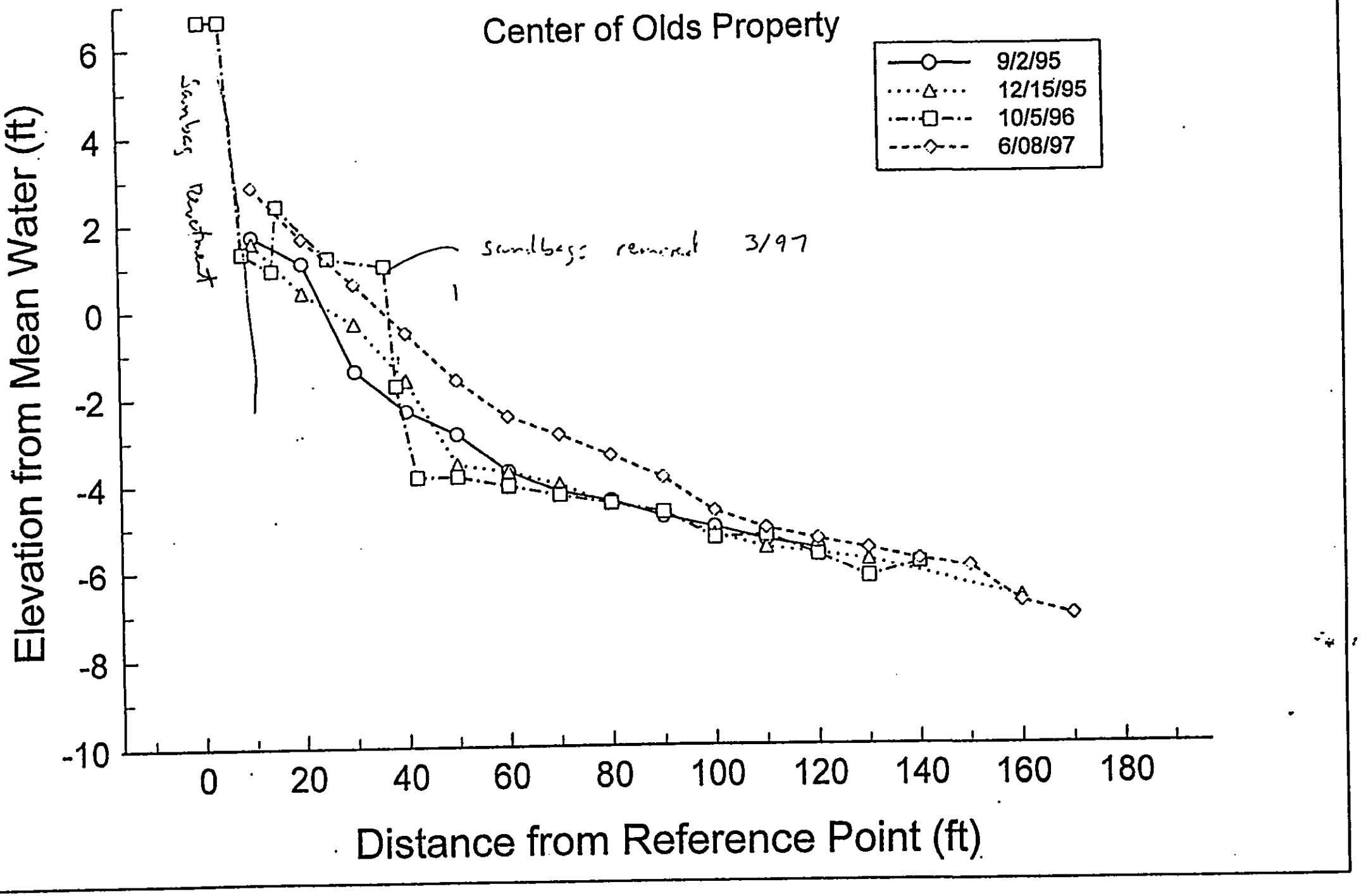


1997 SEP -8 AM 10: 11

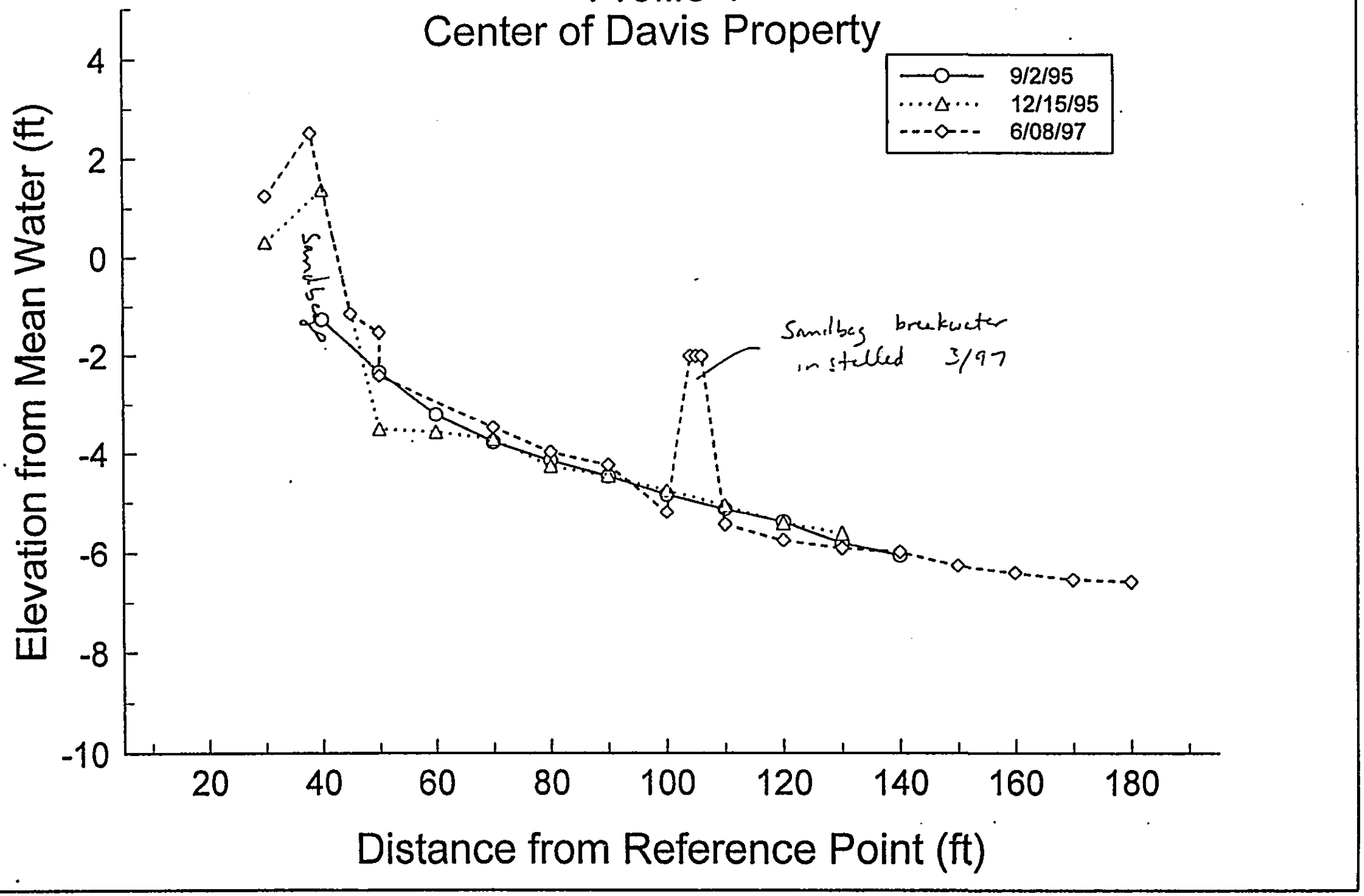
DEPT. OF LAND UTILIZATION
CITY & COUNTY OF HONOLULU

Profile 3

Center of Olds Property



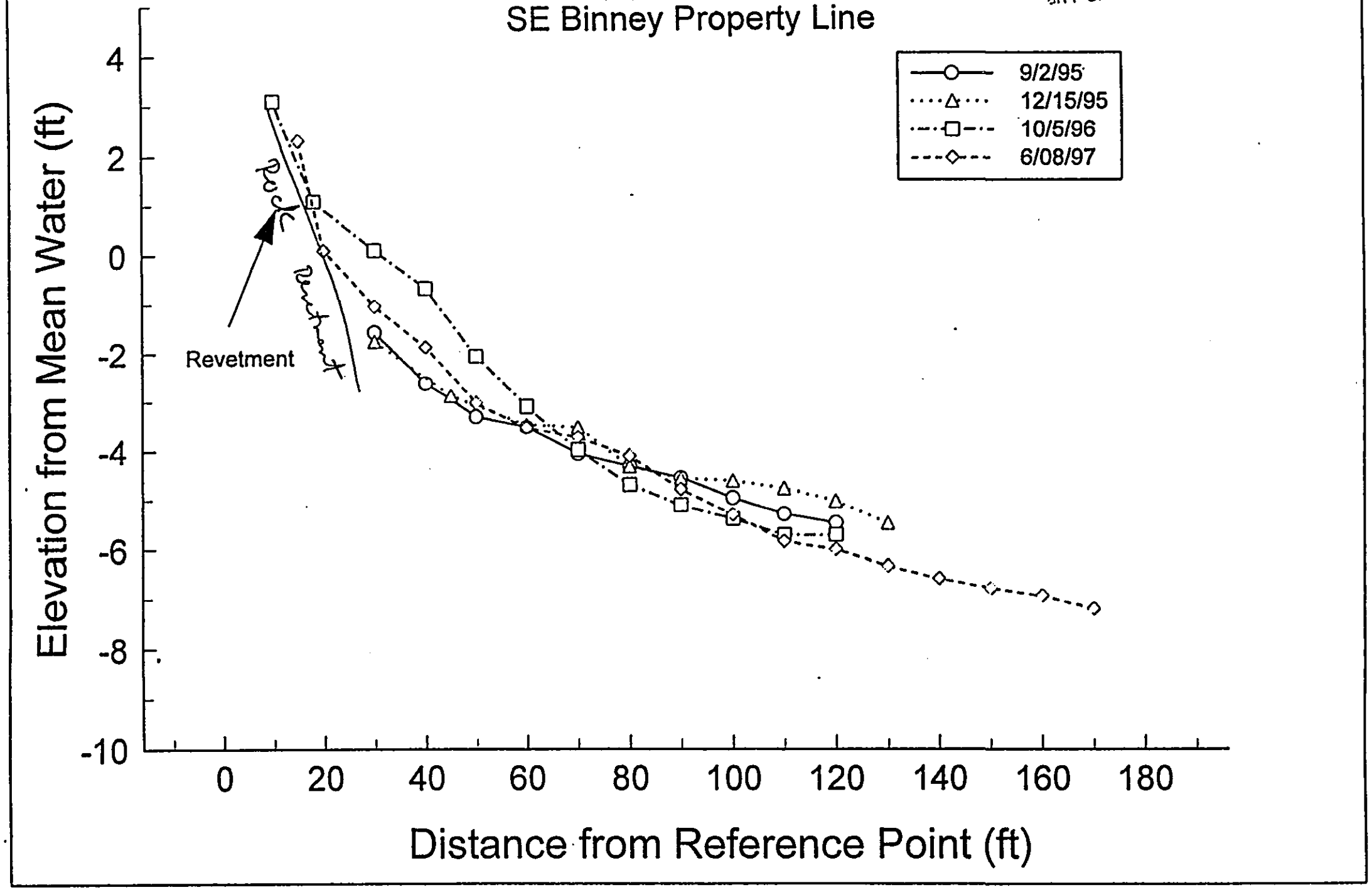
Profile 4
Center of Davis Property



1997 SEP -8 AM 10: 11

DEPT. OF LAND UTILIZATION
CITY & COUNTY OF HONOLULU

Profile 5
SE Binney Property Line



Edward K. Noda
and
Associates, Inc.

