DEPARTMENT OF LAND UTILIZATION
CITY AND COUNTY OF HONOLULU
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97/SV-001(ST)
97-03879

June 25, 1997

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

Recorded Owner:		Darius H. Amjadi, M.D., Inc. Money Purchase Pension Trust c/o American Trust Company of Hawaii, Inc.
Applicant	:	Dr. Darius H. Amjadi
Agent	:	Group 70 International, Inc.
Location	:	55-321B Kamehameha Highway, Laie, Oahu
Tax Map Key	:	5-5-02: 86
Request	:	Shoreline Setback Variance
Proposal	:	After-the-fact variance for a shoreline revetment and walkway
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 Steve Tagawa of our staff at 523-4817.

Very truly yours,

JAN NAOE SULLIVAN
Director of Land Utilization

JNS:am
Encls.

g:fea97sv1.sht

1997-07-08-OA-FEA
Amjadi After-the-Fact
Revetment

APPLICATION FOR SHORELINE SETBACK VARIANCE AND FINAL ENVIRONMENTAL ASSESSMENT

Existing Shoreline Revetment and Walkway
Amjadi Residence, TMK (1) 5-5-2:86 (Lot 116-B)
55-321B Kamehameha Highway, Laie, Oahu, Hawaii

Applicant:

Darius Amjadi
1380 Lusitania Street, Suite 511
Honolulu, HI 96813

Applicant's Agent:

Group 70 International, Inc.
Architecture • Planning • Interiors • Environmental Services
925 Bethel Street, Fifth Floor
Honolulu, HI 96813

May 1997

APPLICATION FOR SHORELINE SETBACK VARIANCE AND
FINAL ENVIRONMENTAL ASSESSMENT

Shoreline Revetment and Walkway at 55-321B Kamehameha Highway, Laie

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APPLICATION FOR SHORELINE SETBACK VARIANCE AND FINAL ENVIRONMENTAL ASSESSMENT

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Existing Shoreline Revetment and Walkway
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55-321B Kamehameha Highway, Laie, Oahu, Hawaii

Overview

After-the-fact approval is being sought for a low grouted wall and sloping boulder revetment structures that were constructed across the shoreline frontage of the subject property in 1988 and 1989. There is also a wooden walkway, stairs and landing constructed above and mauka of the revetment around 1989. These structures were built without City approvals, including a Shoreline Setback Variance (ROH 1992 Chapter 23) and a Building Permit (ROH 1990 Chapter 18). This application and environmental assessment provides a description of the action and addresses the potential impacts to the coastal environment.

(1) Applicant

Darius Amjadi
1380 Lusitania Street, Suite 511
Honolulu, HI 96813
(808) 599-4433

(1a) Applicant's Agent

Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, HI 96813-4307
Jeffrey Overton, Chief Environmental Planner
(808) 523-5866 ext. 111

(2) Approving Agency

City and County of Honolulu, Department of Land Utilization
650 South King Street, 7th Floor
Honolulu, HI 96813
Art Challacombe, Environmental Review Branch
(808) 523-4107

(3) Agencies Consulted

City and County of Honolulu, Department of Land Utilization
City and County of Honolulu, Building Department
State of Hawaii, Department of Land and Natural Resources

(4) General Description of the Action's Technical, Economic, Social and Environmental Characteristics

State/County Land Use. The State Land Use District designation of the property is Urban. The County Development Plan Land Use Map designation is Residential, and the zoning district is R-5 Residential.

Technical Characteristics. The proposed action involves after-the-fact approval of a low grouted wall and sloping boulder revetment structures and walkway at the shoreline frontage of 55-321B Kamehameha Highway in Laie. The general location of the subject property is shown in Figure 1, across from the Quarry Road intersection with Kamehameha Highway, at the south end of the Polynesian Cultural Center.

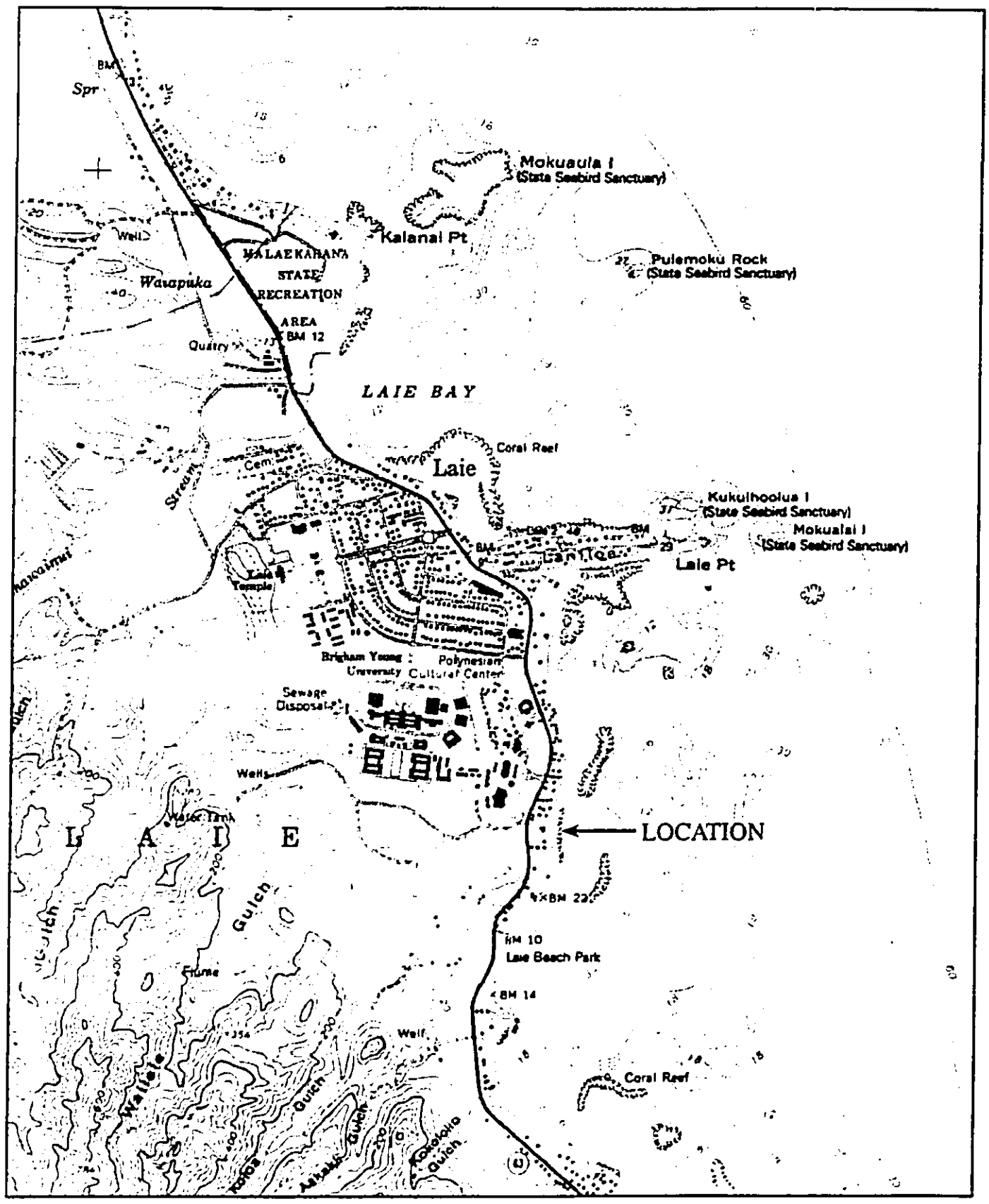
The subject revetment structure is located along the shoreline frontage of the Amjadi property which is 10,565 sq. ft. in area. The parcel is relatively level and improved with two buildings consisting of a single-family residence and garage.

Based on historical aerial photographs of the Laie coastline taken over the past 56 years (1949-1995), there has been a significant loss of shoreline at this location due to erosion activity since the lots were first subdivided. The subject property has lost between 40 to 50 feet of land along the makai edge, totaling approximately 3,000 sq. ft.

Since the 1950's, shoreline structures have been constructed along the ocean frontage of the adjoining properties to the north and south to help stabilize the retreating shoreline. Most of the lots to the north and south have either sloping rock revetments or vertical seawalls protecting their shoreline frontage. Lots that do not have structural protection are experiencing shoreline erosion.

Exhibit A includes the Shoreline Survey Map certified by the DLNR on December 30, 1996. Figures 2 and 3 provide site specific details of the shoreline structure and wooden walkway, showing location and elevation relative to the makai side and neighboring residential lots. Directly makai of the structure is a short section (30 to 40 feet) of low-lying, grouted rock that wall built in September or October 1988. Limestone boulders were placed mauka of and on top of the low rock wall in February 1989. The boulder revetment spans the entire 60 feet of the shoreline frontage of the Amjadi property and the adjoining lot to the south (TMK 5-5-02:77). The shoreline of the adjoining lot to the north, and the shoreline of the four lots beyond the neighbor to the north, are all protected by a sloped revetment structures.

An older low CRM wall (approx. 24 to 36 in. high) exists about 30 to 40 feet makai of the subject revetment, built sometime between 1949 and 1958. The top of the old wall is about 1.6 to 2.5 feet above mean sea level.



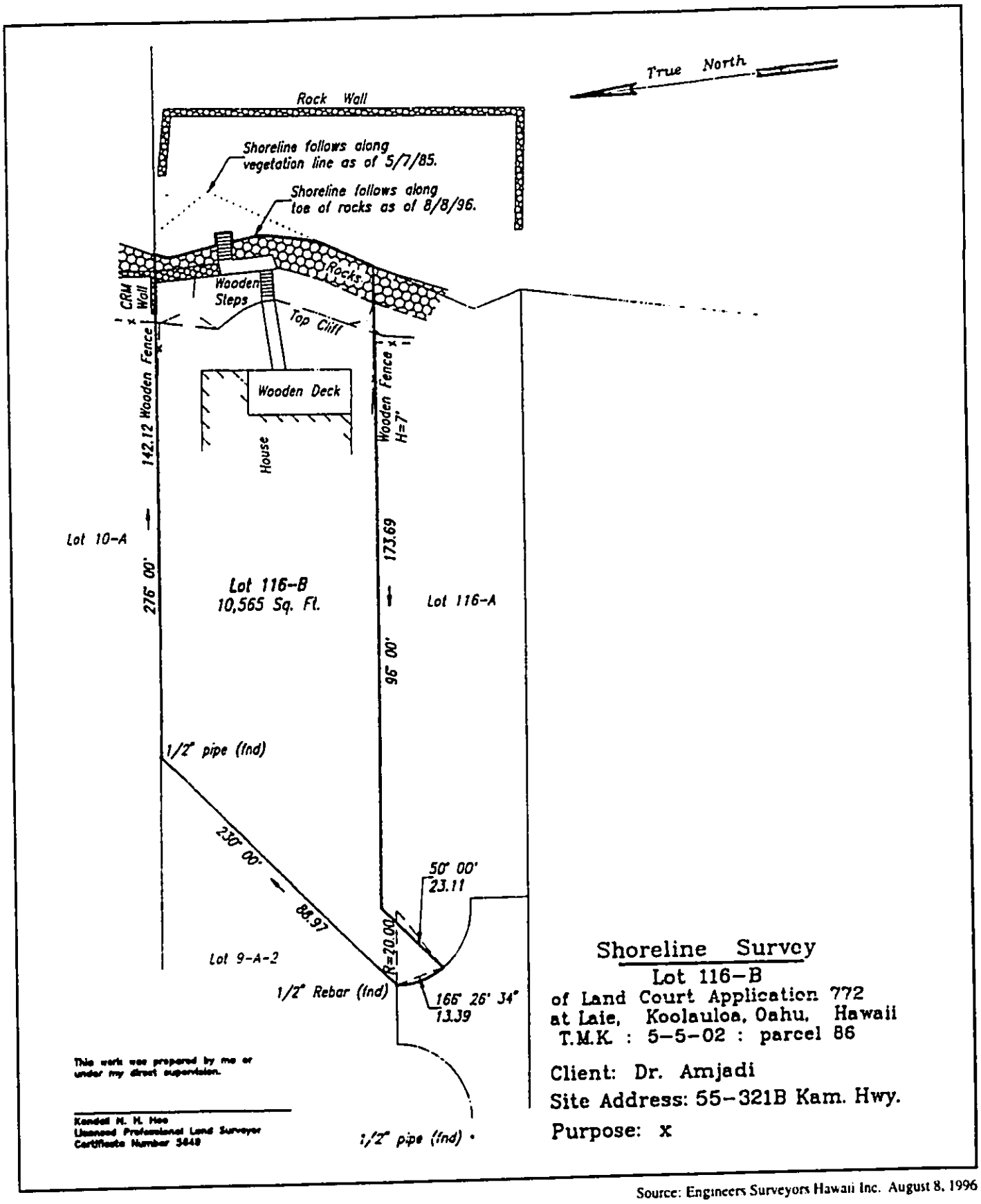
Source: USGS 1983

Location Map

0' 1000' 2000' 4000'

Amjadi Shoreline Setback Variance

Figure 1



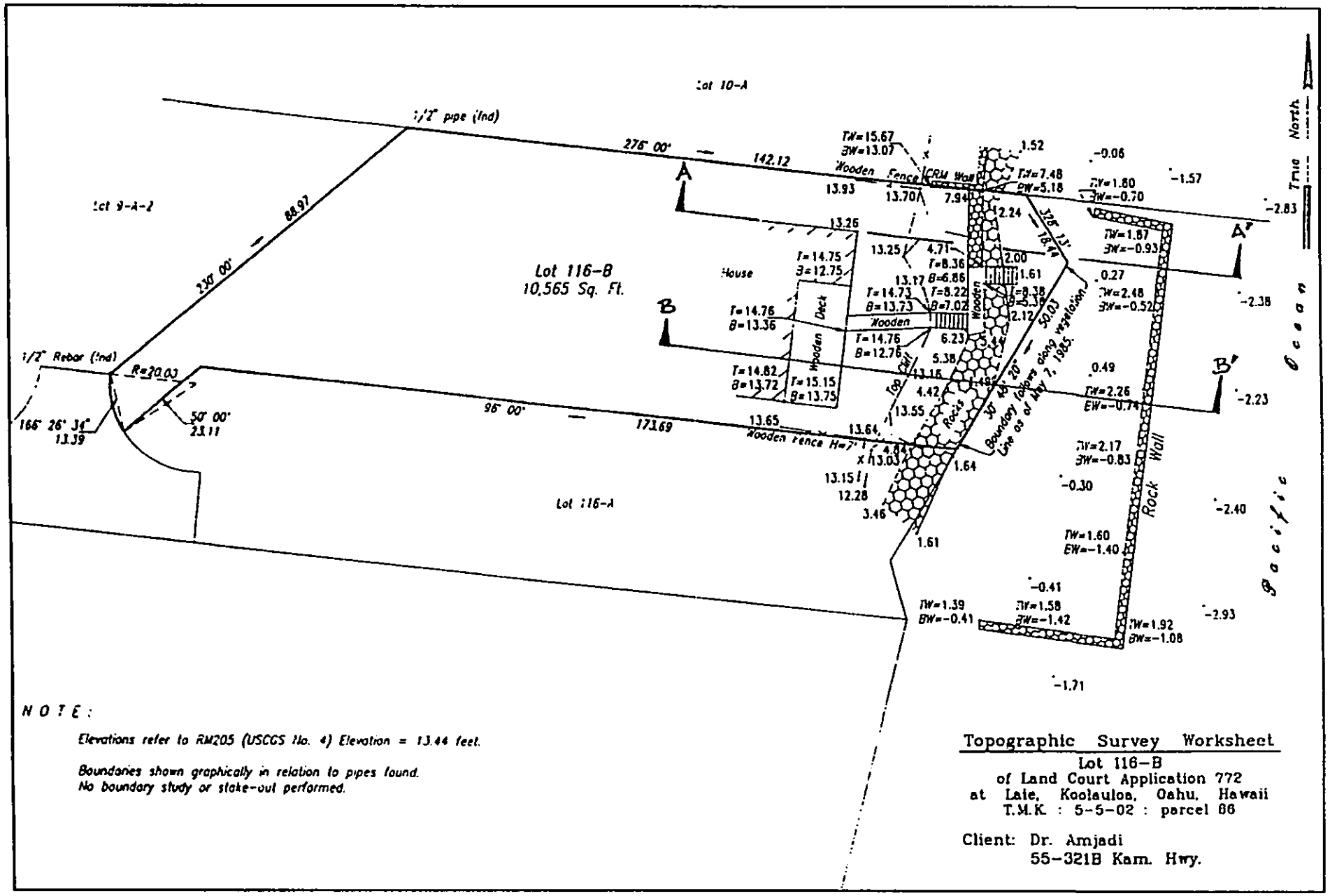
Source: Engineers Surveyors Hawaii Inc. August 8, 1996

Approx. Scale: 1" = 36'

Shoreline Survey

Figure 2

Amjadi Shoreline Setback Variance

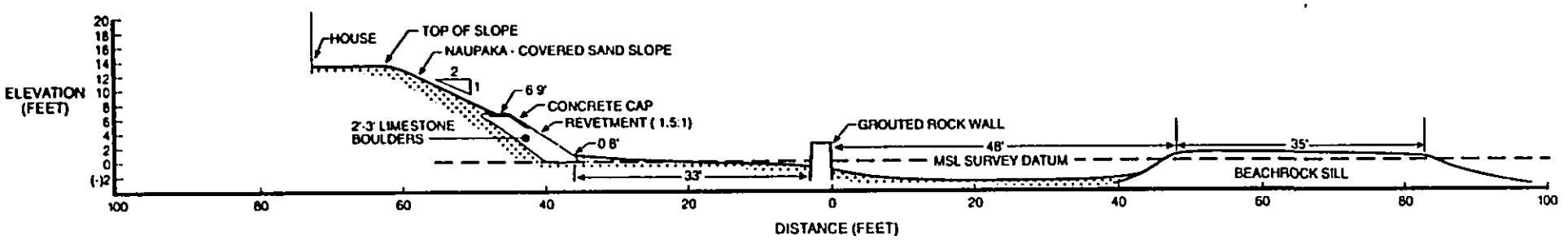


Topographic Survey

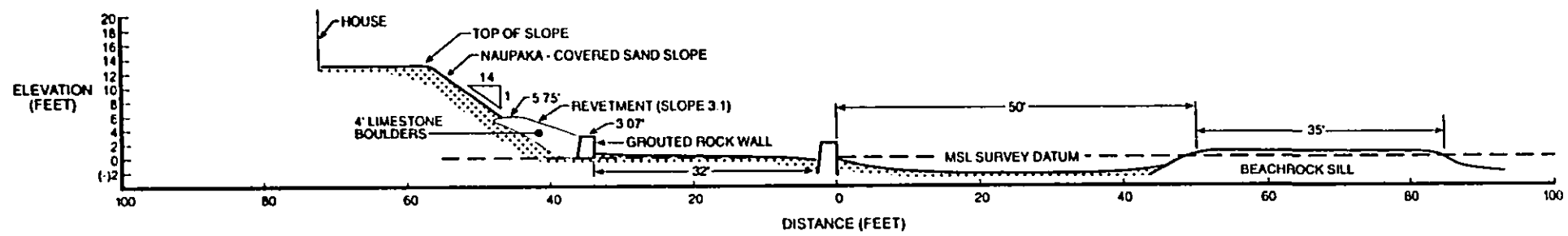
Approx. Scale: 1" = 30'

Amjadi Shoreline Setback Variance

Figure 3



SECTION A-A'



SECTION B-B'

Cross Sections

Source: TNWRE (Dec. 1996)

Amjadi Shoreline Setback Variance

Figure 4

Figure 4 shows cross sections of the composite structure. Its height ranges from 7 to 8 feet on the north side, to 6.2 feet at the wooden stairs, to 4.8 feet above grade on the south side. The revetment and walkway are shown in plan view and cross-sections in Exhibit B.

