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DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

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February 22, 1994

MEMORANDUM

TO: Mr. Brian Choy, Director
Office of Environmental Quality Control

FROM: Mufi Hannemann MFH

SUBJECT: Negative Declaration for the Pier 38 Marine Research Facility TMK 1-5-42: 6 and 7 (portion), Honolulu Harbor, Oahu, Hawaii

The Department of Business, Economic Development & Tourism, Honolulu Waterfront Project has reviewed the comments received during the 30-day public comment period which began on December 8, 1993. The agency has determined that this project will not have a significant environmental effect and has issued a negative declaration. Please publish this notice in the March 8, 1994 Office of Environmental Quality Control (OEQC) Bulletin.

We have enclosed a completed OEQC Bulletin Publication Form and four copies of the final environmental assessment. If you should have any questions, please contact Chris Chung at 586-2530.

Enclosures

1994-03-08-OA-FEA- Pier 38 Master Plan MAR - 8 1994

Pier 38 Master Plan
FINAL Environmental Assessment

FEBRUARY 1994

Prepared For:

State of Hawaii
Department of Business,
Economic Development & Tourism
Honolulu Waterfront Project

Prepared By:

Lacayo Planning, Inc.
in association with Sea Engineering, Inc.

TABLE OF CONTENTS

3. Existing Environment (continued)

4. Potential Adverse Impacts & Mitigative Measures

List of Figures

List of Tables

SUMMARY PROFILE

PROJECT:	PIER 38 MASTER PLAN
Proposing Agency:	State of Hawaii Department of Business, Economic Development & Tourism Honolulu Waterfront Project
Accepting Authority:	State of Hawaii Department of Business, Economic Development & Tourism Honolulu Waterfront Project
Location:	Honolulu Harbor
Tax Map Key:	1-5-42: 006; 1-5-42: 007 (portion)
Land Area:	6.35 acres
Landowner:	State of Hawaii
Existing Uses:	Vacant; warehouse/equipment building
Proposed Uses:	Development of a new, integrated marine research facility, to include shoreside facilities, pier improvements and infrastructure
State Land Use Classification:	Urban
Development Plan (DP) Designation	
Land Use Map:	Public / Quasi-Public
Public Facilities Map:	none
City & County of Honolulu Zoning:	I-3 Waterfront Industrial – marina accessory

SECTION 1
Introduction and Background

1.1. INTRODUCTION

The Master Plan for Pier 38 was prepared in accordance with the Honolulu Waterfront Master Plan and the succeeding planning effort under the Honolulu Waterfront Project. The objective of the Pier 38 Master Plan is to provide for a new Marine Research Facility that would replace existing marine research facilities currently located within the Honolulu Waterfront Project area. Relocation of these facilities is necessary to proceed with other related, high-priority waterfront projects.

1.1.1. Compliance with Hawaii Environmental Impact Statement Law

This Environmental Assessment (EA) complies with Chapter 343, Hawaii Revised Statutes, Environmental Impact Statements (EIS), and Title 11, Department of Health, Chapter 200, Environmental Impact Statement Rules.

1.1.2. Report Organization

The report is divided into five chapters. Section 1 presents background information and a description of the existing conditions at the Pier 38 site. Section 2 describes the proposed new Marine Research Facility. Section 3 details the existing physical environment of the proposed development site. Section 4 identifies potential impacts of the proposed project and outlines measures to mitigate these impacts, and Section 5 summarizes other alternatives considered for the project.

A pre-assessment for the project was distributed to various public agencies and private organizations in October 1993 (see Attachment C for a list of these parties and copies of the correspondence). A notice of availability of the Draft EA was subsequently published in the *OEQC Bulletin* by the Office of Environmental Quality Control on December 8, 1993 and December 23, 1993. Copies of the Draft EA were distributed to interested public agencies and community organizations. In addition, representatives from the Department of Business, Economic Development & Tourism – Waterfront Project consulted with a number of these agencies and organizations. Various changes were made to the Draft EA as a result of these consultations and are indicated in this Final EA as underlined text. A list of consulted parties and copies of the correspondence are presented in Attachment D.

1.2. BACKGROUND

The Honolulu Waterfront Master Plan (October 1989) recommends the redevelopment of the Kapalama area to provide for a full-scale, modern containerized cargo terminal and inter-modal warehouse/distribution facility. This development complex offers an opportunity to develop the last large, contiguous waterfront area in Honolulu Harbor, and will satisfy future maritime expansion requirements and achieve desired land use objectives for the Honolulu waterfront area.

The Master Plan proposed to accomplish this by 1) purchasing the Kapalama Military Lands; 2) relocating the University of Hawaii's Marine Research Center at Snug Harbor to Keehi Lagoon triangle; and 3) redeveloping Piers 37/38 for the relocation of the Honolulu Shipyard operations.

The first of these tasks has been accomplished. The State has expended approximately $96 million for the acquisition of the former military reservation, which was subsequently transferred to the State on October 1, 1993.

The remaining tasks have been modified as a result of further study and evaluation of economic and environmental issues related to the development of the Keehi Lagoon triangle. Based on subsequent analysis, Honolulu Shipyard operations will remain at Pier 41 and the marine research operations at Snug Harbor will be relocated to Pier 38. This relocation to Pier 38 will accommodate the University's existing research activities, and also offers the opportunity to integrate other related University of Hawaii marine research facilities, such as Look Laboratory and the Hawaii Undersea Research Laboratory (HURL), as well as the federally-operated National Marine Fisheries Service (NMFS) and National Oceanic and Atmospheric Administration (NOAA) facilities.

1.3. PROJECT LOCATION

1.3.1. Existing Conditions

Located within the Iwilei/Kapalama subarea of the Honolulu Waterfront (see Figure 1), the Pier 38 site measures approximately 6.35 acres and consists of two parcels: one previously used by Chevron and the other currently used by GASCO.

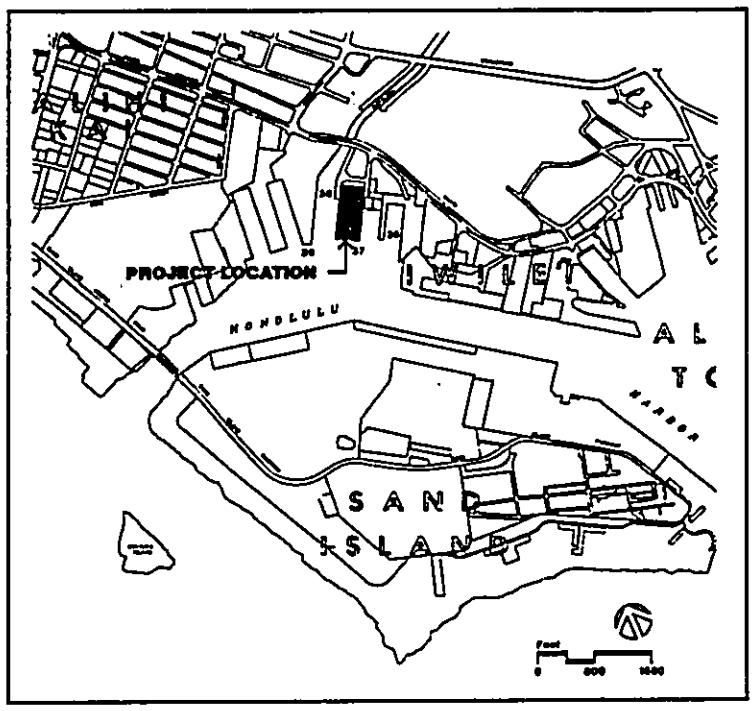


FIGURE 1
LOCATION MAP

While the site is largely unused at present, the makai portion (193,306 sf), was previously used by Chevron for jet fuel storage. In preparing to return the site to the State, Chevron has removed four fuel tanks and appurtenant equipment and has undertaken the necessary environmental hazard assessment, as required by the State of Hawaii Department of Health (DOH). Prior to returning the site in October 1993, Chevron completed all required environmental remediation actions.

An additional area of approximately 83,500 sf will be added to the site from the abutting parcel leased by The Gas Company (GASCO). GASCO will be allowed to expand its facilities mauka, using an existing State right-of-way and an unused portion of Parcel 1 (currently leased by Chevron, extending to Nimitz Highway) in order to replace needed acreage. Prior to returning the designated portion of the site to the State, GASCO will remove all equipment and buildings.

The Schematic Site Plan on page 9 shows the proposed boundaries of the new Pier 38 site, as well as the boundaries of the re-configured GASCO site and the proposed Pier 36 Fresh Fish Wholesale Distribution Center. The Pier 38 site incorporates the area to be abandoned by GASCO.

1.3.2. Surrounding Uses

Abutting uses include GASCO to the north; a proposed Fresh Fish Wholesale Distribution Center to the east; and an existing finger pier to the southeast.

GASCO presently berths a LPG barge at Pier 38C, adjacent to their land-side facilities. Existing berthing facilities include a stub pier (Pier 38C) and a single mooring dolphin. Currently, GASCO is evaluating the feasibility of developing additional facilities, including two mooring dolphins, two shore-side bollards and watershed dredging to increase the berthing area. Although GASCO is also discussing the possibility of berthing a second LPG barge at Pier 38, the State has responded that the pier frontage along the proposed marine research facility site would not be available for their use.

At Pier 36, DOT-Harbors Division has issued a Request for Proposals (RFP) to solicit a private entity to develop a new fish auction and auxiliary facilities to replace uses being dislocated from Kewalo Basin. The RFP allows the developer substantial latitude in the construction, operation and maintenance of the Fresh Fish Wholesale Distribution Center as well as other permitted uses. The actual configuration of the facility will not be known until a proposal is selected and further planning is undertaken.

Just offshore of the southeast edge of the site, an existing finger pier serves as an itinerant berthing for long-line fishing boats, accommodating up to six vessels. No permanent berths are provided and boats are charged on a daily basis for occasional, temporary use. Access to the pier is by foot, using a catwalk that links the pier to an asphalt and dirt roadway along the southeast edge of the Pier 38 site.

Other harbor uses in the surrounding area include Chevron's two jet-fuel storage tanks located mauka of GASCO, along Nimitz Highway; the Sand Island Container Facilities, located directly across Kapalama Basin and opposite the proposed project site; and a water taxi service (P&R Water Taxi) based between Pier 39 and the Nimitz Highway bridge. In addition, the interisland barge service, operated by Young Brothers, is being relocated to Pier 39 and 40, directly across from Pier 38. Construction to upgrade the load capacity of Pier 39 is presently underway and a new triangular berthing wharf for roll-on and roll-off cargo is being constructed at the inshore end of Pier 39.

The Nimitz Business Center and the Xerox/GECC building are located mauka of Nimitz Highway, on the Diamond Head and Ewa sides of Ala Kawa Street, respectively. The Dole Pineapple Cannery facilities and other industrial and warehousing uses are also located along Ala Kawa Street.

SECTION 2
Project Description

2.1. PROPOSED MARINE RESEARCH FACILITY

The Pier 38 Master Plan evaluated the needs of those facilities proposed for relocation to the new UH Marine Facility. The programs evaluated for relocation were: the UH Marine Center; J.K.K. Look Laboratory; Hawaii Undersea Research Laboratory (HURL); National Marine Fisheries Service's Kewalo Research Facility; and the National Oceanic and Atmospheric Administration (NOAA) Corps Operations activities presently located at the UH Marine Center. The evaluation involved a review of the functions carried out at the facilities, vessel operations, type and amount of existing space used, and future space needs. It also identified duplicate activities that could be consolidated to achieve a more efficient use of space. A description of these programs and a summary of the findings from this evaluation are presented in Attachment A.

Following the evaluation of potential users' needs, the Pier 38 Master Plan assessed whether these needs could be accommodated at the proposed site. Part of this assessment involved defining a minimum slip width, and berth and wharf requirements, based on the University's vessel data and State Department of Transportation requirements. These berth and wharf requirements are summarized in Attachment B.

The Schematic Site Plan presented on the following page illustrates that all of the uses evaluated can be accommodated at the Pier 38 site (subject to detailed site planning). The following is a description of the proposed new Marine Research Facility, divided by the major service components:

2.1.1. Docking Facilities

Wharf space for vessel berthing and loading is one of the primary requirements of the new facility (refer to Attachment A for a summary of ocean-going vessels using the UH Marine Center). Since there is no wharf area along both sides of the Pier 38 Peninsula, implementation of the project will result in extensive shoreline modification.

2.1.1.1. Pier 38A (Outboard Wharf)

As shown on the Schematic Site Plan on page 9, a 330-ft-long wharf will be constructed along the south side of the peninsula (Pier 38A). The wharf layout and a cross-section of the proposed pier are illustrated in Figures 3 and 4. The harbor bottom for the outboard wharf will be dredged to a depth of 30 feet and a steel sheetpile bulkhead will be constructed on the inboard side of the wharf to stabilize the shoreline. Modifications to the shoreline will include removal of the existing rock revetment. The major features of the proposed wharf are summarized below:

Wharf Dimensions:	330 feet long, with 15-ft-wide apron (for nesting capability)
Berth Depth:	Dredge to 30-ft depth (capable of supporting the larger, deeper-draft research vessels)
Berth Width:	Approximately 128 feet from wharf edge to Pierhead Line

Construction Activities

To obtain a 30-ft draft along the outboard wharf, approximately 26,000 cubic yards (cy) of material will have to be removed. The area to be dredged is approximately 400 feet-long x 150 feet-wide. The 330-ft-long outboard wharf will be supported by pile bents spaced on 12-ft centers with four concrete-bearing piles per bent. A total of 120 piles will be required.

Dredging operations will likely be conducted with a barge-mounted crane equipped with a clamshell bucket. The duration of the dredging operations should be two to four months. Although the spoil disposal site is unknown, deep ocean disposal of the dredged material is anticipated. The applicant has met with the U.S. Army Corps of Engineers to discuss access to the EPA-approved offshore dump site. Disposal of dredged material is further discussed in Section 4.1.1.

2.1.1.2. Pier 38B (Inboard Wharf)

A sheetpile bulkhead wharf will be constructed along the west side of the peninsula (Pier 38B). *Figures 3 and 4* present the layout and cross-section view of this area. As shown on the Schematic Site Plan, Pier 38B will be located approximately 20 feet inboard of the existing water-line, with the offshore bottom dredged to a depth of 26 feet along the entire length of the bulkhead. The existing rock revetment will be removed during construction of the proposed bulkhead. The major features of Pier 38B are summarized below:

Wharf Design:	Vertical sheetpile bulkhead, with tiebacks
Dimensions:	700 feet long (685-ft vertical sheetpile bulkhead plus 15-ft apron from Pier 38A)
Berth Depth:	Dredge to 26-ft depth
Berth Width:	45 feet (includes 5-ft allowance for fenders)

Construction Activities

Along the inboard wharf, approximately 60,000 cy of material will be removed. The area to be excavated and dredged is approximately 700 feet long x 140 feet wide. In addition to deepening the harbor bottom, the above volume includes cutting the shoreline back an average of 20 feet. A total of 1,015 linear feet (lf) of sheetpile bulkhead will be placed on the outboard and west sides of the peninsula. It is anticipated that steel sheetpiles will be used, capped with concrete from the top of the sheets to a few feet below the waterline. It is also anticipated that a tie-back system will be required for stability of the bulkhead. Dewatering for the construction of the tieback system may not be required, depending upon the final design. Dredging operations will likely occur for two to four months. Although the spoil disposal site is unknown, deep ocean disposal at the EPA-approved offshore dump site is anticipated. Disposal of the dredged material is further discussed in Section 4.1.1.

2.3.2. Main Research Buildings

The Pier 38 Master Plan proposes three new buildings, each of which will house several functions. The resulting building footprints are shown on the Schematic Site Plan to indicate 1) the approximate size of buildings in relation to the site; and 2) the general location of the buildings.

The Proposed Program was based on the principle of providing replacement building space for functions being relocated, as well as allowing room on the site for future expansion. Given the type of space needed and the desire to economize, it was possible to limit the facility to three major buildings. More detailed planning will determine the shape and orientation of interior spaces within buildings, and of buildings and other spaces within the site.

2.3.2.1. UH Marine Center Building

The UH Marine Center Building would house all the functions presently housed in the current facility's Administration/Warehouse Building and its Core Storage Building, with the exception of the HURL ROV (Remote Operated Vehicle) storage and electronics laboratory functions. The new building will concentrate all the functions relating to facility management, port operations, and cruise staging. Although it could also include the relatively small spaces needed by NMFS and NOAA, upon relocation to Pier 38, the University plans to reassess its spatial requirements to determine its ability to accommodate these two programs at the new facility.

2.3.2.2. Machine Shop / Hurl Building

The Machine Shop/HURL Building would house equipment repair and fabrication functions which demand a similar type of building. It would allow replacement of the overhead bridge crane which HURL needs and presently has at its Makai Pier facility, as well as allow the Machine Shop to acquire similar equipment (an overhead crane was specified in the original building plans for the existing Machine Shop but was never installed). In order to maximize space, this building is located at the unusable edge of the pier. The HURL shop is located directly next to the apron, in order to provide for easy on- and off-loading of the manned (and unmanned) submersibles.

2.3.2.3. Look Laboratory Building and Marine Mineral Technology Center

The Look Laboratory Building would house the same functions as the existing Kewalo facility, with the exception of the machine shop and welding functions; these would be assumed by the UH Marine Center Machine Shop. Programmed to have a larger footprint and general dimensions than the existing Kewalo facility, the building provides the additional space requested by Look Laboratory to accommodate a larger area for their increased modeling basin requirements as well as an additional 90-ft length to their existing 80-ft-long towing tank. As shown on the Schematic Site Plan, outside space would be provided for the relocation of the existing wave flume and wind tunnel structure.

A 100-sf communications station on the Kakaako Peninsula is proposed to link the Pier 38 facility to the Makai Range data cable (located in waters off the Kakaako Peninsula). The communications station would house a terminal and communications equipment used to collect and transmit data from the Makai Range to the Pier 38 facility.

As shown on the Schematic Site Plan, "Covered Storage" of 8,000 sf is also proposed. A shed-type structure could accommodate the space requirements of both NMFS and NOAA as follows:

NMFS Gear Storage	3,600 sf
NOAA Storage	1,200 sf

Any operation at the new research facility by these federal programs would continue to function under the established landlord/tenant arragements with the University. The remaining 3,200 sf would be used or allocated by the UH Marine Center as needed. The shed could be divided into secured and unsecured areas by fencing.

2.3.3. Storage / Shipping Containers Relocation

An area near the Machine Shop is recommended for shipping container storage. The UH Marine Center and HURL have identified 17 containers of varying sizes which are needed to carry out harbor-related functions. Three containers will serve as on-board research modules, and 14 others will support UH Marine Center operations and/or specific ocean-going research operations. The existing UH Marine Center harbors 55

containers, many of which serve as general storage for a variety of UH users. At this time, 38 containers are considered not to be harbor-related and may not be accommodated at the Pier 38 facility.

2.3.4. Associated Off-Site Improvements

As part of the project, improvements will also be made to the Pier 37 finger pier. The pier will be extended inland approximately 155 feet and connected to the shore (see Figure 2). A paved area for public parking will be constructed adjacent to the pier to accommodate vehicles servicing berthed fishing vessels.

In addition, the left turn lane into the Pier 38 access road will be lengthened to accommodate the projected increase in traffic generated by the proposed facility and minimize blockage of through traffic.

2.3.5. Preliminary Cost Estimates

Preliminary costs to develop the proposed facility are estimated to total $16.4 million. This estimate includes wharf, building, utilities and fencing costs and estimates for sitework. It must be emphasized, however, that these estimates are preliminary and subject to further refinement during the design phase for the facilities.

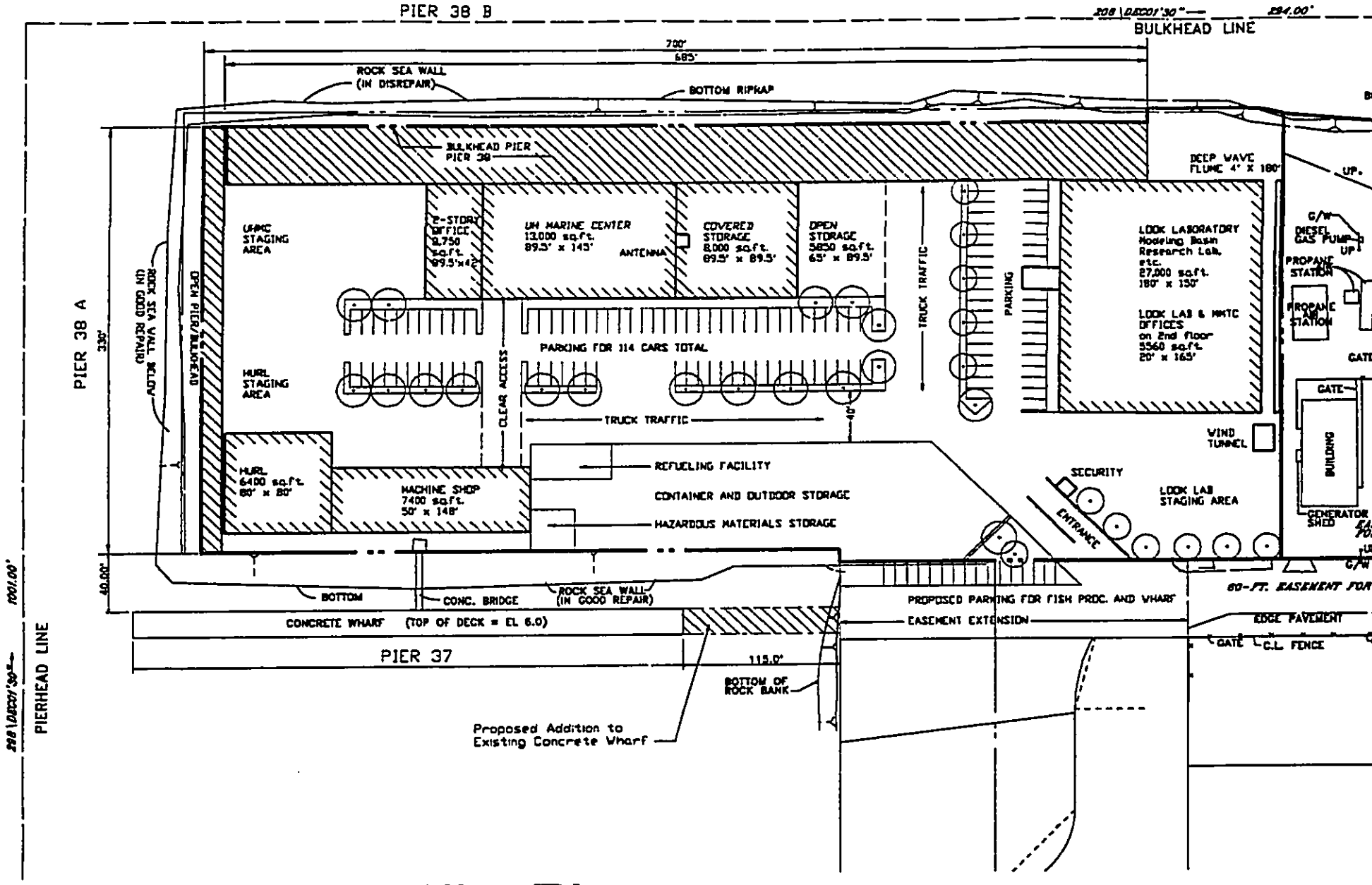
2.3.6. Employment Estimates

Table 1 presents the number of existing staff, by facility, and estimates for future employee additions.