Engineers
and
Environmental
Consultants

Engineering
Planning
Surveys
Computer
Modeling

615 Piikoi Street
Suite 300
Honolulu, Hawaii
96814-3139

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(808) 591-8553
Facsimile:
(808) 593-8551

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.

Comments on Draft Environmental Assessment and Responses to Comments

0000 0008 1169

DEPARTMENT OF LAND UTILIZATION
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 7TH FLOOR • HONOLULU, HAWAII 96813
PHONE: (808) 523-4414 • FAX: (808) 527-6743

JEREMY HARRIS
MAYOR

JAN NAOE SULLIVAN
DIRECTOR

LORETTA K.C. CHEE
DEPUTY DIRECTOR

97/SV-007(ASK)

September 24, 1997

Mr. Robin Foster
PlanPacific, Inc.
737 Bishop Street, Suite 1520
Honolulu, Hawaii 96813

Dear Mr. Foster:

Draft Environmental Assessment (EA) For
Dilks Shore Protection Structure
Tax Map Keys: 4-3-04: 74 and 4-3-05: 61

We have reviewed the above-referenced document. Our comments are provided below. You must respond to these and others (attached) which were received during the 30-day public comment period.

Our comments are as follows:

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

2. Although the flanks of the proposed wall are shown on the Wall Layout Plan, Figure 5, the Final EA should show and describe how the flanks of the walls will prevent scouring from the sides should erosion continue on the adjacent properties.

3. The railing, which is to be located on top of the wall, should be described in the text of the Final EA. We suggest that an elevation drawing also be provided.

4. The description on impacts to adjacent properties should be expanded. The Final EA should recognize that with continued erosion, the proposed wall will impound sand, withholding it from the sand budget of the area, and possibly affecting down drift properties. If adjacent properties erode, would the wall then function as a groin and would wave forces be redirected or focused in a different manner? If so, what impacts might result?

5. The Final EA should indicate what effect the proposal will have on the pilot project being conducted on the adjacent properties to the south.

6. Section 4.0 on Alternatives should be expanded to more specifically describe the dimensions and impacts of a revetment alternative. To that end, we suggest that the information contained on page 2 of the statement of hardship be incorporated into the Final EA. A conceptual diagram, illustrating the height and bulk of a revetment, would allow a good comparison between the requested wall and the revetment alternative.

Should you have any questions, please contact Ardis Shaw-Kim of our staff at 527-5349.

Very truly yours,

JAN NAOE SULLIVAN
Director of Land Utilization

JNS:am
attachs.

a:dilks.a10
g:dilks.ask

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PLANPACIFIC

December 18, 1997

Ms. Jan Naoe Sullivan, Director
Department of Land Utilization
650 S. King Street
Honolulu, Hawaii 96813

Attn: Environmental Review Branch

Dear Ms. Sullivan:

Subject: Environmental Assessment for a Shore Protection Structure, Lanikai
1286 and 1302 Mokulua Drive; Tax Map Key 4-3-04:74 & 4-3-05:61

This responds to your letter dated September 24, 1997, commenting on the Draft Environmental Assessment (EA). The responses were prepared with the assistance of our coastal engineering consultant, Edward K. Noda & Associates.

1. Comment: The Final EA should include a copy of the certified shoreline survey.

   The certified shoreline survey is shown as Figure 3 in the Final EA.

2. Comment: The Final EA should show and describe how the flanks of the walls will prevent scouring from the sides should erosion continue on the adjacent properties.

   The flank sections of the wall will 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 the properties 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.

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3. Comment: The railing on top of the wall should be described.

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.

4. Comment: The Final EA should recognize that with continued erosion, the proposed wall will impound sand, withholding it from the sand budget of the area, and possible affecting down drift properties. If adjacent properties erode, would the wall then function as a groin and would wave forces be redirected or focused in a different manner? If so, what impacts might result?

The sand stored in coastal land is really the sediment and soils comprising the grounds of coastal property. Eroding coastal lands do contribute to the overall sediment supply on a beach. The problem is that when a home becomes threatened because of chronic erosion, allowing the residential lot to continue to feed the beach will ultimately result in destruction of the home. As a practical matter, when coastal erosion threatens developed shorelines, the only alternatives are to protect the shoreline (hardening), replenish the beach (artificial nourishment), or relocate the structures that are threatened by the erosion. The EA/CEE reviews these alternatives and concludes that shore protection is the only feasible alternative in this case.

Although natural forces may continue to erode adjacent properties which do not have shore protection, there is no evidence the presence of a seawall at the location proposed on the Dilks' property would itself cause additional erosion. Note that the proposed location is approximately in line with seawalls located on two properties only one lot (50 feet) to the north of the Dilks' property.

The proposed seawall will not prevent the return of the beach to its natural state, nor will it preclude or foreclose the possibility of future beach restoration, whether by natural or artificial means. There are many existing seawalls protecting properties on the Kailua-side of the Dilks' properties. These seawalls were apparently built in the 1960s and 1970s, at a time when erosion was a problem throughout the middle segment of Lanikai Beach. Concurrently, accretion was occurring on the southern end of Lanikai (refer to Figure 4a in the EA/CEE). From about 1970 to the 1990s, the southern end of Lanikai has been in an erosionary cycle, while the middle segment of Lanikai has accreted substantially in front of the seawalls. In other words, these **existing seawalls did not prevent beach accretion from naturally occurring.**

Because properties on both sides of the Dilks' properties are already armored, there is no possibility that the Dilk's seawall will function as a groin. In order for this situation to occur, extensive erosion of adjacent properties must take place such that the Dilks'

protected shoreline extends much farther seaward into the water than the adjacent shorelines. This situation is not likely to occur, unless adjacent property owners were required to remove their shore protection structures, and their homes are demolished or relocated such that erosion were allowed to proceed.

5. Comment: Section 4.0, "Alternatives," should be expanded to provide drawings and a specific description of the revetment alternative.

The discussion of the sloping revetment alternative in Section 4.0 has been expanded, and plan and section drawings have also been included as Figures 7 and 8. The statement of hardship has been revised and included in its entirety in a new Section 6 of the Environmental Assessment.

Sincerely,
PLANPACIFIC, INC.

Robin Foster

Robin Foster, AICP
Vice-President

0000 0008 1174

97-0667

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

September 3, 1997

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

1997 SEP 12 AM 10:22
DEPT. OF LAND UTILIZATION
CITY & COUNTY OF HONOLULU

LD-NAV
REF.: DLU97SV7.RCM

Honorable Jan Naoe Sullivan
Director of Land Utilization
City and County of Honolulu
650 S. King Street 7th Floor
Honolulu, Hawaii 96813

Dear Ms. Sullivan:

SUBJECT: Review : Draft Environmental Assessment
File No. : 97/ SV-007
Project : Shore Protection Structure
Proposal : Construct a Permanent Concrete-reinforced Masonary Seawall Landward of the Shoreline as Certified on May 14, 1997
Applicant: John and Patricia Dilks
Location : 1286 and 1302 Mokulua Drive, Lanikai Island of Oahu, Hawaii
TMK : 1st/ 4-3-04: 74 and 4-3-05: 61

Thank you for the opportunity to review and comment on the proposed project.

Attached herewith is our Land Division's Planning and Technical Services Branch and Aquatic Resources' comments on the proposed construction of a premanent seawall structure at the subject location.

The Department of Land and Natural Resources has no comments to offer on the subject matter at this time. Should you have any questions, please contact Nick Vaccaro of our Land Division's Support Services Branch at 587-0438.

HAWAII: Earth's best!

Aloha,

for MICHAEL D. WILSON

c: Oahu Land Board Member
At Large Land Board Member
Oahu District Land Office

0000 0008 1175

97-06637

Suspense Date: Friday August 22, 1997

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

MEMORANDUM

To: for Bill Devick, Acting Administrator
From: Richard Sixberry, Aquatic Biologist
Subject: Comments on Shoreline Setback Variance File :97/SV007.COM

Comments Requested By: Dean Uchida, Administrator, Land Division

Date of Request: 8/2/97 Date Received: 8/11/97

1997 SEP 12 AM 10:22
DEPT. OF LAND UTILIZATION
CITY & COUNTY OF HONOLULU

Summary of Project

Title: Shore Protection Structure

Proj. By: John & Patricia Dilks

Location: Lanikai Beach, Oahu

Brief Description:

The applicants propose to construct a CRM (concrete-reinforced masonry) seawall mauka of the certified shoreline along the 150-foot frontage of two beachfront parcels at Lanikai, Oahu. Ongoing erosion of the shoreline is intensifying and storm waves have eroded the shoreline edge of the property to within 8-10 feet of the main residence. A temporary sandbag revetment was installed as an emergency measure but it has not been effective.

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. However, the potential for State liability could exist from accidents if obstacles (sandbags) are placed on public land fronting the seawall after completion.

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".

Planning Section's Comments on Draft Environmental Assessment (DEA) for the Dilks' Shore Protection Structure, Lanikai, Oahu

The Coastal Engineering Evaluation (CEE) incorporated within the DEA briefly describes the DLNR-approved demonstration pilot project for beach replenishment on the adjacent parcels to the south of the subject parcel. This description occurs in the CEE's "Historic Beach and Shoreline Changes" chapter (not in the "Alternatives" chapter), and the CEE does not consider the action of the pilot project as a legitimate or feasible alternative to the proposed seawall. Further, the CEE notes that no conclusions can be drawn regarding the pilot project until documentation of its monitoring component has been provided. Such information is now available, and the EA's CEE should be amended with this data.

The Coastal Engineer for the pilot project has recently submitted an informational update (copy attached) that includes five beach profiles along a stretch of beach that extends both north and south beyond the immediate limits of the pilot project. Each of these profiles were surveyed four times between 7/95 and 6/97, and two of the profiles describe the beach changes that occurred directly makai of the subject (Dilks') property. In general for the entire area, and specifically for the beach makai of the Dilks' property, while the beach did erode quite significantly during 1995-96, currently the sand has returned, and the beach is at least as wide as it was before the beginning of the 1995 erosion phase.

At least two conclusions can be drawn from this data:

1) the immediate threat of erosion-caused damage to the Dilks' property has abated, and
2) the pilot project appears to be working both to protect the upland property and to allow a sand beach to re-accrete.

The pilot project is scheduled to last for at least an additional year, and since it is to a large extent a model of community and government collaboration towards innovative coastal erosion management vis-a-vis the DLNR's new Coastal Erosion Management Plan (COEMAP), it may very well receive favorable attention regarding its ultimate fate.

The CEE describes how sand bags were used to protect the Dilks' property during the 95/96 erosion period, and notes the problems inherent with using sand bags for erosion control, but does not clarify if traditional "small" sand bags were used (such bags were recently observed at the Dilks' shoreline, and are assumed to be the "existing sand bags" referenced in the CEE). Further, the CEE does not clarify that much larger SEAbags (Shoreline Erosion Arrestors) were used in the adjacent pilot project, and these bags have substantially different characteristics that mitigate against the stated problems of the smaller bags.

Beyond our standard concerns over allowing vertical seawalls on sandy beaches, we are concerned that the proposed seawall may have an adverse effect on the pilot project being conducted on the adjacent shoreline and beach area. Significant interest has been generated by this project, and we are very interested in having the project succeed. Given the facts that the project appears to be working and that the threat to the Dilks' property has abated, we would be very concerned if a seawall were allowed to be constructed on the adjacent shoreline. Instead, we would much rather see the pilot project extended to include the Dilk's property. This alternative (the flexible use of SEA bags) was essentially ignored in the CEE's consideration of alternatives, and instead, should be addressed in significant detail. We are very willing to discuss the possiblity of modifying the pilot project to include the Dilk's property within the existing CDUP.

