2005-02-08-OA-FEA-HALEIWA BOAT HARBOR REPLACEMENT, REPAIRS AND IMPROVEMENTS

DEPARTMENT OF LAND & NATURAL RESOURCES
ENGINEERING DIVISION

FINAL
ENVIRONMENTAL ASSESSMENT

REPLACEMENT, REPAIRS & IMPROVEMENTS HALEIWA BOAT HARBOR

JOB NO. B76DO70A

HALEIWA, WAIALUA DISTRICT
CITY & COUNTY OF HONOLULU
TMK: 6-2-03: 11

Project Consultants:
NISHIMURA, KATAYAMA & OKI, INC.
CONSULTING STRUCTURAL ENGINEERS
826 Kaheka Street, Suite 302
Honolulu, HI 96814

Prepared by:
W.Y. THOMPSON, P.E.
98-1051 Kahapili Street
Aiea, HI 96701

JANUARY 2005

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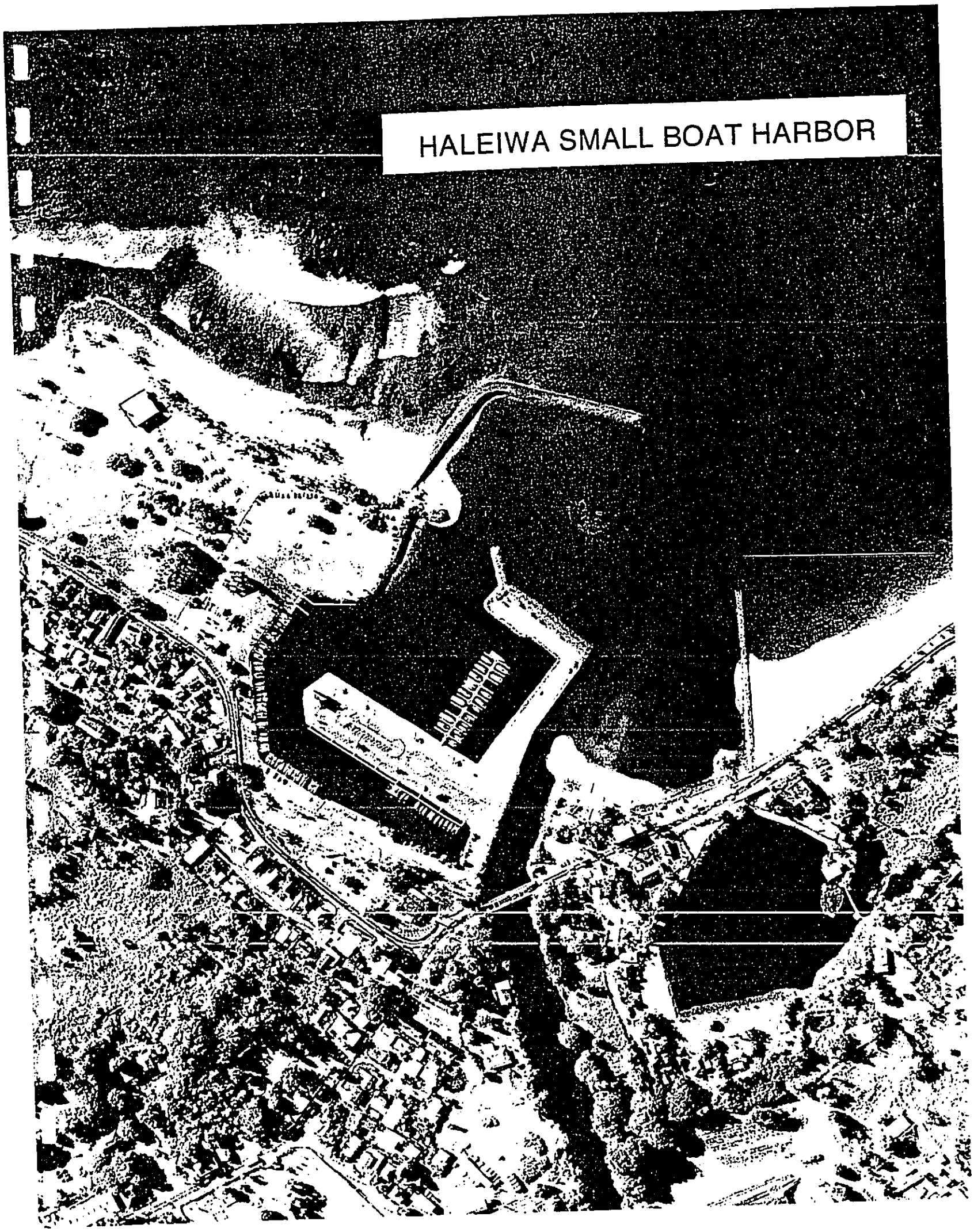

HALEIWA SMALL BOAT HARBOR

TABLE OF CONTENTS

DRAFT ENVIRONMENTAL ASSESSMENT

For The

REPAIRS, REPLACEMENT & IMPROVEMENTS, HALEIWA BOAT HARBOR

Job No. B76D070A

Haleiwa, Waialua District, Oahu

SUMMARY

NEW PIER, HALEIWA HARBOR

The construction of a new floating pier is being proposed for the Haleiwa Boat Harbor. Since the inception of the harbor, which was largely developed in 1966 with subsequent additions, plans to increase the number of mooring facilities has been a priority item. The proposed project is designed to provide 22 additional boat slips.

This project consists of a floating pier supported by precast, prestressed, reinforced concrete piles. The central walkway and finger piers will consist of aluminum frames supporting fiberglass grating decking. These walkway and finger piers will be supported by cast-in-place reinforced concrete pile caps constructed on top of driven piles. The fiberglass grating is being used to reduce uplift forces on the structure caused by wave surges. Recycled plastic lumber will be specified for construction where wood is normally used. The fender system will be rubber. Water and electrical service will also be provided.

Impacts from traffic, noise, vibration, dust, etc., will be generated during construction and will be of a temporary nature. Conditions will return to normal after construction is completed. Mitigation measures will be taken to control pollution of the harbor's water during construction.

The cost estimate for this project is $850,000 and the construction period will be approximately 12 months after award of contract.

SECTION 1

PROPOSING AGENCY & ACCEPTING AUTHORITY

APPLICANT FOR PROJECT:

The applicant for this project is:

Department of Land & Natural Resources
1151 Punchbowl Street, Room 130
Honolulu, HI 96813

The contact person for the agency is:

Eric Hirano, Chief Engineer
Engineering Division
Department of Land and Natural Resources
1151 Punchbowl Street, Room 221
Honolulu, HI 96813
Phone: (808) 587-0230

APPROVING AGENCY:

The approving agency is the Department of Land and Natural Resources whose address is:

Kalanimoku Building, Room 130
1151 Punchbowl Street
Honolulu, HI 96813

Contact person is:

Eric Hirano, Chief Engineer
1151 Punchbowl Street, Room 221
Honolulu, HI 96813
Phone: (808) 578-0230

SECTION 2

LIST OF CONSULTED PARTIES

Federal:
- U.S. Coast Guard
- U.S. Fish & Wildlife Service
- U.S. Geological Survey
- U.S. Marine Fisheries Service
- U.S. National Resources Conservation Service
- National Park Service: Historic Preservation
- U.S. Army District Honolulu

State:
- Department of Health (3 copies)
- Department of Land (4 copies)
- Department of Planning, Economic Development & Tourism
- Department of Transportation
- Department of Hawaiian Homes Lands
- Office Hawaiian Affairs
- U.H. Environmental Center
- Senator Robert Bunda
- Representative Michael Magaoay
- Waialua Public Library

City & County:
- Department of Transportation Services
- Department of Planning & Permitting
- Department of Parks & Recreation
- Honolulu Police Department
- Council Chairperson Donovan DeLa Cruz

Others:
- Audubon Society
- Sierra Club
- Manu O Kekai Canoe Club
- North Shore Canoe Club
- Haleiwa Main Street
- Waialua Ad Hoc Committee
- Friends for Waialua Town
- Waialua Boat Club
- Haleiwa Trolling Association
- Waialua Hawaiian Civic Club
- Sunset Beach Community Association

SECTION 3

SUMMARY DESCRIPTION OF AFFECTED ENVIRONMENT

GENERAL DESCRIPTION:

The Haleiwa Boat Harbor is located in the District to Waialua, City and County of Honolulu, Island of Oahu. The harbor area is a part of what is often referred to as the North Shore which is famous for its spectacular surfing sites. (See **DRAWING NO. 1: GENERAL LOCATION PLAN)**

Haleiwa town is the commercial center for this district and is comprised small shops, restaurants and other types of service establishments which are inter-mingled and surrounded by residential dwellings. The other population center is the town of Waialua which is more residential in nature and is much smaller than Haleiwa.

The designations for the project site are as follows:

1. State Land Use Designation - Urban (See **DRAWING NO. 2: STATE LUC DESIGNATION);**
2. Rural District Boundary - Rural Community (See **DRAWING NO. 3: RURAL DISTRICT COMMUNITY);** and
3. North Shore Sustainable Community Plan - Country Town (See **DRAWING NO. 4: NORTH SHORE SUSTAINABLE COMMUNITY PLAN)**

The principal roads leading to the harbor area are the Kaukonahua Road from the Central Oahu direction and Kamehameha Highway from both the Central Oahu and Kahuku directions. The access to the harbor is from Haleiwa Road which is under the jurisdiction of the City and County of Honolulu.

CLIMATE:

The climate at Haleiwa is considered to be semi-tropical, experiences an average annual rainfall of 28 inches and an average temperature of 70 degrees F. The prevailing winds, referred to as the tradewinds, are from the northeast and usually varies from 10 to 20 m.p.h. These tradewinds usually occur about 50% of the time

between January and March and 90% of the time during June and through August.

FAUNA SURVEY:

As the project area is a man-made landfill for maritime use, it is not a quality habitat for native birds or animals. Approximately 12 miles area, is the James Campbell Wildlife Refuge which supports native water birds. These birds can be expected to fly over the project area at times. Also, native seabirds may fly over the project area.

The bird and mammal fauna, native and introduced species, of the general area includes those classified endangered or threatened by the U.S. Fish and Wildlife Service. These may enter or fly over the project area, namely, the Newells' Shearwater, Dark-rumped Petrel, plus four water birds - the Hawaiian Stilt, the Hawaiian Duck, the Hawaiian Coot, the Hawaiian Gallinule and the Bristle-thighed Curlew. Scientific description is provided in **APPENDIX A: FAUNA SURVEY.**

The complete list of native and introduced birds are listed in **APPENDIX A.** The introduced birds are those that also can be found elsewhere on the island.

The Hawaiian Bat and the Hawaiian Monk Seal, both endangered mammal species, may come near the project site. Other mammals that may be found in or around the project site are introduced species such as the Rat, Mouse, Cat, Dog and Mongoose. These are unwanted and considered pests. **APPENDIX A** describes the native and introduced mammals.

A threatened and protected reptilian species that frequents the nearby shoreline is the green sea turtle (its Hawaiian name is the *Honu*) as listed in **APPENDIX A.** It is herbivorous and feeds on seaweed. It may enter the harbor site in search of food. Local fishermen are aware of the protective status of the green sea turtle and avoid contact. This stipulation to protect the turtle will be described in the project specifications.

FLORA SURVEY:

The area of the project is man-made and does not have a natural environment. There is no significant landscaping save for a median strip with lawn grass and a few scattered trees on the mole. These are the banyan (ficus) and *wiliwili* (erythrina sandwicensis). In this respect, no flora assessment has been made.

SOILS:

The soils in the general area of the harbor are classified as the Kaena-Waialua Association. These soils, on coastal plains, talus slopes and in drainage ways are deep, generally level to gently sloping, and poorly to excessively drained. The sub-soil and underlying material are fine to coarsely textured. The primary soils surrounding the harbor are the Jaucas sand and the Haleiwa soil series. These soils are considered to be well to excessively drained soils which are suitable for cultivation and were planed with sugar canes during the plantation days. The soils are also referred as Sugarcane Group 1.

While these soils underlie the harbor area, the project site itself is a man-made, built-up area.

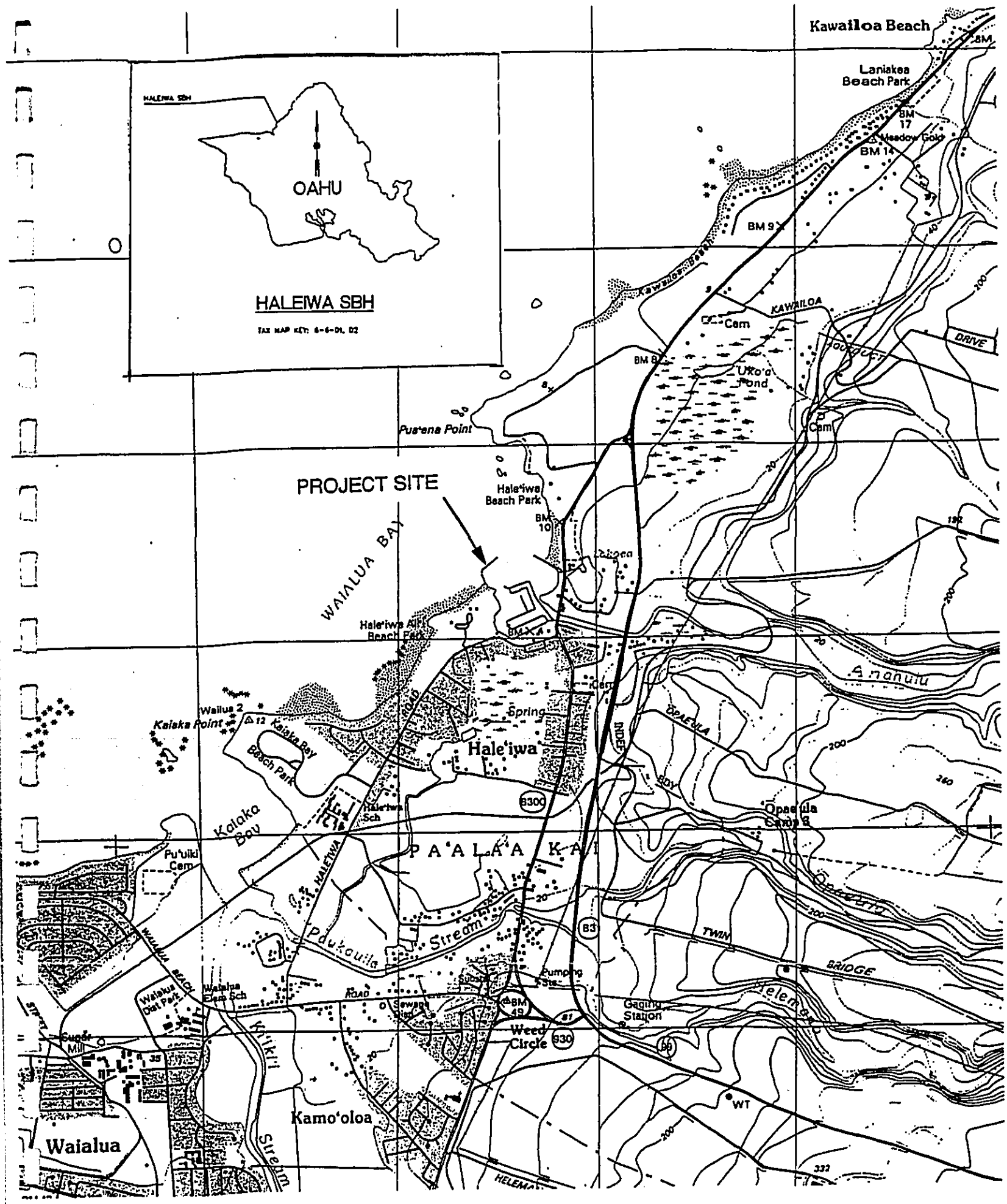
UTILITIES:

Water Service - Provided by the Board of Water Supply, City and County of Honolulu;

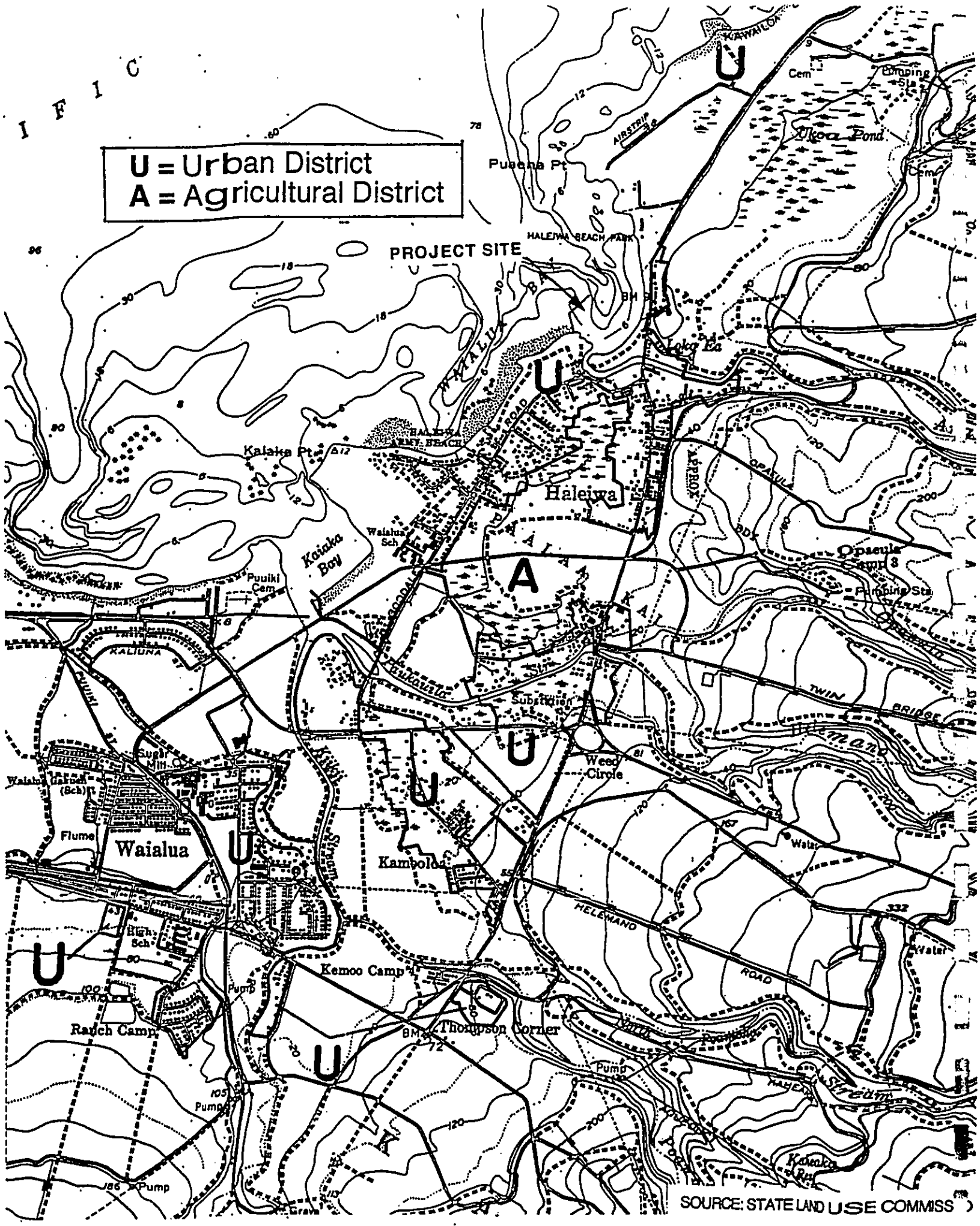
Electrical Service - Provided by the Hawaiian Electric Light Company, Inc.; and

Telephone Service - Provided by Verizon Hawaii, Inc.

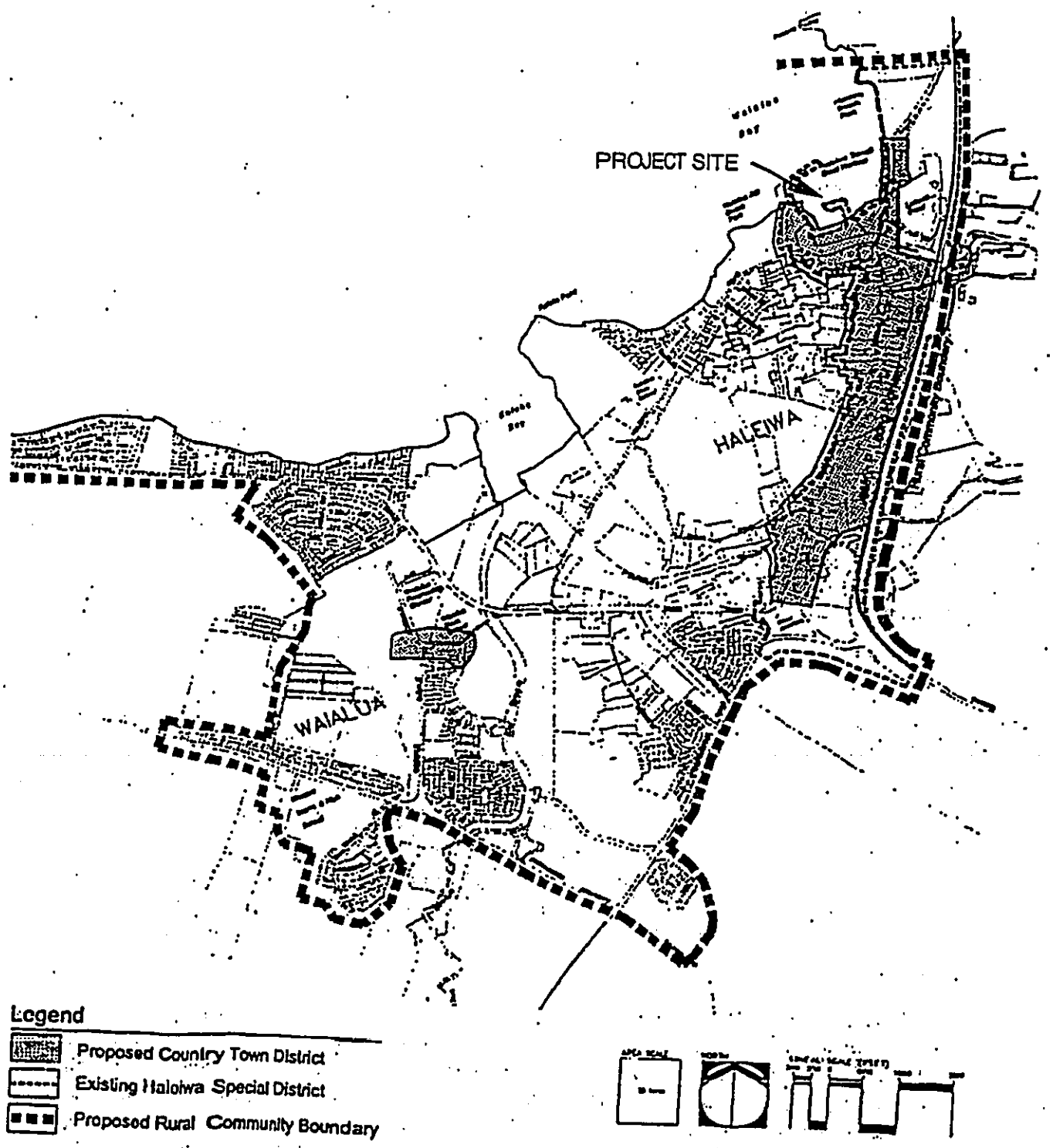
There is no municipal sewer service provided to the harbor. There is a public restroom located in the harbor's Administration Building which has a self-contained sewage disposal unit.



DRAWING NO. 1: GENERAL LOCATION PLAN



DRAWING NO. 2: STATE LUC DESIGNATION

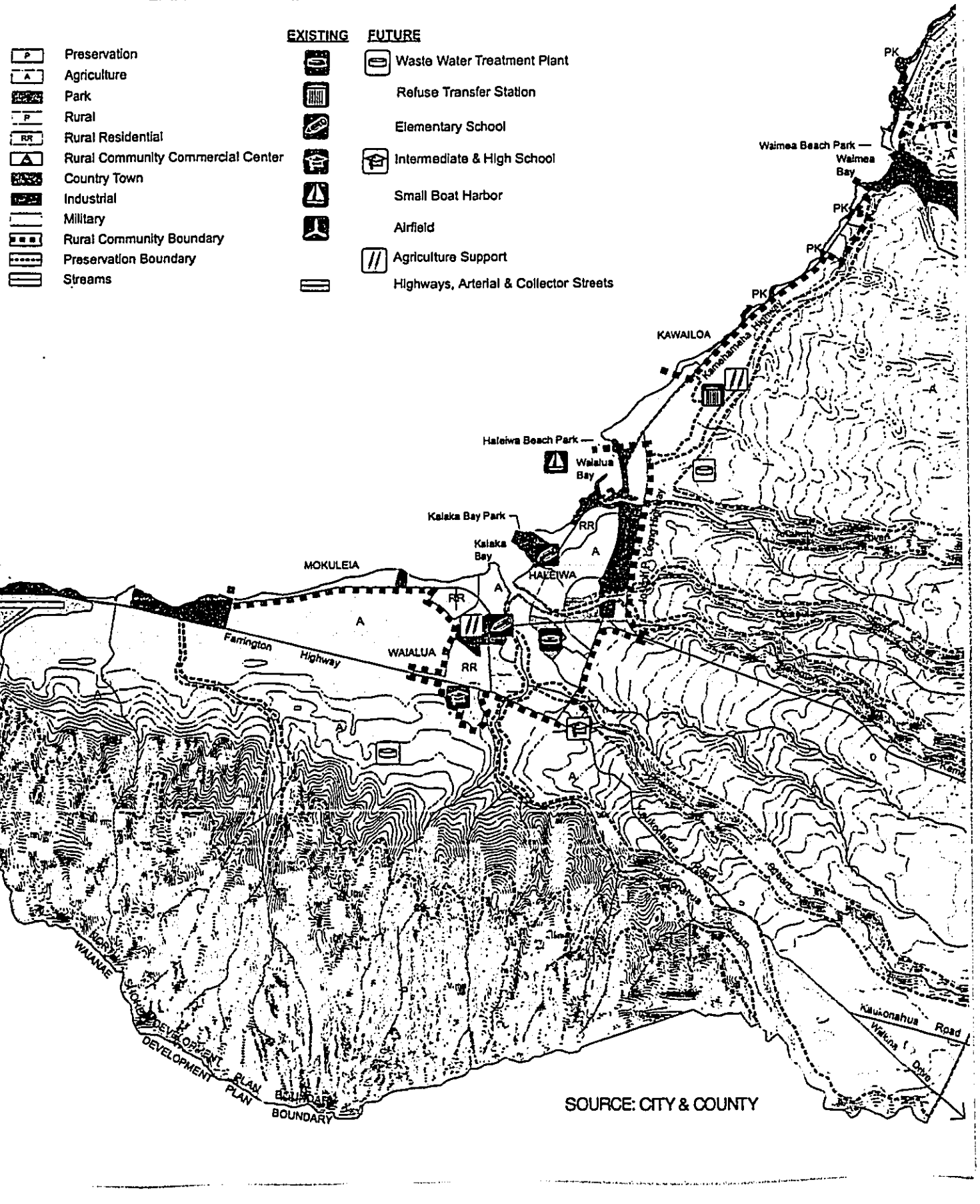


SOURCE: CITY & COUNTY

DRAWING NO. 3: RURAL DISTRICT BOUNDARIES

DRAWING NO. 4

NORTH SHORE
SUSTAINABLE COMMUNITIES PLAN
LAND USE MAP



SECTION 4
GENERAL DESCRIPTION
4A: TECHNICAL CHARACTERISTICS

HALEIWA BOAT HARBOR:

The Haleiwa Boat harbor has been constructed in several phases. Refer to Page 1 and Figure 3 of **APPENDIX B: MARINE ENVIRONMENTAL ASSESSMENT**, for the construction sequence for the harbor's improvements.

Currently, there are 67 boats moored in the inner (south) basin and 24 at the existing Pier 200 in the outer (north) basin. There are approximately 56 names on a list for people who are waiting for slip accommodation. See **DRAWING NO. 5: HALEIWA SMALL BOAT HARBOR.** See also **DRAWING NO. 5A: TAX MAP LOCATION.**

There are boat launching ramps and as well as boat trailer parking area located at the west side of the harbor. On a normal week day, 15 to 20 boats are launched from the ramps. The numbers increase to 40 to 50 boats on week ends and, during fishing tournaments, the number of boats launched may be as high as 100 to 150 boats.

The harbor has a total of 31.024 acres under the Governor's Executive Order No. 2596. The project site location is shown in **DRAWING NO. 6: PROJECT SITE PLAN.**

NATURAL FORCES:

The weather pattern is dominated by trade wind conditions from April through October. During November through March, infrequent storm conditions can develop. Wind-generated waves during average weather conditions are usually less than 3 feet in height measured at the breakwater.

Since Haleiwa SBH is exposed to deepwater waves that approach from the north to northwest directions. These waves are refracted such that they approach the breakwater from the northwest. The major storm patterns affecting the island of Oahu are the Aleutian

Cold Fronts, Kona low pressure troughs, and tropical cyclones. The Aleutian Cold Front produce the largest waves on the north shore caused by the winds are associated with these storms blow with high velocity over long ocean fetches. These waves typically have heights of 15 feet. The Kona low pressure troughs with its southerly winds which generate high waves approach the island from the south. Due to the northerly exposure of Haleiwa SBH, it is not affected by these waves. The tropical cyclones or hurricanes are not a yearly occurrence. The northeast tradewind generated waves are present most of the year. They are most frequent during the summer months with heights of 4 to 12 feet. A brief summary of **APPENDIX B: MARINE ENVIRONMENTAL ASSESSMENT.**

1. Winds - predominately northeast trades with typical speeds ranging from 10 to 20 mph;
2. Tides - Mean higher water, 1.6 ft.; Mean sea level, 0.7 ft.; and mean lower low water, 0.0 ft.; and
3. Waves - Typically 4 to 12 feet high with periods ranging from 6 to 10 seconds; and during winter months up to 15 feet high with periods ranging from 12 to 20 seconds.

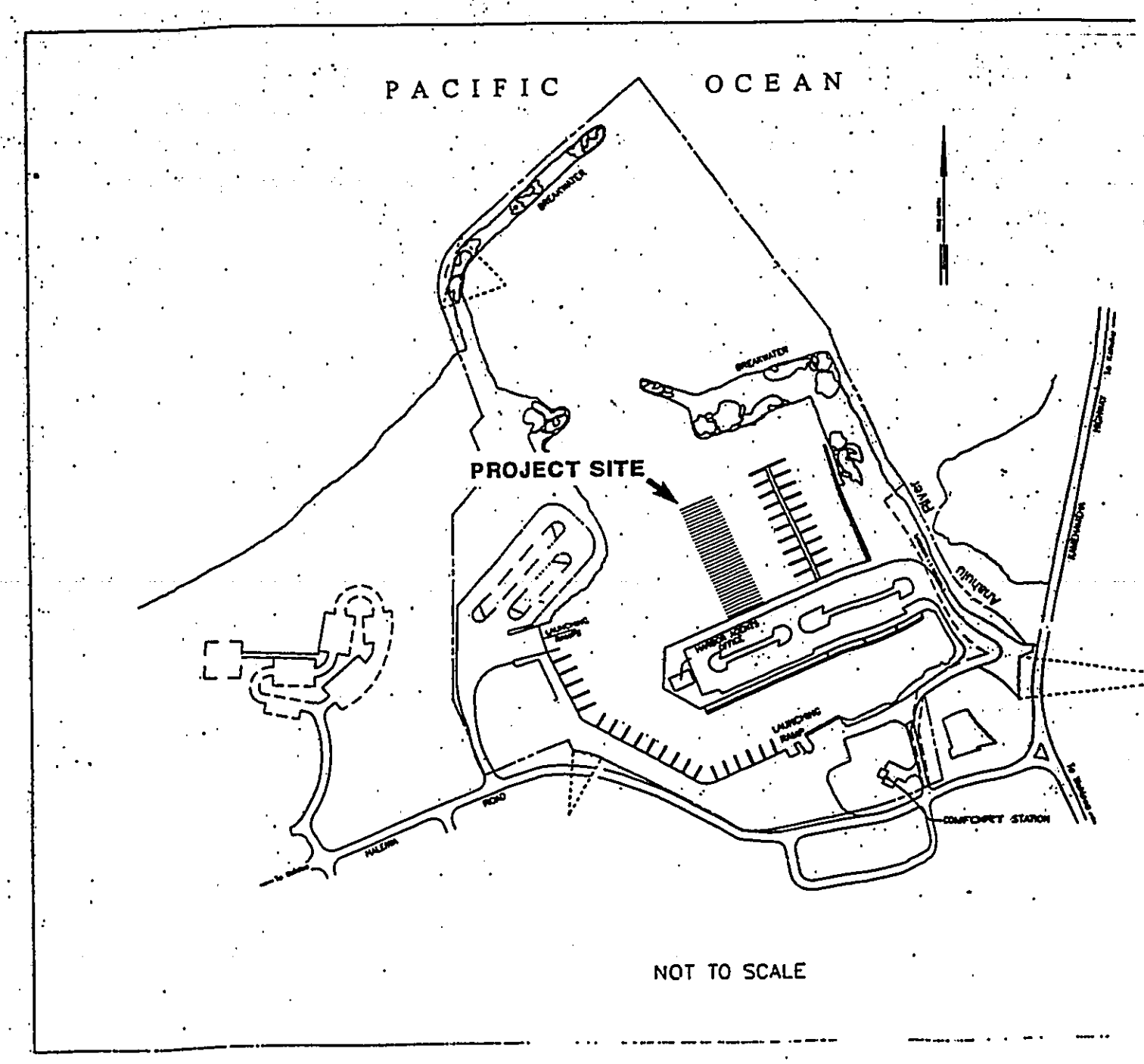
PROPOSED NEW PIER:

The structural system for the pier can be described as a floating pier held in place by precast, prestressed, reinforced concrete piles. Refer to **DRAWING NO. 7: FLOATING DOCK PLAN.** The floating dock will be a pre-fabricated dock system of rust-resisting aluminum frames and decking. The floating dock system will move freely on guided piles. The buoyant shell members will have expanded polystyreme foam with a minimum 20 year UV radiation life. Other materials incorporated in the project- ducts, pipes, fittings, etc.- will be suitable for use in a marine environment.

The 24-inch octagonal precast, prestressed, reinforced concrete piles for this project will be cast at an off-site location and trucked to the project site. The piles will be approximately 60 to 70 feet in length. At the project site, the

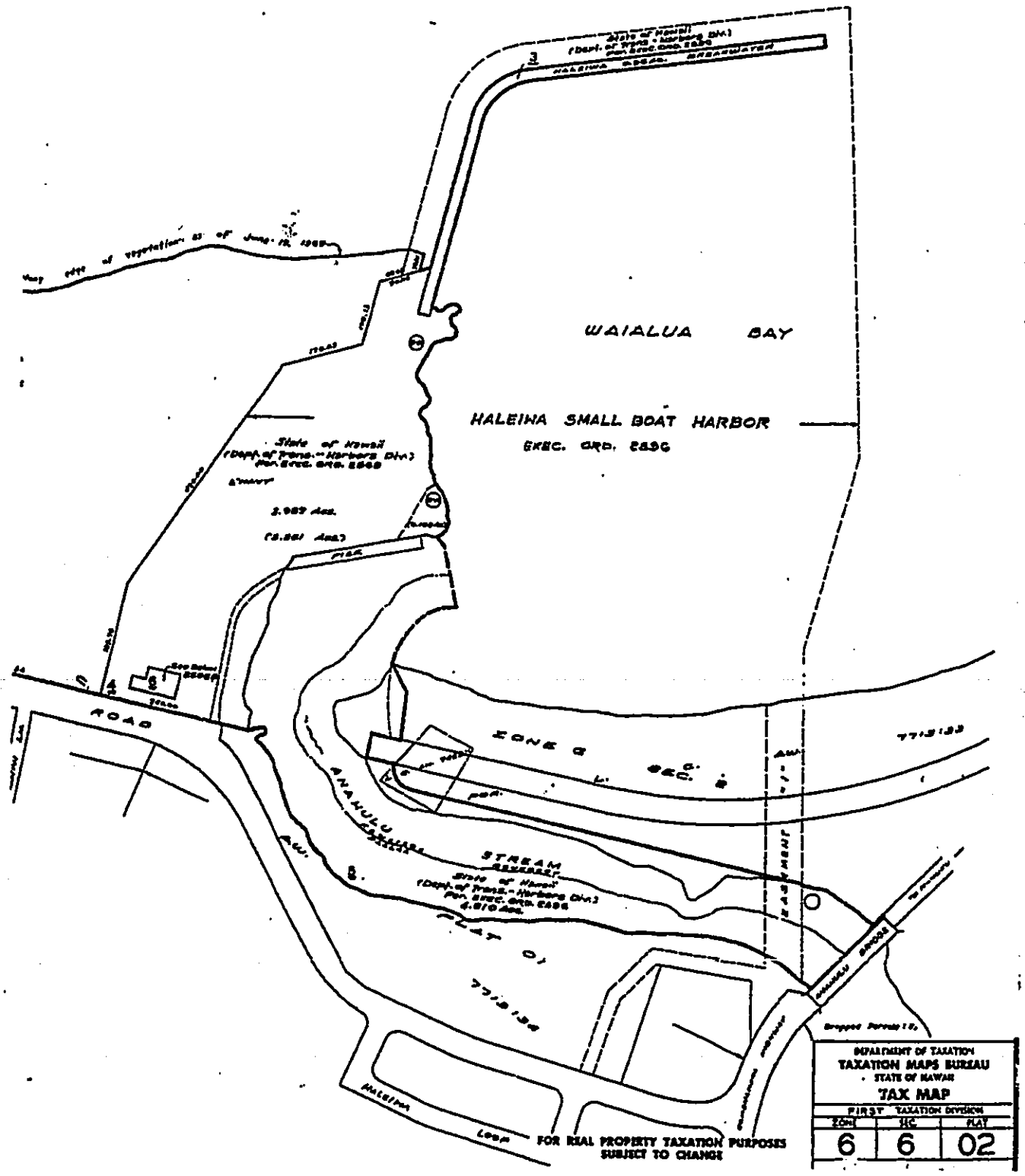
piles will be driven to the depth required to meet design loads and the tops will be cut off down to the required top of the pile elevation. The boring logs of the harbor bottom are shown in **APPENDIX C: TEST BORINGS**

Other improvements will include modular marina power centers which will provide electrical power and water service for each berthing slip. Refer to **DRAWING NO. 8: MODULAR MARINA POWER CENTER.** Fire extinguishers will be provided accessible to each berthing slip. The project will be in compliance with Americans with Disability Act (ADA) regulations. The new pier will provide 22 berthing slips.