TABLE 1
STAFF BASED AT THE PROPOSED MARINE RESEARCH FACILITY

Facility	Existing Full-Time	Existing Part-Time	Anticipated Increase (Decrease)	Total FTE	Comments
UH Marine Center	15	Varies	2	17	Includes two marine technicians. Does not include ships' crews (about 35 for three ships) or ship-based marine technicians (5).
HURL-Submersible	6	–	2	8	Staff accompany research cruises.
HURL-ROV	3	–	2	5	Staff accompany research cruises.
Look Lab	4	17[1]	(4 P-T)[2]	10.5	Graduate laboratory classes are held at Look Lab.
MMTC/HNEI	8	–	–	8	Includes two HNEI staff working on CO_2 Ocean Injection Project.
NMFS	–	–	–	–	Staff based at Dole Street headquarters will prepare research equipment at UHMC for two-three weeks prior to a cruise.
NOAA	3	–	–	3	Shore support for R/V *Townsend Cromwell.*
TOTAL				51.5	

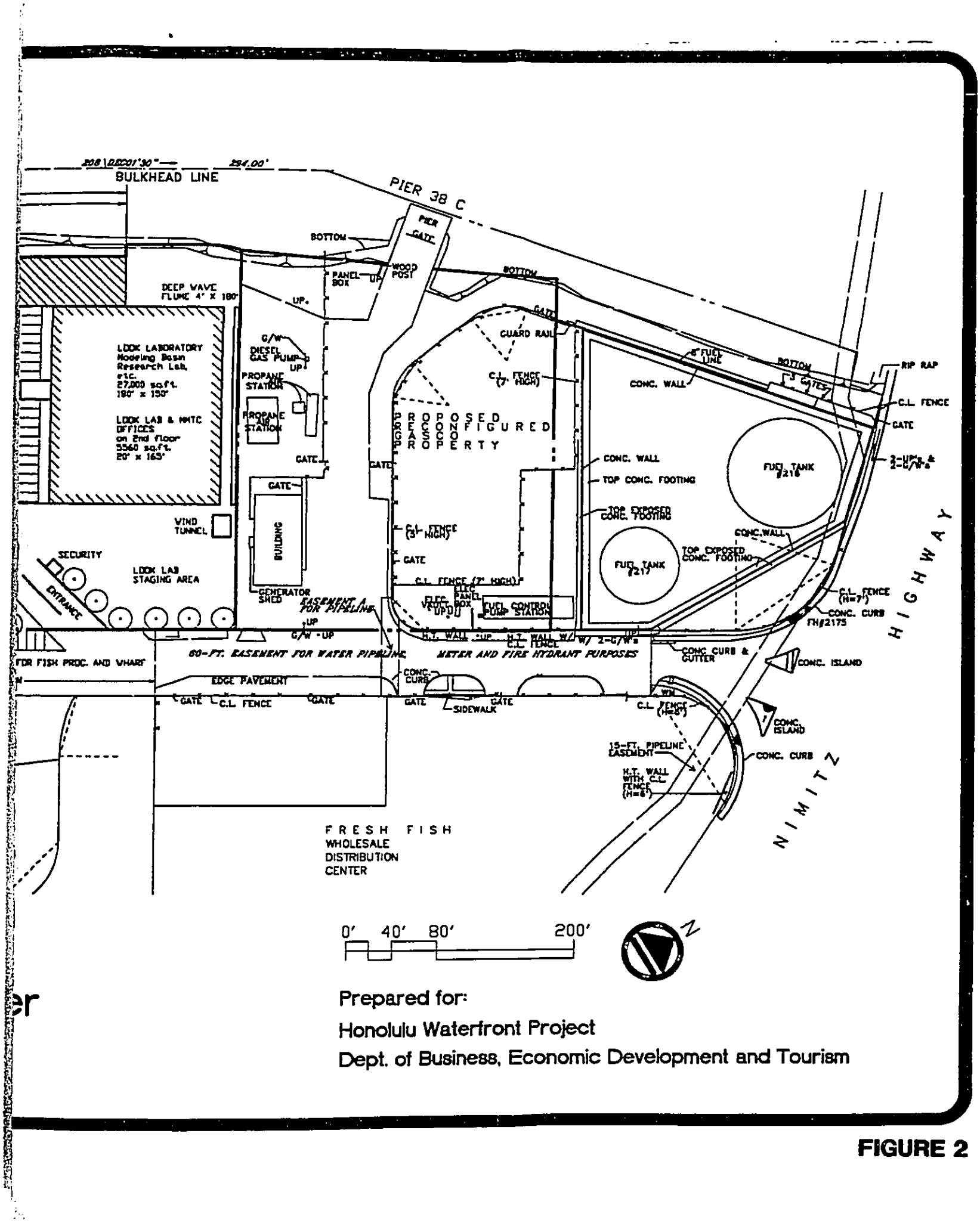
[1]Includes eight graduate assistants and three affiliate faculty.
[2]Part-time shop employees will decrease when shop functions are collocated with UHMC.



Schematic Site Plan

University of Hawaii Marine Research Center
Honolulu Harbor - Pier 38

LACAYO PLANNING



Prepared for:

Honolulu Waterfront Project

Dept. of Business, Economic Development and Tourism

FIGURE 2

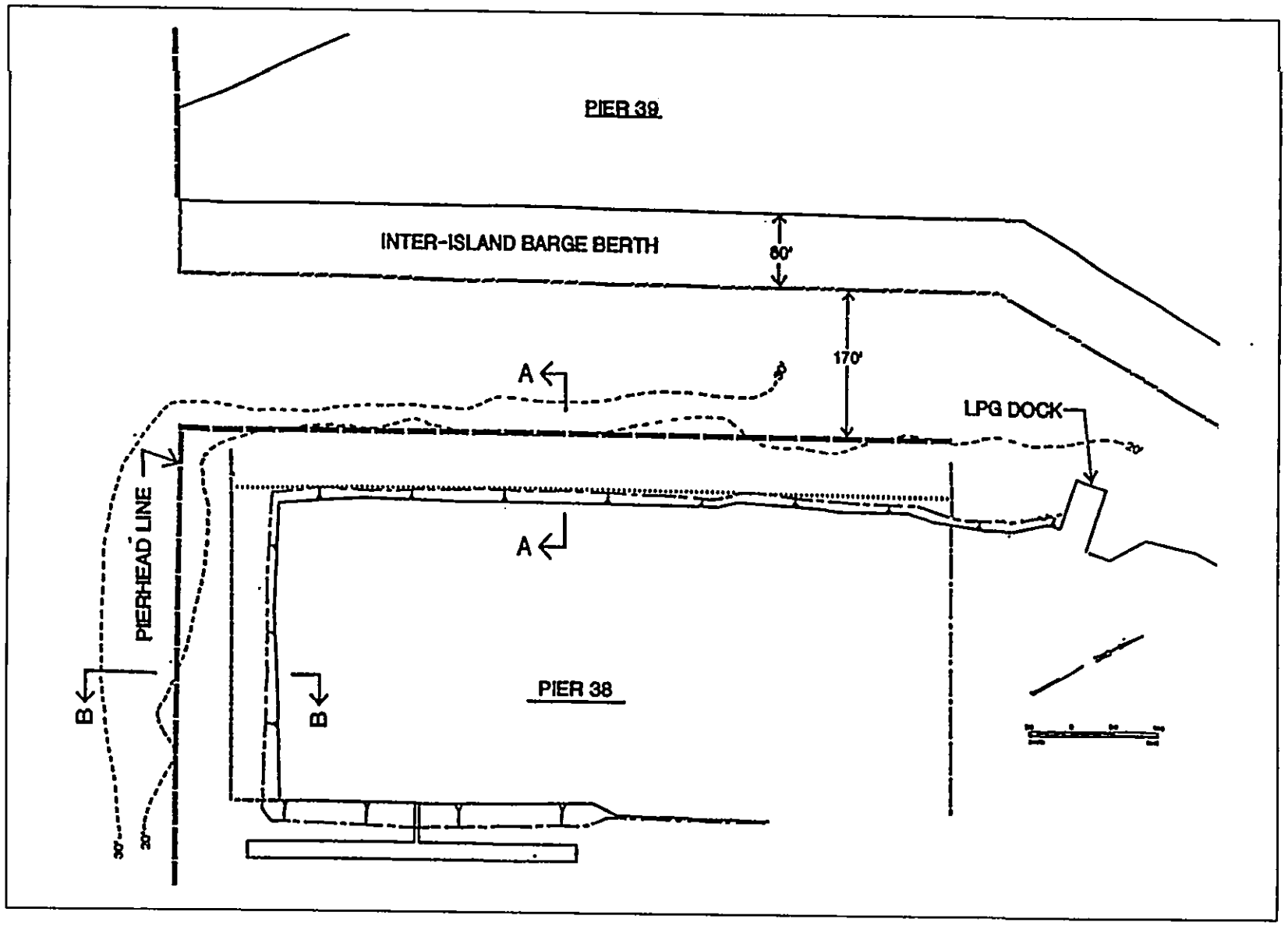


FIGURE 3
WHARF LAYOUT

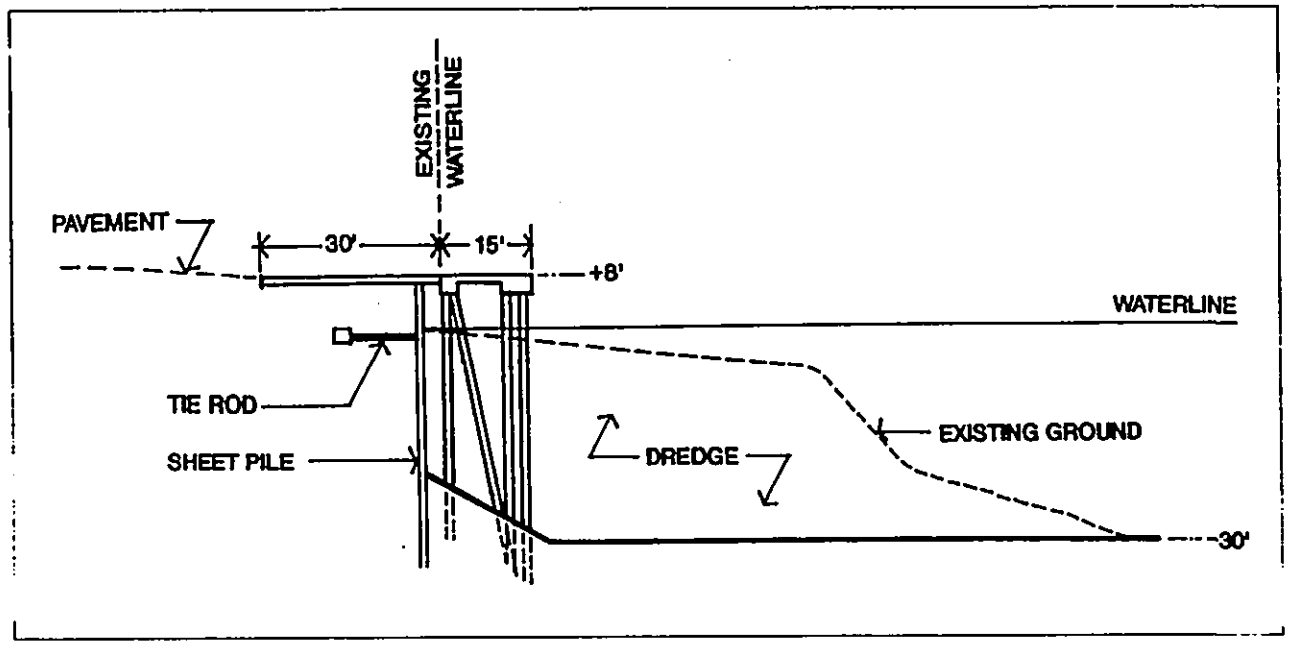
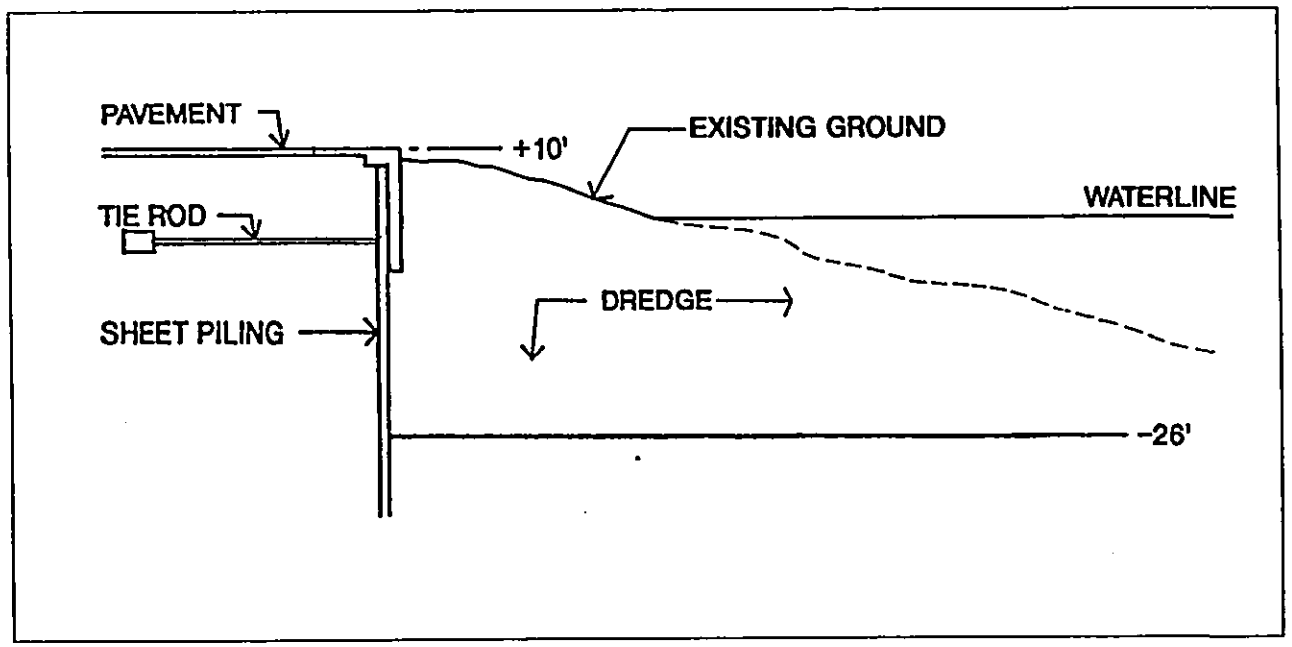


FIGURE 4
PIER 38A – Outboard Wharf
(Section B-B of Figure 3)



PIER 38B – Inboard Wharf
(Section A-A of Figure 3)

SECTION 3
Existing Environment

3.1. MARINE ENVIRONMENT

The Pier 38 project site is located in Honolulu Harbor, the largest civilian port in the state and one of two commercial deep draft harbors on Oahu. The harbor was originally a natural channel in the reef resulting from the discharges of freshwater streams (primarily Nuuanu Stream). The adjacent shorelines and the harbor configuration and depth have been modified extensively since the mid-1880's.

The Pier 38 Peninsula was constructed in the mid- to late-1950's. A 1954 Board of Harbor Commissioners Pier 38 construction plan shows the present peninsula to be completely underwater, with water depths of seven to nine feet at what is now the seaward end of the peninsula.

At present, the harbor consists of the east entrance channel (Honolulu Channel), the main harbor basin, a west harbor basin (Kapalama Basin), a 3,400-ft-long connecting channel between the two basins (Kapalama Channel) and a second entrance channel (Kalihi Channel). The project site is on the north side of the Kapalama Basin.

Two streams discharge into the harbor. Nuuanu Stream, which discharges into the main harbor basin, has a mean flow of 5 mgd. The Kapalama Stream, also known as the Kapalama Drainage Canal, discharges into the slip between Pier 38 and Pier 39. The stream is not perennial and has a low mean flow. In the past, both the Libby Pineapple Company and Del Monte discharged pineapple cannery wastes into the stream. In the 1970's, the pineapple wastes were diverted to the municipal sewer system.

3.1.1. Sedimentation

Sedimentation in the harbor is primarily due to the deposition of stream borne sediments. The harbor basically acts as a settling basin for the stream flows and the associated sediment loads. Typically in Hawaii, most of the sediment load is discharged during relatively infrequent storm events. Records maintained at the U.S. Army Corps of Engineers from 1948 to 1972 indicate that the federal project area in Honolulu Harbor has a maintenance dredging cycle of approximately five years, and the average volume of material removed per cycle was 200,000 cy (U.S. Army Engineer District, 1975).

Records identify a dump site off Honolulu Harbor that has been used since 1968. The site has been accessed nine times for Honolulu Harbor dredge spoil disposal. Maintenance dredging was conducted in 1968, 1972, 1977, 1983 and 1990. Total volume removed was 1,099,400 cy, an average of 220,000 cy per occurrence. In the same period, there have been four other construction-related dredging projects under the jurisdiction of either the Corps, the State or the City that used the disposal site, with a total volume of 1,167,000 cy.

The Kapalama Stream appears to contribute little to the sediment deposition in the harbor. A comparison of two bathymetric surveys, dated 1982 and 1991, covering the area between Piers 38 and 39 indicated negligible depth changes over the ten year period. There is no record of maintenance dredging in the area over that time frame.

Existing information on bottom material composition includes foundation investigations for improvements at Pier 37 (Geolabs-Hawaii, 1983) and at Piers 39/40 (Dames & Moore, 1991), and a soils assessment for Pier 38 (Ogden Energy and Environmental Services, 1993). Borings indicate that the bottom in the area consists of harbor mud, underlain by alternating layers of silt/clay deposits and coral sand/gravel of marine or lagoonal origin.

3.1.2. Sediment Quality

The nature of Honolulu Harbor sediments were first seriously studied by Akazawa (1978) for the Department of Health (also DOH, 1978). In more recent years, samples have been analyzed and subjected to bioassay test procedures. The last study of this type encompassing the project area was by AECOS, Inc. in 1990 where samples from five locations in the Kapalama Basin were composited into a single "Station 1" sample for testing purposes. Heavy metals were found in lower concentrations than had been previously reported for the Kapalama Canal (Akazawa, 1978). In general, the sediment heavy metals were not different in this area as compared with the other inner Honolulu Harbor stations. Organotins were an exception, being higher in the "Station 1" composite sample than elsewhere in the harbor.

The "Station 1" composite was also distinguished by detectable quantities of PCB (0.20 mg/Kg Aroclor 1260) and small amounts of the polynuclear aromatics (PNA): pyrene, chrysene, and benzo-(k)-fluor-anthene. Dredging of these sediments and their disposal at the South Oahu Dredged Spoil Disposal Site was permitted on the basis of the bioassay/bioaccumulation testing results.

The results from "Station 1" are cited due to its close proximity to the Pier 38 site. Inputs to Kapalama basin (from Kapalama Canal and other industrial activities around the shore) suggest sediment quality in the Kapalama Basin to be generally poor. Sediments off Pier 38A and 38B, where project dredging would occur, represent both sediment deposited from Kapalama Canal and perhaps older lagoonal deposits or general harbor sediments.

Sediment samples for this project were collected on October 27, 1993 from the areas proposed for dredging. A total of five core samples were obtained from the upper sediment layer and subjected to laboratory analyses for potentially toxic pollutants suspected of being present based upon previous sediment testing in the harbor and Kapalama Canal. Included were many, but not all of, the potential pollutants required for measurement under the dredged spoil disposal program administered by the COE and the Environmental Protection Agency (EPA).

Results of the trace and heavy metal analysis for the three sediment sites indicate that arsenic values in the sediments off the project site are fairly typical for nearshore sediments in Hawaii (AECOS, 1993). Cadmium, chromium, nickel and silver also appear typical for Hawaiian harbors and embayments. Mercury was slightly elevated at two of the sites, while copper, lead and zinc concentrations were variable among the three samples.

Trace metals are frequently found in Hawaiian sediments, particularly nearshore sediments, since volcanic soils deposited from land run-off have relatively high levels of these metals. In a 1978 report, DOH measured copper at 273 ppm, lead at 392 ppm and zinc at 523 ppm in Kapalama Canal. The copper and zinc values were the highest values among ten different bays and estuaries included in this study; the lead value was the second highest.

Given the locations of the cores relative to the mouth of Kapalama Canal, the harbor sediment samples collected in October 1993 displayed considerable variation in the amounts of organic matter. A general measure of the contribution of petroleum contamination to the organics in the sediments is "total petroleum hydrocarbons" (TPH). For the sediment samples collected in October off Pier 38, nearly all of the oil and grease in the sediment appears to be petroleum hydrocarbons. Polynuclear aromatic hydrocarbons (PAH or PNA) were also found, as were fluorene and chrysene. Any other PNA compounds, if present in these samples, were at concentrations below the detection limits. In a few cases, however, small peaks corresponding to the particular PNA compounds were observed by the chemists.

With respect to the chlorinated organics (mostly pesticides and PCB's), only 4,4'-DDD and endosulfan (I) were detected in quantifiable concentrations, and only at one site. Also known as TDE and sold as Rhothane, this pesticide is usually present in the environment as a breakdown product of the more familiar insecticide DDT.

Endosulfan (I) is also an insecticide, formerly known as alpha-endosulfan. No PCBs were detected in these samples.

3.1.3. Shoreline

The seaward perimeter of the Pier 37/38 peninsula is stabilized by various types of shore protection. The east side is protected by a well built rock revetment that parallels the fishing pier. The revetment extends approximately 15 feet on the seaward side of the peninsula. The shoreline along the rest of the seaward side and the west side consists of randomly dumped basalt boulders of varying size, concrete chunks, concrete pile stubs, with some scattered metal debris. The shoreline fronting the GASCO property has loose rubble dumped at the base of a shoreline scarp. Bare earth is exposed above the rubble, and forms a 2- to 3-foot vertical scarp.

Figure 5, taken from National Ocean Survey chart No. 19367 illustrates the existing bathymetry around the Pier 38 peninsula. Water depths in the slip between Piers 37 and 39 range up to 38 feet. Off the seaward side of the peninsula, the bottom drops off gradually, with a 42-ft depth contour (design harbor depth) located approximately 185 feet offshore.

3.1.4. Tides

Tides in Honolulu Harbor are semidiurnal, with a market diurnal inequality. The mean tide range is 1.2 feet. Various water levels, referenced to Mean Lower Low Water datum are:

Mean Higher High Water (MHHW)	1.9 ft.
Mean Sea Level (MSL)	0.9 ft.
Mean Lower Low Water (MLLW)	0.0 ft.

3.1.5. Wave Climate

The coastline off Honolulu Harbor is exposed to three general wave types: south swells, Kona storm waves and hurricane-generated waves. The harbor, by virtue of its location on the south shore of Oahu, is sheltered from the approach of the winter season North Pacific swell and the waves generated by the prevailing northeast tradewinds.

South swell occurs primarily during the months of April through September. Approach directions range from southeast through southwest, and deepwater wave heights are typically five feet or less. Breaker heights on the fringing reef can reach heights of 15 feet, but typical heights during south swell occurrences are 6 feet or less.

The interior of the harbor is sheltered from the south swell by the land mass of Sand Island, which extends from the Honolulu Harbor Entrance Channel to the Kalihi Channel. Incoming waves are attenuated as they move shoreward up the long entrance channel. As a result of the sheltering and attenuation, the interior of the harbor is typically calm, except during the occurrence of local storms or hurricanes. During typical conditions, there are negligible waves along the project shoreline, except for boat wakes from passing vessels.

Kona storm waves are generated by local low pressure systems and occur most commonly during the winter months when the tradewind pattern weakens. The low pressure systems result in winds and waves approaching from the south or southwest. Deepwater wave heights during severe Kona events may be up to 15 feet.