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PLANPACIFIC

December 18, 1997

Hon. Michael D. Wilson, Chairperson
Department of Land and Natural Resources
P.O. Box 621
Honolulu, Hawaii 96809

Attn.: Land Division

Dear Mr. Wilson:

Subject: Environmental Assessment for a Shore Protection Structure, Lanikai
1286 and 1302 Mokulua Drive; Tax Map Key 4-3-04:74 & 4-3-05:61

This responds to your letter dated September 3, 1997, commenting on the Draft Environmental Assessment (EA). While the Department had no official comment, the letter enclosed memoranda from the Aquatic Resources and Land Divisions. The response was prepared with the assistance of Edward K. Noda & Associates.

Aquatic Resources

Comment: Potential for State liability from accidents if sandbags are placed on public land fronting the seawall after completion.

The existing sandbags were permitted by DLNR. As stated in the EA, to the extent practicable, the existing sandbags will be left in place along the seaward base of the seawall to provide additional scour protection and to facilitate construction of the wall.

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Land Division, Planning Section

Comment: The EA's Coastal Engineering Evaluation should be amended to include the monitoring data from the pilot project. Conclusions drawn from this data are that (1) the immediate threat of erosion-caused damage to the Dilks' property has abated; and (2) the pilot project appears to be working both to protect the upland property and to allow a sand beach to re-accrete.

The Coastal Engineering Evaluation has been revised to address the monitoring data from the pilot project. Mr. Lipp's monitoring report is appended in Appendix A. A memorandum discussing the limitations of the monitoring data is included in the Final EA as Appendix B and is attached for your information.

To summarize the memorandum, the monitoring data in Mr. Lipp's report do not support the conclusions made in your comment letter for the following reasons:

- The monitoring data do not differentiate seasonal movement of sand from long-term trend. There is a significant amount of seasonal sand movement along this shoreline.

- In the monitoring report prepared by Mr. Lipp, he concluded only that "the sandbags did not prevent the beach from reforming." Based on the limited data from a relatively brief monitoring period, it is unreasonable to conclude either that the sand beach is "re-accreting," or that the erosion threat has abated.

- In fact, erosion appears to be continuing to progress northward, as evidenced by the loss of beach vegetation and exposure of previously hidden seawalls on two lots to the north of the Dilks' property during the winter of 1996-'97.

Comment: The sandbags used on the Dilks' property were "small" sand bags and that much larger SEAbags were used in the adjacent pilot project.

The sandbags used to protect the Dilks' property are the same type and size of SEAbags used in the adjacent pilot project, as is evident from the photographs contained in the EA/CEE. The EA/CEE notes that the sandbags placed on the adjacent properties (under the auspices of the pilot program) did not survive the 1995-1996 winter season very well. The sandbags on the Dilks' properties were placed after the 1995-1996 winter season, in April-May 1996. The 1996-1997 winter season caused damage to the Dilks' sandbag revetment as well as damages to the pilot program sandbags on the adjacent properties. Even though these larger SEAbags are more durable and stable that traditional small sand bags, nevertheless, they are still prone to damage from large winter storm waves and vandalism.

Comment: The proposed seawall may have an adverse effect on the pilot project.

Constructing a seawall landward of the certified shoreline should have no impact on the pilot program. If the "erosion" trend reverses, the beach will accrete in spite of the seawall. If the pilot program is successful in mitigating the continued loss of beach sand, the seawall will similarly have no impact, but will be there to protect the properties in the event of severe winter storm wave events. If the SEAbags are allowed to remain in place seaward of the seawall, the effect on the beach (and the pilot project) will be the same as at present.

Permitting the Dilks' seawall will not preclude any future beach restoration efforts. If the beach accretes in front of the seawall (whether naturally or man-made), the seawall will establish the presently defined property boundary (which is considerably landward of the TMK property boundary), and the public will enjoy the fronting beach (similar to the properties with seawalls on the Kailua-side of the Dilks' properties). If the restored or accreted beach subsequently erodes, the seawall will protect the Dilks' home from storm wave and erosion damage.

Comment: We would like to see the pilot project extended to include the Dilks' property. This alternative (the flexible use of SEAbags) was ignored in the consideration of alternatives.

As pointed out above, the same SEAbags were used for the Dilks' emergency sandbag revetment as for the "pilot project." The EA/CEE already describes how the use of the bags is not a viable long-term alternative. In our opinion, the "pilot project" covers too small a portion of the beach to have any long-term effect; and we doubt that private individuals can sustain the intensive effort and expense required to maintain the project over the long term. Like other Lanikai community members, the Dilks would be interested in a technically sound, comprehensive beach restoration project designed and implemented by the DLNR or the U.S. Army Corps of Engineers.

Thank you for your comments.

Sincerely,
PLANPACIFIC, INC.

Robin Foster, AICP
Vice-President

0000 0008 1181

97-06150

BENJAMIN J. CAYETANO
GOVERNOR
SEIJI F. NAYA
DIRECTOR
BRADLEY J. MOSSMAN
DEPUTY DIRECTOR
RICK EGGED
DIRECTOR, OFFICE OF PLANNING

DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

OFFICE OF PLANNING
235 South Beretania Street, 6th Flr., Honolulu, Hawaii 96813
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Ref. No. P-6889

August 1, 1997

1997 AUG 25 AM 10:43
DEPT. OF LAND UTILIZATION
CITY & COUNTY OF HONOLULU

Ms. Jan Naoe Sullivan
Director
Department of Land Utilization
City and County of Honolulu
650 S. King St., 7th Floor
Honolulu. HI 96813

Dear Ms. Sullivan:

Subject: Draft Environmental Assessment and Coastal Engineering Evaluation, Shore Protection Structure, Lanikai, Oahu, TMK 4-3-04 and 4-3-05:61

This is in response to your letter of August 4, 1997, requesting comments on the draft environmental assessment for the Dilks Shore Protection Structure project in Lanikai. We do not have any concerns at this time regarding the proposed structure. However, the assessment does not explicitly discuss the project's consistency with the Coastal Zone Management (CZM) objectives and policies. This is important since Chapter 205A, HRS, the CZM statute, prescribes that all development in Special Management Areas must be evaluated in terms of consistency with the CZM objectives and policies. Therefore, we recommend that the assessment of consistency be incorporated into the environmental assessment of the project

If there are any questions, please contact Jeffrey Walters of our CZM Program at 587-2883.

Sincerely

Rick Egged
Director
Office of Planning

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PLANPACIFIC

December 18, 1997

Mr. Rick Egged, Director
Office of Planning
Department of Business, Economic
Development and Tourism
P.O. Box 2359
Honolulu, Hawaii 96804

Dear Mr. Egged:

Subject: Environmental Assessment for a Shore Protection Structure, Lanikai
1286 and 1302 Mokulua Drive; Tax Map Key 4-3-04:74 & 4-3-05:61

This responds to your letter dated August 1, 1997, commenting on the Draft Environmental Assessment (EA). The EA has been revised to address consistency of the project with the CZM objectives and policies. See Section 5 of the Final EA, enclosed.

Sincerely,
PLANPACIFIC, INC.

Robin Foster, AICP
Vice-President

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97-06801

BENJAMIN J. CAYETANO
GOVERNOR

1997 SEP 18 AM 8:17
DEPT. OF LAND UTILIZATION
CITY & COUNTY OF HONOLULU

GARY GILL
DIRECTOR

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
235 SOUTH BERETANIA STREET
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HONOLULU, HAWAII 96813
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September 15, 1997

Ms. Jan Naoe Sullivan
Director of Land Utilization
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Ms. Sullivan:

Subject: Dilks Seawall Construction, Lanikai, Oahu

It is the policy of the State of Hawaii under HRS Chapter 205A to discourage all shoreline hardening that may affect access to, or the configuration of, our island beaches.

Any EA prepared in conjunction with an application to construct a seawall, revetment or similar structure should be accompanied by appropriate justification and detailed studies including, but not limited to, the following:

1. A Historical Shoreline Analysis of coastal erosion and accretion rates. This should include a description of all movements of the neighboring shoreline over at least the past 30 years. This analysis should be based, at least in part, on aerial photographs available through government agencies and private vendors. The analysis should provide a detailed history of erosion and accretion patterns using all available evidence.

2. A description of the nature of the affected shoreline, whether sandy, rocky, mud flats or any other configuration. The history and characteristics of adjoining sand dunes and reefs should be included.

3. Site maps that clearly show the current certified shoreline, previous certified shorelines, the private property line and the location of the proposed structure. Any nearby public access right-of-way should also be depicted.

4. Beach profiles that extend off shore at appropriate intervals along the beach indicating the width and slope of both the submerged and dry portions of the beach.

5. An analysis of any existing nearby walls or revetments and their cumulative impacts on the shoreline.

6. A description of structures and improvements (such as homes or swimming pools) on the subject property, their distance from the property line and shoreline, and how they may be affected by the construction of the proposed hardening project.

7. A wave and storm frequency analysis for the area in question. This should include any relevant coastal processes such as longshore currents and seasonal wave patterns.

8. **An analysis that predicts the location of future shorelines with and without the proposed wall at least 30 years into the future or over the expected life of the hardening project.**

9. Photos of the site that illustrate past and present conditions and locate the proposed structure.

10. **All alternatives to shoreline hardening should be thoroughly researched and analyzed. These alternatives should include beach replenishment, dune-scaping, retreat from the shoreline by moving existing structures inland, and a no action alternative.**

The inclusion of this information will help make an Environmental Assessment complete and meet the requirements of Chapter 343, HRS. **Our review of the draft environmental assessment indicates that many of these points have been addressed. Please answer the remaining questions (highlighted in bold text) in the final environmental assessment.** Only after thorough study and analysis should any permit for shoreline hardening be considered.

Should you have any questions, please call Jeyan Thirugnanam at 586-4185.

Sincerely,

Gary Gill
Director

c: John and Patricia Dilks

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PLANPACIFIC

December 18, 1997

Mr. Gary Gill, Director
Office of Environmental Quality Control
236 S. Beretania Street - Ste. 702
Honolulu, Hawaii 96813

Dear Mr. Gill:

Subject: Environmental Assessment for a Shore Protection Structure, Lanikai
1286 and 1302 Mokulua Drive; Tax Map Key 4-3-04:74 & 4-3-05:61

This responds to your letter dated September 15, 1997, commenting on the Draft Environmental Assessment (EA). The responses were prepared with the assistance of our coastal engineering consultant, Edward K. Noda & Associates. The following responses refer to the highlighted items in your letter, for which you request additional information.

Item 4: Beach profiles that extend offshore at appropriate intervals along the beach indicating the width and slope of both the submerged and dry portions of the beach.

Figure 3 in the EA/CEE provides more detailed information than beach profiles. An actual topographic survey is provided showing elevations of the property, shoreline escarpment, and beach out to beyond the beach toe—e.g. to water depth of about 3 feet below MSL. (Note that Figure 3 in the Final EA is the same survey as in the Draft, but the new exhibit shows that the survey has been certified). Additionally, beach profile data obtained as part of the demonstration project are included as Appendix A in the Final EA.

Item 8: An analysis that predicts the location of future shorelines with and without the proposed wall at least 30 years into the future or over the expected life of the hardening project.

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Predictions of the location of future shorelines may be reasonably applicable for the situation where the historical shoreline movement, unaffected by structures, can be established prior to construction of proposed major shoreline structures. Figure 4a in the EA/CEE shows the history of shoreline change over a 30+ year period from 1950 to about 1984 for the southern portion of Lanikai. At the present time, over 80 percent of the Lanikai shoreline has already been hardened. For all practical purposes, because the proposed seawall will be only one of many seawalls along this shoreline reach, it will have little overall effect on the future location of the shoreline along this coastal reach.

In general, predictions of shoreline changes 30 years into the future are highly speculative at best, especially for very short segments of shoreline such as individual residential parcels. For example, the past history of shoreline change for southern Lanikai would suggest a 30 year cycle of accretion/erosion affecting this area, and that it should have entered a cycle of accretion in the early 1990s. In reality, the southern Lanikai shoreline has not entered an accretionary phase, and erosion is progressing farther in the Kailua direction.

Item 10: All alternatives to shoreline hardening should be thoroughly researched and analyzed. These alternatives should include beach replenishment, **dune-scaping, retreat from the shoreline by moving existing structures inland,** and a no action alternative.