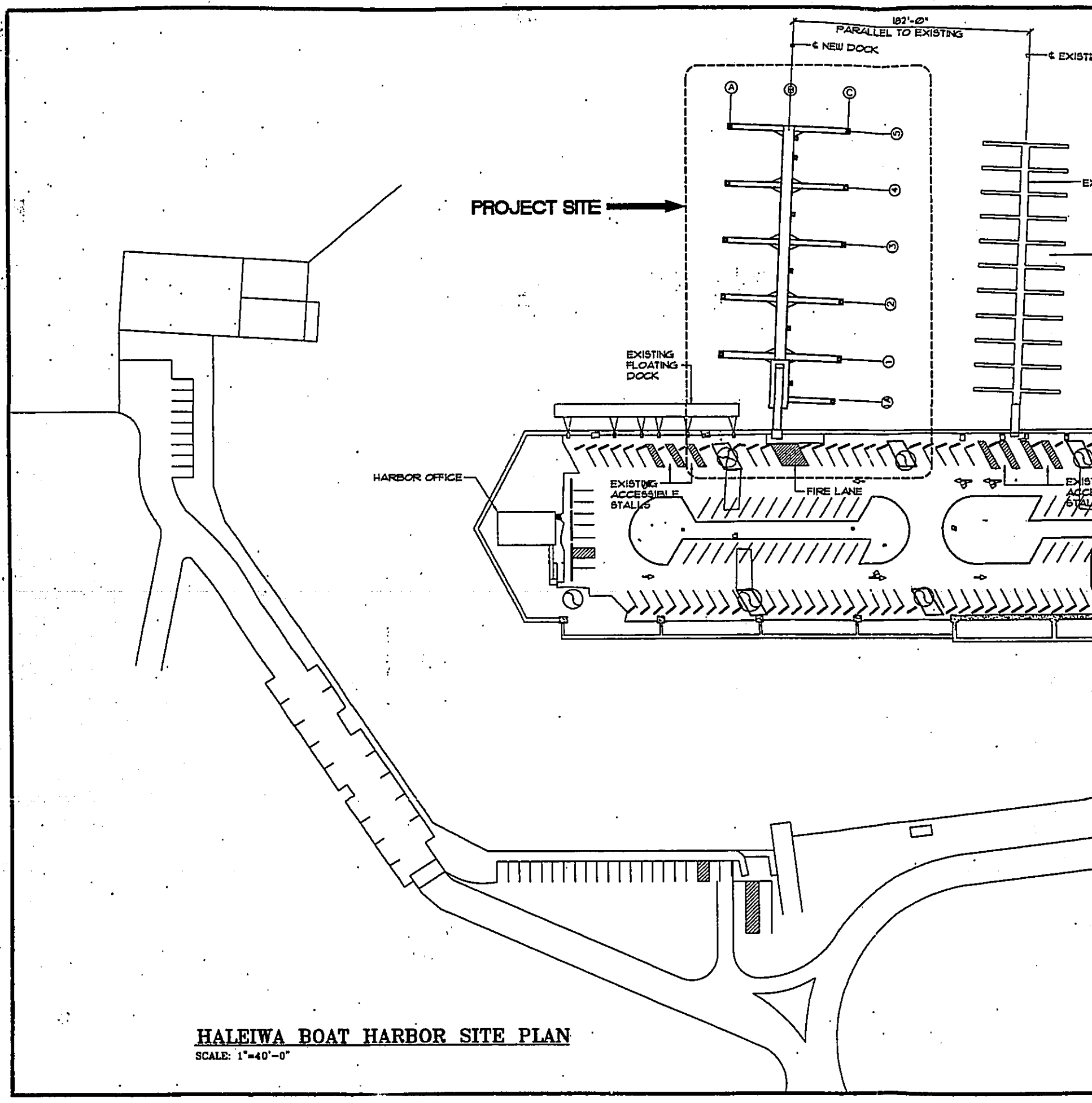


NOT TO SCALE

DRAWING NO. 5: HALEIWA SMALL BOAT HARBOR

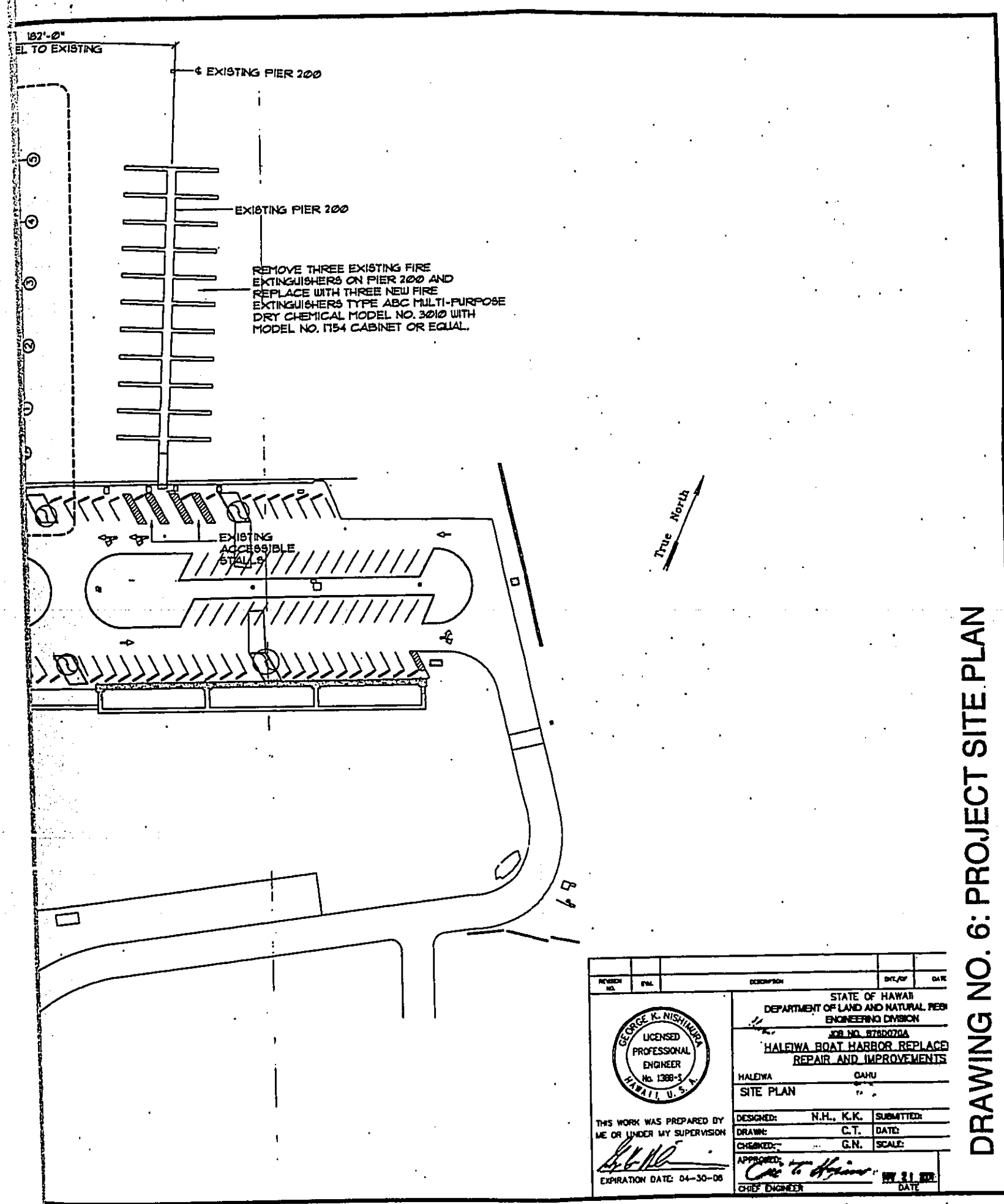


DRAWING NO. 5A: TAX MAP LOCATION



HALEIWA BOAT HARBOR SITE PLAN

SCALE: 1"=40'-0"



REVISION NO.	INIT.	DESCRIPTION	INIT./CK'D	DATE

GEORGE K. NISHIMURA
LICENSED PROFESSIONAL ENGINEER
No. 1388-S
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

EXPIRATION DATE: 04-30-06

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

JOB NO. 878D070A

HALEIWA BOAT HARBOR REPLACED REPAIR AND IMPROVEMENTS

HALEIWA OAHU

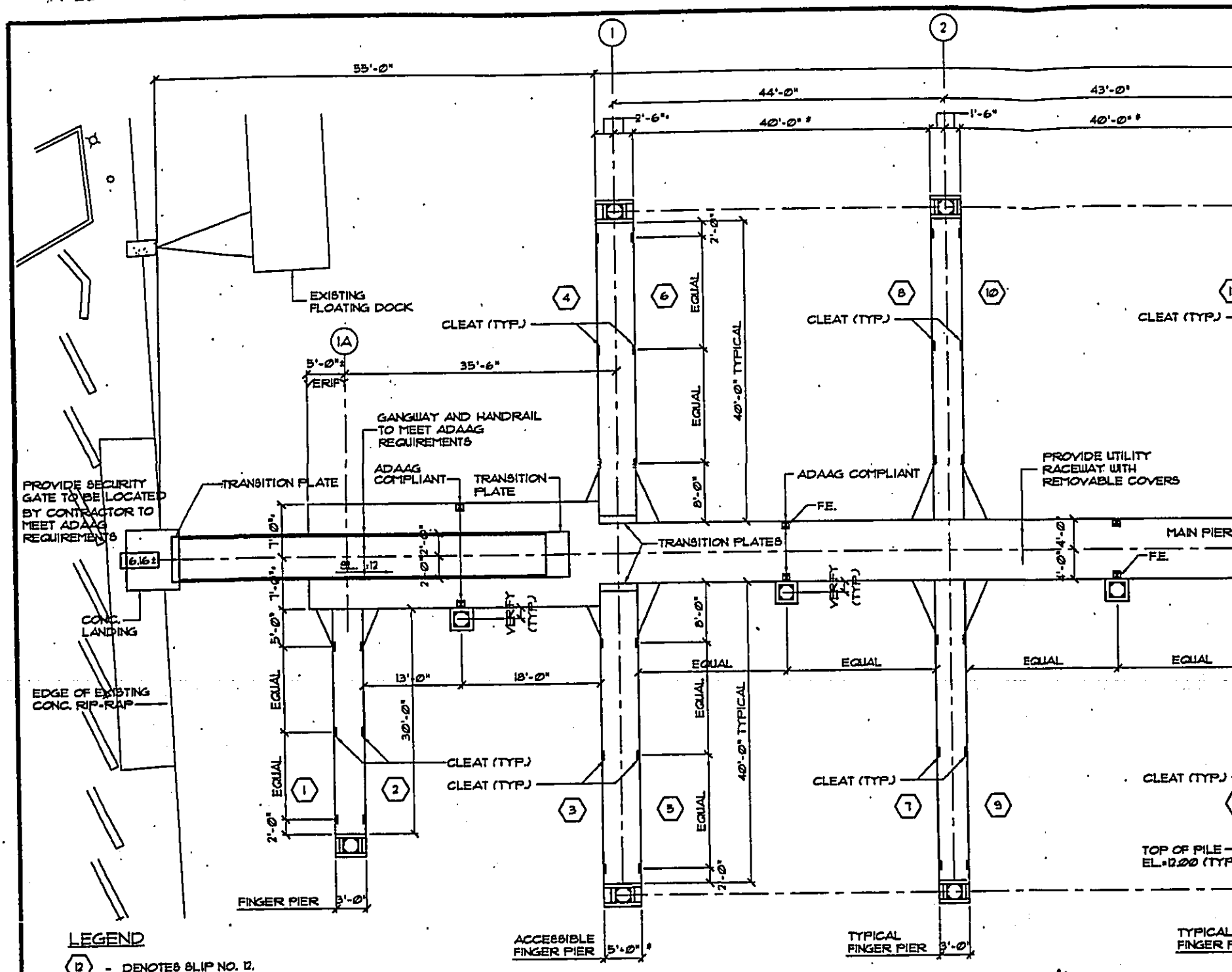
SITE PLAN

DESIGNED:	N.H., K.K.	SUBMITTED:	
DRAWN:	C.T.	DATE:	
CHECKED:	G.N.	SCALE:	

APPROVED: _____ NOV 21 2005
CHIEF ENGINEER DATE

DRAWING NO. 6: PROJECT SITE PLAN

JOB NO. 878D070A



LEGEND

(12) - DENOTES SLIP NO. 12.

▣ - DENOTES PILES WITH GUIDE AND FRAME.

▪ - MODULAR MARINE POWER CENTER WITH TWO (2) ¾" HOSE BIBBS.

F.E. - DENOTES FIRE EXTINGUISHER WITH CABINET MOUNTED ON MODULAR MARINE POWER CENTER. F.E. SHALL BE ABC MULTI-PURPOSE DRY CHEMICAL MODEL NO. 3010 WITH MODEL NO. 1754 CABINET OR EQUAL.

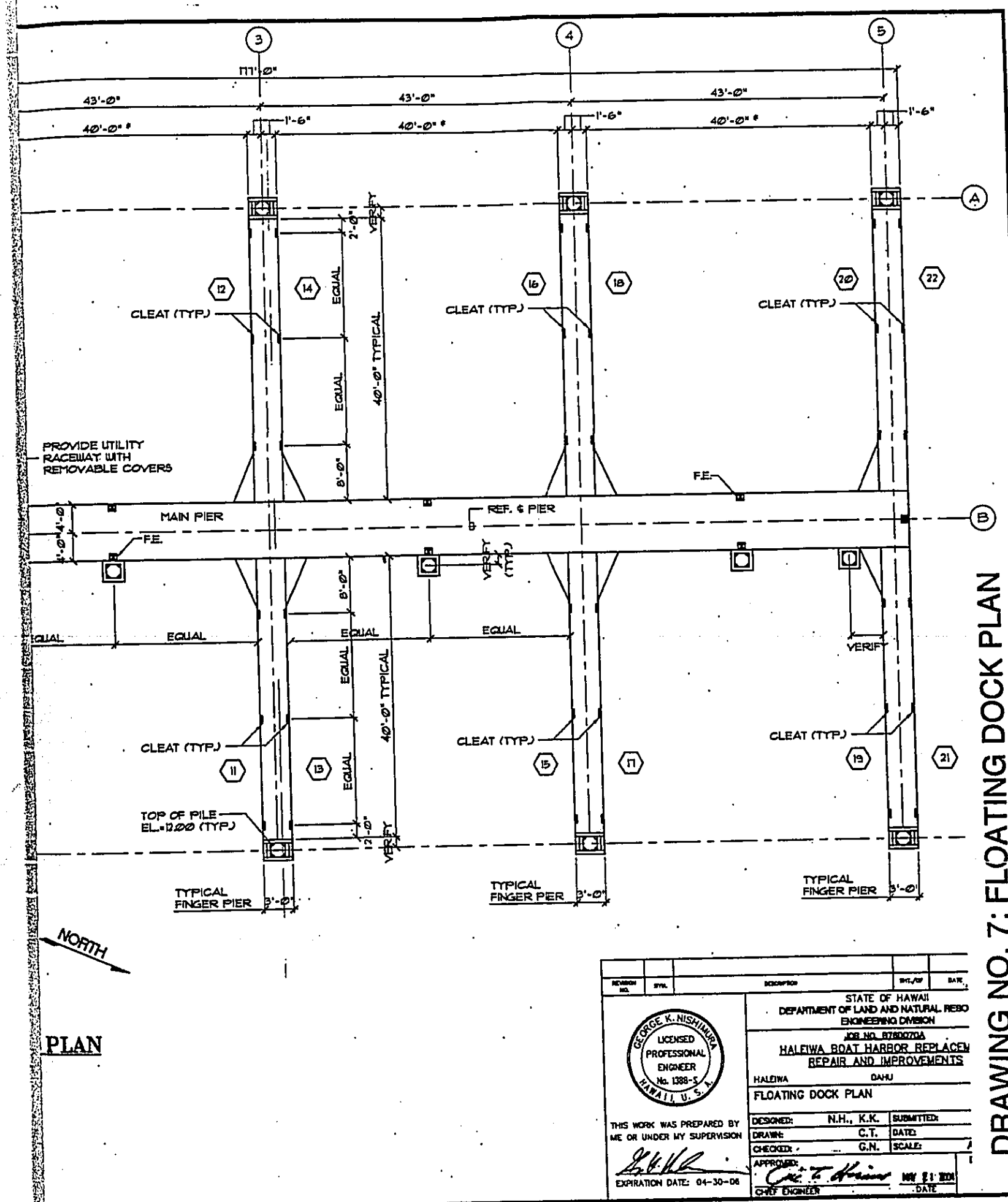
* - DENOTES DIMENSIONS NOT TO BE ALTERED.

NOTE:

1. THE FLOATING DOCK SYSTEM SHALL HAVE UTILITY RACEWAYS, WITH REMOVABLE COVER, ON BOTH SIDES OF THE DECK. THE INSTALLATION OF THE FLOATING DOCK SYSTEM SHALL INCLUDE CONNECTING THE FLEXIBLE ELECTRICAL LINES TO THE LIGHTING AND POWER OUTLETS AND THE FLEXIBLE WATER LINES TO THE HOSE BIBBS AT THE MODULAR MARINE POWER CENTERS.

FLOATING DOCK PLAN

NOT TO SCALE



REVISION NO.	SYM.	DESCRIPTION	INIT./CK	DATE

GEORGE K. NISHIMURA LICENSED PROFESSIONAL ENGINEER No. 1388-S HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

EXPIRATION DATE: 04-30-06

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESO
ENGINEERING DIVISION

JOB NO. B76D070A

HALEIWA BOAT HARBOR REPLACEM
REPAIR AND IMPROVEMENTS

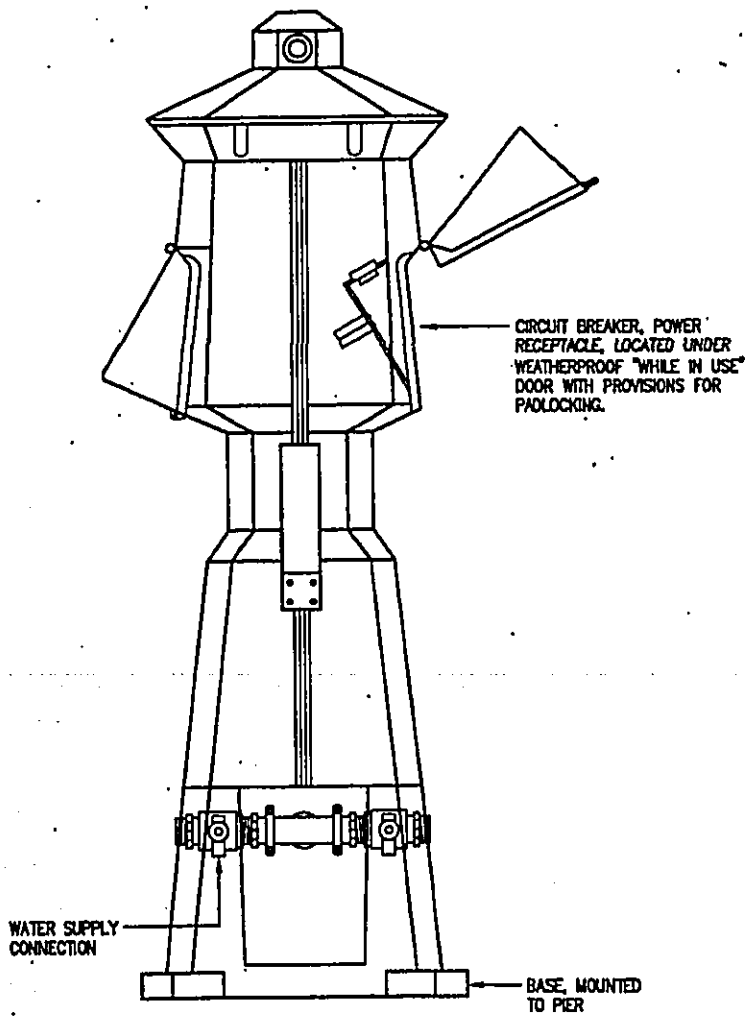
HALEIWA OAHU

FLOATING DOCK PLAN

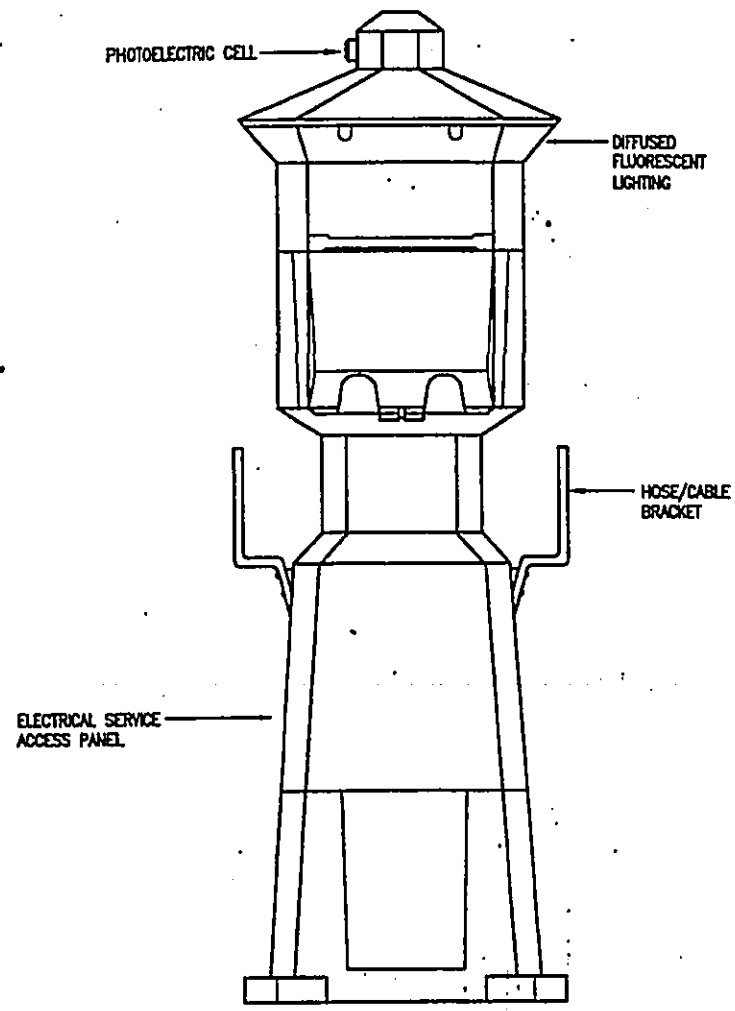
DESIGNED:	N.H., K.K.	SUBMITTED:	
DRAWN:	C.T.	DATE:	
CHECKED:	G.N.	SCALE:	
APPROVED:		MAY 21 2006	
CHIEF ENGINEER		DATE	

DRAWING NO. 7: FLOATING DOCK P

JOB NO. B76D070A



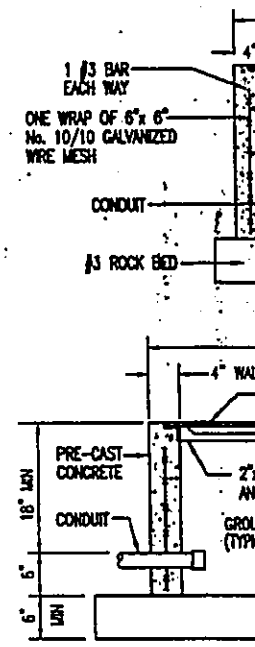
SIDE VIEW



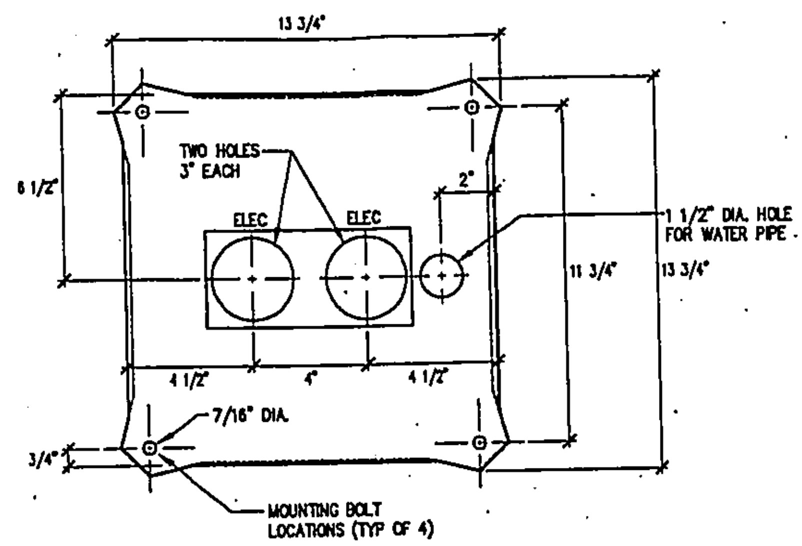
FRONT VIEW

NOTES:
1. MODULAR MARINA POWER CENTER SHALL BE MARINA POWER AND LIGHTING, INC., LIGHTHOUSE POWER PEDESTAL OR APPROVED EQUIVALENT.
2. POWER CENTER SHALL BE ABLE TO SUPPORT PORTABLE FIRE EXTINGUISHER AND CASE.
3. PROVIDE ADAAG COMPLIANT POWER CENTER AS NOTED ON THE DRAWINGS.
4. PROVIDE 2-3/4" HOSE BIBS AT EACH MODULAR MARINA POWER CENTER.

(A / E-5) MODULAR MARINA POWER CENTER DETAIL
NOT TO SCALE



(C / E-5) 2' x 4' E
NOT TO S



B / E-5 **MODULAR MARINA POWER CENTER MOUNTING TEMPLATE**

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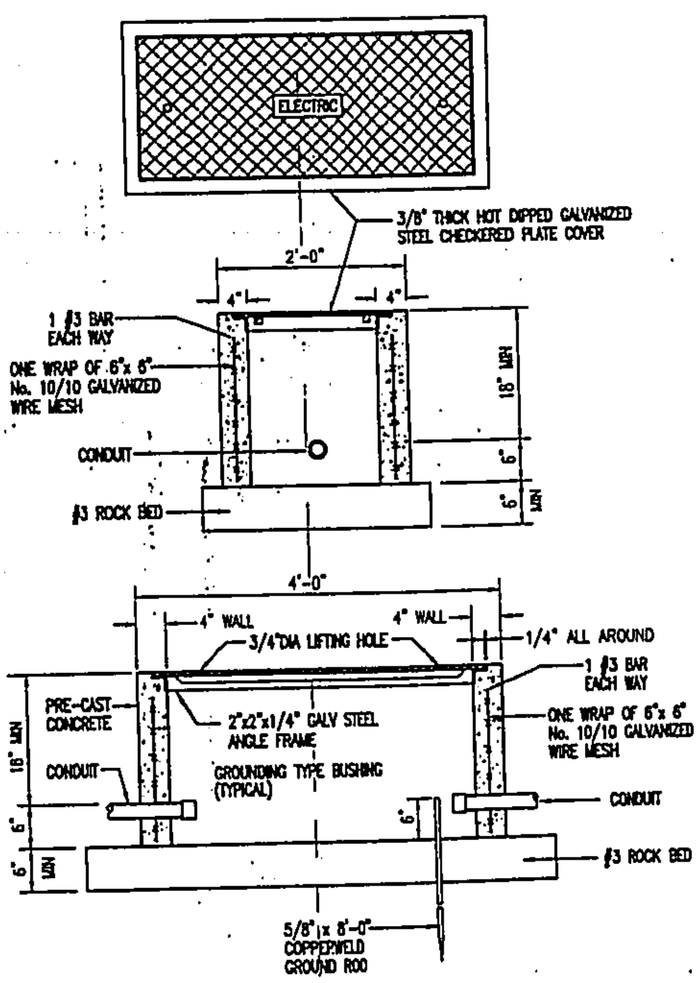


C / E-5 **2' x 4' ELECTRICAL HANDHOLE**

NOT TO SCALE

REVISION NO.	SYM.	DESCRIPTION	DATE

JASON YOGI — LICENSED PROFESSIONAL ENGINEER No. 9082-E — HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

ELECTECH HAWAII, INC. LIC. EXP. 4/30/2006

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RE
DIVISION OF BOATING AND OCEAN REC
JOB NO. 876D070A
HALEIWA BOAT HARBOR REPLAC
REPAIR AND IMPROVEMENT
HALEIWA — OAHU
MODULAR MARINA POWER CENTER DETAIL, MODULAR MARI MOUNTING TEMPLATE, 2' x 4' HANDHOLE DE

DESIGNED:	JM	SUBMITTED:
DRAWN:	JY	DATE:
CHECKED:	JY	SCALE:

RECOMMENDED BY: [signature] MAY 21 2001
ENGINEERING DIVISION — DATE

DRAWING NO. 8: MODULAR MARINA POWER CENTER

JOB NO. 876D070A

SECTION 4

GENERAL DESCRIPTION

4B: SOCIAL-ECONOMIC CHARACTERISTICS

The Island of Oahu is the third largest in the Hawaiian Archipelago. Its area accounts for 608 square miles of the State's total of 6,450 square miles.

The Haleiwa Boat Harbor is located in the district of Waialua, one of the seven judicial districts that make up the City and County of Honolulu. The district encompasses an area from Kaena Point to the west, Elehaha Stream near Waimea Bay to the east and an area north of Wahiawa to the south. Haleiwa town is the focal point of the district. The following tables 1 through 4 show some of the demographics of the district. The population for the City and County of Honolulu is shown by judicial districts in **TABLE NO. 1.** The population of Waialua District is shown in bold type.

TABLE NO. 1

POPULATION OF OAHU BY DISTRICTS

	April 1, 1980	April 1, 1990	April 1, 2000
Honolulu	365,048	377,059	372,279
Koolaupoko	109,373	117,694	117,994
Koolauloa	14,195	18,443	18,899
Waialua	**9,894**	**11,549**	**14,027**
Wahiawa	41,562	43,886	38,370
Waianae	31,487	37,411	42,259
Ewa	191,051	230,189	272,328
TOTAL:	762,565	836,231	876,156

(from DATA BOOK 2000: DBEDT)

TABLE NO. 2 shows the breakdown of the residents living in the Waialua District by ethnicity.

TABLE NO. 2

DEMOGRAPHIC REPRESENTATION OF THE NORTH SHORE CENSUS DISTRICTS: 99.01, 99.02 AND 100.

RACE	POPULATION
African American alone	531+
American Indian alone	< 100
Alaska Native alone	< 100
White alone	4,265
White alone and in combination	6,684
Chinese alone	< 100
Hmong alone	< 100
Indonesian alone	< 100
Japanese alone	1,138
Korean alone	< 100
Laotian alone	< 100
Malaysian alone	< 100
Pakistani alone	< 100
Sri Lankan alone	< 100
Thai alone	< 100
Vietnamese alone	< 100
Other Asian alone	< 100
Polynesian alone	716
Native Hawaiian alone	498
Samoan alone	< 100
Tongan alone	< 100
Micronesian alone	< 100
Guamanian alone	< 100
Melanesian alone	< 100
Fijian alone	< 100
Other Pacific Islander alone	< 100
Some other race alone	290+

Note: This list was taken from the U.S. census data of Y2000. Due to the new form of reporting, the figures depicted show the major ethnic background in these census districts of the North Shore. Those shown with less than 100 (< 100) are below the threshold limit set for the census survey for those districts.

TABLE NO. 3, shows the economic characteristics of the residents for Waialua District:

TABLE NO. 3

ECONOMIC CHARACTERISTICS OF NORTH SHORE CENSUS DISTRICTS

OCCUPATION:	NUMBER:
Management, professional & related occupations	1,400
Service occupations	1,229
Sales and office occupations	1,300
Farming, fishing & forestry occupations	201
Construction, extraction, & maintenance occupations	627
Production, transportation & material moving occupations	674
INDUSTRY:	
Agriculture, forestry, fishing & hunting, & mining	287
Construction	478
Manufacturing	199
Wholesale, trade	154
Retail trade	732
Transportation & warehousing, & utilities	393
Information	77
Finance, insurance, real estate, & rental & leasing	207
Prof, scientific, management, administrative, & waste management services	527
Educational, health & social services	1,005
Arts, entertainment, recreation, accommodation & food services	693
Public administration	483
Other services (except public administration)	196

(Source: DBEDT Census 2K Data)

The major economic base for the district used to be the growing and partial refining of sugar cane. The sugar industry has gone away and the agricultural lands are now being used on a smaller scale for truck farming. Seed corn and coffee are among the crops currently being grown.

The current economy for the district relies very much on tourism. The North Shore area is famous for its world class

surfing sites and draws thousands of people during surf meets. While these events produce major traffic congestion in the area, the merchants depend on these crowds for their livelihood.

Due to its world class surfing sites, the district has gained world-wide publicity through filming of surfing events, television programs and movies. The filming have also generated income for local residents and tax revenues for the local governments. In addition to surfing events and documentaries, movies such as Blue Crush and Baywatch Hawaiian Wedding; and television series Baywatch Hawaii were filmed at the North Shore.

Information on income earned by local residents and tax revenues generated are listed on **TABLE NO. 4** which was prepared by the State of Hawaii's Department of Business, Economic Development and Tourism is shown at the end of this **SECTION 4B.**

The existing Haleiwa Boat Harbor offers recreational and commercial fishing opportunities. The recreational activities include shoreline fishing and picnicking, mostly by local people, and deep sea fishing, diving, whale watching, snorkeling and picnic excursions for tourists which are offered by six companies that have been issued permits to operate charter boats out of the harbor. There are several commercial fishing boats moored at the harbor.

The fish catches and estimated value for the years 2000 and 2002 are shown on **TABLE NO. 5.**

TABLE NO. 5

REPORTED FISH CATCHES AND ESTIMATED VALUE

Haleiwa Small Boat Harbor

Year	2000	2001	2002
No. Of Fishers:	140	142	134
Pounds caught:	396,118	320.888	317,050
Pounds sold:	377,793	296,810	300,276
Value of catch:	$758,810	$591.037	$612,544

TABLE NO.4
MOTION PICTURE & TELEVISION PRODUCTION

MOTION PICTURE AND TELEVISION
PRODUCTION EXPENDITURES/TAX REVENUES IN HAWAII
TWELVE-YEAR PERIOD - 1991 TO 2002 ($ In Millions)

Year	Prod. Exp.	Sales Gen.	Income Gen.	Tax Revenues
1991	$35.4	$56.6	$40.2	$4.6
1992 [1]	$56.8	$90.7	$64.5	$7.3
1993	$45.0	$71.9	$51.1	$5.8
1994 [2]	$96.5	$154.2	$109.5	$12.4
1995	$49.0	$78.3	$55.6	$6.3
1996	$59.7	$95.4	$67.8	$7.7
1997	$70.7	$113.0	$80.2	$9.1
1998 [3]	$99.1	$158.3	$112.5	$12.7
1999 [4]	$98.1	$156.7	$111.3	$11.7
2000 [5]	$136.0	$217.3	$154.4	$16.5
2001 [6]	$83.0	$132.6	$94.2	$10.7
2002 [7]	$147.0	$234.9	$166.8	$18.6
TOTALS:	$976.3	$1,559.8	$1,108.1	$123.4

Major projects affecting statistics:

[1] Raven (TV Series)

[2] WaterWorld (Feature Film); TV Series: Byrds of Paradise; One West Waikiki; Marker

[3] TV Series: Fantasy Island; Wind on Water; Hotel (Japan)

[4] Baywatch Hawaii (TV Series)

[5] Feature films: Pearl Harbor; Windtalkers; Jurassic Park III. Baywatch Hawaii (TV Series); Lessons Learned (TV Pilot)

[6] Feature Films: Dragonfly; X-4 Project; and Planet of the Apes. Possible actor and writer strikes; terrorist attack 9/11

[7] Feature films: Blue Crush; Tears of the Sun; Helidorado; Charlie's Angels II; Big Bounce. TV shows: ER; Baywatch Hawaiian Wedding, North Shore

SOURCE: DBEDT

SECTION 4
GENERAL DESCRIPTION
4C: ENVIRONMENTAL CHARACTERISTICS

EXISTING ENVIRONMENT:

The Haleiwa Boat Harbor is located in Waialua Bay in the *ahupua'a* of Kawailoa. The bay is a coastal plain estuary that receives freshwater influence from the Anahulu River which empties into it. The mouth of the river was diverted to the east side of the harbor and has drastically altered the coastline for the bay. The mouth of the river was diverted to the east side of the harbor and an L-shaped mole was constructed between the river and harbor to serve as channel protection for the river and as a breakwater for the harbor. (See **DRAWING NO. 5)**

The entrance to the harbor is located to the north. The water depth at the entrance is 30 feet and the depths off-shore is as much as 3000 to 4000 feet. The coastline for the harbor and adjacent areas are susceptible to high energy waves which are generated by the North Pacific Swells during the winter months.

Located west of the harbor entrance is the City and County of Honolulu's Haleiwa Ali'i Beach Park. North of the Anahulu River mouth is the State of Hawaii's Haleiwa Beach Park. Both are sandy beaches frequented by surfers and picnickers, both local and visiting.

The existing revetment wall from which the new pier will be constructed is a system called "Fabriform". This product is a fabric bag which is pumped full of concrete after it is in place. The product also has holes which were backed with geo-textile material to prevent erosion of the backfill behind the wall. The geo-textile material has had deteriorated over time and backfill material had eroded from behind the wall. A storm of January 2002 damaged a section of this wall. A probable cause for the damage was the loss of backfill. The damaged section was repaired with a

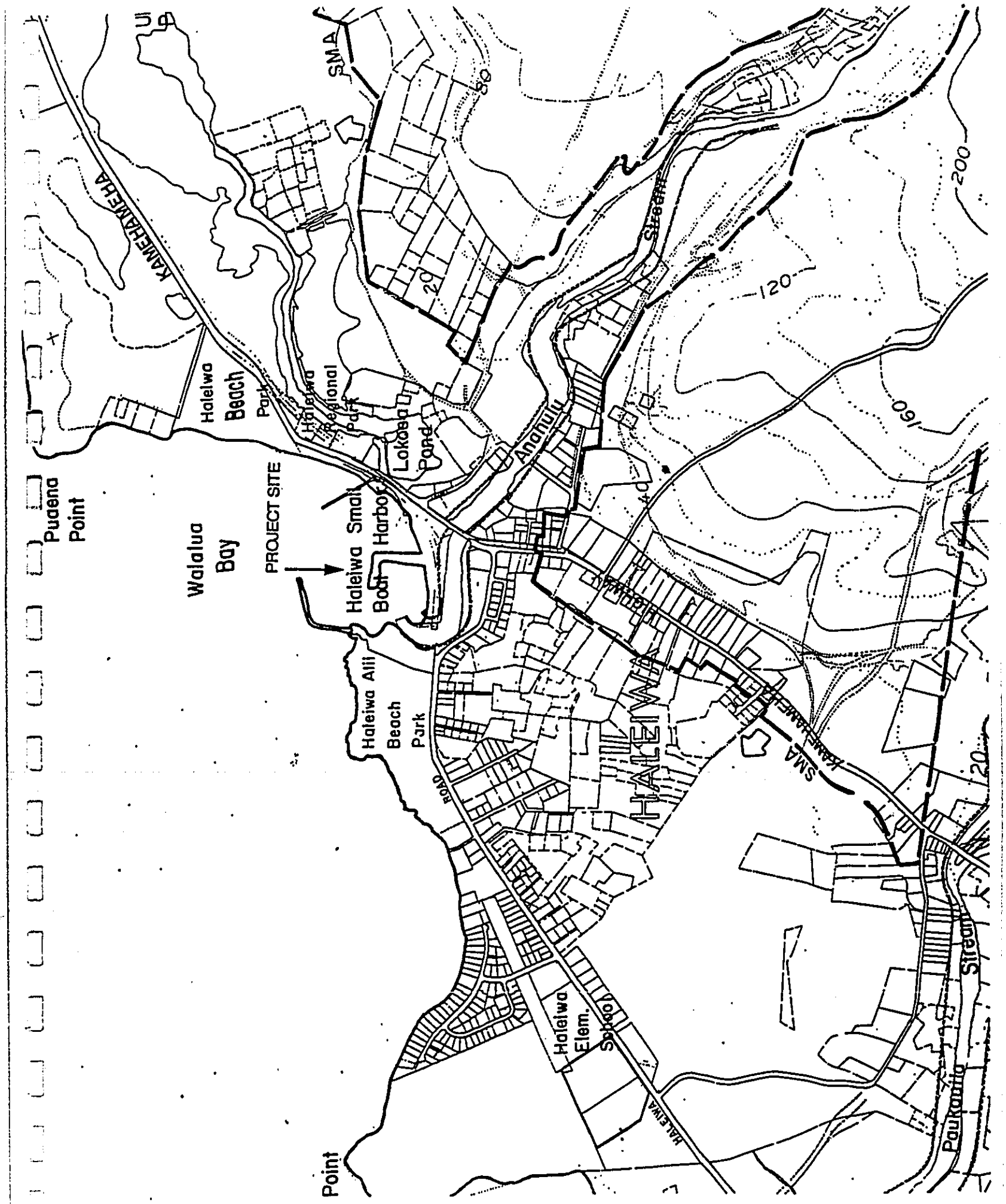
rock wall. After damaged section of the wall was repaired, concrete was pumped in to voids behind the remaining sections of the wall to attempt to prevent future damage.

The prevailing northeast trade winds contribute to the quality of the ambient air at the harbor and keeps the air within acceptable air quality standards.

Ground water quality will not be affected by this project because it is not being constructed on land.

The **MARINE ENVIRONMENTAL ASSESSMENT (APPENDIX B)** shows that the clarity of the harbor waters to be of poor visibility. The Assessment also reports that no toxic contaminants were found in the harbor sediment and no coral colonies were present. The harbor water is considered to be Class A Embayment, Department of Health classification.

The project site is located within boundaries of the State's Special Management Area. See **DRAWING NO. 9: SPECIAL MANAGEMENT AREA BOUNDARIES.** It is also located within the flood plain as designated by the U.S. Corps of Engineers



DRAWING NO. 9: SMA BOUNDARIES

SECTION 5

ARCHAEOLOGICAL AND HISTORICAL/CULTURAL ASSESSMENT

ARCHAEOLOGICAL SURVEY:

The Haleiwa Small Boat Harbor lies in the Kawailoa *ahupua'a* and situated at the mouth of the Anahulu valley and stream. Please refer to **DRAWING NO. 1.** Various studies of this area indicate that due to the abundant marine resources at Waialua Bay, it is likely that some settlement in this area dates back to the A.D. 300-600 (colonization period) or 600-1100 A.D. (Developmental period). During A.D. 1100-1650 (expansion period), land use intensity was low. Subsequently, occupation of temporary rock shelters became permanent and following the occupation of Oahu by Kamehameha in A.D. 1804, permanent house sites replaced the rock shelters. A detailed explanation of the archaeology of this area of Kawailoa is covered in **APPENDIX D: ARCHAEOLOGICAL AND HISTORICAL/CULTURAL ASSESSMENT.**

Some archaeological features may have been impacted during the development of the small boat harbor. Remnants of past shoreline related practices on the sand spit have been eliminated by the construction of the mole where the new dock is be built.

HISTORICAL ASSESSMENT:

A brief summary of the history of the harbor area is as follows:

1. Pre-contact to 1800 - Inhabited by Hawaiians, including *ali'i;*
2. 1800 to 1850 - Sandalwood exported to the orient;
3. 1850 to 1900 - Whaling; and
4. 1900 to 1950 - Sugar.

CULTURAL ASSESSMENT:

Interviews of persons with long-term backgrounds of Haleiwa and the small boat harbor are summarized in **APPENDIX D.** The

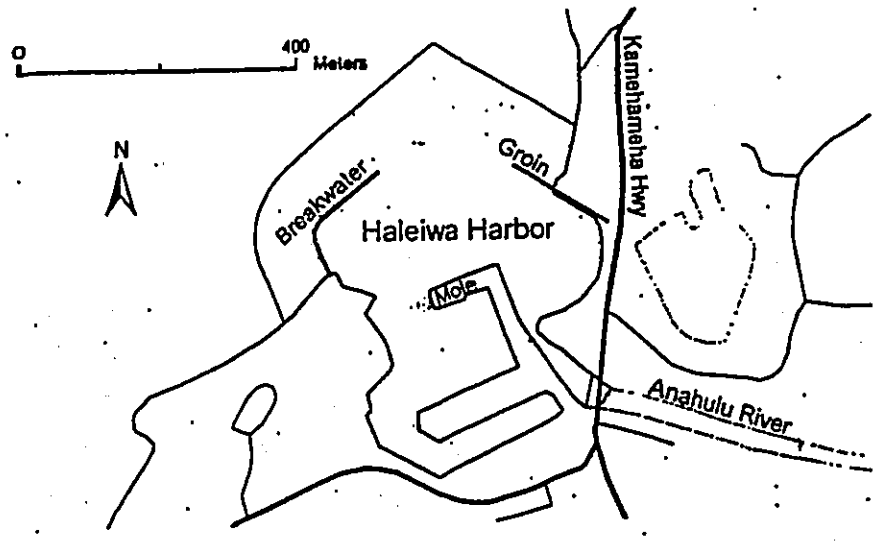
comments made by those interviewed generally agreed that cultural resources, practices and beliefs will not be impacted. **APPENDIX D** lists the interviews and the comments received. The only concern mentioned was the fishing opportunities within the harbor. This is regulated by the Aquatic Resources Division of the Department of Land and Natural Resources. A copy of the fishing regulations, **TABLE NO. 6,** is included in this report at the end of **SECTION 6: ARCHAEOLOGICAL AND HISTORICAL/CULTURAL ASSESSMENT.**

The recommendations in the Assessment states that "no further formal cultural impact mitigation measures are warranted." warranted.

CONCLUSION:

The proposed additional dock facility at the Haleiwa Small Boat Harbor will have little or no impact on cultural practices. Inasmuch as the general harbor area has been disturbed previously and no new land site will be affected by the proposed dock facility, no further formal cultural impact mitigation measures are warranted.

TABLE NO. 6
FISHING REGULATIONS



Waialua Bay (Hale'iwa Harbor)

Location: That portion of Waialua Bay at Hale'iwa bounded by lines drawn 100 yards seaward of and parallel to the Hale'iwa Harbor Breakwater and 100 yards seaward of and parallel to the Hale'iwa Beach Groin, and inland by a line ten yards downstream of and parallel to the Anahulu Bridge.

Permitted

- To take any legal size fish in season with one line, or one rod and line, with no more than two hooks.
- To take crabs with not more than 10 nets, provided the nets are not more than two feet in diameter.
- To take shrimp for bait with a hand net, provided that the net is not more than three feet in any dimension.
- Commercial Marine licensees with a Bait License may take baitfishes.
- Licensed pond owners or operators may take young mullet (pua) or other small fish for stocking their fishpond.

Prohibited

- To fish in or take aquatic life, except as indicated in permitted activities above.

SOURCE: DLNR

SECTION 6
MAJOR IMPACTS AND ALTERNATIVES

NOISE LEVELS:

The major impact arising from this project will be noise generated by pile driving activities. Noise levels generated by pile driving operations are relatively high. At 100 feet from the driving location, the noise level is estimated to be 98 dBA. At 1000 feet, the estimated level is 78 dBA. Residences and businesses located within 1000 feet of the pile driving site may be affected by noise. **APPENDIX E: NOISE/VIBRATION STUDY** shows a detailed analysis of the noise levels which may be generated. **DRAWING NO. 10: MAXIMUM NOISE LEVELS** shows the probable noise levels at selected sites near the harbor. The U.S. Department of Energy publication lists the noise level to be 80 to 90 dBA in noisy urban areas and 90 dBA adjacent to freeways. The noise levels genera ed by the pile driving appears to be within reason when compared to these numbers. There are no current regulations limiting the noise levels generated by pile driving except for mandatory hours allowed for this work. Pile driving can only be performed from 6:00 a.m. to 7:00 p.m. on weekdays, and 9:00 a.m. to 6:00 p.m. on Saturdays. Noise will be also be generated by the contractor's, sub-contractors' and material suppliers' vehicles and equipment. The noise level for these vehicles and equipment will be much less than that for pile driving.