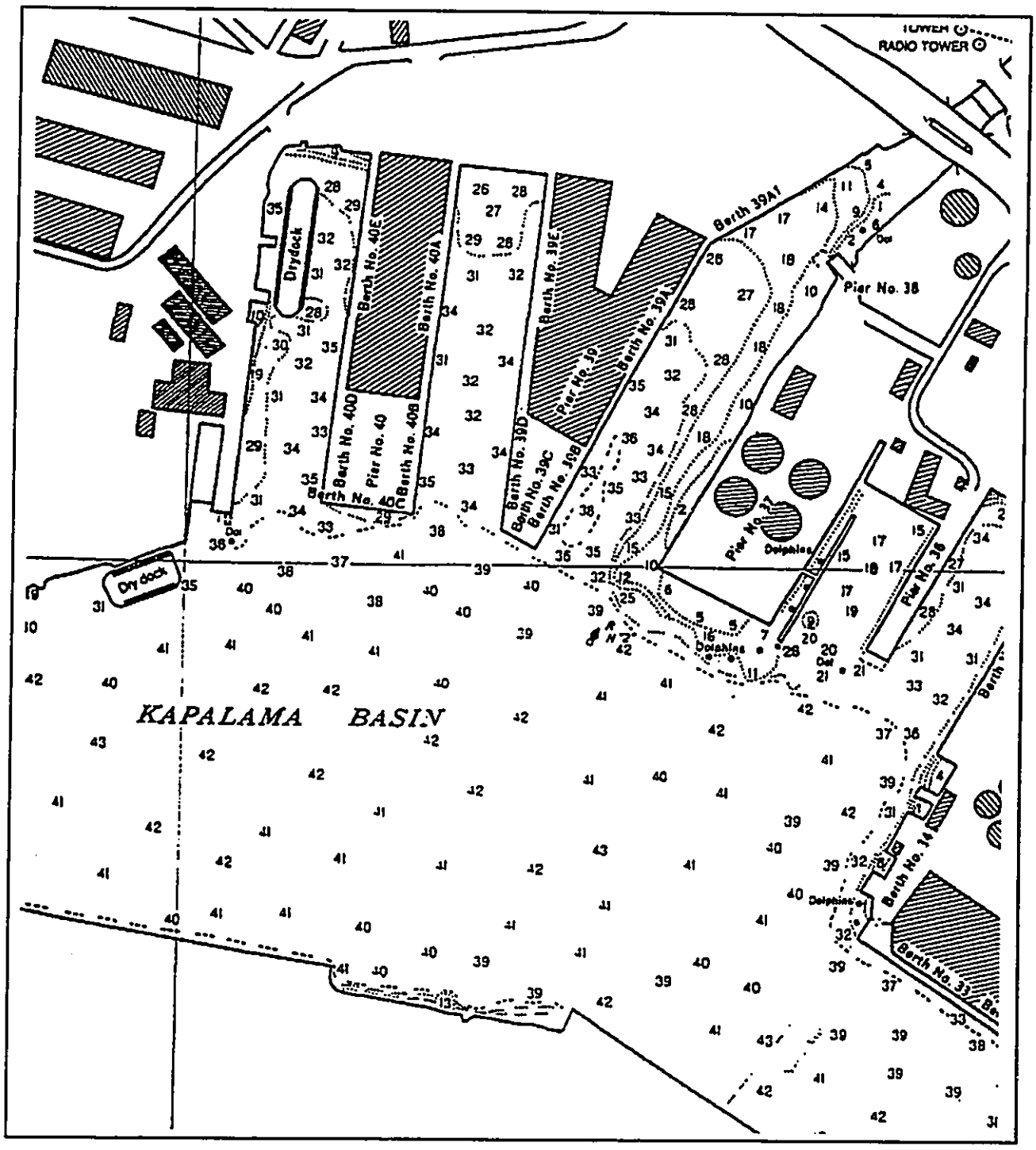


FIGURE 5
BATHYMETRY OF PROJECT AREA
From NOS Chart 19367 (Scale = 1:5,000 feet)

Infrequent hurricanes generate large waves that affect the Hawaiian Islands, particularly the south and west coasts. The wind speeds and wave heights associated with the hurricanes may be much greater than those associated with Kona storms and present the worst case design situation. Two notable hurricanes affected the south coast of Oahu in recent years; Hurricane Iwa in 1982 and Hurricane Iniki in 1992. Maximum deepwater wave heights associated with these events were in excess of 40 feet.

Water level rise above the normal still water level will occur in the harbor during storms or hurricanes. The rise is due to wave setup, wind setups and barometric pressure effect. Bretschneider and Noda (1985) evaluated possible inundation limits for the south coast of Oahu due to hurricane induced water level rise and wave effects. The worst case hurricane was predicted to result in a total water level rise inside the harbor of 3.2 feet above the normal tide level. If this coincided with MHHW, the total water level height would be 5.1 feet above MLLW. During Hurricane Iwa, the measured setup was 2.1 feet above the normal tide level.

3.1.6. Tsunamis

Based upon historical records, tsunami run-up is not a serious problem in Honolulu Harbor. The predicted water level rise during the occurrence of a 100-year tsunami on the seaward side of Sand Island is predicted to be 3.5 feet above prevailing sea level (M&E Pacific, 1978). Recorded tsunami runup heights along the coast between Ala Moana Park and Pearl Harbor have typically been 5 feet or less (Loomis, 1976). Heights inside the harbor should be somewhat less.

3.1.7. Currents

Currents in Mamala Bay off Honolulu Harbor are tidally driven with typical speeds of 0.8 feet per second (fps). The currents usually reverse with the tide, with flood currents setting to the west and ebb currents setting to the east. Overall net transport is to the southwest. Surface currents are affected by the prevailing winds. The inshore currents are typically weaker and more variable than those offshore.

A study conducted by Edward K. Noda and Associates (1977) to assess circulation changes in Keehi Lagoon due to the reef runway construction included current measurements at 13 stations in Keehi Lagoon during various wind and tide conditions. One of the stations was beneath the Bascule Bridge at the west entrance to Honolulu Harbor, approximately 3,000 feet from the project site. During tradewind conditions and flood tide, currents flowed into the harbor, while during ebb tide, flow was out of the harbor. Average speeds were 0.2 and 0.1 fps, respectively. By contrast, during light and variable wind conditions, the flow directions reversed. Flood tide flow was to the west out of the harbor at average speeds of 0.3 fps while ebb tide flow was into the harbor at average speeds of 0.5 fps. The cross section area of the harbor off the Pier 38 peninsula is approximately twice that of the cross sectional area beneath the Bascule Bridge. The currents off the project site should have the same directional patterns as those at the west entrance, but with approximately half the speed.

Drogue and dye measurements were taken by Oceanit Laboratories, Inc. (1990) in the eastern portion of the harbor during an ebbing tide in May 1990. The closest release point to the project site was at the east end of the Kapalama Channel, approximately 3,500 feet east of Pier 38. Both the dye and the drogue results indicated very weak currents at the east end of the Kapalama Channel, with average speeds of .07 fps. The direction oscillated during the observation period. The available evidence suggests that during normal conditions, the circulation east of the Kapalama Channel is controlled by the Honolulu Entrance Channel, and circulation west of the Kapalama Channel is controlled by the Kalihi Channel.

3.1.8. Water Quality

Various studies conducted over the years indicate that Honolulu Harbor has poor water quality, largely due to the numerous sources of outfall from shoreside industrial activities, shipping operations, and urban runoff. The Kapalama Basin generally exhibits the poorest water quality owing partly to drainage discharges from the Kapalama Canal, which services adjacent industrial areas (AECOS, 1979a). Obviously, at times of heavy run-off from the land, poor quality surface water of low salinity may cover much of the harbor. Intense shipping activity has been reported as contributing to turbid conditions (McCain and Coles, 1973; Oceanit Laboratories, 1990).

Water quality studies conducted for the Honolulu International Airport, Reef Runway Construction Project provide a one year record of water quality measurements from a station at the west end of the Kapalama Basin. Monthly samples were collected at several depths for the period from September 1977 through August 1978 (AECOS, 1979b). These samples clearly exceeded the water quality criteria for turbidity and total phosphorus (DOH, 1989).

Follow-up studies, reported by OI Consultants, Inc. in 1986, included a monitoring station located in the Kalihi Channel near the bascule bridge. In July 1986, three samples were collected from the surface, mid-water, and near bottom. This follow-up survey did not show any appreciable change in water quality compared with the 1977-78 study: the value of most parameters measured in 1986 were within the range reported for 1977-78. The exceptions were ammonia and total phosphorus. The 1986 mean ammonia value was slightly greater than the maximum value measured in 1977-78; and the 1986 total phosphorus was lower than any value obtained in the same area in 1977-78.

In 1990, Oceanit Laboratories, Inc. conducted a survey of Honolulu Harbor that included water quality results for several stations. Of relevance to the present site are the "Kalihi Channel" and "Kapalama Channel" stations, identified as mid-channel at the Sand Island, bascule bridge and mid-channel off Pier 29, respectively. For the period represented by these samples, the Kalihi Channel station appeared to have the worst water quality.

In September 1991, AECOS, Inc. collected water quality samples from six sites along the Sand Island shoreline. The survey results indicated that water quality conditions in the area generally exceeded the water quality standards, with the exception of dissolved oxygen values, which fell below the standards. Values for turbidity, ammonia, chlorophyll *a* and phosphorus typically exceeded the standards. Overall, values were similar to those reported by Oceanit in 1990, with somewhat lower total phosphorus values and higher total nitrogen values.

3.1.9. Marine Biology

Although the harbor is not generally thought of as habitat for hermatypic corals, various reports describe several areas that support reasonably good coral growth. For example, Buske and McCain (1972) report corals around the intake and discharge basins of the Honolulu Generating Station (Piers 6 to 8) and off the Sand Island shore across from Fort Armstrong (essentially the harbor entrance). AECOS (1982) reported scattered coral growth between Piers 12 and 15, with up to 25 percent cover on sloping bottom off the sides of Pier 12. The dominant species in this latter area were *Porites lobata*, *Porites compressa*, and *Montipora verrucosa*.

A brief reconnaissance survey of the harbor around Pier 1 (AECOS, 1988) also identified corals on the pilings nearest the harbor entrance, with an estimated coverage of 10 to 15 percent of the surface. In addition, the report noted a diverse community of fishes in this area and along the base of the breakwater extending south from Fort Armstrong.

A 1990 report by Oceanit Laboratories reported biota at seven selected locations in Honolulu Harbor, including a site at the mouth of Kapalama Stream. The location is described as "....50 meters downstream from Nimitz

Highway and along the rock revetment sea-wall at the outer western corner of Pier 37 down to a depth of 10 meters". The following description was provided:

> *The water depth 50 meters from the Nimitz Highway overpass was 2 meters, shoaling to 1 meter within 25 meters of the overpass. There was no noticeable flow, and the horizontal visibility was about 2 meters. The bottom is very soft mud with numerous burrow holes (est. 16-25 per 25 cm x 25 cm square area). These burrows are consistent in size and shape to those of the snapping shrimp, Alpheus (sic) malabaricus mackayi. Several blennies were also seen fleeing into these burrows. Gas bubbles were observed rising from the mudy substrate (sic). The adjacent concrete wharf face was covered with typical fouling growth. Oyster shells (2-3 cm maximum shell length) dominated the upper 20 cm, with sponges, algae (Dictyota), hydroids, tunicates, and other fouling organisms below.*
>
> *Several colonies of the encrusting coral Leptastrea purpurea were noted on the wall. There was evidence of recreational fishing activity (tackle caught in bushes). The area is a likely habitat for mullet, milkfish, and juvenile hammerhead sharks. No fish other than the few blennies, were seen.*
>
> *At the corner of the rock revetment seawall opposite Pier 38 where Kapalama Stream enters Honolulu Harbor Kapalama Basin, a qualitative transect was made from shore to a depth of 10 meters. The rock and boulder revetment was replaced at a depth of 6 meters by a sloping mud bottom. The underwater visibility was 3 meters. Fish seen include: 3 Sergeant (sic) majors (Maomao, Abedefduf (sic) abdominalis), 12 white bar surgeon fish (Acanthuris (sic) lucoparieus (sic)), 1 snapper (Lutjanus fulvus), 3 butterfly fish (2 Chaetodon lunula, 1 C. miliaris). Boulders apparently provide habitat for fish. No fish were noted over the mud slope where there were no boulders.*

The report described the bottom around the mouth of Kapalama Stream as barren in comparison with a number of other sites that were surveyed in the harbor. The area around Pier 12 yielded a more diverse benthic fauna including six species of corals and nine species of fishes (also see AECOS, 1982). A shelf at a depth of 1.5 meters off Pier 8 harbored six common species of corals with an estimated bottom coverage of 75 percent. A similar coral-covered shelf was found off Piers 6 and 7 (Oceanit Laboratories, 1990).

3.1.10. Vessel Operations

The Sand Island Container Facilities are located directly across Kapalama Basin, opposite the proposed project site. Both Matson and SeaLand container facilities are based there. Although Kalihi Channel was once a second entrance to Honolulu Harbor, the Sand Island Bascule Bridge, formerly a drawbridge, is now in a fixed position, and a second fixed bridge was recently constructed to accommodate the increased traffic to the Sand Island container yards. Passage beneath the bridges is now limited to small boats with vertical clearances of approximately 15 feet or less. With the Kalihi Channel inaccessible, all ships entering the Kapalama Basin must turn in the basin. This includes all container ships berthing at Piers 51, 52 and 53 across the harbor from Pier 37/38. Tug assist is required for berthing and turning the container ships and barges. Piers 51, 52 and 53 are in constant use and vessel traffic is heavy.

The interisland barge service operated by Young Brothers is being relocated to Pier 39 and 40. Pier 39 is directly across from Pier 38. Construction to upgrade the load capacity of Pier 39 is presently underway and is scheduled for completion in December 1994. A new triangular berthing wharf for roll-on and roll-off cargo is being constructed at the inshore end of Pier 39.

Young Brothers operates a fleet of 13 barges and 13 tugs (Lum etal, 1992). Typical barge size is 286 feet x 76 feet. During a typical week, there are ten barge arrivals and ten barge departures. Projections in the 1992 report indicate that, should barge sizes remain the same, by the year 2010, the required barge sailings will be more

than double. The Pier 39/40 complex will have six barge berths. Two of the berths will be located on the east side of Pier 39, across from Pier 38. Based upon existing and projected loads, daily vessel movements can be expected at the two berths.

There is a water taxi service (P&R Water Taxi) based between Pier 39 and the Nimitz Highway bridge. There are typically four boats tied at this site. The facility appears to be temporary and it is anticipated that the taxi service will be moved to another location within the harbor.

GASCO presently berths a LPG barge at Pier 38C, adjacent to their on-land facilities. The existing barge, the *Huki Kai,* is approximately 232 feet-long x 44 feet-wide. GASCO has a second barge coming to Honolulu Harbor in 1994 and is exploring the feasibility of mooring it between Pier 38C and the Nimitz Highway bridge. The barge will be approximately the same size as the *Huki Kai.* Unlike the *Huki Kai*, however, the new barge will seldom leave its Honolulu Harbor berth. Present berthing facilities include a stub pier (Pier 38C) and a single mooring dolphin. GASCO is currently investigating additional facilities, including two mooring dolphins, two on-shore bollards and a dredged berthing area.

A finger pier parallels the shoreline along the east side of the peninsula. The pier is used for itinerant berthing of long-line fishing boats and can accommodate up to six vessels. No permanent berths are provided and boats are charged on a daily basis for temporary use.

At Pier 36, Harbors Division is requesting proposals for developing a new fish auction and related facilities to replace those being dislocated from Kewalo Basin. The actual configuration of the facility will not be known until a proposal is selected and further planning is undertaken.

3.2. NON-MARINE ENVIRONMENT

3.2.1 Climate

Average temperatures in the area range from 81.0°F during the warmest months (August and September) and 72.6°F during the coolest months (January and February). Rainfall in the area is relatively low, averaging between 20 to 25 inches per year with roughly 50 percent of the total annual rainfall occurring during the three wettest months of the year (December through February).

The wind climate in Honolulu is dominated by the prevailing trade winds, which approach from the north through southeast sector. During the summer, the trades occur 80 to 90 percent of the time, with typical speeds of 10 to 25 mph. During the winter months, the tradewinds occur less frequently, and the frequency of Kona winds increases due to localized low pressure and frontal systems. Kona wind speeds can range up to gale strength. During a typical windier season, two to three Kona storm events may occur. Heavy rains are generally associated with Kona storm events. Winds associated with infrequent hurricanes can be as high as 80 knots.

The water of the project site are sheltered from wind approach from all directions, and there is little exposed fetch for the generation of wind waves. The main effect of the winds will be on vessel operations at the site, due to wind acting on the sail area of the vessels.

3.2.2. Flood

According to the federal Flood Insurance Rate Map, the project site lies outside the 500-year floodplain.

3.2.3. Geology and Soils

The Honolulu Harbor complex is located within the narrow coastal plain of Oahu's south central coast, geologically referred to as the Honolulu Plain. The Honolulu Plain and much of the rest of the southern edge of Oahu is underlain by a broad elevated coral reef, covered by alluvium carried out from the mountains. Elevation at the proposed site is 8 feet above mean sea level.

According to the Soil Conservation Service, soils in the project area are of mixed fill. This land type is classified as having variable soil properties and used for urban development, including airports, housing areas and industrial facilities.

In 1993, as part of Chevron's soil remediation activities, Ogden Environmental and Energy Services conducted a soils assessment of the former Kapalama South Jet Fuel Storage Facility at the southern end of Pier 37. Their observations indicate that the site's soils consist of fill material to a depth of 15 feet below ground surface (BGS), the maximum depth explored. The fill consists primarily of silty clay with moderate amounts of sand and gravel. Borings on the eastern portion of the Chevron site encountered decomposed and weathered basalt gravel, cobbles and boulders, at a depth of approximately 9 to 15 feet BGS.

Prior investigations by Dames & Moore for the Piers 39/40 redevelopment project indicate loose to medium dense coralline sand and gravel materials overlaying firm to very stiff clay/silt soils across most of the area. This part of the harbor is underlain by alluvial soils, which accumulated at the mouth of Kapalama Stream. As noted in the study, such soils are suitable for supporting pier improvements on moderate capacity friction piles.

Additional investigations by Geolabs Hawaii at the Pier 37 finger pier indicated clay material with poor stability, and recommended that the existing slope steepness not be increased by dredging without incorporating measures to stabilize the slope.

3.2.4. Flora and Fauna

The project area is located within the highly-industrialized Honolulu Harbor complex and is primarily comprised of land created from man-made, fill material with only a small variety of plant life. There are no rare or endangered plant species on or near the project site; virtually all plant material consists of introduced species.

Wildlife in the area is generally limited to mammals and birds which have adapted to the environment. Mongooses, rats, mice, and feral dogs and cats are common. A variety of migratory shore birds occur on Sand Island, especially the seaward shore areas, although Keehi Lagoon is frequented more commonly as a resting and feeding locale. A number of migrating lowland and waterbirds have been recorded in the Keehi Lagoon area, including the 'ae'o or Hawaiian stilt *(Himantopus mexicanus knudseni)*, approximately 3/4 of a mile to one mile from the project site. There is no record, however, of indigenous or endemic bird species nesting in the Keehi Lagoon area.

3.2.5. Air Quality

Air quality monitoring at selected sampling stations in Downtown Honolulu and Liliha showed measurements well within the State Air Quality Standards (AQS). According to a study by Wilson Okamoto & Associates conducted in 1992, the average particulate matter concentration was approximately 30 micrograms per cubic meter ($\mu g/m^3$) in Downtown Honolulu and 32 $\mu g/m^3$ in Liliha, significantly below the 100 $\mu g/m^3$ State AQS for particulate matter. Sulfur dioxide concentrations (SO_2) also averaged well below the State AQS of 80 $\mu g/m^3$. Long-term sampling data for carbon monoxide (CO) is available only from the survey station located at the State Department of Health building in downtown Honolulu, approximately one mile east of the project site. In 1989, based on a maximum

average during any one-hour period, the average CO level was 1.9 milligrams per cubic meter (mg/m^3) – well within the allowable limit of 10 mg/m^3.

3.2.6. Hazardous Materials

Since 1967 and up until April 1992, a portion of the proposed site was used as Chevron's jet fuel storage facility. In 1993, following the fuel's removal and demolition of the storage tanks, Ogden Environmental and Energy Services performed remedial action on the site. According to their Final Remediation Report, from May 1993 through October 1993, approximately 1,800 cy of jet fuel-affected soil were excavated from the former Chevron site. These soils exhibited characteristics of gross contamination, as defined in the current DOH *Technical Guidance Manual for Underground Storage Tank Closure and Release Response*, Section 5.3.1.1. (August, 1992). The excavation was completed when the maximum possible amount of soil was removed and/or when the sample analysis indicated that current DOH cleanup criteria were achieved. The excavated soils were then biotreated and evaluated. Following biotreatment, chemical analysis of the soil indicated that the majority of the soil no longer exhibited characteristics of gross contamination. The treated soils were then backfilled into the excavations, and graded and compacted to acceptable specifications. Based on results of sampling and analysis conducted at the site during the remedial action, the study does not recommend further investigation or remedial activities at this time. DOH has provided its clearance for the return of the premises to the State.

Other than Chevron's fuel storage facility, there is no known history of hazardous material use at the site and no known hazardous material within the remainder of the site.

3.2.7. Noise

The proposed project will be located within the highly-industrialized Honolulu Harbor complex. The two major sources of noise in the area are vehicular traffic and aircraft overflights. According to a 1992 study by Wilson Okamoto & Associates, aircraft noise from the Honolulu International Airport creates a relatively high ambient noise environment – between 70 to 75 Ldn – for the project area. (Ldn is the day-night metric sound level that averages noise levels over a 24-hour period, with a penalty for evening noise.)

3.2.8. Archaeological Resources

The entire Honolulu Harbor complex is primarily composed of land created from man-made, fill material. The proposed site is not known to have any archaeological or cultural resources. Furthermore, there are no buildings, structures or other man-made features of historical significance on the project site that will be demolished during construction.

3.2.9. Visual Resources

Since the site is not visible from Nimitz Highway or any major public gathering places, and the proposed structures will not be very high, the visual impact of the facility is likely to be minimal. The facility is, however, expected to receive visitors and should, therefore, provide a visual identity appropriate for a university-related research institution.

3.2.10. Vehicular Access and Traffic

The Pier 38 Access Road provides the only access to the Marine Research Center project site, and functions as a private road for access to other harbor activities. The one-block long roadway is 30 to 32 feet wide within a 60-ft-wide easement and striped for one lane in each direction. Raised traffic islands are provided to permit a separate channelized right-turn movement to or from Nimitz Highway.

Nimitz Highway (FAP Route 92) is a major roadway that links the Pearl Harbor area, the Honolulu International Airport area, the Honolulu Harbor, and the downtown Honolulu. The highway provides access to the H-1 Freeway at the nearby Keehi Interchange. Nimitz Highway is a median-divided roadway with three lanes in each direction and separate left-turn lanes provided in each direction at the Pier 38 Access Road - Ala Kawa Street intersection. The intersection is controlled by a traffic signal.

Ala Kawa Street provides a connection between Nimitz Highway and Dillingham Boulevard, although it is primarily a privately-owned roadway intended for access to the Dole Cannery and adjacent land uses. The section through the cannery area is gated during night hours. At Nimitz Highway, the street is approximately 36 feet-wide, with one lane in each direction. The approach lane is sufficiently wide to allow right-turning vehicles to bypass waiting left-turn and through vehicles. Driveways to enter the Nimitz Business Center and to enter/exit the Xerox parking lot, are located adjacent to Nimitz Highway and result in occasional disruption of traffic flow on Ala Kawa Street.

3.2.10.1. Existing Traffic Volumes

Traffic observations by Wilbur Smith & Associates, conducted in October 1993, indicate that the afternoon peak hour represents the highest two-way traffic volumes on Nimitz Highway and on Ala Kawa Street, while the morning peak hour has the highest volumes on the Pier 38 Access Road. One unusual feature of the traffic movements at the intersection is that about one-half of the right-turns into the Pier 38 Access Road and most of the straight-through movements from Pier 38 Access Road were vehicles using this "jug-handle" route to actually turn left from Nimitz Highway to Ala Kawa Street. Several of the right-turn vehicles also executed left-turns from Pier 38 Access Road, thus completing "U-turns."