The structure is completely stable. A recent storm (November 1996) brought 20 foot surf to the upper windward coast from a north and northeast direction. Erosion was experienced along the coastline, and several properties and roadside areas received damage to the shoreline structures. The subject property did lose several inches of sand at the toe of the revetment during this event. However, no boulders were dislodged and the grout cap was not damaged. Only the bottom step of the wooden stairs was dislodged by the waves. The offshore reef shelf and the inner beachrock sill provide excellent natural protection from wave attack.

Exhibit C includes a report completed by Tom Nance Water Resources Engineering (TNWRE)(December 1996). This report provides an oceanographic evaluation of the shoreline revetment and color photographs. An evaluation of the seawall's materials and structural stability is also included with the TNWRE report.

Socio-Economic Characteristics. The total construction cost value for the sloping revetment is estimated at $35,000. The revetment construction causes no economic impacts on the immediate community or the community at large.

Without the shoreline revetment, further erosion of the shoreline frontage during high surf events could ultimately resulting in damage to the existing residential structure. The property owner could potentially lose the value of a portion of their land and improvements if the revetment was not constructed. The proposed action was undertaken to protect these assets.

Some people use this shore for fishing and ocean gathering, however, its use is limited due to the lack of good lateral access makai of the revetments along this section of the coast. There is a public beach access located approximately 400 feet to the north. The shallow sand-bottom waters inside of the nearshore sill is used by people for wading and shallow swimming. The sill is exposed at low tides, and provides opportunities for ocean gathering.

Environmental Characteristics. The shoreline revetment was constructed in 1989 and 1990. The oceanographic study completed by TNWRE (Exhibit C) evaluates the potential for erosion caused by the shoreline structure. The study shows that erosion of the adjacent beach areas is not being accelerated by the presence of this structure. Without the revetment, erosion along the seaward frontage of the subject properties would likely occur, possibly threatening the residential structure.

Construction activities associated with the new seawall caused no adverse effects to ocean water quality. Boulder placement and construction activities were limited to areas above high water. No long-term effects to water quality resulted.

The Flood Insurance Rate Map designates this property as Zone AE (elevation 9). The residence and shoreline cliff is at elevation of 13.75 ft.

(5) Summary Description of the Affected Environment.

Soils on this parcel are sandy and well-drained. Excavation for the wall found all subsurface material to be clean, coarse-grained calcareous beach sand. Vegetation on this site primarily consists of introduced landscaping including Bermuda grass, several coconut palms and naupaka. There are no known significant habitat areas for either terrestrial or aquatic flora or fauna directly found at the project site.

Beach and offshore conditions are summarized in this section, based on the detailed assessment provided in TNWRE (March 1995)(Exhibit C).

Adjacent to the seawall is the coastal nearshore environment off Laie. There is a partially emerged sill which runs parallel to the shoreline about 60 to 80 feet offshore. It is comprised primarily of lithified sand and coralline algae. Its top is 15 to 20 feet wide, and is exposed during most low tides. There is a drop of 3 to 4 feet on the land and seaward sides of the sill. Based on the sill's orientation and composition, it is the former location of the shoreline. The nearshore sill and the protruding rock revetments to the north and south enclose a shallow area of the nearshore waters which is almost entirely covered by sand.

The nearshore area has very good water quality. The bottom offshore is a shallow (less than 6 feet) and gently sloping reef platform, with bottom cover comprised of dead coral, coralline algae and cemented sand. Ocean waves from trade wind swell and longer period waves from distant sources typically break in two to four feet of water along this sloping reef platform. Only a few live corals were observed in several transects of the reef platform to 500 feet offshore. Sand deposits are few and generally only a few inches deep with insignificant volume. This is typical of the nearshore area. Extending offshore about 1,500 to 3,000 feet the reef drops to 6 feet and 18 feet, respectively. General offshore bathymetry is shown in Figure 1 and Exhibit C.

The offshore reef and the inner beachrock sill provide excellent natural protection from wave attack. As a consequence, the largest wave which can break on or just in front of the shoreline revetment is constrained by the available water depth. Using the most critical combination of the highest tide level and a generous allowance of wave set-up, the highest wave that could strike the revetment is about 2.7 feet. All waves larger than this break further offshore, dissipating most of their energy before reaching the revetment.

There have been significant shoreline changes along this section of the Laie shoreline. The fast lands are comprised of well sorter, medium to coarse-grained calcareous beach sand which is easily eroded. Despite the natural protection from waves provided by the offshore reef platform and nearshore sill, substantial shoreline retreat has occurred over the past 50 years.

Review of historical aerial photographs from 1949 to 1995 verify the shoreline changes during this period. Exhibit C presents a series of these photographs are presented with overlays showing the past and present shoreline positions.

The 1949 aerial photograph shows a smooth, arcuate-shaped shoreline without any structural protection for this 1,100 foot section of coast. Nine years later in 1958, the pattern of erosion which continues into the 1990's is demonstrated. Rock revetments at the north and south ends of the photo are in place, and these portions of the shoreline have remained stable to the present. The 900 feet of shoreline between these two protruding revetments has retreated inland. The wall offshore of the subject property and neighbor was in place at the time of the 1958 photo, as were the loose boulders to the south of this structure. Despite these actions, shoreline retreat continued along this stretch.

Additional shoreline revetment construction occurred in the 1972 to 1982 period, with more occurring between 1982 and 1995. The few lots frontages which remain unprotected have been subjected to further erosion, including recent storms such as November 1996.

(6) Identification and Summary of Major Impacts and Alternatives Considered

Potential Short-term Impacts. The construction of the shoreline revetment along the frontage of this lot had some minor short-term effects on vegetation, water quality and noise conditions. Some landscaping vegetation (grass and bushes) was removed by the construction activity. Naupaka bush was replanted following construction. During construction, there is always the potential for soils to erode from the upland area and cause silt runoff to ocean waters. Soils were protected to avoid runoff to the ocean, and there has been no apparent soil erosion due to the construction. Lastly, construction noise may have been noticeable to residents at neighboring properties. Construction activity took place during allowed daytime periods for construction and did not cause excessive noise levels off-site.

Potential Long-term Impacts.

Shoreline Processes. The effect of the shoreline revetment on shoreline processes at this location is considered, given that there are existing walls and revetments on adjacent properties to the north and south. The subject revetment structure has been in place for about seven years. The impact on shoreline processes of the revetment has been negligible due to the presence of a series of shoreline structures on adjoining lots.

For more than a 1,500 foot stretch of the Laie shoreline in this area, only a 10-foot wide section to the north and three contiguous lots to the south remain unprotected. All other lots in this stretch are protected by boulder revetments or vertical seawalls. Shoreline retreat of the remaining unprotected lot frontages is definitely occurring. Over a record period of 38 years, the Oahu Shoreline Study (Sea Engineering, 1989) found a shoreline retreat of 52 feet in this sector of the Laie coastline where there are no protective structures (Laniloa 2, Transects 4/5). With the pattern of shoreline protection which has been established, an individual lot owner has little choice but to protect his property with a structure similar to the one existing along the frontage of the subject property.

Aesthetics. The sloping limestone boulder revetment at the subject property is similar in aesthetic condition to the surrounding lots with shoreline structures. The subject property's frontage is actually more attractive than some of the other frontages. This due to the open spaces which remain between the limestone boulders which allow the naupaka plants to grow down the slope and intersperse with the hard structure. This tends to soften the appearance of the shoreline structure and allow it to blend with the landscape in the area mauka of the wall and makai of the residential structure.

(7) Proposed Mitigative Measures

Several mitigative measures have been taken and are proposed to reduce or eliminate the potential impacts of the sloping revetment construction at the subject lot.

Best Management Practices. Water quality was protected during construction of the revetment structure. Measures were taken during the construction activities to avoid erosion and silt runoff to surface water in the ocean. Soils on the mauka side of the structure were stabilized to prevent silt runoff to the beach and ocean water.

Aesthetic Effects. The owner has agreed to retain and encourage the naupaka bushes along the mauka side of the revetment and maintain them so they grow over the top of the wall. This will essentially maintain a more appealing visual condition at this site, nullifying any potential aesthetic change resulting from the construction of the revetment.

(8) Alternatives to the Proposed Action & Evaluation of Hardship

There are several issues which must be considered in the evaluation of hardship for the application for Shoreline Setback Variance at the subject property. Four alternative approaches are considered possible at this time, including:

(a) No-action alternative - require removal of the revetment,
(b) Construct a vertical seawall in place of the revetment,
(c) Modify the revetment through reconstruction, and

(d) Attempt a non-structural approach to protect this property.

These options are discussed individually in terms of their potential impacts, including hardship to the applicant.

(a) No action - Remove revetment structure

The no-action scenario would involve removal of the revetment and leave the shoreline frontage of the lot unprotected. This action would expose the property to storm wave erosion, causing the makai 20 to 30 feet of the property to erode, as witnessed two lots to the south. The residence on the subject property would potentially be exposed to storm wave run-up and damage.

Shoreline structures fronting parcels on either side of the subject lot could also potentially be back-cut by the erosional activity. The no-action alternative would potentially cause damage and property loss to the subject lot, and is not considered feasible. The historical trend of this stretch of shoreline is steady erosion on the order of one to two feet per year.

(b) Construct a vertical seawall in place of the revetment

A vertical seawall at this location would match the seawall on the adjoining property to the north. However, a seawall is not the best type of structure for the shoreline situation at the subject property. There is space to accommodate a sloping boulder revetment as it exists. The revetment causes less energy reflection to the nearshore shallow water area, causing less erosion forces. Construction of the vertical seawall would cause short-term environmental effects and incur expense for the landowner that is unwarranted.

(c) Modify the revetment structure through reconstruction

The boulder revetment at this location could be reconstructed to provide additional structural strength and provide a greater slope for wave energy dissipation. This would require removal of the existing revetment structure that is structurally stable and reconstruction with corresponding short-term environmental effects.

A reconstructed revetment would potentially take up some of the owner's usable lot area in the place of the new revetment rock slope. The construction of the new revetment would only add economic hardship to the owner. The owner would have to demolish and reconstruct a functioning shore protection structure. There is no environmental benefit, such as reduced shoreline erosion, that could be anticipated from such a reconstructed revetment in this situation.

(d) Attempt "soft structure" and non-structural solutions along this property

There are a number of non-structural approaches to curbing shoreline erosion that have been suggested for the shoreline of Oahu. These options include the use of sand-filled sea bags, offshore sand mining for beach replenishment, and moving structural improvements further mauka to avoid ocean wave damage.

Sea bags have shown to provide some effectiveness in curbing shoreline property loss to erosion at some locations. In this situation, the sea bags would interfere with lateral access in front of the subject property. The sea bags would temporarily take the place of the revetment, and would be a short-term solution to an obviously long-term erosion problem at this location. The owner would need to continually maintain the bags and periodically replace them at continuing cost. There would be no real environmental benefit from this option.

Offshore sand mining and beach replenishment has been proposed for a number of locations in Hawaii. The intent of beach replenishment is to offset erosion activity along a coastline by providing sand material from offshore sand reserves or other nearby sources. Sand replenishment can be used in an attempt to re-create the beach and dune structure. This alternative could be potentially feasible in areas where offshore sand reserves exist (not present at this location) and a government agency or large private entity can fund this activity. This type of area-wide massive beach replenishment project would not be a practical solution for a small single property owner. Formation of an improvement district would be a possible long-term approach to solving erosion problems along this coastal section. This solution would take extensive time to plan the program and assemble the government approvals and resources to complete the project. In the current situation at the subject property, this would not be a practical way to satisfy an urgent need to protect against imminent property loss and damage.

Another alternative to the shoreline structure would be to move the structural improvement (residence) further mauka placing it outside of the erosion and ocean wave hazard. At this location, moving the residence mauka to avoid erosion activities would not be practical, since there is no space on the lot to shift the building.

(9) Consistency with Coastal Management Objectives and Policies.

The objectives of the Hawaii Coastal Zone Management Program, Section 205A-2, HRS, are to protect valuable and vulnerable coastal resources such as coastal ecosystems, special scenic and cultural values and recreational opportunities. The objectives of the program are also to reduce coastal hazards and to improve the review process for activities proposed within the coastal zone. Described below are the ten objectives and policies of the Hawaii Coastal Zone Management Program and an assessment of the project impacts relative to the CZM objectives and policies.

(1) *Recreational Objective.* *"Provide coastal recreational opportunities accessible to the public."*

(A) Improve coordination and funding of coastal recreation planning and management.
(B) Provide adequate, accessible, and diverse recreational opportunities in the coastal zone management area by:
- *(i) Protecting coastal resources uniquely suited for recreational activities that cannot be provided in other areas;*
- *(ii) Requiring replacement of coastal resources having significant recreational value, including but not limited to surfing sites and sandy beaches, when such resources will be unavoidably damaged by development; or requiring reasonable monetary compensation to the State for recreation when replacement is not feasible or desirable;*
- *(iii) Providing and managing adequate public access, consistent with conservation of natural resources, to and along shorelines with recreational value;*
- *(iv) Providing an adequate supply of shoreline parks and other recreational facilities suitable for public recreation;*
- *(v) Encouraging expanded public recreational use of county, State, and federally owned or controlled shoreline lands and waters having recreational value;*
- *(vi) Adopting water quality standards and regulating point and nonpoint sources of pollution to protect and where feasible, restore the recreational value of coastal waters;*
- *(vii) Developing new shoreline recreational opportunities, where appropriate, such as artificial lagoons, artificial beaches, artificial reefs for surfing and fishing;*
- *(viii) Encouraging reasonable dedication of shoreline areas with recreational value for public use as part of discretionary approvals or permits by the land use commission, board of land and natural resources, county planning commissions; and crediting such dedication against the requirements of section 46-6.*

Discussion: Public access to the beach fronting the property is not affected by the shoreline structure. Children in the area make regular use of the shallow lagoon waters and narrow beach fronting the property. Recreational uses will not be diminished by the proposed action.

(2) *Historic Resources Objective.* *"Protect, preserve and, where desirable, restore those natural and man made historic and pre-historic resources in the coastal zone management area that are significant in Hawaiian and American history and culture."*

(A) Identify and analyze significant archaeological resources.
(B) Maximize information retention through preservation of remains and artifacts or salvage operations.
(C) Support State goals for protection, restoration, interpretation and display of historic resources.

Discussion: Archaeological resources are not affected by the shoreline structure at this property. The action to stem erosion of the shoreline at this location could actually avoid exposure of any unknown buried cultural deposits and remains.

3) *Scenic and Open Space Resources Objective.* *"Protect, preserve and, where desirable, restore or improve the quality of coastal scenic and open space resources."*

(A) Identify valued scenic resources in the coastal zone management area.
(B) Insure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural landforms and existing public views to and along the shoreline.
(C) Preserve, maintain, and, where desirable, improve and restore shoreline open space and scenic resources.
(D) Encourage those developments which are not coastal dependent to locate in inland areas.

Discussion: The shoreline structure at the subject property is built of limestone boulders which have a natural appearance. The boulder pile has openings and crags which allow for the naupaka plant to grow down and across the face of the upper portion of the structure. These features serve to soften the structure and create a natural looking shoreline transition that is more visually appealing than a standard shoreline structure..

(4) *Coastal Ecosystems Objective.* *"Protect valuable coastal ecosystems from disruption and minimize adverse impacts on all coastal ecosystems."*

(A) Improve the technical basis for natural resource management.
(B) Preserve valuable coastal ecosystems of significant biological or economic importance.
(C) Minimize disruption or degradation of coastal water ecosystems by effective regulation of stream diversions, channelization, and similar land and water uses, recognizing competing water needs.
(D) Promote water quantity and quality planning and management practices which reflect the tolerance of fresh water and marine ecosystems and prohibit land and water uses which violate state water quality standards.

Discussion: The project will have no adverse effect on coastal ecosystems. Runoff will be controlled at the project site. Mitigative measures to reduce runoff for the short-term construction and long-term use of the site are planned. Best management practices will be applied in site construction activities.

(5) *Economic Uses Objective.* *"Provide public or private facilities and improvements important to the State's economy in suitable locations."*

(A) Concentrate in appropriate areas the location of coastal dependent development necessary to the state's economy.

(B) Insure that coastal dependent development such as harbors and ports, visitor industry facilities, and energy generating facilities are located, designed, and constructed to minimize adverse social, visual, and environmental impacts in the coastal zone management area.
(C) Direct the location and expansion of coastal dependent developments to areas presently designated and used for such developments and permit reasonable long-term growth at such areas, and permit coastal dependent development outside of presently designated areas when:
(i) Utilization of presently designated locations is not feasible;
(ii) Adverse environmental effects are minimized;
(iii) Important to the State's economy.

Discussion: The subject property has no economic activity at present. The proposed action will generate short-term economic benefits from construction activity.

(6) *Coastal Hazards Objective.* *"Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion and subsidence."*

(A) Develop and communicate adequate information on storm wave, tsunami, flood, erosion, and subsidence hazard.
(B) Control development in areas subject to storm wave, tsunami, flood, erosion, and subsidence hazard.
(C) Ensure that developments comply with requirements of the Federal Flood Insurance Program.
(D) Prevent coastal flooding from inland projects.

Discussion: The subject property is located in the flood hazard area and complies with the Federal Flood Insurance Program. The shoreline structure at this property serves to stem erosion along this shoreline, which protects the residence on this property, adjoining properties and inland areas.

(7) *Managing Development Objective.* *"Improve the development review process, communication, and public participation in the management of coastal resources and hazards."*

(A) Effectively utilize and implement existing law to the maximum extent possible in managing present and future coastal zone development.
(B) Facilitate timely processing of application for development permits and resolve overlapping or conflicting permit requirements.
(C) Communicate the potential short and long-term impacts of proposed significant coastal developments early in their life cycle and in terms understandable to the general public to facilitate public participation in the planning and review process.

Discussion: The landowner has commissioned the preparation of this application and environmental assessment in part to provide the public with details about their shoreline structure and shoreline setback variance request. The applicant has been in contact with the City Department of Land Utilization and State Department of Land and Natural Resources. Agencies, organizations and individuals will be notified of this

proposed action in the Environmental Notice published by the Office of Environmental Quality Control. A public hearing will be held by the Department of Land Utilization.

(8) *Public Participation Objective. "Stimulate public awareness, education, and participation in coastal management."*
- *(A) Maintain a public advisory body to identify coastal management problems and to provide policy advice and assistance to the coastal zone management program;*
- *(B) Disseminate information on coastal management issues by means of educational materials, published reports, staff contact, and public workshops for persons and organizations concerned with coastal-related issues, developments, and government activities; and*
- *(C) Organize workshops, policy dialogues, and site-specific mediations to respond to coastal issues and conflicts.*

Discussion: Refer to discussion for Objective 7.

(9) *Beach Protection Objective. "Protect beaches for public use and recreation."*
- *(A) Locate new structures inland from the shoreline setback to conserve open space and to minimize loss of improvements due to erosion;*
- *(B) Prohibit 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; and*
- *(C) Minimize the construction of public erosion-protection structures seaward of the shoreline.*

Discussion: The shoreline structure at this property is located inland of the certified shoreline. There is no loss of public recreation space and open space as a result of this structure. Erosion of property and improvements is minimized by this shoreline structure. The design of the rock revetment structure and landscaping is an aesthetically pleasing solution to offset the erosion activity at this property, as compared to more massive structures fronting some adjoining lots to the north.

(10) *Marine Resources Objective. "Implement the State's ocean resources management plan."*
- *(A) Exercise an overall conservation ethic, and practice stewardship in the protection, use, and development of marine and coastal resources;*
- *(B) Assure that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial;*
- *(C) Coordinate the management of marine and coastal resources and activities management to improve effectiveness and efficiency;*
- *(D) Assert and articulate the interests of the State as a partner with federal agencies in the sound management of ocean resources within the United States exclusive economic zone;*
- *(E) Promote research, study, and understanding of ocean processes, marine life, and other ocean resources in order to acquire and inventory information necessary to understand how ocean development activities relate to and impact upon ocean and coastal resources; and*

(F) Encourage research and development of new, innovative technologies for exploring, using, or protecting marine and coastal resources. [L 1977, c 188, pt of §3; am L 1993, c 258, §1; am L 1994, c 3, §1; am L 1995, c 104 §5]

Discussion: A conservation ethic is applied in the protection of this property with an aesthetically pleasing limestone boulder revetment. Naupaka plant growth along the top section of this wall serves to soften the appearance of this structure and creates a more natural transition at the shoreline.