VIBRATION LEVELS:

Vibration levels generated by pile driving have a potential of causing architectural and structural damage to structures and may be discomforting to people sensitive to high levels of vibration. **APPENDIX E: NOISE/VIBRATION STUDY** shows a detailed analysis of the vibration levels which may be generated. **DRAWING NO: 11: MAXIMUM VIBRATION LEVELS** included in the study shows that the expected vibration levels at selected sites near the harbor

will not exceed 0.12 inches/sec. **TABLE NO. 7: SUMMARY OF BUILDING DAMAGE CRITERIA** also included in the report shows that there should be no architectural or structural damage at this level of vibration. However, the Harbor Agent's Office is located approximately 200 feet from the pile driving location. The vibration levels will be higher for the building and the recommendation is to monitor vibration levels at this building during pile driving. If the levels at this building exceed 2.0 inches/sec., the vibration monitoring should be expanded to include the Haleiwa Joe's Seafood Grill building.

TRAFFIC:

There will be a slight increase in traffic in and out of the harbor due to the construction. However, since the construction will be totally within the harbor, there should be no disruption to traffic. Some disruption to traffic will occur when the piles are transported from the casting site to the project site. Police escort will be required to accompany the delivery trucks to help to minimize traffic disruption.

AIR QUALITY:

Emissions from the pile driver and construction vehicles and equipment will affect the air quality during construction. The emissions should be dissipated quickly by the trade winds.

WATER QUALITY:

The pile driving will affect the turbidity level of the harbor's water. This turbidity will occur only where the individual piles are placed and is expected to clear soon after the driving is completed.

ALTERNATIVES CONSIDERED:

A. Type of pier structure:

1. Fixed pier - This was the first consideration for this

project, and while a fixed pier would require fewer piles, constructing the fixed pier to withstand the wave surges which are generated in the harbor during storms will exceed available funds; and

2. Jetty pier - A jetty pier will have significantly more adverse environmental impacts and will be more costly.

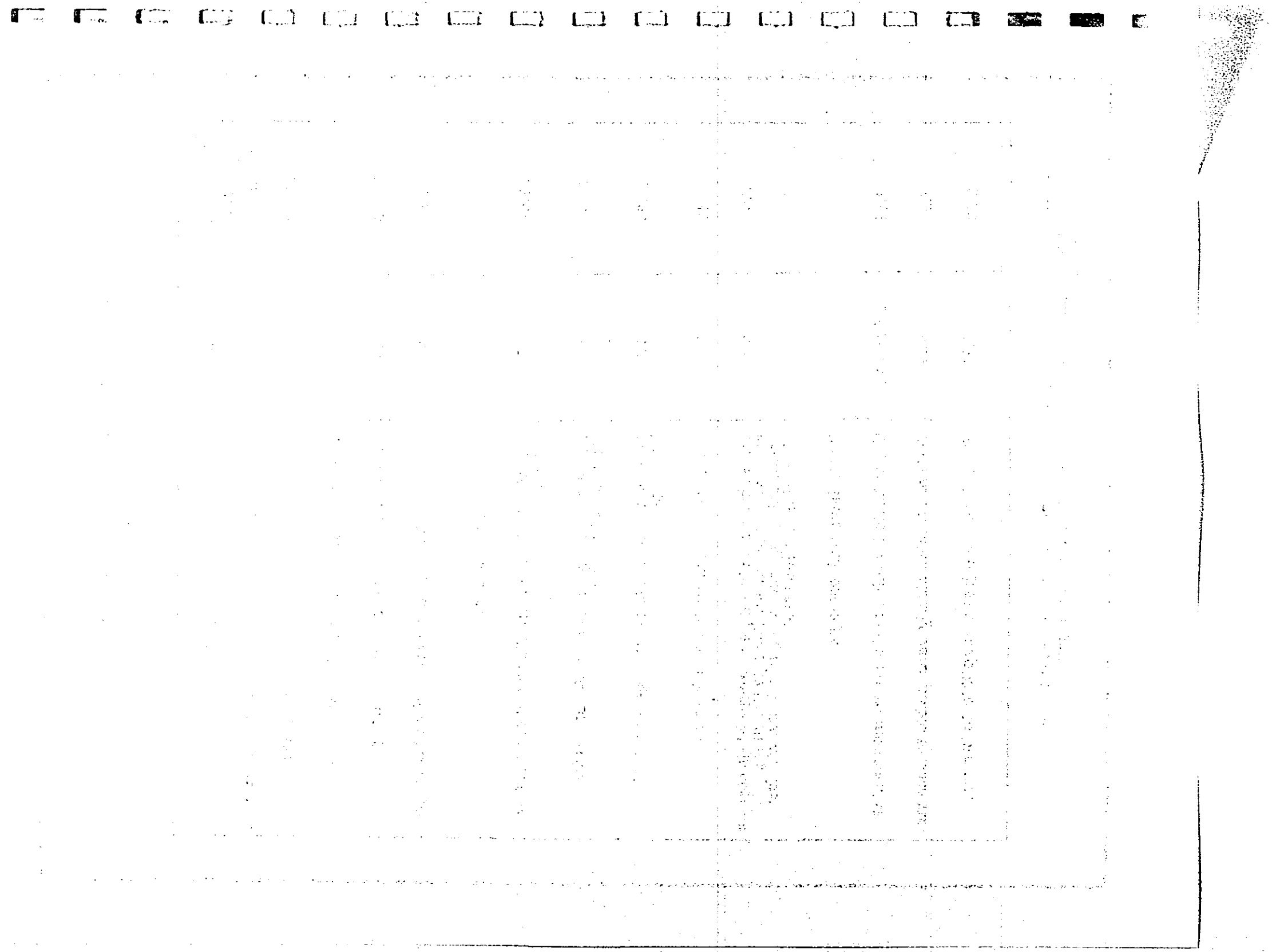
B. Type of piles:

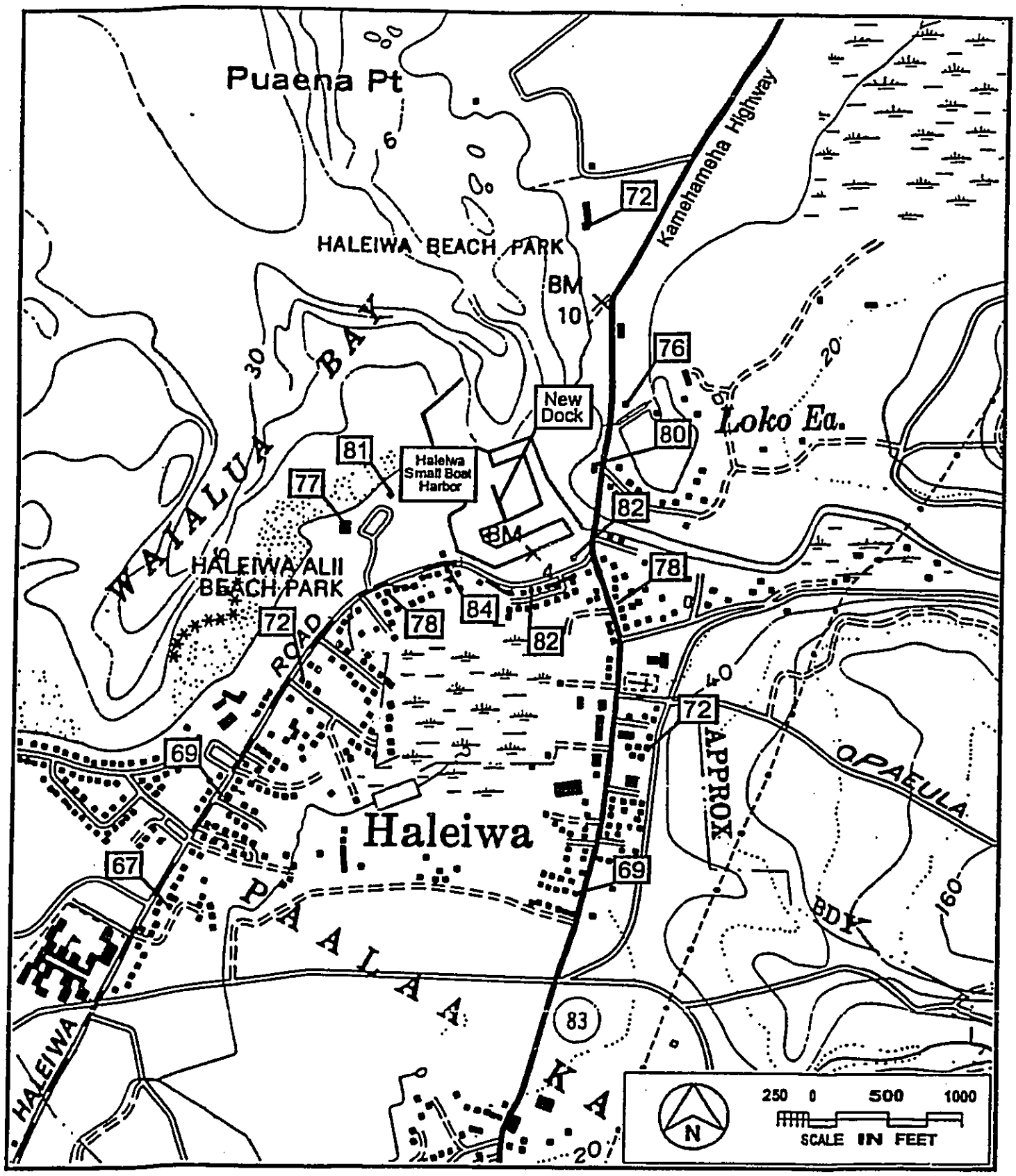
1. Cast-in-place concrete piles - Cast-in-place concrete construction, especially under water, significantly increases the risk of introducing pollutants into the harbor;
2. Structural steel piles - The corrosive sea atmosphere will damage the steel quickly; and
3. Wooden piles - Sizes of wooden piles available will not be large enough to support the required loads and are subject to attack by water borne insects.

TABLE NO. 7
SUMMARY OF BUILDING DAMAGE CRITERIA

PEAK GROUND VELOCITY (mm/sec)	PEAK GROUND VELOCITY (in/sec)	COMMENT
193.04	7.6	Major damage to buildings (mean of data).
137.72	5.4	Minor damage to buildings (mean of data).
101.16	4.0	'Engineer structures' safe from damage.
50.8	2.0	Safe from damage limit (probability of damage <5%).
		No structural damage.
33.02	1.3	Threshold of risk of 'architectural' damage for houses.
25.4	1.0	No data showing damage to structures for vibration <1 in./sec.
15.24	0.6	No risk of 'architectural' damage to normal buildings.
10.16	0.4	Threshold of damage in older homes:
5.08	0.2	Statistically significant percentage of structures may experience minor damage (including earthquake, nuclear event, and blast data for old and new structures).
		No 'architectural' damage.
3.81	0.5 to 0.15	Upper limits for ruins and ancient monuments.
1.0	0.04	Vertical vibration clearly perceptible to humans.
0.32	0.01	Vertical vibration just perceptible to humans.

Source: 'State-of-the-Art Review: Prediction and Control of Groundborne Noise and Vibration from Rail Transit Trains'; U.S. Department of Transportation; December 1983.

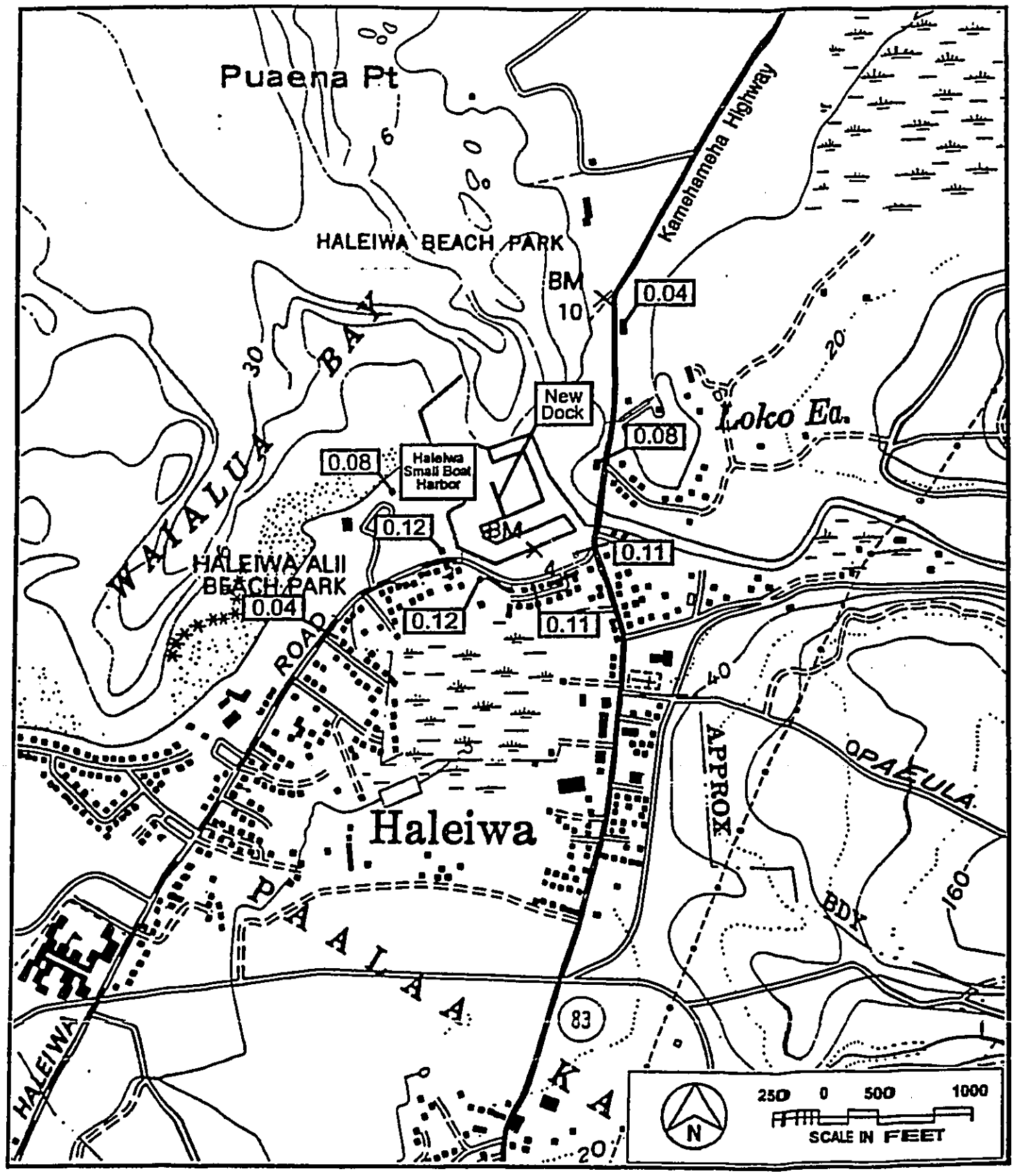




MAXIMUM NOISE LEVELS (IN DBA)
DURING PILE DRIVING

SOURCE: Y. EBISU & ASSOCIATES

DRAWING NO. 10: MAXIMUM NOISE LEVELS



PEAK VIBRATION LEVELS (IN INCHES / SEC.)
DURING PILE DRIVING

SOURCE: Y. EBISU & ASSOCIATES

DRAWING NO. 11: MAXIMUM VIBRATION LEVELS

SECTION 7
MITIGATION MEASURES

NOISE AND VIBRATION:

There are no regulations limiting noise levels for the pile driving. There are regulations as to when pile driving can be performed. These regulations are listed in the State of Hawaii's Department of Health rules "Title 11, Administrative Rules, Chapter 46, Community Noise Control." The contractor will be required to limit his pile driving activities during the regulated hours.

Vibration is not expected to be a problem. However, a vibration monitor will be installed at the Harbor Agent's Office and if vibration level exceeds 2.0 inches/sec. there, additional monitoring will be performed at another nearby building.

AIR QUALITY:

The contractor shall prepare a dust control management plan which will be reviewed and approved by the Clean Air Branch, Department of Health. Construction activities must comply with the provisions of the HAR, Title 11, Chapter 60.1-33, Air Pollution control. The contractor's plan for dust control shall cover the different phases of the construction.

Focus shall be on minimizing the amount of dust-generating materials and activities, centralizing on-site vehicular traffic routes, and locating potential dust-generating equipment in areas of the least impact. The contractor shall provide adequate dust control measures during week-ends, after hours and during start-up times. Water spraying will be used when necessary.

The contractor shall control dust from debris being hauled away from the project site. No burning of debris or rubbish will be permitted on the project site. Exhaust fumes from the contractor's equipment will be controlled by ensuring mufflers on power-driven equipment are in good working condition; and motors

are tuned or adjusted properly. The air quality will be impaired during the contractor's operations and but is expected to reach its normal ambient levels when the project is finished

WATER QUALITY:

The pile driving activity will disturb the harbor bottom with a resultant increase in turbidity. The contractor will be required to prepare a Best Management Plan (BMP)in conformance with the requirements of the Clean Water Branch (CWB) of the Department of Health for a Section 401 Water Quality Certification. Guidelines issued by the CWB shall be used for the preparation of the BMP. Included in the BMP shall be a water monitoring plan. This will cover baseline measurements, timely sampling, and final measurements to ensure the harbor water quality has regained its original condition before removing the protective silt curtain. This shall conform to HAR Sections 11-54-09.1 to 11-54-09.1.09

The contractor shall maintain a silt curtain in good condition around his work area at all times to prevent possible pollution from his pile driving activity to impact the adjacent harbor waters. Since the harbor is subject to wave action, the contractor shall schedule his work accordingly.

Additionally, the contractor shall ensure that there will be no pollution of the harbor waters from his shore activities. Precaution shall be taken to prevent oil spills, wash water, and the like from entering the harbor waters. His work area shall be secured from the public for health and safety reasons.

The disturbance of the harbor water will be of temporary nature while the work is going on. It is expected that no permanent impairment of the water quality is foreseen upon completion of the new pier project.

TRAFFIC:

The major concern for traffic disruption will be when the piles are being delivered. The contractor will be required to hire

police personnel to direct traffic and deliver the piles at times when it would be least disruptive to traffic.

HARBOR BOAT NAVIGATION:

This project should not interfere with harbor navigation. The only boats which need to pass the construction site are the boats that are moored at the existing Pier 200. There is ample space at the end of the construction site to allow these boats to pass safely.

CULTURAL:

Since there are no known remaining archaeological or cultural sites at the project area, no mitigation measures will be required.

However, as a precautionary measure, personnel involved in the design and construction of the new dock facility will be informed of traditional cultural practices and sites associated with Waialua Bay. While there is little possibility of inadvertent cultural finds, personnel on the job site will be made aware of the appropriate measures to follow.

SECTION 8
DETERMINATION

This project is a part of the State of Hawaii's long range plan to increase ocean recreation and commercial activities. There is a waiting list of 56 people seeking mooring slips at this harbor. The addition of these mooring slips at the Haleiwa Boat harbor will help the State of Hawaii to accomplish this long range goal and will reduce the number of people on the waiting list. The construction of this project is well justified.

Funding for this project is made available by Act 259, SLH 2002, Items 17 and 18.

SECTION 9
REASONS FOR DETERMINATION

The new pier project at Haleiwa Boat Harbor fills a long awaited community need. The project does not require additional land space; and it will be situated at a site previously provided under a long range master plan. Further, an analysis of the impacts based on the criteria of HAR 11-200-12, show the following:

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

   There will no natural or cultural resources destroyed by this project as it will be a planned addition to an existing harbor. No additional land space will be required as the dock will be over water.

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

   The proposed dock project will improve the harbor environment by providing use of a vacant space within the harbor. It does not curtail the beneficial uses of the environment; rather it expands the use of the harbor for additional boats.

3. Conflicts with the State's long-term environmental policies or goals and guidelines as expressed in Chapter 344, HRS; and any revisions thereof and amendments thereto, court decisions, or executive orders:

   The proposed development is consistent with the Environmental Policies established in Chapter 344, HRS, and the National Environmental Policy Act.

4. Substantially affects the economic or social welfare of the community or State:

   The floating dock project will contribute to the economic welfare of the district by increasing the number of boats used for commercial uses such as fishing and charter tours. It also expands the recreational use of the harbor for local residents.

5. Substantially affects public health:

The project includes mitigation measures to lessen the impacts on noise, vibration, air quality, water quality and traffic. These impacts are construction generated and will be of temporary duration.

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

The project does not involve secondary impacts such as population changes as it is part of the harbor plan for boating opportunities. The existing facilities, utilities and parking, will accommodate this floating dock addition to the small boat harbor without the need for additional off-site development.

7. Involves a substantial degradation of environmental quality:

The project is in the existing small boat harbor and will require no additional land space. The impacts on the environment are temporary and will be mitigated. There will be no lasting degradation of the environment.

8. Is individually limited but cumulatively has considerable effect upon the environment or involves a commitment for larger actions:

This new floating dock project does not involve a commitment for additional actions. It merely fulfills the commitment for a long range planned docking facility.

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

No endangered, rare or threatened animal or plant species, or their permanent habitat, have been found at the project site. A protective reptilian species, the green sea turtle (*honu*), has been known to enter the harbor and its surrounding in search of food. Due to its protective status, users of the harbor will avoid contact with the green sea turtle.

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

Impacts due to the project will be mitigated as will be specified in the job specifications. These impacts are construction generated and of temporary nature.

11. Affects or is likely to suffer damage by being located in an environmentally sensitive area, such as a flood plain, tsunami zone, beach erosion-prone area, geologically hazardous land, estuary, freshwater, or coastal waters:

The floating dock will be in a high wave and *tsunami* zone. This is concomitant with its location. However, the engineering design has taken into consideration the hazardous location of the boating facility.

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

The new dock will not adversely affect scenic vistas or view planes due to its low silhouette. It will be about 4 feet above the water level in the harbor. There are no land-based structure included in this project. In the view of some, the berthing of boats will add to the scenic value of the harbor.

13. Requires substantial energy consumption:

The energy consumption related to this project will be that consumed by the contractor's operations and that required by the additional boats served by this new dock facility.

REFERENCES

Atlas of Hawaii, 2nd Edition, Department of Geography, University of Hawaii, University of Hawaii Press, 1983

Data Book - 2000, A Statistical Abstract, Department of Business, Economic Development, & Tourism, 2001

Department of Planning & Permitting, City & County: North Shore Sustainable Communities Plan, Dept of Planning & Permitting, July 2000.

Department of Land Utilization, City & County of Honolulu: Haleiwa - Special District Design Guidelines, Department of Land Utilization, City & County of Honolulu, April 1991

Division of Aquatic Resources: Hawaii Fisheries Plan -1990-1995; LMR Fisheries Research, Inc., San Diego, CA; June 1992

Environmental Impact Analysis, 2nd Edition, Larry W. Canter, Irwin Mcgraw-Hill, 1996

Geology & Ground-Water Resources of the Island of Oahu, Hawaii, Bulletin 1, H.T. Stearns, K.N. Vaksvik, May 1935

U.S. Army Engineer District Honolulu: Detailed Project Report - Haleiwa Harbor, U.S. Army Engineer District Honolulu, June 11, 1974.

U.S. Army Engineer District Honolulu: Detailed Project Report - Harbor for Light Draft Vessels, Haleiwa, Oahu, Hawaii; January 7, 1963.

U.S.G.S., Bulletin 1, Geology and Ground-Water Resources of the Island of Oahu, Stearns, H.T., and Vaksvik, K.N., May 1935

PERMITS/CLEARANCES REQUIRED FROM:

Department of Health - Section 401 WQC
U.S. Army Engineers - Department of Army Permit
C&C Special Management Area
DLNR Conservation District Use
Various Construction Permits

ENVIRONMENTAL ASSESSMENT CONTRIBUTORS:

Engineering - Nishimura Katayama & Oki, Inc.
Marine Assessment - Sea Engineering
Noise/Vibration - Y. Ebisu & Associates, Inc.
Historical and Cultural Assessment - Cultural Surveys Hawaii
Soil Borings - Ernest K. Hirata & Associates, Inc.
Fauna Study - Paul Breese
W.Y. Thompson, P.E. - Coordinator

COMMENTS & RESPONSES

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

REPLY TO ATTENTION OF

Regulatory Branch

November 30, 2004

Mr. Eric Hirano, P.E.
Chief Engineer
Engineering Division
Hawaii Department of Land and Natural Resources
1151 Punchbowl Street, Room 221
Honolulu, Hawaii 96813

Dear Mr. Hirano:

This responds to your proposed activity to construct a new floating pier at Haleiwa Small Boat Harbor, Oahu Island (TMK 6-6-02: por. 4). Based on the information provided in the draft Environmental Assessment (dEA) titled ***"Replacement, Repairs & Improvements, Haleiwa Small Boat Harbor, Job. No. B76DO70A..."*** the proposed activity will be conducted in a water of the United States and will result in the placement of pre-cast concrete piles to support a central walkway and floating finger piers. The activity and resultant structures are regulated under Section 10 of the Rivers and Harbors Act of 1899 and therefore, the Corps will exercise its jurisdiction and require an application for a Department of the Army permit be submitted before the activity begins.

The address block in the cover letter dated November 15, 2004 from W.Y. Thompson, P.E. to U.S. Army District Honolulu should be corrected in future correspondence to read:

U.S. Army Engineer District, Honolulu
Mr. George (not Peter) Young, P.E.
Chief, Regulatory Branch

Thank you for your diligence in ensuring the protection and conservation of Hawaii's water resources. If you require additional information or have further questions, you may call Mr. Farley Watanabe at (808)438-7701 or by fax at (808)438-4060. Please refer to File Number **POH-2004-1083** in any future correspondence with us.

Sincerely,

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

Copy furnished:
Commission on Water Resource Management, Department of Land and Natural Resources,
1151 Punchbowl Street, Honolulu, Hawaii 96850
Office of Planning, Coastal Zone Management Program, P.O. Box 2359, Honolulu, Hawaii 96804
Clean Water Branch, Department of Health, P.O. Box 3378, Honolulu, Hawaii 96801-3386
Nishimura, Katayama & Oki, Inc., Project Consulting Structural Engineers, 826 Kaheka Street,
Suite 302, Honolulu, Hawaii 96814
W.Y. Thompson, P.E., Environmental Consultant, 98-1051 Kahapili Street, Aiea, Hawaii 96701

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

ENGINEERING DIVISION
PO BOX 373
HONOLULU, HAWAII 96809

December 21, 2004

U.S. Army Engineer District, Honolulu
Mr. George P. Young, P.E.
Chief Regulatory Branch
Fort Shafter, HI 96858-5440

Dear Mr. Young:

SUBJECT: Repairs, Replacement & Improvements
Haleiwa Boat Harbor
Job NO. B76DO70A
Haleiwa, Waialua, Oahu
Tax Map Plat: 6-6-02:04
Reference: File No. **POH-2004-1083**

Thank you for responding to the draft EA relating to the Repairs, Replacement & Improvements, Haleiwa Boat Harbor. In compliance with your request, we are pleased to submit an application (Form 4345) for a Department of Army permit. Together with this application, we are also submitting a set of plans and specifications for this project for your review. We look forward to working with Mr. Farley Watanabe of your staff.

The contract for this project has not been awarded as of this date and hence, the contractor's Best Management Practice (BMP) plan is not available. We will submit this at the earliest opportunity.

Our consultant apologizes for the mix-up of names in our previous correspondence. Thank you for calling this to our attention.

Additional information may be obtained by contacting our consultant, Mr. Bill Y. Thompson, P.E. at 488-0388 or Mr. Roger Masuoka of my staff at 587-0276.

Sincerely,

Eric T. Hirano
Chief Engineer

Enc.

c: Nishimura, Katayama & Oki, Inc.
W.Y. Thompson, P.E.

LINDA LINGLE
GOVERNOR OF HAWAII

PETER T. YOUNG
CHAIRPERSON
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DEPUTY DIRECTOR - WATER

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STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

LD-NAV

DEC 10 PM 07:03 ENGINEERING

December 9, 2004
DLNRHALEIWABOATHARBOR.RCM

Eric Hirano, P.E., Chief Engineer
Department of Land and Natural Resources
Engineering Division
1151 Punchbowl Street, Room 221
Honolulu, Hawaii 96813

Dear Mr. Hirano:

Subject: Draft Environmental Assessment for Repair, Replacement and Improvements to Haleiwa Boat Harbor, Oahu, Hawaii - DLNR Job No. B76D070A

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

The Department of Land and Natural Resources' (DLNR) Land Division made available or distributed a copy of the document pertaining to the subject matter to the following DLNR Divisions for their review and comment:

- Division of Forestry and Wildlife
- Division of Boating and Ocean Recreation
- Division of State Parks
- Commission on Water Resource Management
- Office of Conservation and Coastal Lands
- Land-Oahu District Land Office

Enclosed please find a copy of the Division of Aquatic Resources comment. Based on the attached responses, the Department of Land and Natural Resources has no comment to offer on the subject matter. If you have any questions, please feel free to contact Nicholas A. Vaccaro of the Land Division Support Services Branch at 1-808-587-0384.

Very truly yours,

DIERDRE S. MAMIYA
Administrator

C: ODLO

LINDA LINGLE
GOVERNOR OF HAWAII

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CHAIRPERSON
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DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION
KAKUHIHEWA BUILDING, ROOM 555
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

HAWAI'I HISTORIC PRESERVATION DIVISION REVIEW

Log #: 2004.3431
Doc #:0411EJ33
Date Received: November 19, 2004

December 1, 2004

Applicant/Agency: W. Y. Thompson, P.E.
Address: 98-1051 Kahapili Street
Aiea, Hawaii 96701

SUBJECT: Chapter 6E-8 Historic Preservation Review- Draft Environmental Assessment for Repairs, Replacement & Improvements at Haleiwa Boat Harbor
Ahupua`a: Haleiwa
District, Island: Waialua, O`ahu
TMK: (1) 6-6-002:004

1. ____ This project has not gone through the historic preservation review process. Please submit documentation _____

2. _____ This project has already gone through the historic preservation review process.
_____ a. mitigation has been completed
_____ b. other

3. ✓ We were not previously consulted on this undertaking, however we believe there are no historic properties present, because:
____ a) intensive cultivation has altered the land
____ b) residential development/urbanization has altered the land
____ c) previous grubbing/grading has altered the land
____ d) an acceptable archaeological assessment or inventory survey found no historic properties
✓ e) other: There are no known sites at the proposed location of the new floating pier. The new pier will be built within the man-made area of the harbor, making it unlikely that historic sites would be found.

✓ Thus, we believe that "no historic properties will be affected" by this undertaking.

Aloha,

Melanie A. Chinen, Administrator
State Historic Preservation Division

EJ:jen

c: Eric Hirano, P. E., Chief Engineer, DLNR, Engineering Division

LINDA LINGLE
GOVERNOR OF HAWAII

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

YVONNE Y. IZU
DEPUTY DIRECTOR - WATER

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

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

REF:OCCL:SL

Correspondence: OA 05-157

JAN 12 2005

W.Y. Thompson, P.E.
98-1051 Kahapili Street
Aiea, Hawaii 96701

Dear Mr. Thompson,

SUBJECT: Proposed Dock Improvements for the Haleiwa Small Boat Harbor Located at Haleiwa, Island of Oahu, TMK: (1)6-6-002: 04

The Office of Conservation and Coastal Lands (OCCL) is in receipt of project site plans and contract specifications for the proposed dock improvements for the Haleiwa Small Boat Harbor.

Based on the submitted materials, it appears that Department of Land and Natural Resources Division of Boating and Ocean Recreation proposes to construct a dock within the existing Haleiwa boat basin.

The OCCL notes, the Board of Land and Natural Resources (BLNR) approved Conservation District Use Permit (CDUP) OA-302 on August 25, 1972, for the Haleiwa Small Boat Harbor improvements. On March 25, 1976 the BLNR approved CDUP OA-750 for berthing and dock improvements.

Approved development plans for the harbor indicate several berthings and dock improvements and the proposed dock appears to be an anticipated action in the approved CDUA's. Thus, the filing of a new Conservation District Use Application is **not** required. In addition, the OCCL has no objections to the proposed improvements and has approved the construction plan. Should you have any questions, please feel free to contact Tiger Mills of our Office of Conservation and Coastal Lands staff at 587-0382.

Sincerely,

Samuel J. Lemmo, Administrator
Office of Conservation and Coastal Lands

cc: Chairperson
DLNR Boating Division

LINDA LINGLE
GOVERNOR OF HAWAII

PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
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YVONNE Y. IZU
DEPUTY DIRECTOR - WATER

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STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION
PO BOX 373
HONOLULU, HAWAII 96809

JAN 18 2005

TO: Deidre S. Mamiya, Administrator
Land Division

FROM: Eric Hirano, Chief Engineer

SUBJECT: **Draft Environmental Assessment (DEA): Job NO. B76DO70A, Repairs, Replacement & Improvements Haleiwa Boat Harbor Haleiwa, Waialua, Oahu**

Thank you for coordinating the comments from the various divisions of the Department of Land & Natural Resources. We received comments from the Aquatics Division. A copy of our response is enclosed.

The Historic Preservation Division has also reviewed the DEA and has determined that no historic properties will be affected.

For your information, we are in direct communication with Mr. Sam Lemmo, Division of Conservation & Coastal Lands, regarding a Conservation District Use permit.

Thank you for your assistance.

Enc.
c: NKO, Inc.
W.Y. Thompson, P.E.

SUSPENSE DATE: December 6, 2004

STATE OF HAWAII
Department of Land and Natural Resources
Division of Aquatic Resources

MEMORANDUM

To: William Devick, Administrator
From: Richard Sixberry, Aquatic Biologist
Subject: Comments on Draft Environmental Assessment

Comments Requested By: Dede Mamiya - Land Division

Date of Request: 11/17/04 Date Received: 11/19/04

Summary of Project

Title: Harbor Repair, Replacement and Improvements

Proj. By: DLNR

Location: Haleiwa Boat Harbor, Oahu

Brief Description:

The DLNR, Engineering Division plans to construct a new floating pier in Haleiwa Boat Harbor supported by precast, prestressed, reinforced concrete piles to provide 16 additional slips, and possibly more.

Ancillary improvements will include a walkway, fiberglass grating and a rubber fender system.

Comments:

Mitigation measures have been proposed by the applicant which should limit or prevent excessive impact to aquatic resource values within Haleiwa Boat Harbor. We suggest that those mitigation measures be incorporated, as conditions, into the permit process.

Significant long-term impacts adverse to aquatic resource values are not expected from the activities proposed. However we suggest the following mitigation measures to insure minimum impact to the aquatic environment.

A. Best Management Practices should be implemented to insure that water quality and marine resources are protected and preserved.

B. No construction materials should be stockpiled in the aquatic environment.

C. All construction-related materials should be placed or stored in ways to avoid or minimize disturbance to the aquatic environment.

D. All construction-related material should be free of pollutants.

E. Extreme care must be taken to ensure that no debris, petroleum products, or deleterious materials or wastes be allowed to fall, flow, leach, or otherwise enter the water.

F. Turbidity and siltation from installing the concrete piles should be minimized and contained in the immediate vicinity of construction through the use of effective silt containment devices and the curtailment of construction during adverse weather conditions.

Richard Sixberry
Aquatic Biologist

cc: Jeff Newman, USFWS

LINDA LINGLE
GOVERNOR OF HAWAII

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

YVONNE Y. IZU
DEPUTY DIRECTOR - WATER

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DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION
PO BOX 373
HONOLULU, HAWAII 96809

JAN 18 2005

TO: Francis Oishi, Acting Administrator
Division of Aquatic Resources

FROM: Eric Hirano, Chief Engineer

SUBJECT: **Draft Environmental Assessment (DEA): Job NO. B76DO70A, Repairs, Replacement & Improvements, Haleiwa Boat Harbor, Haleiwa, Waialua, Oahu**

Thank you for your review and comments on the DEA for Haleiwa Boat Harbor project. In response to your recommendations:

A. Best Management Practices:
This item is included in the project specifications and will be submitted by the contractor after award of bid.

B. Stockpiling of construction materials:
This item is also covered in the project specifications. No construction materials will be stored in the aquatic environment.

C. Storage of construction materials:
Construction materials will be stored to prevent disturbance of the aquatic environment as required by the project specifications.

D. Construction materials shall be free of pollutants:
This item is covered in the project specifications.

E. Extreme care to avoid foreign matter from entering the water:
This item is covered in the project specifications.

F. Use of silt containment devices:
This item is covered in the project specifications.

In closing, there are specific sections in the project specifications dealing with the topics described above. One section covers pollution control; and the other section deals with environmental controls.

We appreciate your concerns; protection of the aquatic environment will be strictly enforced. Please feel free to call our consultant W. Y. Thompson, P.E., phone 488-0388, if additional information is required.

We appreciate your assistance.

c: NKO, Inc.
W. Y. Thompson, P.E.

LINDA LINGLE
GOVERNOR OF HAWAII

CHIYOME L. FUKINO, M.D.
DIRECTOR OF HEALTH

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

In reply, please refer to:
EMD / CWB

11098PKP.04

November 29, 2004

To: Eric Hirano, P.E., Chief Engineer
Engineering Division
Department of Land and Natural Resources

From: Thomas E. Arizumi, P.E., Chief *W. Wong* FOR
Environmental Management Division
Department of Health

Subject: Draft Environmental Assessment
Repairs, Replacement & Improvements
Haleiwa Boat Harbor
Job No. B76DO70A
Haleiwa, Waialua, Oahu
Tax Map Plat: 6-6-002:004

The Department of Health (DOH), Clean Water Branch (CWB), has reviewed the subject document and offers the following comments:

1. The Army Corps of Engineers should be contacted at (808) 438-9258 to identify whether a Federal license or permit (including a Department of Army permit) is required for this project. Pursuant to Section 401(a)(1) of the Federal Water Pollution Control Act (commonly known as the "Clean Water Act"), a Section 401 Water Quality Certification is required for "[a]ny applicant for Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into the navigable waters..."

2. A National Pollutant Discharge Elimination System (NPDES) general permit coverage is required for the following activities:

   a. Storm water associated with industrial activities, as defined in Title 40, Code of Federal Regulations, Sections 122.26(b)(14)(i) through 122.26(b)(14)(ix) and 122.26(b)(14)(xi).

   b. Construction activities, including clearing, grading, and excavation, that result in the disturbance of equal to or greater than one (1) acre of total land area. The total land area includes a contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under a larger common plan of development or sale. **An NPDES permit is required before the commencement of the construction activities.**

   c. Discharges of treated effluent from leaking underground storage tank remedial activities.

d. Discharges of once through cooling water less than one (1) million gallons per day.

e. Discharges of hydrotesting water.

f. Discharges of construction dewatering effluent.

g. Discharges of treated effluent from petroleum bulk stations and terminals.

h. Discharges of treated effluent from well drilling activities.

i. Discharges of treated effluent from recycled water distribution systems.

j. Discharges of storm water from a small municipal separate storm sewer system.

k. Discharges of circulation water from decorative ponds or tanks.

The CWB requires that a Notice of Intent (NOI) to be covered by an NPDES general permit for any of the above activities be submitted at least 30 days before the commencement of the respective activities. The NOI forms may be picked up at our office or downloaded from our website at:
http://www.hawaii.gov/health/environmental/water/cleanwater/index.html

3. The applicant may be required to apply for an individual NPDES permit if there is any type of activity in which wastewater is discharged from the project into State waters and/or coverage of the discharge(s) under the NPDES general permit(s) is not permissible (i.e. NPDES general permits do not cover discharges into Class 1 or Class AA State waters). An application for the NPDES permit is to be submitted at least 180 days before the commencement of the respective activities. The NPDES application forms may also be picked up at our office or downloaded from our website at:
http://www.hawaii.gov/health/environmental/water/cleanwater/index.html

4. Hawaii Administrative Rules, Section 11-55-38, also requires the applicant to either submit a copy of the new NOI or NPDES permit application to the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD), or demonstrate to the satisfaction of the DOH that the project, activity, or site covered by the NOI or application has been or is being reviewed by SHPD.

If you have any questions, please contact Ms. Kris Poentis of the Engineering Section, CWB, at 586-4309.

LINDA LINGLE
GOVERNOR OF HAWAII

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

YVONNE Y. IZU
DEPUTY DIRECTOR - WATER

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DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION
PO BOX 373
HONOLULU, HAWAII 96809

JAN 18 2005

TO: Mr. Tom E. Arizumi, P.E., Chief
Department of Health, Environmental Management Division

FROM: Eric Hirano, Chief Engineer

SUBJECT: **Draft Environmental Assessment (DEA): Job NO. B76DO70A, Repairs, Replacement, and Improvements, Haleiwa Boat Harbor, Haleiwa, Waialua, Oahu**

Thank you for your review of the DEA for the Haleiwa Boat Harbor project and for your helpful comments.

We will shortly submit an application for a Section 401 Water Quality Certification for this project together with plans and specifications. Your comments will greatly assist us in the preparation of our application. (Items 1 and 2.)

Since the project will be mostly in and over the harbor waters, little land area will be required; mainly for the underground installation of an electrical system to serve the new boat slips. Should a NPDES be required, an application will be submitted. (Item 3.)

There will be no discharge of wastewater into State waters under this project. As such, we do not intend to apply for an individual NPDES. Further, under the project specifications, the contractor is forbidden from allowing any water pollutant to enter State waters without a permit or variance. (Item 4.)

c: NKO, Inc.
W.Y. Thompson, P.E.

LINDA LINGLE
GOVERNOR OF HAWAII

GENEVIEVE SALMONSON
DIRECTOR

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

December 23, 2004

Mr. Peter Young, Chair
Department of Land and Natural Resources
P.O. Box 621
Honolulu, Hawai'i 96809

Dear Mr. Young:

Subject: Draft Environmental Assessment for the Haleiwa Boat Harbor Improvements

Thank you for the opportunity to review the subject document. We have the following comments.

1. Up to 20 additional boat slips may be added to the harbor. What are the traffic, parking, boat congestion, and wastewater impacts associated with the additional boats?

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

Sincerely,

Genevieve Salmonson

Genevieve Salmonson
Director

C: NKO, Inc.

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

ENGINEERING DIVISION
PO BOX 373
HONOLULU, HAWAII 96809

JAN 18 2005

TO: Ms. Genevieve Salmonson, Director
Office of Environmental Quality Control

ATTN: Mr. Jeyan Thirugnanam

FROM: Eric Hirano, Chief Engineer

SUBJECT: **Draft Environmental Assessment (DEA): Repairs, Replacement & Improvements Haleiwa Boat Harbor, Haleiwa, Waialua, Oahu**

Thank you for your review and comments on the Haleiwa Boat Harbor floating dock project. We are pleased to respond to your questions.