Lanikai is a developed urban shoreline. Former dunes have been fully developed with residential properties. A major beach replenishment project for this entire coastal reach can consider the creation of an artificial dune and the use of dune-scaping to help stabilize it. However, as discussed in the EA, major beach replenishment projects are beyond the means of individual residential property owners.

Thank you for your comments.

Sincerely,
PLANPACIFIC, INC.

Robin Foster, AICP
Vice-President

University of Hawai'i at Mānoa

Environmental Center
A Unit of Water Resources Research Center
2550 Campus Road • Crawford 317 • Honolulu, Hawai'i 96822
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REVISED
September 22,1997
EA:00163

John and Patricia Dilks
P.O. Box 4458
Carmel, California 93921

Dear Mr. and Mrs. Dilks:

Draft Environmental Assessment
Shore Protection Structure
1286 and 1302 Mokulua Drive
TMK: 4-3-04:74 and 4-3-05:61
Lanikai, O'ahu

The applicants, John and Patricia Dilks, seek a Shoreline Setback Variance, to construct a 12ft. high and 150ft. long vertical concrete-reinforced masonry seawall (CRM), that will front two single-family dwellings. Currently the property is protected by a sandbag revetment, installed in April-May of 1996. Both short term construction impacts on water quality and noise level, and longer term effects on beach stability are likely consequences of the proposed action.

We reviewed this Draft Environmental Assessment with the assistance of Charles Fletcher, Geology and Geophysics; and Hans-Jurgen Krock, Ocean Engineering/Look Laboratory; and Alexandra Gurary of the Environmental Center.

General Comments:

We recommend that the request for the permit for the Shoreline Setback Variance be denied. Even though we sympathize with the Dilks family's fears of possible structural damage to their property, this proposed action contradicts the state's policy on seawalls. Construction of a shoreline protective structure is an extreme, ultimate measure justifiable only when no other means is available to protect a structure in imminent danger of loss or damage. In the present case our reviewers suggest that no immediate threat to the structure exists, as a cycle of accretion presently prevails in that part of Lanikai. Currently there is no indication that the erosion cycle will continue, and the existing sandbag revetment is providing adequate protection.

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Mr. and Mrs. Dilks
September 22, 1997
Page 2

Significant Impacts and Alternative Options

The report, "Changes In Beach Profiles Due To Wave Reflections Off Seawalls At Lanikai, Hawaii" prepared by David G. Lipp in 1995, concluded that due to increased energy in wave reflectivity caused by seawalls, Lanikai beach has experienced increased offshore sediment transport. The study also demonstrated again that vertical seawalls reflect more energy than seawalls with a sloping face and energy absorbing surface.

Seawalls protect coastal structures, not beaches. If erosional conditions persist fronting a seawall, the beach will be lost. Intensive coastal residential development in the last 30 years has led to seawalls being applied as a panacea to a property owner's fear of property damage. Many studies looking into the effects of armoring our beaches (e.g., the recent University of Hawaii study entitled "Beach Loss Along Armored Shorelines on Oahu, Hawaiian Islands") came to the same conclusion: seawalls and other armoring structures have led to beach narrowing and loss.

In a recent report to the Office of State Planning, Charles Fletcher and Dennis Hwang recommended that the State, the counties and community residents should work together to implement a more long term solution to the loss of Hawaii beaches through the establishment of Beach Management Districts. Instead of building seawalls, which only perpetuate erosion, regional sand nourishment projects should be implemented to restore the coastline's former topography. Lanikai beach is a prime candidate for such a project. Lipp's data show that the change in the total volume of sand in the Lanikai Beach system in the last 70 years has been very small, but the distribution of the sand has changed significantly; largely due to the proliferation of seawalls. More than 5000 cubic meters of sand has migrated offshore due to the reflective nature of seawalls, and this impounded sand, along with sand resources from other nearby offshore deposits, is available for beach renourishment.

Conclusion

All beaches in Hawaii are Public Trust resources, jurisdiction over which is assigned by the State Constitution to State government:

> **For the benefit of present and future generations, the State and the political subdivisions shall conserve and protect Hawaii's natural beauty and all natural resources... All public resources are held in trust by the State for the benefit of the people." (State Constitution, Art. XI-Sec.3).**

Although accretion and erosion are natural processes, any private action likely to result in loss of a beach resource directly conflicts with these Constitutional provisions. As noted above, our reviewers strongly suggest that the problems of beach loss require regional, as opposed to individual redress. Hence, we recommend that the requested Shoreline Management Variance be denied, and we suggest that Lanikai be designated as a Beach Management District, allowing the evolution of a more regional implementation of shoreline management.

Thank you for the opportunity to comment.

Sincerely,

John T. Harrison
Environmental Coordinator

cc: OEQC
Roger Fujioka
D.L.U., Ms. Ardis Shaw-Kim
Plan Pacific, Inc., Robin Foster
Hans-Jurgen Krock
Charles Fletcher
Alexandra Gurary

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PLANPACIFIC

December 18, 1997

Mr. John T. Harrison, Environmental Coordinator
Environmental Center
University of Hawaii at Manoa
2550 Campus Road - Crawford 317
Honolulu, Hawaii 96822

Dear Mr. Harrison:

Subject: Environmental Assessment for a Shore Protection Structure, Lanikai 1286 and 1302 Mokulua Drive; Tax Map Key 4-3-04:74 & 4-3-05:61

This responds to your letter dated September 22, 1997, commenting on the Draft Environmental Assessment (EA). The responses were prepared with the assistance of our coastal engineering consultant, Edward K. Noda & Associates.

Comment: Our reviewers suggest that no immediate threat to the structure (house) exists, as a cycle of accretion presently prevails in that part of Lanikai. Currently, there is no indication that the erosion cycle will continue, and the existing SEAbag revetment is providing adequate protection.

There is no factual basis for the comment. If the opinion that "a cycle of accretion presently prevails" is based on the monitoring report prepared by David Lipp for the Lanikai Beach Committee's demonstration project, we suggest that you have misinterpreted the report. The chief conclusion of the monitoring report is that "the sandbags did not prevent the beach from reforming." For your information, we have enclosed the monitoring report and a memorandum from Edward K. Noda, in review of the monitoring report (included in the Final EA as Appendixes A and B).

The SEAbag revetment on the Dilks' property is an interim emergency measure. These bags are prone to damage from large winter storm waves and vandalism. The EA/CEE notes that the SEAbags placed on the adjacent properties (under

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the auspices of the pilot program) did not survive the 1995-1996 winter season very well. The SEAbags on the Dilks' property were placed in April-May 1996, and the 1996-1997 winter season caused damage to the Dilks' SEAbag revetment as well as damages to the pilot program SEAbags on the adjacent properties. A seawall will provide more positive, permanent protection than the existing SEAbag revetment, and will be less prone to catastrophic failure in a storm wave event.

Comment: Due to increased energy in wave reflectivity caused by seawalls, Lanikai Beach has experienced increased offshore sediment transport. If erosional conditions persist fronting a seawall, the beach will be lost.

The perception that increased energy in wave reflectivity caused by seawalls leads to increased erosion is not supported in factual prototype data. As cited in the EA/CEE, long-term field studies by the University of California at Santa Cruz found no significant difference in impact to the beach in comparing the beach fronting a sloping rip-rap revetment and an adjacent vertical concrete seawall.

The proposed seawall will not preclude or foreclose the possibility of future beach restoration, whether by natural or artificial means. A recent inspection of the Lanikai shoreline reveals that over 80 percent of all beachfront properties have seawalls or some form of shore protection structure. There are many existing seawalls protecting properties on the Kailua side of the Dilks' property. These seawalls were apparently built in the 1960s and 1970s, at a time when erosion was a problem throughout the middle segment of Lanikai Beach. Concurrently, accretion was occurring on the southern end of Lanikai (refer to Figure 4a in the EA/CEE). From about 1970 to the 1990s, the southern end of Lanikai has been in an erosion cycle, while the middle segment of Lanikai has accreted substantially in front of the seawalls. **These existing seawalls did not prevent beach accretion from naturally occurring.** In fact, so much accretion has occurred that many of the seawalls in the middle segment of Lanikai Beach are almost completely buried.

Comment: Although accretion and erosion are natural processes, any private action likely to result in loss of a beach resource directly conflicts with Constitutional provisions (Art. XI-Sec.3). Our reviewers strongly suggest that the problems of beach loss require regional, as opposed to individual redress. Hence we recommend that the requested variance be denied, and we suggest that Lanikai be designated as a Beach Management District, allowing the evolution of a more regional implementation of shoreline management.

Chapter 205A-46(9) allows for shore protection structures where the shoreline erosion is likely to cause hardship to the applicant if the improvements are not allowed. The EA

addresses the hardship considerations. In this case, the applicants have already lost about 35 feet of yard area and now stand to lose their house.

We concur that the problem of coastal erosion is regional and statewide. In order to adequately address a coastal erosion problem, one must design and carry out a comprehensive solution for the entire littoral cell—in this case, the littoral cell is the entire Lanikai Beach. The concept of carrying out beach renourishment through a Beach Management District is appealing, but such a program is beyond the means of individual homeowners. Only government has the means to carry out a program that covers an entire beach district, requires compliance with or change to numerous regulations, needs to extract sand from offshore (State-owned) resources, requires development of a system of public-private financing, and will extend over many years.

Despite many studies on beach erosion conducted through the State's Coastal Zone Management Program over the course of many years, there has been no action. In the absence of a coherent program, the state and the counties have followed a de facto policy of granting variances to allow shore protection in cases of hardship.

Thank you for your comments.

Sincerely,
PLANPACIFIC, INC.

Robin Foster, AICP
Vice-President

Enclosure

0000 0008 1193

97-06608

Charles Fletcher, Associate Professor
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Department of Geology and Geophysics
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Jan Naoe Sullivan, Director
Department of Land Utilization
City and Conty of Honolulu
650 S. King St., 7th Flr.
Honolulu, HI 96813

9/8/97

fx: 527-6743

The Coastal Geology Group at the University of Hawaii recommends that DLU reject the application for the Dilks Shore Protection Structure in Lanikai. The Draft Environmental Assessment (DEA) and Coastal Engineering Evaluation (CEE) fail to show both that the present shore protection structure (seabag revetment) is not fulfilling its intended purpose, and that the proposed seawall would better address the supposed shortcomings of the seabags.

Cited Problems and Responses

The DEA and CEE enumerate various problems with the present shoreline protection structure. Implicitly, these problems should be minimized or eliminated by the proposed alternative solution. The documents point out, however, that the proposed seawall will be problematic in the same areas as the seabags.

- "*Significant wave overtopping* (of the seabag revetment) *also caused sand and water damage to the house and property...*" (CEE)

Wave overtopping is still a possibility with the proposed seawall: "Because the top of the (proposed) wall does not extend much above the existing shoreline elevations, wave overtopping can occur during high tides and storm wave attack." (CEE)

- "*...sandbags...can require frequent and continual maintenance...*(because) *the bags are prone to damage from storm wave attack and vandalism...*" (CEE)

The shoreline is a dynamic environment; any shore protection structure, from beach nourishment to seawalls, must be responsibly monitored and maintained to secure its continued efficacy.

- "*Wave energy is more readily reflected rather than dissipated within the* (seabag) *structure slope as would be for a rock revetment.*" (CEE)

Any shore protection structure that has a slope greater than the natural beach gradient will increase the reflection of wave energy at a site. The comparison of the reflectivity of seabags versus rock revetments is irrelevant in this case, as the proposal is to replace the seabags with a near-vertical seawall; in any case, the CEE notes that "...there is no evidence of significance (sic) difference in beach response related to the types of shore protection structures that have been built." This beach response "....may be to discourage sand buildup because of the increase in reflectivity."