Conclusion

The subject shoreline revetment structure at 55-321B Kamehameha Highway, Laie, was constructed around 1989. The findings of this Environmental Assessment indicate that no significant environmental impacts have been associated with this action. The proposed action is found to be a reasonable activity when considering other possible alternative actions at this location. In terms of oceanographic processes, the revetment structure does not cause adverse effects to the beach at the adjoining and nearby properties. The preparers of this assessment recommend that a Finding of No Significant Impact (FONSI) be issued for this action.

Given the performance of this revetment over the last nine years, and particularly during the strong surf witnessed in November 1996, there is pragmatic evidence to support the finding that the revetment will withstand the expected storm wave events. Without the revetment, the residence would be susceptible to storm wave run-up in the first year. The crest of the shoreline cliff is about 10 to 12 feet away from the residence at the closest point. Given the retreat rate over the past 46 years, the residence might be undermined within three to five years.

There is a well-documented recent history of shoreline retreat along this portion of the Laie coast. The landowner would necessarily experience hardship if the revetment was not constructed, with a likely loss of property and damage to residential structure. For these reasons, and based on the documentation provided, this landowner requests after-the-fact approval of a variance from the shoreline setback ordinance.

APPLICATION FOR SHORELINE SETBACK VARIANCE AND
FINAL ENVIRONMENTAL ASSESSMENT

Shoreline Revetment and Walkway at 55-321B Kamehameha Highway, Laie

COMMENT LETTERS RECEIVED ON THE

DRAFT ENVIRONMENTAL ASSESSMENT

&

RESPONSES TO COMMENTS

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-001(ST)

April 2, 1997

Mr. Jeffrey Overton
Group 70 International, Inc.
925 Bethel Street, Fifth Floor
Honolulu, Hawaii 96813

Dear Mr. Overton:

Project Name: Amjadi After-The-Fact Revetment
File No. : 97/SV-1
Tax Map Key : 5-5-02: 86

We are forwarding copies of all comments we have received relating to the Draft Environmental Assessment (DEA) of the above-referenced project.

In accordance with the provisions of Chapter 343, Hawaii Revised Statutes (HRS), you must respond in writing to these and any other comments which were received during the 30-day comment period which began with publication of a notice of availability of the DEA in The Environmental Notice on February 23, 1997. The final Environmental Assessment must include these comments and response, as well as revised text, if appropriate.

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

Very truly yours,

for JAN NAOE SULLIVAN
Director of Land Utilization

JNS:am
Encls.

g:agt97sv1.sht

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-001(ST)

March 25, 1997

Mr. Jeffrey Overton
Group 70 International, Inc.
925 Bethel Street, Fifth Floor
Honolulu, Hawaii 96813

Dear Mr. Overton:

Draft Environmental Assessment (DEA) for an
After-the-Fact Shoreline Setback Variance (SV) at
55-321B Kamehameha Highway, Laie, Oahu
Tax Map Key: 5-5-02: 86

We have reviewed the DEA for the subject after-the-fact application received on January 30, 1997, and have the following comments:

Section 4 - General Description

1. The DEA (page 2) fails to clearly disclose when the subject revetment and walkway were constructed. Although paragraph 4 implies that the revetments on adjoining properties are much older, the photographs in Appendix A suggest that these structures are *contiguous*, or at least of similar construction. The Final Environmental Assessment (FEA) should clearly disclose when the subject revetment and walkway were constructed.

2. Similarly, the DEA describes the existence of a low grouted wall immediately makai of the subject revetment but does not clarify whether this structure is part of the after-the-fact application. The FEA should clarify what the applicant intends to do about this structure.

3. The DEA does not discuss the anticipated structural life expectancy of the subject revetment. Insofar as the DEA indicates that without this revetment damage to the existing residence would ultimately occur (page 3, paragraph 5), the revetment's durability, as well as the projected time-frame for the undermining of the residence without the revetment, are relevant details in proving the applicant's hardship.

4. The exaggerated vertical scale (5:1) of Exhibit 4 unnecessarily distorts the beach profile. We suggest that the FEA include an exhibit which more accurately conveys the shoreline profile of this property.

Section 5 - Affected Environment

5. The DEA does not contain the General Plan, Development Plan or Zoning designation information for the subject property. It also does not include the property's Federal Flood Insurance Rate Map (FIRM) zone designation. This information should be included in the FEA.

6. The DEA does not discuss whether the subject area is utilized for recreational fishing or other ocean gathering activities. The FEA should be revised to address these activities and discuss where public beach access to this shoreline area is possible.

Section 8 - Alternatives

7. Option C (page 7) states that relative to the reconstruction of the existing revetment to a reduced slope revetment, "There would be no environmental benefit, such as reduced shoreline erosion, that could be anticipated from such a reconstructed revetment in this situation".

   The FEA should discuss how this assessment was made. It should clarify whether this statement is based on actual evidence (i.e., calculations, modeling, etc.) or some other process or evidence. Given the continual recession of the shoreline documented for this area (i.e., the now submerged low CRM wall built circa 1940-50), the FEA should discuss the probable success of any structure in this area over the long-term.

Section 9 - Consistency with CZM Objectives and Policies

8. Relative to the Beach Protection Objective (9), the DEA indicates that the revetment is located mauka (inland) of the certified shoreline. However, contrary to section 4, page 2, a certified shoreline survey has not been filed to date. Therefore, it is not clear that this structure is located outside of public recreation and open spaces.

We have no further comments to offer at this time. If you have any questions, please contact Steve Tagawa of our staff at 523-4817.

Very truly yours,

LORETTA K.C. CHEE
Acting Director of Land Utilization

LKCC:am

cc: Dr. Darius Amjadi
Carolyn Aiu
Kimberly K. Conant, Real Estate Officer
Office of Environmental Quality Control

g:amjaddea.sht

May 9, 1997

Jan Naoe Sullivan, Director
Department of Land Utilization
City and County of Honolulu
650 S. King Street, 7th Floor
Honolulu, Hawaii 96840-0001

Attn: Mr. Art Challacombe, Chief
Environmental Review Branch

Subject: Amjadi Property, 55-321B Kamehameha Highway, Laie, Oahu
TMK 5-5-02:86 (Lot 116-B) Responses to Comments on Draft EA

Dear Ms. Sullivan:

Thank you for providing comments on the Draft Environmental Assessment in your letter of March 25, 1997. We have prepared a response to your comments.

Construction Dates for Revetment and Walkway. According to the owner, the 2.5 to 3.0 ft. high grouted rock wall, which is now cracked into several lengths and sits at the foot of the revetment, was built in September or October of 1988. In February 1989, limestone boulders were placed behind and on top of the rock wall, and also in front of the adjacent lot (Lot 116-A, TMK 5-5-02:77). The walkway and deck were also constructed in early 1989.

Low Grouted Wall. The low grouted wall is entirely beneath the limestone boulders. As an integral part of the structure, it will not be removed. On the south side, the wall is broken into three pieces of significant size. The owner would prefer to not remove the remnants of this wall, since it provides additional protection at the toe of the revetment.

Structural Life Expectancy. The subject revetment is anticipated to have a life of at least another 20 years. Given the performance of this revetment over the last nine years, and particularly during the strong surf witnessed in November 1996, there is pragmatic evidence to support the finding that the revetment will withstand the expected storm wave events. Without the revetment, the residence would be susceptible to storm wave run-up in the first year. The crest of the shoreline cliff is about 10 to 12 feet away from the residence at the closest point. Given the retreat rate over the past 46 years along the unprotected shoreline two lots to the south, the residence might be undermined within the next three to five years, and might likely be undermined in the next five to ten years.

Shoreline Profile. We have prepared a revised exhibit showing less vertical distortion of the beach profile, which is attached to this letter.

GROUP 70
INTERNATIONAL

Group 70 International, Inc. • Architecture • Planning • Interior Design • Environmental Services
925 Bethel Street, Fifth Floor • Honolulu, Hawaii 96813-4307 • Phone (808) 523-5866 • FAX (808) 523-5874

State/County Land Use and Flood Hazard Designations. The State Land Use District designation of the property is Urban. The County Development Plan Land Use Map designation is Residential, and the zoning district is R-5 Residential. The Flood Insurance Rate Map designates this property as Zone AE (elevation 9). The residence and shoreline cliff is at elevation of 13.75 ft.

Fishing and Ocean Gathering. Some people use this shore for fishing and ocean gathering, however, its use is limited due to the lack of good lateral access makai of the revetments along this section of the coast. There is a public beach access located approximately 400 feet to the north. The shallow sand-bottom waters inside of the nearshore sill is used by people for wading and shallow swimming. The sill is exposed at low tides, and provides opportunities for ocean gathering.

Reduced Slope Revetment Alternative and Longevity. A qualitative discussion was presented in the Draft EA regarding the implications of a reduced slope shoreline revetment at this location. All other things being equal, a flatter revetment slope would tend to reflect less wave energy. However, since all of the other revetments to the north and south of the subject property are as steep or steeper, reconstructing this one on a flatter slope would not provide a significant reduction in potential shoreline erosion energy.

Consistency with CZM Objectives and Policies. We were unable to provide a copy of the certified shoreline to your office at the time we filed the Draft EA. The State Department of Land and Natural Resources certified the shoreline survey on December 30, 1996, but held the signed maps until January 30, 1997 awaiting expiration of the appeal period. We are now providing a copy of the certified shoreline survey with this letter, which shows that the structure (including the low grouted wall) is inland of the public open space and recreation area.

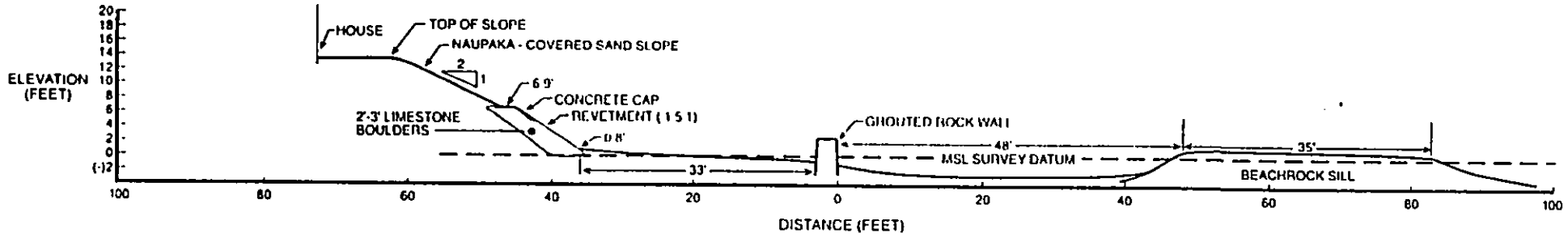
Thank you for providing your comments on the Draft EA. Please contact me if you have any questions or require additional information.

Sincerely,

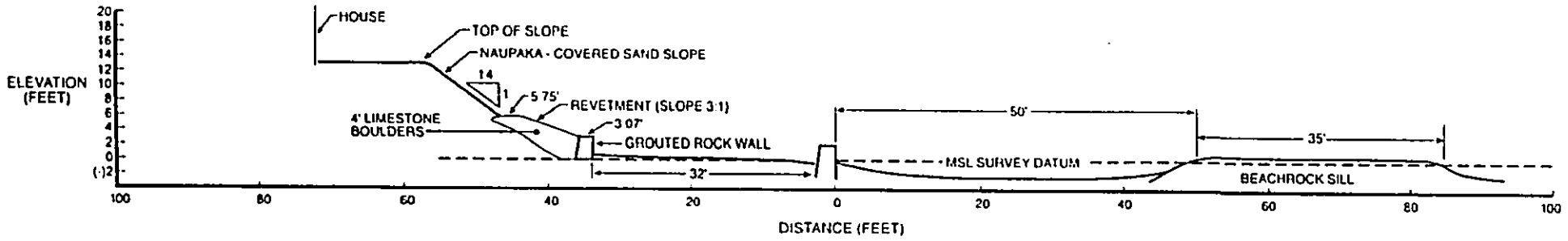
GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Chief Environmental Planner

cc: Dr. Darius Amjadi



SECTION A-A'



SECTION B-B'

Cross Sections

Source: TNWRE (Dec. 1996)

Amjadi Shoreline Setback Variance

University of Hawai'i at Mānoa

Environmental Center
A Unit of Water Resources Research Center
2550 Campus Road • Crawford 317 • Honolulu, Hawai'i 96822
Telephone: (808) 956-7361 • Facsimile: (808) 956-3980

March 28, 1997

Darius H. Amjadi
1380 Lusitana Street, Suite 511
Honolulu, Hawaii 96813

Dear Dr. Amjadi:

Draft Environmental Assessment
Shoreline Revetment and Walkway
Laie, Oahu

The applicant seeks after-the-fact approval for a sloping boulder revetment fronting the Amjadi property, with a height ranging from 4.8 to 7-8 feet above grade. A wooden walkway extends from the deck of the house to the edge of the revetment, and a wooden stairway provides access to the beach below. Shoreline protective structures have been constructed along the ocean frontage of the adjoining properties to either side of the subject property. The revetment structure was completed in 1990.

The Environmental Center has reviewed this draft Environmental Assessment (EA) with the assistance of Charles Fletcher, Geology and Geophysics; Rob Mullane, Hawaii Sea Grant Extension; and Malia Akutagawa of the Environmental Center.

In general, our reviewers found the document comrehensive and well prepared. However, we offer the following comments relating to areas where additional information would be helpful.

Physical Oceanography

We note a general absence of information relating to the physical oceanography of the region immediately offshore of the subject property. In particular, the analysis of design and mitigation characteristics would be greatly aided by a descriptive portrayal of the wave climate of the area, including the distribution and frequency of wave occurrences. In addition to a lack of data on the wave climate, there is a general absence of descriptive information regarding the inshore oceanography of the region. In particular, we are told nothing of the dimensions of the littoral cell of which this area is a part, nor is

there any discussion of the direction and nature of nearshore current patterns. For instance, it is likely that refraction of waves around Laie Point sets up a northward nearshore current which carries entrained beach sand back to the point and seaward. Some additional information in this area would allow more reasoned evaluation of alternatives.

Alternatives

It is true that beach nourishment (see top of p.8) would be impractical for just this one lot. However, it would be interesting to determine how many of the shoreline protective structures in this area are illegal, and perhaps to suggest that the government might establish this region as a beach management area. One of the best offshore deposits of sand known near Oahu occurs at Punaluu, just south of this area. In addition, there is evidence from older survey work that sand deposits do occur offshore of Laie (ref. Beach Nourishment Viability Study, recently completed by the Coastal Zone Management office). As the EA points out, establishment of such a program is a long-term prospect, and would require the involvement of all the shoreline property owners in the area.

Thank you for the opportunity to review this draft EA.

Sincerely,

John T. Harrison
Environmental Coordinator

cc: OEQC
DLU
Roger Fujioka
Jeffrey Overton, Group 70
Charles Fletcher
Rob Mullane
Malia Akutagawa

May 9, 1997

GROUP 70
INTERNATIONAL

Francis S. Oda, AIA, AICP
Norman G.Y. Hong, AIA
Sheryl B. Seaman, A.A. ASID
Hitoshi Hida, AIA
Roy H. Niheu, AIA, CSI
James I. Nishimoto, AIA
Ralph F. Portmore, AICP
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Paul P. Chorney, AIA
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Norma J. Scott, AIA
Stephen E. Callio, CPA
George I. Atta, AICP
Jeffrey H. Overton, AICP
Linda L. Chung, AIA
Ronald L. Proctor
Kathryn A. Tsusaki
Roy A. Inouye
Mary J. O'Leary

John T. Harrison, Environmental Coordinator
University of Hawai'i at Manoa, Environmental Center
2550 Campus Road, Crawford 317
Honolulu, HI 96822

Subject: Amjadi Property, 55-321B Kamehameha Highway, Laie, Oahu
TMK 5-5-02:86 (Lot 116-B) Responses to Comments on Draft EA

Dear Mr. Harrison:

Thank you for providing comments on the Draft Environmental Assessment in your letter of March 28, 1997 to Ms. Jan Sullivan, Director of Land Utilization. We have prepared a response to your comments.

Physical Oceanography. The wave climate and current patterns of the Laie area are generally described in the Final EA. The littoral cell including the subject property is approximately 900 feet long, bounded by the rocky headland to the south (TMK 5-5-02:3), and the armored protruding land to the north (TMK 5-5-02:95). There is a partially emerged beachrock sill which runs parallel to the sand beach for the entire 900-foot length. Laie Point is about 2,000 feet to the north, beyond the end of this small littoral cell. Beach sand occurring along the subject property is generally contained within this cell due to the existence of the nearshore sill.

Beach Nourishment and Shoreline Structures in Vicinity. It is not known exactly how many of the shoreline structures fronting the 900 ft. littoral cell are legal. Ten of the 13 lots within this coastal cell have shoreline protection structures. The DLU records show that one of these structures has a permit.

Creating a beach management area to introduce sand replenishment to replace seawalls as a method of shoreline protection could be a costly and impractical process. The cost for such a project would be sizable – well beyond the means of 13 individual small property owners. Shoreline retreat rates of one to two feet per year would require that a sizable beach be created. We estimate well over 20,000 cubic yards of material would be required to establish a modest beach with an artificial dune line. Costs to initially place this sand, even if it were obtained from Punalu'u, could range from $35 to $70 per cubic yard. In-place material costs alone would total between $0.7 and $1.4 million. There would also be sizable costs for environmental studies, design and permitting at least $0.5 million, with multiple years of controversial permitting process likely. If a total initial cost of $1.2 to $1.9 million is divided among 13 property owners, the cost per lot would probably be between $92,000 to $146,000. Subsequently, there would be additional, periodic costs for future sand supplements. Obviously,

major public funding and community support for the project would be required to accomplish the beach nourishment option.

Thank you for providing your comments on the Draft EA. Please contact me if you have any questions or require additional information.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Chief Environmental Planner

cc: Dr. Darius Amjadi

97-01412

97 MAR -7 AM 10: 55

CITY & COUNTY OF HONOLULU

REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
PACIFIC OCEAN DIVISION, CORPS OF ENGINEERS
FORT SHAFTER, HAWAII 96858-5440

March 6, 1997

Planning and Operations Division

Ms. Jan Naoe Sullivan, Acting Director
Department of Land Utilization
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Dear Ms. Sullivan:

Thank you for the opportunity to review and comment on the Environmental Assessment (EA) for the Amjadi After-the-Fact Revetment, Laie, Oahu (TMK 5-5-2: 86). The following comments are provided pursuant to Corps of Engineers authorities to disseminate flood hazard information under the Flood Control Act of 1960 and to issue Department of the Army (DA) permits under the Clean Water Act; the Rivers and Harbors Act of 1899; and the Marine Protection, Research and Sanctuaries Act.

a. The Corps issued an after-the-fact permit for the revetment on July 18, 1990. The project was considered authorized under nationwide permit authority at 33 CFR 330.5(a)13. In the same authorization letter, we noted that the concrete base of the stairway structure was in violation of DA permit requirements. We suggested that the landing be removed and the stairwell be rebuilt to terminate above the high tide line. A memorandum dated April 24, 1991, confirmed that the stairway was rebuilt to reflect the suggested changes. At that time, the violation was considered resolved. Unless the structures have been substantially modified since this authorization, no further action by our office is required.

b. The flood hazard information provided on page 11 of the EA is correct.

Should you require further information, you may contact Mr. Alan Everson of our Regulatory Section at 438-9258, (extension 11) and refer to file number NW91-057.