Question: Traffic-

The additional boat slips will not cause any vehicular traffic problem as the users will not all enter at the same day and time.

Question: Parking-

There are nearly 200 parking stalls of which the bulk, 150 stalls, are located on the mole (or jetty) that will serve the new floating dock users. These parking stalls were developed in anticipation of future additions to the harbor facilities. Please refer to Drawing No. 6 of the DEA.

Question: Boat Congestion

The new boat slips are not expected to impact the harbor boat traffic. On days when tournaments are held, boat traffic increase is by through use of the launching ramp; little or no impact will be caused by the proposed new boat slips. The size of the harbor, generally permit boats to freely navigate the harbor in accordance with boating rules and courtesy. If required a permitting system could be instituted. However, such an adverse situation has not occurred requiring issuance of permits.

Question: Wastewater Impacts

Since there are no pump-outs, boats with holding tanks will have to dispose of their waste in the nearby restroom, a common practice. Those trailer-mounted boats without holding tanks will dispose of their small quantity of waste out at sea in compliance with Coast Guard regulations.

Please call our consultant, Mr. W.Y. Thompson, P.E. at 488-0388 should additional information be required.

Thank you for your comments.

c: NKO, Inc.
W.Y. Thompson, P.E.

DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 7TH FLOOR • HONOLULU, HAWAII 96813
PHONE: (808) 523-4414 • FAX: (808) 527-6743
DEPT. WEB SITE: www.honoluludpp.org • CITY WEB SITE: www.honolulu.gov

JEREMY HARRIS
MAYOR

ERIC G. CRISPIN, AIA
DIRECTOR

BARBARA KIM STANTON
DEPUTY DIRECTOR

2004/ELOG-2616 (JP)

December 16, 2004

Eric Hirano, P.E.
Chief Engineer
Department of Land and Natural Resources
Engineering Division
1151 Punchbowl Street, Room 221
Honolulu, Hawaii 96813

'04 DEC 17 AM 11:31 ENGINEERING

Dear Mr. Hirano:

Draft Environmental Assessment
Replacement, Repairs & Improvements
Haleiwa Boat Harbor
Tax Map Key 6-6-2: 4

Thank you for the opportunity to review the Draft Environmental Assessment (DEA), which we received on November 17, 2004. We have the following comments.

1. The project site, shown on Drawing Nos. 5 and 6 of the DEA, does not appear to correspond with Tax Map Key 6-6-2: 4. The parcel identified as Tax Map Key 6-2-3: 11 may be the correct identification for the project site.

2. We cannot confirm, based on the information provided in the DEA, that the project site is located within the Shoreline Management Area. It appears to us that the project site may actually be located seaward of the shoreline, in which case the proposed improvements would not be subject to the provisions of Chapter 25, Revised Ordinances of Honolulu (ROH) (i.e., it would not require a Special Management Area Permit).

3. It is similarly unclear whether the project site is located within the I-3 Waterfront Industrial District and/or the Haleiwa Special District. The DEA should clearly identify whether the project site is affected by Zoning Map No. 17 (Mokuleia-Waialua-Haleiwa) and the Haleiwa Special District.

For the above reasons, we strongly recommend that the EA include the conclusions of a licensed surveyor concerning the location of the project site with respect to its relationship to regulatory documents; particularly, whether the site is affected by Chapters 21 (the Land Use Ordinance) and 25, ROH.

Based on the drawings included in the DEA, we suspect that the project site is not within either the SMA, the I-3 District or the Haleiwa Special District, since it appears to be located seaward of the shoreline. However, if it turns out that the site is, in fact, located within the SMA, then: The project will require a Major SMP; the floating pier would be permitted in the I-3 District as a "public use and structure;" and, we would consider the project to be "exempt" for Haleiwa Special District purposes.

Please contact Jamie Peirson of our Land Use Permits Division staff at 527-5754 if you have any questions on these comments.

Sincerely yours,

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

EGC:nt

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STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

ENGINEERING DIVISION
PO BOX 373
HONOLULU, HAWAII 96809

JAN 18 2005

Honorable Henry Ing, Director
Department of Planning & Permitting
650 South King Street, 7th Floor
Honolulu, HI 96813

Attn: Jamie Peirson

Dear Mr. Ing:

Draft Environmental Assessment (DEA):
Job No. B76DO70A: Repairs, Replacement & Improvements
Haleiwa Boat Harbor, Haleiwa, Waialua, Oahu
Tax Map Plat: 6-2-03:11

Thank you for your review and comments on the floating dock project at Haleiwa Boat Harbor. We appreciate your evaluation of the project site. In response to your comments, we wish to state the following:

1. Project Site:
   You are correct in identifying the project as being located in TMK: 6-2-03:11. The harbor site, under E.O. 2596, is 31.024 acres and is comprised of several parcels with separate tax key numbers. We will revise the DEA by adding TMK: 6-6-03 plat as DRAWING NO. 5A to show this feature.

2. Shoreline Management Area location:
   In as much as the boat harbor area has not been consolidated into one parcel, we, too, are unclear as to its location relating to the City and County land use boundaries. In this respect, we will be submitting a request, under separate cover for A Special Management Area determination together with applicable drawings and photos.

3. Zoning Map location:
   Our reply is same as for Item 2: a separate request for boundary determination will be submitted to your office. The topography of the area was considerably altered during the development of the boat harbor in past years. Unfortunately, the tax map boundaries were not revised to reflect the new land configuration.

We hope that the location of the project with respect to the land use boundaries of the City and County can be determined in a timely manner and that the project can proceed with securing whatever permits are required by the City and County.

Thank you for your assistance.

Respectfully submitted,

ERIC T. HIRANO
Chief Engineer

c: NKO, Inc.
W.Y. Thompson, P.E.

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 3RD FLOOR • HONOLULU, HAWAII 96813
TELEPHONE: (808) 523-4529 • FAX. (808) 523-4730 • INTERNET: www.co.honolulu.hi.us

JEREMY HARRIS
MAYOR

GEORGE "KEOKI" MIYAMOTO
DIRECTOR

ROBERT J. FISHMAN
DEPUTY DIRECTOR

TPD04-00625

'04 DEC 27 PM01:59 ENGINEERING

December 22, 2004

Mr. Eric Hirano, P.E., Chief Engineer
Engineering Division
Department of Land and Natural Resources
State of Hawaii
1151 Punchbowl Street, Room 221
Honolulu, Hawaii 96813

Dear Mr. Hirano:

Subject: Replacement, Repairs and Improvements
Haleiwa Boat Harbor

In response to the November 15, 2004 letter from W. Y. Thompson, P.E., we have reviewed the draft environmental assessment (EA) for the subject project. The following comments are the result of this review:

1. The draft EA should be consistent in its description of the proposed project. In the Summary (Page 1), the proposed project is described as providing 16 additional slips, and possibly four more slips. However, on Page 9, it is stated that the new pier will provide 22 berthing slips. In addition, Drawing No. 7: Floating Dock Plan shows 22 slips.

2. Page 8 of the draft EA states that the precast piles will be trucked from an off-site location to the project site. The discussion regarding the delivery of these piles on Pages 25 and 26 should also state that a Department of Transportation Services street usage permit for oversized/overweight loads will be required to transport the piles if they are using City streets.

Should you have any questions regarding these comments, please contact Faith Miyamoto of the Transportation Planning Division at 527-6976.

Sincerely,

GEORGE "KEOKI" MIYAMOTO
Director

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

ENGINEERING DIVISION
PO BOX 373
HONOLULU, HAWAII 96809

JAN 18 2005

Honorable Ed Hirata, Acting Director
Department of Transportation Services
650 S. King Street, 3rd Floor
Honolulu, Hawaii 96813

Dear Mr. Hirata:

Draft Environmental Assessment (DEA):
Job NO. B76DO70A, Repairs, Replacement & Improvements
Haleiwa Boat Harbor, Haleiwa, Waialua, Oahu

Thank you for your review and comments regarding the proposed floating dock project at the Haleiwa Boat Harbor. In response to your comments, we wish to state the following:

1. The discrepancy that you cite on the number of boat slips will be corrected in the final EA. Since this DEA was prepared, it has been determined that 11 finger piers will be constructed which will provide 22 boat slips.

2. Delivery of reinforced concrete piles:
You are correct in stating that a permit for over-sized and overweight loads will be required. This will be the responsiblitity of the contractor as to how he transports the piles, singularly or in multiple loads. Thank you for calling this to our attention. We will remind the contractor of this requirement.

Your review and comments are appreciated. Thank you.

Respectfully submitted,

ERIC T. HIRANO
Chief Engineer

c: NKO, Inc.
W.Y. Thompson

WAIALUA BOAT CLUB

P. O. BOX 860817
WAHIAWA, HAWAII 96786

'04 DEC 14 AM 08:08 ENGINEERING

December 10, 2004

Eric Hirano, P.E., Chief Engineer
Department of Land & Natural Resources
Engineering Division
1151 Punchbowl Street, Room 221
Honolulu, HI 96813

Re: DEA/Haleiwa Boat Harbor

Dear Mr. Hirano:

I am the president of the Waialua Boat Club and submit this letter in support of the Haleiwa Harbor new floating pier proposal. Our members comprise a mix of boat owners who use the trailer ramp as well as the berths available in the Haleiwa Harbor. The members have had a chance to review the project and DEA. Our club supports the project and has no objection to the project.

The concerns of our membership are as follows:

1. Section 5.0 and related Table 7 omits mention of the mullet and uoauoa of the family *mugilidae* family. These species are prevalent in the harbor and may not have been noticed at the time of inspection in 2003.

2. The height displacement of the floating pier is not clear. In the high swell episodes of the past 2-3 years, the harbor swell has crested the shoreline area at the proposed dock site as well as at the scale. Dock boxes on the Pier 200 were ripped out due to water pressure. Appendix B only lists peak winter waves at 15 feet. It is not uncommon for the waves to reach 20-25 feet with the occasional 30 footers. The height displacement of the pier needs to be sufficient to handle maximum swells which may elevate the pier above the shoreline height to avoid damage to the gangway as well as utility fixtures.

3. Dimensionally, the new finger piers will jut out 40+ feet towards the Pier 200 which juts out approximately 40 feet which leaves a turning basin between the two piers of 100 feet. Is the 100 foot turning area too large?

4. The DEA indicates that the vessel traffic will not be effected by the

construction, however, the current turning basin between the trailer ramp and the new pier will reduce the current turning basin and traffic pattern.

5. Our members who are moored at Pier 200 also wish to make known that the condition of Pier 200 is poor at best. It was more than 10 years ago that the Department was to explore the installation of electricity at the Pier 200, however this has not been done. Although we understand that this project is different, the repairs to Pier 200 and electricity installation should be remedied.

Thank your for allowing us to review the DEA and comment. Should you need any further information or elaboration please do not hesitate contacting me.

Very truly yours,

STEPHEN W.H.A. LEE
President

cc: Waialua Boat Club

LINDA LINGLE
GOVERNOR OF HAWAII

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

YVONNE Y. IZU
DEPUTY DIRECTOR - WATER

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

ENGINEERING DIVISION
PO BOX 373
HONOLULU, HAWAII 96809

JAN 18 2005

Mr. Stephen W.H.A. Lee
Waialua Boat Club
P.O. Box 860817
Wahiawa, Hawaii 96786

Dear Mr. Lee:

Draft Environmental Assessment (DEA):
Job NO. B76DO70A, Repairs, Replacement & Improvements
Haleiwa Boat Harbor, Haleiwa, Waialua, Oahu

Thank you for your review and comments regarding the proposed floating dock project at Haleiwa Boat Harbor. In response to your concerns, we offer the following:

1. Presence of mullet and uoauoa in the boat harbor:
   Your finding is correct as the species you mention were probably not there or observed during the marine survey. We will add this to the list of aquatic biota as an addendum.

2. Height displacement of floating pier:
   In design for the floating pier, the parameters established by the U.S. Corps of Engineers in the design and construction of the Haleiwa Boat Harbor were used.

3. 100-foot turning area:
   The turning area or navigable space between the existing and proposed piers was selected to provide safe navigation by the boats berthed at these piers.

4. Vessel traffic during construction:
   By coordinating the contractor's work with the needs of the boaters, vessel traffic impediment will be kept to a minimum. After award of the contract, and receipt of the contractor's Best Management Plan practice, we will be able to initiate steps to avoid disruptions. It is expected that the contractor will hold meetings with the boaters to learn their viewpoints and to work out an equitable work plan.

5. Electrical connection to existing pier:
   Your recommendation regarding the installation of electrical service to the existing pier has been forwarded to the Division of Boating and Ocean Recreation for consideration.

The comments by the Waialua Boat Club are appreciated. It is the department's hope that with the support of boaters additional improvements can be made to enhance the recreational and economical aspects of this North Shore boating center.

Thank you.

Respectfully submitted,

ERIC T. HIRANO
Chief Engineer

c: NKO, Inc.
W.Y. Thompson, P.E.

OTHER COMMENTS

POLICE DEPARTMENT

CITY AND COUNTY OF HONOLULU

801 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96813 · AREA CODE (808) 529-3111
http://www.honolulupd.org
www.honolulu.gov

JEREMY HARRIS
MAYOR

BOISSE P. CORREA
CHIEF

GLEN R. KAJIYAMA
PAUL D. PUTZULU
DEPUTY CHIEFS

OUR REFERENCE CS-KP

December 2, 2004

Mr. Eric Hirano, P.E., Chief Engineer
Engineering Division
Department of Land and Natural Resources
State of Hawaii
1151 Punchbowl Street, Room 221
Honolulu, Hawaii 96813

Dear Mr. Hirano:

Thank you for the opportunity to review and comment on the Draft Environmental Assessment for the Replacement, Repairs and Improvements to the Haleiwa Boat Harbor.

This project should have negligible impact on the facilities and services of the Honolulu Police Department.

If there are any questions, please call Lieutenant Brain Chang of District 2 at 621-8442 or Ms. Carol Sodetani of the Support Services Bureau at 529-3658.

Sincerely,

BOISSE P. CORREA
Chief of Police

By
KARL GODSEY
Assistant Chief of Police
Support Services Bureau

Serving and Protecting with Aloha

PV119 AVERY

CORRECTION

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

POLICE DEPARTMENT

CITY AND COUNTY OF HONOLULU

801 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96813 · AREA CODE (808) 529-3111
http://www.honolulupd.org
www.honolulu.gov

JEREMY HARRIS
MAYOR

BOISSE P. CORREA
CHIEF

GLEN R. KAJIYAMA
PAUL D. PUTZULU
DEPUTY CHIEFS

OUR REFERENCE CS-KP

December 2, 2004

Mr. Eric Hirano, P.E., Chief Engineer
Engineering Division
Department of Land and Natural Resources
State of Hawaii
1151 Punchbowl Street, Room 221
Honolulu, Hawaii 96813

Dear Mr. Hirano:

Thank you for the opportunity to review and comment on the Draft Environmental Assessment for the Replacement, Repairs and Improvements to the Haleiwa Boat Harbor.

This project should have negligible impact on the facilities and services of the Honolulu Police Department.

If there are any questions, please call Lieutenant Brain Chang of District 2 at 621-8442 or Ms. Carol Sodetani of the Support Services Bureau at 529-3658.

Sincerely,

BOISSE P. CORREA
Chief of Police

By
KARL GODSEY
Assistant Chief of Police
Support Services Bureau

Serving and Protecting with Aloha

DEPARTMENT OF PARKS AND RECREATION
CITY AND COUNTY OF HONOLULU
1000 ULUOHIA STREET, SUITE 309 • KAPOLEI, HAWAII 96707
TELEPHONE: (808) 692-5561 • FAX: (808) 692-5131 • INTERNET: www.co.honolulu.hi.us

JEREMY HARRIS
MAYOR

WILLIAM D. BALFOUR, JR.
DIRECTOR

EDWARD T. "SKIPPA" DIAZ
DEPUTY DIRECTOR

'04 NOV 30 AM 11:32 ENGINEERING

November 26, 2004

Mr. Eric Hirano, P.E., Chief Engineer
Department of Land and Natural Resources
Engineering Division
1151 Punchbowl Street, Room 221
Honolulu, Hawaii 96813

Dear Mr. Hirano:

Subject: Draft Environmental Assessment
Repairs, Replacement and Improvements to Haleiwa Boat Harbor
Job No. B76DO70A
Haleiwa, Waialua, Oahu
Tax Map Plat: 6-6-02:04

Thank you for the opportunity to review and comment on the Draft Environmental Assessment relating to the Repairs, Replacement and Improvements at Haleiwa Boat Harbor.

The Department of Parks and Recreation has no comment on this project.

Should you have any questions, please contact Mr. John Reid, Planner, at 692-5454.

Sincerely,

W. D. Balfour

WILLIAM D. BALFOUR, JR.
Director

WDB:mk
(84447)

cc: W. Y. Thompson, P.E.

LINDA LINGLE
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

RODNEY K. HARAGA
DIRECTOR

Deputy Directors
BRUCE Y. MATSUI
BARRY FUKUNAGA
BRIAN H. SEKIGUCHI

IN REPLY REFER TO:

STP 8.1476

December 2, 2004

'04 DEC 09 PM 08:13 ENGINEERING

TO: MR. ERIC HIRANO, P.E., CHIEF ENGINEER
ENGINEERING DIVISION
DEPARTMENT OF LAND & NATURAL RESOURCES

FROM: RODNEY K. HARAGA
DIRECTOR OF TRANSPORTATION

SUBJECT: HALEIWA BOAT HARBOR (REPAIRS, REPLACEMENT & IMPROVEMENTS) – DRAFT ENVIRONMENTAL ASSESSMENT (DEA)
TMK: 6-6-02: 04

Thank you for your transmittal requesting our comments on the subject report.

The proposed repairs, replacement & improvements to the Haleiwa Boat Harbor will not have any impact to our State facilities.

We appreciate the opportunity to provide our comments.

LINDA LINGLE
GOVERNOR
STATE OF HAWAII

PY

MICAH A. KANE
CHAIRMAN
HAWAIIAN HOMES COMMISSION

BEN HENDERSON
DEPUTY TO THE CHAIRMAN

KAULANA H. PARK
EXECUTIVE ASSISTANT

RECEIVED
2004 NOV 23 A10:39
DEPT OF LAND & NATURAL RESOURCES
STATE OF HAWAII

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P.O. BOX 1879
HONOLULU, HAWAII 96805

November 22, 2004

To: The Honorable Peter A. Young, Chairperson
Board of Land and Natural Resources

Attention: Eric Hirano, Chief Engineer
Engineering Division

From: Micah A. Kane, Chairman
Hawaiian Homes Commission

Subject: Draft Environmental Assessment
Repairs, Replacement and Improvements
Haleiwa Boat Harbor, Haleiwa, Waialua, Oahu

Thank you for the opportunity to review the draft environmental assessment report for the Haleiwa Boat Harbor project on Oahu. The Department of Hawaiian Home Lands has no comments to offer.

If you have any questions, please call me at 586-3801 or call our Planning Office at 586-3836.

'04 NOV 24 A11:06 ENGINEERING

NRCS
Natural Resources Conservation Service
P.O. Box 50004
Honolulu, HI 96850
808-541-2600

United States Department of Agriculture

Our People...Our Islands...In Harmony

'04 DEC 09 AM 08:16 ENGINEERING

December 3, 2004

Mr. Eric Hirano, P. E., Chief Engineer
Department of Land & Natural Resources
Engineering Division
1151 Punchbowl Street, Room 221
Honolulu, Hawaii 96813

Subject: Draft Environmental Assessment (DEA) Repairs, Replacement & Improvements Haleiwa Boat Harbor; Job No. B76DO70A ;Haleiwa, Waialua, Oahu Tax Map plat: 6-6-02:04

Attention: Mr. Eric Hirano

We have reviewed the above mentioned document and have no comment to offer at this time.

Thank you for the opportunity to comment.

Sincerely,

LAWRENCE T. YAMAMOTO
State Conservationist

The Natural Resources Conservation Service provides leadership in a partnership effort to help people conserve, maintain, and improve our natural resources and environment.

An Equal Opportunity Provider and Employer

APPENDIX A
FAUNA SURVEY

FAUNA SURVEY FOR THE
NEW FIXED DOCK
HALEIWA SMALL BOAT HARBOR
WAIALUA, OAHU

Prepared by Paul Breese on September 14, 2003

The actual dock area with its many private boats and human activity is not quality habitat for native birds. However, approximately 12 miles away, near Kahuku, there is an important native water bird area. This is the James Campbell National Wildlife Refuge. Some birds from this refuge may be expected to fly over the proposed dock area of the small boat harbor. Native seabirds also may fly over the area.

The bird and mammal fauna of the immediate area is composed of both native and introduced species. It is also possible that endemic Hawaiian creatures classified as endangered or threatened by the U. S. Fish & Wildlife Service may enter or fly over the project site. These are the Newell's Shearwater, Dark-rumped Petrel, plus four endangered water birds: the Hawaiian Stilt, the Hawaiian Duck, the Hawaiian Coot, and the Hawaiian Gallinule. Also, the Hawaiian Bat and the Hawaiian Monk Seal may come near the site. The green sea turtle is abundant on this coast.

Green Sea Turtles (Honu) Chelonia mydas

During a field survey on August 25, 2003 at 1 p.m., this observer and his assistant saw a congregation of sea turtles along the shoreline of Laniakea Beach approximately 2.5 miles northeast of the Haleiwa Small Boat Harbor. The turtles appeared to be feeding on the seaweed growing on the rocks along the sand. At that time, the seaweed was under water due to high tide. This permitted access for the turtles to feed. Our observations tentatively identified these animals as green sea turtles (Chelonia mydas).

Green sea turtles have greatly increased in numbers in Hawaiian waters in recent years. This remarkable recovery is probably due to passage of federal and state laws in the 1970's making it illegal to kill or harass any sea turtles in Hawaii. The green sea turtle is currently listed as a "threatened species" by the US Fish & Wildlife Service.

Based on the abundance of sea turtles along this shore, the honu should be seen regularly in the small boat harbor at Haleiwa. The honu appear to be relatively unafraid of humans. The proposed dock may actually benefit the honu by providing additional surface for seaweed to grow --- their food source.

FAUNA LIST

These birds may possibly be found near or flying over the project site.

NATIVE BIRDS

Common Name	Hawaiian Name	Scientific Name
* Hawaiian Duck	Koloa maoli	Anas wyvilliana
* Hawaiian Gallinule	Alae ula	Gallinula chloropus sandwichensis
* Hawaiian Coot	Alae keokeo	Fulica americana alai
* Hawaiian Stilt	Aeo	Himantopus mexicanus knudseni
Hawaiian Owl	Pueo	Asio flammeus sandwichensis
Pacific Golden Plover	Kolea	Pluvialis fulva
Wandering Tattler	'Ulili	Heteroscelus incanus
Sanderling	Hunakai	Calidris alba
Ruddy Turnstone	Akekeke	Arenara interpres
* Bristle-thighed Curlew	Kioea	Numenius tahitiensis
Black-Crowned Night Heron	Auku'u	Nycticorax nycticorax hoactli
Great Frigatebird	Iwa	Fregata minor palmerstoni
Brown Booby	'A	Sula leucogaster plotus
Red-footed Booby	'A	Sula sula rubripes
White-tailed Tropicbird	Koa'e Kea	Phaethon lepturus dorotheae
Red-tailed Tropicbird	Koa'e Ula	Phaethon rubricauda rothschildi
Hawaiian Noddy Tern	Noio	Anous minutus melanogenys
Common Noddy Tern	Noio Koha	Anous stolidus pileatus
Sooty Tern	Ewa Ewa	Sterna fuscata oahuensis
White Tern	Manu o ku	Gygis alba rothschildi
+ Newell's Shearwater	Ao	Puffinus newelli
Wedge-tailed Shearwater	Uau kani	Puffinus pacificus
* Dark-rumped Petrel	Uau	Pterodroma phaeopygia sandwichensis
Laysan Albatross	Moli	Diomedea immutabilis
Pintail Duck	Koloa mapu	Anas acuta
Shoveler Duck	Koloa moha	Anas clypeata
Fulvous Tree Duck	--	Dendrocygna bicolor

*** Indicates classification as endangered by US Fish & Wildlife Service**

+ Indicates classification as threatened by US Fish & Wildlife Service

INTRODUCED BIRDS

Common Name	Scientific Name
Barn Owl	Tyto alba
Cattle Egret	Bubulcus ibis
Black Francolin	Francolinus francolinus
Spotted Dove	Streptopelia chinensis
Zebra Dove	Geopelia striata
Domestic Pigeon	Columba livia
Japanese White-Eye	Zosterops japonicus
Japanese Bush-Warbler	Cettia diphone
Common Mynah	Acridotheres tristis
House Sparrow	Passer domesticus
House Finch	Carpodacus mexicanus
Java Sparrow	Padda oryzivora
Strawberry Finch	Amandava amandava
Common Waxbill	Estrilda astrild
Chestnut Mannikin	Lonchura malacca
Spotted Munia (Ricebird)	Lonchura punctulata
Northern Cardinal	Cardinalis cardinalis
Red-crested Cardinal	Cardinalis coronata
Red-vented Bulbul	Pycnonotus cafer
Red-whiskered Bulbul	Pycnonotus jocosus

MAMMALS

The Hawaiian Bat, the State's only native land mammal, is widely distributed on the main Hawaiian Islands. It could possibly inhabit or fly over the project site from time to time. The Hawaiian Monk Seal is primarily found in the Leeward Islands of Hawaii. In recent years it has been seen with some frequency swimming near and coming ashore on beaches of the main islands.

NATIVE MAMMALS

Common Name	Scientific Name
*Hawaiian Bat	Lasiurus cinereus semotus
*Hawaiian Monk Seal	Monachus schauinslandi

Other mammals that could be present are all introduced by humans. It is probable that the following introduced mammals could be found at the project site:

INTRODUCED MAMMALS

Common Name	Scientific Name
Rat	Rattus rattus
House Mouse	Mus musculus
Cat	Felix catus
Dog	Canis familiaris
Mongoose	Herpestes auropunctatus

* Indicates classification as endangered by US Fish & Wildlife Service

APPENDIX B
MARINE ENVIRONMENTAL ASSESSMENT

Marine Environmental Assessment
for the New Docks at
Haleiwa Small Boat Harbor, Oahu
TMK: 6-6-01,02

October 2003

Prepared for:

W. Y. Thompson, P.E.
98-1051 Kahapili Street
Aiea, Hawaii 96701

Submitted by:

Sea Engineering, Inc.
Makai Research Pier
Waimanalo, Hawaii 96795

and

AECOS Consultants, Inc.
45-939 Kamehameha Hwy. Room 104
Kaneohe, Hawaii 96744

#3-30

Table of Contents

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1.0 INTRODUCTION

The Haleiwa Small Boat Harbor is located on the North Shore of Oahu at the head of Waialua Bay (Figures 1 and 2), where the Anahulu River drains into the ocean. The harbor is a popular site for recreational fishermen and North Shore residents. Charter vessels for fishing and diving, and numerous recreational vessels regularly use the harbor. According to the Harbor Master's office, there is a long wait-list for docking space in the harbor.

The present harbor was constructed in several stages. Initially, in 1955, a rubblemound breakwater approximately 700 feet long was constructed on the sandy point immediately west of the mouth of the Anahulu River (Figure 3). The breakwater was intended to protect fishing craft that were mooring in the sheltered mouth of the river. Although the breakwater greatly improved mooring conditions, large waves continued to cause damage, boats were exposed to river flood damage, and the river channel often shoaled and restricted navigation. Thus, in 1966, the small boat harbor was constructed. This included redirecting the outlet of the Anahulu River, and constructing an L-shaped revetted exterior mole that bounded the east side of the harbor, and formed the west side of the river channel (Figure 3). The harbor interior was divided into two basins by the remnant of the sand spit that extended from the mole about 600 feet to the west. The entrance channel is located along the west side of the harbor, and is 740 feet long, 120 feet wide and 12 feet deep. Subsequent improvements have included constructing a rubblemound jetty about 120 feet long extending into the existing channel area from the west end of the original revetted mole to further diminish wave energy entering the harbor; and developing the interior sand spit to provide parking, an administration building and boat berthing.

The present harbor configuration is illustrated in the aerial photographs in Figures 2 and 3. A new dock is planned alongside the existing dock, as illustrated in Figure 3. In support of the environmental assessment and permitting process for this project, Sea Engineering and AECOS, Inc. were contracted to complete a marine environmental assessment of the site. This report describes the marine environment and possible impacts of this project. The field reconnaissance survey for this report was conducted on August 1, 2003 by Marc Ericksen of Sea Engineering, and *AECOS* biologist, Susan Burr. Surface currents were monitored, and three water samples and two sediment samples were collected to characterize the marine environment and identify potential contaminants. The biologist snorkeled the area to characterize the environment and identify whether any sensitive marine resources were present.

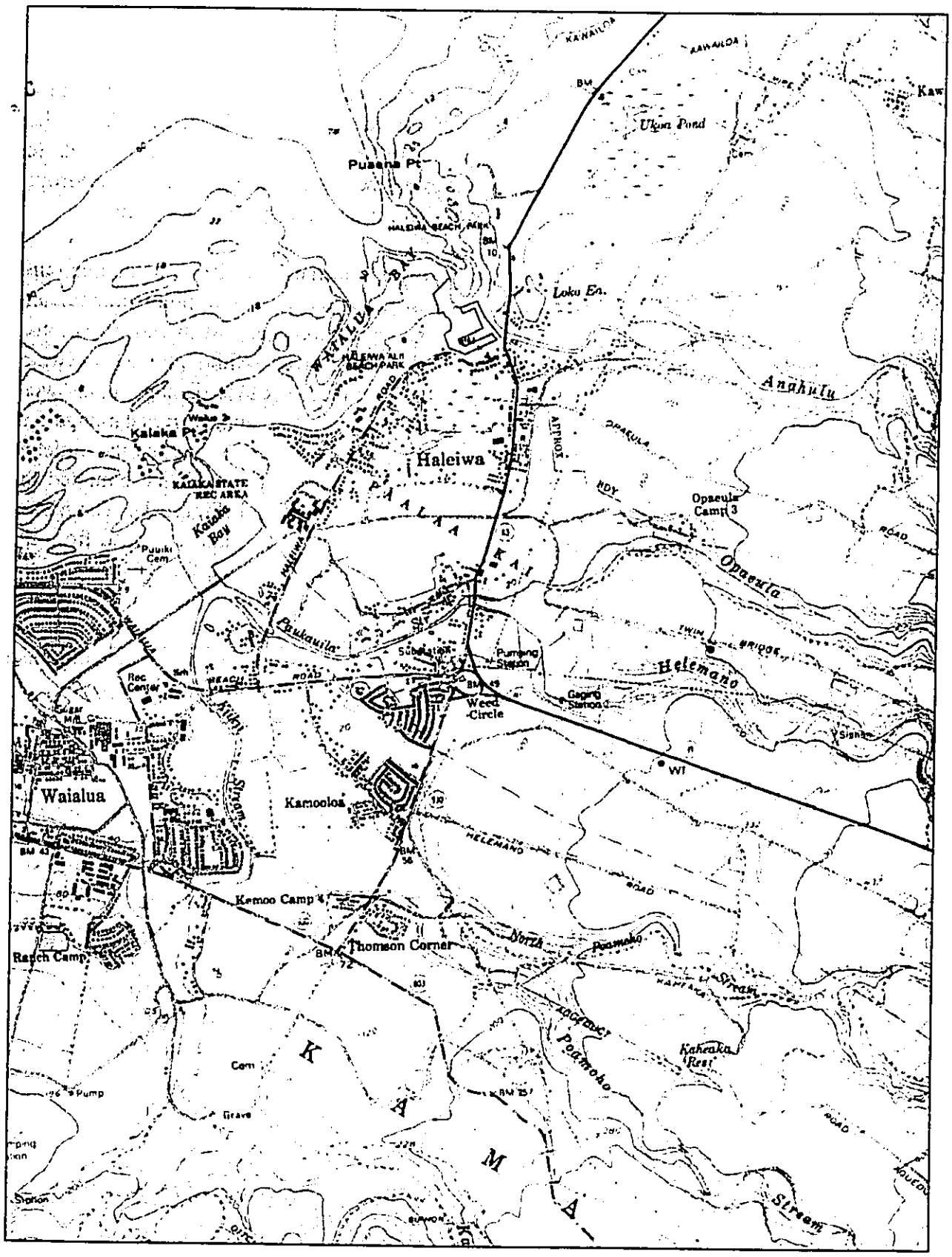

Figure 1. Project Location Map

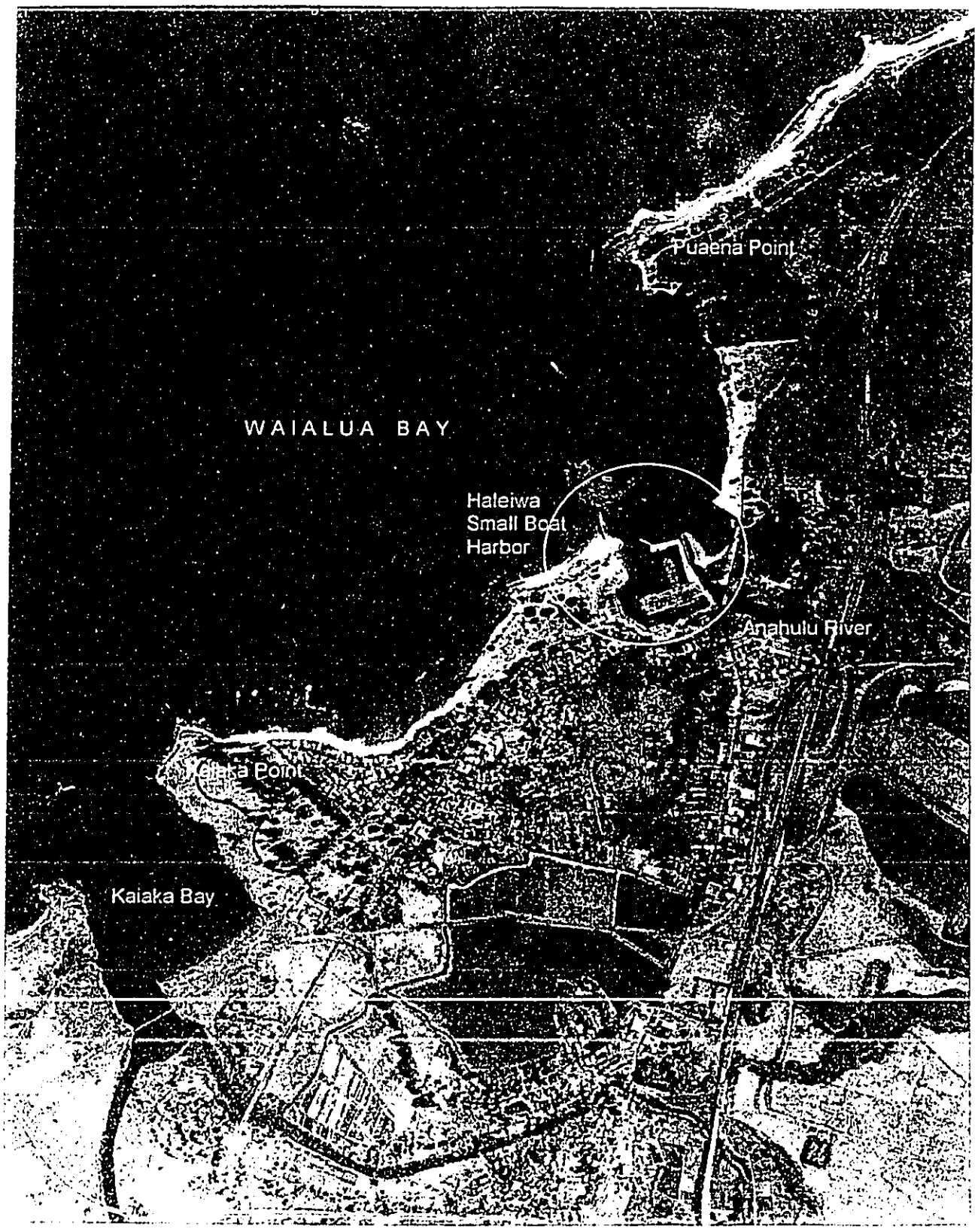

Figure 2. Aerial Photograph of Waialua Bay

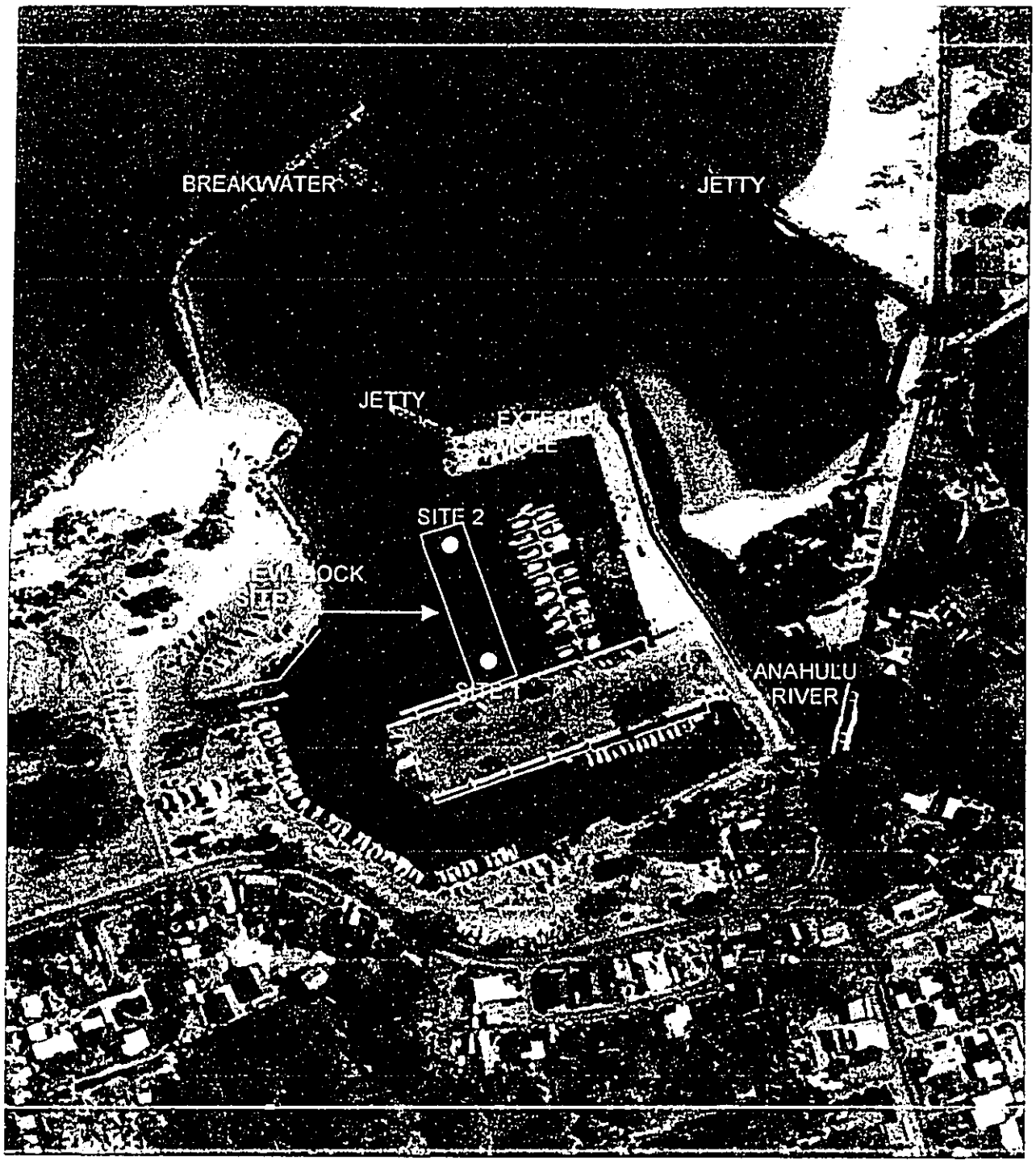

Figure 3. Haleiwa Small Boat Harbor Project Site

2.0 PHYSICAL MARINE ENVIRONMENT

2.1 Coastal Setting

Haleiwa Small Boat Harbor is located in Waialua Bay, on the north shore of Oahu. Wailua Bay is a coastal plain estuary that receives freshwater influence from Anahulu River, and is bounded by the rocky limestone outcrops of Kaiaka Point to the west and Puaena Point to the east (Figure 2). The offshore bathymetry is dominated by two pronounced troughs or canyons associated with the Paukauila and Anahulu River drainages that extend towards shore (Figure 1). The 30-foot depth contour approaches the tip of the Haleiwa Small Boat Harbor breakwater, while immediately to the northeast and southwest, it is 3000 to 4000 feet offshore (Figure 1). During the winter, this is a high wave energy coastline, directly exposed to North Pacific Swell.

The shoreline in the harbor area has been significantly altered from its natural state. These alterations include diversion of the river channel and mouth, the offshore breakwater protecting the harbor, the L-shaped exterior mole bounding the harbor and river channel, and a jetty bounding the southwest end of Haleiwa Beach Park. Figure 4 shows the mole separating the river channel and the harbor. Figure 5 shows the view outward from the proposed new dock location, showing the exterior mole and breakwater in the background. Figure 6 shows the view of the new dock site from the end of the existing dock, while Figure 7 shows the shoreline at the proposed dock location. The shoreline consists of a geotextile, cast-in-place concrete shore protection system known as Fabriform. Lengths of geotextile bags are pumped full of concrete to form the existing sloping concrete surface. There is also a short length of sloping concrete-rubble-masonry wall in the midst of the concrete Fabriform. This is possibly a section of the wall that was repaired.

Depths at the proposed dock site range from –7 feet near the shoreline to –11 feet at the proposed outboard edge of the new docks.

2.2 Winds

The predominant winds in Hawaii are the northeast trades, which are present 70 percent of the time, with typical speeds ranging from 10 to 20 mph. The climate in Hawaii is characterized by two distinct seasons, primarily defined by the annual variation in the occurrence of the tradewinds. The trades occur 90 percent of the time from June through August and only 50 percent of the time from January through March. The winds at the project site during tradewind conditions would vary from onshore to sideshore, depending upon the degree of easterly component of the winds.

During the winter, the high-pressure system is not as strong or as persistent as in the summer months, resulting in a lower frequency of tradewinds. Low pressure systems periodically displace the trades, resulting in south or southwest winds known as "Kona" winds. Kona

winds may occur up to 17 percent of the time in the winter months, with speeds ranging from light and variable to gale force. Kona winds result in offshore winds at the site.

2.3 Tides

Tides in Hawaiian waters are semi-diurnal, with pronounced diurnal inequalities (i.e. two tidal cycles per day with unequal ranges of water level movement). The following tide levels have been established for the Haleiwa/Waialua Bay area:

Tide Level	Feet (MLLW)
Mean Higher High Water	1.6
Mean Sea Level	0.7
Mean Lower Low Water	0.0 (Reference Datum)

2.4 Waves

Two general wave types affect the Haleiwa area – Northeast tradewind waves and north swell. Tradewind generated waves are present throughout most of the year, but are most frequent during the summer months when they dominate the local wave climate. Typically, these waves have periods ranging from 6 to 10 seconds, and heights of 4 to 12 feet. North swell is generated by winter storms in the Aleutian area of the North Pacific Ocean and by mid-latitude low-pressure areas. North swell is largest and most frequent during the winter months of October through March, and typically has heights of up to 15 feet with periods of 12 to 20 seconds. The waves approach from the sector northwest through north-northeast. Haleiwa is exposed to waves from directional sectors approximately 349 to 33 degrees.