- "*soil is eroded from the yard behind the sandbags*" (DEA)

In other words, the application claims that the seabags do not completely eradicate the threat of coastal erosion. The construction of a seawall does not guarantee that coastal erosion will stop. The CEE notes that seasonal changes affect the beach adjacent to a hardening structure as well as along an unarmored shoreline, citing Aliomanu, Kauai, a Noda-monitored seawall site, as an example of a situation in which beach accretion occurs in front of a seawall as well adjacent to an unprotected shoreline. The CEE does not say, however, that coastal erosion also occurs mauka of seawalls as well as along unprotected shorelines. This can be seen at the previously-mentioned Aliomanu site, where a near-vertical CRM seawall has failed to prevent severe erosion of property behind the wall. Because the seawall is immobile, it is unable to protect the huge puka on its mauka side; if such a situation occurs adjacent to seabags, the resulting void can be filled in by repositioning the bags.

- "*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...*" (CEE)

Algae grow on any surface, including basalt and concrete; the growth is not preferential to the synthetic seabag material. As the application notes, the loss of the adjacent beach is the probable result of the hardening of the shoreline; thus, any submerged portion of a structure will be subject to the growth of algae.

A Seawall is not the answer

In addition to pointing out various problems with the seabags, problems that will not be addressed through the construction of a seawall, the application also states that the seabags have been essentially a success: "...the emergency sandbag protection prevented significant additional damage to the shoreline embankment fronting the subject properties....and potential undermining of the house foundation." (CEE) Thus, the existing bags successfully serve the same purpose as the proposed seawall: attempting to protect the land from coastal erosion. The application makes two important points regarding protection against coastal erosion:

- "*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...causing erosion damage to the private properties.*" (CEE)

- "*Loss of beach in front of the shore protection structure....is the probable long-term consequence of building the proposed seawall at the Lanikai properties.*" (CEE)

Coastal land is protected by beaches, but beach loss will result from the continued hardening of the Lanikai shoreline. These two points illustrate the Catch-22 that accompanies the current approach to coastal land loss in Hawaii; the proposed shoreline-hardening "solutions" do not address the cause of the problem. The only viable permanent solution to the coastal erosion problem is the return of the beach to its natural, wide, freely-migrating state. Sandbags should be used as long as a threat exists to coastal property; once the threat is

reduced by continued nourishment of the beach, the bags can be removed so that the sand stored in coastal land can become a part of the overall sediment budget on the beach. If and when coastal lands are threatened again, then the sandbags can be reinstated. The installation of a seawall prevents the return of the beach to its natural state, even though sand can and probably will seasonally accrete adjacent to armoring structures. Beaches in Hawaii must have free communication with mauka sands in order to maintain their ability to mitigate against coastal erosion.

We recommend that the applicants use 10% of the cost of the proposed seawall to start a Lanikai Beach Nourishment fund, to which other community members, as well as the state and county, should be encouraged to contribute. The application acknowledges that "beach nourishment or construction of a permanent breakwater, if properly executed, are viable long-term solutions...(but) they are beyond the means of a single property owner" (DEA). Beach nourishment must be community-based; if one owner signifies his or her willingness to put their money where their mouth is, then perhaps others will follow suit and action will be taken. The current proposal, to replace sand bags with a seawall, does not solve anything.

Sincerely,

Chip Fletcher

Charles H. Fletcher, Ph.D.
Associate Professor

Melanie Coyne

Melanie Coyne,
Research Associate

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PLANPACIFIC

December 18, 1997

Mr. Charles Fletcher, Associate Professor
Ms. Melanie Coyne, Research Associate
Department of Geology & Geophysics
University of Hawaii
School of Ocean & Earth Science & Technology
2525 Correa Road
Honolulu, Hawaii 96822

Dear Mr. Fletcher and Ms. Coyne:

Subject: Environmental Assessment for a Shore Protection Structure, Lanikai
1286 and 1302 Mokulua Drive; Tax Map Key 4-3-04:74 & 4-3-05:61

This responds to your letter dated September 8, 1997, commenting on the Draft Environmental Assessment (EA). The responses were prepared with the assistance of Edward K. Noda & Associates.

Comment: Wave overtopping is still a possibility with the proposed seawall.

The top elevation of the proposed seawall is at approximately the same grade as the property in order to minimize visual/aesthetic impacts. Therefore, wave overtopping can still occur during high tides and storm wave attack. However, for the same crest elevation, wave overtopping will not be as severe with the seawall as with the existing sloping SEAbag revetment. Scour and erosion damage to the SEAbag revetment crest and supporting back slope will occur whenever there is significant wave overtopping. Such damage is not a threat to the seawall because the seawall does not require a supporting back slope for structural integrity.

Comment: The shoreline is a dynamic environment; any shore protection structure, from beach nourishment to seawalls, must be responsibly monitored and maintained to secure its continued efficacy.

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The economic feasibility and overall viability of any shore protection structure or erosion control measure is directly related to its long-term stability and functionality. A sandbag structure will require more frequent and continual maintenance than a CRM seawall, and it is certainly more prone to catastrophic failure in a storm wave event than a CRM seawall.

Comment: Any shore protection structure that has a slope greater than the natural beach gradient will increase the reflection of wave energy at a site. The comparison of reflectivity of SEAbags versus rock revetments is irrelevant in this case, as the proposal is to replace the SEAbags with a near-vertical seawall.

This comment was made in reference to a discussion of the existing SEAbag revetment in the alternatives section of the EA/CEE. The discussion of the functionality of the SEAbag revetment in comparison to other alternatives is relevant. The intent in the EA/CEE was to dispel the myth that a SEAbag structure functions similarly to a natural beach because of its permeability and that it does not constitute shoreline "hardening". As stated in the EA/CEE, the SEAbags are solid, hard building materials when fully filled, and a SEAbag revetment structure probably is more reflective than a rock revetment, for the same slope.

Comment: The construction of a seawall does not guarantee that coastal erosion will stop. Coastal erosion also occurs mauka of seawalls...this can be seen at the mentioned Aliomanu site where a near-vertical CRM seawall has failed to prevent severe erosion of property behind the wall. Because the seawall is immobile, it is unable to protect the huge puka on its mauka side; if such a situation occurs adjacent to SEAbags, the resulting void can be filled in by repositioning the bags.

If properly designed and constructed, a shore protection structure will prevent continuing coastal erosion mauka of the protective structure. The purpose of a shore protection structure, such as a seawall or revetment, is to provide a physical barrier between the waves and the mauka lands to be protected. A properly constructed barrier will prevent waves from attacking the mauka lands. Large holes can develop on the mauka side of seawalls, but it is not due to coastal erosion processes. Significant wave overtopping of walls can cause hydrostatic pressures on the mauka side, which can lead to leaching of sand/soil from behind the wall as the water flows seaward through voids in the wall, thereby causing "sinkholes". This problem is addressed in the design and construction by using a geotextile filter fabric behind the wall, providing weepholes to relieve the hydrostatic pressure, and providing an adequate foundation for the base of the wall. If such a problem does occur, it can be directly remedied by standard engineering techniques, and is part of the maintenance of the seawall. If such a situation occurs behind a revetment, whether a SEAbag revetment or rock revetment, it can lead to major slope failure and damage to the revetment structure.

Comment: Algae grow on any surface, including basalt and concrete; the growth is not preferential to the synthetic SEAbag material.

Because of the smooth surface of the bag material, the bags are very slippery to walk on—more so than on a rock structure or a roughened concrete surface. As stated in the EA/CEE, even newly installed bags with no algal growth can be slippery because of the smooth surface of the bag material.

Comment: Coastal land is protected by beaches, but beach loss will result from the continued hardening of the Lanikai shoreline. The only viable permanent solution to the coastal erosion problem is the return of the beach to its natural, wide, freely migrating state.

Over 80 percent of the Lanikai shoreline is already hardened. The Dilks' property is among the few that are not presently protected with a permanent structure. Properties on the Kailua side of the site (in the direction of progressive erosion) are already hardened with seawalls. No one will argue the point that the best alternative to the coastal erosion problem is to restore the beach. But the specific shoreline variance application is for the construction of a seawall to protect the Dilks' home. Beach nourishment of Lanikai's shoreline is clearly not a viable alternative for the individual homeowner/applicant.

Comment: Sandbags should be used as long as a threat exists to coastal property; once the threat is reduced by continued nourishment of the beach, the bags can be removed so that the sand stored in coastal land can become a part of the overall sediment budget on the beach. If and when coastal lands are threatened again, then the sandbags can be reinstated. The installation of a seawall prevents the return of the beach to its natural state, even though sand can and probably will seasonally accrete adjacent to armoring structures. Beaches in Hawaii must have free communication with mauka sands in order to maintain their ability to mitigate against coastal erosion.

You appear to be recommending that private property owners allow their coastal lands to erode so that sediments from their property nourish the public beach. The problem is that when homes become threatened because of chronic erosion, allowing the fastlands to continue to feed the beach will ultimately result in destroying the house. As a practical matter, when coastal erosion threatens developed shorelines, the only alternatives are to protect the shoreline (hardening), replenish the beach (artificial nourishment), or relocate the structures that are threatened by the erosion.

The proposed seawall will not prevent the return of the beach to its natural state, nor will it preclude or foreclose the possibility of future beach restoration, whether by natural or

artificial means. There are many existing seawalls protecting properties on the Kailua-side of the Dilks' properties. These seawalls were apparently built in the 1960s and 1970s, at a time when erosion was a problem throughout the middle segment of Lanikai Beach. Concurrently, accretion was occurring on the southern end of Lanikai (refer to Figure 4a in the EA/CEE). From about 1970 to the 1990s, the southern end of Lanikai has been in an erosionary cycle, while the middle segment of Lanikai has accreted substantially in front of the seawalls. In other words, these **existing seawalls did not prevent beach accretion from naturally occurring.**

Comment: Beach nourishment must be community-based; if one owner signifies his or her willingness to put their money where their mouth is, then perhaps others will follow suit and action will be taken. The current proposal, to replace sand bags with a seawall, does not solve anything.

The objective of the proposed shore protection project is simply to protect the Dilks' residence from undermining and severe damage or destruction. As recognized in the 1992 report prepared for the Hawaii Coastal Zone Management Program entitled "Beach Management Plan with Beach Management Districts," the long-term problem of eroding beaches demands inventive strategies and assertive action. As the report also discusses, however, solutions such as beach nourishment programs require changes to the regulatory regime, new funding, and new implementation programs. These are beyond the reach of a single homeowner. While community support is an essential ingredient, we cannot rely on voluntary community organizations to address beach erosion problems. Voluntary organizations simply lack the scope of authority and decision-making processes needed to undertake a beach nourishment program. This is one area in which the government must exercise leadership, as it has in other coastal states.

Sincerely,
PLANPACIFIC, INC.

Robin Foster, AICP
Vice-President

0000 0008 1202

97-0648

Lanikai Beach Management Committee

1343 Mokulua Drive
Kailua, Hawaii, 96734

September 3, 1997

1997 SEP -8 AM 10:10
DEPT. OF LAND UTILIZATION
CITY & COUNTY OF HONOLULU

Jan Sullivan, Director
Department of Land Utilization
650 South King St., 7th Floor
Honolulu, HI 96813

Re: 97/SV-007 (ASK)

The Lanikai Beach Management Committee has carefully reviewed the Draft Environmental Assessment and Coastal Engineering Evaluation prepared by E.K. Noda and Associates for a seawall fronting TMK 4-3-04:74 and 4-3-05:61.

The location of the proposed seawall is immediately adjacent to a demonstration pilot project for beach replenishment on state owned submerged lands in Lanikai. The project has been in the planning process since 1994 and involves a cooperative effort between four property owners, the Lanikai Association, the DLU, DLNR, Army Corps of Engineers, State Office of Planning and the Department of Health. In the past year we have slowly acquired most of the necessary permits to proceed and have begun work in those permitted areas. The rest will soon follow. Our DLNR permit allows us two years after completion to assess the results. Enclosed is a written summery of the experiment's intent.

There is no question but that construction of a 150 foot vertical seawall in this location at this time will have an adverse impact on the Lanikai Beach Management project. This experiment has received the approval of the state and federal agencies that oversee coastal management in Hawaii. They are most interested in the potential for its use in other areas of the State experiencing similar beach erosion. The data produced thus far is promising.