Sincerely,

George P. Young, P.E.
Acting Chief, Planning
and Operations Division

May 9, 1997

GROUP 70
INTERNATIONAL

George P. Young, P. E., Acting Chief
Planning and Operations Division
Pacific Ocean Division, Corps of Engineers
Department of the Army
Fort Shafter, Hawaii 96858-5440

Subject: Amjadi Property, 55-321B Kamehameha Highway, Laie, Oahu
TMK 5-5-02:86 (Lot 116-B) Responses to Comments on Draft EA

Dear Mr. Young:

Thank you for providing comments on the Draft Environmental Assessment in your letter of March 6, 1997 to Ms. Jan Sullivan, Director of Land Utilization. We have prepared a response to your comments.

We appreciate your information regarding the Army Corps after-the-fact permit issued for this structure in 1990. Subsequent actions were completed to bring the structure into compliance with DA permit requirements. The structure has not been substantially modified since this authorization.

We also appreciate your verification that the flood hazard information presented in the Draft EA is correct.

Thank you for providing your comments on the Draft EA. Please contact me if you have any questions or require additional information.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Chief Environmental Planner

cc: Dr. Darius Amjadi

97-01160

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

97 FEB 25 11:24

DEPT. OF LAND & NATURAL RESOURCES
CITY & COUNTY OF HONOLULU

MICHAEL D. WILSON, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES

Gilbert Coloma-Agaran

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

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET, 6TH FLOOR
HONOLULU, HAWAII 96813

February 24, 1997

Jan Sullivan
Acting Director of Land Utilization
Department of Land Utilization
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

LOG NO: 18991
DOC NO: 9702EJ29

Dear Ms. Sullivan:

SUBJECT: **Chapter 6E-42 Historic Preservation Review -- Application for Shoreline Setback Variance and Draft Environmental Assessment: Amjadi After the Fact Revetment**
Laie, Ko'olauloa, O'ahu
TMK: 5-5-2:86

Thank you for the opportunity to review the draft EA for this after-the-fact application. A review of our records shows that there are no known historic sites at this parcel, although buried cultural deposits including human remains have been found in the sandy soils in nearby areas. No historic sites were found during construction of the boulder revetment, therefore, we believe that this after-the-fact application had "no effect" on historic sites.

Aloha,

Don Hibbard, Administrator
Historic Preservation Division

EJ:jk

May 9, 1997

GROUP 70
INTERNATIONAL

Mr. Don Hibbard, Administrator
Historic Preservation Division
Department of Land and Natural Resources
State of Hawai'i
33 South King Street, 6th Floor
Honolulu, HI 96813

Subject: Amjadi Property, 55-321B Kamehameha Highway, Laie, Oahu
TMK 5-5-02:86 (Lot 116-B) Responses to Comments on Draft EA

Dear Mr. Hibbard:

Thank you for providing comments on the Draft Environmental Assessment in your letter of February 24, 1997 to Ms. Jan Sullivan, Director of Land Utilization.

We appreciate your review of the records of historic sites in the area, and your confirmation that there are no known historic sites at this parcel. It is understood that buried cultural deposits including human remains have been found in the sandy soils in nearby areas. Should any new excavation work be planned at this parcel, the contractor will be informed of the potential for encountering such cultural remains. If any new work uncovers cultural remains, standard procedures will be followed to immediately suspend work in the area and notify DLNR.

Thank you again for commenting on the Draft EA. Please contact me if you have any questions or require additional information.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Chief Environmental Planner

cc: Dr. Darius Amjadi

97-01

PHONE (808) 594-1888

FAX (808) 594-1865

STATE OF HAWAI'I
OFFICE OF HAWAIIAN AFFAIRS
711 KAPI'OLANI BOULEVARD, SUITE 500
HONOLULU, HAWAI'I 96813

'97 APR 1 PM 2 37
DEPT OF LAND UTILIZATION
CITY & COUNTY OF HONOLULU

March 12, 1997

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

Dear Ms. Sullivan:

Thank you for the opportunity to review the Application for Shoreline Setback Variance and Environmental Assessment (EA) for the Amjadi Residence, Laie, Island of Oahu. Based on the information contained in the EA, the applicant is seeking after-the-fact approval for a sloping boulder revetment structure built across the shoreline frontage of the property around 1989.

The Office of Hawaiian Affairs concurs with the applicant's concern that without the revetment protection, the Amjadi residence could have experienced losses in ground and property. But there are two issues in the EA which require further clarification.

First, the applicant states that "Several lot owners installed boulder revetments. In the last two decades, most of the other lots along the shoreline also had revetments installed." (see p. 12 of EA). This raises several questions. What is the County's position on revetment? Does the County promote or discourage the use of such physical measures to control wave erosion? What are the impacts, if any, of such measures on beaches and shoreline habitats? Does this kind of structures privatize shoreline and prevent public access to coastal marine resources?

Second, it is unclear why the applicant is seeking approval for an action that took place in 1989. This should be made clear for a proper understanding of the matter. Please contact Lynn Lee, Acting Officer of the Land and Natural Resources Division, or Luis Manrique, should you have any questions on this matter.

Sincerely yours,

Martha Ross

Martha Ross
Deputy Administrator

97/SV-1

May 9, 1997

GROUP 70
INTERNATIONAL

Ms. Martha Ross, Deputy Administrator
Office of Hawai'ian Affairs
State of Hawai'i
711 Kapi'olani Boulevard, Suite 500
Honolulu, HI 96813

Subject: Amjadi Property, 55-321B Kamehameha Highway, Laie, Oahu
TMK 5-5-02:86 (Lot 116-B) Responses to Comments on Draft EA

Dear Ms. Ross:

Thank you for providing comments on the Draft Environmental Assessment in your letter of March 12, 1997 to Ms. Jan Sullivan, Director of Land Utilization. As the applicant's agent, we have prepared this response to your comments.

County Position on Shoreline Structures. Structures built to protect shoreline properties from ocean wave erosion are common along many sections of Oahu's shoreline. It has been our experience that the County addresses each request for permits for shoreline structures on a case-by-case basis. The hardening of the shoreline is generally not a preferred solution if other reasonable options are available to avoid loss of property due to coastal erosion. In certain situations, however, there is a clear hardship to the applicant that justifies the placement of a protective structure along the shoreline. It is the responsibility of each individual applicant to demonstrate hardship through the application process, including an ocean engineering evaluation of past and current shoreline trends.

The potential impacts of shoreline hardening on the beach and shoreline habitats are considered in an Environmental Assessment required for the variance application. A variance for a shoreline structure is granted only in cases where hardship is demonstrated, and the variance carries conditions that mitigate potential environmental impacts.

This particular structure does not prevent public access to coastal marine resources. There is an existing public beach access located about 400 feet to the north. Lateral coastal access is not interrupted by this structure, and it does not protrude beyond the certified shoreline into the public open space shoreline area. Therefore, this structure does not privatize the shoreline. In fact, a sizable portion of this property (over 3,000 sq. ft.) has actually become public land due to the shoreline retreat of 40 to 50 feet since 1949. The County has no jurisdiction over structures or fill placed makai of the certified shoreline, as this authority rests with the State Board of Land and Natural Resources.

Application for a Structure Built in 1989. Shoreline structures built since 1970 without a Building Permit and a Shoreline Setback Variance are illegal. There are a great number of illegal shoreline structures built along Oahu's shoreline. Many of these structures do not come to the attention of the DLU until someone makes a complaint. The Amjadi shoreline structure was built without County permits, and was cited in 1996 as an illegal structure lacking both a Building Permit and a Shoreline Setback Variance. The owner has the choice of removing the structure or seeking "after-the-fact" permits. The applicant has been fined for these violations, and the fines continue to accrue on a daily basis until the proper permits have been obtained. The final Building Permit is not issued until the outstanding fines have been settled with the County. In this instance, the applicant and the applicant's consultants are actively seeking approval of these permits. This Final Environmental Assessment has been prepared to meet County requirements for the Shoreline Setback Variance request.

Thank you for providing your comments on the Draft EA. Please contact me if you have any questions or require additional information.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP
Chief Environmental Planner

cc: Dr. Darius Amjadi

97-01787

'ARTMENT OF PARKS AND RECREATI

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

JEREMY HARRIS
MAYOR

JOHN R. D'ARAUJO, JR.
DIRECTOR
MICHAEL T. AHII
DEPUTY DIRECTOR

March 20, 1997

TO: JAN NAOE SULLIVAN, DIRECTOR
DEPARTMENT OF LAND UTILIZATION

FROM: JOHN R. D'ARAUJO, JR., DIRECTOR

SUBJECT: DARIUS AMJADI APPLICATION FOR AN AFTER-THE-FACT REVETMENT AT 55-321B KAMEHAMEHA HIGHWAY, LAIE
TAX MAP KEY 5-5-002:086
PROJ. REF. NO. 97/SV-001 (ST)

Thank you for the opportunity to review the after-the-fact shoreline setback variance application and draft environmental assessment for a revetment along the Laie coast.

Based upon the information presented in the application, it appears that the proposed project will not have a significant adverse impact on the City's recreational resources in the area.

Please have your staff contact Daniel Takamatsu of our Facilities Development Division at extension 6301 if you need further information.

JOHN R. D'ARAUJO, JR.
Director

JRD:ei

97-01349

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96843
PHONE (808) 527-6180
FAX (808) 533-2714

March 3, 1997

1997 MAR -5 AM 11:18
DEPT. OF LAND UTILIZATION
CITY & COUNTY OF HONOLULU

TO: JAN SULLIVAN, DIRECTOR
DEPARTMENT OF LAND UTILIZATION

ATTN: STEVE TAGAWA

FROM: RAYMOND H. SATO, MANAGER AND CHIEF ENGINEER
BOARD OF WATER SUPPLY

SUBJECT: YOUR MEMORANDUM OF FEBRUARY 12, 1997 ON THE DRAFT ENVIRONMENTAL ASSESSMENT, CHAPTER 343, HRS, FOR THE AMJADI AFTER-THE-FACT REVETMENT, LAIE, OAHU, TMK: 5-5-02: 86

Thank you for the opportunity to review and comment on the application for a variance for the shoreline revetment.

We have no objections to the existing revetment. We have no water system facilities in the project area.

If you have any questions, please contact Barry Usagawa at 527-5235.

97-01080

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 11TH FLOOR • HONOLULU, HAWAII 96813
PHONE: (808) 523-4341 • FAX: (808) 527-5857

JEREMY HARRIS
MAYOR

JONATHAN K. SHIMADA, PhD
Acting DIRECTOR AND CHIEF ENGINEER
ROLAND D. LIBBY, JR.
DEPUTY DIRECTOR

ENV 97-031

February 19, 1997

1997 FEB 21 AM 10:37
DEPT. OF LAND UTILIZATION
CITY & COUNTY OF HONOLULU

MEMORANDUM:

TO: JAN NAOE SULLIVAN, ACTING DIRECTOR
DEPARTMENT OF LAND UTILIZATION

FROM: JONATHAN K. SHIMADA, PhD
ACTING DIRECTOR AND CHIEF ENGINEER

SUBJECT: ENVIRONMENTAL ASSESSMENT (EA)
AMJADI AFTER-THE-FACT REVETMENT
TMK: 5-5-02: 86

We have reviewed the subject EA and have no comments to offer at this time.

If you have any questions, please contact Alex Ho at Local 4150.

APPLICATION FOR SHORELINE SETBACK VARIANCE AND FINAL ENVIRONMENTAL ASSESSMENT

Shoreline Revetment and Walkway at 55-321B Kamehameha Highway, Laie

EXHIBIT A

SHORELINE SURVEY MAP

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

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

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

Ref.:LD-PEM

Land Mgmt. Case No. OA-612

Mr. Kendall Hee
Engineers Surveyors Hawaii Inc.
1020 Auahi Street, Suite 1
Building 6
Honolulu, Hawaii 96814

Dear Mr. Hee:

Subject: Shoreline Certification Request
Applicant: Engineers Surveyors Hawaii, Inc.
Property Owner: Darius Amjadi, M.D.
Location - Island: Oahu District: Koolauloa
Tax Map Key: 5-5-02:86
Property Description: Lot 116-B of Ld Ct App 772, Laie, Koolauloa, Oahu
Land Management Case No.: OA-612

This is to inform you that the subject shoreline certification request has been certified and no appeal has been received. Eleven (11) certified copies of the map are enclosed herewith.

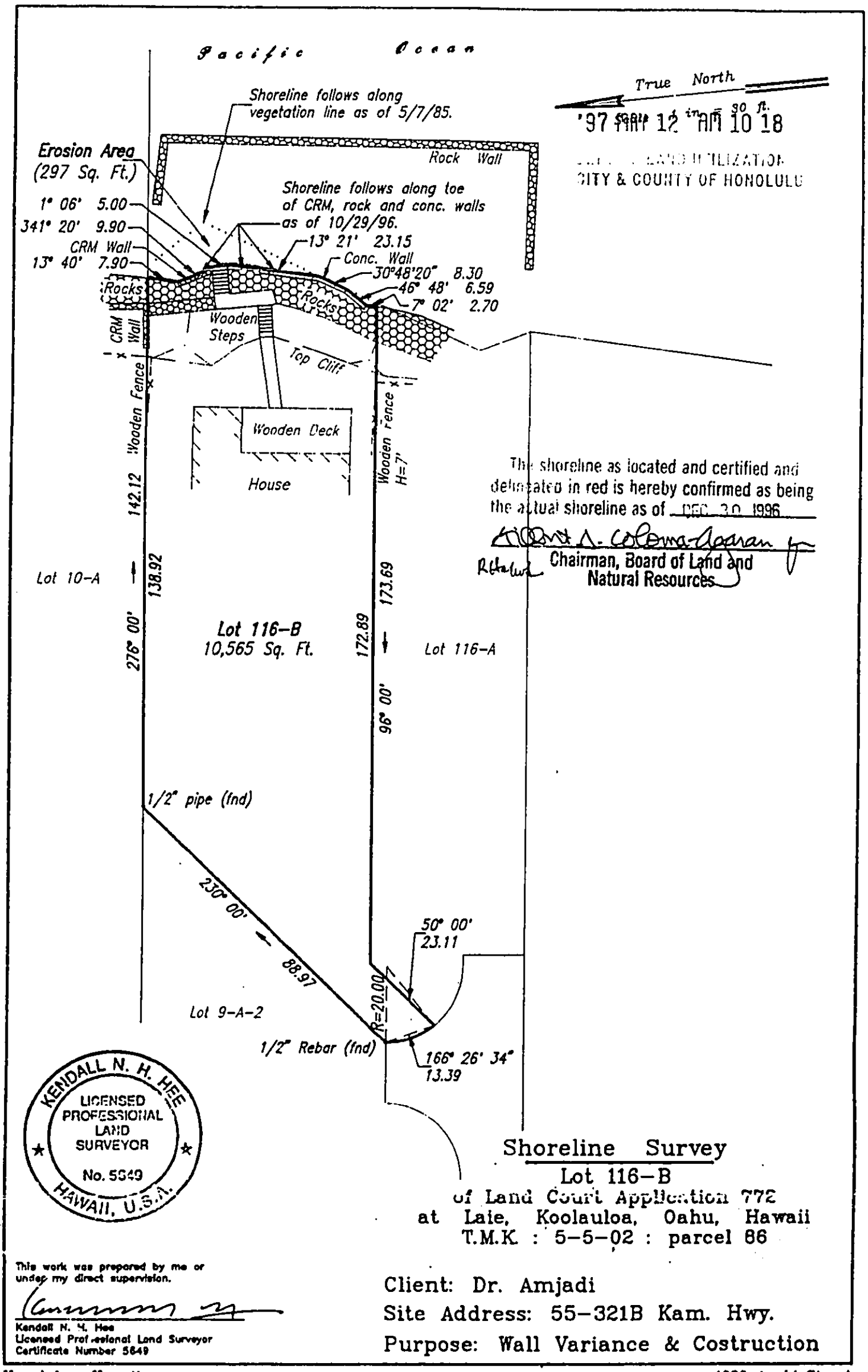
Should you have any questions regarding this matter, please feel free to contact Patti Miyashiro of our Honolulu Office at 587-0430.

Very truly yours,

DEAN Y. UCHIDA
Administrator

Enclosures

c: Oahu Land Board Member
At-Large Land Board Member
Oahu District Land Office
Survey Div., DAGS (w/enclosures)



Shoreline Survey

Lot 116-B
of Land Court Application 772
at Laie, Koolauloa, Oahu, Hawaii
T.M.K : 5-5-02 : parcel 86

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

Kendall N. H. Hee
Licensed Professional Land Surveyor
Certificate Number 5649

Client: Dr. Amjadi
Site Address: 55-321B Kam. Hwy.
Purpose: Wall Variance & Costruction

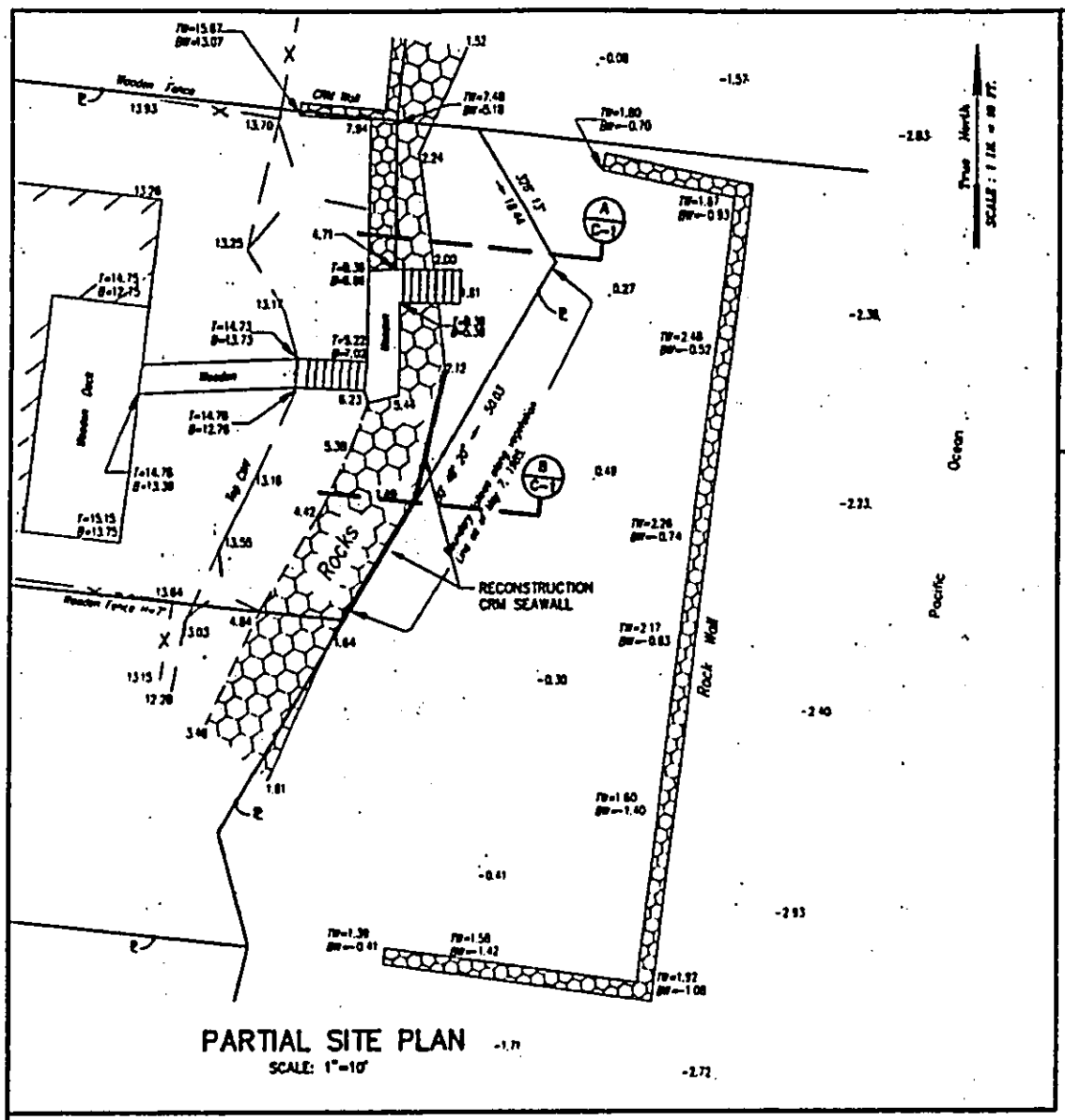
Honolulu, Hawaii
FB: 986/pgs.56-63,79,80
96-71

ENGINEERS SURVEYORS HAWAII, INC.
CIVIL ENGINEERS ~ LAND SURVEYORS ~ PLANNERS

1020 Auahi Street
October 29, 1996

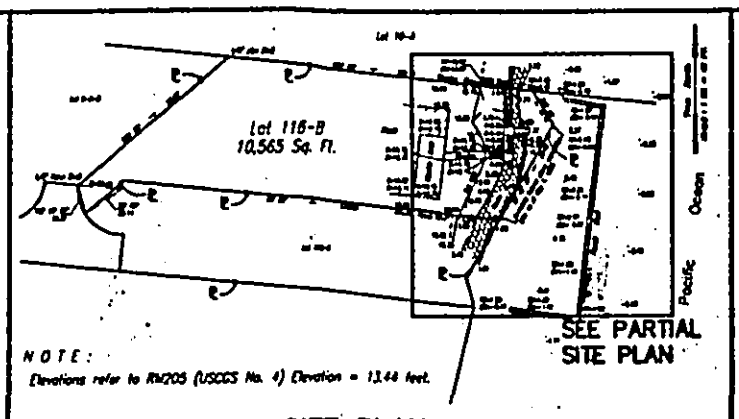
EXHIBIT B

CONSTRUCTION PLANS



PARTIAL SITE PLAN

SCALE: 1"=10'



NOTE:

Elevations refer to RM205 (USCGS No. 4) Elevation = 13.44 feet.