The Haleiwa Boat Harbor Development Study (McAuliffe et al., 1970) reported that deep water waves with heights in excess of 9.9 feet occur about 1 percent of the year with periods typically of 15 to 19 seconds. Waves up to 6 feet high occur about 10 percent of the time. This study also hindcast the wave characteristics of large wave events known to have impacted the Haleiwa area between 1956 and 1970. The results are listed below in Table 1.

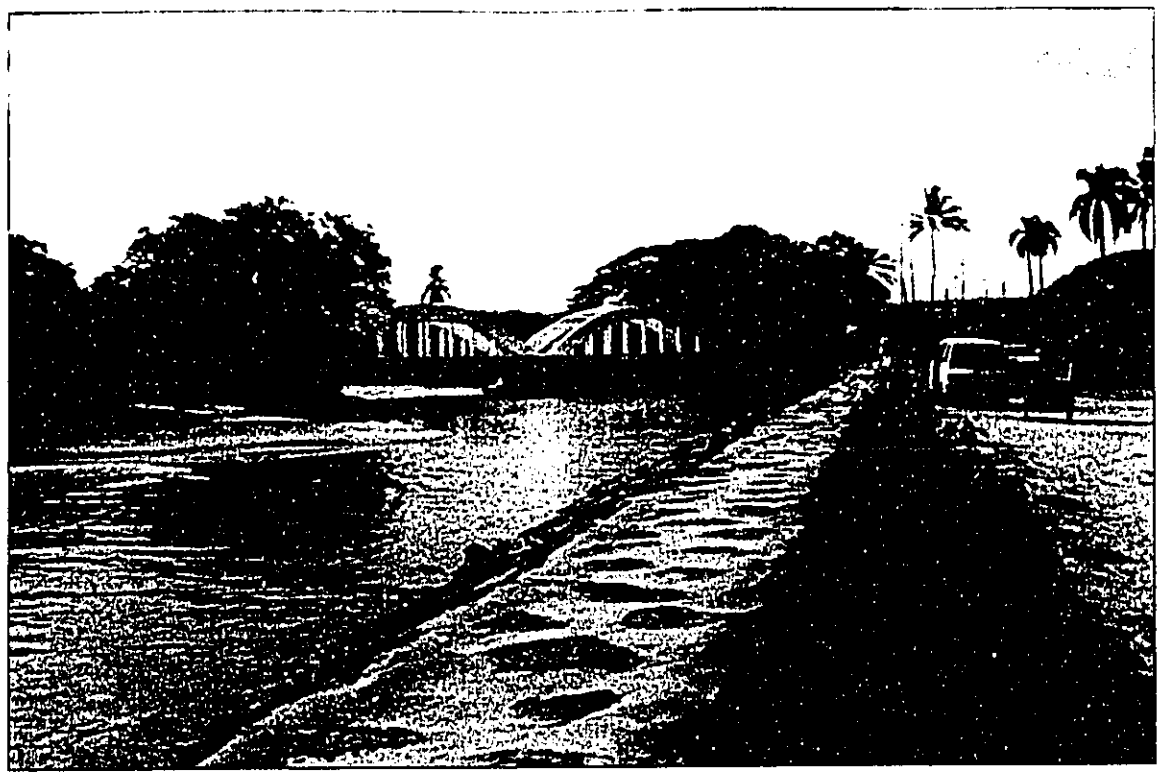

Figure 4. Exterior mole bounding Anahulu River and Haleiwa Small Boat Harbor

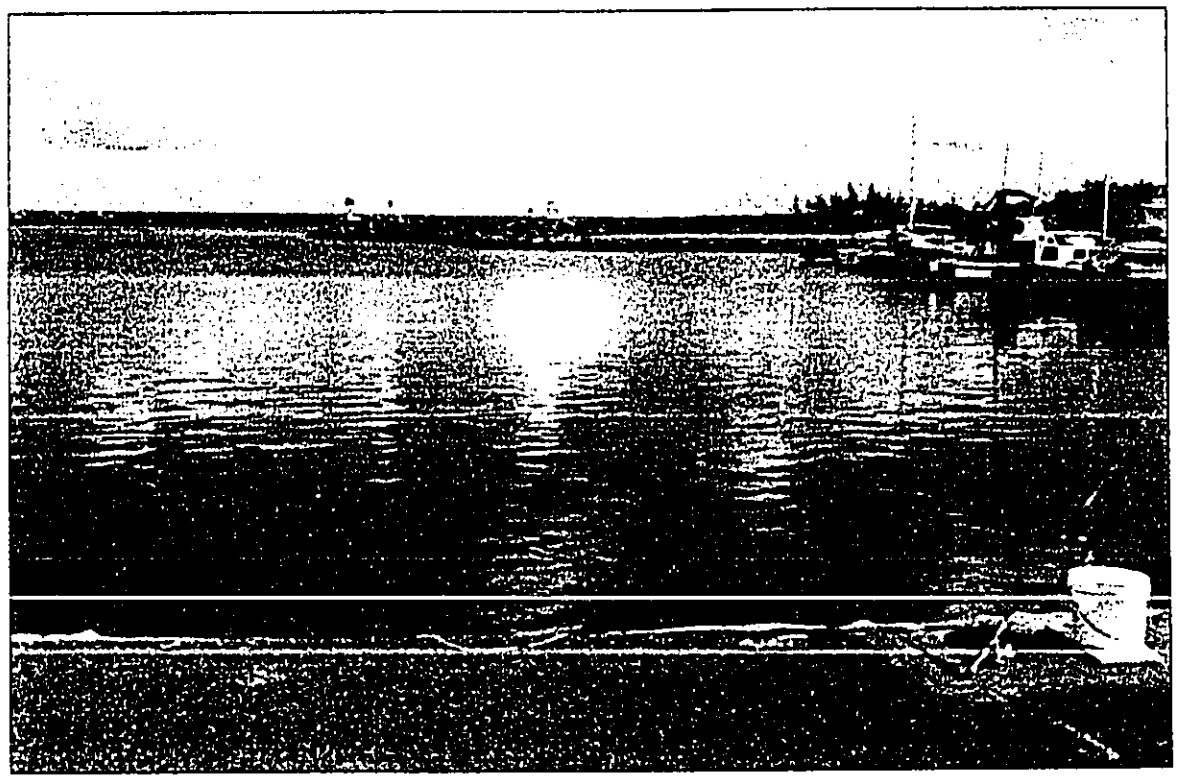

Figure 5. Proposed dock site

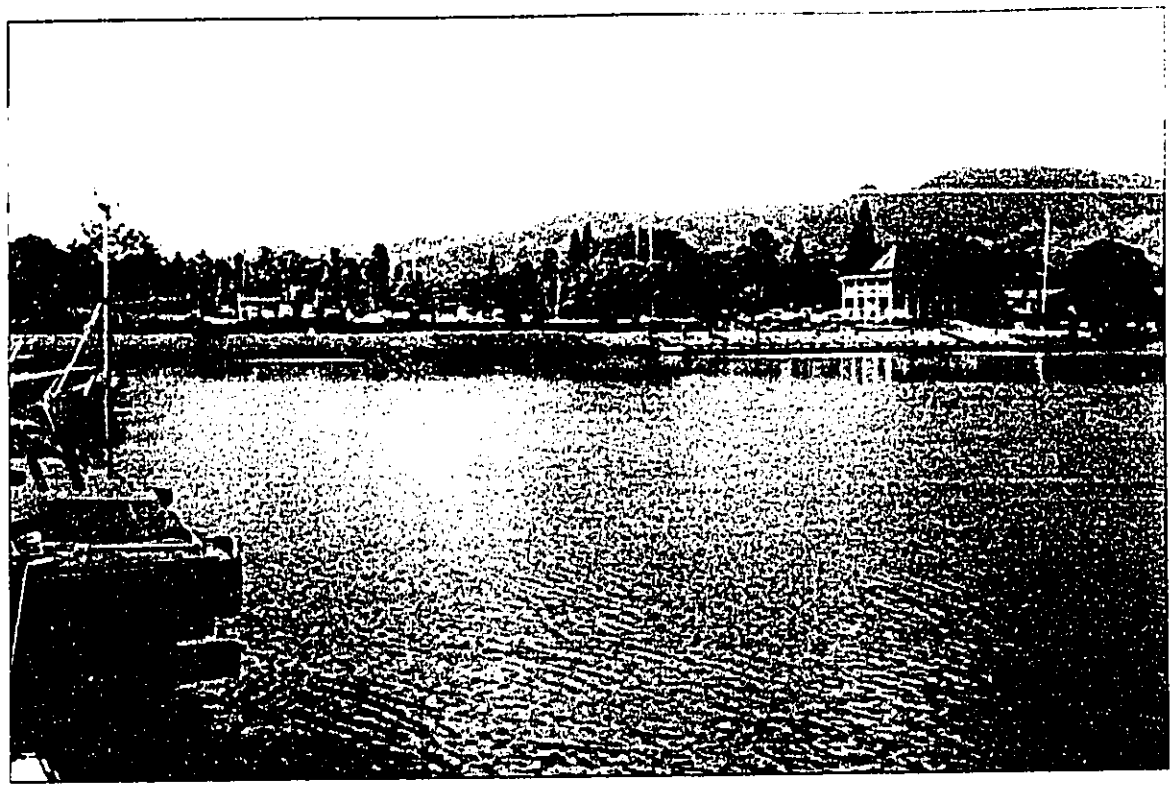

Figure 6. View of proposed dock site from the end of the existing dock

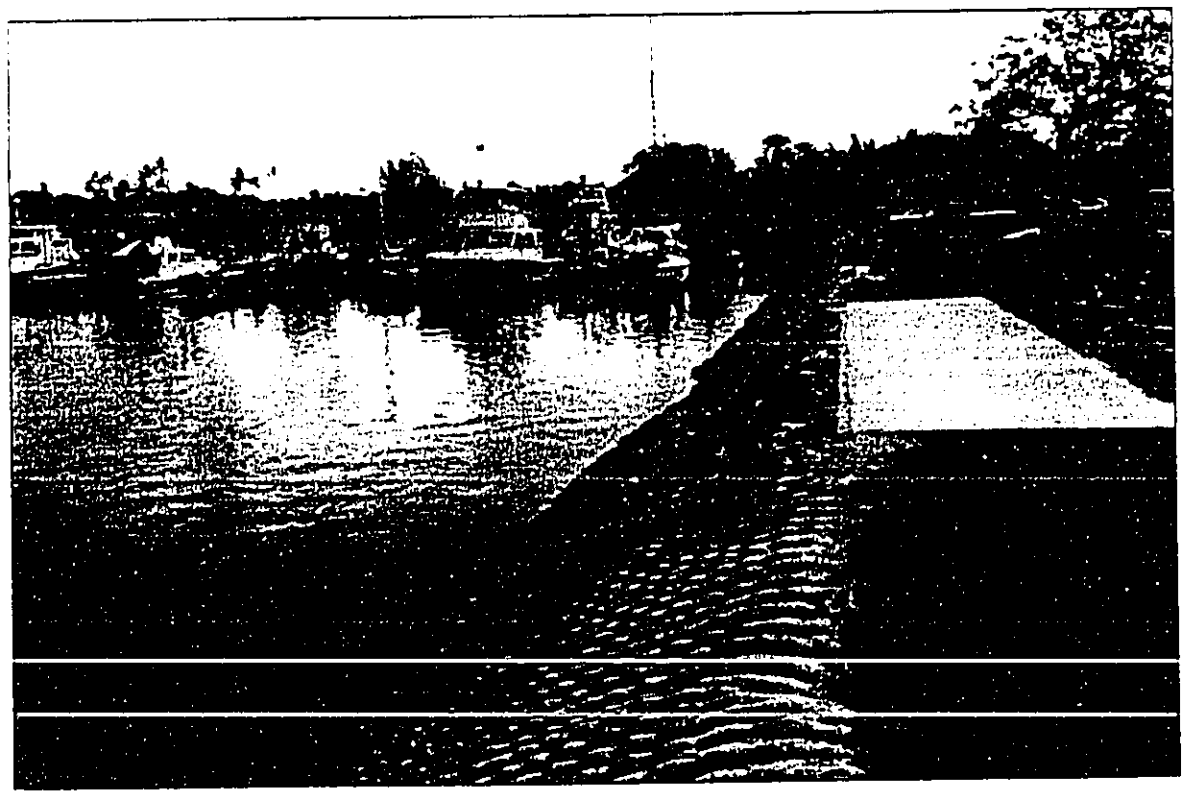

Figure 7. Shoreline at the proposed dock site

Table 1. Deep Water Significant Wave Characteristics

Date	H_o (feet)	T (seconds)	Direction
November, 1956	19.0	15	NW
January, 1958	24.0	17	WNW
December, 1960	13.0	13	N
December, 1960	19.0	13	NW
January-February, 1965	29.0	12	WNW
December, 1968	22.0	11	NW
December, 1969	30.0	17	WNW

A University of Hawaii report (1977) also predicted long term expected wave heights for the north shore of Oahu. The database used was a summary of hindcasts by the Army Corps of Engineers for the years 1947 through 1965. The mean expected deepwater significant wave heights as a function of return period are listed in Table 2 below.

Table 2. Mean Expected Significant Wave Heights

Return Interval (years)	Significant Deep Water Wave Height (feet)
10	23.0
25	27.9
50	31.3

The incoming deepwater waves are transformed by the processes of refraction, shoaling, bottom friction and breaking as they near shore. Larger waves break offshore on or seaward of the reef, and only a small portion of the incoming wave energy actually reaches the shoreline. The size of the waves at the shoreline is limited by water depth. The design wave height cited in the Haleiwa Boat Harbor Development Study (McAuliffe et al., 1970) to design improvements to the harbor was a breaker height of 11 feet at the breakwater.

In addition to the primary wave types discussed above, infrequent tropical storms and hurricanes may generate large waves which affect the study area. The Windward Oahu Hurricane Vulnerability Study, Waialua District (Sea Engineering, 1990) indicates that a model hurricane approaching from the south to southwest could result in deepwater waves 32 feet high with periods of 12 seconds. In the harbor vicinity, these waves would break in a water depth of 44 feet with a breaking height of 35 feet. A model hurricane is defined as the probable hurricane that will strike the Hawaiian Islands in the future based on the characteristics of hurricanes Dot and Iwa that previously struck the islands.

2.5 Still Water Level Rise

Storms and large waves produce storm surge and wave setup that results in elevated water levels at the shoreline. During prevailing, annual conditions this water level rise can be 1 foot above the tide level. However, during extreme events, the still water level rise can be significantly greater. The Windward Oahu Hurricane Vulnerability Study, Waialua District (Sea Engineering, 1990) reports that during the model hurricane (see above), storm surge and wave setup in the harbor area would be 0.7 and 3.7 feet respectively, resulting in a water level rise of 4.4 feet above tide level.

During the extreme north swell event in December 1969 (see Table 1), there were reports that the water levels rose to 6.5 to 7 feet mllw (5.5 to 6 feet above reported tide levels of 1 foot mllw) in the harbor parking and access area inshore of the berthing basin (McAuliffe et al., 1970). Smaller water level rises have also been reported on numerous occasions. Most recently, during the 2002-2003 winter, a large North Pacific swell caused a rise in water level that flooded the backshore and parking areas of the harbor. To account for this still water level rise, McAuliffe (1970) suggested that an increment of 2.5 to 3.0 feet should be added to a maximum high tide level of 2.5 feet, resulting in recommended elevations of 5 to 5.5 feet mllw for interior harbor structures.

2.6 Tsunamis and Flood Insurance Rate Map Designation

The Haleiwa area is susceptible to tsunami inundation. The tsunamis of 1946, 1952, 1957, 1960 and 1964 generated flood heights of 10, 13, 13, 8 and 10 feet, respectively, in Wailua Bay (Loomis, 1976).

The Flood Insurance Rate Map Designation for the harbor area ranges from Zone VE flood elevation 16 feet at the breakwater, to Zone VE flood elevation 12 feet at the exterior mole, to Zone AE flood elevation 8 feet in the interior of the harbor (FEMA, 1987). The flood elevations are based on the 100-year flood, and Zone VE refers to areas subject to flooding with velocity hazards.

2.7 Currents

Currents inside the harbor are generally weak. Currents were measured on August 1, 2003 by tracking surface drift drogues deployed at the proposed dock location. Winds were from the east-northeast at approximately 10 knots. The drogues moved downwind at speeds of 0.08 and 0.10 knots.

3.0 WATER QUALITY

Water samples were collected from two stations in the small boat harbor and one offshore from Haleiwa Beach (Figure 3). Some parameters were measured by field meter and others in water samples collected in appropriate containers and taken to the AECOS Laboratory in Kaneohe (laboratory Log No. 17672). Table 3 lists field instruments and analytical methods used with these samples. The tide was low and rising during the survey on August 1, 2003. A low tide of 0.2 ft (higher low water or HLW) occurred at 9:34 am and the afternoon high tide of 1.7 ft (higher high water or HHW) occurred at 5:30 pm (NOAA, 2002b).

Hawaii's Water Quality Standards classify the Haleiwa Small Boat Harbor as a Class A embayment (State DOH, 2000). As stated in the Water Quality Standards, it is the objective of Class A waters that their use for recreation and aesthetic enjoyment be protected (State DOH, 2000).

The primary purpose of the water quality measurements was to characterize the existing marine environment, not to set baseline values or determine compliance with Hawaii's Water Quality Standards (Table 4). In fact, the State criteria for turbidity, nutrients, and chlorophyll α are based upon geometric mean values and a minimum of three separate samples per location would be needed to compute a geometric mean (DOH, 2000).

Table 3. Analytical methods and instruments used for the August 1, 2003 water quality sampling in Haleiwa Small Boat Harbor, Haleiwa, Oahu

Analysis	Method	Reference	Instrument
Chlorophyll α	10200 H	Standard Methods, 18th Edition (1992)	Turner Model 112 fluorometer
Dissolved Oxygen	EPA 360.1	EPA (1979)	YSI Model 85 DO meter
Nitrate + Nitrite	EPA 353.2	EPA (1993)	Technicon AutoAnalyzer II
pH	EPA 150.1	EPA (1993)	SA 250
Salinity	bench salinometer	Grasshoff in Grasshoff et al. (1986)	AGE Model 2100 salinometer
Temperature	thermister calibrated to NBS cert. thermometer (EPA 170.1)	EPA (1979)	YSI Model 85 DO meter
Total Nitrogen	persulfate digestion / EPA 353.2	D'Elia et al. (1977) / EPA (1993)	Technicon AutoAnalyzer II
Total Phosphorus	persulfate digestion / EPA 365.1	Koroleff in Grasshoff et al. (1986) / EPA (1993)	Technicon AutoAnalyzer II
Total Suspended Solids	Method 2540D (EPA 160.2)	Standard Methods 18th Edition (1992); EPA (1979)	Mettler H31 balance
Turbidity	Method 2130B (EPA 180.1)	Standard Methods 18th Edition (1992); EPA	Hach 2100P Turbidimeter

Analysis	Method	Reference	Instrument
		(1993)	

D'Elia, C.F., P.A. Stendler, & N. Corwin. 1977. *Limnol. Oceanogr.* 22(4): 760-764.
EPA. 1979. Methods for Chemical Analysis of Water and Wastes. U.S. Environmental Protection Agency, EPA 600/4-79-020.
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Grasshoff, K., M. Ehrhardt, & K. Kremling (eds). 1986. Methods of Seawater Analysis (2nd ed). Verlag Chemie, GmbH, Weinheim.
Standard Methods. 1992. Standard Methods for the Examination of Water and Wastewater. 18th Edition. 1992. (Greenberg, Clesceri, and Eaton, eds.). APHA, AWWA, & WEF. 1100 p.

A review of the water quality data collected at the project site on August 1, 2003 (Table 5) show, in general, good water quality as compared to the non-specific and "dry" geometric mean embayment criteria. "Dry" criteria apply when the average fresh water inflow from the land is less than one percent of the embayment volume per day, but generally is defined as the period between May 1 and October 31. The salinity values were around 34 ppt, indicating there was minimal freshwater inflow from the land.

Table 4. State of Hawaii Criteria for Embayments (HAR §11-54-06(a)(3))

	Ammonium (µg N/l)	Nitrate + nitrite (µg N/l)	Total N (µg N/l)	Total P (µg P/l)	Chl α (µg N/l)	Turbidity NTU
Geometric mean Wet Criteria*	6.00	8.00	200.00	25.00	1.50	1.5
Geometric mean Dry criteria**	3.50	5.00	150.00	20.00	0.50	0.40

* Wet criteria apply when the average freshwater inflow from the land equals or exceeds one percent of the embayment volume per day.
**Dry criteria apply when the average freshwater inflow from the land is less than one percent of the embayment volume per day.

- pH shall not deviate from 7.6 to 8.6.
- Dissolved oxygen shall not be less than 75% saturation.
- Temperature shall not vary more than 1 °C from ambient.
- Salinity shall not vary more than 10% from natural or seasonal changes.

The temperature, salinity, and pH values are within the expected ranges for both sites within the harbor and the site off of Haleiwa Beach. The waters in the harbor are nearly saturated with dissolved oxygen, but the percent saturation of the waters off of Haleiwa Beach is less than 50%. The algal productivity (as measured by chlorophyll α concentration) is high in the harbor and lower, but still slightly elevated, off Haleiwa Beach. The waters were found to have slightly elevated concentrations of nutrients (nitrate + nitrite and total nitrogen), but low concentrations of ammonia and total phosphorus. Turbidity and TSS values were also slightly elevated. The waters off Haleiwa Beach had higher nutrient (nitrate + nitrite and total nitrogen) and sediment levels than those measured in the harbor - possibly because that site is more directly influenced by the water being discharged from Anahulu River.

Table 5. Water quality characteristics of Haleiwa Small Boat Harbor and Haleiwa Beach from samples taken on August 1, 2003

	Time sampled	Temp. (°C)	Salinity ‰	pH (pH units)	DO (mg/l)	DO % sat	Chl α (µg/l)
Site #1 - harbor	1010	26.7	34.1560	8.38	6.36	98	2.72
Site #2 - harbor	1000	26.7	34.2173	8.42	6.28	96	2.99
Site #3 - Haleiwa Beach	1120	27.3	33.9524	8.41	3.07	47	1.30

	Nitrate + nitrite (µg N/l)	Ammonium (µg N/l)	Total N (µg N/l)	Total P (µg P/l)	Turbidity (ntu)	TSS (mg/l)
Site #1 - harbor	7	< 1	175	17	1.07	8.1
Site #2 - harbor	4	< 1	172	21	1.96	5.5
Site #3 - Haleiwa Beach	36	< 1	211	26	2.14	10.7

4.0 SEDIMENT CHARACTERISTICS

Sediment samples were collected from the harbor bottom at sampling sites 1 and 2. The sediments were collected by scooping the surface and sub-surface sediments with a trowel and placing them in glass containers. The samples were analyzed for eight Toxicity Characteristics Leaching Procedure (TCLP) metals. The TCLP protocol extracts and decomposes complex or bound metals in sediment samples to determine the degree of hazard these sediments may pose to the environment if disposed of on land.

Table 6 presents results of the analysis. None of the TCLP metals analyzed for was detected in either of the samples (Table 6).

Probes of sediment thickness were also conducted at Sites 1 and 2. The sediment thickness at Site 2 was 2 feet, while at Site 1, it was greater than 4 feet.

Table 6. Sediment quality characteristics of Haleiwa Small Boat Harbor samples collected on August 1, 2003

	TCLP Barium (mg/l)	TCLP Cadmium (mg/l)	TCLP Chromium (mg/l)	TCLP Lead (mg/l)	TCLP Arsenic (mg/l)	TCLP Selenium (mg/l)	TCLP Silver (mg/l)	TCLP Mercury (mg/l)
Site #1 - harbor	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Site #2 - harbor	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00

5.0 BIOLOGICAL SURVEY

Water clarity in the harbor was poor, with visibility about one meter. Most animals were living on the hardened shoreline, pilings, and docks. Fouling organisms, such as sponges, ascidians, hydroids, and barnacles living on these artificial substrates were the dominant fauna of Haleiwa Small Boat Harbor.

Few fishes were observed, in part because of the low clarity of the water. A couple of schools of *opelu* (*Decapterus* sp.) were observed in the harbor and were being fished for by several fishermen casting from the shore. The man-made structures in the harbor, including the shoreline, pilings, and existing docks, attract juvenile and reef fishes and various macroinvertebrates. No rare or unusual fish species were observed.

A *honu* or green sea turtle (*Chelonia mydas*) was observed swimming in the harbor. The green sea turtle is protected by both State and Federal endangered species laws – it is listed as a threatened species by the Department of Land and Natural Resources (DLNR, 1998) and U.S. Fish and Wildlife Service (Federal Register, 1999a, b, and 2001).

A listing of the aquatic biota observed in and around the project site is given in Table 7.

Table 7. Checklist of aquatic biota observed in the Haleiwa Small Boat Harbor on August 1, 2003

Species	Common name	Location
INVERTEBRATES		
PORIFERA		
unident.	sponges	sessile
PORIFERA, CALCAREA		
CLATHRINIDA, LEUCETTIDAE		
Leucetta sp.	leucetta sponge	sessile
CNIDARIA, HYDROZOA		
HYDROIDA	hydroids	sessile
CNIDARIA, HEXACORALLIA		
ACTINIARIA, ZOANITHIDAE		
unident.	anemones	sessile
ZOANTHINARIA, ZOANITHIDAE		
Palythoa caesia Dana	blue-gray zoanthid	sessile
ANNELIDA, POLYCHAETA		
SABELLIDAE		
Sabellastarte sanctijosephi	feather duster worm	sessile
SERPULIDAE		
Salmacina dysteri	sea frost	sessile
MOLLUSCA, GASTROPODA, PROSOBRANCHIA		
NERITIDAE		

Species	Common name	Location
Nerita picea	black nerite	on substrate
Nerita polita	polished nerite	on substrate
LITTORINIDAE		
Littoraria pintado	dotted periwinkle	on substrate
MOLLUSCA, BIVALVIA		
MYTILIDAE	mussels	sessile
ARTHOPODA, CRUSTACEA		
CIRRIPEDIA, BALANIDAE		
unident.	barnacles	sessile
DECOPODA, GRAPSIDAE		
Grapsus tenuicrustatus	thin-shelled rock crab	on substrate
STENOPODIDAE		
Stenopus hispidus	banded coral shrimp	on substrate
	VERTEBRATES	
CHORDATA, UROCHORDATA		
ASCIDIACEA	ascidians	sessile
VERTEBRATA, PICES	fishes	
CICHLIDAE		
Sarotherodon sp.	tilapia	near substrate
KUHLIIDAE		
Kuhlia sandvicensis	*aholehole* or Hawaiian flagtail	free-swimming
CARANGIDAE		
Decapterus spp.	*opelu* or round scad	free-swimming
MULLIDAE		
Parupeneus multifasciatus	manybar goatfish	near substrate
CHAETODONTIDAE		
Chaetodon lineolatus	lined butterflyfish	near substrate
Chaetodon lunula	raccoon butterflyfish	near substrate
POMOCENTRIDAE		
Abudefduf abdominalis	Hawaiian seargent	near substrate
LABRIDAE		
unident. (juv.)	wrasses	near substrate
Stethojulis balteata	belted wrasse	near substrate
SCARIDAE		
unident. (juv.)	parrotfishes	near substrate
ZANCLIDAE		
Zanclus cornutus	Moorish idol	near substrate
ACANTHURIDAE		
Acanthurus triostegus	*manini* or convict surgeonfish	near substrate
Acanthurus guttatus (juv.)	whitespotted surgeonfish	near substrate
Ctenochaetus strigosus	goldring surgeonfish	near substrate
SPHYRAENIDAE		
Sphyraena barracuda (juv.)	great barracuda	near substrate

Species	Common name	Location
BLENNIDAE		
unident.	blennies	near substrate
TETRAODONTIDAE		
Arothron hispidus	stripebelly puffer	near substrate
Canthigaster jactator	Haw. whitespotted toby	near substrate
DIODONTIDAE		
Diodon hystrix	porcupinefish	near substrate

KEY TO SYMBOLS USED IN TABLE 7:
Location:
sessile: permanently attached to a substrate
on or near substrate: stays on or near a surface
free-swimming: not associated with substrate
QC:
All species were observed in the field by the biologist on August 1, 2003. None was collected for identification in the laboratory or as a voucher specimen.

No coral colonies were observed in the small boat harbor, not even growing on the pilings or other hard substrates as might be expected. This may be due to the inability of light to penetrate very deep through the water, due to its poor clarity.

6.0 ASSESSMENT OF POSSIBLE IMPACTS

The proposed project in Haleiwa Small Boat Harbor will involve installing a new dock parallel to the existing dock. Dock designs being considered include both floating and fixed docks. The fixed docks would be supported by 40 sixteen-inch octagonal piles, while the floating docks would be supported by 24 piles. A barge would likely be required for the pile driving operations, and the construction time is estimated to be 10 months. The only direct impact to the bottom will be the installation of support piles for the dock. The results of this marine environmental assessment indicate that the proposed project should not have significant impacts on the marine environment. If proper best management practices (BMPs) are employed during construction, installation of a dock should not have a long-term negative effect on either the water quality or biological communities of the area. In fact, the hard surfaces of the dock and piers will soon be colonized by numerous sessile organisms, which will in turn create habitat for various macroinvertebrates and fishes.

Sediments are likely to be suspended in the water column during pile driving operations. However, no contaminants were detected in the sediment samples. Sediments should therefore not cause a problem in the water column or if disposed of on land. Turbidity and suspended solids in the water column are likely to temporarily increase, but the use of BMPs should minimize the effect the project has on the surrounding environment. Additional BMPs should be utilized during construction of other facilities to reduce the release of any fine sediments or other pollutants into the water.

7.0 REFERENCES

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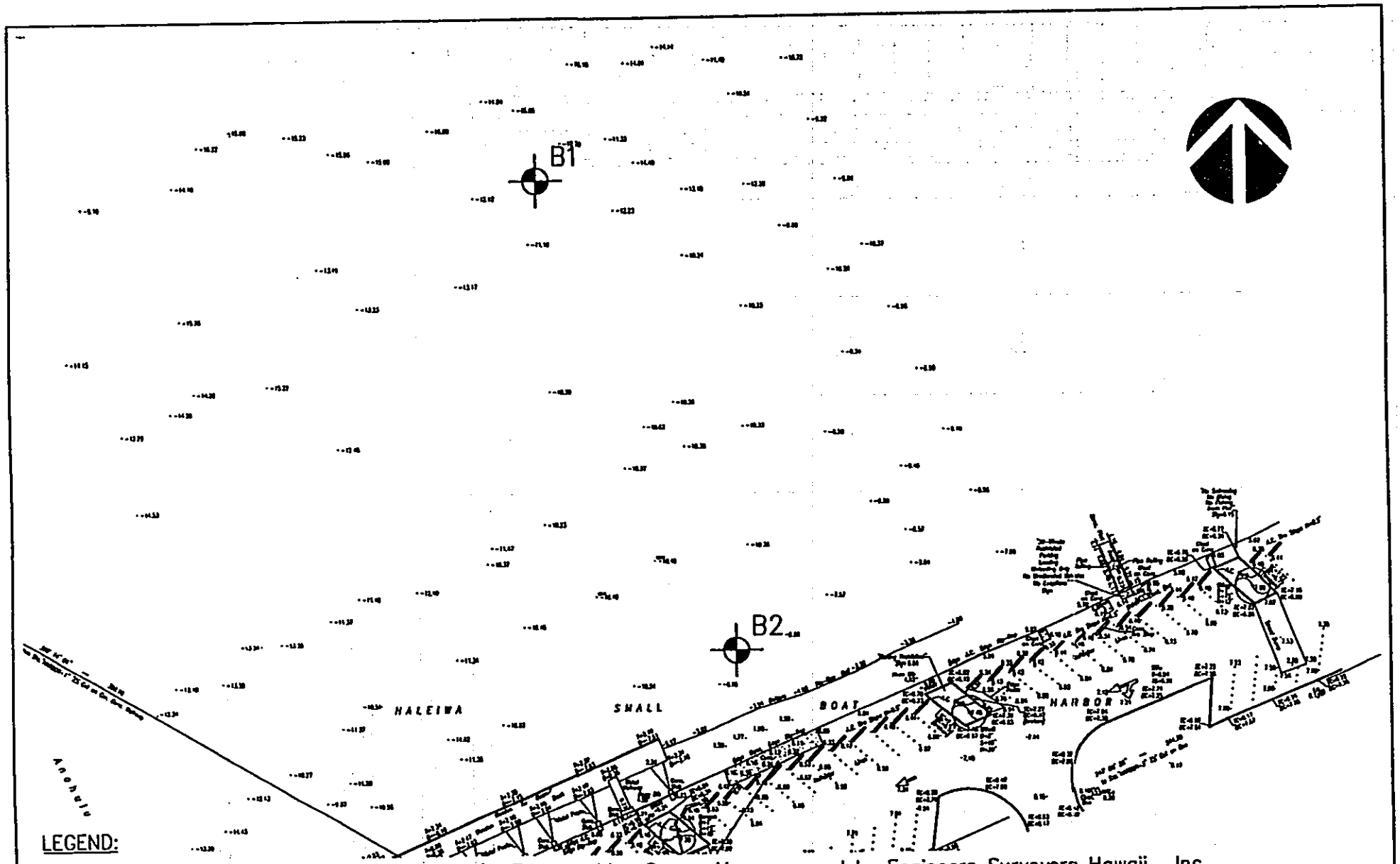
ADDENDUM

Since publication of this "Marine Environmental Assessment" report by Sea Engineering, Inc., it was called to our attention that the following fish species are also present in the Haleiwa Boat Harbor:

FISH SPECIES:	COMMON NAME:	LOCATION:
MUGILIDAE *mugil cephalus*	stripped mullet (*'ama'ama*)	near substrate
neomyxus leuciscus	sharpnose mullet (*uouoa*)	near substrate

APPENDIX C
TEST BORINGS



LEGEND:

Approximate location of borings

GRAPHIC SCALE:

0 30 60 120FT.

1" = 60'

Reference: Topographioc Survey Map prepared by Engineers Surveyors Hawaii, Inc.

W.O. 03-3777	New Pier, Haleiwa Boat Harbor
Ernest K. Hirata & Associates, Inc.	BORING LOCATION PLAN Plate A2.2

ERNEST K. HIRATA & ASSOCIATES, INC.
Geotechnical Engineering

BORING LOG

W.O. 03-3777

BORING NO. B1 DRIVING WT. 140 lb. START DATE 8/26/03
SURFACE ELEV. -12±* DROP 30 in. END DATE 8/27/03

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Clayey SILT (ML) – Gray, soft, with fine sand.
						Silty Coralline GRAVEL (GM) – Tan, dense, with sand. (Coral Rubblestone)
5			4	75	37	Sandy SILT (SM) – Gray, loose, with shell fragments.
10			4	62	67	
15			3	67	58	
20			5	63	64	
25			3	65	60	
30			5	71	55	

Plate A4.1

ERNEST K. HIRATA & ASSOCIATES, INC.

Geotechnical Engineering

BORING LOG

W.O. 03-3777

BORING NO. B1 (continued) DRIVING WT. 140 lb. START DATE 8/26/03

SURFACE ELEV. -12± DROP 30 in. END DATE 8/27/03

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
30						
35			10/No Penetration			BASALT (WS) – Gray, hard, fractured, slightly weathered. Begin NX coring at 33 feet. 84% Recovery from 33 to 38 feet. RQD = 60% 92% Recovery from 38 to 43 feet. RQD = 60%
40						
45						End boring at 43 feet. Depth of water measured at 12.3 feet on 8/26/03. * Elevations based on Topographic Survey Map prepared by Engineers Surveyors Hawaii, Inc.
50						
55						
60						

Plate A4.2

ERNEST K. HIRATA & ASSOCIATES, INC.
Geotechnical Engineering

BORING LOG

W.O. 03-3777

BORING NO. B2 DRIVING WT. 140 lb. START DATE 8/28/03
SURFACE ELEV. -9± DROP 30 in. END DATE 8/29/03

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Clayey SILT (ML) – Gray, soft, with fine sand.
5		☐	18	76	27	Silty Coralline GRAVEL – Tan, dense, with sand. (Coral Rubblestone)
10		☐	5	65	63	Silty SAND (SM) – Gray, loose, with shell fragments.
15		☐	5	70	54	
20		☐	8	62	65	
25		☐	7	64	62	
30						

Plate A4.3

ERNEST K. HIRATA & ASSOCIATES, INC.

Geotechnical Engineering

BORING LOG

W.O. 03-3777

BORING NO. B2 (continued) DRIVING WT. 140 lb. START DATE 8/28/03

SURFACE ELEV. -9± DROP 30 in. END DATE 8/29/03

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
30			12	77	45	
35			31	68	49	Medium dense to dense from 35 feet.
40			68	64	48	
45			101/9"	79	41	COMPLETELY WEATHERED BASALT (WC) – Grayish brown, stiff. (Clayey Silt)
50			90/8"	76	50	
55			64	66	62	
60			74	62	67	End boring at 60.5 feet. Depth of water measured at 10 feet on 8/28/03.

Plate A4.4

APPENDIX D
ARCHAEOLOGICAL & CULTURAL/HISTORICAL ASSESSMENT

HISTORICAL AND CULTURAL ASSESSMENT FOR THE PROPOSED IMPROVEMENT PROJECT AT HALE'IWA SMALL BOAT HARBOR, KAWAILOA *AHUPUA'A*, WAIALUA DISTRICT, ISLAND OF O'AHU

(TMK 6-2-03)

by

Kēhaulani E. Souza, B.A.

Rodney Chiogioji, B.A.

and

Hallett H. Hammatt, Ph.D.

Prepared for

W.Y. Thompson, P.E.

by

Cultural Surveys Hawai'i, Inc.

December 2003

TABLE OF CONTENTS

PV119 AVERY

CORRECTION

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

TABLE OF CONTENTS

LIST OF FIGURES

I. INTRODUCTION

At the request of W.Y. Thompson, P.E., Cultural Surveys Hawai'i, Inc. has prepared an historical and cultural assessment for a proposed harbor improvement project at Hale'iwa Small Boat Harbor, Kawailoa *Ahupua'a*, Waialua District, on the island of O'ahu (Figures 1 & 2). The project comprises the installation of a new floating dock facility within the harbor basin (Figures 3-5).

The scope of work for this historical and cultural assessment includes:

Examination of historical documents, Land Commission Awards, and historic maps with the specific purpose of identifying traditional Hawaiian activities including gathering of plant , animal and other resources or agricultural pursuits as may be indicated in the historic record.

A review of the existing archaeological information pertaining to the general region as it may allow a reconstruction of traditional land use activities, in order to identify and describe the cultural resources, practices, and beliefs associated with the harbor area prior to the harbor's construction.

Contact persons knowledgeable about the historic and traditional practices in the project area and region by letter and telephone.

Preparation of a report on items 1-3 summarizing the information gathered related to traditional practices and land use. The report will assess the impact of the proposed project on the cultural practices and any features identified.

Background research for this study included: review of archeological reports in the library of the State Historic Preservation Division; study of documents at the Hawai'i State Archives; review of historic maps at the Survey Office of the Department of Accounting and General Services; and review of historic photographs at the Bishop Museum Archives. Personnel at the State Historic Preservation Division and North Shore community members were consulted to identify individuals knowledgeable about Hale'iwa and cultural practices in the harbor area.