Enclosed are copies of beach profiles at the subject site taken by David Lipp, project coastal engineering consultant. They cover the period from September 1995 to June 1997. Lipp's written assessment of the project to date is also enclosed. The profiles taken in front of the Dilks property clearly show that sand lost in winter storms from 1995 to 1996, has returned. What this means for the future is unknown, but it is a clear indication that the experiment is having positive short term effects. Lipp states that the sandbags were not of themselves responsible for the return of sand, but he emphasizes that it is important to note that their presence did not prevent the beach from reforming. It will be of great value to continue this process in uninterrupted fashion until more conclusive evidence is gathered.

Noda's Draft EA makes the speculative assumption that the proposed seawall will have no long term impact on littoral processes, nor will it adversely impact recreational, biological or scenic resources. (Impacts, p. 5) We point to the 150 feet of vertical seawall to the South of the proposed project, constructed after the 1946 tidal wave. These two contiguous walls are now the scourge of the central Lanikai coastline. Their reflective nature has altered the wave pattern in that area, sweeping away any attempted accretion of sand. It is too perilous to wade in front of them due to submerged rocks and wave action. Sink holes repeatedly develop behind them, leaching soil and rocks into the water. Exposed as they are from top to toe, they are extremely unattractive to the eye. Do we need another 150 foot seawall that may in a few years add to the recreational, biological and scenic degradation of Lanikai Beach?

In attempting to make its case the Draft EA selectively omits unfavorable material. Section 3.0, page 4, discusses the long term erosion/accretion cycle as a natural process that occurred at Kailua Beach Park as well as in Lanikai. It states that most seawalls were constructed in response to the erosion cycle and were not the cause of the erosion. What it does not say is that while walls were going up in Lanikai, they did not at the Beach Park. During the erosion cycle at the Park, the boat ramp was in danger of being submerged. Today it is awash in sand, as the accretion phase of the cycle has left a heavy sand buildup. On the South end of Lanikai there has been no end to the erosion cycle and it is not unreasonable to surmise that this continuation is because of the proliferation of walls, altering the natural process, preventing any accretion.

The report further states that "The history along Lanikai Beach gives evidence that the presence of a seawall does not preclude natural beach accretion." (3.0, page 7) One single seawall might not, however, in South Lanikai there is a near unbroken line of seawalls and revetments and this unrelenting armoring of the shoreline has precluded natural beach accretion. Do we need any more walls to add to the hard armoring of the shoreline?

Dr. Stephen Leatherman, coastal geologist at the University of Maryland, who is also known as Dr. Beach, has warned that seawalls on Lanikai Beach are "squeezing the beach out of existence." He further states, "...if you put a wall there and the beach is slightly eroded and the beach disappears, what have you got? You've lost public access and you don't have a beach either." (Star Bulletin, 5/23/97) Last year Lanikai was at the top of Leatherman's best beach list, but with the caveat that, "Lanikai Beach will likely be gone in the near future because bulkheads, built by homeowners to protect their property against slow erosion, are squeezing the beach out of existence." (Star Bulletin, 5/24/96) In a State where tourism is our economic mainstay, it makes no sense at all to contribute further to anything that will squeeze our economy out of existence.

The Lanikai Beach Management Committee recommends that the DLU deny this variance on two grounds:

One: the experimental project has barely begun to make an impact and it is premature to assume that it will fail. The Dilks property is adequately protected by seabags and is under no danger at

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this time. A seawall would be of no greater protection than what the seabags currently afford. The project should be given a chance to proceed unencumbered.

Two: No matter what the circumstances, a vertical seawall is a terrible thing to place on a recreational beach. The sad history of Lanikai Beach is one of uninformed decisions by governmental agencies that have allowed the destruction to occur. We must not let history repeat itself. Now we know better.

Thank you for your consideration.

Sincerely,

Mollie Foti
Secretary

Summary of the Lanikai Beach Management Committee Experiment

Statement of the Problem

Historically and currently, seawalls and revetments are built in areas of shoreline erosion. Seawalls and revetments do not protect the beach, they protect the private property shoreward of them. Although the structures are built on private property, landward of the high water mark, the erosion continues until no beach remains in front of the structure. This loss of beach has been extensive. Lanikai has lost 38% of its beach to this mismanagement of public resources. The Lanikai Beach Management Committee finds the status quo unacceptable. The State of Hawaii must take proactive measures to protect the beaches.

There is a policy under development by the State Department of Planning which deals with hardened structures in the shoreline conservation district, including the private property shoreward of the high water mark. This policy basically says no structures will be allowed, including revetments. This is a very confrontational approach which will simply line the pockets of attorneys as they fight in court for decades over the right to protect private property vs. the right to protect a public resource. It is also blind to the fact that there would be extensive economic loss to the state as land, the basis of wealth, is lost.

The Lanikai Beach Management Committee believes that there are solutions to this problem which both protect property and maintain beaches for the enjoyment of the public. These solutions require that we all work together. As Mike Wilson (DLNR Chairman) has said, "As the most remote land mass on earth, Hawaii has an extra need for a human population that can work together to solve community problems." (Star Bulletin 2/3/1996).

Long Term Solutions

Professor Chip Fletcher, University of Hawaii Dept. of Geology and Geophysics, has done an extensive amount of work for the State of Hawaii regarding beach management and policy. This work sits on the shelf collecting dust. He suggests a layered approach which combines short term protection with removable structures, mid term protection with sand nourishment, and long term retreat from the shoreline **with compensation** to landowners who lose property. He has further suggested ways the state and county governments can fund and implement such a program.

Because of the government's inaction in this area, the Lanikai Beach Management Committee has taken the initiative to improve public beach access. The Lanikai Beach Management Committee supports the concept of beach nourishment as a mid term solution. The committee recognizes that a properly designed nourishment project could cost in excess of $1 million and take years to implement. Because of the high cost and long time frame, the committee has looked to interim solutions while a nourishment project is being initiated.

Short Term Solutions

The Lanikai Beach Management Committee believes that inexpensive measures can be taken to improve public access to the shoreline in areas which have already lost the beach to erosion. The committee further believes that these same inexpensive measures can both protect property and

retain a small beach for public access in areas which are currently undergoing major erosion. The committee feels this is much preferable to the eventual loss of the beach which history tells us will occur if the landowners simply are allowed to build a revetment.

All the structures which are proposed are built from sandbags, which are termed soft structures as opposed to hardened structures. This ties in well with Fletcher's layered approach to beach management. Further, the proposal is deemed an experiment and its success or failure can be assessed at the end of the experimental period. The sandbags are large, durable, and sand colored. Each bag will hold 1.5 to 2 cubic yards of sand and weigh more than 2 tons. The bags can be removed at any point by removing the sand from the bags, thus there is no risk of permanent damage to the littoral process should the experiment not perform as anticipated.

Summary of the Experiment

A set of experiments will be conducted whose purpose is to create a small beach fronting an area of seawalls and revetments, and to attempt to find an alternative to the traditional revetment in an area of active erosion.. This experiment will be performed in Lanikai, in an area which has historically had a sandy beach. A two year experiment will be conducted fronting seawalls, revetments, and eroding properties. Two separate test areas will investigated.

In the first test area there are vertical seawalls which reflect a considerable amount of wave energy. This wave reflection has 'trapped' approximately 600 cubic yards of sand offshore of this area. As the wave reflection is reduced, the sand will migrate shoreward naturally. To reduce the reflections, submerged sandbag revetments will be placed at a distance of 75' off the walls. A small perched beach will be located from the seawalls to a distance of 20' offshore. This perched beach will be 'seeded' with up to 150 cubic yards of nourishment sand.

The second test area will be conducted fronting an area which has undergone active erosion for the past few years. The homes are in jeopardy due to the erosion. Bags have been previously been placed to create a perched beach, similar to a terrace. Offshore of the terrace, sandbags will be placed to create a submerged breakwater. This will reduce the wave energy at the shore. A small amount of sand will be brought in and backfilled on the perched beach. Up to 150 cubic meters of sand may be brought in for the nourishment.

The nourishment sand will only be used if it is deemed suitable for Lanikai beach. The sand will be tested for both size and color compatibility prior to its acceptance. The sand will be placed in the perched beach section, above the mean waterline, thus will not create a turbidity problem during construction.

Topographic profiles will be taken perpendicular to the shoreline before and periodically after the sandbags are in place. These will determine the response of the beach equilibrium slopes to the reduced reflections. The bags will be monitored for structural integrity. Should bags become severely ripped they will be removed and disposed of prior to them becoming a marine hazard or an eyesore. Change in beach accessability will be measured qualitatively with a survey of local beach users.

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PLANPACIFIC

November 29, 1997

Ms. Mollie Foti, Secretary
Lanikai Beach Management Committee
1343 Mokulua Drive
Kailua, Hawaii 96734

Dear Ms. Foti:

Subject: Environmental Assessment for a Shore Protection Structure, Lanikai
1286 and 1302 Mokulua Drive; Tax Map Key 4-3-04:74 & 4-3-05:61

This responds to your letter dated September 3, 1997, commenting on the Draft Environmental Assessment (EA). The responses were prepared with the assistance of our coastal engineering consultant, Edward K. Noda & Associates.

Comment: There is no question but that construction of a 150 foot vertical seawall in this location at this time will have an adverse impact on the Lanikai Beach Management project.

Constructing shore protection should have no effect on the pilot project. If the erosion trend reverses, evidence from other parts of Lanikai suggests that the beach will accrete regardless of the seawall. If the pilot program is successful in mitigating the continued loss of beach sand, the seawall will similarly have no impact, but will be there to protect the property in the event of severe winter storm waves.

The proposed seawall will not prevent the return of the beach to its natural state, nor will it preclude the possibility of a future beach restoration project. A recent inspection of the Lanikai shoreline reveals that over 80 percent of all beachfront properties have seawalls or some form of shore protection structure. There are many existing seawalls protecting properties on the Kailua side of the Dilks' property. These seawalls were apparently built in the 1960s and 1970s, at a time when erosion was a problem throughout the middle segment of Lanikai Beach.

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During the same years, accretion was occurring on the southern end of Lanikai (refer to Figure 4a in the EA/CEE). From about 1970 to the 1990s, the southern end of Lanikai has been in an erosion cycle, while the middle segment of Lanikai has accreted substantially—seaward of the seawalls built there in the 1960s and 1970s. In other words, these **existing seawalls did not prevent beach accretion from naturally occurring.**

Certainly the proposed shore protection would not have any greater effect on the beach or the pilot project than the 100-foot length of vertical seawall protecting the two properties just 50 feet to the north of the Dilks' property at TMKs 4-3-04: 62 and 63. These seawalls were not visible until last winter's storms removed the vegetation and sand which previously covered them.

Finally, please note that the Final EA offers a detailed proposal for the alternative of constructing a sloping revetment rather than a vertical seawall. If the Department of Land Utilization and the Department of Land and Natural Resources find that a sloping revetment would be preferable in relation to enabling future beach restoration, then that alternative is available.

Comment: The data produced thus far (related to the demonstration pilot project) is promising. The beach profile data indicate that the experiment is having positive short term effects.

The monitoring report on the pilot project prepared by David Lipp is included as Appendix A to the Final EA. A review by the coastal engineering consultant Edward K. Noda & Associates, included as Appendix B to the Final EA, finds that there is insufficient information from the monitoring program to draw any valid conclusions about the "success" of the demonstration project. EKNA's memorandum is attached for your information.

Comment: Seawalls were not built at Kailua Beach Park during the erosionary cycle, but seawalls were constructed on the south end of Lanikai; this is the reason that erosion is continuing in Lanikai.