SITE PLAN

SCALE: 1"=40'

GENERAL NOTES

1. THE CONTRACTOR SHALL PERFORM APPLICABLE CONSTRUCTION WORK ALL IN ACCORDANCE WITH THE "STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION" DATED SEPTEMBER 1984 AS AMENDED, AND THE "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION" DATED SEPTEMBER 1986 OF THE DEPARTMENT OF PUBLIC WORKS, CITY AND COUNTY OF HONOLULU, AND THE REVISED ORDINANCES OF HAWAII, 1990 AS AMENDED.

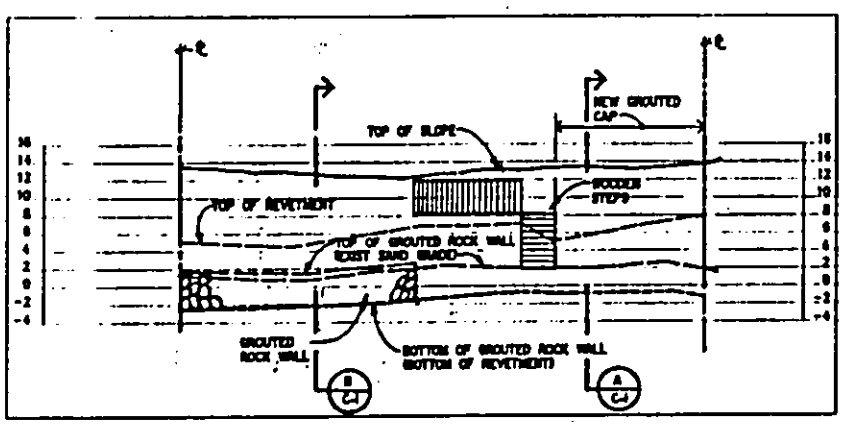
2. THE EXISTENCE AND LOCATION OF UNDERGROUND UTILITIES AND STRUCTURES AS SHOWN ON THESE PLANS ARE FROM THE LATEST AVAILABLE RECORDS BUT ARE NOT GUARANTEED AS TO THE ACCURACY OR THE EXISTENCE OF OTHER OBSTACLES WHICH MAY BE ENCOUNTERED DURING THE COURSE OF THE WORK. THE CONTRACTOR MUST EXERCISE PROPER CARE DURING EXCAVATION TO PREVENT DAMAGE TO UTILITIES.

3. THE CONTRACTOR SHALL NOTIFY ALL AGENCIES TO VERIFY THE ACTUAL LOCATION OF ALL UTILITIES IN THE PROJECT AREA PRIOR TO EXCAVATING. THE CONTRACTOR SHALL COORDINATE ALL WORK. WHEREVER CONNECTIONS OF NEW UTILITIES TO EXISTING UTILITIES ARE SHOWN ON THE PLANS, THE CONTRACTOR SHALL EXPOSE THE EXISTING LINES AT THE PROPOSED CONNECTIONS TO VERIFY THEIR LOCATIONS AND DEPTHS PRIOR TO EXCAVATION FOR THE NEW LINES.

4. THE CONTRACTOR SHALL RESTORE TO THEIR ORIGINAL OR BETTER CONDITION ALL IMPROVEMENTS DAMAGED AS A RESULT OF THE CONSTRUCTION, INCLUDING PAVEMENTS, EMBANKMENT, CURBS, SIGNS, LANDSCAPING, STRUCTURES, UTILITIES, WALLS, FENCES, ETC. UNLESS PROVIDED FOR SPECIFICALLY IN THE PROPOSAL, DEMOLITION AND RESTORATION OF EXISTING ITEMS SHALL BE INCIDENTAL AND INCLUDED WITHIN THE AMOUNT PAID FOR UNCLASSIFIED TRENCH EXCAVATION.

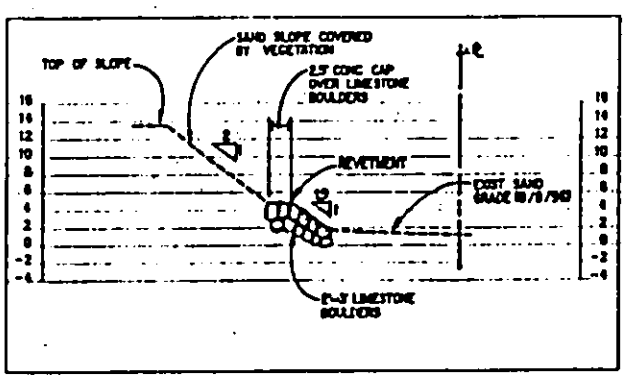
5. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND ELEVATIONS PRIOR TO CONSTRUCTION. IN THE EVENT OF A DISCREPANCY WITHIN THE DRAWINGS, OR BETWEEN DRAWINGS AND SPECIFICATIONS, OR WITHIN THE SPECIFICATIONS, IMMEDIATELY BRING THE DISCREPANCY TO THE ATTENTION OF THE ARCHITECT OR ENGINEER FOR A DECISION BEFORE PROCEEDING WITH THE PARTICULAR WORK INVOLVED. WORK CARRIED OUT DISREGARDING THESE INSTRUCTIONS IS SUBJECT TO REMOVAL AND REPLACEMENT AT THE EXPENSE OF THE CONTRACTOR.

8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONFORMANCE WITH THE APPLICABLE PROVISIONS OF CHAPTER 54, WATER QUALITY STANDARDS, AND CHAPTER 55, WATER POLLUTION CONTROL, OF TITLE 11, ADMINISTRATIVE RULES OF THE STATE DEPARTMENT OF HEALTH.



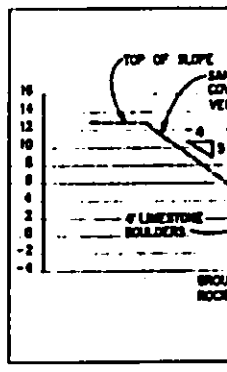
ELEVATION

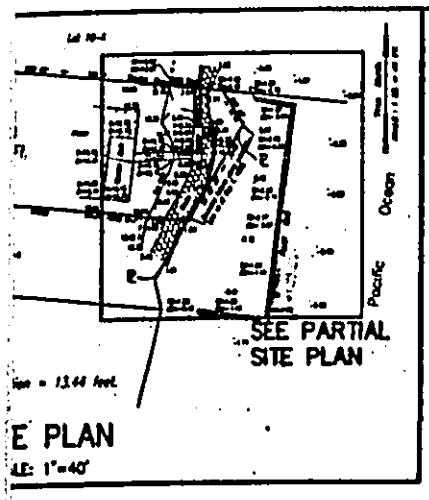
SCALE: 1"=10'



SECTION (A / C-1)

SCALE: 1"=10'





E PLAN

LE: 1"=40'

ESTIMATED EARTHWORK QUANTITIES	
GRADED AREA	720 SQ. FT
EXCAVATION	32 CU. YD
EMBANKMENT	0 CU. YD

LICABLE CONSTRUCTION WORK ALL IN ACCORDANCE PUBLIC WORKS CONSTRUCTION" DATED SEPTEMBER NDARD SPECIFICATIONS FOR PUBLIC WORKS 88 OF THE DEPARTMENT OF PUBLIC WORKS, CITY VISED ORDINANCES OF HAWAII, 1990 AS AMENDED.

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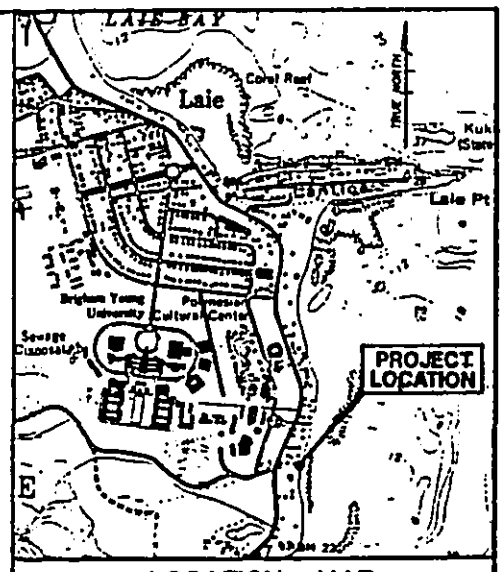
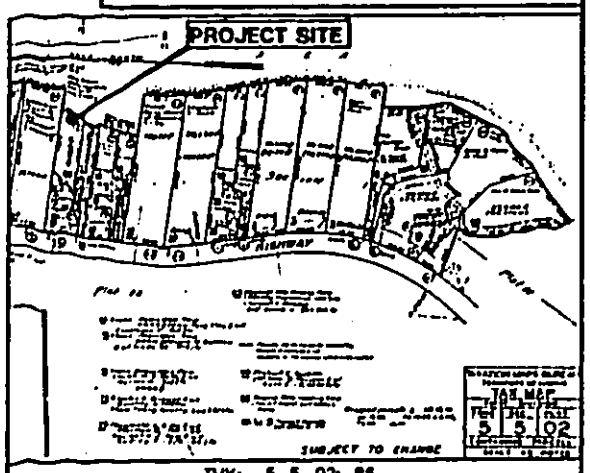
SIONS AND ELEVATIONS PRIOR TO CONSTRUCTION. EITHIN THE DRAWINGS, OR BETWEEN DRAWINGS HE SPECIFICATIONS, IMMEDIATELY BRING THE THE ARCHITECT OR ENGINEER FOR A DECISION TICULAR WORK INVOLVED. WORK CARRIED OUT S IS SUBJECT TO REMOVAL AND REPLACEMENT R.

IBLE FOR CONFORMANCE WITH THE APPLICABLE QUALITY STANDARDS, AND CHAPTER 55, WATER 11, ADMINISTRATIVE RULES OF THE STATE



LOCATION MAP

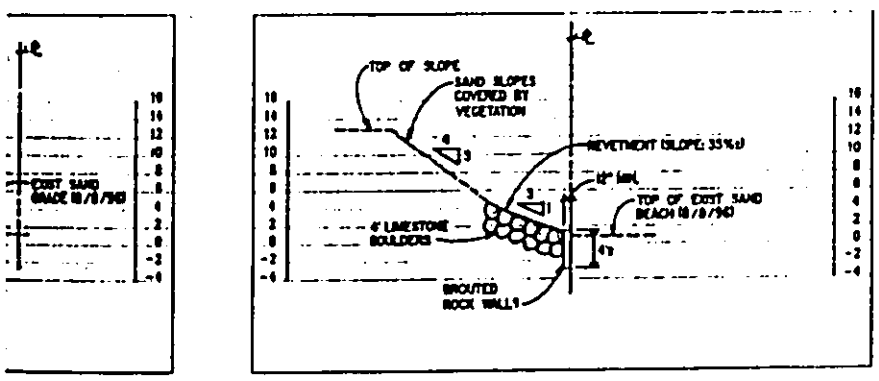
SCALE: 1"=1500'



TMK: 5-5-02: 86

SITE MAP

SCALE: 1"=200'



SECTION B / C-1

SCALE: 1"=10'

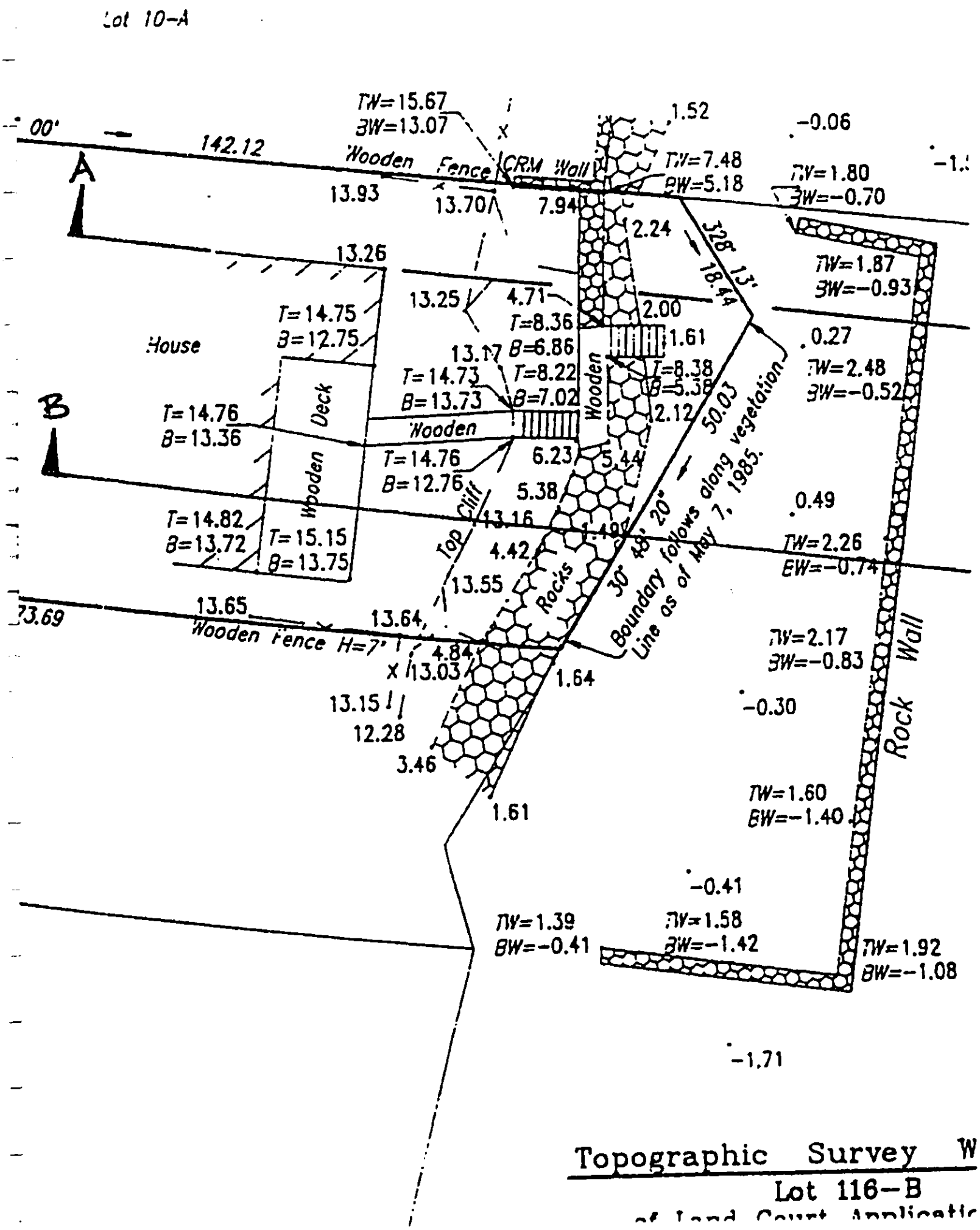
RECEIVED
1991 JAN 20 AM 8:51
CITY & COUNTY OF HONOLULU

HIDA, OKAMOTO & ASSOCIATES, INC.
CONSULTING ENGINEERS

SEAWALL RECONSTRUCTION

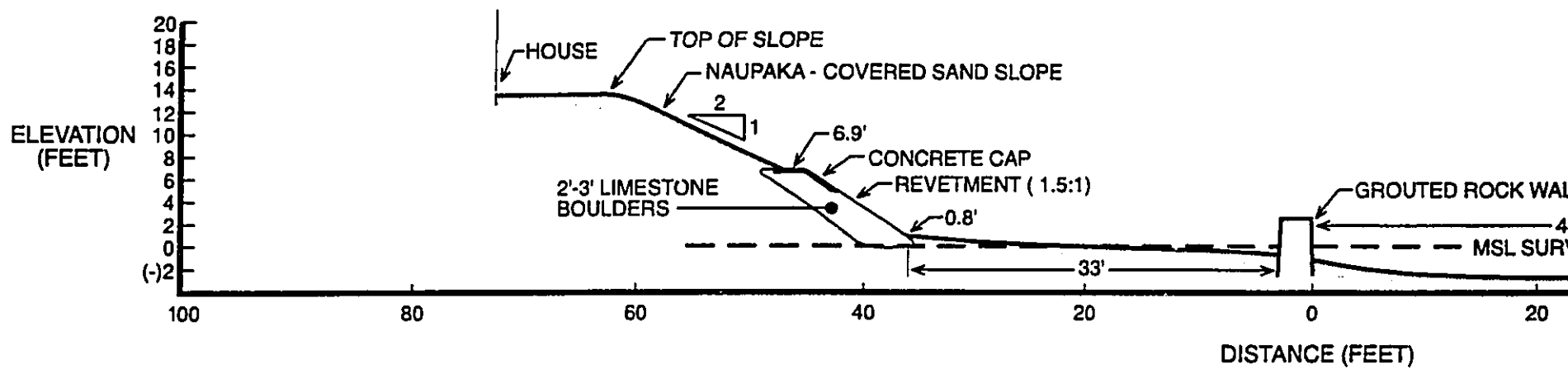
VICINITY MAP, LOCATION MAP
SITE PLAN, NOTES, ELEVATION
AND TYP. SECTIONS

C-1

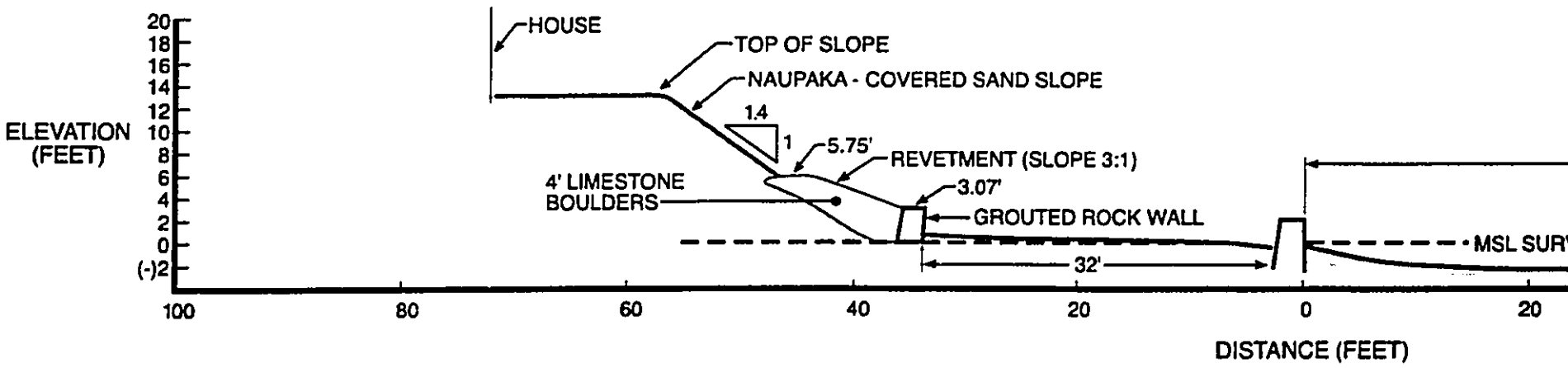


Topographic Survey W

Lot 116-B



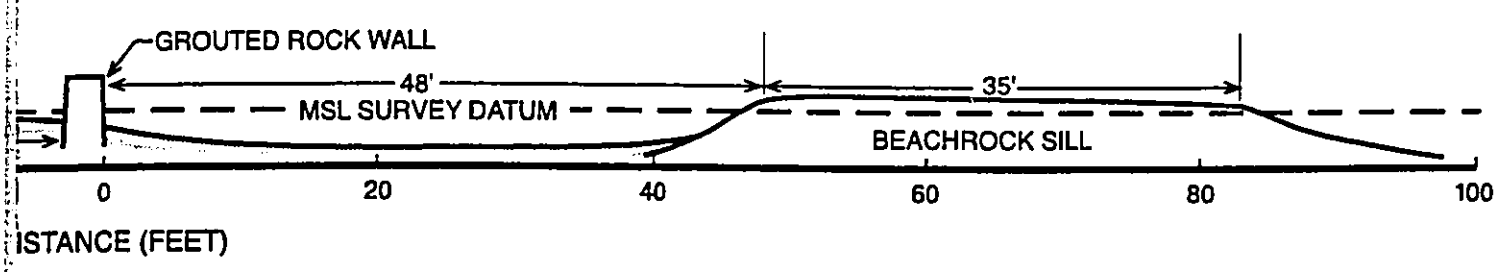
SECTION A-A'