3.2.10.2. Intersection Conditions

The Transportation Research Board (TRB), a division of the National Science Foundation, has developed standardized methods for evaluating the effectiveness and quality of service for roadways and streets. This evaluation method, known as level-of-service (LOS), describes facility operations on a letter basis from A to F, which signify excellent to unacceptable conditions, respectively (refer to Figure 6). The methods generally compare traffic volumes on a facility to the facility's theoretical capacity. Capacity is estimated based on the facility's physical characteristics (e.g. number of lanes), traffic conditions (e.g. types of vehicles), and type of traffic controls. The comparisons are frequently referred to as the volume-to-capacity (V/C) ratio.

The **OPERATIONS LEVEL METHODOLOGY**, which is described in the Transportation Research Board's Highway Capacity Manual, defines Level of Service (LOS) for signalized intersections in terms of delay. Technically, delay is the amount of time an average vehicle must wait at an intersection before being able to pass through the intersection. For signalized intersections, the relationship between LOS and delay is based on the average stopped delay per vehicle for a fifteen minute period.

LEVEL OF SERVICE 'A' - Delay 0.0 to 5.0 seconds

Describes operations with very low delay, i.e., less than 5 seconds per vehicle. This occurs when signal progression is extremely favorable. Most vehicles arrive during the green phase and are not required to stop at all.

Corresponding V/C ratios usually range from 0.00 to 0.60.

LEVEL OF SERVICE 'B' - Delay 5.1 to 15.0 seconds

Describes operations with delay in the range of 5 to 15 seconds per vehicle generally characterized by good signal progression and/or short cycle lengths. More vehicles are required to stop than for LOS 'A' causing higher levels of average delay.

Corresponding V/C ratios usually range from 0.61 to 0.70.

LEVEL OF SERVICE 'C' - Delay 15.1 to 25.0 seconds

Describes operations with delay in the range of 15 to 25 seconds per vehicle. Occasionally, vehicles may be required to wait more than one red signal phase. The number of vehicles stopping at this level is significant although many still pass through the intersection without stopping.

Corresponding V/C ratios usually range from 0.71 to 0.80.

LEVEL OF SERVICE 'D' - Delay 25.1 to 40.0 seconds

Describes operations with delay in the range of 25 of 40 seconds per vehicle. At LOS 'D', the influence of congestion becomes more noticeable. Many vehicles stop, and the proportion of vehicles not stopping declines. The number of vehicles failing to clear the signal during the first green phase is noticeable.

Corresponding V/C ratios usually range from 0.81 to 0.90.

LEVEL OF SERVICE 'E' - Delay 40.1 to 60.0 seconds

Describes operations with delay in the range of 40 to 60 seconds per vehicle. These high delay values generally indicate poor signal progression, long cycle lengths and high V/C ratios. Vehicles frequently fail to clear the intersection during the first green phase.

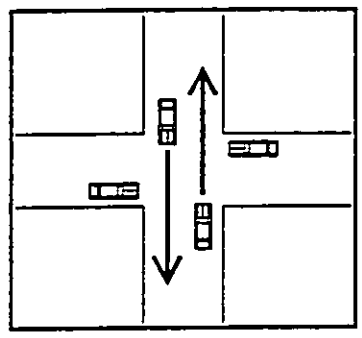
Corresponding V/C ratios usually range from 0.91 to 1.00.

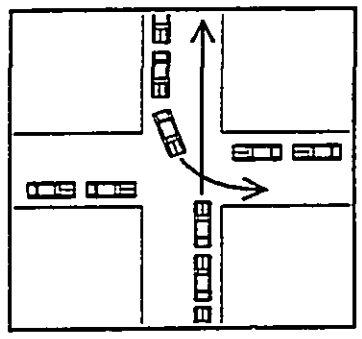
LEVEL OF SERVICE 'F' - Delay 60.1 seconds plus

Describes operations with delay in excess of 60 seconds per vehicle. This condition often occurs with oversaturation, i.e., when arrival flow rates exceed the capacity of the intersection.

Corresponding V/C ratios of over 1.00 are usually associated.

V/C - Volume-to-capacity ratio.
SOURCE: Transportation Research Board, "Operations Level Methodology-Signalized Intersections", Highway Capacity Manual, Special Report 209, 1985. LOS-HCS-1/21/92CRL


LOS 'A'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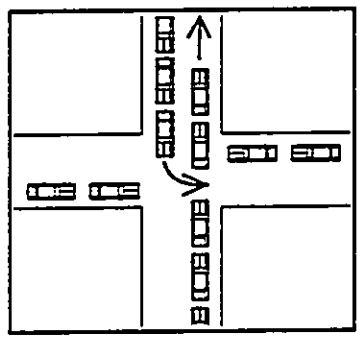
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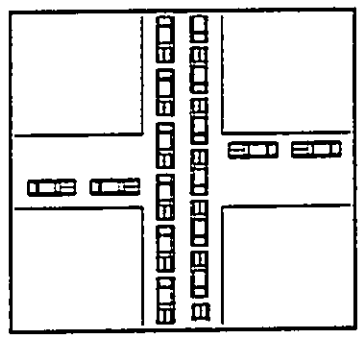
LOS 'F'

FIGURE 6
LEVEL OF SERVICE DIAGRAM

The analysis results, presented on Table 2, indicate that the overall intersection is operating at very acceptable levels-of-service and acceptable capacity levels during both the morning and afternoon peak hours. However, the analysis also indicates that traffic on the Ala Kawa Street approach experiences lengthy delays in the morning (LOS E, 41 seconds average delay and afternoon (LOS F, 108 seconds average delay) peak hours. This is largely a function of the long signal cycle length. Field observations found that most vehicles on Ala Kawa Street cleared the intersection on each signal cycle, although there were several occasions when all vehicles did not clear the intersection and had to wait for the following green phase.

TABLE 2
EXISTING INTERSECTION CONDITIONS
Nimitz Highway at Pier 38 Access Road and Ala Kawa Street

Condition	V/C Ratio	Average Delay per Vehicle	LOS
Morning	0.847	9.7 seconds	B
1995 Without Project	0.913	15.6 seconds	C

Wilbur Smith Associates, October 1993.

In the afternoon peak period, Ewa-direction traffic flow was often affected by constraints or bottlenecks beyond this intersection. The constraints (Waiakamilo Road or Sand Island Access Road intersections) were observed to often preclude Ewa-direction traffic movement though this intersection during portions of the green signal phase.

3.2.10.3. Public Transit Access

Transit access to the project site is available via TheBus Route 19, which operates along Nimitz Highway. Bus stops in each direction are located on the Diamond Head side of the Pier 38 Access Road intersection.

Route 19 provides direct connections to Waikiki, Ala Moana Center, downtown Honolulu, and the airport area. Transfers to Leeward suburban routes are available near the Airport; transfers to urban trunk routes and express routes are available in the downtown area, including connections to the U.H. Manoa campus. Route 19 service frequencies approximate 20 minutes in each direction throughout the daytime hours.

3.2.11. Public Services and Utilities

3.2.11.1. Water, Wastewater, Electrical and Communications Systems

There are no water, sewer, electrical or communications services at the proposed site.

3.2.11.2. Drainage System

The proposed site is practically level with an elevation of 8 feet above mean sea level. Drainage is by sheet flow into the harbor.

3.2.12. Socio-Economic Environment

3.2.12.1. Population

Pier 38 lies makai of Downtown Honolulu and is surrounded primarily by maritime, commercial and industrial uses. Although the majority of nearby residences are located further mauka of the waterfront and industrial area, residential neighborhoods in the pier's vicinity include Downtown and Kalihi-Palama. In 1990, the resident population of Oahu was 836,231, of which 377,059 lived in urban Honolulu. Pier 38 and much of Honolulu Harbor are included in the Kalihi-Palama District, with a resident population numbering 40,147. The proposed project site is part of Census Tract 57, which in 1990, had a resident population of 1,867. There are no permanent residential dwellings on or in the immediate vicinity of the site; no residents will be displaced.

3.2.12.2. Recreational Resources

Pier 38 is within the highly-industrialized Honolulu Harbor. There are no recreational resources at the site.

SECTION 4
Potential Impacts and Mitigative Measures

Short-term impacts to the marine and non-marine environment will occur from construction-related activities and are anticipated to be temporary. Long-term impacts, however, will result from the permanent alteration of the environment following development of the proposed project.

4.1. SHORT-TERM IMPACTS

4.1.1. Marine Environment

Primary marine construction activities associated with this project are dredging and pile driving. The dredging of harbor sediments can be separated into several steps, each of which may have a different impact or set of impacts on the environment.

4.1.1.1. Marine Biology

The first step is sediment removal, which will impact most of the infaunal biota associated with the environment being dredged. The Pier 38 site is along the northshore of the Kapalama Basin and is one of the more damaged marine environments in the harbor area. Pier 38 is remotely located from the harbor entrance – where water quality tends to be the highest in the harbor – and is adjacent to the Kapalama Canal – where runoff from the land and industrial areas has contributed to water quality degradation over the years. Dominant substrate in the project area includes the rock revetment and rip-rap around the perimeter of Pier 38, and the mud bottom and slopes of the harbor basin. The latter appears to support typical benthic fauna for soft harbor bottoms in Hawaii, although insufficient data exists to adequately describe the infauna of this area, or determine what sorts of gradients might exist with respect to the freshwater and pollutant discharge from the Kapalama Canal.

The long term consequences of this activity depend on the type of bottom that will replace the dredged material. However, given the generally poor quality of the benthic environment within Kapalama Basin, the local impact on the infaunal community (primarily small invertebrates) is not expected to be significant . Other than a deeper bottom, there will be little change from what presently exists, and no long-term adverse impacts are anticipated.

4.1.1.2. Water Quality

Dredging activities will also have water quality impacts as a result of the mixing of fine material into the water column. Without containment provisions, water quality degradation can spread over a wide area, resulting in adverse impacts to benthic environments at distances beyond the dredging site. Water quality degradation in the immediate vicinity of the dredging operation cannot be avoided. However, monitoring and containment practices will be employed to minimize the impact from particulates. Containment methods (e.g., silt screens) are generally effective in quiet harbor waters.

As sediments are dredged, the material may be placed either (1) directly in containers for transport, (2) on nearby land for drying or (3) elsewhere in the aquatic environment. Only the first two options are possible for dredging in Honolulu Harbor. Placement in containers (e.g., barge or scow) or on land will probably result in recurrence of

turbid water and fine materials to harbor waters. Impacts can be minimized by directing such runoff back into the dredging area or within the turbidity-confinement area.

Remobilization of contaminants found in the bottom sediments may occur with the resuspension of these sediments during dredging and in runoff from the recently removed sediments. However, the degree of threat posed by these contaminants to the local environment is difficult to gauge because of the complex relationships between chemical concentration, biological availability, toxicity, synergistic effects, etc. Similar complex relationships will come into play at the disposal site, discussed later in this section.

Based on the numerous dredging operations that have been conducted in the past, the proposed dredging is not expected to have significant impacts. Dredging has taken place in Honolulu Harbor at regular intervals, and based upon past observations, impacts will be temporary and the long term effects, negligible. Adjacent areas have also been recently dredged with no long term adverse impacts. For example, maintenance dredging of Kapalama Basin was conducted in 1990 by the COE and 135,000 cy of material was removed.

The harbor is also subject to other sources of turbidity and sediment resuspension. Ship activities and stream discharges cause turbidity plumes that last from hours to weeks (Oceanit Laboratories, Inc., 1990). Oceanit, during their field work for the environmental assessment of the Aloha Tower redevelopment, frequently observed turbidity plumes generated by tugboats assisting large ships. However, it was also noted that the ship- or tug-generated sediment plumes settled rapidly and disappeared from view within an hour. Sediment suspended by ships in the main basin was not observed leaving the harbor through the Honolulu Channel.

Construction-generated turbidity will be comparable to turbidity caused by maintenance dredging, ship operations and stream runoff into the harbor. Sediment suspension, however, will be relatively short.

The extent to which the suspended sediment will be circulated within the harbor depends upon the prevailing currents and winds, and the methods used to contain the sediments. The clamshell bucket method generates more turbidity than other dredging methods, since fine material is washed from the bucket as it moves upward through the water column. The coarser material will settle out close to the dredge, but finer material will remain in suspension longer and be carried by the prevailing currents.

Given the location of the dredging and the relatively weak currents, it is anticipated that most of the suspended sediments will settle out in the harbor. However, sediments fine enough to remain in suspension for long periods of time may eventually be transported out of the harbor. Once out of the harbor, these fine sediments will have a slow deposition rate and will settle out over a large area, with negligible deposition in any one area. The resuspended sediments would contribute to the overall deposition rates established by the naturally occurring stream flows and drainage runoff in harbor, coastal and offshore water (U.S. Army 1975).

Turbidity generated by the pile driving will be negligible, as compared to other sources of turbidity in the harbor. Once in place, the piles will provide shelter for fish and a hard substrate for benthic organisms, and may, in the long term, actually improve marine habitat.

4.1.1.3. Dredged Material Disposal

Once sediments are removed and prepared for transport, the final step generating potential impacts involves disposal. These harbor sediments can only be disposed of at an EPA-designated offshore dredged material disposal site or in a landfill. Primary concerns for offshore disposal encompass water column effects and bottom effects. The offshore dredged material disposal site for Oahu is in water between 190 and 220 fathoms deep. Benthic impacts from dredged material are negligible since the fine material from the harbor is spread over a very wide area (Environmental Center, 1977, 1978). While water column effects are minimal with respect to turbidity, toxicity from trace metals and organics may pose a threat. Because of the difficulty in assessing these toxicity

impacts from estimates of sediment concentrations for specific toxic elements or compounds, a bioassay screening procedure may be required by EPA to use the offshore disposal site (EPA/COE, 1977 and subsequent revision under Section 103 of PL 92-532).

4.1.1.4. Shoreline

All shorelines adjacent to the project area are hardened. The proposed construction or operation of this facility will not cause any shoreline or coastal erosion.

4.1.1.5. Harbor Operations

During construction, the use of a barge mounted crane and dump scow for dredging will interfere with other harbor activities. This can be mitigated by maintaining close coordination with the harbormaster and adjacent harbor users.

4.1.1.6. Site Preparation

Site preparation and grading activities will be conducted in compliance with applicable State and City and County regulations to minimize runoff and adverse impacts to offshore waters.

4.1.2. Non-Marine Environment

4.1.2.1. Soils

During construction, on-site clearing and grading operations may increase the potential for short-term erosion and runoff may occur. To control and reduce discharge of pollutants resulting from the construction activities, appropriate construction management practices and erosion control measures will be employed. To the extent possible, construction activities will be conducted during periods of low rainfall. Where such activity is necessary during periods of higher rainfall, every effort will be taken to minimize potential impacts associated with erosion and stormwater runoff. In addition, a landscaping and erosion control plan will be prepared prior to any land clearing or construction activity. All construction activities will comply with the City's grading ordinance (Chapter 14, Revised Ordinances of Honolulu) and all requirements of Title 11, Chapter 55 of the Department of Health Administrative Rules (Water Quality Control) will be strictly adhered to.

4.1.2.2. Air Quality

Ambient air quality is expected to temporarily decrease during construction of the proposed project. The principal pollutants anticipated are hydrocarbon emissions or exhaust fumes from excavation activities, hauling of construction materials and debris, construction vehicles and equipment, vehicles owned by construction employees, and traffic congestion.

To mitigate potential impacts, all construction activities will comply with the Department of Health Administrative Rules, Title 11, Chapter 60, Air Pollution Control. An effective dust control plan will be employed, to include frequent watering of bare-dirt surfaces and the use of wind screens. Open-bodied trucks will be covered at all times to prevent airborne dust, and landscaping and paving will be done, as appropriate.

4.1.2.3. Noise and Vibration

During the short-term, the project will involve clearing and grading activities, dredging activities along the shoreline, revetment demolition, and wharf and building construction. These activities will create a temporary increase in noise levels in the project area. However, since the project area is generally surrounded by industrial

uses and already subject to high levels of noise from aircraft overflights, construction activities are not anticipated to be significantly disruptive. In addition, the contractor will comply with all applicable regulations for minimizing construction noise impacts. Should noise levels exceed the allowable levels specified under Title 11, Chapter 43, Department of Health Administrative Rules, the contractor will be required to obtain a noise permit.

4.1.2.4. Employment

The project will generate short-term direct employment, both on- and off-site during the construction period. Preliminary costs for construction of the proposed facility are estimated to total $16.4 million. This figure includes the wharf costs, building costs, and estimates for sitework; utilities and fencing costs (cost estimates are preliminary and subject to further refinement during the design phase for the facilities). Construction activity will also generate indirect and induced employment opportunities and multiplier effects, as local material suppliers and retail businesses will benefit from the increased construction.

4.2. LONG-TERM IMPACTS

4.2.1. Marine Environment

Operational impacts at the Pier 38 site will be the same as those presently occurring at the Snug Harbor location. The new site is located at the east end of the Kapalama basin, while the existing marine research center site is located at the west end of the basin. All ship traffic to the site will continue to transit through the Honolulu Entrance Channel, the main harbor basin and the Kapalama Channel. The move itself will not result in additional ships being berthed at the site or in a change in mission for the facility. The only vessel additions will be two small boats and the submersible Launch/Recovery Transport (see Attachment A; Table A7).

4.2.1.1. Vessel Operations

At the Pier 38 site, there are potential conflicts with vessel traffic on both the outboard wharf side of the peninsula (Pier 38A) and inboard bulkhead (Pier 38B). The Kapalama Basin is used as a turning basin for ships berthing at the Sand Island Container Facility, and any encroachment on this activity would impact safe harbor operations and vessel traffic. On the Pier 38B side, potential conflicts may arise as a result of the Interisland Barge Terminal operations at Pier 39 and GASCO's adjacent Pier 38C LPG barge activities.

These potential conflicts were identified during the earlier planning phase for the Pier 38 Master Plan, and led to consultations with the Department of Transportation, Harbors Division. The Harbors Division determined that along the outboard side (Pier 38A), the Marine Center could use the area up to the Pierhead Line for new piers and ship berthing, as long as vessels berthed at 38A do not protrude beyond the Pierhead Line. The Pierhead Line is shown on the Schematic Site Plan, Figure 2. The site plan also shows the seaward edge of the wharf, which is set back 128 feet from the Pierhead Line. Based upon the above constraints, a hybrid open wharf/bulkhead design was selected to maximize the distance from the seaward edge of the wharf to the Pierhead Line. This optimizes future flexibility with respect to nesting of ships or berthing of wide beam SWATH vessels. The portion of the pier overhanging the water is only 15 feet wide, compared to the standard 45-ft width. This effectively reduces the usable land area on the site by approximately 10,000 feet.

4.2.1.2. Water Quality

At present, a catch basin in front of the Pier 39 storage sheds discharges into the slip between Piers 38 and 39. This runoff from the Inter-Island Barge Facility will have some impact on water quality in the area. Long term water quality conditions in the project area, however, are expected to be the same, with or without the proposed project. The major influence on water quality in the immediate area and the Kapalama Basin will continue to be

the discharge from the Kapalama Canal during heavy rainfall. Significant runoff will occur for only short periods following heavy rainfall events, when the harbor is the receiving area for runoff from much of the downtown Honolulu. Since the operations at the proposed Pier 38 site will be essentially the same as those presently taking place at Snug Harbor, the overall impact is likely to be minimal. Stormwater runoff will be further addressed during the preparation phase for the various State Department of Health permits. As part of the permit requirements, onsite facilities and controls will be designed to prevent any process waste, laboratory waste or waste oil from discharging into the harbor. Any potential discharges will be fully addressed during the permit process.

4.2.2. Non-Marine Environment

4.2.2.1. Air Quality

Long-term air quality impacts will result from increased vehicular traffic and associated increases in levels of carbon monoxide. The volume of traffic generated by the proposed project is projected to be fairly low (162 vehicle trips per day, 81 during the morning peak hour and 81 during the afternoon peak hour).

The Marine Research Facility will generate air pollutants primarily from activities associated with maintenance operations. Areas within the sand blasting and fiberglass work areas will be susceptible to high levels of dust and other particulates in the air, while any painting workbays will be subject to paint fumes and overspray. The potential impact to those outside the work areas will be fully mitigated by enclosing the machine shop and its mechanical ventilation system. All employees, students and visitors will be instructed to adhere to Occupational Safety and Health Administration (OSHA) requirements for proper safety procedures and equipment.

Furthermore, since all the facilities proposed at Pier 38 presently operate at nearby Snug Harbor, Kewalo Basin or Makai Pier, they will not create new impacts on air quality. In addition, the construction of new facilities for these operations offers the opportunity to design them for improved environmental conditions at the workplace.

4.2.2.2. Noise

Noise impacts from the proposed Marine Research Facility will be generated by vehicular and equipment traffic, and any machine-power equipment that may be used in the shop and laboratories. Given the industrial character of the surrounding harbor activities, however, any noise created by the proposed facility is not anticipated to have significant impact.

According to a 1992 study by Wilson Okamoto & Associates, aircraft noise levels in the area measure between 70 to 75 Ldn. Although industrial-type activities are generally compatible within the 70 Ldn contour, the existing noise levels may impact the proposed research facility, particularly in office settings. These noise levels, however, will not differ significantly from those at the existing research facility at Snug Harbor. In addition, potential noise impacts can be mitigated by designing enclosed, air-conditioned instructional and work areas, and using noise attenuating building materials (e.g., CMU construction, metal doors and double-glazed windows).

4.2.2.3. Vehicular Traffic and Access

A traffic impact study was conducted by Wilbur Smith and Associates in October 1993 to assess localized impacts along adjacent roadway sections for year-end 1995, when the project is scheduled for completion and full operation.

4.2.2.3.a. 1995 Traffic Volumes Without Project

According to the study, no major new development projects are anticipated for the adjacent areas by the end of 1995. Traffic increases over the next two years are expected to result from a general increase in the area's economy and travel activity, small infill development, and the completion of several projects along Nimitz Highway in the Downtown area. The analysis of 1995 traffic conditions at the intersection of Nimitz Highway with the Pier 38 Access Road is summarized in Table 3. The estimated traffic increases would affect intersection conditions more in the afternoon peak hour than in the morning. Although the traffic increase would not be sufficient to lower the service level, the afternoon increases would be approaching the theoretical capacity of the intersection.

TABLE 3
1995 INTERSECTION CONDITIONS WITHOUT PROJECT
Nimitz Highway at Pier 38 Access Road and Ala Kawa Street

Condition	V/C Ratio	Average Delay per Vehicle	LOS
Morning Peak Hour			
Existing	0.847	9.7 seconds	B
1995 Without Project	0.912	13.1 seconds	B
Afternoon Peak Hour			
Existing	0.913	15.6 seconds	C
1995 Without Project	0.977	22.6 seconds	C

Wilbur Smith Associates, October 1993.

4.2.2.3.b. Project Beyond 1995

Regardless of whether the Marine Research Facility is developed, there are several projects in the planning phase that could affect conditions at Pier 38 Access Road intersections with Nimitz Highway. These are:

Pier 37 Fresh Fish Wholesale Distribution Center

Redevelopment of the Dole Food Company Iwilei property

Nimitz Highway Makai Viaduct project

The Fresh Fish Wholesale Distribution Center is expected to be advertised by the State for development proposals and bids in 1994. The site extends eastward from the Pier 38 Access Road. Access to the site could be exclusively to/from the Pier 38 Access Road or via the Pier 35 intersection with Nimitz Highway.

Driveway access to the Pier 38 Access Road could be either two-way or one-way as part of a one-way internal circulation layout between the Pier 38 and Pier 35 access points. Depending upon the traffic volumes generated by the Fresh Fish Wholesale Distribution Center and the choice of access layout, the project could result in need for improvements to the Pier 38 Access Road. Considerations include:

- Locating the Distribution Center's driveway to Pier 38 Access Road as far from Nimitz Highway as possible.
- If the driveway entrance is close to Nimitz intersections, then sufficient width may be needed for a left-turn lane into the Distribution Center in order to avoid stacking inbound traffic back onto Nimitz Highway.