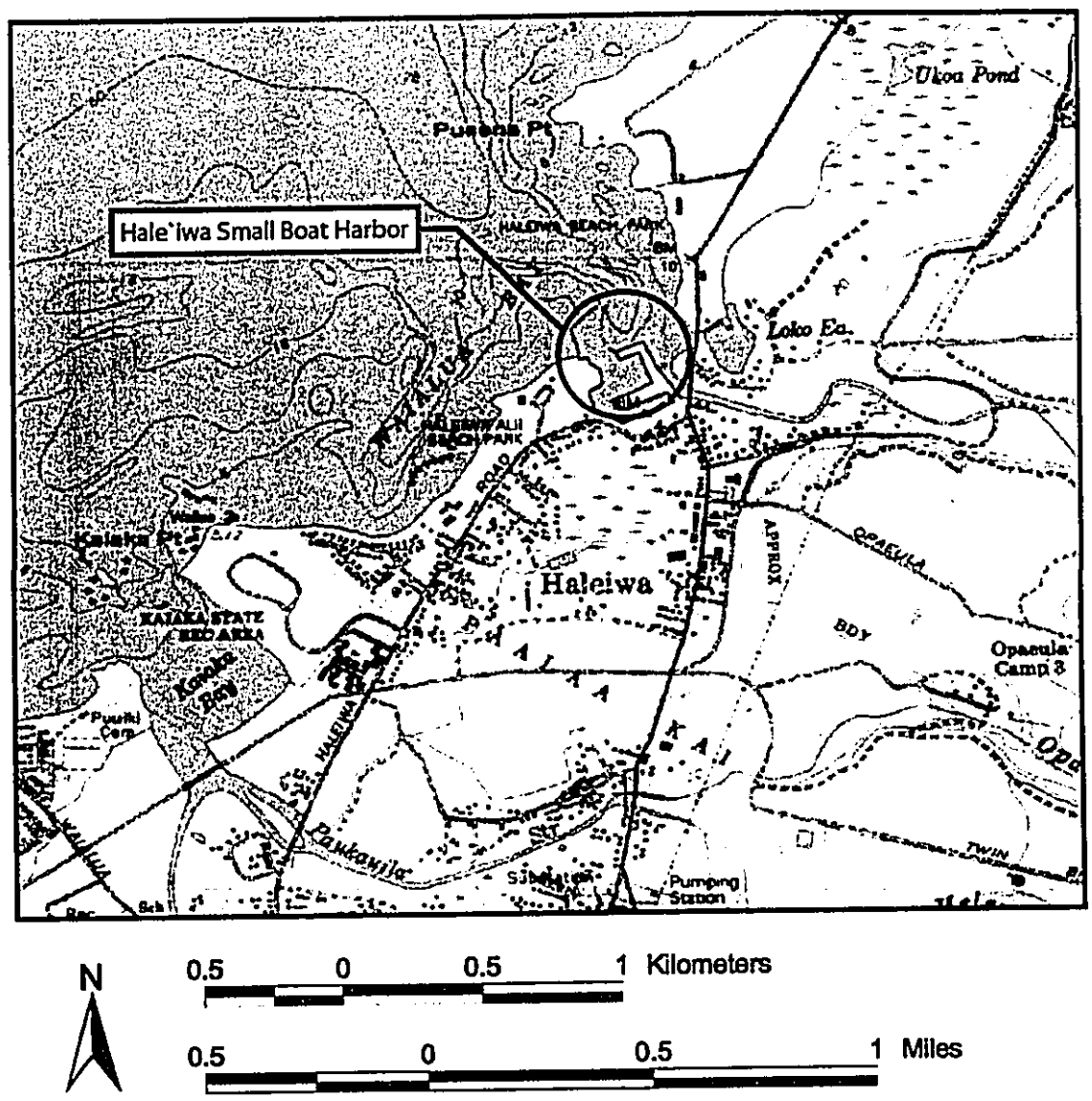


Figure 1 Portion of USGS Topographic Map, Haleiwa Quadrangle, Showing the Location of the Project Area

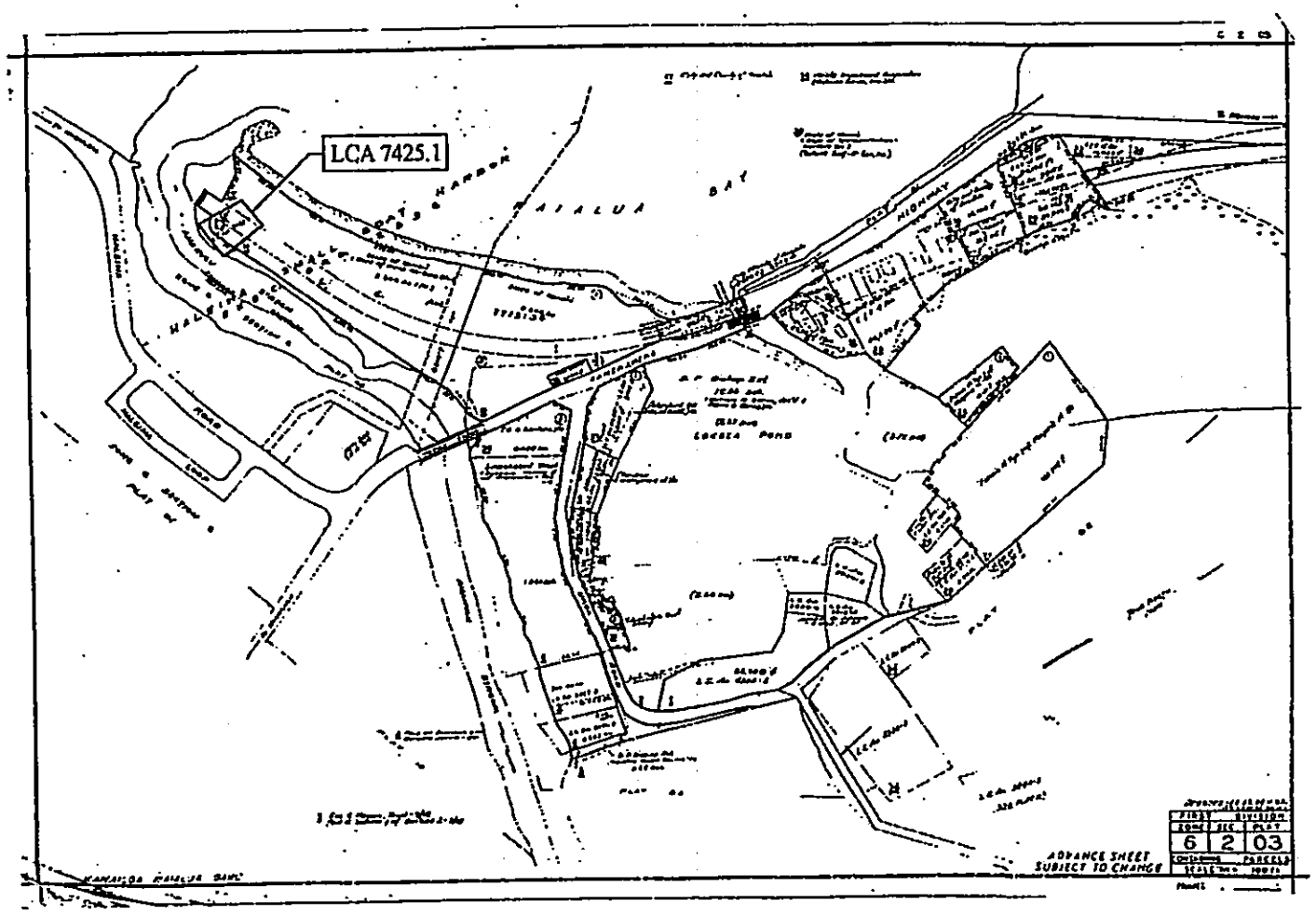


Figure 2 Tax map (TMK 6-2-03) showing location of Hale'iwa Small Boat Harbor and LCA 7425

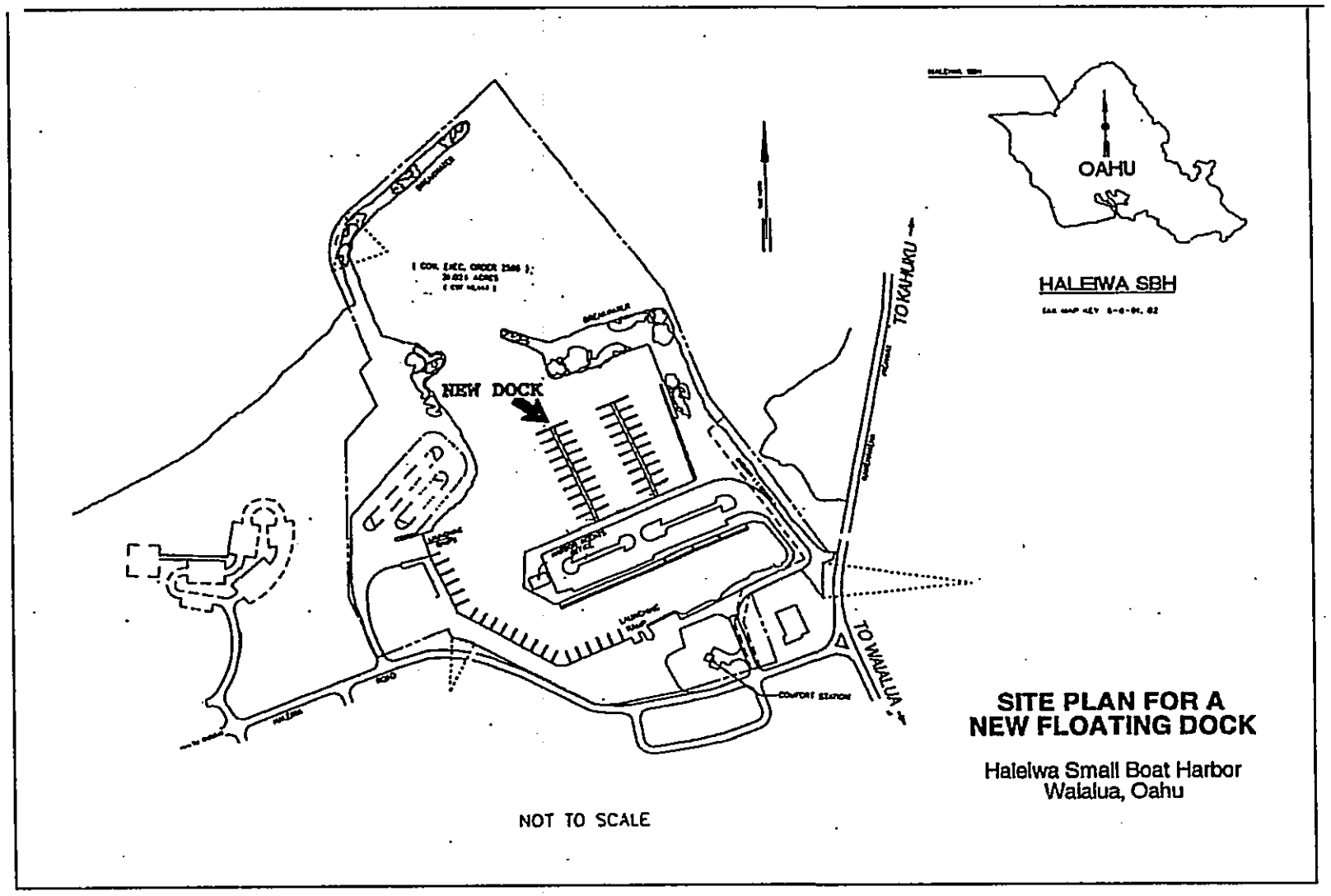


Figure 3 Site plan showing location of new floating dock at Hale'iwa Small Boat Harbor

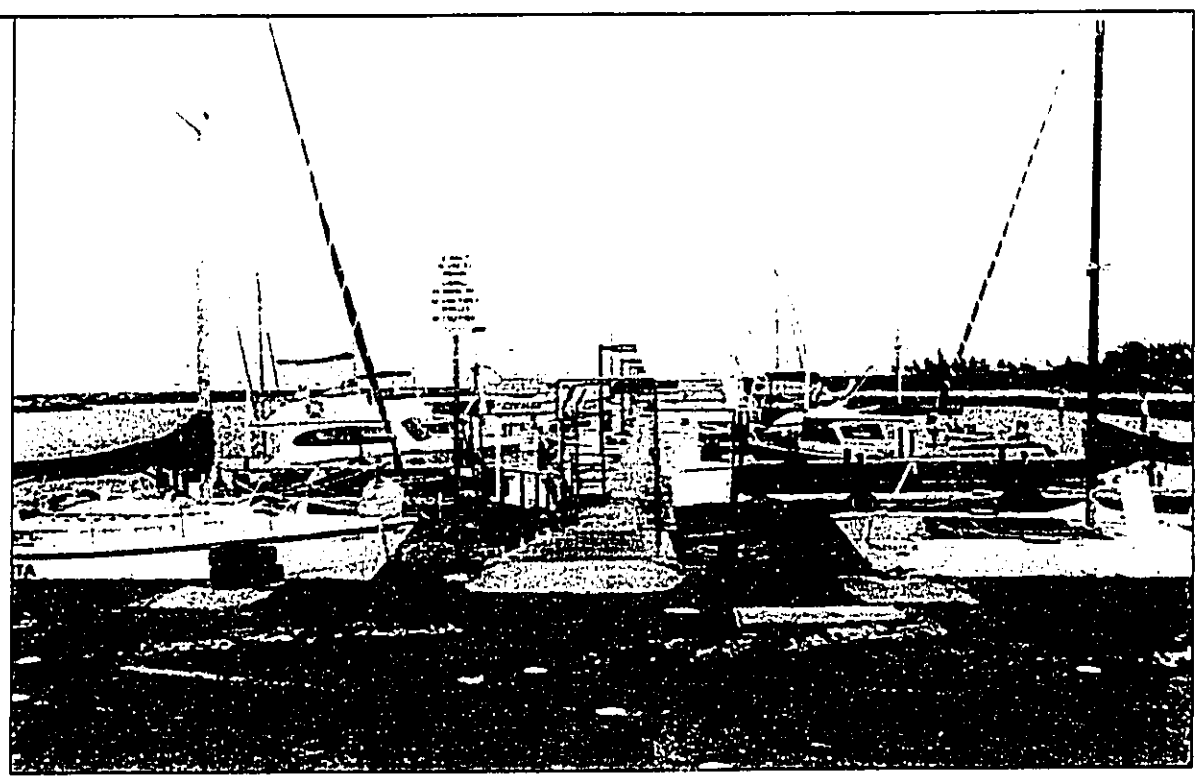


Figure 4 Existing dock at Hale'iwa Small Boat Harbor

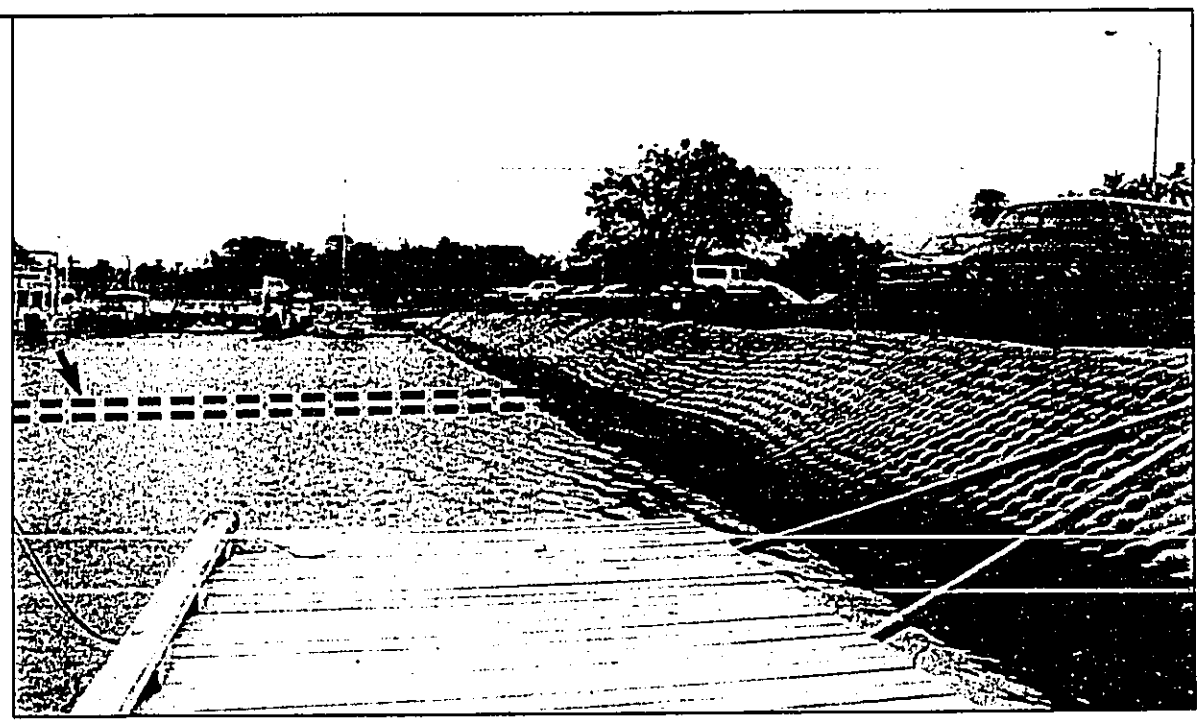


Figure 5 Location of new floating dock

II. KAWAILOA *AHUPUA'Ā*: HISTORICAL AND CULTURAL DOCUMENTATION

The project area is located within the *ahupua'a* of Kawailoa ("the long water" [Pukui 1974]) in the district of Waialua. The *ahupua'a* of Kawailoa is located on the northern side of O`ahu. This traditional land unit is bordered by the *ahupua'a* of Waimea to the northeast, the *ahupua'a* of Pa`ala'a Uka to the south, the Ko`olau Range to the east, and the ocean to the west. From the Ko'olau Mountains, Kawailoa extends downslope with the southern boundary at 'Ōpae'ula Stream and the northeastern boundary along the ridge between Kamananui and Kaiwiko'ele Streams.

Clues to the history of land use and activity within the *ahupua'a*, specifically within the project area, are found in preserved records, including journals, government records, scholarly studies, memoirs, archaeological studies, maps, historic photographs, and oral histories. The earliest records present glimpses of landmarks and events within Kawailoa and the Waialua district; however, by the middle decades of the 19th century, it is possible to focus more precisely on the project area as documentation becomes more abundant and specific.

A. Pre-Contact to 1800

The significance of the district of Waialua and the *ahupua'a* of Kawailoa in the consciousness of native Hawaiians is suggested in the numerous traditions associated with the district and *ahupua'a*. Samuel Kamakau, the pioneering 19th-century Hawaiian historian who was himself born in Waialua, identifies the district as the site of a significant event in the consolidation of chiefly power in the islands:

> For the 28 generations from Hulihonua [the first man in the ancient Hawaiian past] to Wākea, no man was made chief over another. During the 25 generations from Wākea to Kapawa, various noted deeds are mentioned in the traditions and well-known stories. Kapawa was the first chief to be set up as a ruling chief. This was at Waialua, Oahu; and from then on, the group of Hawaiian Islands became established as chief-ruled kingdoms...(Kamakau 1964:3)

The Waialua district's material abundance would have made it a focus of population and *ali'i* residence:

> Waialua, on its seaward slopes, was as generously endowed with water as any area on Oahu. Much of the gently sloping and level land...was formerly covered with wet-taro terraces. And beyond there was a great spread of

> kula land with red soil...which was ideal terrain for sweet-potato planting. The Wai`anae range gave this area a rich hinterland. Waialua had a fine bay with a broad beach, and there were several fishponds...Altogether this was the most bounteously endowed area on the sunset coast [of O'ahu]. (Handy and Handy 1972:466-7)

Two of the "several fishponds" of Waialua were the well-known royal ponds 'Uko'a and Loko'ea in Kawailoa *ahupua'a.*

The presence of no less than eleven temples, several of *luakini* class and therefore associated with ruling chiefs, testifies to the importance of these lands in the Hawaiian culture. The political importance of the district, of course, was grounded in the system of agricultural and aquacultural production, notably the extensive taro irrigation complexes and 'Uko'a and Loko'ea fishponds (Kirch 1992:19).

Several legends of 'Uko'a fishpond exist and are associated with the goddess Laniwahine:

> Laniwahine was the guardian of Uko'a at Waialua, and Uko'a was regarded as the long house where she lived. She was a native of Uko'a and all her deeds centered about that place. The natives of Uko'a never failed to recognize her deeds, but few of her descendants are now left or perhaps none. Uko'a was a very strange fishpond in which lived extraordinary fishes. A fish might be a kumu fish on one side and on the other side a mullet; or on one side weke pueo and on the other mullet; or one side might be silver whit like a white cock; when scaled the skin might be striped and variegated inside. It was clear to all her descendants that these strange fish belonged to Laniwahine and it was not right to eat them. But the mullet of Uko'a were full of fat when, as in all such ponds, the native guardian of the pond was remembered; (at other times) the fish had thin bodies and heads like wood or sometimes disappeared altogether. (Kamakau in Sterling and Summers 1978:119-120)

Further evidence of the importance of the *ahupua'a* of Kawailoa and events occurring there is revealed in the recounting of the fate of the O'ahu Chief Elani. In 1783, forces of the Maui Chief Kahekili gained control of O'ahu by defeating the island's *mō'ī.* Kahahana. Elani, father of Kahahana, and other O'ahu chiefs were killed by Kahekili following an unsuccessful rebellion against the Maui invaders. Elani's body was left to decompose on a ledge at Pua'ena Point:

> The place became known as Kahakakau Kanaka. As the odor came to the sands at Hale'iwa they became known as Māeaea; the point on the other side became known as Kupava. (McAllister 1933:141-142)

Samuel Kamakau records that Kawailoa also figured in the fate of Hu'eu, one of Kahekili's Maui chiefs, who had been installed at Waialua. While Kahekili and the other Maui chiefs had been warned of the O'ahu chiefs plot and escaped, "Hu'eu, who was living at Ka'owakawaka, Kawailoa, in Waialua, was killed on one of the Kāloa nights while his guards were asleep" (Kamakau 1992:138).

In 1794, Ka-'eo-kū-lani recruited the "warriors of Waialua and Wai'anae" to make war on his nephew Kalanikūpule, then ruler of O'ahu (*ibid.*:168); by December 1794 Ka'eo had been killed and his forces were defeated. Kalanikūpule would himself be deposed the following year when the invading Hawai'i Island forces of Kamehameha prevailed at the Battle of Nu'uanu in April 1795. Apparently the Waialua District was spared direct involvement in the battles associated with Kamehameha's conquest. However, Kamehameha's hegemony on O'ahu would have immediate consequences for the district during the first decades of the 19th century.

B. 1800 to 1850

The Hawaiian Islands began exporting sandalwood to the Orient shortly after 1800 and the commerce flourished until the supply dwindled in the mid-1830's. Trade in sandalwood was the strict monopoly of the *ali'i* beginning with Kamehameha. At the height of the sandalwood boom, Kamehameha was buying foreign ships, including six vessels between 1816 and 1818, to transport his own wood to the Orient (Kuykendall 1965:87). When Kamehameha bought the schooner Columbia in 1817, it was paid for with sandalwood from Kaua'i and from the districts of Waimea and Wai'anae on O'ahu (*ibid.*:88). Peter Corney, the chief officer on the Columbia, describes the prodigious operations the sandalwood trade demanded on O'ahu's north shore. In an account of a voyage in March 1818 from Honolulu to Waimea Bay Corney reported:

> Next day we sailed for Whymea bay, on the west end of the island, to get another cargo of wood. In our passage we touched at Wyeni (Wai'anae), and took on board some wood and hogs. We lay here for a few days, and then sailed along the shore for Whymea...where we took on board a full cargo of wood in thirty-six hours - more than 200 canoes employed in bringing it off, day and night. (Corney 1896:89-90)

After Kamehameha's death in 1819, Liholiho (Kamehameha II) allowed his chiefs to share in the sandalwood trade, resulting in an unrestrained demand on the stocks of the wood and upon the energies of the *maka'āinana* (commoners) who did the harvesting. Already in October 1817, a Russian visitor noted on O'ahu: "There are now many fields left uncultivated, since the natives are obliged to be cutting sandalwood" (Barratt 1988:218).

"Traders' records from Kamehameha's last years show several important ali'i trafficking in sandalwood on their own, including...Kālaimoku, Cox, Boki, Ka`ahumanu, and some others" (Kirch and Sahlins 1992:59). Among these *ali'i*, Ke`eaumoku Cox was the Hawai'i Island chief who had been given control of Waialua by Kamehameha. Diaries and journals of the western entrepreneurs on O'ahu record the early 19th-century sandalwood-based trade that intruded upon the established mores and customs of the Waialua population. Stephen Reynolds, a clerk for the Honolulu merchant William French, noted in his journal on April 30, 1824:

> Very hot sun - many of the residents [of Honolulu] preparing to go to Wairua [Waialua], some for wood - some to buy hogs, some for pleasure - All the Kanakas of Wairua belonging to Cox who lately died, came up to day - bringing cows, Pigs, Dogs, Fowls & other things, produce of the Country to give to Krymakoo [Kālaimoku, the Regent], Kahumana, & other principal chiefs - according to the custom of the country. (King 1989:27)

During the same decades that commercial ventures were forcing changes upon the Hawaiian landscape, western missionary interests were establishing their foothold in the islands. The American Board of Commissioners for Foreign Missions, headquartered in Boston, sent its first company of missionaries to the Hawaiian Islands in 1819, leaving Boston on October 23rd aboard the brig "Thaddeus". By the 1820s, the Protestant missionaries had established close links with the *ali'i*. From July to August 1826, Ka'ahumanu and an entourage consisting of up to 300 persons conducted a proselytizing tour around O'ahu. Rev. Hiram Bingham's account of the proceedings at Waialua suggests the extent of the missionaries' inroads in the district:

> A very large concourse of people assembled on the Lord's day, for public worship in the open air. To the listening throngs I endeavored to proclaim the great salvation...
>
> After the Sabbath we examined and encouraged, and partially supplied with books, the incipient schools established there under the particular patronage of Lydia Nāmāhana and Gideon La'anui, to whom the district belonged. There were found under Maiao and his assistant teachers, four hundred and ninety-five male and female pupils, and under Kaoo, one hundred and sixty-four, amounting together to six hundred and fifty-nine pupils, chiefly men and women. (Bingham 1847:295-296)

Lydia Pi'ia Nāmāhana, a sister of Ka`ahumanu, retained control of Waialua by 1827. The previous year, she was already involved in the Waialua sandalwood trade. Stephen Reynolds' journal entry of October 24, 1826 noted: "Convoy sailed for Wairua - to get 400 piculs of wood from Piia [Nāmāhana] - Due from Cox's estate" (King 1989:155).

Namahana's husband, Gideon La'anui, had been born on Hawai'i Island and grew up in the train of Kamehameha. La'anui himself, in his "Reminiscences of Gideon La'anui" published in 1838, described his origins:

> Kamehameha battled against Nāmakehā, in which the latter was killed, thus ending the war, with Kamehameha victorious [1794]. Then was I born, Hilo being the birthplace, and from birth till the readiness of the peleleu fleet when Kamehameha sailed for Maui. I was five years old on leaving Hawaii with the peleleu for Maui, and lived there [presumably Lahaina]. While yet a child, though somewhat grown, we moved to Wailuku, where was also the king. On going to Lahaina, food was distributed to men and women, consisting of wailau (bundled hard poi). We were one year at that place. Then the king came to Oahu on a foreign ship. Brown was the name of its captain. We followed on the peleleu, my parents and I, and landed at Waikīkī. (La'anui 1929:86)

La'anui's daughter Elizabeth Pratt (by his second wife, Teresa Owana) records that it was Kamehameha himself who arranged La'anui's marriage to Namahana:

> Among the visitors to the royal court was Kekuwai-Piia [Nāmāhana], who had just become a widow, coming as a guest of her sister, Queen Ka'ahumanu. La'anui was a boy growing to maturity. The king had not forgotten the great wish of his heart, coveting possession of Waimea and hoping to gain it, if not in battle, through a matrimonial alliance...[Now] he chose a new agent of his ambition by inviting La'anui to the court. The invitation was gladly accepted and the visit lasted for months. Kamehameha was loath to have La'anui depart while he was still slyly intriguing with Ka'ahumanu to negotiate a marriage between Piia and La'anui. Piia is described as being a person heavily built and not prepossessing in appearance like her sisters Ka'ahumanu and Kaheiheimālie. When at last the proposition was put squarely to La'anui, that it was the united wish of the king and queen that the marriage should take place, for a moment he was dejected. To wed a woman very many years his senior was not the desire of his heart. Yet realizing that it might be perilous to go contrary to the express desire of the powerful monarch he quietly consented "to take the bitter pill." (Pratt 1920:46)

La'anui's own testimony (to the mid-19th century Land Commission) reveals how he and his wife had come to reside at Waialua and of his special interest in Kawailoa *ahupua'a*:

> My wife Kuaipua [Lydia Nāmāhana Kekuaipi'ia] is the foundation [kumu]

> of my claim here in Waialua, and I have truly become a kama'āina here, like the native children of the place [a lilo maoli i kama'āina no o nei, me ke keiki papa la]. After I had been living at Waialua for a little while with Kekuaipiia, the 'ili of 'Uko'a became hers - that is at Kamananui - along with Kalopa [Kalaopa], the two of them. Ka'ahumanu asked Ke'eaumoku [Cox} for Loko'ea and he consented it be given to Piia and she gave me [a hā'awi a Piia ia'u] 'Uko`a, Loko'ea and Kalopa in [the ahupua'a of] Kamananui. When Ke'eaumoku died in 1824, Ka'ahumanu gave Piia Waialua, from one point to the other, just for her support [`food', kona 'ai io na'e], and Kawailoa from the sea inland to the mountain and one side to the other, excepting the kus ['ili kūpono]. Piia then said to me: Your land is Kawailoa, from upland to the sea and one side to the other, I retain no ku within it; I give it to you, together with the two 'ili at Pa'ala'a and the six ili at Kamananui. 'Uko'a and Loko'ea are to be joined with the ahupua'a of Kawailoa. *This Piia spoke to me. (in Kirch and Sahlins 1992:95)*

Though 'Uko'a and Loko'ea Ponds were included with the *ahupua'a* of Kawailoa, it appears however, as Sahlins (1992) points out, that "these lands were part of and administered from Kamananui the ahupua'a which was still the political center of Waialua" (Sahlins 1992:95). As late as 1815, Kamehameha's rights to the fishponds were still in effect, and were mentioned by Whitman who was visiting the area in September of 1815.

Thus Whitman, in September 1815, describes 'Uko'a Pond as "the property of the King and no fish are allowed to be taken out of it without his orders, and there had not at this time been any taken out for several years" (1979:78). Paralleling the general decline of sovereign powers, the royal rights to Waialua's famous fish ponds seem to have declined thereafter, the benefits falling more to the Ka'ahumanu lords of the land and the de facto control to the resident chiefs Pi'ia and La'anui. And as residents of Kawailoa with preexisting claims to the sites of 'Uko'a and Loko'ea, Pi'ia mā, were able to integrate these lands into their *ahupua'a*. With this consolidation, Kawailoa displaced Kamananui as the leading settlement of Waialua. La'anui would soon confirm the change by making the lower Anahulu River the ritual center also: in 1830 he built a *luakini* (chiefly temple) there; *i.e.*, the first Protestant church in Waialua (Sahlins 1992:95-96).

La'anui was living at Kawailoa in 1832 (Namahana had died in 1829) when the Rev. John S. Emerson (1800-1867) and his wife arrived at Waialua Bay to establish a mission station in the Waialua district; Emerson reported in a letter:

> The wind was against us as we entered the harbor at Waialua, and we were obliged to "beat in." As soon as we approached the land, La`anui, our chief,
>
> came alongside in a canoe to welcome us, presenting us with a good watermelon, of which we ate freely and were at once relieved of our seasickness. (Emerson 1928:55)

Emerson gave the name Hale'iwa ("home of the frigate bird") to their settlement. Emerson's son, John Pomeroy Emerson, recounts an episode revealing the authority La'anui possessed within Waialua:

> The new [meeting] house [at Waialua] was opened for the first time for dedication and public worship on September 25th, 1833, and Dr. Judd, Mr. Bingham and Mr. Brinsmade, a merchant, came from Honolulu for the occasion. When they got to the meeting with my father, they found an immense crowd of natives filling every part of the house and others crowding around all the windows and doors, utterly unable to enter. 'Truly the Spirit of God is here working on the hearts of this people, who are hungering for instruction,' thought my father. Dr. Judd, who had been in the country four years longer than he, began to ask questions, and found that La'anui had issued positive commands that everyone in the entire district of Waialua should attend this service under threat of severe penalty...When La'anui had filled the meeting-house with the crowd of people standing, he ordered them to sit down on the floor packed together as close as possible, but a great many were still compelled to stand outside. After the services were over, Dr. Judd and my father kindly explained to La'anui that he should not force his people to attend church in that way... (Emerson 1928:88-89)

It is possible to estimate the population comprising "everyone in the entire district of Waialua" in 1833. Censuses taken by Protestant missionaries throughout the Hawaiian Islands beginning in 1831 provide the earliest documentation of the size of the native population after the first decades of western contact. During the first census of O'ahu Island in 1831-1832, a total population of 2,640 was recorded in the Waialua District, comprising only 8.8% of the entire island population of 29,745 (Schmitt 1977:12). By the census of 1835-1836, the Waialua population had dropped to 2,415, comprising 8.6% of the O'ahu Island population of 27,798 (*ibid.*:38). These early censuses do not record the specific Kawailoa *ahupua'a* population figures.

By the time Protestant missionaries were establishing their presence in Waialua in the 1830's, the sandalwood trade that had driven commerce in the Hawaiian Islands had collapsed. However, new enterprises were emerging to fill the void and activity at Waialua would continue apace. In October of 1819, two whale ships had anchored in the Hawaiian Islands. During the next decades, other whale ships would follow, as the islands became a victualing and layover base in the mid-Pacific. Supplies of beef, fresh and salted, and produce were in demand; and a trade in hide and tallow was also developing. As had happened during the years of the sandalwood trade, authority to commandeer valued goods from the commoners of Waialua was vested in the chiefs:

The variety as well as amount of things being appropriated from Waialua by the ruling chiefs is impressive. "The [letters of Gideon La'anui] speak of ocean fish taken in sweeps as well as great quantities of fish shipped from the old royal ponds of 'Uko'a and Loko'ea, of dry cooked taro (pa'i'ai) as well as poi, of sweet potato, breadfruit, shrimp, goats and pigs, timbers of different kinds, chickens, oranges and lemons - and often cash money. (Kirch and Sahlins 1992:145)

The Organic Acts of 1845 and 1846 initiated the process of the *Mahele*, the first privatization of Hawaiian lands. In 1848 the crown and the *ali'i* (royalty) received their land titles. The majority of Waialua was awarded to Victoria Kamāmalu, sister of Alexander Liholiho (King Kamehameha IV) and Lot Kamehameha (King Kamehameha V).

Kuleana awards for individual parcels within the *ahupua'a* were subsequently granted in 1850. These awards were presented to tenants - native Hawaiians, naturalized foreigners, non-Hawaiians born in the islands, or long-term resident foreigners - who could prove occupancy on the parcels before 1845 (Apple 1978:45). More than 140 Land Commission Awards (LCAs) for individual parcels were recorded in Kawailoa *ahupua'a*. These parcels were generally small plots in the valley bottoms (Kirch and Sahlins 1992: 167).

Within the project area, LCA 7425 is located at the shoreline of Waialua Bay, near the mouth of the Anahulu Stream (see Figure 2 above). Land Commission Award documents identify LCA 7425 as awarded to Kawelu. While the Figure 2 tax map identifies the award at Waialua Bay as Parcel 1 (*i.e.* "L.C.Aw. 7425:1"), the LCA records suggest that the award is more likely Parcel 3, which is described as:

> Third. A house at Mokukailaelae, Kawailoa kai. The right to take fish from the sea: seven strings of opelu, ten lobster holes and ten kumu /fish/ holes. (Native Register vol. 5, pg. 337)
>
> Apana 3. House site at Mokulaelae sand spit in the `ili of Anahulu.
>
> Apana 3: This parcel is surrounded by the Muliwai of Anahulu and the sea of Lapaone. (Foreign Testimony vol. 11, pg. 472)

The records thus indicate that, at the mid-1800s, at least one individual was living at Waialua Bay, within the area that would become Hale'iwa Small Boat Harbor, and that the individual continued to gather ocean resources near his house site. This single Land Commission Award may represent the remnant of much more extensive shoreline habitation with associated ocean gathering within and in the vicinity of the present project area.

C. 1850 to 1900

The whaling industry in the Pacific Ocean reached its peak in 1859. Prices for whale oil collapsed five years later. Since the 1840's, the Hawaiian economy had been dependent primarily on supplying whale ships during their long layovers in the islands. With the dwindling number of arriving ships during the 1860's, many residents of districts like Waialua which had been dependent on the victualing trade migrated to Honolulu and other parts of O'ahu.

Government censuses during the second half of the 19th century document the diminishing population of the Waialua District and, presumably, Kawailoa *ahupua'a*. In 1853 a total of 1,126 persons was recorded in Waialua. Nineteen years later, in 1872, the total district population had dropped to 851 (Schmitt 1977:12-13).

During the second half of the 19th century, following the death of Victoria Kamāmalu in 1866, Kawailoa *ahupua'a* was passed on to successive members of the *ali'i*:

> [Kamāmalu's] entire estate was inherited by her father, Kekūanao'a. He died two years later and the estate went to Kekūanao'a's son Lota Kapuāiwa, who by that time reigned as Kamehameha V...Kapuāiwa died intestate in 1872, whereupon Ruta Ke'elikōlani, Kapuāiwa's half-sister, petitioned for and received in 1873 the entire estate...By 1883, Ruta Ke'elikōlani died, leaving all of her estate to her cousin Bernice Pauahi Bishop. (Kame'eleihiwa 1992:309-310)

The Kamehameha Schools presently retains ownership of most of the *ahupua'a*.

The diaries of Robert C. Perkins, an entomologist and ornithologist, who collected specimens at Kawailoa in 1892-1893 reveal aspects of life in the *ahupua'a* near the end of the 19th century:

> The end of 1892 and early months of 1893 were not very favourable for collecting, the weather being generally wet in the mountains and there were three big spates of the mountain streams, these did very much damage to the system of flumes belonging to the Chinese of the district on more than one occasion during the winter months. (Perkins 1892-1893)

The "Chinese of the district" Perkins mentions were the rice growers who had settled after fulfilling their contracts with the sugar plantations that had brought them to the Hawaiian Islands (the first Chinese contract laborers had arrived in 1852). The islands were well-positioned for rice cultivation. A market for rice in California had developed as increasing numbers of Chinese laborers immigrated there since the mid-19th century. Similarly, as Chinese immigration to the islands also accelerated, a domestic market opened:

> By 1876 there was still a considerable amount of former taro land available for rice farming. The great demand for rice land brought disused taro patches into requisition - especially because water rights attached to them...
>
> As the demand for rice continued, it became profitable to bring into use land hitherto unused. The land most easily rendered fit for rice cultivation was swamp or marsh land of which there was a large amount in the islands...At Waialua on Oahu, about three hundred acres of swamp land were reclaimed for rice farming. (Coulter and Chun 1937:11)

In 1892, there were 180 acres under cultivation of rice in the Waialua District; these rice fields were located in the *ahupua'a* of Mokulē'ia, Kamananui and Kawailoa (*Ibid.*:12,21). The immigrant Chinese may account for the rise in the Waialua District population during the last quarter of the 19th century: government censuses record populations of 939 in 1878, 1,265 in 1884 and 1,286 in 1890 (Schmitt 1977:13).

Robert Perkins' diaries also reveal that Kawailoa and Waialua had become a favorite haunt of hunters:

> At this time Waialua was much visited by sportsmen of Honolulu, as great numbers of golden plover were scattered over the forehills and along the coast. The native wild duck was common on the ponds and there were a good many pheasants amongst the lantana on the plains, but still more on the dry forehills below the forest and within this, before the trees became continuous or dense. At intervals during the day the plover habitually resorted to the ponds near the coast, usually in small flocks at a time, and were shot from blinds...Some of the men that I met at Waialua were very fine shots and on their weekend visits made large bags of duck and plover. In the mountains there were a few wild chicken and here and there some wild turkeys...
>
> Thick forests, no doubt, once came down at least to 700 feet, for there were many traces of fires, some very old and some comparatively recent. Great herds of wild pigs may sometimes be seen crossing the flats between the gulches, where they chiefly hide. I counted 42 in one lot, of different sizes,
>
> from the largest boar with great tusks to pigs only half grown. High up in the dense forest I occasionally came on a solitary old boar in the soft fern. These do not run away when one comes on them suddenly, but, if one is only a few yards distant and stands still, they will walk very slowly away, looking back at one...(Perkins 1892-93)

By the 1890's, hunters and other visitors to Waialua could have reached there by train from Honolulu. The Oahu Railway and Land (O.R.&L.) Company, organized by Benjamin Dillingham in 1889, connected outlying areas of O'ahu to Honolulu. During the last decade of the 19th century, the railroad would reach from Honolulu to Pearl City in 1890, to Wai'anae in 1895, to Waialua in 1898, and to Kahuku in 1899 (Kuykendall 1967:100). Capitalizing on the increasing numbers of visitors to the north shore of O'ahu who journeyed on his railroad, Dillingham opened the two-story Hale'iwa Hotel at Waialua Bay in 1899. The hotel's name – Hale'iwa - eventually identified the area above the bay and the "town" there, which then comprised only the hotel, a church and a courthouse.

The development of the railroad also spurred the development of large-scale sugar farming in Waialua. Sugarcane had been first cultivated at Waialua earlier in the century by the missionary John Emerson who constructed a small mill to produce sugar and molasses. During subsequent decades, other missionaries and western entrepreneurs continued expanding, though still on a small-scale, sugar cultivation in the district. Benjamin Dillingham, pursuing new business for his railroad, persuaded Castle & Cooke to lease Waialua land already under cultivation of sugar. In 1898, Castle & Cooke organized the Waialua Agricultural Company and soon began a program of land purchases and leases to increase the plantation's capacity.

D. 1900 to 1950s

Waialua Agricultural Company, later named Waialua Sugar Company, continued to expand during the first decades of the 20th century, eventually reaching more than 12,000 acres, including a large portion of Kawailoa *ahupua'a* which was leased from the Bishop Estate. Kawailoa became the site of one of the three camp units (the other two were Halemano and Waialua) into which the plantation was divided. Kawailoa camp comprised housing, social and recreational facilities for the workers of the adjacent fields and their families.

The expansion of the sugar plantation is reflected in government censuses of the early 1900's. While in 1896 there were only 1,349 persons recorded in Waialua District, subsequent censuses recorded 3,285 persons in 1900, 6,083 in 1910, 7,641 in 1920, and 8,129 in 1930 (Schmitt 1977:13-14).

Following the Japanese attack and the United States' entrance into World War II, December 7th, 1941, Hale'iwa and the surrounding area was subjected to major infrastructure improvements associated with military activity. Military records indicate the construction of bunkers, housing and storage buildings, as well as improvements to the Hale'iwa Auxiliary Field facilities (Borthwick *et al.* 1998). These improvements in turn created the demand for labor, services, and associated constructions which led to a further increase in population.

The war in the Pacific had been over less than a year when the Hawaiian Islands were devastated by a tsunami (tidal wave) that left at least 150 people dead and caused more than $25 million in property damage. On April 1, 1946, an earthquake off the Aleutian Islands at about 2:00 a.m. (Hawaiian time) generated the tsunami that reached the islands about four hours later. The severity of the tidal waves varied at different locales along the islands' coasts. At Waialua Bay, the waves ranged from 10 to 11 feet above sea level; further along the coast between Waialua and Waimea bays, waves heights of 19 and 17 feet above sea level were recorded (Shepard *et al.* 1950:418,421).

The O.R. & L. Company ceased operating its rail line in 1947. The Hale'iwa Hotel, which the U. S. Army had used as a recreation facility during the war, closed in 1952.

E. The Development of Hale'iwa Small Boat Harbor

A 1942 aerial photograph shows the coastal configuration at Waialua Bay in the area in which the future Hale'iwa Small Boat Harbor would be constructed (Figure 6). Anahulu Stream is shown to meander around a sand bar before entering the bay. This is the "Mokulaelae sand spit" upon which LCA 7425 parcel 3 was located.

The Hale'iwa Small Boat Harbor construction project was authorized under Section 107 of the River and Harbor Act of 1960. The local sponsor of the project was the State of Hawai'i Department of Land and Natural Resources (DLNR), Division of Boating and Ocean Recreation. The harbor was completed in 1966.

The navigation features of the newly-completed harbor consisted of: an entrance channel 740 feet long, 100 to 120 feet wide, and 12 feet deep; a revetted mole 1,310 feet long; a stub breakwater 80 feet long; and a wave absorber 140 feet long. The total project cost was $1,777,642.