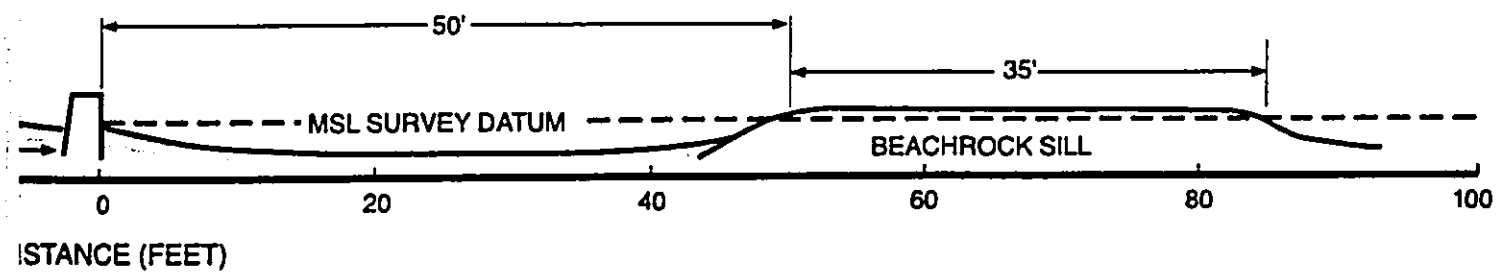


SECTION B-B'

Cross Sections

Amjadi Shoreline Setback Variance





Source: TNWRE (Dec. 1996)

APPLICATION FOR SHORELINE SETBACK VARIANCE AND
FINAL ENVIRONMENTAL ASSESSMENT

Shoreline Revetment and Walkway at 55-321B Kamehameha Highway, Laie

EXHIBIT C

OCEANOGRAPHIC AND STRUCTURAL EVALUATION

EVALUATION OF THE
EXISTING SHORELINE REVETMENT
AT TMK 5-5-02:66 (Lot 166-B)
Laie, Oahu, Hawaii

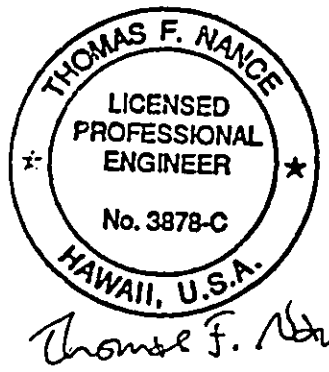
Evaluation of the
Existing Shoreline Revetment at
TMK 5-5-02:86 (Lot 116-B)
Laie, Oahu, Hawaii

Prepared for

Dr. Darius Amjadi
1380 Lusitana Street - Suite 511
Honolulu, Hawaii 96813

Prepared by

Tom Nance Water Resource Engineering
680 Ala Moana Boulevard - Suite 406
Honolulu, Hawaii 96813



December 1996

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Introduction

This report has been prepared to provide technical and environmental information to support a Shoreline Setback Variance application for an existing revetment across the shoreline frontage of TMK 5-5-02:86 (Lot 116-B) in Laie, Oahu. The 10,565-square foot lot has a 60-foot shoreline frontage. The lot is located directly across Kamehameha Highway from the south entrance to the Polynesian Cultural Center's parking lot.

Information on which this report is based includes the following: discussions with the owner of the lot, Dr. Amjadi, on dates of the revetment's construction; a topographic survey worksheet and a shoreline survey, both prepared by Engineers Surveyors Hawaii (ESH); a series of six aerial photographs which span from 1949 to 1995 and delineate shoreline movement during this 46-year period; and a number of site visits made from September through November of 1996.

Shoreline Setting

Figure 1 is an aerial photograph taken in September 1995 and reproduced here at an approximate scale of 1 inch equals 100 feet. Significant features of the shoreline are identified on the acetate overlay and are described below.

- With a few exceptions which are described subsequently, the shorelines of lots to the north and south of Lot 116-B have been stabilized by rubble revetments, rubble masonry walls, and vertical concrete walls. Ground level photographs in Appendix A illustrate many of these shoreline structures.

- Directly offshore of Lot 116-B and the adjacent lot to the south (TMK 5-5-02:77 or Lot 116-A), there is a low-lying, grouted rock wall. Based on the aerial photographs in Appendices B and C, the wall was constructed sometime between 1949 and 1958, making it at least 38 years old. Photo Nos. 2, 3, and 5 in Appendix A show the wall from various ground level views. The top of the wall is 1.6 to 2.5 feet above the mean sea level datum used for the survey by ESH. It lies between 32 and 41 feet seaward of the toe of the revetment which is the subject of this report.

- Immediately to the south of the offshore wall and directly in front of TMKs 5-5-02:92 and 93, there is a line of loose basalt boulders in the nearshore waters (Photo Nos. 6 and 7). Available aerial photographs indicate that these boulders were also placed sometime between 1949 and 1958.

- A partially emerged sill runs parallel to the shoreline (Photo Nos. 12, 13, and 16). For the 400 feet to the north of Lot 116-B, the sill is 60 to 80 feet offshore. For the 400 feet to the south, the sill is generally 120 to 140 feet offshore. It is comprised primarily of lithified sand and coralline algae. Its top is 15 to 20 feet wide and most high tides, the top is entirely submerged. Conversely, on most low tides, it is fully emerged. There is a relatively abrupt drop of 3 to 4 feet on the land and seaward sides of the sill. Based on the sill's orientation and composition, it undoubtedly is a former location of the shoreline.

- The nearshore sill and the protruding rock revetments at TMK 5-5-02:95 to the north and TMK 5-5-02:05 to the south enclose a shallow area of the nearshore waters which is almost entirely covered by sand. The enclosed area is shallower on the north end and the sill there is very close to shore. This means that on mid-mean to low tides, most of the water which is carried across the still by waves drains out the south end of the enclosed area. This wave-driven current is of relatively slow velocity except during very high waves.

- The bottom offshore of the sill is a shallow (less than 6 feet), gently sloping (less than 1:100) reef platform. The platform is remarkably devoid of topographic relief, either as raised features or depressions. Only a few live corals were seen in several transects made across the platform to 500 or 600 feet offshore. Sand deposits are few in number, generally only a few inches deep, and contain insignificant volumes. For this study, only the innermost 600 feet of the platform was examined. Bathymetry on the USGS' Kahuku quadrangle map suggest that the reef platform has ledges at the 6- and 18-foot depths, about 1500 and 3000 feet offshore, respectively.

Shoreline Changes, 1949 to 1995

Fast lands along this section of the Laie shoreline are comprised of well sorted, medium to coarse-grained calcareous beach sand which is highly erodible. Despite the natural protection from waves which is provided by the shallow offshore reef platform and nearshore sill, substantial shoreline retreat has occurred over the last 40 to 50 years. To discuss these shoreline changes, it is convenient to divide the shoreline into the five segments identified on Figure 2 and detailed in Table 1. As a point of reference, the revetment which is the subject of this report is in Segment 3.

In addition to the September 1995 aerial photo which is the base for Figures 1 and 2, five other aerial photos were used to identify shoreline changes over the last 40 to 50 years. Dates of these photos are as follows: May 1949; June 1958; April 1967; May 1972; and December 1982. The photos, each with an acetate overlay of the shoreline in 1995, can be found in Appendices B to F. Changes to each of the five shoreline segments in the years between each of the six aerial photos are summarized on Table 2.

In general, the 1949 aerial photo in Appendix B depicts a smooth, arcuate-shaped shoreline which is devoid of any protective structures for the 1100-foot length of the shoreline covered by the photo. Nine years later in the 1958 photo (Appendix C), the pattern of erosion which has continued into the 1990s had been set in motion. The rock revetments at TMKs 5-5-02:95 and 05, which are at the north and south ends of the 1958 photo, were in place. These revetments have held those portions of the shoreline in place until the present time, while the 900 feet of shoreline between these two protruding revetments has retreated progressively inland. Notably, the low-lying, rectangular-shaped wall offshore of TMKs 5-5-02:86 & 77 (Segment 3) was in place at the time of the 1958 photo. Also the loose boulders in the nearshore waters in front of TMKs 5-5-02:92 and 93 (Segment 4) were in place in 1958. Despite these modest efforts at shoreline protection, erosion continued to occur at these four lots at about the same rate as the lots to the north and south.

32
95

Table 1

Shoreline Segments in the Vicinity of TMK 5-5-02:86
(Refer to Figure 3 For Segment Locations)

Shoreline Segment	Tax Map Key	Approximate Frontage Length (Feet)	Status of Shoreline Protection (November 1996)
1	5-5-02:95	100	*Substantial boulder revetment (Photo Nos. 16 & 17).*
2	5-5-02:85	100	Boulder revetment installed in 1991 (left side of Photo No. 17).
	5-5-02:32 & 33	200	Boulder revetments.
	5-5-02:67	10	No protection; substantial recent erosion has occurred (Photo Nos. 14 & 15).
	5-5-02:34	100	Boulder revetment topped by a vertical, grouted rock wall (right side of Photo Nos. 2 & 4).
3	5-5-02:86	60	Offshore rock wall and shoreline revetment (Photo Nos. 1 & 2).
	5-5-02:77	40	Similar to 5-5-02:86, although with less protection (Photo Nos. 1, 2, & 8).
4	5-5-02:92 & 93	100	No shoreline protection; basalt boulders placed in nearshore waters 50 feet offshore (Photo Nos. 9, 10, & 11).
5	5-5-02:37	100	No protection; erosion is occurring (left side of Photo Nos. 10 & 11).
	5-5-02:35	100	Grouted boulder revetment (Photo No. 18).
	5-5-02:80	50	Revetment of large boulders (right side of Photo No. 21).
	5-5-02:81	50	Vertical rock wall completely collapsed during November 1996 rains and high waves (Photo Nos. 19, 20, & 21).
	5-5-02:05	100	North half of lot has no protection; south half has boulder revetment (Photo No. 22).

Table 2

Changes of the Laie Shoreline in the Near Vicinity of TMK 5-5-02:86, 1949 to 1995

Period	No. of Years	Shoreline Segment (Refer to Figure 3 For Segment Locations and Appendices B to F For Aerial Photos)				
		1	2	3	4	5
May 1949 to June 1958	9.1	Vegetation line moved inland 5 to 10 feet except at TMK 5-5-02:95; it has rocks placed in the nearshore waters.	Vegetation line retreated inland from 10 to 40 feet.	Partially emerged seawall is built in front of TMKs 5-5-02:86 & 77. The wall is generally along 1949 vegetation line (Appendix B). By 1958, the vegetation line is 20 to 60 feet inland.	Vegetation line moved inland 50 to 65 feet. Boulders placed in the water fronting TMKs 5-5-02:92 & 93.	Vegetation line retreated 30 to 65 feet inland; boulders are placed at the shoreline of TMKs 5-5-02:4 and a portion of 5.
June 1958 to April 1967	8.8	Vegetation line remained stable. Rocks placed in front of TMK 5-5-2:95 are more prominent in the 1967 photo.	Vegetation line is generally stable; in some locations, it actually moved seaward.	Vegetation line retreated 15 to 20 feet.	Vegetation line retreated 5 to 10 feet.	Vegetation line retreated 15 to 25 feet along this segment except in front of TMKs 5-5-02:4 & 5.
April 1967 to May 1972	5.1	Essentially no change; shoreline stabilized by rocks.	Vegetation line quite stable.	Vegetation line moved seaward by 10 to 15 feet. Large house was constructed on TMK 5-5-02:86.	Vegetation line retreated 15 feet, but only in one localized area.	Vegetation line retreated 5 to 15 feet generally and up to 25 feet at TMK 5-5-02:81 and a portion of 5.
May 1972 to December 1982	10.6	Essentially no change.	Vegetation line retreated between 10 and 15 feet.	Vegetation line moved seaward, albeit less than 5 feet. House at TMK 5-5-02:86 removed and replaced by the present structure.	Vegetation line retreated 5 to 15 feet.	Vegetation line moved inland, 5 to 10 feet generally and up to 15 to 20 feet in places.
December 1982 to September 1995	12.7	Essentially no change.	Revetments constructed along the entire segment except for deep scour at the 10-foot frontage of TMK 5-5-02:37.	Shoreline stabilized by a rock revetment. Vegetation retreated 10 to 15 feet.	Vegetation line moved inland 5 to 40 feet.	Very little change; some shoreline revetments are visible in the 1995 photo.

The progressive retreat of the unprotected 900-foot stretch of shoreline between TMKs 5-5-02:95 and 05 is clearly shown by the aerial photos in Appendices B to F. To arrest this trend, lot owners began shoreline revetment construction in the interval between the 1972 to 1982 aerial photos. However, it appears that most of the revetments were installed between 1982 and 1995. At present, only the few lot frontages listed below remain unprotected and all of these are subjected to further erosion such as occurred during November 1996. Particularly given the current mix of hardened and natural shorelines, revetments are necessary to stop further shoreline retreat.

Tax Map Key	Photo No.
5-5-02:67	14 & 15
5-5-02:92, 93, & 37	9, 10, & 11
5-5-02:05 (North half)	22

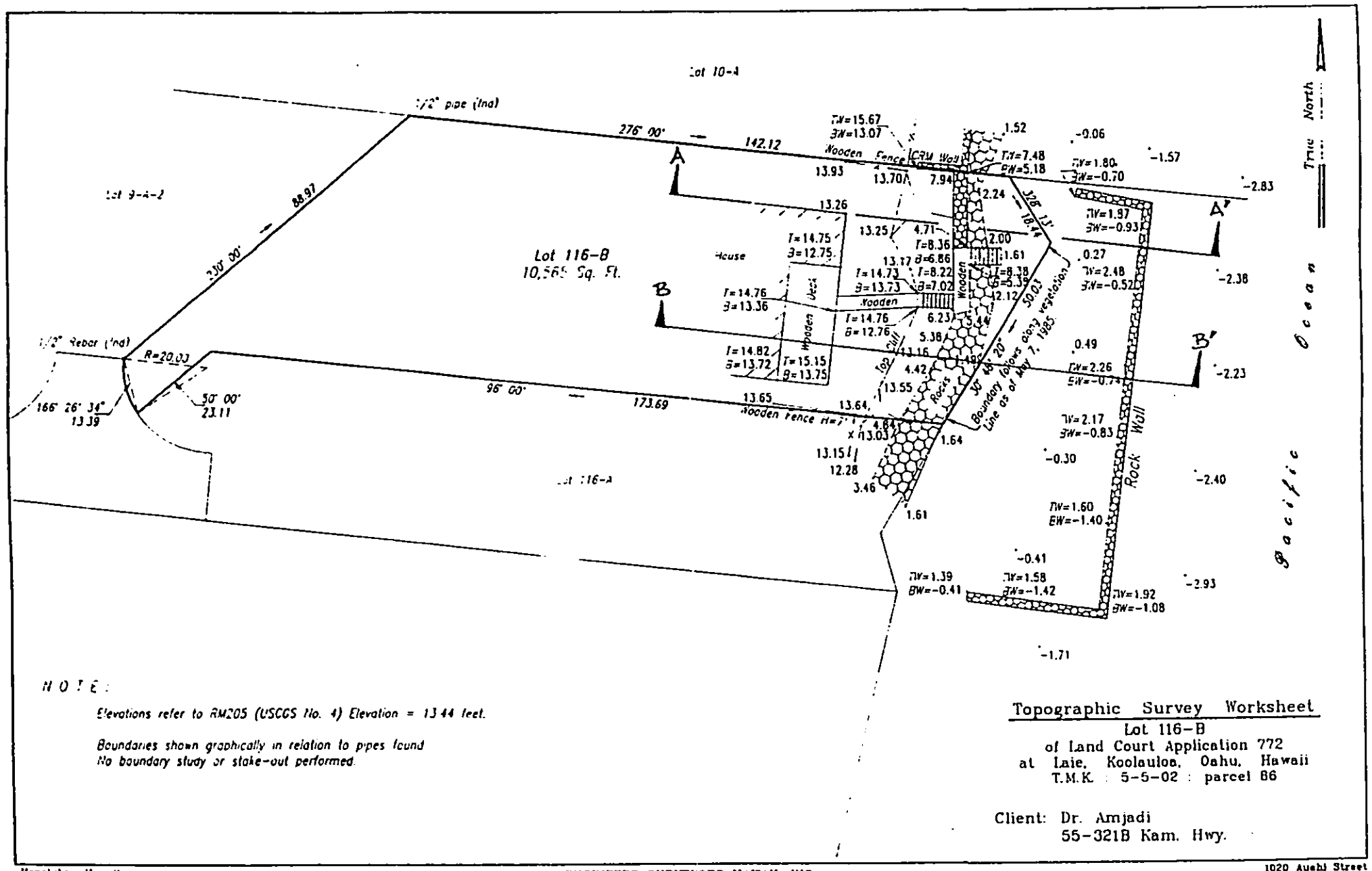
Shoreline Revetment at TMK 5-5-02:86 (Lot 116-B)

The "Topographic Survey Worksheet" and "Shoreline Survey", both prepared by ESH, are reproduced here as Figures 3 and 4. Details of the revetment's construction are illustrated in Photo Nos. 1, 2, 3, and 4 in Appendix A. According to Dr. Amjadi, the 2-1/2- to 3-foot high grouted rock wall, which is now cracked into several lengths and sits at the foot of the revetment, was built in September or October of 1988. On the northern third of the present revetment, broken pieces of this wall are actually beneath the revetment. There is no evidence that this wall had a footing or grout base on which it was constructed. Being without adequate foundation and quite low, it did not provide the necessary protection from shoreline erosion during high wave events.

In February 1989, limestone boulders were placed behind and on top of the rock wall and was also placed in front of the adjacent lot (Lot 116-A, TMK 5-5-02:77), creating the revetment which is in place today. Two cross sections of this composite "structure" are shown on Figure 5. One of the sections is typical for the north end which has a grout cap. The other section is of the south end, where the boulders are larger but there is no grout cap. Clearly, the revetment is not an engineered structure. However, as illustrated by high wave events such as occurred in November 1996, its performance in the post seven and a half years has been quite credible:

1. At the north end of the revetment where the top of the grout cap is at 7 to 8 feet (msl), there was no loss of sand on the inland side of the revetment during the high waves of November 1996.