- If the Distribution Center's exit volumes are high enough, the Pier 38 Access Road may need to be widened by about five feet to allow right-turn vehicles access to the channelized right-turn lane.

Along the mauka side of Nimitz Highway, present plans for redeveloping the Dole Food Company property includes realigning Ala Kawa Street to intersect Nimitz Highway at the Pier 35 intersection. This rerouting would significantly reduce traffic volumes using the mauka leg of the Pier 38 Access Road intersection, with the present Ala Kawa Street leg remaining for access to the Nimitz Business Center and Xerox. This should improve future conditions at the Pier 38 intersection.

The State DOT is studying the potential for an elevated roadway viaduct for high occupancy vehicles (HOV) along this section of Nimitz Highway, as well as alternatives to this project. Construction of a Nimitz Highway project could either improve or worsen traffic conditions along Nimitz Highway at the Pier 38 Access Road intersection, depending upon the type and limits of the project that is eventually constructed.

4.2.2.3.c. 1995 Traffic Conditions with the Pier 38 Project

The Pier 38 project is planned for completion and occupancy at the end of 1995. Following its completion, the shore staff based at the facility is estimated at 52 full-time equivalent employees, which is slightly more than the present staff of the operations planned for relocation to Pier 38. Ship's crews for the three UH vessels total 35 persons, plus five ship-based marine technicians. The *Townsend Cromwell* has a crew of 21. Pier 38 will also accommodate visiting research vessels. However, these visiting ships will typically be berthed at Pier 38 when one or more of the UH vessels are out at sea. Since the crew sizes of the visiting ships are approximately the same as those of the UH vessels, no significant increase in total crew population at Pier 38 is anticipated when a visiting research vessel is berthed there. The normal work hours for the Marine Center are weekdays between 7:00 AM and 3:30 PM; for Look Laboratory, the work hours are weekdays from 7:30 AM until 4:30 PM.

For purpose of this analysis, all of the Pier 38 project trips are considered to be "new" trips along Nimitz Highway. In actuality, many of the present trips to the existing Snug Harbor and Look Laboratory facilities likely use Nimitz Highway through the Pier 38 area. In addition, the peak traffic hour of the Pier 38 facility was assumed to coincide with the highest peak hour volumes on Nimitz Highway.

The analysis indicates that the project would result in only small increases on the intersection legs, other than the Pier 38 Access Road.

The proportional increases, relative to 1995 without the project are:

76.0% to 77.0% on the Pier 38 Access Road

0.6% to 0.8% on Nimitz Highway

0.2% to 0.4% on Ala Kawa Street

TABLE 4
VEHICLE TRIP GENERATION RATES AND ESTIMATED TRIPS

Item	Units	Morning Peak Hour		Afternoon Peak Hour	
		To Project	From Project	To Project	From Project
TRIP RATES					
Shore Staff	Employees[1]	0.81	0.16	0.16	0.81
Ship Crews	Employees	0.40	0.08	0.08	0.40
Visitors	Daily Visitors	0.20	0.04	0.04	0.20
VEHICLE TRIPS					
U.H. Marine Center / NOAA					
Shore Staff	20 Employees	16	3	3	16
Ship Crews	40 Employees[2]	16	3	3	16
Visitors	30 Visitors	6	1	1	6
	Subtotal	38	7	7	38
HURL					
Staff	13 Employees	11	2	2	11
MMTC					
Staff	8 Employees	7	1	1	7
Look Laboratory					
Staff	11 Employees	9	2	2	9
Visitors	15 Daily Visitors	3	1	1	3
	Subtotal	12	3	3	12
	TOTAL	68	13	13	68

[1]Equivalent full-time employees
[2]Ship crews reflect 3 U.H. research vessels: *Kaimikai-O-Kanaloa, Moana Wave,* & *Kila* - in port

Wilbur Smith Associates, October 1993.

The analysis of 1995 traffic conditions with the project was made assuming no changes in the layout of the Nimitz Highway intersection with the Pier 38 Access Road. The analysis results, summarized in Table 5, indicate that the intersection would operate at the same service levels with or without the project (LOS B in the morning and LOS C in the afternoon). The project would increase the estimated average vehicle delay by about 0.9 seconds per vehicle during the peak traffic hours.

TABLE 5
1995 INTERSECTION CONDITIONS WITH PROJECT
Nimitz Highway at Pier 38 Access Road and Ala Kawa Street

Conditions	V/C Ratio	Average Delay per Vehicle	LOS
Morning Peak Hour			
Existing	0.847	9.7 seconds	B
1995 Without Project	0.912	13.1 seconds	B
1995 With Project	0.930	14.0 seconds	B
Afternoon Peak Hour			
Existing	0.913	15.6 seconds	C
1995 Without Project	0.977	22.6 seconds	C
1995 With Project	0.981	23.5 seconds	C

Wilbur Smith Associates; October 1993

The project would primarily affect the intersection V/C ratio during the morning peak hour when arriving traffic would increase the critical Ewa-direction left-turn volume at the intersection. The morning increase from 0.912 to 0.93 would still be within the theoretical capacity of the intersection. The afternoon traffic increase would have little effect on the V/C ratio since left-turn traffic exiting the Pier 38 Access Road would overlap with the much higher existing left-turning traffic from Ala Kawa Street. However, afternoon traffic volumes would approach the theoretical capacity of the intersection either with or without the project.

4.2.2.3.d. Proposed Mitigative Measures

No mitigation actions appear needed to increase the capacity of the Nimitz Highway-Pier 38 Access Road intersection as a result of the Pier 38 project. Future traffic levels along Nimitz Highway are expected to approach intersection capacity with or without the Pier 38 project, and improvements are warranted as part of an overall Nimitz corridor improvement project.

The Ewa-direction left-turn lane on Nimitz Highway at the Pier 38 Access Road should be lengthened to accommodate the increase in left-turn traffic. The present length of the storage lane approximates 75 feet. With the forecast traffic and a continuation of a 150-second morning signal cycle, the storage lane should be lengthened to a minimum of 100 feet, and desirably to 125 feet, to minimize blockage of the through lane by waiting left-turn vehicles. Any additional length to the lane will conform to current AASHTO and State Highway Design Standards and will be coordinated with the State Department of Transportation - Highways Division.

In addition, the existing access road from Nimitz Highway will have to be extended to the fishing pier and to the project site. The road and on-site pavement should be designed to accommodate H20-S44 highway loading. Dock aprons should be designed for 1,000 pounds per square-foot loading. A geotechnical engineer would be required to design the pavement structure and to advise on the building and wharf foundation design. All required improvements will be provided at no cost to the State Department of Transportation.

4.2.2.4. Public Utilities

Construction of the Marine Research Facility is not anticipated to impact existing utilities serving the site. The project's development phase will be coordinated with appropriate agencies and organizations to minimize potential disruption of utility services to area businesses during construction. To ensure proper coordination with utility companies, construction plans shall be submitted for their review and approval. Should it be necessary to

temporarily disrupt service during the course of construction, the contractor will be responsible for obtaining the necessary permits and clearances.

4.2.2.4.a. Water System

Adequate potable water service can be provided by extending the 12-inch line which serves existing fire hydrants along the entrance roadway. New 6- and 8-inch-diameter ductile iron water mains would provide service to each building, fire hydrant and dockside utility box. The water lines fittings and hydrant locations will conform to the requirements of the Board of Water Supply Design Standards, and Board of Water Supply facility and consumption charges would apply. In addition, the project will obtain a water allocation from the State Department of Land & Natural Resources, which is coordinating the water requirements for all state agencies.

4.2.2.4.b. Wastewater System

There are no sewers to the project site at the present time. New 6- and 8-inch-diameter sewer lines will be required to service each structure and docks. Although the sewer lines will have to be laid at minimum grade to avoid the necessity of pumping, they will have adequate capacity to meet anticipated demand. The new sewer lines will connect to the county sewer manhole on Nimitz Highway. A short existing 8-inch sewer line extends from this manhole to a manhole on the Nimitz Highway trunk sewer. The trunk sewer goes to the Hart Street Pumping Station, about 1,000 feet east of Pier 38, and pumps the sewage to the City and County Sand Island Wastewater Treatment Plant. In addition, the City and County of Honolulu Department of Wastewater Management (WWM) is designing a new relief sewer in Nimitz Highway and anticipates its completion sometime in 1996. The design and construction of the sewer lines will be in accordance with WWM Sstandards, and the installation will be subject to their facility and use charges.

4.2.2.4.c. Drainage System

The site is practically level with an elevation of 8 feet above mean sea level. As most of the surface area of the project will be paved to accommodate necessary functions, the proposed drainage system will be designed to collect surface runoff prior to eventual discharge into Kapalama Basin. No new industrial effluent will be allowed into the drainage system for discharge into Kapalama Basin. Industrial discharge will be conveyed to oil/water separators whereupon wastewater will be conveyed to the wastewater system. Waste oil from the oil/water separator will be collected by a hazardous waste management company for proper disposal off-site. Dry wells can also be used for the new facility. A regulated waste management plan will be developed as part of the Department of Health permit requirements.

Runoff within the facility's parking area will be collected by catch basins which will then convey the water into the Kapalama Basin. The project area will be graded to facilitate sheet flows to drainage inlets. Storm runoff from the parking lot will also be designed to preclude entry to the drain provided for the washdown area.

A National Pollutant Discharge Elimination System (NPDES) Permit for Stormwater Discharge will be required for the new drainage system.

4.2.2.4.d. Solid Waste Disposal

Solid waste generated from the project will likely be transported by private refuse collection service and either landfilled or disposed of at the H-Power Plant at Campbell Industrial Park. Alternative disposal sites include the Kalaheo Landfill in Kailua, the Waimanalo Gulch landfill near the Kahe Power Plant and the Waipahu Incinerator.

4.2.2.4.e. Power and Communication Systems

The Hawaiian Electric Company can provide 120 and 240 volt electrical service to the site. The service will be by overhead lines to a pole in the vicinity of the proposed Look Laboratory building near the north east corner of the site. Underground service will be provided to buildings, dockside utility boxes and wherever required.

Telephone and communication lines can parallel the electrical distribution system – overhead to the site and underground on-site.

4.2.2.4.f. Fuel

There are no fuel lines to the project site at present. A vehicle refueling facility is, however, deemed highly desirable and a site for a small facility has been indicated on the Master Plan. The facility will include an above-ground fuel storage tank for vehicles, in conformance with fire and safety regulations. All ocean vessels will be fueled by tank trucks.

Gas lines are located along Nimitz Highway so gas service could also be provided. Although gas service was not deemed necessary, if ever required, lines can be extended to the Pier 38 site or LPG can be provided by truck delivery.

4.2.2.5. Security

The existing security fence would be replaced with a new fence to close off adjacent land. Area lighting will also contribute to safety and enhance security.

4.2.2.6. Employment

Following construction, it is estimated that the proposed facility will support six additional full-time positions.

SECTION 5
Alternatives Considered

5.1. ALTERNATIVE LOCATIONS

5.1.1. Remain at Snug Harbor (no action)

The Honolulu Waterfront Master Plan (October 1989) recommends the redevelopment of the Kapalama area, including Snug Harbor, to provide for a full-scale, modern containerized cargo terminal to meet projected future maritime needs to the year 2010 and inter-modal warehouse/distribution facilities. The Master Plan proposed to accomplish this by 1) purchasing the Kapalama Military Lands; 2) relocating the University of Hawaii's Marine Research Center at Snug Harbor to Keehi Lagoon triangle; and 3) redeveloping Piers 37/38 for the relocation of the Honolulu Shipyard operations.

The first of these tasks has been accomplished. The State has expended approximately $96 million to purchase the former military reservation. With the formal transfer and acquisition of the lands completed in October 1993, the State is now in the process of soliciting a private developer, through a Request for Proposals (RFP) process, to construct required improvements for the Kapalama Development complex. As a result, existing Snug Harbor facilities and operations must be relocated.

5.1.2. Relocate to Keehi Lagoon

As stated above, the Honolulu Waterfront Master Plan envisioned relocating the University's marine research facilities to a new Marine Science and Research Center on reclaimed land at Keehi Lagoon. However, further study and evaluation of this proposal revealed potentially significant economic and environmental issues. In addition, given the lengthy regulatory process associated with developing the Keehi Lagoon site, the State would be unable to accommodate the anticipated accelerated schedule of acquiring and redeveloping the Kapalama Development Complex. As a result, Honolulu Shipyard operations will remain at Pier 41 in order to accommodate the UH Marine Research Facility and other related facilities at Pier 38.

5.1.3. Relocate to Pier 1

Although relocation to Pier 1 was the alternative preferred by the University, use of this site for the University's research activities is incompatible with the Honolulu Waterfront Master Plan recommendations for permanent cruise ship terminals and future itinerant, lay-by berthing demands. More important, Pier 1 is one of Honolulu Harbor's most valuable deepwater and emergency berths, and both the Master Plan and the State Department of Transportation's 2010 Harbor Plan call for maintaining Pier 1 as a single contiguous pier and having it function as such, indefinitely.

5.2. ALTERNATIVE LAYOUTS

5.2.1. Redevelop Pier 37

There was some preliminary discussion about relocating small research vessels to Pier 37. This arrangement, however, would eliminate pier space that is currently used for itinerant berthing by long-line fishing boats and could interfere with future operations of the Fresh Fish Wholesale Distribution Center.

5.2.2. Add Finger Pier for Small Crafts

Another alternative considered involved constructing a finger pier adjacent to the proposed inboard wharf (Pier 37B). The major features of this design are summarized below:

Pier 38A (Outboard Wharf)

Wharf Dimensions:	330 feet long, with 45-ft-wide apron
Berth Depth:	Dredge to 30-ft depth (capable of supporting the larger, deeper-draft research vessels)
Berth Width:	Approximately 98 feet from wharf edge to Pierhead Line

Pier 38B (Inboard Wharf)

Wharf Design:	Vertical sheetpile bulkhead with tiebacks; located approximately 20 feet inboard of the existing waterline
Dimensions:	500 feet long (455-ft vertical sheetpile bulkhead plus 45-ft apron from Pier 38A)
Berth Depth:	Dredge to 26-ft depth
Berth Width:	45 feet (includes 5-ft allowance for fenders)

Floating Pier

Wharf Design:	Vertical sheetpile bulkhead with floating dock secured by concrete guide piles; the hard edge of the pier will be located approximately 330 feet from Pier 39 across Kapalama Channel, four feet from the edge of the bulkhead
Dimensions:	20 feet-long x 6 feet-wide
Berth Depth:	Dredge to 15-ft depth
Number of Accesses:	Two (at minimum)

This design was not selected because the University requested that the 200-ft floating dock be eliminated in exchange for increasing the length of Pier 38B from 500 linear feet to 700 linear feet.

5.2.3. Open Wharf

Alternative wharf designs were developed, based on the following design assumptions:

Water Depths:	As shown on NOAA Chart 19367 of Honolulu Harbor and the bathymetry chart provided by Harbors Division.
Open Wharf:	Open wharf cross-section similar to that of similar designs for 1,000 psf live loads, with bent spacing at 10 feet and 6 vertical and 1 batter pile per bent.
Bearing Piles:	Bearing piles will be 20-inch octagonal pre-stressed piles. *Tip elevation will depend on* site-specific soils studies. For planning/cost estimate purposes, assume 20-inch octagonal piles, with a final tip elevation of 110 feet MLLW and total pile length of approximately 120 feet.
Cut Slopes:	After dredging, cuts will be stabilized at 1V:2H slope. For all open wharf configurations, this slope angle will determine the height of the sheetpile cut-off wall at the back bulkhead. A revetted slope may be substituted for the cut-off wall.

This design was superseded by the 345-ft slip-width constraint prescribed by the State Department of Transportation (refer to Attachment B).

SECTION 6
Determination and Findings

6.1. Determination

The proposed Pier 38 Master Plan project is not anticipated to cause significant negative impacts to the environment. It has therefore, been determined that a negative declaration will be issued.

6.2. Findings and Reasons Supporting Determination

The following findings are based on the information provided above:

a. *The proposed project will not involve an irrevocable commitment to the loss or destruction to any natural or cultural resource;*

b. *The proposed project will not curtail the range of beneficial uses of the environment;*

c. *The proposed project will not conflict with the State's long-term environmental policies;*

d. *The proposed project will not substantially affect the economic or social welfare of the community or State;*

e. *The proposed project will not involve substantial secondary impacts, such as population changes or effects on public facilities;*

f. *The proposed project will not involve a substantial degradation of environmental quality;*

g. *The proposed project will not substantially affect any rare, threatened or endangered species of flora or fauna or habitat. No endangered species of flora or fauna are known to exist in any of the facility sites;*

h. *The proposed project will not detrimentally affect air or water quality or ambient noise levels; and*

i. *The various elements of the proposed project will not be located in any environmentally sensitive area, such as a flood plain, tsunami zone, erosion-prone area, geologically hazardous land, estuary, frewhwater or coastal waters.*

For the reasons above, the proposed project will not have any significant effect in the context of Chapter 343, Hawaii Revised Statutes and §11-200-12, Hawaii Administrative Rules.

ATTACHMENT A
Evaluation of Facility Needs

ATTACHMENT A
Evaluation of Facility Needs

Facilities studied include the following: the UH Marine Center; J.K.K. Look Laboratory; the Hawaii Undersea Research Laboratory (HURL); the National Marine Fisheries Service's Kewalo Research Facility; and the National Oceanic and Atmospheric Administration (NOAA) Corps Operations activities at the UH Marine Center. The evaluation included a review of the functions carried out at the facilities, type and amount of existing space utilized, and future space needs. It also identified duplicate activities that could be consolidated to achieve a more efficient use of space.

A.1. UH Marine Center

The mission of the UH Marine Center, also known as "Snug Harbor", is to provide port facilities and services in support of UH marine research programs in Hawaiian coastal waters, the Pacific, and world wide. Administered as a support facility of the University of Hawaii's School of Ocean and Earth Science and Technology (SOEST), the UH Marine Center relies primarily on federal funding to carry out its operations.

Direct vessel support functions include operational, engineering and logistics management; ship maintenance, repair and modification; ship loading and unloading; communications; security; machine shop repair and fabrication services; purchasing; warehousing; and shipping and receiving.

In addition to direct vessel support, the UH Marine Center provides facilities for fabrication of research equipment and staging of research programs. Program staging functions include electronic instrumentation development, testing and maintenance; staging and fitting for large equipment such as manned submersibles and towed sub-surface electronic mapping systems; shoreside laboratories for readying research programs; and staging for pre-cruise mobilization and post-cruise demobilization.

Ocean going vessels utilizing the UH Marine Center are summarized in Table A1. Currently, the UH Marine Center is home-berth for and provides full husbandry support to two UH research vessels, the R/V *Moana Wave* and the R/V *Kila*. In 1993, the University will take delivery of a third ship, the R/V *Ka'imikai-O-Kanaloa*. The University plans to replace the *Moana Wave* with a larger, more capable vessel; the target date for replacement is 1997. The UH also expects to replace the *Kila*.

The UH Marine Center is also home-berth for the NOAA ship *Townsend Cromwell*, and the facility accommodates staff and equipment of the NOAA Office of Corps Operations. Most of the voyages undertaken by the *Townsend Cromwell* are in service to NMFS research programs. NOAA port operations are evaluated below.

In addition to serving its own research vessels, the UH Marine Center provides port services to other ocean-going research vessels through its membership in the University National Oceanographic Laboratory System (UNOLS). This organization is comprised of major U.S. universities which have substantial, federally supported programs in marine studies. Under the UNOLS Charter, the UH cooperates with other member institutions to share ships, equipment, and ship support facilities. Intended to optimize use of the U.S. academic fleet, UNOLS provides a mechanism for cooperative scheduling of facility use. Over the past five years, the UH Marine Center has typically provided support for four to nine visiting research vessels, with an average of 80 port-days per year. This activity may increase due to the possibility of these federally funded academic ship operations being consolidated nationwide within three to four years. Hawaii can expect one and possibly two additional ships under its operational responsibility.

Finally, the UH Marine Center houses SOEST oceanographic data storage facilities, including 1) an archive for paper, photographic and computer media and 2) storage for geological samples and cores. These facilities are clearly not harbor-dependent and could be located elsewhere.

Tables A2 and A3 summarize the major facilities which comprise the existing UH Marine Center. This information was obtained by analysis of building plans and on-site observations. Buildings surveyed include the Administration/Warehouse building, the Core Storage Building, the Machine Shop building, and the "concrete module" building which preexisted the UH Marine Center's occupancy of the site and only parts of which are in active use.

The UH Marine Center presently has a 200-ft floating pier used for University sailboats, the Look Laboratory's 45-ft work boat SEAHORSE, and other smaller boat activities. Table A7 lists the various small boats that will be home-berthed at the Research Facility. These boats can be accommodated with the amount of pier space proposed, although they may require special docking arrangements

A.2. J.K.K. Look Laboratory

Originally established by the U.S. Army Corps of Engineers as a hydraulic modeling facility, Look Laboratory was turned over to the University's Department of Ocean Engineering in the mid-1960s. Over the years, research uses expanded to include in-ocean testing and computer modeling. The Laboratory is also used for graduate instruction in ocean engineering.

When the department was incorporated into SOEST, Look Laboratory's mission was enlarged to incorporate research activities of the Hawaii Natural Energy Institute and to act as headquarters for the National Marine Minerals Technology Center (MMTC), which is administered through the Hawaii Natural Energy Institute (HNEI). It is SOEST's intention that Look Laboratory serve as its primary site for ocean technology research. Following is a summary of functions being carried out at Look Laboratory:

- Ocean engineering research on coastal structures and harbors utilizing hydraulic model testing facilities, including a 40-ft x 80-ft modeling basin, a 4-ft x 180-ft-deep wave flume, and a 12-ft x 80-ft towing tank.
- In-ocean data collection, supported by a 31-ft catamaran based in Kewalo Basin and used for deploying current meters, wave gauges and other instrumentation, as well as serving as a diving platform. A 41-ft mono-hull, also based in Kewalo Basin but currently under repair, is used similarly.
- In-ocean tests and experiments using the seven-acre shallow-water Makai Range, located off Point Panic. The Makai Range has been provided with power cables and a fiber optic data cable.
- Field and laboratory classes for the 40-student graduate program in ocean engineering. Students use computer and classroom facilities at Look Laboratory, as well as undertaking research using the hydraulic modeling and in-ocean facilities and equipment.
- Offices and library for the Marine Minerals Technology Center.
- Projects and experiments under the sponsorship of MMTC, which use space in the main Look Laboratory building.

These functions are supported by a machine shop, welding area, wood shop, electronics shop, diving locker, boat locker, and offices for staff. All of these are housed within the main building, a large warehouse structure with mezzanines. The building dimensions and the area taken up by various functions is described in Table A4.

In addition, there is outside storage and a staging area for materials and equipment used in building coastal models in the modeling basin.

Also currently occupying the Kewalo site are facilities which are in apparent disuse or are not closely related to Look Laboratory's primary mission. These include a large pressure vessel, a tank and pump for the Alternative Fuels Project, and a small frame building used as a wind tunnel. There is also a 2,000-sf modular building that has recently been outfitted for the planned wet laboratory facility. The wet laboratory has no direct programmatic relationship to Look Laboratory's ocean engineering functions.

As shown in Table A4, Look Laboratory's main building has 18,000 sf under roof, and the usable floor area is increased by large mezzanines.

A.3. Hawaii Undersea Research Laboratory

The mission of the Hawaii Undersea Research Laboratory (HURL) is to conduct deep-ocean tests, data collection, and experimentation using manned and unmanned submersible vessels. HURL presently consists of two semi-autonomous divisions: the manned submersible division based at Makai Pier, Waimanalo, and the ROV (Remote Operated Vehicle) division based at the UH Marine Center. Administrative offices are located at UH-Manoa.

Two manned submersibles are based at Makai Pier: the Makali'i, with a 440-meter depth rating; and the Pisces V, with a 2,000-meter capability. The Makali'i is not in service at this time but may be reactivated. The Launch/Recovery Transport (LRT) used to launch the Pisces V is moored alongside the dock. There are six existing staff positions, and two more may be added when the new support ship (*R/V Ka'imikai-O-Kanaloa*) arrives. Staff accompanies the submersible on research cruises.