The harbor in its current configuration is shown on an aerial photograph of 2000 (Figure 7). The configuration of the harbor has been delineated on an enlarged portion of the 1942 photograph of Waialua Bay (Figure 8). The harbor is shown to have been constructed around the meander of Anahulu Stream at its entrance to the bay. However

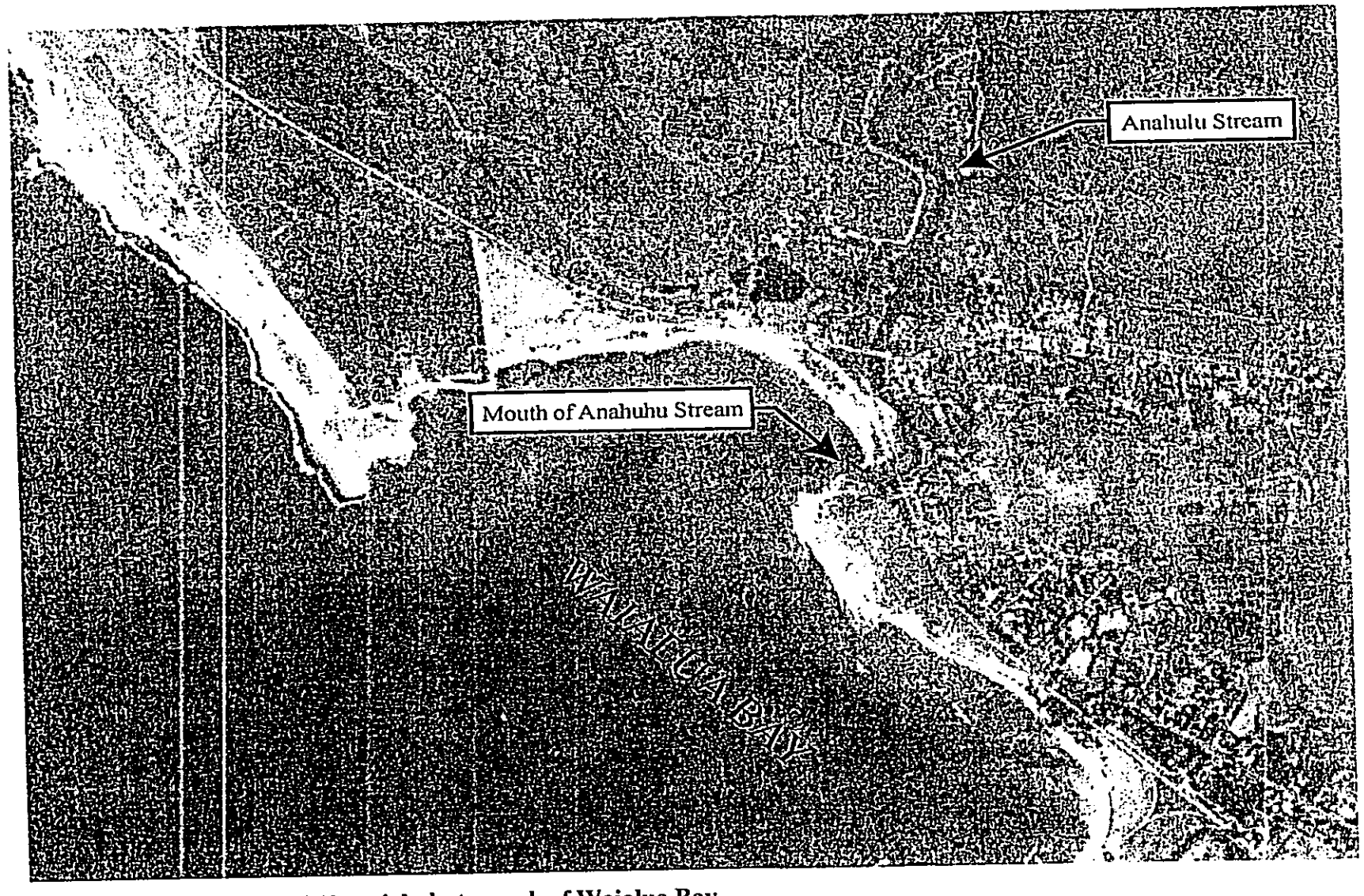


Figure 6 1942 aerial photograph of Waialua Bay

Figure 7 2000 aerial photograph showing Hale'iwa Small Boat Harbor in Waialua Bay

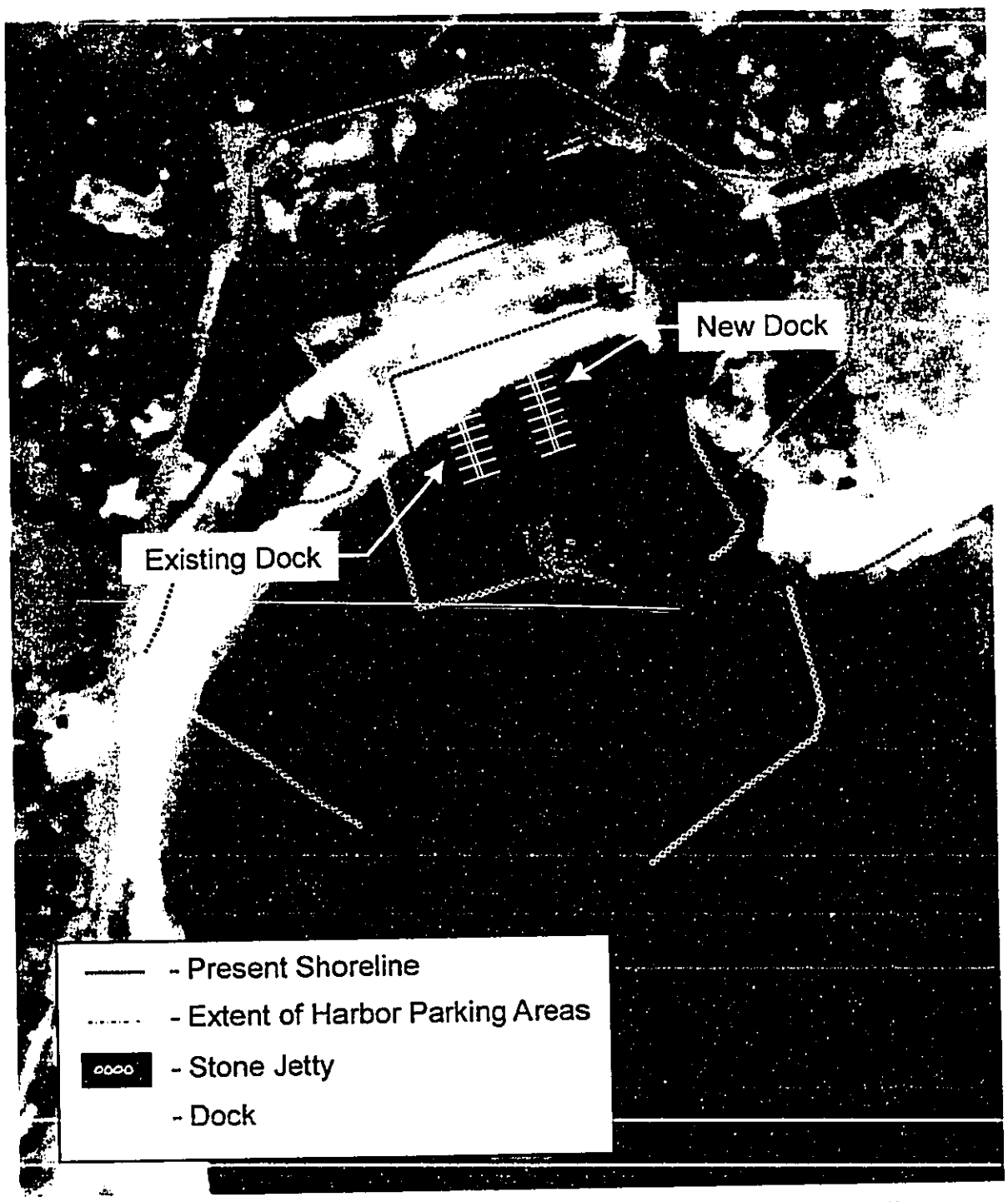


Figure 8 Portion of 1942 aerial photograph with locations of Hale'iwa Small Boat Harbor features and new dock site indicated

the stream itself has been rerouted and now enters the bay on the north side of the harbor. The "sand spit" has been dramatically modified to create a large jetty. Located on the jetty are parking facilities and the harbor agent's office. The photograph also indicates that the existing floating dock and proposed floating dock are located in an area that was dredged for the harbor basin.

The degree of modification most likely eliminated any remnants of past shoreline-related practices on the sand spit in the area where the new floating dock is proposed for construction.

III. ARCHAEOLOGICAL RESEARCH

Kawailoa *ahupua'a* has been the subject of intensive archaeological, historical, and paleo-environmental studies in recent years. Anahulu Valley and the lowlands around Waialua Bay were the focus of studies initiated in the 1970's. The "Anahulu Valley Project" as it was called, "joined archival ethnography with field archaeology, so as to construct an integrated history of Anahulu Valley" (Kirch 1992:1). The data from this project is presented in the two volumes of *Anahulu the Anthropology of History in the Kingdom of Hawaii* (Kirch and Sahlins 1992). Four additional studies related to the Hale'iwa bypass (Barrera 1979; Athens 1995), the Hale'iwa Beach Park expansion (Moore 1993), Pua'ena Point (Borthwick *et al.* 1998) and Loko'ea Pond (McGerty and Spears 2000) contributed valuable information relevant to the current project area.

The Anahulu Valley Project, though focused on sites in the mid- and upper-valley, included extensive background research concerning all of Waialua. The study documented the expansion into the inland areas of Kawailoa, *ca.* fourteenth century, as evidence by temporary camps within rock shelters in Anahulu Valley (Kirch 1992:165). Land use during this "Expansion Period" (*i.e., ca.* A.D. 1100-1650) "appears to have been of a very low intensity, focused on the exploitation of native birds (both land birds and nesting seabirds), and other stream an forest products, with some limited shifting cultivation" (*Ibid.*). Subsequently occupation of the rock shelters became permanent though land use was still focused on "shifting cultivation and forest product extraction" (*Ibid.*). It was not until the "occupation of O'ahu by Kamehameha's forces in A.D. 1804" that land use changed dramatically with permanent house sites replacing rock shelters and irrigated taro terrace complexes replacing shifting cultivation.

Though no evidence of early occupation (*i.e.* colonization, A.D. 300-600, or developmental, A.D. 600-1100, period) was found within mid- or upper-Anahulu Valley, Kirch suggested that because of the "abundant marine resources at Waialua it is likely that initial Polynesian settlement of this area dates back to the early developmental or colonization period" (*Ibid.*:165). Additional evidence that Waialua Bay was probably occupied relatively early comes from "a small basalt adze of distinctive form eroding from a disturbed midden deposit at Hale'iwa Beach Park" (*Ibid.*:14). The adze form was previously only known from "the two earliest Hawaiian sites" and "the presence of this early adze form at Waialua may thus indicate a colonization or early developmental period occupation in the Waialua area" (*Ibid.*:14).

Studies related to the Hale'iwa bypass highway were initiated in the late 1970's. The initial survey of alternatives resulted in the identification of five sites: 50-80-04-1439, -1440, -1441, -1442 and -1443. Additionally three previously recorded sites, -229 Kawaipuolo spring, -233 Loko'ea fishpond, and site -236 'Uko'a pond were also documented (Barrera 1979:4). Site 1439 refers to an historic rubbish dump where "bottle typology suggests a date between about A.D. 1880 and 1920" (*Ibid.*:29). Subsurface

testing indicated "that the subsurface cultural materials were deposited during relatively recent clearing of the surrounding area" (*Ibid.*:29). Site -1440 refers to a stacked stone wall remnant of unknown function, though it may have represented the remains of a larger structure. Site - 441 refers to presently utilized *lo'i*-type terraces, though at the time of the survey, cultivation of hasu, or lotus root, was the dominant crop. Site -1442 designates the former homestead of the missionary John S. Emerson on the south side of Anahulu River. Site -1443 refers to the remains of "an old church" on the north side of Anahulu stream. These findings suggest that the lowlands around Anahulu River were some of the more intensely utilized in the region.

'Uko'a Pond, State Site 50-80-04-236, was the subject of paleo-environmental research by IARI Inc. (Athens *et al.* 1995). The study, related to the Hale'iwa Bypass Highway project, consisted of analyzing core samples from the 'Uko'a Pond wetlands. Coring investigation of 'Uko'a Pond revealed up to 18 stratigraphic layers in three fully analyzed cores. Paleo-environmental studies associated with 'Uko'a Pond (Site 50-80-04-236) were conducted "to evaluate archaeological resources and mitigate adverse impacts caused by construction of the Hale'iwa Bypass Road through archaeologically sensitive wetlands" (*Ibid.*:1). A total of four sediment cores were collected with three being fully analyzed.

The study provides discussions on environmental changes, "for the past 8,000 years or so" as evidenced by pollen and diatom analysis, sediment accumulation rates and charcoal particle counts. The pollen analysis culminated in dividing up the entire sequence into four zones, A-D, with Zone A the earliest "period from 7500 to 3400 years B.P.", Zone B "from 3400 to 1600 years B.P.," Zone C "dating from 1000 to 500 years B.P." and Zone D "the last 500 years" (*Ibid.*:118-119). In general, the pollen record indicates that: (1) the first two zones, A and B, are "characterized by an abundance of arboreal types;" (2) through out Zone C (1000 to 500 B.P.) there is a distinct decline "and in many cases extirpation from the record of all arboreal pollen types." This indicates that "the lowland forest evidently becomes entirely replaced by an open scrub land in perhaps no more than 300 years. On a calendrical time scale this change begins to appear in the pollen record about A.D. 950. The nature of the change, which has been similarly documented in other pollen cores on O'ahu, is strongly suggestive of a causal relation with the advent of the Polynesian colonization of Hawaii" (*Ibid.*). The pollen record for the last 500 years, Zone D, was so poorly preserved that "information concerning this zone is not available" (*Ibid.*:119).

The presence of particle charcoal within the cores was suggested to be evidence of fires utilized in the 'Uko'a watershed area to clear forested lands for agriculture. The presence of charcoal was somewhat unexpected as previous coring on O'ahu had "not yielded particle charcoal records" (ibid.:119). Based on the particle charcoal analysis occupation of the Kawailoa area appears significantly earlier than previously thought: "the charcoal particle evidence suggests occupation of this area probably by about A.D. 800, and both the charcoal particle and pollen evidence strongly indicate occupation definitely by A.D.

950. This finding, in effect, pushes back the previously accepted date of initial occupation of Kawailoa by some four centuries at a minimum" (Athens et al 1995:121).

The study at 'Uko'a pond provided evidence of the change in the environmental conditions over a span of roughly 8000 years. Particle charcoal and pollen records strongly suggested human evolved impacts to the 'Uko'a watershed ca A.D. 850 and definitely by A.D. 950. The dates are suggestive of forest clearing in the 'Uko'a watershed related to initial Polynesian occupation of the Kawailoa area of the Waialua region. Accumulation rates for sedimentation were calculated suggesting that the steepest rate of accumulation occurred about 2200 years B.P., well prior to the settlement of the Hawaiian Islands. It was concluded, however, that:

> .....the sediment accumulation curve drops steeply just when Polynesian impacts and upland erosion would be expected to be at their most severe. The 'Uko'a Pond data, therefore, certainly do not support a model of anthropogenic erosion leading to coastal infilling and progradation. The fact that the upward trend starts at 2200 years B.P. is suggestive of sea level change as the governing process. This, as was discussed earlier, is just the time that the high sea stand of the mid-Holocene is thought to have reached its modern level and stabilized in Hawai'i. The sediment accumulation curve, therefore, may only represent the process of coastal sediments reaching a new equilibrium state (in terms of erosion and deposition) in response to changed sea level conditions. (Athens *et al.* 1995)

In 1993 Archaeological Consultants Inc. conducted an inventory survey with extensive subsurface testing for the expansion of Hale'iwa Beach Park (Moore *et al.*, 1993). During the survey, two surface sites (Site 50-80-04-4589, historic house site; McAllister's Site -235, a stone), two intact and four partial burials (Sites 50-80-04-4593, 4594 and 4595), three fire pits (Site 50-80-40-4590 Feature A - C), and a posthole and charcoal lens (Site 50-80-04-4601 Features A and B) were encountered.

Radiocarbon analysis from contents of three separate fire pits (Site 4590 Features A-C) yielded "age ranges of between 1399 and 1672 A.D." (Moore *et al.* 1993:82). The three fire pits which were from different localities and "different stratigraphic zones" throughout the project area, were assigned the single state site number (4590) because "of the contemporaneous ages obtained for these fire pits" (*Ibid.*:69). Additionally the other subsurface feature postholes, a pit and a charcoal lens, though not specifically dated, were suggested to "represent a temporary habitation site from the prehistoric or early historic period" (*Ibid.*:69-70).

The three burial sites included the remains of six individuals. Site -4595 contains the remains of four individuals in "an area measuring approximately 90 m2. The remaining two burials (sites 4593 and 4594) were isolated from the multiple burial site, both located at least 35 meters from site 4595" (ibid.:68-69). Based on "the remains of six individual in a 10.0 meter stretch of the coast line" additional burials where deemed possible "though excavation indicated that the likely distribution of these possible sites is in the form of scattered, isolated burials" (*Ibid.*: 77, 82).

The beach park expansion project area was also the location of mid-1800's *kuleana* house lots. The location had been referred to by Sahlins as containing "a coastal settlement of at least eleven families" (Sahlins 1992:176). However, no evidence of "any deposits that could be associated with these houselots" were observed due to "disturbances including subsurface pavements, broken and displaced bedrock slabs, inversions of stratigraphy, and a subsurface cesspool" (Moore *et al.* 1993:83).

The natural or undisturbed stratigraphy within the beach park parcel "consisted of basal layers of Jaucas sands, though pockets of terrestrially developed sandy clay loams form the basal layer in some location"...which were "overlain by layers of silty sands and Jaucas sands." However the "natural stratigraphy has been corrupted by a series of historic disturbances including occupation of the property during the Mahele period, consolidation of the property into single early twentieth century house site with its associated landscaping activities, and military activity associated with Hale'iwa airfield in the mid twentieth century" (Moore *et al.* 1993:83).

The Hale'iwa Beach Park project area contained evidence of three contemporaneous fire pits (i.e. Site -4590 A-C) indicative of temporary habitation use of the sandy coast line within the protected eastern portion of Waialua Bay "since as early as the fourteenth century" (Moore *et al.* 1993:82). Though no evidence of permanent "early prehistoric" habitation was found, further research would be required to address permanency of occupation. Additionally, although historic background research clearly indicates permanent mid 1800's (*i.e. Māhele* era) occupation of the project area (*i.e.* five *kuleana* house lots) no evidence relating to that occupation was located. Clearly the amount of historic and modern land altering activities within the beach park project area has obliterated much of the evidence of prehistoric and early historic land use.

Cultural Surveys Hawai'i conducted an archaeological inventory survey with subsurface testing on a 140-acre parcel within Kawailoa *Ahupua'a* at Pua'ena Point (Borthwick *et al.* 1998). A surface survey and 44 backhoe test pits were executed to gain a better understanding of previous activities, both historic and pre-contact. Eight sites were encountered during the survey including remnants of World War II-era structures and bunkers (Sites 50-80-04-5641, -5642, and -5643), an historic trash dump (site -5644), a buried cultural layer (site -5661) and one human burial (site -5495). The burial was encountered during backhoe testing in a shallow pit in the location of a former *kuleana*

house lot. The absence of a coffin or historic artifacts, apparently flexed position and proximity to other known burials (sites -4593, 4594 and 4595) presumed to be traditional Hawaiian pre-contact burials (Moore *et al.* 1993), suggests that site -5495 is a traditional Hawaiian burial as well.

Scientific Consultant Services Inc. conducted an archaeological inventory survey with six backhoe trenches just south of Loko'ea Pond, approximately 250 m south of the current project area. During the survey two sites were identified: State Site50-80-04-5795, a series of charcoal deposits and burn events; Site 5839, a stacked basalt boulder wall. One charcoal sample was submitted "resulting in the radiocarbon date, at two sigma, of A.D. 1420-1530" (McGerty *et al.* 2000:37) which represents a pre-Contact cultural deposit.

Based on an early adze type (Kirch 1992), charcoal evidence suggesting occupation by A.D. 800 (Athens *et al.* 1995:121), three separate charcoal dates "yielding age ranges of between AD 1399-1672" (Moore 1993:82), and a charcoal sample suggesting occupation between AD 1420-1530 (McGerty and Spears 2000) this data suggests a continual occupation of the lower Anahulu Valley since AD 800.

Cultural Surveys Hawai'i conducted an archaeological inventory survey which included 9 backhoe trenches in a five-acre portion of Hale'iwa Ali'i Beach Park in Pa'ala'a *Ahupua'a* (McDermott *et al.* 2000). The background research revealed a previously recorded historic property (State Site 50-80-04-5791), the right-of-way of the O. R. & L. railroad. In addition, within two of the backhoe trenches a sandy subsurface cultural layer, State Site 50-80-04-5850, related to prehistoric habitation contained charcoal, food midden, and artifacts was documented. The layer contained intrusive subsurface features including a likely post hole, earth oven excavations and a human burial (part of site -5850).

Two charcoal samples returned similar dates ranging between A.D. 1430-1680 (McDermott *et al.* 2000). The presence of a pre-contact human burial, abundant midden and pre-contact dates confirms previous studies suggesting a continual habitation of the Waialua district and lower Anahulu Valley.

Cultural Surveys Hawai'i, Inc. carried out an archaeological inventory survey for 5 parcels totaling 3.4 acres for the proposed Hale'iwa Beach Park Skate Park (Borthwick *et al.* 2001). Three sites were identified and documented during the survey including a segment of the O.R. & L. railroad right-of-way (State Site 50-80-04-5791), a basalt boulder structure (State Site 50-80-04-5915), and a subsurface cultural layer (State Site 50-80-04-5916). The basalt boulder structure was interpreted as a foundation for above-ground wooden water tanks related to the O.R. & L. railroad, that subsequently was modified for a variety of functions (e.g. cattle barrier, lot delineation, plantings). The subsurface cultural layer (Site -5916) is a poorly defined mixed stratum containing

modern to early 1900's trash with sparse charcoal flecking. The mixed stratum rests upon gleyed deposits.

Burials have been documented in the Hale'iwa Beach Park expansion project area, as detailed earlier (Moore 1993). Additional burials in Kawailoa in sandy deposits were inadvertently discovered across from the former Meadow Gold dairy in a house lot off of Kamehameha Highway. The inadvertent finds, from footing trenches for a house, consisted of the disturbed remains of three individuals which were assigned state site 50-80-04-4670 (Avery and Kennedy 1993). The examination of the footing trenches indicated that no further burials were present and no burial specific features were noted. "No stratigraphic associations could be made due to the nature of the backhoe disturbance and no in situ human remains were found " (*Ibid.*:1).

IV. HAWAIIAN SETTLEMENT AND TRADITIONAL CULTURAL PRACTICES IN KAWAILOA *AHUPUA'A* AND THE PROJECT AREA

Reviewing the information provided by the elements of this cultural impact assessment – historical documentation and archaeological research – there emerges a more detailed picture of the traditional landscape of Kawailoa *ahupua'a* and the current project area at Waialua Bay.

The historical and archaeological research concerning Kawailoa details changing settlement patterns from ca. A.D. 900 through modern times. Based on particle charcoal and pollen analysis, initial occupation of the Kawailoa area is thought to have occurred ca. A.D. 800 and definitely by A.D. 950 (Athens *et al.*. 1995). These dates coincide with the "Developmental Period, A. D 600-1100" (Kirch 1992) which Kirch has suggested based on Waialua's favorable environment as well as an early adze type found within Hale'iwa Beach Park. Research indicates early coastal settlement with movements inland for forest clearing for swidden agriculture and procurement of the abundant forest resources (e.g. birds, timber, plants, etc.). Dates based on particle charcoal and pollen resources derived from three cores within 'Uko'a pond tend to suggest early occupation (A.D. 800-950), though the next earliest radiocarbon dates for Kawailoa cluster around A.D. 1400-1600 (Moore *et al.* 1993; McGerty and Spears 2000; McDermott *et al.* 2000).

Radiocarbon analysis from three separate fire pits in the Hale'iwa Beach Park Expansion area, north of the present project area, yielded calibrated age ranges of A.D. 1448-1672, 1420-1628 and 1399-1642 (Moore *et al.* 1993). In Anahulu Valley initial occupation of mid and upper valley rock shelters were dated to ca. "mid-fourteenth century A.D." (Kirch 1992:39, Table 2.1). Analysis from the coastal and rock shelters excavations related to these fourteenth century dated indicated temporary occupation rather than permanent.

Permanent occupation of inland Anahulu Valley occurred post A.D. 1650 though until ca. 1800 rock shelters were still the primary habitation site type. In the post A.D. 1800 era, concurrent with Kamehameha's O'ahu conquest "open habitation sites" replace rock shelters as the primary site type. These open habitation sites consisted of large earthen rock faced terraces, upon which the houses were constructed. The open habitation sites were utilized through the *Mahele* period until abandonment in the late 1800's.

The coastal zone or "seaward Kawailoa" (Sahlins 1992) remained the loci of habitation with the shoreline of Waialua Bay and areas surrounding 'Uko'a and Loko'ea being densely populated.

The dominant land use in Kawailoa from the late 1800's through the late 20th century was commercial sugar cane cultivation. Waialua Sugar Plantation set up numerous residential camps throughout Waialua with the closest being Kawailoa Camp, near the project area on the low backshore bluff overlooking the coast and 'Uko'a Pond. The plantation camps are a distinct divergence from the traditional settlement pattern. The former coastal permanent habitations are taken over for parks, roadways, commercial activities (*e.g.* stores, restaurants, etc.) with housing clustered into camps in plantation-specified areas.

Archaeological research indicates that the resource rich coastal strip and natural ponds with associated taro *lo'i* around the perimeter was likely populated by ca. AD 950 and definitely by AD 1400. Mid-1800's documentation including LCA testimonies indicates that permanent habitations associated with *kuleana* were also present within the coastal zone above Waialua Bay in 1848, likely reflecting a continued occupation of the lands around the bay and 'Uko'a and Loko'ea ponds. As noted above, one *kuleana* which included a house site – LCA 7425 – was located within the present project area.

This scenario was likely in place at the time of first western contact and remained relatively undisturbed until the mid-1800s.

Based on the above documentation, traditional cultural practices associated with Waialua Bay and the current project area would include, on shore, habitation sites and temporary fishing camps with associated activity areas and possible human interment in jaucus sand dunes; and, offshore, fishing.

However, as has been documented above, the development of the Hale'iwa Small Boat Harbor in the 1960s has eliminated any surface sites and most likely eliminated any subsurface deposits related to these traditional cultural practices.

V. RESULTS OF COMMUNITY CONTACT PROCESS

Throughout the course of this assessment, an effort was made to contact and consult with representatives of cultural organizations and government agencies, and individuals who might have knowledge and/or concerns about traditional cultural resources, practices and beliefs specifically related to the Hale'iwa Small Boat Harbor project area.

Five individuals with long-term backgrounds at the Hale'iwa Small Boat Harbor and in the North Shore community shared their knowledge for this assessment. Their views are summarized below:

Paul Sensano, Harbormaster of Hale'iwa Small Boat Harbor

Paul Sensano was contacted by telephone on November 17 and 25, 2003. Mr. Sensano gave recommendations of individuals to be contacted. He noted that current regulations prohibit certain types of shoreline activities within the harbor, including pole fishing, surround netting and spearfishing. He did not know of any cultural resources, practices, and beliefs that would be affected by the new dock project.

Masa Ibata, Waialua resident and fisherman

Masa Ibata was contacted by telephone on November 25, 2003. He owns the boat "Naomi" which is currently docked at Hale'iwa Small Boat Harbor. He did not know of any cultural resources, practices, and beliefs that would be affected by the new dock project. Mr. Ibata did not see the project as creating any problems. He thinks it's a good idea that will allow additional boats into the harbor.

Richard Murakami, Wahiawa resident and boat owner

Richard Murakami was contacted by telephone on November 25, 2003. He has been fishing in Waialua Bay (*i.e.*, before the construction of Hale'iwa Small Boat Harbor) since 1949. He has a boat currently docked in the harbor. Before the construction of the harbor, Mr. Murakami recalled that boaters would park their boats in Anahulu Stream. He also recalled that there was a swim meet in Anahulu Stream during the 1930s. He noted that the stream was re-routed during the construction of the harbor. Mr. Murakami did not know of any cultural resources, practices, and beliefs that would be affected by the new dock project.

Randy Sanborn, President of Manu O Ke Kai canoe club

Randy Sanborn was contacted by telephone on December 2, 2003. Mr. Sanborn noted that the club launches their canoes outside of the harbor area. Only occasionally, when waves are bigger, will the club launch canoes within the harbor. Mr. Sanborn does not believe the new dock facility will impact canoe club activities. He did not know of any cultural resources, practices, and beliefs that would be affected by the new dock project.

James Awai, Secretary of the North Shore Neighborhood Board

James Awai was contacted by telephone on December 3, 2003. Mr. Awai does not believe the new dock facility will impact cultural resources, practices, and beliefs. He does note that there is an occasional problem at the harbor with people fishing on the present pier and having their lines tangle with mooring lines and passing boats.

VI. SUMMARY AND RECOMMENDATIONS

A. Summary

Historical documentation indicates that the district of Waialua, in which the project area is located, comprised in traditional Hawaiian times a landscape of material abundance that made it a focus of populous settlement and *ali'i* residence. Archaeological documentation suggests that the resource rich coastal strip and natural ponds with associated taro *lo'i* at Waialua Bay was a focus of permanent habitation and associated activities. Mid-1800's documentation including LCA testimonies indicates that permanent habitations associated with *kuleana* – including LCA 7425 within the current project area – were present within the coastal zone above Waialua Bay in 1848, likely reflecting a continued occupation of the lands around the bay and 'Uko'a and Loko'ea ponds.

Based on the above documentation, traditional cultural practices associated with Waialua Bay and the current project area would include, on shore, habitation sites and temporary fishing camps with associated activity areas and possible human interment in jaucus sand dunes; and, offshore, fishing.

However, as has also been documented above, the construction of the Hale'iwa Small Boat Harbor in the 1960s has eliminated any surface sites and most likely eliminated any subsurface deposits related to these traditional cultural practices.

The five individuals with long-term backgrounds at the Hale'iwa Small Boat Harbor and the North Shore community expressed no specific concerns related to traditional cultural resources, practices or beliefs that might be impacted by the development of the new dock facility. Current practices – including shoreline fishing and canoe-paddling – are either restricted within the harbor or take place outside the harbor.

B. Recommendations

Based on the above findings, it is recommended that no further formal cultural impact mitigations measures are warranted.

As a precautionary measure, personnel involved in the design and construction of the new dock facility should be informed of traditional cultural practices and sites associated with Waialua Bay. Personnel should be made aware of the possibility, however slight, of inadvertent cultural finds, and made aware of the appropriate notification measures to follow.

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APPENDIX E
NOISE/VIBRATION STUDY

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YEA Job #41-044
August 13, 2003

W. Y. Thompson, P.E.
98-1051 Kahapili Street
Aiea, Hawaii 96701

Subject: Results of Noise/Vibration Study; New Floating Dock, Haleiwa Small Boat Harbor; Waialua, Oahu

Dear Mr. Thompson:

Purpose. The following letter report describes my predictions and evaluations regarding potential noise and vibration impacts resulting from pile driving operations during the addition of a New Floating Dock at Haleiwa Small Boat Harbor. Figure 1 depicts the relationship of the Floating Dock Project Site to the surrounding Haleiwa community. Pre-drilling will be required by the project specifications, and should reduce the number of blows required to drive a pile to refusal. But pre-drilling is not expected to significantly reduce the worst case noise or vibration levels of the pile driver, particularly during the final stages of hard driving at refusal.

Existing Background Ambient Noise Levels. Existing background ambient noise measurements were obtained during the afternoon of August 11, 2003 at seven locations around the project site. The results of these measurements are depicted in histogram format in Figures 2 through 8 for Locations "A" through "G", respectively. The noise measurement locations are shown in Figure 1. In the histograms of measured ambient noise levels, the Lmax, Leq, and Lmin values represent the maximum, average, and minimum sound levels, respectively, which were recorded at the measurement location. The L50 and L10 values represent the statistical median (level exceeded fifty percent of the time), and the level exceeded ten percent of the time, respectively.

Measured background ambient noise levels were controlled by motor vehicle traffic, marine craft, helicopters, fixed wing aircraft, lawn maintenance equipment, birds, roosters, and dogs. In the areas removed from major roadways, such as at Locations C, D, and E, background ambient noise levels were relatively low, and typically ranged between 42 and 70 dBA. In the areas near major roadways, such as at Location B, motor vehicle traffic noise controlled the background ambient noise levels, which typically ranged between 42 and 80 dBA.

Pile Driving Noise. Typical maximum (or Lmax) noise levels of impact pile drivers are expected to range between 98 dB at 100 feet distance to 78 dB at 1,000

feet distance. Typical median (L50, or noise level exceeded 50 percent of the time) noise levels during impact pile driving activities are expected to range between 93 dB at 100 feet distance to 71 dB at 1,000 feet distance.

The predicted outdoor noise levels during pile driving activities at various locations around the Haleiwa Small Boat Harbor Floating Dock Project Site are shown in Figure 9. Maximum noise levels in the closest residential areas across Haleiwa Road are expected to range between 78 and 84 dBA. Indoors, typical levels of pile driving noise within naturally ventilated and air conditioned structures are approximately 10 and 22 dBA less, respectively, than the outdoor levels shown in Figure 9. Lower levels less than 78 dBA are expected beyond 1,000 feet from the pile driving activity. The predicted noise levels from pile driving activities are moderately high at the residences closest to the pier across Haleiwa Road, and can interfere with sleep and speech communication. The maximum background ambient noise levels from traffic and other sources range from 55 to 88 dBA along Haleiwa Road, and will not mask the impulsive noise from pile driving activities.

Mitigation of impact pile driving noise to inaudible levels will not be practical due to the intensity of the noise sources (98 dBA at 100 FT distance), and due to the exterior nature of the work. There are no noise limits placed on pile driving activities, except for the mandatory curfew periods shown in Figure 10. These curfew periods are administered by the State Department of Health (DOH) and are applicable on the island of Oahu under "Title 11, Administrative Rules, Chapter 46, Community Noise Control;" Hawaii State Department of Health; September 23, 1996. As indicated in Figure 10, noisy construction activities are not allowed on holidays or Sundays, during the early morning, and during the late evening periods under the DOH permit procedures.

It is recommended that the State advise the community of the probable period of pile driving activities prior to award of the contract due to the potentially disruptive nature of the work. Prior to scheduling of the pile driving work, a mutually acceptable work schedule should be arranged between the community and the Contractor. Because of the residents across Haleiwa Road from the project site, a later start time of 9:00 AM instead of 7:00 AM is recommended for pile driving activities. This later start time should be incorporated into the project specifications.

Vibration from Pile Driving. Induced ground vibrations from impact pile driving operations have the potential to cause architectural and structural damage to structures, and to create discomfort to those exposed to high levels of vibration.

Ground vibrations generated during pile driving operations are generally described in terms of peak particle (or ground) velocity in units of inches/second. The human being is very sensitive to ground vibrations, which are perceptible at relatively

low particle velocities of 0.01 to 0.04 inches/second. Damage to structures, however, occurs at even higher levels of vibration as indicated in Table 1. The most commonly used damage criteria for structures is the 2.0 inches/second limit derived from work by the U.S. Bureau of Mines and a value of 0.5 inches/second used by Dames and Moore (August 28, 1992 letter to Walter Leong & Associates). Use of the more conservative limits of 0.2 to 0.5 inches per second may be used on this project because of the presence of lightweight structures within 500 feet of the project site.

Based on measured vibration levels during pile driving operations under various soil conditions and at various distances, estimates of ground vibration levels vs. distance from the pile driver have been made for various soil conditions and for various energy ratings of the pile drivers. Figure 11, which was extracted from "Damage Effects of Pile Driving Vibration;" Highway Research Record, Number 155, may be used to predict vibration levels for the soil conditions indicated. When coral layers must be penetrated, vibration levels can be expected to be higher than those shown in Figure 11, particularly if the adjacent structures are supported by the common coral layer. Predrilling should eliminate this concern. From Figure 11, and for wet sand or clay soil conditions, the 2.0 inches/second vibration damage criteria will be exceeded at a scaled energy distance factor of approximately 7.0. The scaled energy distance factor is equal to the square root of the energy (in foot-pounds) per blow of the hammer divided by the distance (in feet) between the pile tip and the monitoring location. For a 30,000 foot-pound pile driver, a scaled energy distance of 7.0 equates to a separation distance of 25 feet. For a 50,000 foot-pound pile driver, a scaled energy distance of 7.0 equates to a separation distance of 32 feet. Figure 12 depicts the predicted vibration levels from a 50,000 foot-pound pile driver using the wet sand (worst case) curve of Figure 11. Predicted vibration levels outside the harbor area are expected to be less than 0.2 inches per second, so risks of architectural or structural damage from ground vibrations during pile driving are expected to be low. At the Harbor Agent's Office (which is as close as 200 feet to the pile driver), predicted vibration levels are approximately 1.5 inches per second, with some risk of architectural damage to the wooden structure.

Predictions of peak ground vibration levels vs. scaled energy distance factor from the driven pile are not precise, with initial uncertainty factor for a given location in the order of 10:1. For this reason, it is standard practice to employ seismograph monitoring of ground vibrations during pile driving operations with a 3-axis geophone or accelerometer. Since pile drivers of approximately 30,000 to 50,000 foot-pounds ratings will probably be specified for use on the job site, the initial vibration predictions indicate that there is relatively low risk of exceeding the 2.0 inches/second vibration damage criteria at the closest structures to the job site (see Figure 12). Monitoring during the initial phase of pile driving operations may still be warranted because of the relatively large uncertainty factor when predicting vibration levels during pile driving. Monitoring alone, however, may not be a practical mitigation measure unless there are

alternative pile driving methods or foundation plans which can be employed if the damage criteria is exceeded. Nevertheless, the following mitigation measures are recommended for implementation during the design and construction phases of the project:

- In addition to the normal planning and design concerns regarding potential damage due to settling and heaving during construction, consideration should also be given to risks of damage due to vibration from pile driving. A damage criteria of 2.0 inches/second is suggested in conjunction with the vibration prediction method of Figure 11 to identify the potential damage risk distances to the driven piles. Because of the possible over-prediction of vibration levels using Figure 11, the requirement for initial 3-axis geophone monitoring at the Harbor Agent's Office (which is as close as 200 feet to the pile driver) should be added to the project specifications. If measured vibration levels are significantly less than 1.5 inches/per second at the Harbor Agent's Office, the vibration monitoring program may be discontinued.

- If measured vibration levels at the Harbor Agent's Office indicate that 2.0 inches/second will be exceeded, the geophone monitoring program should be continued and expanded to include the Haleiwa Joe's Seafood Grill Restaurant, and alternate pile driving methods should be investigated.

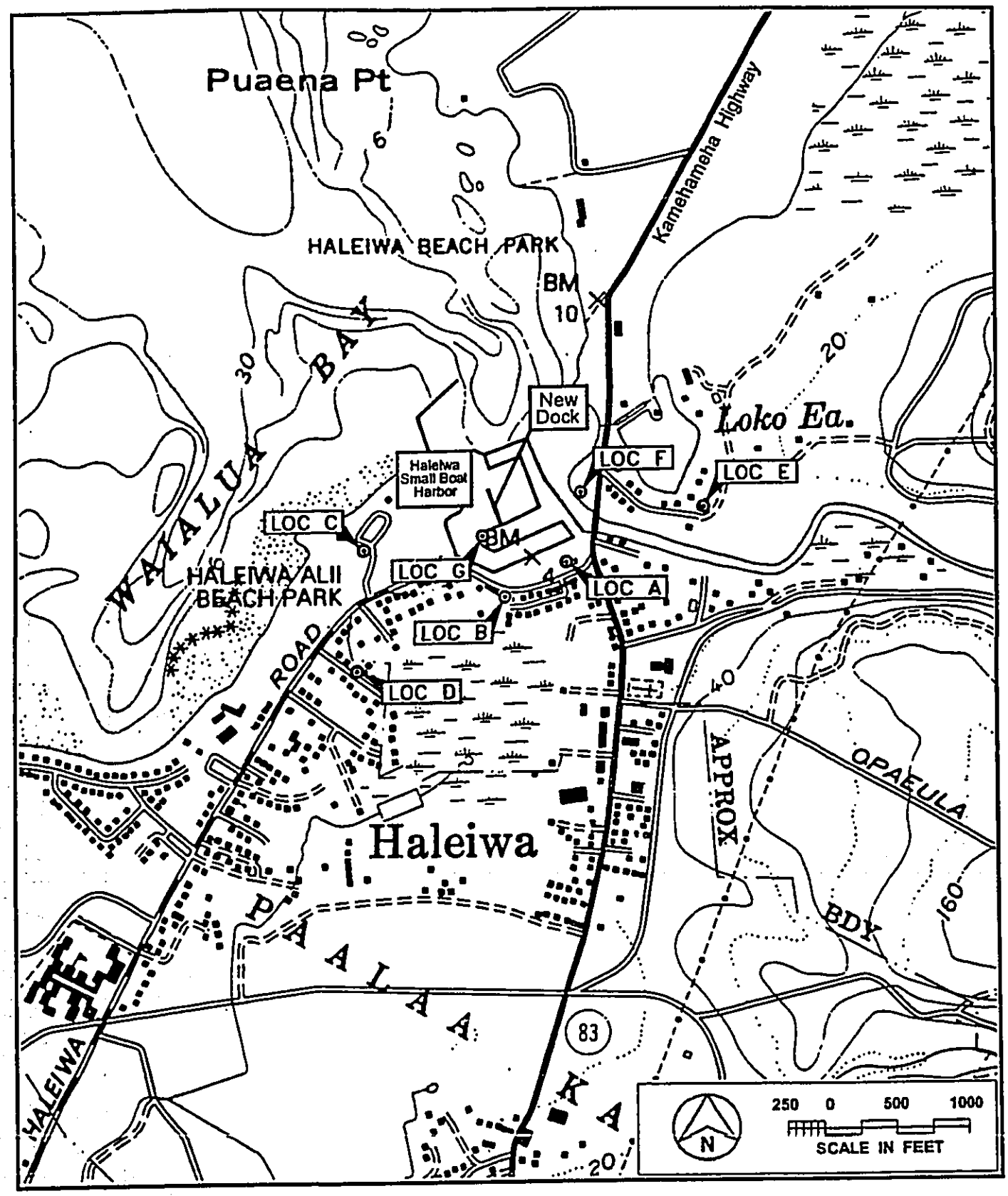
Summary. To summarize, the airborne noise impacts from the pile driving activities are not expected to be serious due to the relatively large distances (500 to 1,500 feet) to the nearest noise sensitive structures. Risks of adverse noise impacts are greatest at the residences south of the project site and across Haleiwa Road. A mutually agreeable schedule for pile driving operations should be established between the community and the Contractor in order to minimize potential noise impacts at the closest residences and business establishments.

Architectural damage to the closest structure (Harbor Agent's Office) is possible under worst case conditions. Risk of architectural or structural damage to nearby residential or commercial structures are very low. Nevertheless, initial vibration monitoring is recommended for empirically confirming that vibration levels at the Harbor Agent's Office and beyond will be significantly less than 2.0 inches per second during pile driving activities.