2. Beginning at the wooden stairs and proceeding to the south end, the top of the revetment declines from 6.2 to 4.8 feet. At the lower end, overtopping by the November 1996 waves did scour the sand behind the boulders. The top of the revetment continues to decline further moving south in front of TMK 5-5-02:77. The loss of sand behind this lower portion of the revetment was more substantial in November 1996 (Photo No. 8).



NOTE:

Elevations refer to RM205 (USCGS No. 4) Elevation = 13.44 feet.

Boundaries shown graphically in relation to pipes found
No boundary study or stake-out performed.

Topographic Survey Worksheet
Lot 116-B
of Land Court Application 772
at Laie, Koolauloa, Oahu, Hawaii
T.M.K. : 5-5-02 : parcel 86

Client: Dr. Amjadi
55-321B Kam. Hwy.

Honolulu, Hawaii
FB: 988/pgs. 58-63 & 1059/28-29
96-71

ENGINEERS SURVEYORS HAWAII, INC.
CIVIL ENGINEERS ~ LAND SURVEYORS ~ PLANNERS

1020 Auahi Street
August 8, 1996

Figure 3

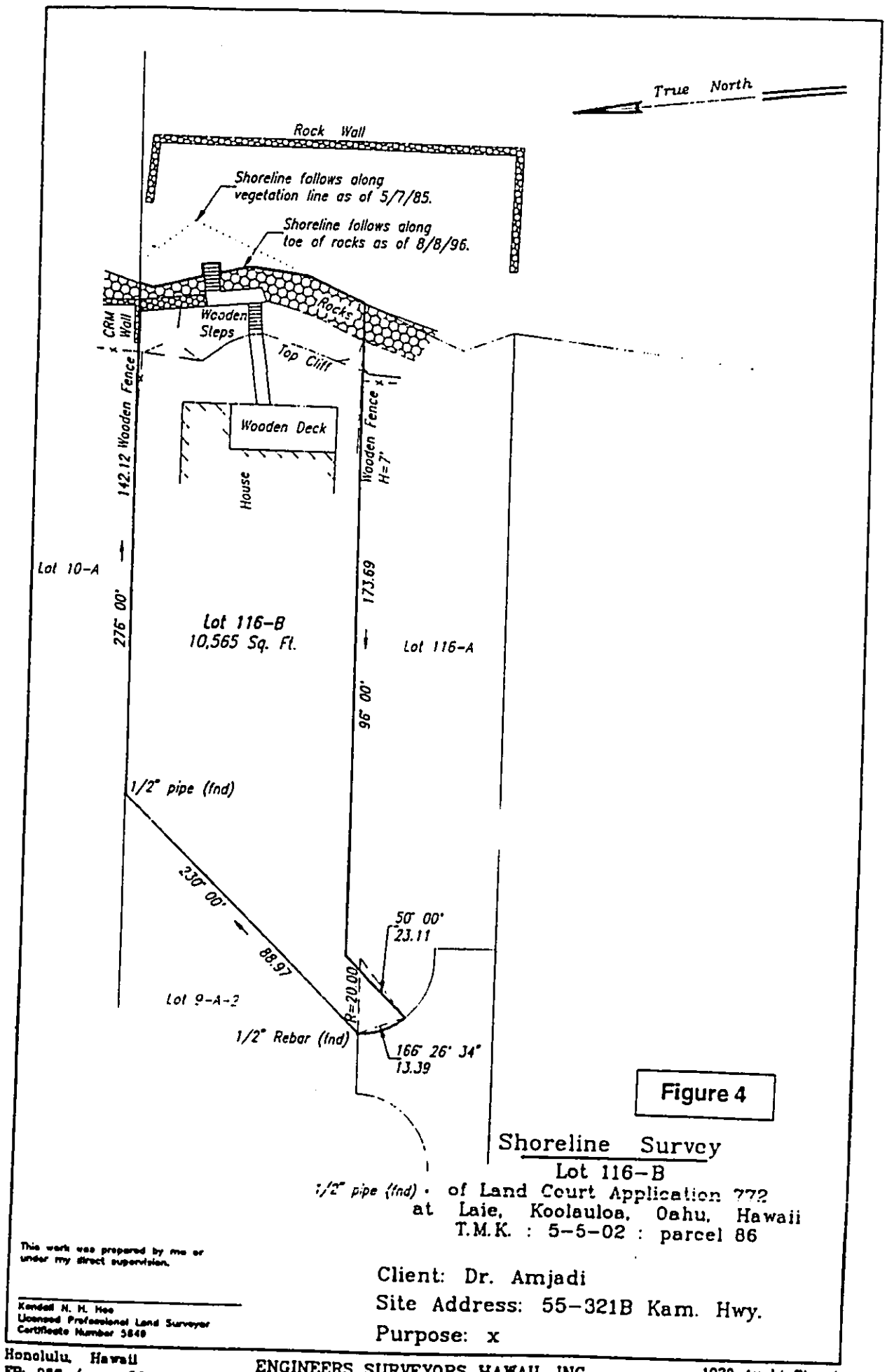


Figure 4

Shoreline Survey
Lot 116-B
of Land Court Application 772
at Laie, Koolauloa, Oahu, Hawaii
T.M.K. : 5-5-02 : parcel 86

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

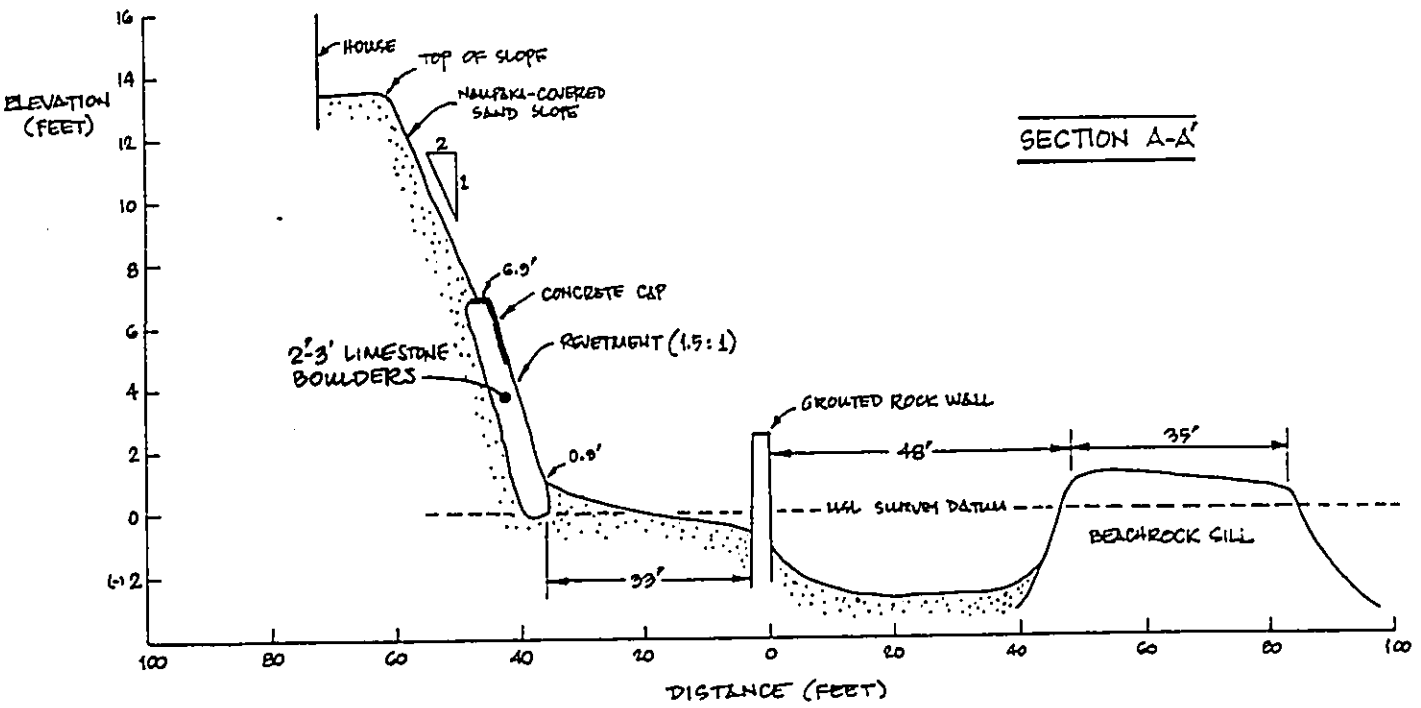
Kendall N. H. Hee
Licensed Professional Land Surveyor
Certificate Number 5849

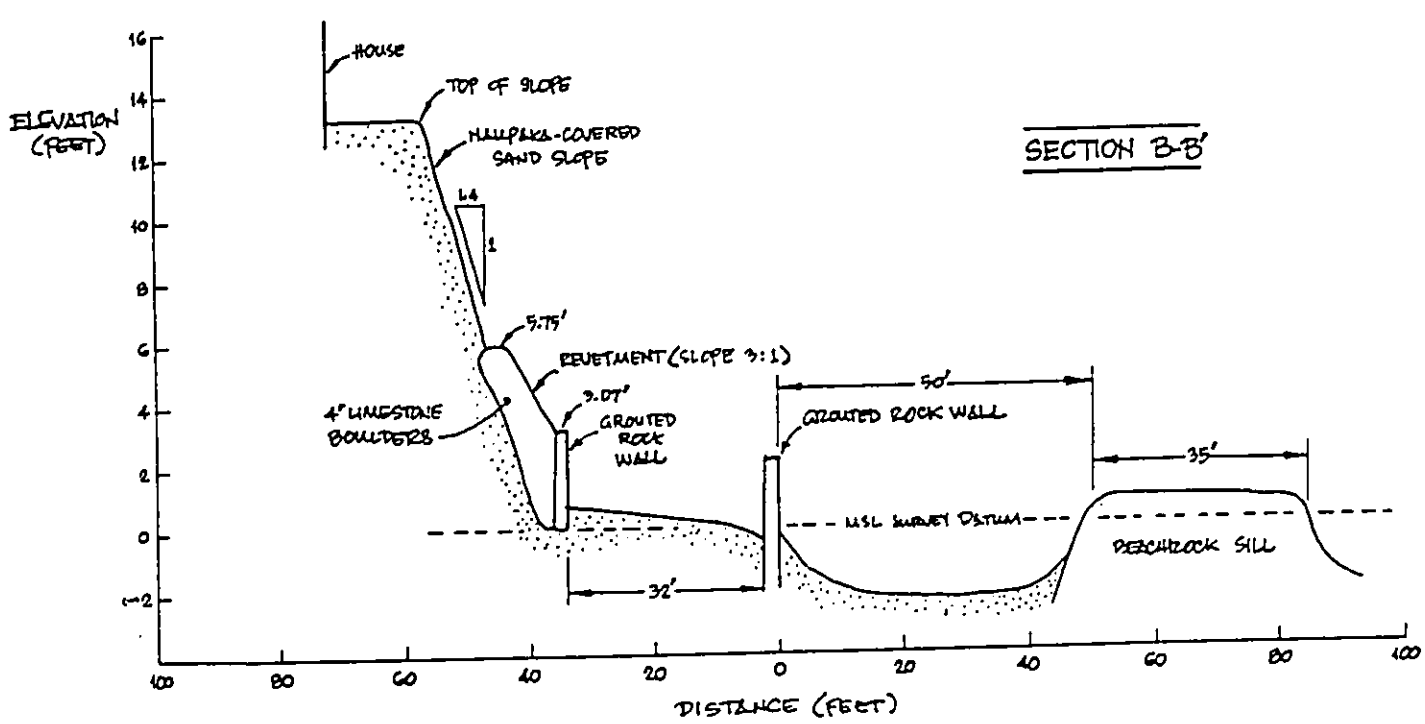
Client: Dr. Amjadi
Site Address: 55-321B Kam. Hwy.
Purpose: x

Honolulu, Hawaii
FB: 986 / pgs. 56-63
96-71

ENGINEERS SURVEYORS HAWAII, INC.
CIVIL ENGINEERS ~ LAND SURVEYORS ~ PLANNERS

1020 Auahi Street
August 8, 1996





Notes:
1. Refer to Figure 3 for the locations of the cross sections.
2. Topographic survey by ESH was supplement with spot elevations by TNWRE.
3. Both cross sections are shown with a five-fold vertical exaggeration.

Figure 5

Cross Sections of the Shoreline Revetment at TMK 5-5-02:86

3. Although there was a loss of several inches of sand at the toe of the revetment in November 1996, the structure itself was completely stable. No boulders were dislodged and the grout cap was not cracked or moved. Loss of the bottom rung of the wooden stairs was the only damage.

The width and limited depth of the offshore reef shelf and the presence of the inner beachrock sill provide excellent natural protection from wave attack. As a consequence, the largest wave which can break on or just in front of the shoreline revetment at TMK 5-5-02:86 is constrained by the available water depth. Using the most critical combination of the highest tide level (1-foot above the beachrock sill), a generous allowance of 2.5 feet for wave set-up, the existing offshore slope (approximately 0.01 as defined by the slope from 6-foot depth to the shoreline), and incoming wave periods of 5 to 10 seconds, the depth-limited, maximum breaking wave height which could strike the revetment is 2.7 feet. All waves larger than this would break further offshore, dissipating most of their energy before reaching the revetment. For sizing of boulders for shoreline revetments, the design should be based on the maximum breaking wave height.

The Hudson formula is an empirical equation used to determine the weight of boulder necessary to withstand a breaking wave of a particular height. For the depth-limited, maximum breaking wave height of 2.7 feet, the formula indicates that armor stones should be in the range of 200 to 400 pounds:

$$W = \frac{w_r H^3}{K_D (S_r - 1)^3 \cot\emptyset} = \frac{(150)\ (2.7)^3}{(2.0)\ (2.34 - 1)^3\ (1.5 \text{ to } 3.1)} = 200 \text{ to } 400 \text{ lbs.}$$

w_r = unit weight of armor stone (150 lbs/ft^3 for limestone)

H = wave height in feet

K_D = stability coefficient (2.0 for breaking waves and randomly placed, rough angular stone)

S_r = specific gravity of armor unit compared to seawater (150 ÷ 64 = 2.34)

$\cot\emptyset$ = angle of the structure measured from the horizontal (ranges from 1.5 to 3.1 for the existing revetment)

Limestone boulders between 200 and 400 pounds with a specific weight of 150 lbs/ft^3 are typically about 1.4 to 1.8 feet in size. North of the wooden stairs, rock size of the revetment varies between one and four feet with an average of about two feet. South of the wood stairs, the boulders range from three to five feet with an average of four feet. In both locations, the revetment rock is larger than the armor stone weight computed by the Hudson formula.

Some confidence regarding the weight of armor stone computed by the Hudson formula is provided by the line of boulders piled in the shallow water in front of TMKs 5-5-02:92 and 93 (Photo Nos. 6 and 7). These boulders were placed prior to 1958 and have generally remained in place for more than 38 years. Although they are basalt (which has a higher specific gravity than limestone), they are generally smaller than the size computed by the Hudson formula. They are also smaller than the rocks used for the revetment in front of TMK 5-5-02:86.

Summary Conclusions

This report has been prepared to meet the certification requirements of the City and County's Shoreline Setback Rules and Regulations and to provide other relevant technical information. Specific issues of the certification are as follows:

1. Need For the Structure to Stop Further Erosion. As detailed by the aerial photos from 1949 to 1995, retreat of unprotected shorelines in this area has been occurring for more than 40 years. Without a protective revetment, erosion of the beach frontage of TMK 5-5-02:86 would subject the house on the lot to wave damage in the forseeable future. The revetment that was constructed in 1989 has stabilized the lot's frontage, preventing further property damage.

2. Revetment Protection is the Best Alternative. Several lot owners installed boulder revetments. In the last two decades, most of the other lots along this shoreline also had revetments installed. The several remaining lots which have been left unprotected continue to experience erosion and shoreline retreat. With the number of revetments in place today, the only practical alternative to protect the house on TMK 5-5-2:86 was to construct a revetment. Although the revetment is not an engineered structure and its south end should have been extended higher up the slope, it is stable for the depth limited, maximum breaking wave height expectable. This is indicated by the empirical Hudson Formula and confirmed by the performance of the revetment since 1989.

3. Effect on the Adjacent Shoreline. For a more than 1500-foot long stretch of the Laie shoreline, only a 10-foot wide section to the north (TMK 5-5-02:67) and three contiguous lots to the south (the 200-foot frontage of TMKs 5-5-02:02: 92, 93 and 37) remain unprotected. All other lots are protected by boulder revetments or vertical seawalls. Shoreline retreat of the remaining unprotected lot frontages is definitely occurring. With the pattern of shoreline protection which has been established over the last several decades, an individual lot owner has little choice but to protect his property with a structure similar to the one in front of TMK 5-5-02:86.

Appendix A

Ground Level Photographs

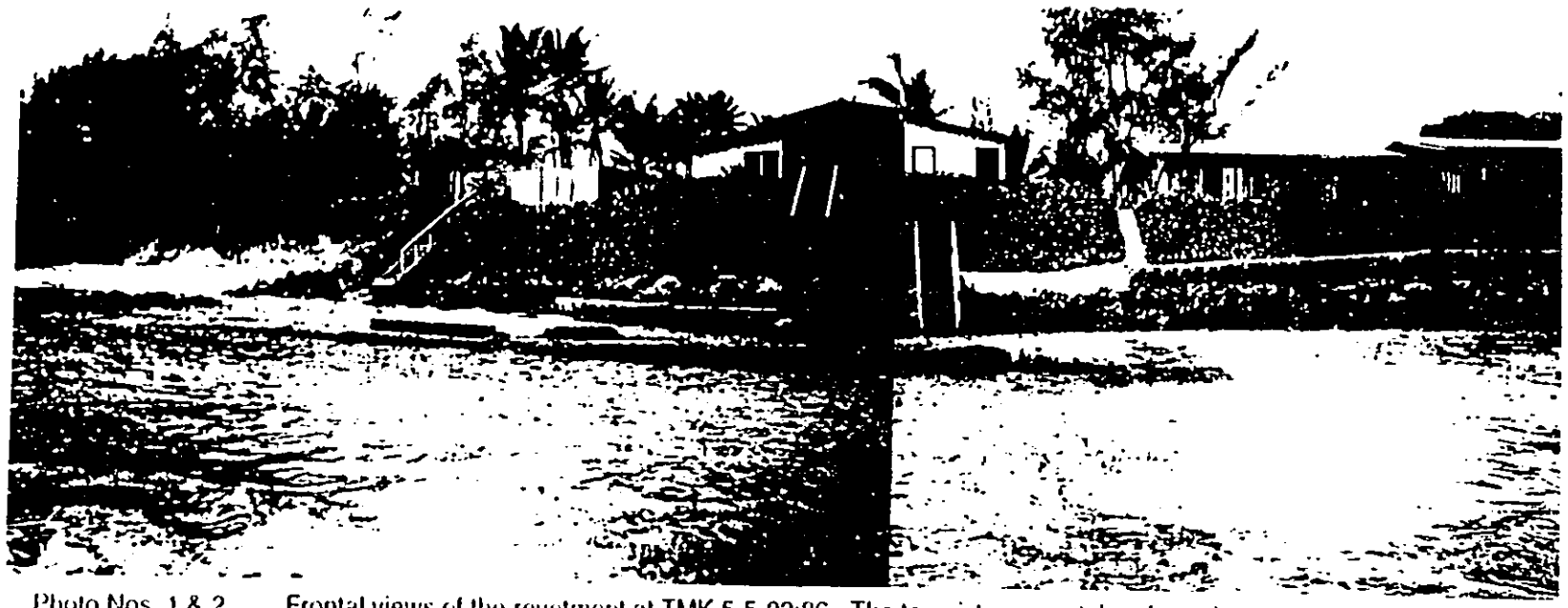


Photo Nos. 1 & 2. Frontal views of the revetment at TMK 5-5-02:86. The top picture was taken from the wall which is 30 to 40 feet offshore The bottom photo was taken from the sill which is 80 to 100 feet offshore

Photo No 3. This view of the revetment at TMK 5-5-02:86 shows the relationship of the collapsing wall at the foot of the revetment and boulders behind it.