The manned submersible operations are housed in a hangar-style building with a 3,300-sf footprint and mezzanine offices. Table A5 summarizes building dimensions and space utilization. An important feature of the building is an overhead bridge crane. The submersibles are frequently stripped down to the bare pressure hulls, and the bridge crane provides the very precise lifting capability needed. The machine shop serving the submersibles has special equipment and probably could not be combined with the UH Marine Center machine shop.

SOEST has submitted a Capital Improvement Program (CIP) request through the University to construct a new 5,000-sf manned submersible building at the UH Marine Center at a projected cost of $2.5 million. The additional floor area would relieve congestion in the existing facility and allow for program expansion. There is a long-term possibility of adding a second Pisces class submersible, which could be accommodated in the proposed new building. Requirements for the new facility include the following:

- a site near the water, since the submersibles are lifted off the support ship by crane and then rolled into the maintenance building;
- possibly a track system for guiding the transport dolly from the dock to the building;
- a hangar- or warehouse type building with at least one overhead bridge crane; and
- the ability to leave the 50-ft-long LRT in the water, when necessary.

The ROV division is being developed to provide a deeper diving capability and to provide back-up for the Pisces V submersible. The division has three staff members and plans to add two additional staff.

Currently based at the UH Marine Center, the ROV division uses space within the Core Storage Building. As shown in Table A2, the building houses a HURL electronics laboratory and a storage area and darkroom for the ROV program. In addition, the ROV program utilizes staging areas in the building and has one launch/recovery transport. The small vessel provides support for manned submersibles and in port approximately 240 days/year.

Outside storage includes the following: a cable winch A-frame (8-ft x 15-ft); two 7-ft-diameter ROV launchers; a control van (9-ft x 15-ft); a 20-ft container holding a camera sled; three 4-ft-diameter workstands; 10-ft x 10-ft cable storage; and two 40-ft containers holding equipment, spare parts and files.

A.4. National Marine Fisheries Service - Kewalo Research Facility

The Kewalo Research Facility serves the research and management functions of the Honolulu Laboratory, one of four fishery research laboratories comprising the Southwest Fisheries Science Center of the National Marine Fisheries Service (NMFS). NMFS is part of the National Oceanic and Atmospheric Administration (NOAA), administered by the U.S. Department of Commerce. In earlier years, research efforts focused on tuna physiology and behavior, but current research is concentrated on fish populations and fishery management, as well as on protected species populations. Currently, most of the research is conducted aboard vessels – primarily the *Townsend Cromwell* and the Honolulu Laboratory's 33-ft research vessel, the *Kaahele'ale.* The main offices of the Honolulu Laboratory are located on Dole Street, near UH-Manoa.

The Kewalo Research Facility currently occupies a 1.25-acre site at Kewalo Basin, leased from the State of Hawaii. The site is occupied by outside tanks for maintaining fish and other non-mammal species for research; outside storage of ocean-going research equipment; and a warehouse-type building which is shared with the Department of Transportation, Harbors Division. The research facility serves the following functions: 1) a wet laboratory for animal research; 2) a storage and staging area for ship-based research; and 3) a base office for fishery data collection – i.e., daily monitoring of fish catches.

The wet laboratory function takes advantage of a clean seawater supply pumped directly from the coral aquifer underlying the site. This function cannot be moved to Pier 38 due to lack of a clean seawater source at that site.

The gear storage and cruise staging function can be moved, and the Honolulu Laboratory has stated a preference for locating this function at the site where the *Townsend Cromwell* will be berthed. Table A6 summarizes the areas currently used to carry out this function.

A.5. NOAA Corps Operations / Home-Berthing for the *Townsend Cromwell*

The Office of Corps Operations currently maintains a staff of three, headed by the Port Captain, to provide shore support for the *Townsend Cromwell* at its current UH Marine Center home-berth. While the U.S. Coast Guard had informed the Honolulu Waterfront Project that it would provide a home-berth for the *Townsend Cromwell* in its Base Honolulu Master Plan, the Project is currently giving consideration to berthing the NOAA ship at the proposed Marine Research Facility because of its relationship to NMFS and the compatibility of its operations with UH port operations.

As reflected in Table A1, the *Townsend Cromwell* is at sea 66 percent of the year, spending an average of 121 days/year in port. To provide shore support, the NOAA staff currently occupies about 20 percent of the UH Marine Center Warehouse and uses additional space for outside storage. Current use of space is summarized in Table A6.

TABLE A1
OCEAN GOING VESSELS USING THE UH MARINE CENTER

UH VESSELS	DIMENSIONS	CAPABILITIES	NEEDS	AVERAGE PORT DAYS
R/V Moana Wave	213' x 36' x 14'	Ocean-going, multi-capability research vessel	440V electrical power, water supply, sewer connection, cable TV, telephone, trash service	85 / yr
R/V Kila	104' x 24' x 13'	Used in local waters, multiple capabilities including diving support	Same, except requires only 220V power	240
R/V Ka'imikai-O-Kanaloa	214' x 38' x 16'	Ocean-going, multiple capabilities including as "mother ship" for HURL manned submersibles	Same as for *Moana Wave*	125 (est.)
Other Major Vessels				
Townsend Cromwell (NOAA)	165' x 33' x 12'	Ocean-going, multiple capabilities including fisheries population research and endangered marine mammal research	Same	121
UNOLS Vessels	Length: 150'-275' Beam: 30'-40' Draft: 12'-16'	Various	Same	80

TABLE A2
UH MARINE CENTER:
Existing Space by Facility and Function

FACILITY/FUNCTION	EXISTING SPACE				CEILING HEIGHT
Main Building					
Offices, Meeting Room	32 x 52	=	1,664		
Electronics Lab	32 x 52	=	1,664		
			3,328	sf	8'
Shipping/Receiving Warehouse[1]	70 x 104	=	7,280	sf	16' to eave 21' to peak
Machine Shop Building					
(includes welding and fabrication)	60 x 80	=	4,800		
	20 x 40	=	800		
			5,600	sf	35'
Core Storage Building					
(geological sample storage; archives; HURL electronics lab; staging area[2]; lab space)	51 x 102	=	5,202		
	51 x 136	=	6,936		
			12,138	sf	15'
Old Concrete Modular Building					
(shoreside labs)			550	sf	8'

[1]Includes space currently occupied by NOAA in support of the *Townsend Cromwell*: 375 sf office space; approx. 1,100 sf warehouse space.

[2]HURL's Remote Operated Vehicle (ROV) program and other research projects use this space as needed for equipment assembly and staging.

TABLE A3
EXISTING CORE STORAGE BUILDING, UH MARINE CENTER:
Summary of Space and Functions

FUNCTION	EXISTING SPACE	UTILIZATION
Geological Sample Storage		
Core and Rock Storage (containers on shelving) and open area	3,460 sf	40%
"Dry Core Storage" (misc. storage)	1,730	10%
Refrigeration Room (misc. storage; refrigeration not in use)	870	10%
Subtotal: Geological Sample Storage	6,060 sf	30%
Archives (incl. computer tapes, records on paper)	1,300 sf	40%
Staging and Shoreside Labs		
HURL Electronics Lab	440 sf	80%
Equipment Staging Area	710	90%
Laboratory Space	710	90%
Darkroom, ROV Storage	1,020	80%
Meteorological Project	150	n.a.
Subtotal: Staging and Labs	3,030 sf	
Other	870 sf	10%
Restrooms, Mechanical, etc.	870 sf	—

TABLE A4
LOOK LABORATORY:
Existing Space by Facility and Function

FACILITY/FUNCTION	EXISTING SPACE				
MAIN BUILDING					
Footprint:	180'	x	100'	=	18,000 sf
Ceiling Height:	20' to eave/40' to peak				
Main Floor					
Modeling Basin and Towing Tank	100'	x	80'	=	8,000 sf
Machine Shop/Welding/Research Projects/ Fabrication & Staging	80'	x	65'	=	5,200 sf
Boat Locker	20'	x	15'	=	300 sf
Affiliate Faculty / Utility Office	40'	x	15'	=	600 sf
Under Mezzanine	165'	x	16'	=	2,640 sf
Tool Storage/General Shop					
Electronics Lab					
MMTC Library					
Dive Locker					
Restrooms					
Mezzanine	165'	x	20'	=	3,300 sf
Offices - Look Lab					
Offices - MMTC					
Classroom / Conference Room					
Computer Room					
SPECIAL EQUIPMENT (outside)	180'	x	4'	=	720 sf
Deep Wave Flume					
HYPERBARIC BUILDING[1]	approximately				3,000 sf
OUTSIDE STORAGE AND STAGING AREA	approximately				20,000 sf
Forklift, front-end loader					
Stockpiles and staging for modeling basin					
Anchors					

[1]Building not currently used for Look Laboratory operations.

Facilities not proposed for relocation: Large pressure vessel; alternative fuels underground tank and pump; portable bldgs. being remodeled as wet lab.

TABLE A5
HAWAII UNDERSEA RESEARCH LABORATORY:
Existing Space by Facility and Function

FACILITY/FUNCTION	EXISTING SPACE
MAKAI PIER BUILDING	
Manned Submersible Program	Footprint: 3,300 sf Ceiling height (est.): 20' to eave / 35' to peak
Main Floor Dismantling/Assembly/Repair of submersible vessel; also welding shop and inflatable boat storage	2,700 sf
Machine Shop	600 sf
Mezzanine 1 Office & equipment storage	800 sf
Mezzanine 2 Diving equipment & general storage	800 sf
SPECIAL EQUIPMENT Overhead bridge crane to move submersible(s) within the building	
OUTSIDE STORAGE & STAGING AREA	2,350 sf

TABLE A6
EXISTING SPACE FOR (1) NOAA CORPS OPERATIONS - HOME-PORT FOR *TOWNSEND CROMWELL* AND (2) NMFS HONOLULU LABORATORY - STAGING & EQUIPMENT STORAGE FOR OCEAN RESEARCH

FUNCTION	EXISTING SPACE
NOAA[1]	
Shipping/Receiving Warehouse	20% of 7,280 sf = 1,460 sf
Covered Outside Storage	1,200 sf
Uncovered Storage	5,200 sf
NMFS[2]	
Covered Storage	3,620 sf
Uncovered Storage	8,000 sf
Office, interior storage	700 sf

[1]Occupying approximately 20% of the UHMC Warehouse, this includes a 375-sf office space.

[2]Currently located at the NMFS Kewalo Research Facility.

TABLE A7
SMALL VESSELS PROPOSED FOR RELOCATION TO PIER 38

FACILITY/VESSELS	DIMENSIONS	CAPABILITIES	AVERAGE PORT DAYS
HURL Launch/Recovery Transport	50'x25'	Support for manned submersible	Approx. 240 / year Can be stored on land
Look Lab *Sea Horse** *Tinker I** (motorized catamaran)	44'x16' 31'x12.5'	Used in nearshore waters for deployment of instruments; sampling sand deposits; sub-bottom profiling; dive support; laboratory classes	364/year 364/year
NMFS *Kaahele'ale**	33'x11'	Used for tagging fish, turtles; tracking sonic tags; various UH research activities	Approx. 180 / year Can moor next to *Townsend Cromwell* Also berths at & operates from Coconut Island

*Vessels currently berthed at Kewalo Basin.

ATTACHMENT B
Docking Requirements

ATTACHMENT B
Docking Requirements

The following minimum docking requirements are based on the potential users' vessel data and consultation with the State Department of Transportation, Harbors Division.

B.1. Definition of Slip Width

In preparing the Pier 38 Master Plan, the Department of Transportation, Harbors Division was consulted about extending Piers 38A and 38B to the existing Pierhead and Bulkhead Lines. (The Pierhead and Bulkhead Lines affecting the site are shown on the Schematic Site Plan.)

The existing Pierhead Line lies approximately 140 feet beyond the end of Pier 38A (towards Kapalama Basin) but is contiguous with the end of the adjacent Pier 39. The Department of Transportation, Harbors Division has indicated that the Marine Research Facility could utilize the area up to the Pierhead Line for new piers and ship berthing. In other words, Pier 38A could be extended seaward insofar as the wharf structure and vessels berthed at the pier do not extend beyond the Pierhead Line.

The siting and use of the future wharf at Pier 38B depends on the ability of the slip between Piers 38B and 39 to accommodate anticipated vessel operations. (The slip is at the mouth of Kapalama Stream.) Pier 39 is currently being redeveloped as part of the new Inter-Island Barge Terminal, so the slip must accommodate barge operations. The Department of Transportation, Harbors Division has determined that the minimum width of the slip should be 345 feet, based on the following:

- 5-ft fender at Pier 39;
- 80-ft-beam interisland barge berthed at Pier 39;
- 80-ft barge passing the berthed barge;
- 35-ft-beam tugboat on the hip of the passing barge;
- 100-ft maneuvering area;
- 40-ft maximum beam dimension of research vessels berthed at Pier 38B (governing beam dimension)
- 20-ft maximum beam dimension of research vessels berthed at the floating dock; and
- 5-ft fender at Pier 38B.

According to measurements scaled from existing charts and surveys, the slip will need to be widened in order to accommodate research vessel berthing at a new Pier 38B wharf. It is estimated that the edge of the wharf needs to be constructed approximately 20 feet inland from the existing water line. This will increase the amount of dredging needed and limit the wharf to a bulkhead design. It will also reduce the land area available at the site by about 9,000 sf.

B.2. Berth and Wharf Requirements

Following are recommended berth and wharf requirements based on vessel dimension data, average port-days per year (see Table A1), desired loading capacities, and anticipated future expansion needs:

Berth Width:	40 feet
Berth Depth:	20 - 30 feet Minimum 20 feet based on 16-ft draft, plus 4-ft clearance. Depths up to 30 feet should be provided for at least some berths.
Siltation:	The rate of siltation at both inboard (Pier 38) and outboard (Pier 37) bulkheads since 1982 has been negligible. Therefore, over-dredging to a depth of 30 feet along Pier 38 to accommodate siltation appears costly and unnecessary.
Berth Length:	1,030 feet of improved wharf with an additional 330 feet of nesting area at Pier 38A. Current berthing at the UH Marine Center is 600 feet of improved wharf space and 500 feet of nesting area. To accommodate all four ocean-going home-berthed vessels at one time would require 700 lf of berth space. In addition, three smaller vessels are proposed for home berthing (see Table A2).
Wharf Width:	Must be adequate for staging and handling of scientific equipment, machinery and supplies during vessel loading and unloading and vessel maintenance activities. Maneuvering room is necessary for vehicular traffic and truck crane operation. Recommended minimum width is 45 feet, the same as at the UH Marine Center's existing Pier 44.
Wharf Elevation:	Recommended top of dock elevation is +8 feet MLLW; may vary ±1-2 feet depending on wharf design.
Vertical Load:	Recommended design capacity for uniform loading of 1,000 pounds per square foot, truck loading equal to H 20 S44 of the American Association of State Highway and Transportation Officials, and operation of a 70-ton truck crane.
Dock Utilities:	Recommended dockside utilities include water, 440V (3 Phase, 500 amps), 220V (3 Phase, 300 amps) and 110V (20 amps) electrical power, telephone, sewer connection, oily wastewater separator, low pressure compressed air, and Cable TV. The location and number of dock boxes required will be evaluated during the detailed design stage. The UH Marine Center has requested that each dock box be individually metered for both power usage and peak (demand) power.
Wharf Lighting:	It is recommended that all wharf areas be illuminated to lighting levels sufficient to satisfy security and safety requirements.

ATTACHMENT C
Parties Consulted in Preparation of Draft Environmental Assessment

ATTACHMENT C
Parties Consulted in Preparation of the Draft Environmental Assessment

In accordance with the State's EIS rules concerning early consultation [§11-200-9, HAR], a letter was sent to various organizations and individuals informing them that an environmental assessment for this project was being prepared, and requesting their comments on the proposed development. The following is a list of the parties consulted and any comments received:

Federal Agencies
Department of Commerce
National Marine Fisheries Service
Department of Interior
U.S. Fish and Wildlife Service
Department of the Army
U.S. Army Corps of Engineers

State Agencies
Department of Accounting and General Services
Department of Health
Department of Land and Natural Resources
Department of Transportation
Hawaii Community Development Authority
Office of Environmental Quality Control

University of Hawaii
Environmental Center

City & County of Honolulu
Board of Water Supply
Building Department
Department of Land Utilization
Department of Public Works
Department of Transportation Services
Department of Wastewater Management
Planning Department

Public Utility Groups
Hawaiian Electric Company
The Gas Company – BHP Petroleum

Other Interested Parties
Chevron U.S.A. Products Company
Kalihi-Palama Community Council
Kalihi-Palama Neighborhood Board No. 5

JOHN WAIHEE
Governor

RECEIVED
WATERFRONT PROJECT
Oct 12 1 55 PM '93
BUSINESS & ECONOMIC
DEVELOPMENT

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
220 SOUTH KING STREET
FOURTH FLOOR
HONOLULU, HAWAII 96813
TELEPHONE (808) 586-4185

BRIAN J. J. CHOY
Director

October 11, 1993

Daniel Orodenker, Special Assistant to the Director
Department of Business, Economic Development and Tourism
220 S. King Street, 11th Floor
Honolulu, Hawaii 96804

Attention: Chris Chung

Dear Mr. Orodenker,

Subject: Pier 38 Marine Research Facility Environmental Pre-Assessment, Honolulu Harbor, Oahu, Hawaii

Thank you for the opportunity to review and comment on the above project in its pre-assessment phase. The preliminary information you provided did not discuss potential environmental impacts. However, since you are soliciting comments from numerous State and federal agencies as well as community groups, who will request consideration of their particular concerns, we will restrict our comments to general issues.

We anticipate that the Environmental Assessment will include the following:

1) A thorough technical description of the proposed action, including discussions of the various types of research to be conducted at Pier 38.

2) Disclosure of the use, containment and disposal of hazardous materials in connection with the operation of a boat maintenance facility and laboratory research facilities.

3) Proposed phasing and timing of the project.

4) Summaries of major impacts (short- and long-term) pertaining but not limited to:
   A) operational and financial interests of occupants at neighboring sites;
   B) marine flora and fauna;
   C) water quality;
   D) land and harbor traffic.

5) Measures to mitigate adverse impacts.

6) Discussion of alternative sites considered.

If you have any questions, please call Faith Caplan at 586-4185.

Sincerely,

Brian J.J. Choy
Director

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR

C. MICHAEL STREET
DIRECTOR AND CHIEF ENGINEER

KENNETH SPRAGUE
DEPUTY DIRECTOR

ENV 93-222

October 12, 1993

RECEIVED
WATERFRONT PROJECT
Oct 14 11 34 AM '93
BUSINESS & ECONOMIC DEVELOPMENT

Mr. Daniel E. Orodenker
Special Assistance to the Director
Department of Business, Economic
Development and Tourism
State of Hawaii
Central Pacific Plaza
220 South King Street, 11th Floor
Honolulu, Hawaii 96813

Dear Mr. Orodenker:

Subject: Pre-Environmental Assessment (PEA)
Pier 38 Marine Research Facility
TMK: 1-5-42: 03 and 07

We have reviewed the subject PEA and have the following comments:

1. The PEA should address the potential impact of storm water discharge associated with construction activities on water quality of the receiving waters.

2. If dewatering is anticipated during the construction, dewatering permits are required by the State Department of Health as well as the Department of Public Works, City and County of Honolulu.

3. We suggest that a copy of the PEA be forwarded to the Department of Wastewater Management for their review and comment.

Should you have any questions, please contact Mr. Alex Ho, Environmental Engineer, at 523-4150.

Very truly yours,

C. Michael Street

C. MICHAEL STREET
Director and Chief Engineer

BUILDING DEPARTMENT
CITY AND COUNTY OF HONOLULU
HONOLULU MUNICIPAL BUILDING
650 SOUTH KING STREET
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FRANK F. FASI
MAYOR

HERBERT K. MURAOKA
DIRECTOR AND BUILDING SUPERINTENDENT

WILLIAM F. REMULAR
DEPUTY

PB 93-1012

October 20, 1993

Mr. Daniel E. Orodenker
Special Assistant to the Director
Department of Business, Economic
Development & Tourism
P. O. Box 2359
Honolulu, Hawaii 96804

Dear Mr. Orodenker:

Subject: Pre-assessment Consultation for the
Pier 38 Marine Research Facility
Environmental Assessment
Honolulu Harbor, Oahu, Hawaii

We have reviewed the subject pre-assessment and have no comments to offer. Thank you for including us in your pre-assessment consultation.

Very truly yours,

HERBERT K. MURAOKA
Director and Building Superintendent

cc: J. Harada

RECEIVED
WATERFRONT PROJECT
Oct 22 12 41 PM '93
BUSINESS & ECONOMIC
DEVELOPMENT

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

REPLY TO
ATTENTION OF
Operations Division

October 28, 1993

RECEIVED
WATERFRONT PROJECT
Oct 29 10 01 AM '93
BUSINESS & ECONOMIC
DEVELOPMENT

Mr. Daniel E. Orodenker
Special Assistant to the Director
Department of Business, Economic Development
and Tourism
P.O. Box 2359
Honolulu, Hawaii 96804

Dear Mr. Orodenker:

This is in response to your October 8, 1993 letter, providing preliminary information on the Pier 38 Marine Research Facility, Honolulu Harbor, Oahu, Hawaii. The project involves development of shoreside facilities, pier improvements and infrastructure on a 6.3-acre site.

As noted on page 3 of the Early Assessment, a Department of the Army (DA) permit is required for all work below the mean high water line. The DA permit application should include appropriate drawings showing the wharf construction and dredging, and should describe the construction methods and disposal of dredged materials.

We appreciate the opportunity to participate in this early review. File No. PO 94-008 has been assigned to this project. Please refer to this number in future inquiries or correspondence.

Sincerely,

Michael T. Lee
Chief, Operations Division

PLANNING DEPARTMENT
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR

ROBIN FOSTER
CHIEF PLANNING OFFICER

ROLAND D. LIBBY, JR.
DEPUTY CHIEF PLANNING OFFICER

TH 10/93-2389

October 29, 1993

Mr. Daniel E. Orodenker
Special Assistant to the Director
Department of Business and Economic
Development and Tourism
State of Hawaii
P.O. Box 2359
Honolulu, Hawaii 96804

Dear Mr. Orodenker:

Pre-Assessment Consultation for the
Pier 38 Marine Research Facility Environmental
Assessment, Honolulu Harbor, Oahu, Hawaii

In response to your letter of October 8, 1993, we have reviewed the subject consultation and offer the following comments:

1. We have no objections to the proposed project.

2. The proposed project site is located in the Kalihi-Palama Special Area which has a general height limit of 70 feet in accordance with Section 24-2.2(b)(10)(G) of the Development Plan (DP) Special Provisions for the Primary Urban Center.

3. A DP Public Facilities Map amendment is required to add a College symbol to identify the proposed project on the Primary Urban Center DP Public Facilities Map.

Thank you for the opportunity to comment on this matter. Should you have any questions, please contact Tim Hata of our staff at 527-6070.

Sincerely,

ROLAND D. LIBBY, JR.
Acting Chief Planning Officer

RDL:js

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
HONOLULU MUNICIPAL BUILDING
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR

JOSEPH M. MAGALDI, JR.
DIRECTOR

AMAR SAPPAL
DEPUTY DIRECTOR

TE-4037
PL93.1.401

October 29, 1993

Mr. Mufi Hannemann, Director
Department of Business,
Economic Development & Tourism
State of Hawaii
P. O. Box 2359
Honolulu, Hawaii 96804

Dear Mr. Hannemann:

Subject: Honolulu Harbor - Pier 38 Marine Research Facility
Consultation for Environmental Assessment,
TMK: 1-5-42: 3 and 7

This is in response to your letter dated October 8, 1993 requesting our comments on the subject project.