Lanikai is a developed urban shoreline. Shoreline movement of 160 feet or more can be accommodated at Kailua Beach Park, but not along the Lanikai shoreline where the shoreline setback is only 40 feet and houses will be destroyed if the shoreline is not hardened. Notwithstanding the fact that shore protection structures were necessary in Lanikai to prevent houses from becoming undermined and/or damaged by waves, there is no basis for assuming that the seawalls along the south Lanikai shoreline are responsible for the continuing erosion. In the middle portion of Lanikai, nearly the entire shoreline is armored with seawalls that were built during the erosionary phase affecting that portion of the shoreline. These seawalls did not preclude subsequent accretion, and many are now buried by many feet of accreted

sand. Existing seawalls on the Kailua-side of the Dilks' property are now fully exposed because of the continuing erosion, and the Dilks' property is but one of a few along the entire Lanikai shoreline that is not presently protected with a permanent structure.

Comment: Recommend that DLU deny the variance because: (1) The Dilks property is adequately protected by SEAbags and is under no danger at this time. A seawall would be of no greater protection than what the SEAbags currently afford. (2) A vertical seawall is a terrible thing to place on a recreational beach.

The SEAbag revetment on the Dilks' property is an interim emergency measure. These bags are prone to damage from large winter storm waves and vandalism. The EA/CEE notes that the SEAbags placed on the adjacent properties (under the auspices of the pilot program) did not survive the 1995-1996 winter season very well. The SEAbags on the Dilks' property were placed in April-May 1996, and the 1996-1997 winter season caused damage to the Dilks' SEAbag revetment as well as damage to the pilot program SEAbags on the adjacent properties. A seawall will provide more positive, permanent protection than the existing SEAbag revetment, and certainly less prone to catastrophic failure in a storm wave event.

A vertical seawall is only terrible if you attribute fault to it. Vertical seawalls exist along much of the Waikiki Beach shoreline—the most highly visible and economically important recreational beach in Hawaii. Vertical seawalls exist along practically the entire Lanikai shoreline, and many are completely buried by the accreted beachfront. The real problem is the lack of a positive beach nourishment program that could be employed to restore Lanikai and other beaches throughout the islands.

Sincerely,
PLANPACIFIC, INC.

Robin Foster, AICP
Vice-President

Enclosure

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O'AHU GROUP
SIERRA CLUB, HAWAI'I CHAPTER
P.O. Box 2577, Honolulu, Hawaii 96803
Phone: (808) 538-6616

1997 SEP -9 AM 10: 27

DEPT. OF LAND UTILIZATION
CITY & COUNTY OF HONOLULU

97-06524

September 4, 1997

Jan Sullivan
Director
Department of Land Utilization
650 S. King St 7th Floor
Honolulu, HI 96813

Dear Ms. Sullivan,

RE: DILKS SEAWALL VARIANCE APPLICATION

The O'ahu Group of the Sierra Club objects to the Dilks' application for a shoreline setback variance. Please include this in the public record for both the variance application and the environmental assessment.

Shoreline Setback Variances must be consistent with the objectives and policies of HRS 205A-2. 205A-4(b) These objectives and policies include:

- providing recreational opportunities accessible to the public;
- protecting the quality of coastal scenic and open space resources;
- protecting beaches for public use and recreation;
- providing and managing adequate public access to and along shorelines with recreational values; and
- prohibiting construction of private erosion-protection structures seaward of the shoreline, except when they result in improved aesthetic and engineering solutions to erosion at the sites and do not interfere with existing recreational and waterline activities.

No variance may be granted unless safe lateral access to and along the shoreline is provided. 205A-46(c)(1) No variance may be granted unless conditions are imposed to minimize adverse impacts to beach processes. 205A-46(c)(2). No variance may be granted unless conditions are imposed to minimize loose rocks from impacting public property. 205A-46(c)(3). No variance may be granted unless conditions are imposed to minimize adverse impacts on public views. 205A-46(c)(4).

We know that 25% -- about 10 miles -- of Oahu's beaches have eroded thanks to coastal armoring. Studies done by the Army Corps of Engineers, the University of Hawai'i and the Coastal Zone Management Program (all of which DLU has in its records and all of which are incorporated into the record by reference) demonstrate that if a shoreline is undergoing long-term retreat, beach narrowing and loss can be expected if the beach is armored. See, e.g., Hwang and Fletcher, Beach Management Plan with Beach Management Districts (June 1992).

The environmental assessment notes that the adjacent beach is used for walking and jogging. It also notes that Lanikai's beaches have been undergoing net long-term retreat. Since a CRM seawall will cause beach loss -- and a loss of recreation -- it would be inconsistent with the objectives and policies of chapter 205A.

A seawall by its nature is ugly. This proposal reduces the scenic value of an open, natural shoreline -- and therefore is inconsistent with the objectives and policies of chapter 205A.

DLU should review Ed Noda's coastal engineering study with skepticism. A Kauai Circuit Court (Fifth Circuit) found that a negligently designed seawall damaged neighboring property, Holtwick v. Oehlert (Civ. No. 86-0118). It is our understanding that this destructive seawall was designed by Ed Noda and Associates.

The applicant has not proven hardship. In general, a variance should be viewed as an extraordinary exception which should be granted sparingly. The reasons to justify approval must be substantial, serious and compelling. R.R. Powell on Real Property 79c.16[1] (1995). The applicant has the burden of proof. Hawaii property law does not give private property owners the right to damage public property (i.e., cause beach erosion). The beach is a public trust resource (Application of Sanborn, 57 Haw. 585) and the government, as a trustee, can restrain those activities that damage the resource (Orion Corp. v. State 747 P.2d 1062). Coastal property is encumbered with the risk that erosion will take away property. Because this principle is inherent in the property law (County of Hawaii v. Sotomura 55 Haw. 176; 5A Powell on Real Property 66.01), there is no "hardship" caused by erosion. It is a natural phenomenon.

If DLU imprudently grants the variance, at the very least, it should have an expiration date to ensure that no vested right is granted.

Finally, the Environmental Assessment should include the shoreline certification -- with a clear description of where the shoreline is; where it used to be; and where the current vegetation line is.

Sincerely,

Philip Bogetto
Chair

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PLANPACIFIC

December 18, 1997

Mr. Philip Bogetto, Chair
Oahu Group, Sierra Club
P.O. Box 2577
Honolulu, Hawaii 96803

Dear Mr. Bogetto:

Subject: Environmental Assessment for a Shore Protection Structure, Lanikai
1286 and 1302 Mokulua Drive; Tax Map Key 4-3-04:74 & 4-3-05:61

This responds to your letter dated September 4, 1997, commenting on the Draft Environmental Assessment (EA). The response was prepared with the assistance of our coastal engineering consultant, Edward K. Noda & Associates.

Comment: Since the CRM seawall will cause beach loss and a loss of recreation, it would be inconsistent with the objectives and policies of Chapter 205A.

While a shore protection structures does not advance certain objectives and policies of Chapter 205A (the Coastal Zone Management Act), nevertheless the Act makes provision for allowing such structures under a variance procedure. Section 205A-46(9) provides that a variance to construct a shore protection structure may be granted where the shoreline erosion is likely to cause hardship to the applicant if the structure is not allowed. Clearly, construction of a shore protection structure is a measure of last resort, usually undertaken reluctantly by the property owner when his house is threatened with severe damage, as in this case.

The applicant's justification of hardship is included in the new Section 6 of the Final EA. Beach loss has, and will continue to occur, with or without the seawall. Section 5 of the Final EA discusses consistency of the proposed project with the Coastal Zone Management objectives and policies.

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Comment: A seawall by its nature is ugly. This proposal reduces the scenic value of an open, natural shoreline—and therefore is inconsistent with the objectives and policies of Chapter 205A.

Photos 1 and 7 in the EA/CEE show the shoreline fronting the Dilks' properties prior to placing the emergency seabag revetment—not a picture of scenic or aesthetic beauty. Seawalls are not necessarily "ugly." Vertical seawalls exist along much of the Waikiki Beach shoreline—the most highly visible and economically important recreational beach in Hawaii. Vertical seawalls exist along practically the entire Lanikai shoreline—many are completely buried by the accreted beachfront. Seawalls are not the problem, but a symptom. The real problem is an historical pattern of development along the shoreline confronted by continuing erosion of many beaches. That problem can only be addressed comprehensively by government through such programs as beach nourishment.

Comment: DLU should review Ed Noda's coastal engineering study with skepticism. A Kauai Circuit Court found that a negligently designed seawall damaged the neighboring property in the case Holtwick v. Oehlert (Civ. No. 86-0118). It is our understanding that this destructive seawall was designed by Ed Noda and Associates.

The seawall at Aliomanu, Kauai, the subject of the Holtwick v. Oehlert case, was not designed by Edward K. Noda and Associates, Inc. Your crude attempt to discredit a local company reflects poorly on the Sierra Club.

Comment: The applicant has not proven hardship.

The applicant's statement of hardship is included as Section 6 of the Final EA.

Comment: The EA should include a copy of the shoreline certification.

It is included as Figure 3 of the Final EA.

Sincerely,
PLANPACIFIC, INC.

Robin Foster, AICP
Vice-President

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97-06459

843 Aalapapa Drive
Kailua, Hi 96734
September 3, 1997

1997 SEP -5 AM 11: 14

DEPT. OF LAND UTILIZATION
CITY & COUNTY OF HONOLULU

Mr. Art Challacombe
Department of Land Utilization
650 S. King Street
Honolulu, HI 96813

Re: John Dilks' Application for Variance

Der Mr. Challacombe:

I saw in the paper that the Dilk's have applied for a shoreline setback variance in order to build a wall along their property on Mokulua Drive in Lanikai. I asked Roy and Forest Bell if they knew where to address comments and they suggested sending to you as you had been involved in the sand bag project. I would appreciate your getting my letter to the proper party. I am leaving tomorrow and won't be back until 9/16 and don't know when comments are due.

I am appalled at this possibility. The sand bag project has been wonderful as far as I can see. I walk the beach nearly every day and am always glad to see the continuing replenishment of the beach where the bags have been placed. For a long time it was not possible to walk anywhere near that area and now you can go past the Binney's and sometimes as far as Paul Mitchell's. The right-of-way was impossible to use because of the drop-off. Now the right-of-way is level with the beach. A great many of the bags are now under the sand and no longer visible.

If the Dilks think that additional protection is needed during periods of high surf, it would seem they easily could stack a few layers of sand bags at the edge of their property - above the present top layer. If they are allowed to build a wall which takes up part of the beach, I don't think there will be any beach left either in front of their property nor on either side. The waves break against the walls and scour the sand away. I don't see how it is possible to require that the Davis' wall be removed and to make them pay for the restoration project and then allow the Dilks to build a completely new, larger and longer wall.

If there is time to comment after the 16th, I would appreciate your letting me know and, if possible, give me the fax #'s or e-mail addresses of the proper parties to contact. Our fax # is 262-6384 and our e-mail address is "eslnl@worldnet.att.net". Thank you.

Sincerely,

Normamae Lamberg

Normamae Lamberg

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PLANPACIFIC

December 18, 1997

Ms. Normamae Lamberg
843 Aalapapa Drive
Kailua, Hawaii 96734

Dear Ms. Lamberg:

Subject: Environmental Assessment for a Shore Protection Structure, Lanikai
1286 and 1302 Mokulua Drive; Tax Map Key 4-3-04:74 & 4-3-05:61

This responds to your letter mailed in September 1997 to the Department of Land Utilization, in which you commented on the shore protection structure proposed to protect the Dilks' house.

Contrary to the assumptions stated in your letter, the proposed seawall will not take up beach area. It is proposed to be constructed mauka of the SEAbags (large sandbags) now protecting the property. In fact, it is proposed that the SEAbags remain in place after the seawall is built. The project will not affect the pilot project which is being conducted by the Lanikai Beach Management Committee.

Thank you for your comments.

Sincerely,
PLANPACIFIC, INC.

Robin Foster, AICP
Vice-President

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1997 SEP 10 PM 2:34

DEPT. OF LAND UTILIZATION
CITY & COUNTY OF HONOLULU

September 9, 1997

Jan Sullivan - Director
Dept. of Land Utilization
650 South King St.
Honolulu, HI 96813
523-4414

Dear Ms. Sullivan,

Recently a small article appeared in a local newspaper (photocopy enclosed) commenting on the fact the John and Patricia Dilks of Lanikai, Kailua "have applied for a shoreline setback variance" to allow for the construction of a sea wall.