Sincerely,

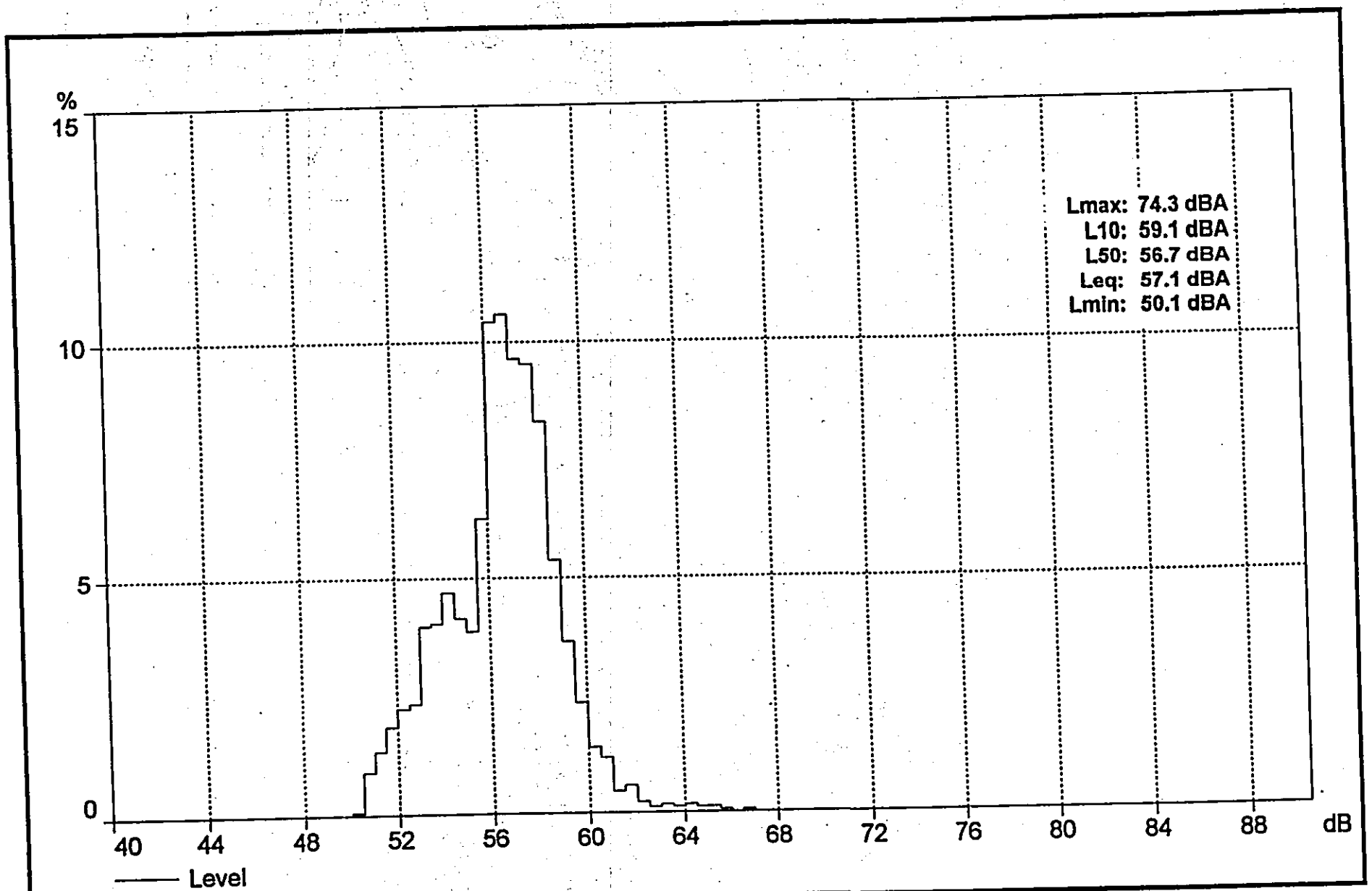
Yoichi Ebisu, P.E.

encl.



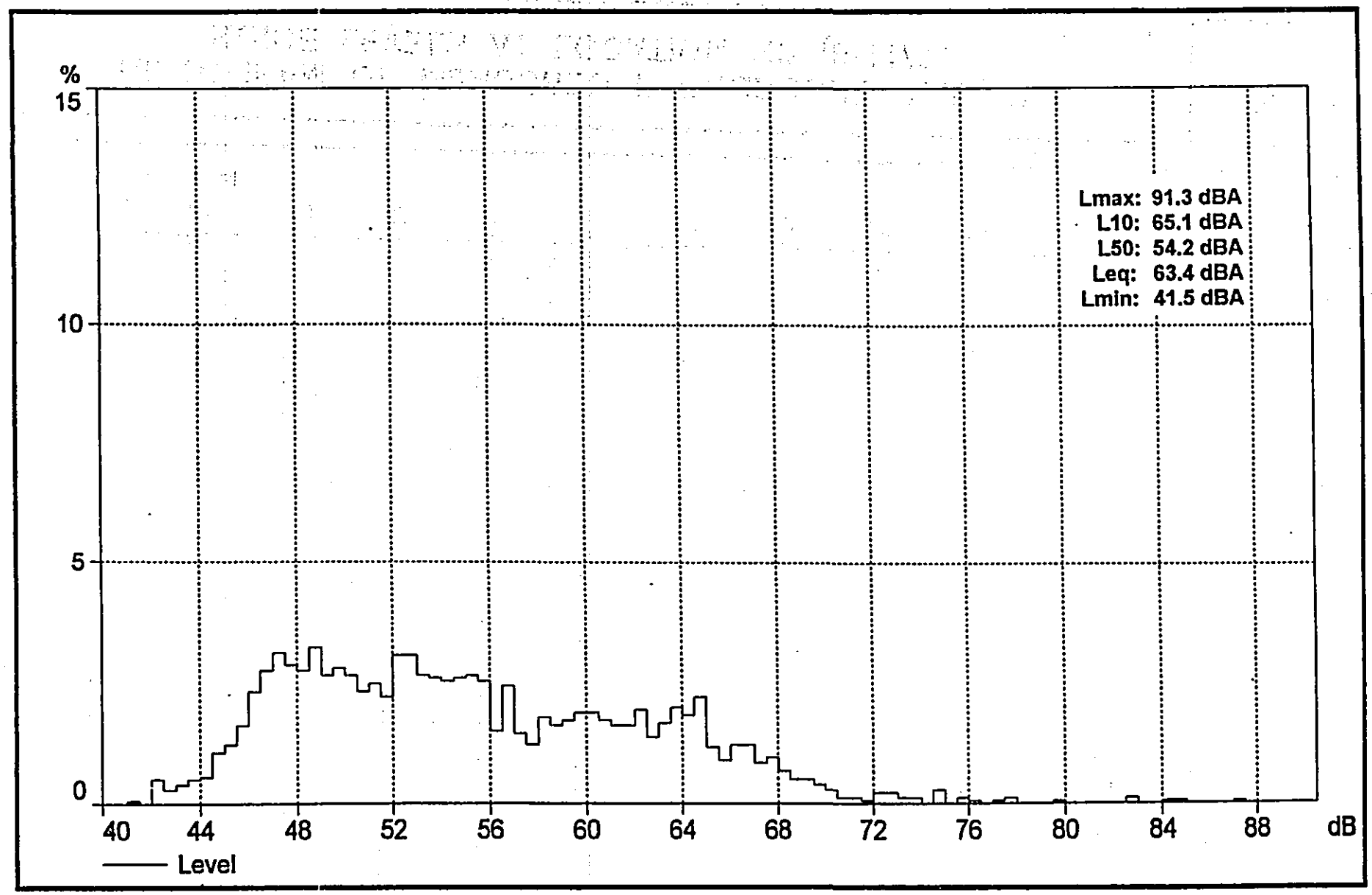
PROJECT SITE AND LOCATIONS OF BACKGROUND AMBIENT NOISE MEASUREMENTS

FIGURE 1



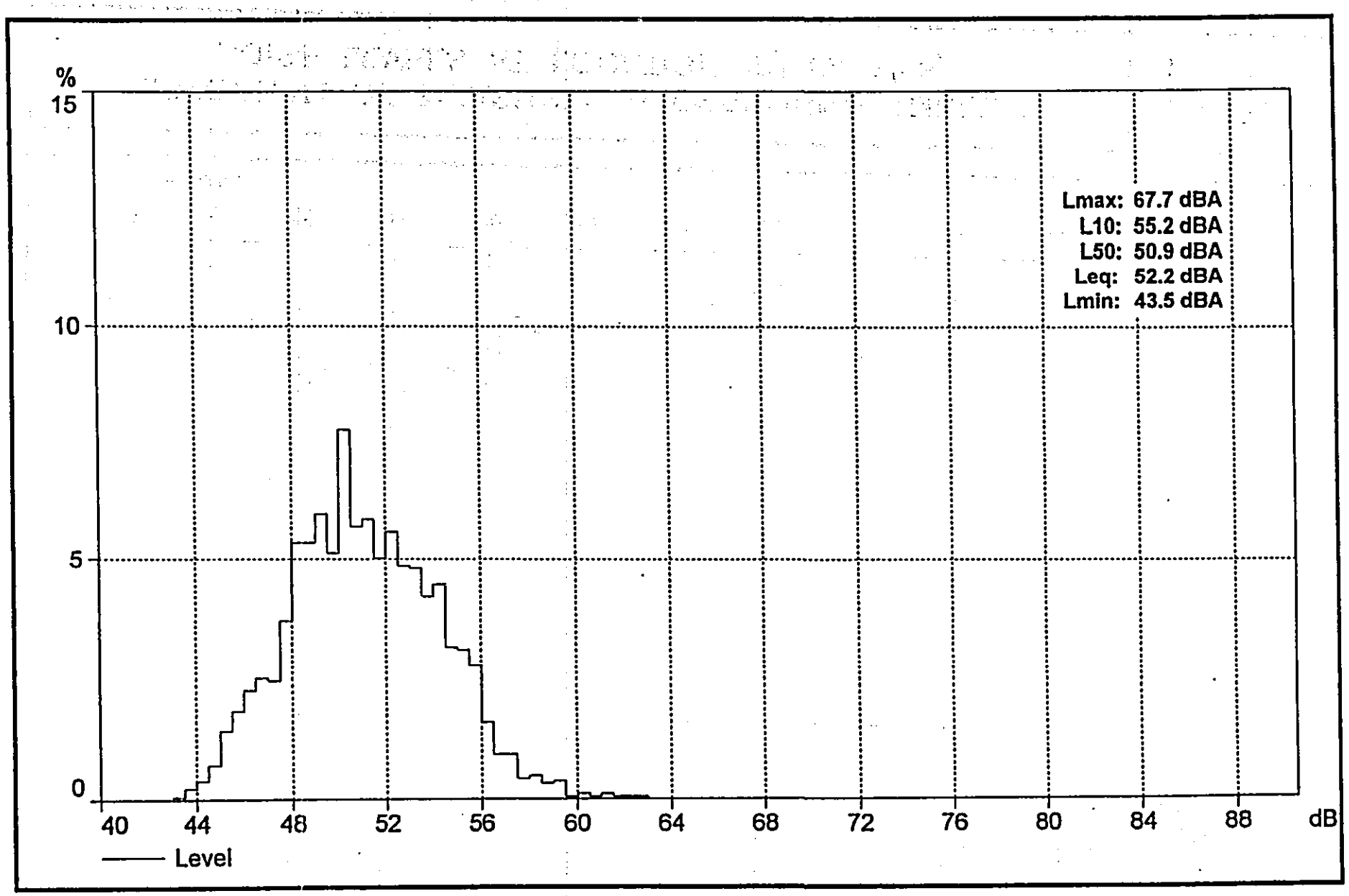
HISTOGRAM OF MEASURED BACKGROUND AMBIENT NOISE LEVELS AT LOCATION "A" (8/11/03)

FIGURE 2



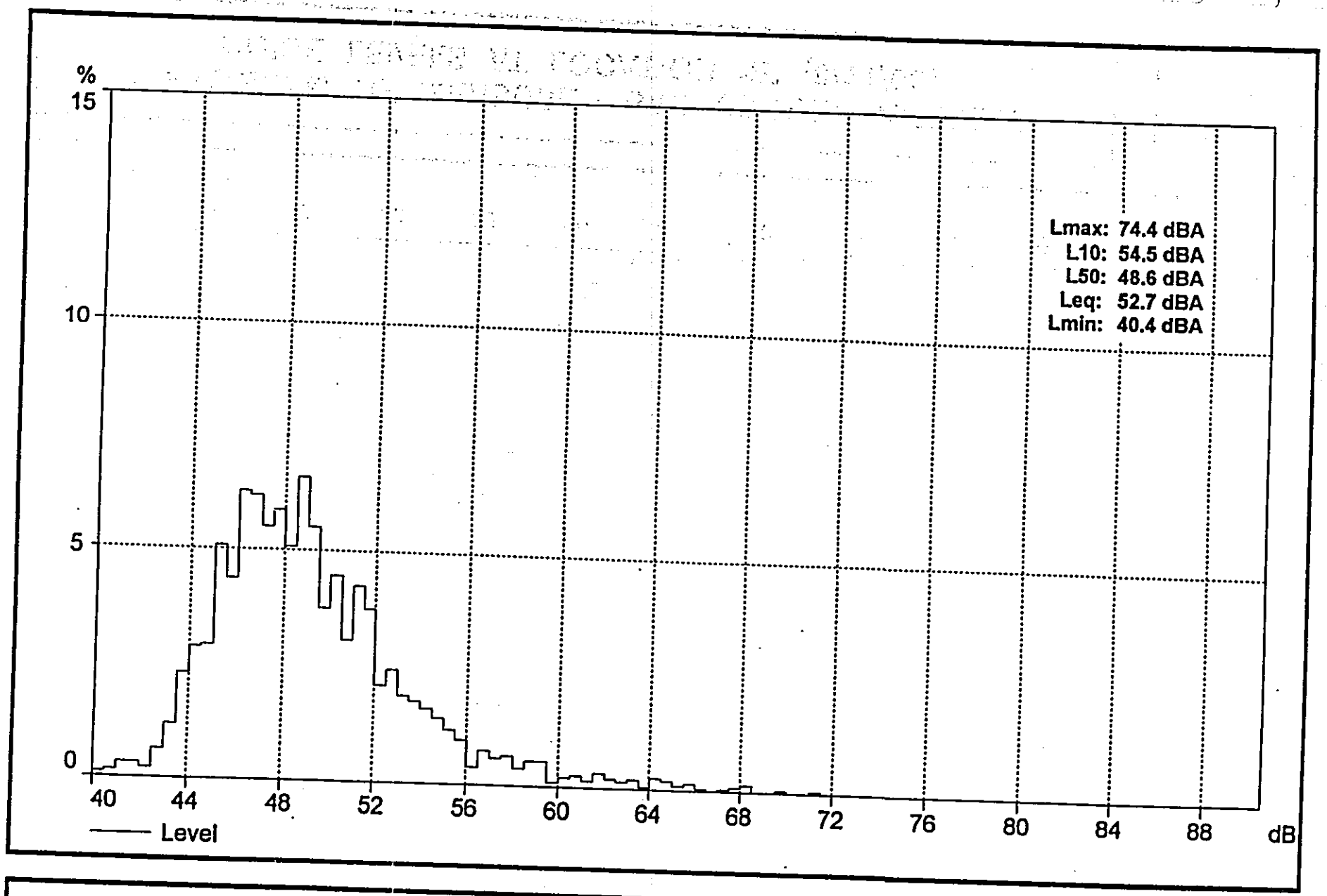
HISTOGRAM OF MEASURED BACKGROUND AMBIENT NOISE LEVELS AT LOCATION "B" (8/11/03)

FIGURE 3



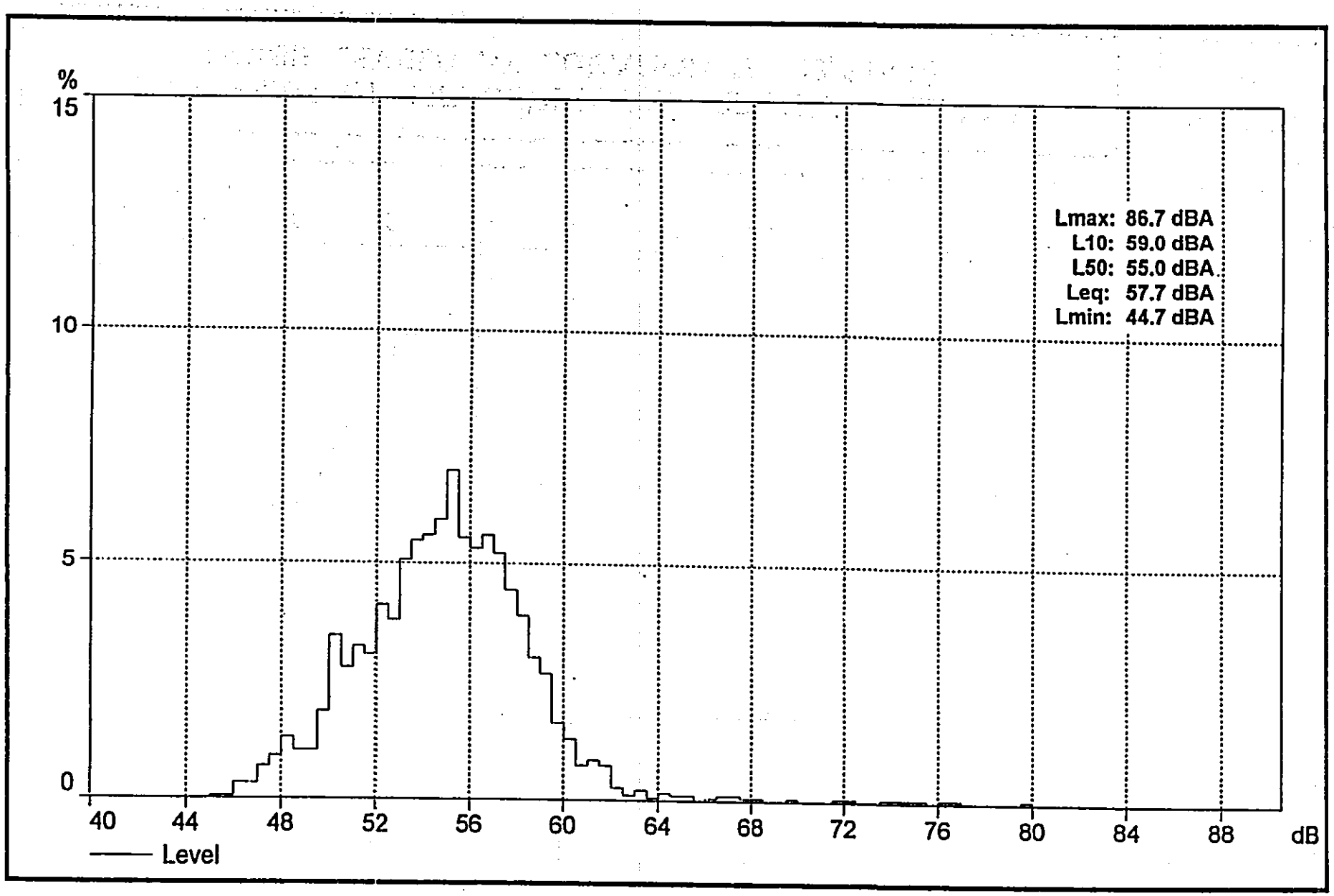
HISTOGRAM OF MEASURED BACKGROUND AMBIENT NOISE LEVELS AT LOCATION "C" (8/11/03)

FIGURE 4



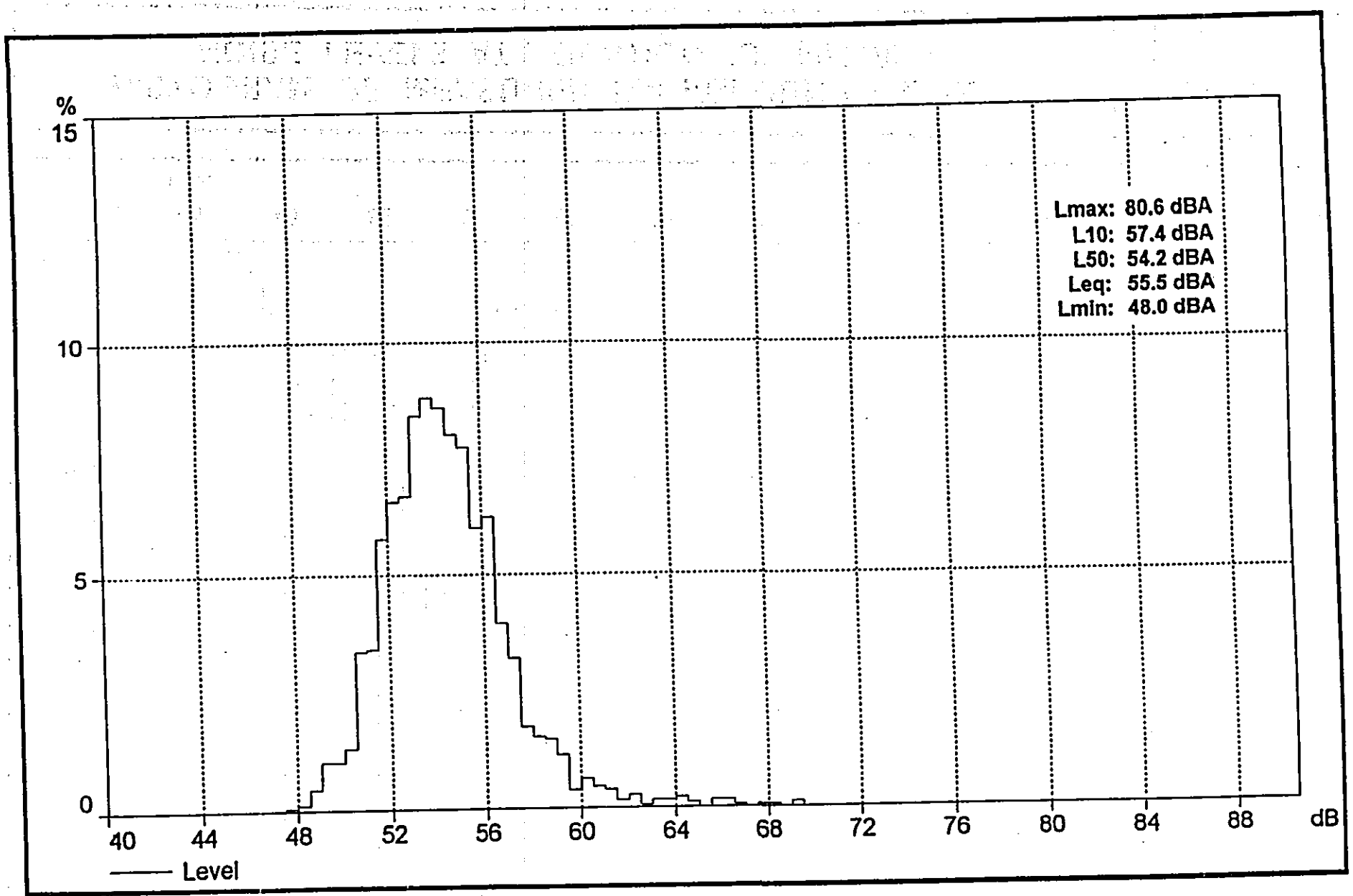
HISTOGRAM OF MEASURED BACKGROUND AMBIENT NOISE LEVELS AT LOCATION "D" (8/11/03)

FIGURE 5



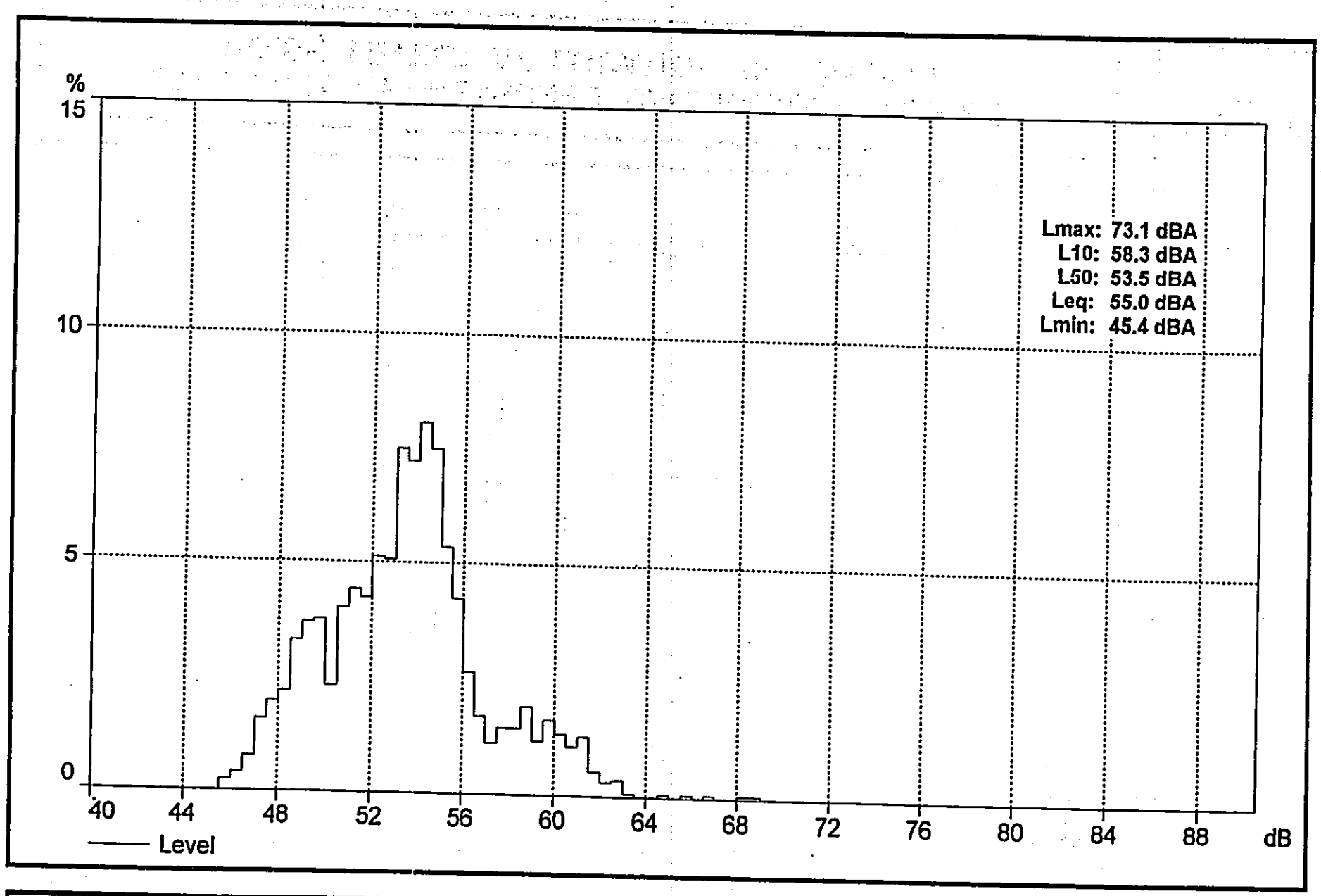
HISTOGRAM OF MEASURED BACKGROUND AMBIENT NOISE LEVELS AT LOCATION "E" (8/11/03)

FIGURE 6



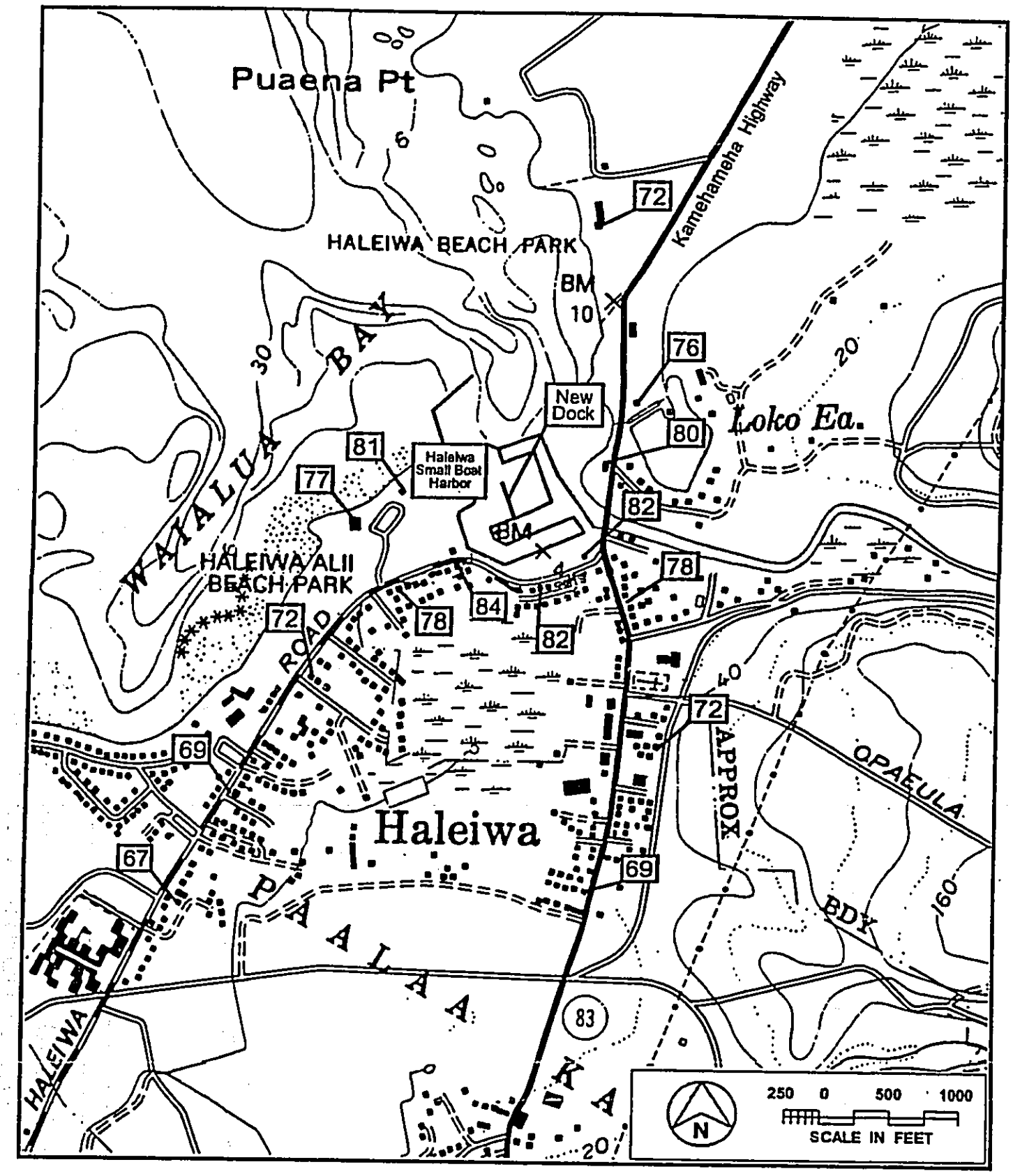
HISTOGRAM OF MEASURED BACKGROUND AMBIENT NOISE LEVELS AT LOCATION "F" (8/11/03)

FIGURE 7



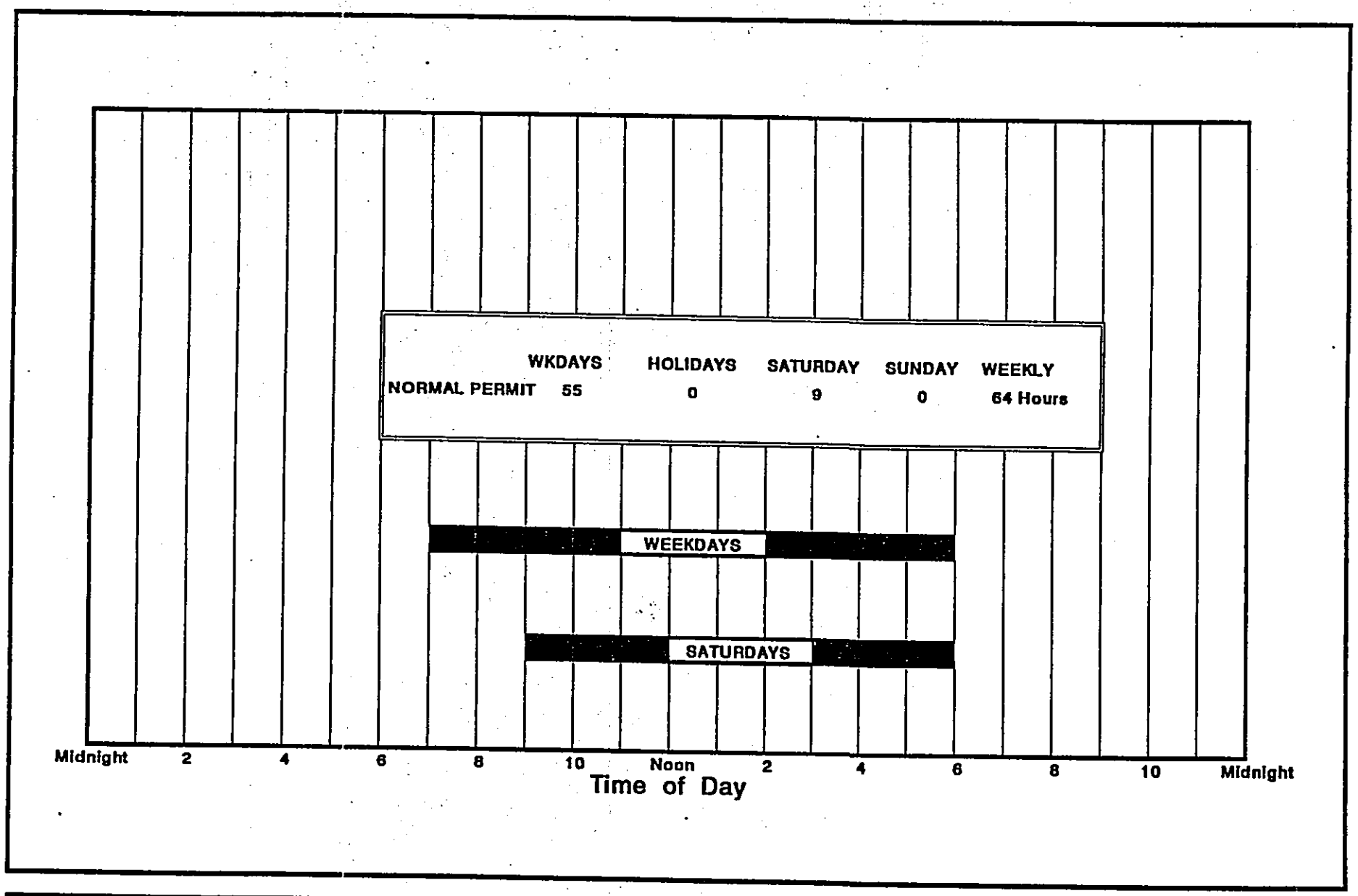
HISTOGRAM OF MEASURED BACKGROUND AMBIENT NOISE LEVELS AT LOCATION "G" (8/11/03)

FIGURE 8



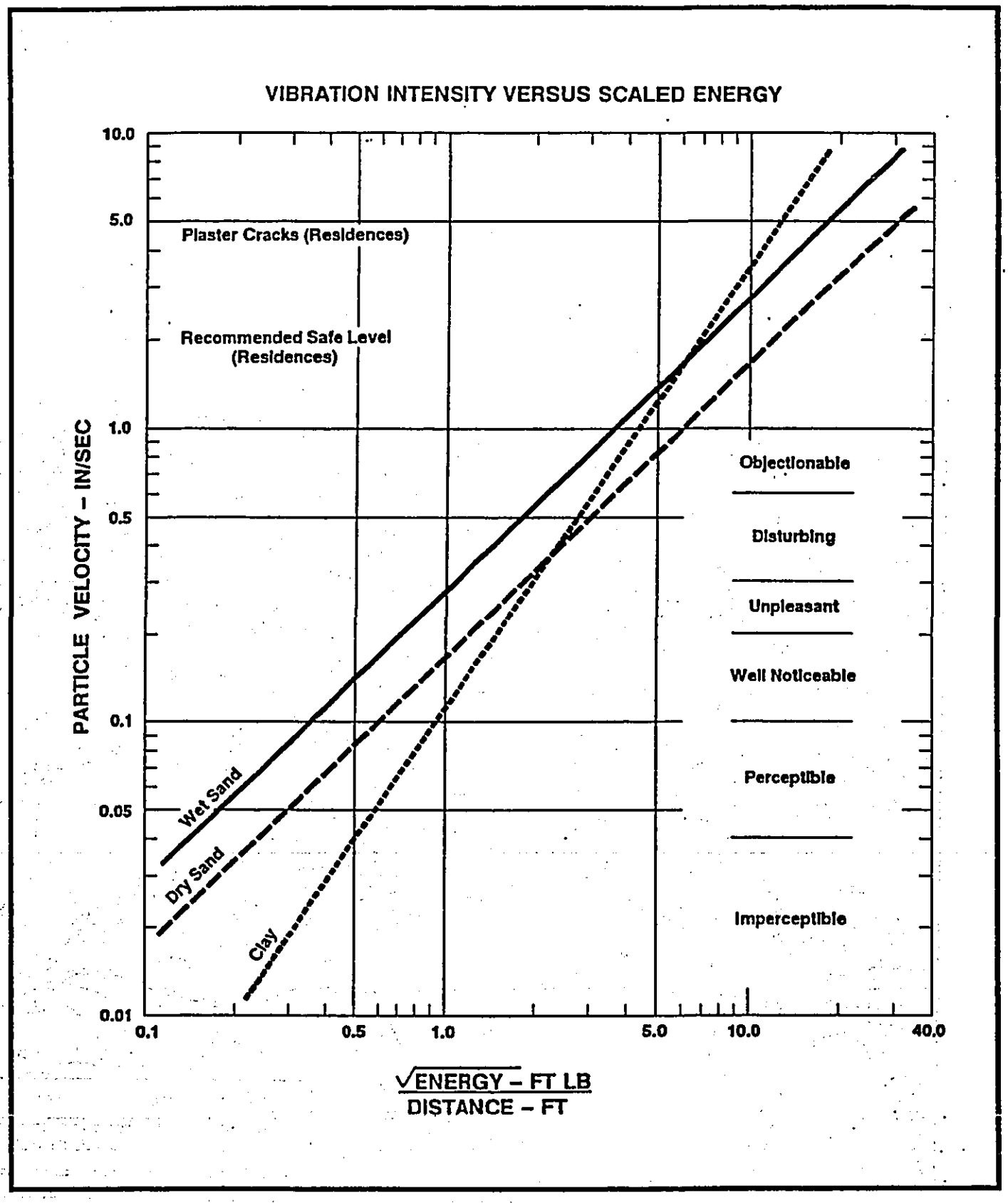
MAXIMUM NOISE LEVELS (IN DBA)
DURING PILE DRIVING

FIGURE
9



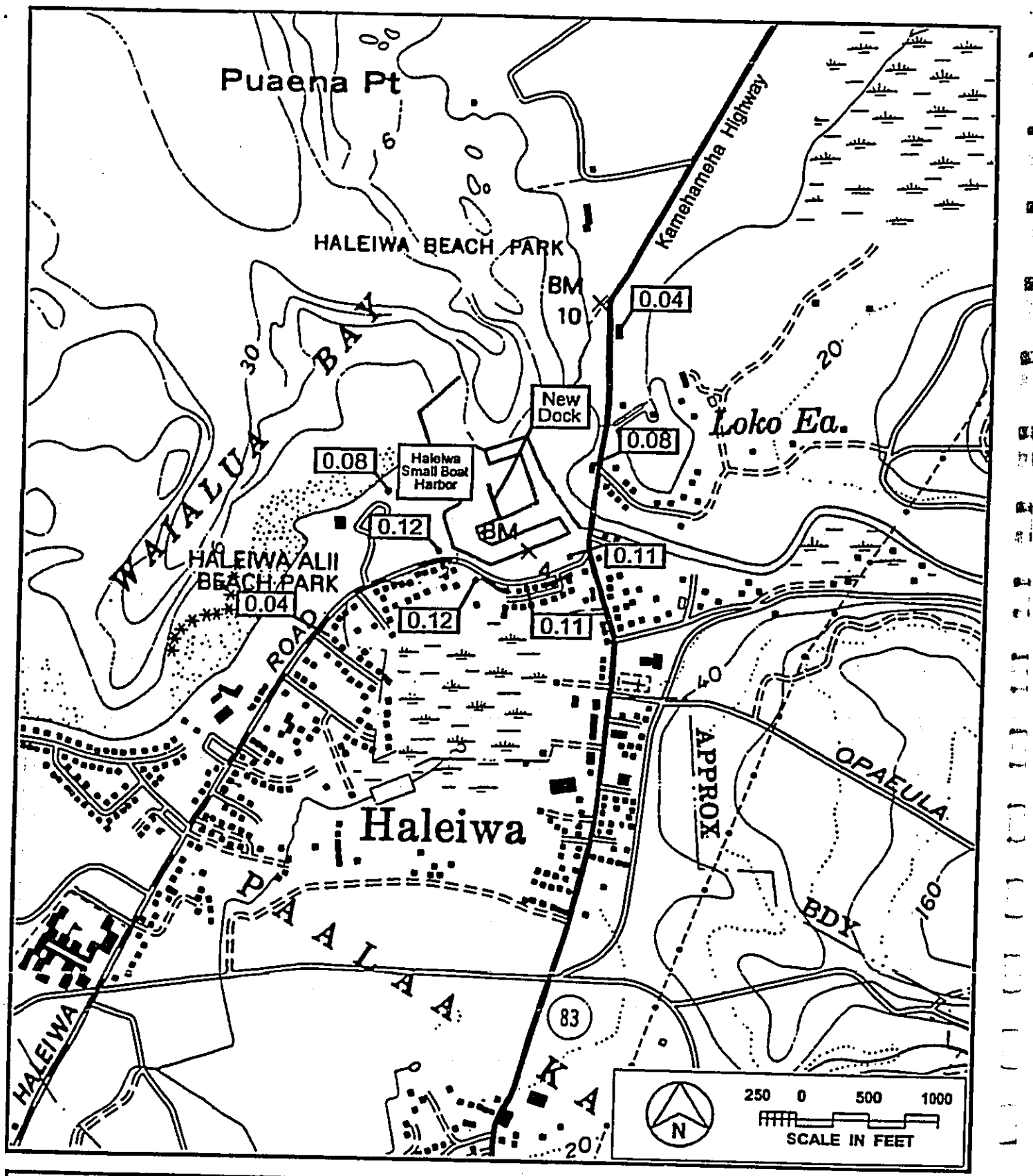
AVAILABLE WORK HOURS UNDER DOH PERMIT PROCEDURES FOR CONSTRUCTION NOISE

FIGURE 10



MINIMUM VIBRATION INTENSITIES EXPECTED FROM PILE DRIVING

FIGURE 11



PEAK VIBRATION LEVELS (IN INCHES / SEC.)
DURING PILE DRIVING

FIGURE
12

TABLE 1

SUMMARY OF BUILDING DAMAGE CRITERIA

PEAK GROUND VELOCITY (mm/sec)	PEAK GROUND VELOCITY (in/sec)	COMMENT
193.04	7.6	Major damage to buildings (mean of data).
137.72	5.4	Minor damage to buildings (mean of data).
101.16	4.0	'Engineer structures' safe from damage.
50.8	2.0	Safe from damage limit (probability of damage <5%).
		No structural damage.
33.02	1.3	Threshold of risk of 'architectural' damage for houses.
25.4	1.0	No data showing damage to structures for vibration <1 in./sec.
15.24	0.6	No risk of 'architectural' damage to normal buildings.
10.16	0.4	Threshold of damage in older homes.
5.08	0.2	Statistically significant percentage of structures may experience minor damage (including earthquake, nuclear event, and blast data for old and new structures).
		No 'architectural' damage.
3.81	0.5 to 0.15	Upper limits for ruins and ancient monuments.
1.0	0.04	Vertical vibration clearly perceptible to humans.
0.32	0.01	Vertical vibration just perceptible to humans.

Source: 'State-of-the-Art Review: Prediction and Control of Groundborne Noise and Vibration from Rail Transit Trains'; U.S. Department of Transportation; December 1983.