The only access to this project appears to be from Nimitz Highway, which is a State Department of Transportation Facility. We, therefore, have no objections or comments to offer at this time.

Should you have any questions, please contact Wayne Nakamoto of my staff at 523-4190.

Sincerely,

JOSEPH M. MAGALDI, JR.
Director

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96843

November 10, 1993

Mr. Daniel E. Orodenker
Special Assistant to the Director
Department of Business, Economic
Development and Tourism
State of Hawaii
P. O. Box 359
Honolulu, Hawaii 96804

Dear Mr. Orodenker:

Subject: Your Letter of October 8, 1993 Regarding the Pre-Assessment Consultation for the Pier 38 Marine Research Facility Environmental Assessment, TMK: 1-5-42: 6 and 7, Honolulu Harbor

Thank you for the opportunity to review the proposed Pier 38 project. We have the following comments:

1. As confirmed with your office, the proposed project is located on parcels 6 and 7 rather than parcels 3 and 7 as stated in the preliminary information.

2. The developer will be required to obtain a water allocation from the Department of Land and Natural Resources.

3. There is a 1-inch water meter and two 2-inch water meters currently serving the proposed project site.

4. If the installation of a 3-inch or larger meter is required, the construction drawings showing the installation should be submitted for our review and approval.

5. The availability of additional water will be confirmed when the building permit application is submitted for our review and approval. If additional water is made available, the applicant will be required to pay the prevailing Water System Facilities Charges for transmission and daily storage and any applicable meter installation charges.

6. The on-site fire protection requirements should be coordinated with the Fire Prevention Bureau of the Honolulu Fire Department.

7. The proposed project is subject to Board of Water Supply cross-connection control requirements prior to the issuance of the building permit application.

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

Very truly yours,

KAZU HAYASHIDA
Manager and Chief Engineer

Pure Water . . . man's greatest need – use it wisely

Hawaiian Electric Company, Inc. • PO Box 2750 • Honolulu, HI 96840-0001

November 5, 1993

William A. Bonnet
Manager
Environmental Department

Mr. Daniel E. Orodenker
State of Hawaii
Department of Business, Economic
Development & Tourism
220 South King Street
Honolulu, Hawaii 96813

Dear Mr. Orodenker:

Subject: Pre-Assessment Consultation for the Pier 38
Marine Research Facility Environmental Assessment
Honolulu Harbor, Oahu, Hawaii

We have reviewed the subject document and have no comments on the proposed marine research facility. HECO shall reserve further comment pertaining to the protection of existing power line facilities surrounding the project area until construction plans are finalized. Thank you for the opportunity to comment.

Sincerely,

for William A. Bonnet

RECEIVED
WATERFRONT PROJECT
Nov 10 1 30 PM '93
DUSINESS & ECONOMIC
DEVELOPMENT

DEPARTMENT OF WASTEWATER MANAGEMENT
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR

KENNETH M. RAPPOLT
DIRECTOR

FELIX B. LIMTIACO
DEPUTY DIRECTOR

WPP 93-575

November 12, 1993

Mr. Mufi Hanneman, Director
Department of Business,
Economic Development & Tourism
220 South King Street, 11th Floor
Honolulu, Hawaii 96813

Dear Mr. Hanneman:

Subject: Pre-Assessment Consultation for the Pier 38
Marine Research Facility Environmental Assessment
Honolulu Harbor, Oahu, Hawaii

We have reviewed the preliminary information for the proposed project and have no comments to offer at this time in regard to the municipal wastewater facilities.

Should you have any questions, please contact Mr. Thomas Tamanaha at 523-4671.

Very truly yours,

KENNETH M. RAPPOLT
Director

Ref. 93-330-Y
From Director's Office
To Administrative Assistant
Coordinate with
Xc 23 LHF
— Draft reply for Governor's signature
— Draft reply for Director's signature
— Direct reply (w/box Director)
— Comment/Recommendation
— Follow-up/Report
✓ Your information/file
— Your comment(s)
— Return w/ [illegible]
— Other
Date

JOHN WAIHEE
GOVERNOR

REX D. JOHNSON
DIRECTOR

DEPUTY DIRECTORS
KAHANA HOLT
JOYCE T. OMINE
AL PANG
CALVIN M. TSUTA

IN REPLY REFER TO:
STP 8.5615

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

November 17, 1993

TO: Mr. Daniel Orodenker
Special Assistant to the Director
Department of Business, Economic Development & Tourism

FROM: Rex D. Johnson
Director of Transportation

SUBJECT: Pre-Assessment Consultation for the Pier 38 Marine Research Facility Environmental Assessment, Honolulu Harbor, Oahu, Hawaii
TMK: 1-5-42: 03, 07

A Traffic Assessment (TA) should be prepared and submitted for our review as part of the environmental assessment. The TA should include a level-of-service analysis of the Pier 37/38 access intersection with Nimitz Highway. We wish to reserve comments on traffic impacts until after we have reviewed the TA.

On page 2 of the draft environmental assessment, it is not clear why a 15-foot wide wharf dimension for Pier 38A is indicated for nesting since wharf width is unrelated to nesting capability. Nesting of vessels beyond the pierhead line will not be allowed as adequate navigable waterways of Honolulu Harbor must be maintained at all times. In addition, berth widths for Piers 38A and 38B should be confirmed with our Harbors Division's Oahu District Manager.

Thank you for the opportunity to provide comments.

ATTACHMENT D
Parties Consulted in Preparation
of Final Environmental Assessment

ATTACHMENT D
Parties Consulted in Preparation of the Final Environmental Assessment

In accordance with the State's EIS rules, a copy of the Draft Environmental Assessment was sent to various organizations and individuals with a request for comments on the proposed development. The following is a list of the parties consulted and copies of the correspondence:

Federal Agencies
Department of Commerce
National Marine Fisheries Service
Department of Interior
U.S. Fish and Wildlife Service
Department of the Army
U.S. Army Corps of Engineers

State Agencies
Department of Accounting and General Services
Department of Health
Department of Land and Natural Resources
Department of Transportation
Hawaii Community Development Authority
Office of Environmental Quality Control

University of Hawaii
Environmental Center
School of Ocean & Earth Science & Technology

City & County of Honolulu
Board of Water Supply
Building Department
Department of Land Utilization
Department of Public Works
Department of Transportation Services
Department of Wastewater Management
Planning Department

Public Utility Groups
Hawaiian Electric Company
The Gas Company – BHP Petroleum

Other Interested Parties
Chevron U.S.A. Products Company
Kalihi-Palama Community Council
Kalihi-Palama Neighborhood Board No. 5
Young Brothers

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

REPLY TO ATTENTION OF

December 17, 1993

Planning Division

Mr. Daniel E. Orodenker
Special Assistant to the Director
State of Hawaii
Department of Business, Economic Development,
and Tourism
220 South King Street, 11th Floor
Honolulu, Hawaii 96804

Dear Mr. Orodenker:

Thank you for the opportunity to review and comment on the Draft Environmental Assessment for the Pier 38 Marine Research Facility, Honolulu Harbor, Oahu (TMK 1-5-42: 6 and 7). We do not have any additional comments to offer beyond those provided in our previous letter dated October 28, 1993.

Sincerely,

Kisuk Cheung, P.E.
Director of Engineering

RECEIVED
WATERFRONT PROJECT
Dec 20 8 26 AM '93
BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

DEPARTMENT OF BUSINESS,
ECONOMIC DEVELOPMENT & TOURISM

JOHN [illegible]
Director
MARI HANNEMAN
Deputy Director
JEANNE K. SCHULTZ
Deputy Director
RICK EGGE
Deputy Director
TAKESHI YOSHIHARA
Deputy Director

Central Pacific Plaza, 220 South King Street, 11th Floor, Honolulu, Hawaii
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804 Telephone: (808) 586-2466 Fax: (808) 586-2377

Ref. No. W-1686

February 17, 1994

Mr. Kisuk Cheung, P.E.
Director of Engineering
Department of the Army
U.S. Army Engineer District, Honolulu
Fort Shafter, HI 96858-5440

Dear Mr. Cheung:

Subject: Pier 38 Master Plan
Draft Environmental Assessment (EA)
Tax Map Key: 1-5-42:006 and 1-5-42:007 (portion)
Honolulu, Harbor, Oahu, Hawaii

Thank you for your letters of October 28, 1993 and December 17, 1993 (File No. PO 94-008). As noted in your October letter and in the Draft EA, a Department of the Army (DA) permit is required for all work below the mean high water line. The DA permit will include appropriate drawings showing the wharf construction and dredging, and will describe the construction and dredging methods.

We appreciate your time and effort in reviewing the Draft Environmental Assessment. Should you have any questions regarding this project, please contact Chris Chung, Waterfront Project Manager, at 586-2534.

Sincerely,

Daniel E. Orodenker
Special Assistant to the Director

JOHN WAIHEE
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P. O. BOX 119, HONOLULU, HAWAII 96810

ROBERT P. TAKUSHI
COMPTROLLER

LLOYD L. UYEBASAMI
DEPUTY COMPTROLLER

LETTER NO. (P) 1886.3

DEC 20 1993

Honolulu Waterfront Project
Department of Business, Economic
Development and Tourism
P. O. Box 2359
Honolulu, Hawaii 96804

RECEIVED
WATERFRONT PROJECT
Dec 22 8 32 AM '93
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT

Attention: Mr. Chris Chung

Gentlemen:

Subject: Pier 38 Marine Research Facility
Honolulu Harbor, Oahu, Hawaii
Draft Environmental Assessment

Thank you for the opportunity to review the subject document. The proposed project will not impact any of our facilities. Therefore, we have no comments to offer.

If there are any questions, please have your staff contact Mr. Ralph Yukumoto of the Planning Branch at 586-0488.

Very truly yours,

GORDON MATSUOKA
State Public Works Engineer

RY:jy

JOHN WAIHEE
Governor

MURI RANNEMAN
Director

JEANNE K. SCHULTZ
Deputy Director

RICK EGGE
Deputy Director

TAKESHI YOSHIHARA
Deputy Director

DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

Central Pacific Plaza, 220 South King Street, 9th Floor, Honolulu, Hawaii
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804 Telephone: (808) 586-2486 Fax: (808) 586-2377

Ref. No. W-1695

February 17, 1994

Mr. Gordon Matsuoka
State Public Works Engineer
State of Hawaii
Department of Accounting & General Services
P.O. Box 119
Honolulu, Hawaii 96810

Dear Mr. Matsuoka:

SUBJECT: Pier 38 Master Plan
Draft Environmental Assessment (EA)
Tax Map Key: 1-5-42:006 and 1-5-42:007 (portion)
Honolulu Harbor, Oahu, Hawaii

Thank you for your letter of December 20, 1993 indicating that you have no comments regarding the subject project. We appreciate your time and effort in reviewing the Draft Environmental Assessment.

Should you have any questions regarding this project, please contact Chris Chung, Waterfront Project Manager, at 586-2534.

Sincerely,

Daniel E. Orodenker
Special Assistant to the Director

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

JOHN C. LEWIN, M.D.
DIRECTOR OF HEALTH

In reply, please refer to:

January 27, 1994

93-333/epo

Mr. Chris Chung, Project Manager
Honolulu Waterfront Project
Department of Business, Economic Development & Tourism
P.O. Box 2359
Honolulu, Hawaii 96804

Dear Mr. Chung:

Subject: Draft Environmental Assessment
Pier 38 Marine Research Facility
Honolulu Harbor
Oahu, Hawaii
TMK: 1-5-42: 6 & 7

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

Water Pollution

1. The U.S. Army Corps of Engineers, Honolulu District, indicated in its October 28, 1993 letter that a Department of the Army permit is required for all work below the mean high water line. Therefore, a Section 401 Water Quality Certification from the Department of Health (DOH) is also required.

2. National Pollutant Discharge Elimination System (NPDES) General Permit Coverage is required if discharges from any of the following activities are anticipated:

   a. Storm water discharges associated with construction activity;

   b. Hydrotesting effluent discharges from new water main and sewer main construction.

   c. Construction dewatering; and

   d. Once-through, noncontact cooling water discharges under one (1) million gallons per day.

3. No process waste or laboratory waste will be allowed to be discharge into Honolulu Harbor.

4. Current ambient water quality data collected immediately adjacent to Piers 38, 39 and 40 is available at the Clean Water Branch or the State Department of Transportation, Harbors Division. This data can be useful in evaluating the potential adverse impacts from the construction and operation of the proposed facility.

If you should have any questions on this matter, please contact Mr. Edward Chen of the Engineering Section, Clean Water Branch at 586-4309.

Solid Waste

The Department of Health (DOH) suggests that the Department of Business, Economic Development and Tourism consider developing a waste minimization plan prior to demolition of the existing structures and development of the new research facility.

The State of Hawaii, in Act 324-91, the Integrated Solid Waste Management Act, formally established waste reduction and diversion goals of 25% by 1995 and 50% by the year 2000. As this project will be undertaken by a state agency, waste reduction efforts should be incorporated into the plan. The structures and facilities should include a dedication of space for collection of recyclable materials. The Act also mandates participation for all State offices in the State Office Paper Recycling Program.

The Integrated Solid Waste Management Act also directs the State to promote the development of markets for recycled materials. The DOH also suggests that secondary resources from recycled materials be used in the construction whenever feasible. Locally produced compost is available for landscaping purposes, and plastic lumber is an alternative building material which can be used for pilings. Act 213-92 established the State's commitment to using glasphalt for road paving purposes. Therefore, we also request that the parking lots of the facility be paved with glasphalt.

If you should have any questions on this matter, please contact Ms. Carrie McCabe of the Office of Solid Waste Management at 586-4243.

Very truly yours,

JOHN C. LEWIN, M.D.
Director of Health

c: Clean Water Branch
Office of Solid Waste Management

JOHN WAIHEE
GOVERNOR OF HAWAII

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

94:002 Q

December 29, 1993

TO: The Honorable Mufi Hanneman, Director
Department of Business and Economic Development and Tourism

FROM: John C. Lewin, M.D.
Director of Health

SUBJECT: Draft Environmental Assessment (DEA)
Marine Research Facility, Pier 38
Honolulu Harbor

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

Water Pollution Concerns

A National Pollutant Discharge Elimination System (NPDES) permit is required for any discharge to waters of the State including the following:

1. Storm water discharges relating to construction activities for projects greater than five acres;
2. Storm water discharges from industrial activities;
3. Construction dewatering activities;
4. Cooling water discharges less than one million gallons;
5. Ground water remediation activities; and
6. Hydrotesting water.

Any person wishing to be covered by the NPDES general permit for any of the above activities should file a Notice of Intent with the Department's Clean Water Branch at least 90 days prior to commencement of any discharge to waters of the State.

Any questions regarding this matter should be directed to Mr. Denis Lau of the Clean Water Branch at 586-4309.

Hazardous Wastes

The draft EA indicates that the proposed Marine Research Facility will include fueling facilities. We assume that the above ground storage tanks in the schematic site plan (Fuel Tanks #216 and #217) will be used to store fuel for this purpose.

However, if this is not the case, and underground storage tanks (UST) will be used for fuel storage, the applicant should be aware that new UST installations are subject to the technical standards and financial responsibility requirements of 40 CFR Part 280. These requirements include: design, construction, installation, and notification; general operating requirements; release detection; release reporting, investigation, and confirmation; release response and corrective action; changes-in-service and closure; and financial responsibility requirement. In addition, these USTs will be subject to State Administrative Rules on underground storage tanks that may be promulgated pursuant to HRS Chapter 342L. Owners of newly installed USTs must notify our UST Section of the existence of such USTs within 30 days of installation. Also, the appropriate fire and building permits must be obtained from the City and County of Honolulu before the installation of any USTs.

Should you have any questions on this matter, please call Eric Sadoyama of our Underground Storage Tank Section at (808) 586-4231.

Due to preliminary plans being the sole source of discussion, we reserve the right to impose future environmental restrictions on the project when more detailed information is submitted to the Department of Health.

c: Clean Water Br.
Solid & Haz. Waste Br.

JCL:AB:sy

JOHN WAIHEE
Governor
MURI RANNEMANN
Director
JEANNE K. SCHULTZ
Deputy Director
RICK TOGAMI
Deputy Director
TAKEMI YOSHINAGA
Deputy Director

DEPARTMENT OF BUSINESS,
ECONOMIC DEVELOPMENT & TOURISM

Central Pacific Plaza, 220 South King Street, 4th Floor, Honolulu, Hawaii
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804 Telephone: (808) 586-2466 Fax: (808) 586-2377

Ref. No. W-1692

February 17, 1994

MEMORANDUM

TO: The Honorable John C. Lewin, Director
Department of Health

FROM: Daniel E. Orodenker
Special Assistant to the Director

SUBJECT: Pier 38 Master Plan
Draft Environmental Assessment (EA)
Tax Map Key: 1-5-42:006 and 1-5-42:007 (portion)
Honolulu Harbor, Oahu, Hawaii

Thank you for your December 29, 1993 memorandum and January 27, 1994 letter regarding the subject project.

Water Pollution

With regard to your water pollution concerns, we understand that the proposed project will require a National Pollutant Discharge Elimination System (NPDES) permit. We also understand that a Section 401 Water Quality Certification will be required for all work below the mean high water line. Furthermore, no process waste or laboratory waste will be allowed to be discharged into Honolulu Harbor. As recommended, we will review existing ambient water quality data that has been collected immediately adjacent to Piers 38, 39 and 40 to evaluate potential adverse impacts from the construction and operation of the proposed facility.

Hazardous Waste

Regarding your concerns over hazardous wastes, the proposed project calls for above ground storage tanks for vehicles and the use of tank trucks for bunkering ocean vessels. While we appreciate your informing us of the Underground Storage Tank (UST) regulations and notification requirements, no USTs are proposed or anticipated for this project. The Final EA will clarify the facilities that will be used to store fuel.

Solid Waste

As recommended, every attempt will be made to incorporate waste reduction activities as part of the demolition of the existing structures and the development of the new research facility, including the recycling of demolition material such as scrap metal, the dedication of spaces for collecting recyclable materials, and the use of alternative construction materials such as locally produced compost, recycled plastic and glasphalt. During the design phase the use of alternative building materials will be encouraged.

We appreciate your time and effort in reviewing the Draft Environmental Assessment. Should you have any questions regarding this project, please contact Chris Chung, Waterfront Project Manager, at 586-2534.

GOVERNOR OF HAWAII

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

KEITH W. AHUE, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES
JOHN P. KEPPELER II
DONA L. HANAMIE

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

REF:OCEA:SKK

File No.: 94-371
Doc. No.: 3960

JAN 6 1994

RECEIVED
WATERFRONT PROJECT
Jan 7 9 09 AM '94
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

MEMORANDUM

TO: The Honorable Mufi Hannemann, Director
Dept. of Business, Economic Development and Tourism

ATTN: Chris Chung, Project Manager
Honolulu Waterfront Project

FROM: Keith W. Ahue, Chairperson
Board of Land and Natural Resources

SUBJECT: Draft Environmental Assessment (DEA): Pier 38 Marine Research Facility, Honolulu, Oahu, TMKs: 1-5-42: 3, 7

We have reviewed the DEA for the subject project transmitted by your memorandum dated November 26, 1993, and have the following comments:

Division of Aquatic Resources

The Division of Aquatic Resources (DAR) has no objections to the proposed development. An integrated facility for the Marine Center and the Look Laboratory would probably benefit both programs and permit closer cooperation between them. The plans also show a facility for the Hawaii Under Sea Research Laboratory, which as a frequent user of University of Hawaii research vessels, would also benefit from the integrated location.

Past dredging operation have apparently had little long-term adverse effect in Honolulu Harbor. As long as the release of toxic elements are prevented, and turbidity containment devices (such as silt curtains) are used, significant adverse effects on the aquatic environment are not expected to occur. Likewise, the dredged sediment should be handled and disposed of in such a manner to keep turbidity to a reasonable minimum. The sediment plume at the dredge and ocean disposal sites should be monitored for toxic elements or compounds.

The proposed Marine Research Facility will be adjacent to a proposed new Fresh Fish Wholesale Distribution Center. The construction and use of this facility should be compatible with the fresh fish center.

Commission on Water Resource Management

The Commission on Water Resource Management's (CWRM) staff comments that the applicant proposes to dredge and construct a pier at the mouth of the Kapalama Stream. It appears that a Stream Channel Alteration Permit (SCAP) pursuant to Section 13-169-50, Hawaii Administrative Rules, is required for the proposed construction activities. For more information regarding SCAP requirements, the applicant should call CWRM at 587-0249.

Office of Conservation and Environmental Affairs

The Office of Conservation and Environmental Affairs (OCEA) comments that the submerged lands of Honolulu Harbor are located within the Resource "R" subzone of the Conservation District. At present, the dredging of these submerged lands will require that a Conservation District Use Application be filed with the Department and approved by the Board of Land and Natural Resources (Board).

However, OCEA points out that the Board approved on December 17, 1993, CDUP-2658 to the Department of Transportation (DOT) for the subdivision of the submerged lands of Honolulu Harbor. DOT is also seeking the issuance of an Executive Order (E.O.) for the development and management of Honolulu Harbor. Once this E.O. is issued, the authorization for such dredging [illegible] would become subject to DOT's administration.

Historic Preservation Division

The Historic Preservation Division (HPD) comments that a review of their records [illegible] that these parcels are fill land in an area marked on old maps as [illegible]palama fishery, which appears to have been a nearshore fishing are[illegible] for the Kapalama ahupua'a. The parcels have been used for industrial purposes for many years. The proposed project would replace the industrial facilities with a research facility, and would modify the existing pier. Because construction of the existing facilities would have destroyed any historic sites that might have been present, HPD believes that this project will have "no effect" on historic sites.

Division of Water and Land Development

The Division of Water and Land Development (DOWALD) comments that any increase in potable water needs for this facility above that currently provided, should be coordinated with them.

Division of Land Management

The Division of Land Management comments that before any construction or encumbrance documentation is done, the applicant needs to provide detailed study of all the fuel, electrical, water and other utility lines within the site showing which ones are active and which have encumbrance documents. Copies of this study should be provided to the Department of Transportation, the Honolulu Harbor Fire Station, Department of Land and Natural Resources as well as the utility companies.

We have no other comments to offer at this time. Thank you for the opportunity to comment in this process.

Please feel free to call Steve Tagawa at our Office of Conservation and Environmental Affairs, at 587-0377, should you have any questions.

DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

JOHN WAIHEE
Governor
MURRAY HANNEMANN
Director
JEANNE K. SCHULTZ
Deputy Director
RICK EGGE
Deputy Director
TAKESHI YOSHIHARA
Deputy Director

Central Pacific Plaza 220 South King Street, 19th Floor, Honolulu, Hawaii
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804 Telephone: (808) 586-2486 Fax: (808) 586-2377

Ref. No. W-1699

February 17, 1994

MEMORANDUM

TO: The Honorable Keith W. Ahue
Chairperson
Board of Land and Natural Resources

FROM: Daniel Orodenker
Special Assistant to the Director

SUBJECT: Pier 38 Master Plan
Draft Environmental Assessment (EA)
Tax Map Key 1-5-42: 006 and 1-5-42: 007 (portion)
Honolulu Harbor, Oahu, Hawaii

Thank you for your memorandum of January 6, 1994 regarding the subject project. We offer the following response to your comments:

1) Division of Aquatic Resources (DAR) - DAR's comment that it has no objections to the proposed development is duly noted. As recommended, containment devices will be used during dredging operations to prevent significant adverse impact on the aquatic environment. In addition, to minimize any negative impacts to the marine environment, the handling of the dredged material will be coordinated with both the Department of Health and the U.S. Army Corps of Engineers as part of their permit requirements.

2) Commission on Water Resource Management - We will comply with all permits which may be required for the project.

3) Office of Conservation and Environmental Affairs - We understand that the Department of Transportation is seeking the issuance of an Executive Order for the development and management of Honolulu Harbor. However, according to DOT they are uncertain when this process will be concluded. In order to insure that the project remains on schedule, we will submit an application for a Conservation District Use Permit.