Lanikai Beach, as you must know, has been voted the most beautiful beach in the United States on several occasions over the years. My family has had property in Lanikai for 30 years and we have watched the destruction of this national treasure proceed at an alarming rate. Although I sympathize with the problem that the Dilks are experiencing, the only reason that they have their current problem is because the State of Hawaii and City and County of Honolulu, have permitted the neighbors of Mr. & Mrs. Dilks to build and maintain sea walls.

This cycle of destruction must stop!

I have spoken to my attorney who specializes in Real Estate Law. We are currently researching the merits of a multi million dollar law suit against the State of Hawaii and City and County of Honolulu for willful neglect in allowing Lanikai Beach to be destroyed.

Not only must this variance be denied, but a method must be found to restore sand deposits already lost to erosion and remove all existing sea walls on Lanikai Beach.

Mahalo,

Robert Light
1407 Kehaulani Dr.
Lanikai, Kailua, HI
96734

0000 0008 12 17

PLANPACIFIC

December 18, 1997

Mr. Robert Light
1407 Kehaulani Drive
Kailua, Hawaii 96734

Dear Mr. Light:

Subject: Environmental Assessment for a Shore Protection Structure, Lanikai
1286 and 1302 Mokulua Drive; Tax Map Key 4-3-04:74 & 4-3-05:61

This responds to your letter dated September 9, 1997, concerning the Environmental Assessment (EA) for the proposed shore protection structure.

Construction of a shore protection structure is a costly measure of last resort, usually undertaken reluctantly by the property owner when his house is threatened with severe damage—as in this case. Like you, Mr. and Mrs. Dilks are concerned about the serious erosion affecting Lanikai Beach. Two points of information:

- Over 80 percent of the properties along Lanikai Beach already have shore protection structures, including many in the middle of the beach. A lot of them cannot be seen because they have been covered by accreting sand. Seawalls in and of themselves do not prevent recovery of the beach.

- Beach replenishment is a favored strategy in addressing beach erosion in urban areas which has been applied extensively in other states. Many State of Hawaii-funded studies have recommended that government undertake a comprehensive program of sand replenishment on beaches such as Lanikai. These studies recognize that an effective beach replenishment program must be well-designed and address the entire littoral cell, which is the length of beach within which the sand supply circulates—in this case, Lanikai Beach is thought to constitute a single littoral cell. A well-designed beach replenishment/beach management program might entail adding sand to the

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system, moving sand from one part of the system to another, and/or building small structures to retain sand on all parts of the beach. It is obvious that such a program cannot be undertaken by individual property owners. Such a program can only be mounted by the State and/or the City government, which have the ability to enact financing districts, grant permits, and adopt a plan that affects an entire district involving multiple property owners.

Thank you for your comment.

Sincerely,
PLANPACIFIC, INC.

Robin Foster

Robin Foster, AICP
Vice-President

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91-07095

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

LAWRENCE MIIKE
DIRECTOR OF HEALTH

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DEPT OF LAND UTILIZATION
CITY & COUNTY OF HONOLULU

STATE OF HAWAII
DEPARTMENT OF HEALTH
P.O. BOX 3378
HONOLULU, HAWAII 96801

In reply, please refer to:

September 25, 1997 97-167/epo

Ms. Jan Naoe Sullivan, Director
Department of Land Utilization
City & County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Ms. Sullivan:

Subject: DRAFT ENVIRONMENTAL ASSESSMENT [FILE NO. 97/SV-007]
Project: Dilks Shore Protection Structure
Location: 1286 and 1302 Mokulua Drive
Lanikai, Oahu, Hawaii
TMK: (1) 4-3-04: 74 and (1) 4-3-05: 61

Thank you for allowing us to review and comment on the subject project. We have the following comments to offer:

Water Pollution

The Clean Water Branch (CWB) staff conducted visits to the subject site on July 24 and August 14, 1997. The July 24 visit was during low and flooding tide (from 2:03 p.m. to 3:05 p.m.), and the August 14 visit was during high and flooding tide (from 1:29 p.m. to 1:51 p.m.). The following are our comments:

1. We support shore protection projects that are designed, constructed and maintained in a manner that will not cause any adverse impacts to the receiving State waters, adjacent beaches or adjacent properties, or cause injury or harm to the existing surrounding uses (including recreational uses).

   Recreational uses of the beach fronting the project site were quite heavy during our visits. Among the recreational activities observed were: wading, swimming, pole fishing from the shore, net fishing, kayaking and walking. The sandbag revetment placed below the high tide line has temporarily interfered with the existing uses of the adjacent sand beach.

2. The Draft Environmental Assessment (DEA) and Coastal Engineering Evaluation (CEE) stated that the sandbags are only a temporary measure to protect the properties from further erosion. Yet, this plan (as indicated in Figure 6) also proposes to maintain the existing sandbags on-site for additional erosion protection after the completion of the proposed concrete-reinforced masonry (CRM) seawall construction.

   We have no objections to temporarily keeping the sandbag revetment on-site during the period of construction if the sandbag revetment is legally permitted. If the proposed CRM seawall is considered to be adequate in protecting the properties and will not cause any harm to the adjacent beach or properties, then the temporarily placed sandbags shall be removed immediately after the completion of the CRM seawall.

3. As discussed in section 3.0, *Historic Beach and Shoreline Changes,* of the CEE:

   a. The long-term accretion-erosion cycle was a natural process at this area;

   b. The seawall and revetment armoring of the entire southern end of Lanikai may have discouraged sand build-up due to the increase in reflectivity;

   c. The deficit of sand along the 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; and

   d. There is no evidence that the long-term erosion cycle in the vicinity of the project site is likely to reverse.

   The discussion on Page 6 and 7 of the CEE regarding the impacts of seawalls and sandbag revetments on adjacent beach and property parcels needs to be clarified. Has erosion on the subject parcels been aggravated by the sandbag revetment located to the south? Is the CEE also stating that sandbag revetment fronting the subject parcels causes the seawalls to the immediate north to be exposed and susceptible to damage?

   Sandbag revetment is now fronting TMKs: 4-3-04: 74, 76, 77, 98, and 4-3-05: 61. It is inappropriate to evaluate the environmental impact based solely on a CRM seawall

construction at this stretch. The impact of approving any shoreline protection measure(s) at this stretch shall be evaluated as a whole instead of one at a time. Will the sand beach fronting this stretch be lost permanently if shoreline hardening is approved?

The impact assessment shall not be completed until a beach management plan or shoreline protective measure acceptable to all property owners in this stretch is developed. We understand that the Lanikai Beach Management Committee is working towards this direction. Applicable alternatives may become available in the near future. Furthermore, long-term sand beach topography monitoring shall also be developed to properly monitor the effectiveness of the beach erosion control and/or beach nourishment measure(s) implemented. We recommend that the determination on whether to approve the shoreline setback variance application be made only after an acceptable alternative becomes practicable.

Should you have any questions on these comments, please contact Mr. Edward Chen of the Clean Water Branch at 586-4309.

Noise Concerns

Construction activities must comply with the provisions of Hawaii Administrative Rules, Chapter 11-46, "Community Noise Control."

1. The contractor must obtain a noise permit if the noise levels from the construction activities are expected to exceed the allowable levels of the regulations as stated in Section 11-46-6(a).

2. The contractor must comply with the conditional use of the permit as specified in the regulations and conditions issued with the permit as stated in Section 11-46-7(d)(4).

If there are any questions regarding this matter, please contact Mr. Jerry Haruno, Environmental Health Program Manager of the Noise, Radiation and Indoor Air Quality Branch at 586-4701.

Sincerely,

for BRUCE S. ANDERSON, Ph.D.
Deputy Director for Environmental Health

c: CWB
NR&IAQB

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PLANPACIFIC

December 18, 1997

Mr. Bruce S. Anderson, Ph.D.
Deputy Director for Environmental Health
Department of Health, State of Hawaii
P.O. Box 3378
Honolulu, Hawaii 96801

Dear Mr. Anderson:

Subject: Environmental Assessment for a Shore Protection Structure, Lanikai
1286 and 1302 Mokulua Drive; Tax Map Key 4-3-04:74 & 4-3-05:61

This responds to your letter dated September 25, 1997, commenting on the Draft Environmental Assessment (EA). The response was prepared with the assistance of Edward K. Noda & Associates.

Water Pollution

1. Comment: Sandbag revetment placed below the high tide line has temporarily interfered with use of the sand beach.

   The existing SEAbag revetment was permitted by DLNR as emergency shore protection. As in other parts of Lanikai Beach, coastal erosion and its ramifications have indeed interfered with use of the beach. Along much of the south end of Lanikai, there is no longer a dry beach to use.

2. Comment: If the proposed CRM wall is constructed and if it is considered to be adequate protection, then the temporarily placed sandbags should be removed immediately after construction, provided that this will not cause any harm to the beach or adjacent properties.

   The applicant's proposal is to retain the SEAbags in place, as additional protection for the seawall foundation and the property. This would

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essentially maintain the current configuration of the beachfront, possibly reducing any impact that a near-vertical seawall may have on the beach in the immediate area.

3. Comment: Has erosion on the subject parcels been aggravated by the sandbag revetment located to the south?

The effects of the SEAbags are unclear, but the major cause of erosion is natural.

Comment: Will the sand beach be lost permanently if shoreline hardening is approved?

Although natural forces may continue to erode adjacent properties which do not have shore protection, there is no evidence the presence of a seawall at the location proposed on the Dilks' property would itself cause additional erosion. Note that the proposed location is approximately in line with seawalls located on two properties only one lot (50 feet) to the north of the Dilks' property.

The proposed seawall will not prevent the return of the beach to its natural state, nor will it preclude or foreclose the possibility of future beach restoration, whether by natural or artificial means. There are many existing seawalls protecting properties on the Kailua-side of the Dilks' properties. These seawalls were apparently built in the 1960s and 1970s, at a time when erosion was a problem throughout the middle segment of Lanikai Beach. Concurrently, accretion was occurring on the southern end of Lanikai (refer to Figure 4a in the EA/CEE). From about 1970 to the 1990s, the southern end of Lanikai has been in an erosionary cycle, while the middle segment of Lanikai has accreted substantially in front of the seawalls. In other words, these **existing seawalls did not prevent beach accretion from naturally occurring.**

As a practical matter, when coastal erosion threatens developed shorelines, the only alternatives are to protect the shoreline (hardening), replenish the beach (artificial nourishment), or relocate the structures that are threatened by the erosion. The EA/CEE reviews these alternatives and concludes that shore protection is the only feasible alternative in this case.

Comment: The impact assessment should not be considered complete until a beach management plan or shoreline protective measure acceptable to all property owners in this stretch of beach is developed.

State law provides for an individual property owner to apply for a Shoreline Setback Variance or a Conservation District Use Permit in order to construct shore protection. The Shoreline Setback Variance was explicitly adopted by the Legislature and the City Council to address hardship that may be created by coastal erosion.

With regard to the suggestion that action on the Dilks' application wait until a comprehensive beach management plan is prepared, please consider that the State and the City have prepared many and plans on beach erosion over the past 10-15 years. Several of them have specifically studied Lanikai Beach, and several have concluded that Lanikai is a good candidate for a beach nourishment and restoration program. Only the government has the authority and capability to design, permit, and finance a comprehensive beach restoration program. Until that happens, erosion on Lanikai Beach appears likely to continue. (The experimental pilot project of the Lanikai Beach Management Committee points in the right direction, but is too limited an effort to be considered a viable long-term solution.)

Construction of a shore protection structure is a costly measure of last resort, usually undertaken reluctantly by the property owner when his house is threatened with severe damage—as in this case.

Noise Concerns

The contractor will comply with the noise regulations, as described in your letter.

Thank you for your comments.

Sincerely,
PLANPACIFIC, INC.

Robin Foster, AICP
Vice-President