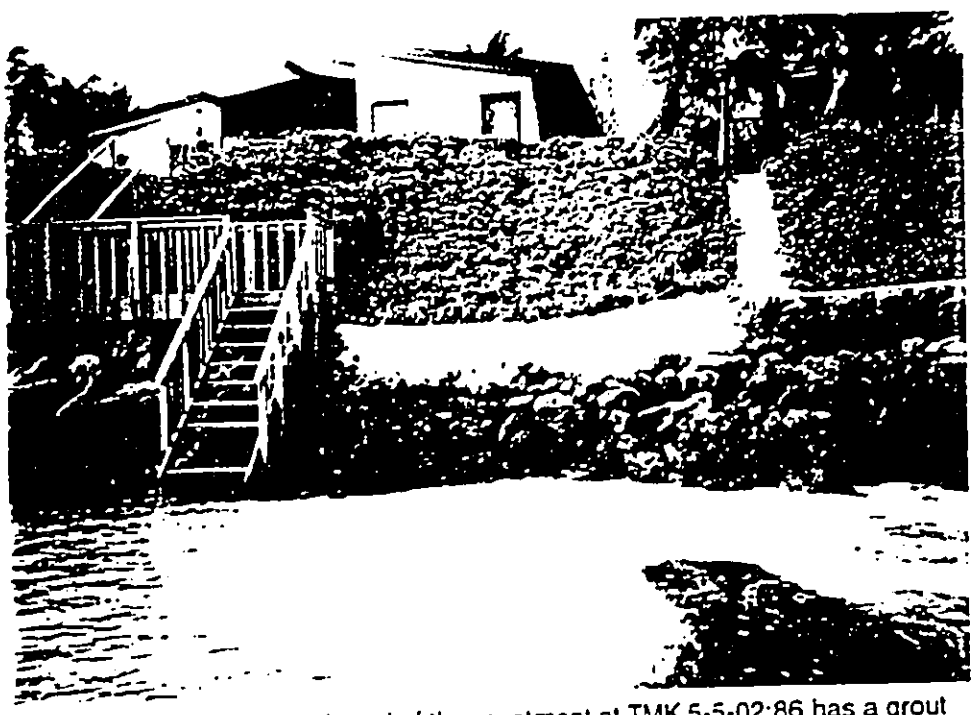


Photo No 4. The north end of the revetment at TMK 5-5-02:86 has a grout cap.

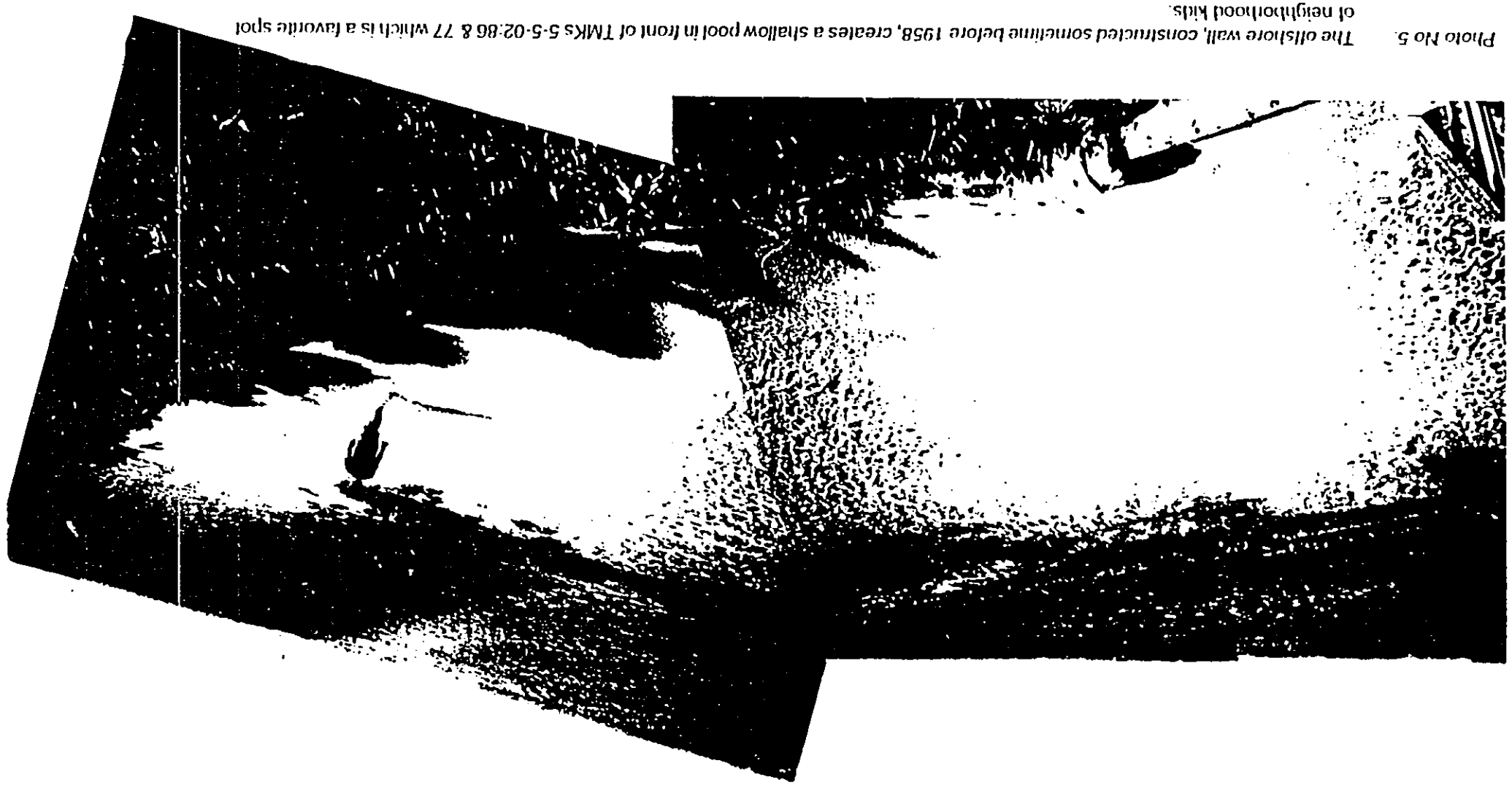


Photo No 5. *The offshore wall, constructed sometime before 1958, creates a shallow pool in front of TMKs 5-5-02:86 & 77 which is a favorite spot of neighborhood kids.*

Photo No 6. View of the basalt boulders in front of TMKs 5-5-02:92 & 93 taken at mid-tide.

Photo No. 7. Close up of the basalt boulders at low tide. These were placed sometime prior to 1958.

Photo No. 8. This erosion behind the revetment in front of TMK 5-5-02:77 occurred in November 1996.

Photo No. 9. Most of this erosion at the north end of TMK 5-5-02:92 also occurred in November 1996.

Photo Nos. 10 & 11. These photos show the shoreline retreat of the 200-foot length of the shoreline which is without revetment protection. The frontage includes three lots: TMK 5-5-02:92 is at right; 5-5-02:37 is on the left, and 5-5-02:93 is in the middle

Photo Nos. 12 & 13. These views of the nearshore sill were taken at mid-tide. The top photo is looking north and the bottom is looking south. At low tide, the sill is fully emerged.

Photo Nos. 14 & 15. This gap in the shoreline revetments is for the 10-foot wide shoreline access for TMK 5-5-02:67. TMK 5-5-02:34 is on the left and TMK 5-5-02:32 is on the right. This is the only break in shoreline protection to the north of the subject property.

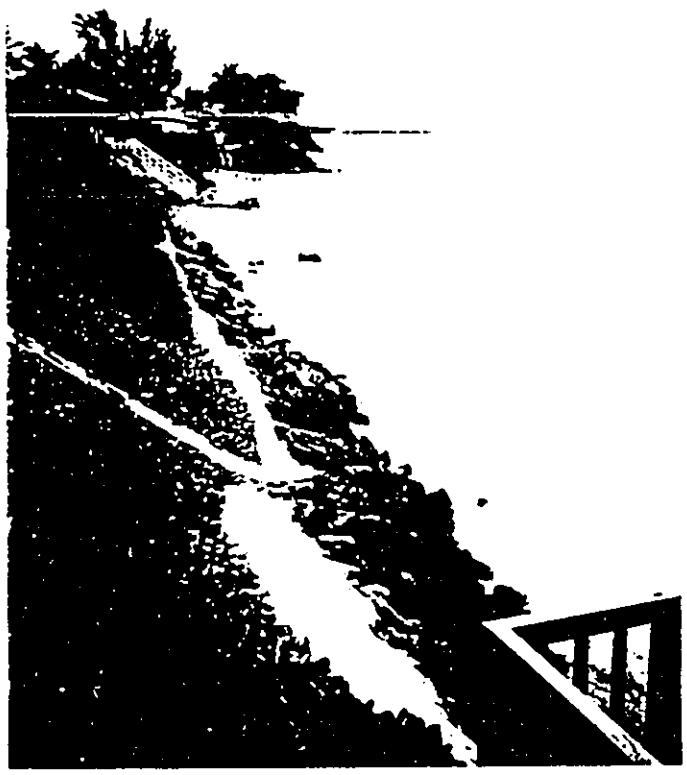


Photo No 16. Views of the shoreline to the north of the subject property. The sill is almost at the shoreline in front of TMK 5-5-02:95.

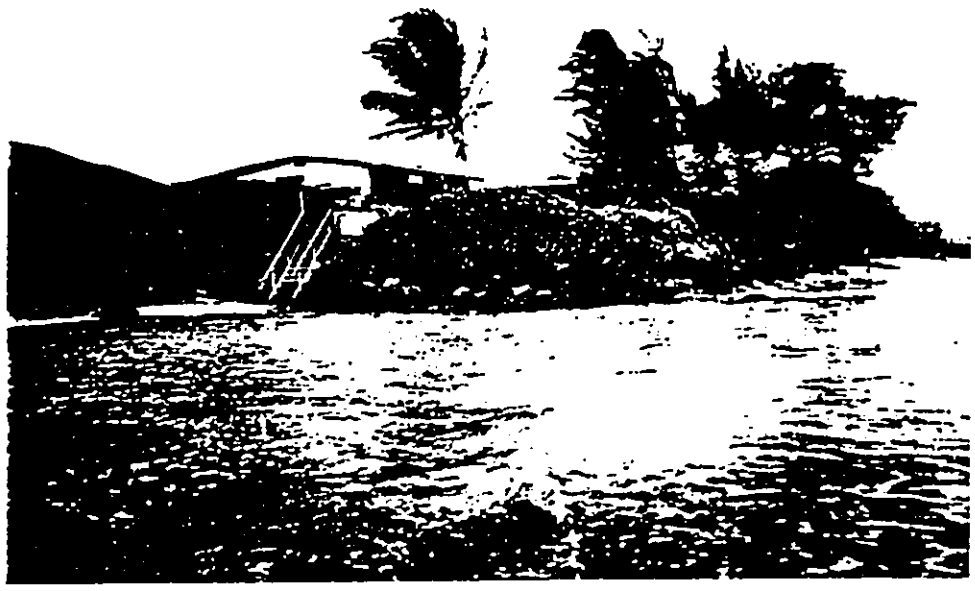


Photo No 17. Boulder revetment in front of TMK 5-5-02:95 which was constructed sometime prior to 1958.

Photo No 18. Grouted boulder revetment in front of TMK 5-5-02:35.

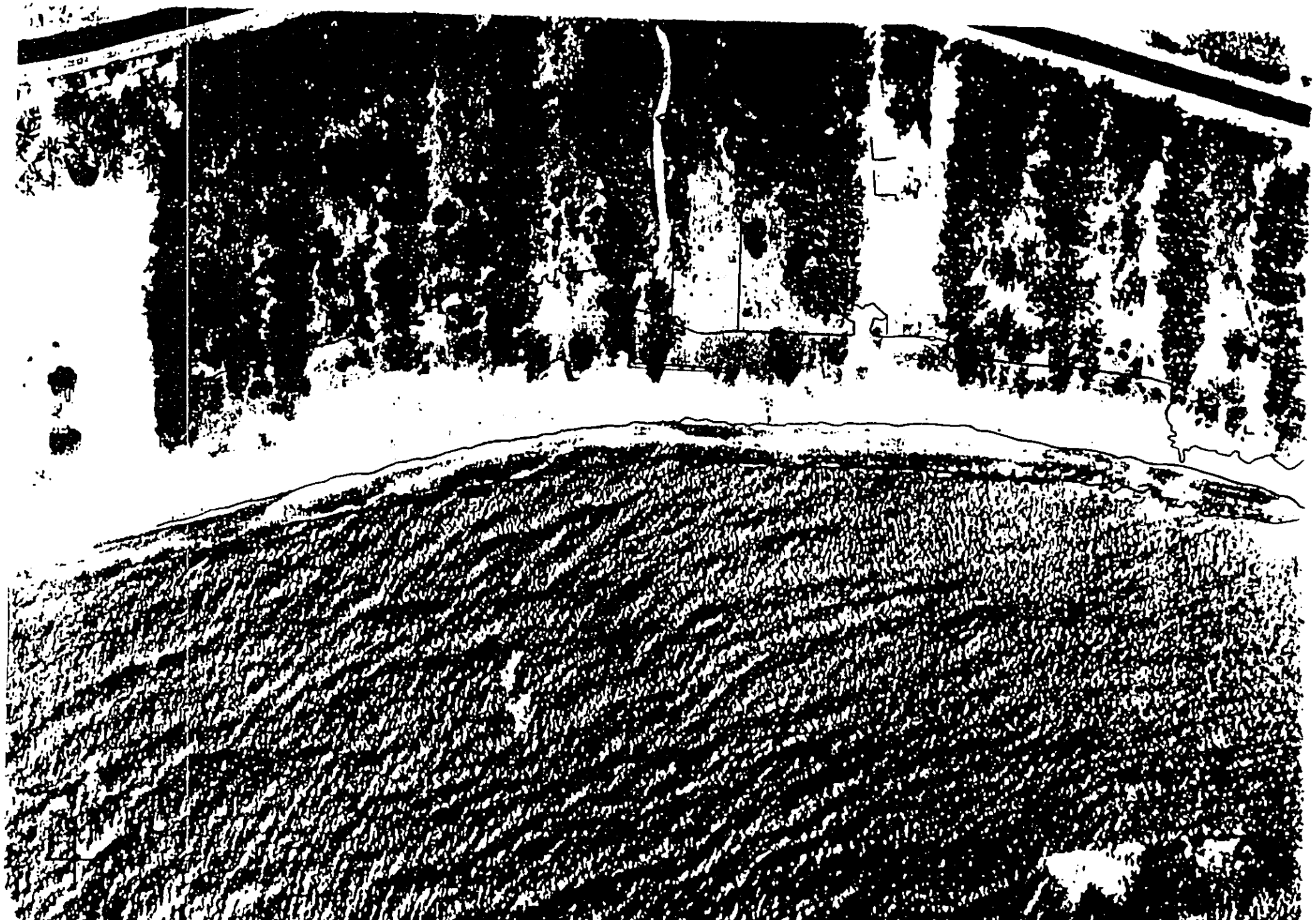
Photo Nos. 19 & 20. Views of the collapsed wall in front of TMK 5-5-02:81. Heavy rains during the week of November 5, 1996 created cracks. Subsequent high waves caused the wall to collapse.

Photo No 21. From right to left, this photo shows the shoreline frontages of TMKs 5-5-02:35, 80, 81 (the collapsed wall) and the north end of TMK 5-5-02:05.

Photo No 22. The north end of TMK 5-5-02:05 is without the boulder revetment which protects the southern half of the lot.

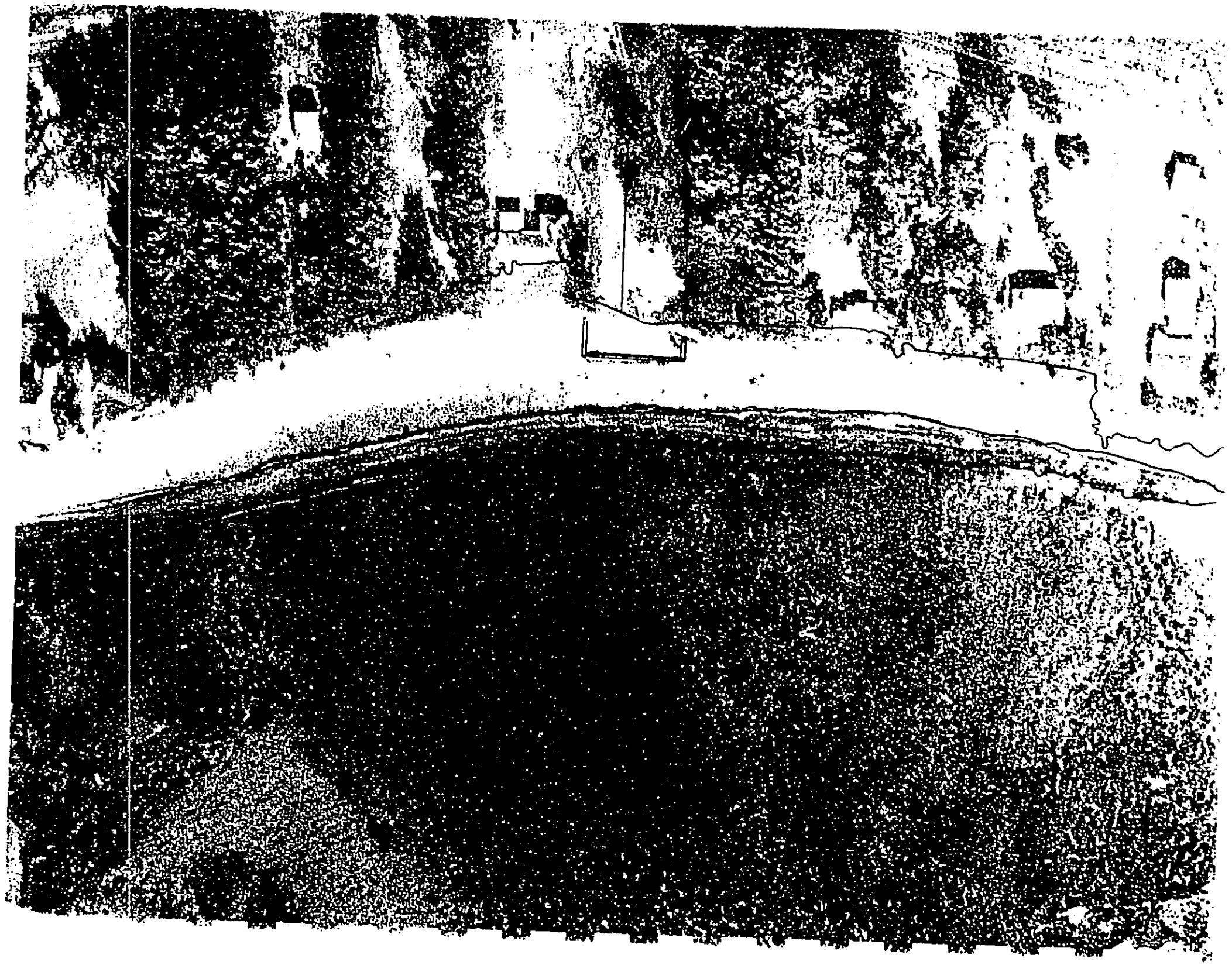
Appendix B

May 7, 1949 Aerial Photo With
Overlay of the 1995 Shoreline



Appendix C

June 19, 1958 Aerial Photo With
Overlay of the 1995 Shoreline



Appendix D

April 23, 1967 Aerial Photo With
Overlay of the 1995 Shoreline

Appendix E

May 26, 1972 Aerial Photo With
Overlay of the 1995 Shoreline

Appendix F

December 5, 1982 Aerial Photo With
Overlay of the 1995 Shoreline