4) Historic Preservation Division - The comment by the Historic Preservation Division that the project is expected to have "no effect" on historic sites is duly noted.

5) Division of Water and Land Development (DOWALD) - As recommended by the DOWALD, we will consult with the Division should the proposed development require any increase in potable water above what is currently allocated.

6) Division of Land Management - As recommended by the Division of Land Management, prior to commencing with any construction activity or encumbrance documentation, we will provide a study of all fuel, electrical, water and other utility lines within the project site, and identify those lines that are active and those with encumbrance documents. Furthermore, we will provide a copy of this study to the Department of Transportation, Honolulu Fire Department, Department of Land & Natural Resources, and the utility companies.

We appreciate your time and effort in reviewing the Draft Environmental Assessment. Should you have any questions regarding this project, please contact Chris Chung, Waterfront Project Manager, at 586-2534.

JOHN WAIHEE
GOVERNOR

REX D. JOHNSON
DIRECTOR

DEPUTY DIRECTORS
KAHAHI HOLT
JOYCE T. OMINE
AL PANG
CALVIN M. TSUDA

IN REPLY REFER TO:
STP 8.5691

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

January 6, 1994

TO: Mr. Chris Chung, Project Manager
Honolulu Waterfront Project
Department of Business, Economic Development & Tourism

FROM: Rex D. Johnson
Director of Transportation

SUBJECT: Draft Environmental Assessment for the Pier 38 Marine Research Facility
TMK: 1-5-42: 6 and 7 (portion, Honolulu Harbor, Oahu, Hawaii

We have the following comments:

1. The left-turn lane into the Pier 37/38 access road should be lengthened to accommodate the increased traffic generated by the facility and minimize blockage of through traffic. The required length should conform to current AASHTO and State Highway Design Standards and be coordinated with the Highways Division.

2. Required improvements must be provided at no cost to the State Department of Transportation. In addition, plans for construction work within the State highway right-of-way must be submitted for our review and approval.

We appreciate the opportunity to provide comments.

JOHN WAIHEE
Governor
MUFI HANNEMANN
Director
JEANNE K. SCHULTZ
Deputy Director
RICK EGGED
Deputy Director
TAKESHI YOSHIHARA
Deputy Director

DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

Central Pacific Plaza, 220 South King Street, 9th Floor, Honolulu, Hawaii
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804 Telephone: (808) 586-2446 Fax: (808) 586-2377

Ref. No. W-1688

February 17, 1994

MEMORANDUM

TO: The Honorable Rex D. Johnson, Director
Department of Transportation

FROM: Daniel E. Orodenker
Special Assistant to the Director

SUBJECT: Pier 38 Master Plan
Draft Environmental Assessment (EA)
Tax Map Key: 1-5-42:006 and 1-5-42:007 (portion)
Honolulu Harbor, Oahu, Hawaii

Thank you for your memorandum of January 6, 1994 regarding the subject project. As recommended, the left-turn lane into the Pier 38 access road will be lengthened to accommodate anticipated increased traffic. The required length will conform to current AASHTO and State Highway Design Standards, and will be coordinated with the Department of Transportation (DOT) - Highways Division. Furthermore, the required improvements will be provided at no cost to DOT and any plans for construction work within the State highway right-of-way will be submitted for your review and approval.

We appreciate your time and effort in reviewing the Draft Environmental Assessment. Should you have any questions regarding this project, please have your staff contact Chris Chung, Waterfront Project Manager, at 586-2534.

School of Ocean & Earth Science & Technology
1000 Pope Road, Marine Science Bldg 205
Honolulu, HI 96822
TEL 808 956-6182 FAX 808 956-9152
Office of the Dean

soest
University of Hawai'i

January 6, 1994

Mr. Daniel E. Orodenker
Special Assistant to the Director
Department of Business,
Economic Development & Tourism
P.O. Box 2359
Honolulu, HI 96804

RE: Draft Environmental Assessment (EA) for Pier 38 Marine Research Facility; November 26, 1993

Dear Mr. Orodenker:

Thank you for the opportunity to review and comment on the Environmental Assessment (EA) for the proposed U.H. Marine Facility at Pier 38. Our review of the EA resulted in general agreement with many of the findings of your consultants, however, there are serious discrepancies which require further discussion.

Among the several major issues which require resolution and clarification is that the EA does not comport with several earlier discussions and associated correspondence concerning the possibility of a NOAA presence at the new site. It was agreed earlier by DBEDT that any NOAA presence at the new site of the UH Marine Facility would be only at the prerogative of the U.H. and on the basis of the landlord/tenant relationship that currently exists as evidenced by correspondence between our offices and NOAA (copies attached for your reference). Moreover, it is our final position that while we desire to accommodate NOAA's needs to the extent possible, we will be unable to determine our ability to extend to NOAA any accommodations at Pier 38 until we are able to reassess U.H. spatial requirements subsequent to the move. The EA states, however, that "... the Project is currently giving consideration to berthing the NOAA ship at the proposed Marine Facility because of its relationship to NMFS and compatibility of its operations with U.H. port operations." It is not the prerogative of the Project to assign U.H. office, pier and storage space to the Natural Marine Fisheries Service and R/V CROMWELL operations or other entity. This should be corrected and clarified in the EA and the Master Plan by deletion of references to NOAA in terms of space allocations and planning assumptions and a statement to the effect that the entire pier 38 area will be under the exclusive control of the U.H. subsequent to the proposed move.

A second major issue is the continued implication in the Master Plan and EA documents that there is room at the Pier 38 site for U.H. program expansion. As stated on several occasions by the U.H., the compaction of three SOEST programs now situated on approximately 23 acres to less than 6.5 acres leaves no possibility for program expansion, and is in fact marginal in area for the U.H. activities proposed for relocation. Even without a NOAA presence as discussed in the EA, the shore space available to U.H. would, contrary to stated planning assumptions, be marginal at best. With the presence of NOAA ships, the U.H. dock space would be reduced by approximately 40 percent. Moreover, the proposed site would not meet the Federal caveats associated with the Snug Harbor/Pier 38 land exchange which require that the 6.35 acre site is to be reserved to the University for its exclusive use through December 21, 2003; and that the 6.35 acre site at Pier 38 meets or exceeds requirements for continued operation of the Marine Center.

There is also the question of the loss of an additional 9000 sf of U.H. land at Pier 38B by dredging to widen the slip, as discussed on page 3-1 of the EA. Is this due to the design incorporated into construction of Pier 38B or to maintain a 345 foot slip width? If it is the latter, the U.H. should not bear the full impact, i.e.; the Pier 39 redevelopment should be impacted as well to preserve the extremely limited land area available at the Pier 38 site. It should also be noted that visiting UNOLS ships have beams exceeding 52 feet. In addition, there is no floating dock depicted in Figure 2 as referenced on page 3-2 of the EA.

Other major issues concern the planning for the HURL and Look Lab programs. The HURL Program concerns raised by the September 1993 Master Plan were not adequately addressed in the development of the EA. The following paragraphs reflect the concerns of HURL regarding the development of the University of Hawaii Marine Center facility at the Pier 38 site.

There is some contradiction in the EA regarding the width of the apron on Pier 38A. Figure 2 of the EA appears to show a 15' apron. HURL operations require that the outboard wharf (Pier 38A) fronting their building be 45' wide to facilitate the loading and unloading of large seagoing equipment and to provide access to the area with large trucks and cranes. This could be accomplished by relocating the HURL building footprint 30 feet to the north.

The EA does not directly address the replacement of the overhead crane arrangement required by the HURL program. In response to past Draft Master Plans and reiterated at waterfront development planning meetings, we have

strongly voiced our need to have dual overhead cranes in the HURL building similar to the ones currently used at our Waimanalo facility. These cranes are used in tandem to provide the precise positioning of components during the maintenance and overhaul of manned submersibles. It is not possible to conduct major work on the submersibles without this type of lifting capability.

With reference to the lack of small boat docking facilities in the plan, HURL, in addition to the Pisces V launch/recovery/transport (LRT) platform, also owns two other vessels which will need to be accommodated at the Pier 38 site. The first is a smaller LRT used for Makali'i operations (30' x 15'). The second vessel is the R/V Mao Mao, a 36' x 10" boat that is used for towing the Pisces V/LRT during training operations. The boat will continue to be used for training purposes by HURL.

With regard to Look Laboratory requirements, the following issues remain for correction and clarification:

The 100 sf communications station proposal to remain at the present Look Lab site is unacceptable. As stated previously, there is a continuing need for a 1/2 acre area to accommodate the Wet Laboratory plus the Look Laboratory In-Ocean Test Range on-shore station and test platform preparation area.

The clean seawater requirements at the Look Lab site are similar to those discussed for NMFS on page A4. This is a requirement of the Wet Laboratory which has a direct relationship to the SOEST Ocean Engineering Department functions at Look Lab contrary to the EA statement in section A2 on page A3.

Other issues which require amplification and/or clarification include; 1) The project cost estimates do not appear to include moving costs for UH facilities and equipment at Snug Harbor and Look Lab to Pier 38 which will be significant. 2) The EA discusses the need for special docking arrangements for small boats, however, these facilities are not provided for in the Master Plan or the EA. 3) The oceanographic data storage facilities now located at Snug Harbor are closely related to our ship and research operations contrary to the statement on page A2 that they are clearly not harbor related and could be located elsewhere. Where, and why? 4) The alternative to relocate to Pier 1 discussed in Section 5-1 is much too abbreviated, in error and incomplete. There is, to our knowledge, no known plan to accommodate cruise ship terminals at Pier 1 (they would be at Pier 2). Emergency berths could be accommodated at Pier 1 even with the University facility there (the U.H. proposal would in fact add 1000' of pier space). More land area would be available for U.H. facilities and the 1/2 acre requirement for a Wet Lab and In-Ocean Test Range support at the present Look Lab site would not be

necessary. NOAA and NMFS could also be accommodated, without the constraints existing at the Pier 38 site. A more detailed discussion of whether planned usage actively exists for Pier 1 would enable a more meaningful environmental assessment in light of such an alternative.

There are other issues of lesser impact that can be clarified or resolved in the course of further planning sessions, therefore, they are not described here. It is requested that the most important issues, i.e.; stipulation that the new Marine Center is reserved to the University for its exclusive use, and resolution of such issues as operations impacted by incomplete planning as regards Look Laboratory facilities remaining at Kakaako, and the lack of small boat docking facilities at Pier 38 to make the site acceptable to the U.H., be given priority for resolution at your earliest opportunity.

Thank you again for the opportunity to comment on the EA and we look forward to working with you to resolve outstanding issues.

Most Sincerely,

C. Barry Raleigh
Dean

Attachments

cc: D. Yount
H. Krock
R. Longfield
J. Coste
A. Malahoff

JOHN WAIHEE
Governor
MUFI HANNEMANN
Director
JEANNE K. SCHULTZ
Deputy Director
RICK EGGE
Deputy Director
TAKESHI YOSHIHARA
Deputy Director

DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

Central Pacific Plaza, 220 South King Street, 9th Floor, Honolulu, Hawaii
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Ref. No. W-1700

February 17, 1994

Dr. C. Barry Raleigh, Dean
School of Ocean & Earth Science & Technology
1000 Pope Road
Marine Science Bldg. 205
Honolulu, Hawaii 96822

Dear Dr. Raleigh:

Thank you for your January 6, 1994 memorandum commenting on the Draft Environmental Assessment (EA) for the Pier 38 Marine Research Facility. The Draft EA was prepared by Lacayo Planning, Inc., based on the Pier 38 Master Plan. Preparation of the Pier 38 Master Plan involved professional research, planning, and analysis to determine necessary site improvements to accommodate the relocation of existing marine research facilities located within the Honolulu Waterfront and the Hawaii Undersea Research Laboratory (HURL) located at Makai Pier. This work was closely coordinated with representatives from the University of Hawaii, School of Ocean and Earth Science and Technology (SOEST), over a period of 15 months (July 1992 to September 1993) and reflects an agreed upon development plan. As you are aware, everything possible has been done to address reasonable concerns within the constraints of existing resources.

The majority of your comments on the Draft EA concern either planning issues which were addressed during the Pier 38 Master Plan process, or design issues which will be considered during the design phase. These issues are for the most part not pertinent to the Draft EA or have been previously resolved. We have provided the following comments to clarify the previous decisions/understandings which were made with you and your staff regarding these issues:

- Accommodation of NOAA/NMFS Operations at Pier 38 -- This issue was resolved. As set forth in previous correspondence and at coordination meetings with SOEST, the inclusion of these facilities in the Pier 38 Master Plan was for planning purposes only (as outlined in the master plan scope of

work) to insure that the facility would be sized to accommodate existing marine research-related activities currently located in the Honolulu Waterfront and the Hawaii Undersea Research Laboratory located at Makai Pier. It has never been the intent of the Department of Business, Economic Development & Tourism, Honolulu Waterfront Project (DBEDT) to dedicate space to any user at the proposed marine research facility. The Pier 38 Master Plan clearly states on Pages 9 and 10 that the University (SOEST) has priority over Federal activities and that any NOAA/NMFS presence would be subject to landlord/tenant arrangements with the University. This language, on Pages 9 and 10, will be written verbatim into the Final EA to clarify the statements made in the Draft EA.

It should be noted that the space requirements for NOAA and NMFS are relatively modest in comparison to the total space programmed for the marine research facility. Given the fact that there appears to be a number of opportunities for joint research activities, it would seem to be advantageous for these facilities to be located with SOEST's facilities at Pier 38. However, the ultimate decision and responsibility for their location at Pier 38 will be with SOEST.

- Pier 38 Future Expansion Space -- As indicated throughout the master plan process, the objective of the Pier 38 plan was to provide for a new marine research facility that would replace existing marine research facilities located within the Honolulu Waterfront including the Hawaii Undersea Research Laboratory located at Makai Pier, while at the same time providing room for future expansion. Based on a thorough analysis of space requirements for the existing facilities and input from SOEST, the Pier 38 Master Plan meets this objective. The under roof square footage for each research facility at Pier 38 is equal to or greater than their existing floor areas. In the case of Look Laboratory the total amount of under roof square footage is increased by 40 percent (from 23,000 to 32,000 square feet). The master plan also provides for adequate storage and staging area for the various facilities. In addition, vehicle parking exceeds the number of full-time staff by over a 2 to 1 margin and pier berthing space has been increased from 600 linear feet (with 500 linear feet for nesting) to 1,030 linear feet (with 330 linear feet for nesting).

- U.S. Department of Education "Educational Use" Restriction -- DBEDT is aware of the restriction resulting from the transfer of 2.837-acre parcel of Federal land to the State for educational purposes and has initiated efforts to transfer this restriction to Pier 38. The "educational use" restriction applies to only that parcel. The U.S. Department of Education has indicated that transfer of the educational use restriction would be

permitted if the State provided replacement acreage at Pier 38 which was of equal value. A market value appraisal is currently being prepared by and independent appraiser to quantify the land acreage needed at Pier 38 to effectuate the transfer. Once completed, approval from the Federal Department of Education will be pursued.

- Channel Width between Piers 38 and 39 -- The channel width requirement between Piers 38 and 39 is based on discussions held with the Department of Transportation, Harbors Division during preparation of the master plan. As a result of this discussion, it was determined that a width of 345 feet must be maintained to insure safe vessel maneuvering between Piers 38 and 39. In this regard, a 20-foot wide strip of fast and submerged land, along the length of the inboard pier, will need to be excavated and dredged. The resulting loss of approximately 9,000 square feet of fast land at Pier 38 will be replaced by the land currently used as an access road along Pier 37. These site parameters were originally reflected in the Draft Master Plan and have been consistent throughout the planning process.

  Your suggestion that the Pier 39 area be excavated and dredged to maintain the necessary channel width is unwarranted based on (1) the ability of the Pier 38 Master Plan to accommodate the required facilities within the designated project area; and (2) a significant State investment has already been made at Pier 39 to strengthen and improve the pier area to accommodate the relocation of interisland barge operations currently located at Piers 24 to 29.

- Pier 38A Apron Width -- The 15-foot apron width along Pier 38A is indicated in both the master plan and the Draft EA. This width is based on a June 22, 1993 memorandum from SOEST commenting on the draft master plan. In that memorandum, SOEST selected the option of reducing the Pier 38A apron from 45 feet to 15 feet so that the berth width along the pier could be increased to 98 feet. This option would allow vessels to be nested on the pier without exceeding the established pierhead line.

  As you indicate, the width of the apron can be increased in front of the HURL building by shifting the HURL building and the Machine Shop 30 feet inland. If SOEST would desire this change, it can be accommodated during the design phase.

- HURL Overhead Crane Requirements -- A SOEST letter dated January 21, 1993 provided necessary space requirements for the HURL facilities as well as a summary of activities occurring at Snug Harbor and the Makai Pier. In response, DBEDT indicated that HURL space requirements at the Snug Harbor and the Makai Pier would be accommodated.

As indicated previously, DBEDT will be responsible for securing funding for construction of new facilities based on the required space needs for HURL and the other marine research facilities identified in the Pier 38 Master Plan. Existing equipment located at Snug Harbor and Look Laboratory will be relocated to the Pier 38 Facility or replaced if relocation is not feasible. The purchase of new equipment, not currently located at these two facilities, will be the responsibility of the University. However, during the design stage our consultant will work with the HURL program to ascertain the structural requirements necessary to accommodate the desired overhead cranes.

- Look Lab Communications Station -- As indicated in the Pier 38 Master Plan, a 100-square foot communications station on the Kaka'ako Peninsula is proposed to house power supply and regulation facilities, planned data receiving and storage equipment from the Makai Range data cable, operator space, and a staging area to test equipment mounted on the underwater platform structures. This requirement was based on an analysis of the existing building area which is devoted to these activities. Further analysis of the space requirements and potential communications systems linking the station to Pier 38 will be conducted during the design phase in consultation with SOEST.

- Wet Laboratory Facility -- Although the wet laboratory was not part of the original scope of work for the master plan, relocation of this facility to Pier 38 was considered in the early planning stages. However, because a research quality seawater source was not available at Pier 38 this option was not pursued further. As indicated in the Pier 38 Master Plan, this facility will remain on the Kaka'ako Peninsula. The exact area which will be devoted to this facility will be evaluated further during the design phase, based on input from the University and future development and regulatory requirements for the Kaka'ako Makai Area.

- Facility Moving Costs -- Moving costs are reflected as "Relocation Expenses" in Table 14 of the Pier 38 Master Plan. A total of $200,000 has been estimated for the relocation of Look Laboratory and Snug Harbor equipment and furnishings. These costs will be the responsibility of DBEDT. As previously indicated to SOEST, the HURL facility at Makai Pier will be responsible for its own relocation costs.

- Small Boat Docking Arrangements -- At a meeting with you on August 31, 1993, it was agreed that the 200-foot floating dock for smaller boats would be eliminated so that the length of Pier 38B could be increased from 500 to 700 linear feet. The Pier 38 Master Plan and the Draft EA both reflect this understanding.

- Oceanographic Data Storage -- As part of the preparation of the Pier 38 Master Plan, the consultant assessed all of the activities located at Snug Harbor and Look Laboratory to determine those activities which were harbor-dependent or related. Harbor-dependent or related activities are those activities which are dependent on a harbor location to function or are directly related to harbor activities. The long-term storage of oceanographic rock and core samples is not a harbor dependent or related activity. This activity could occur at an inland location just as effectively thereby allowing scarce waterfront land to be devoted to harbor dependent and/or related uses. Despite this analysis, the oceanographic rock and core sample storage was accommodated in the proposed Pier 38 Marine Research Facility as indicated in the Pier 38 Master Plan.

- Piers 1 & 2 Marine Research Center Option -- This matter has been discussed in detail with University representatives. As indicated several times in previous discussions and correspondence with SOEST, Piers 1 and 2 will be maintained as a contiguous pier for cruise ship and emergency vessel berthing. Land-side redevelopment of the area will occur as the Kakaako Makai Area Plan is implemented. Relocation of the University marine facilities to this area is not an option for consideration.

We are aware that detailed design issues, not related to the overall environmental impact of the project, need to be resolved. Please be assured that during the design phase we will continue to work with you and the SOEST staff to address these issues. If you should have any questions, please contact me at 586-2531.

Sincerely,

Daniel E. Orodenker
Special Assistant to the Director

cc: Hon. Rex D. Johnson, DOT
Hon. Harold S. Masumoto, OSP
Mr. Calvin Tsuda, DOT
Mr. Eric Masutomi, HCDA

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96843

KAZU HAYASHIDA
Manager and Chief Engineer

December 29, 1993

Mr. Chris Chung, Project Manager
Honolulu Waterfront Project
Department of Business, Economic
Development and Tourism
State of Hawaii
P. O. Box 2359
Honolulu, Hawaii 96804

Dear Mr. Chung:

Subject: Your Letter of November 26, 1993 Regarding the Draft Environmental Assessment (DEA) for the Proposed Pier 38 Marine Research Facility, TMK: 1-5-42: 6 and Por. 7, Honolulu Harbor

Thank you for the opportunity to review the DEA for the proposed Pier 38 project. Our pre-assessment comments of November 10, 1993 are still applicable and are included in Attachment C.

We have the following additional comments:

1. Page 23: Our previous November 10, 1993 letter described the existing water services at the proposed project site. As we indicated, the development should obtain a water allocation from the Department of Land and Natural Resources (DLNR) which is coordinating the water requirements for all State agencies. We suggest that you meet with them to discuss your other projects' water requirement so that water can be made available on a timely basis. Otherwise, your projects may have to be deferred until DLNR develops the necessary sources.

2. Page 34: The existing distribution line serving fire hydrants along the entrance roadway is a 12-inch, rather than 6-inch, waterline.

3. We concur with the developer's proposal to submit construction plans to public utilities for review and approval during the project's development phase. Submission of construction plans to our Engineering Branch will minimize potential impact to existing water system facilities in the area.

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

Very truly yours,

KAZU HAYASHIDA
Manager and Chief Engineer

Pure Water . . . man's greatest need – use it wisely

JOHN WAIHEE
Governor

MURI HANNEMANN
Director

JEANNE K. SCHULZ
Deputy Director

RICK EGGERT
Deputy Director

TAKESHI YOSHIHARA
Deputy Director

DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

Central Pacific Plaza, 220 South King Street, 11th Floor, Honolulu, Hawaii
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804 Telephone: (808) 586-2355 Fax: (808) 586-2377

Ref. No. W-1690

February 17, 1994

Mr. Kazu Hayashida
Manager and Chief Engineer
City & County of Honolulu
Board of Water Supply
630 South Beretania Street
Honolulu, Hawaii 96813

Dear Mr. Hayashida:

SUBJECT: Pier 38 Master Plan
Draft Environmental Assessment (EA)
Tax Map Key: 1-5-42:006 and 1-5-42:007 (portion)
Honolulu Harbor, Oahu, Hawaii

Thank you for your letter of December 29, 1993 regarding the subject project. As recommended, we will continue to consult with the State Department of Land and Natural Resources regarding a water allocation. In addition, the description of the existing waterline will be corrected to reflect its proper size.

We appreciate your time and effort in reviewing the Draft Environmental Assessment. Should you have any questions regarding this project, please contact Chris Chung, Waterfront Project Manager, at 586-2534.

Sincerely,

Daniel E. Orodenker
Special Assistant to the Director

RECEIVED
WATERFRONT PROJECT
Dec 22 8 32 AM '93
BUSINESS, ECONOMIC DEVELOPMENT

DEPARTMENT OF LAND UTILIZATION
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813 • (808) 523-4432

DONALD A. CLEGG
DIRECTOR

LORETTA K.C. CHEE
DEPUTY DIRECTOR

93-09460(JT)

December 20, 1993

Mr. Chris Chung, Project Manager
Honolulu Waterfront Project
Department of Business, Economic
Development & Tourism
State of Hawaii
P.O. Box 2359
Honolulu, Hawaii 96804

Dear Mr. Chung:

Draft Environmental Assessment (DEA) for the
Pier 38 Marine Research Facility - Honolulu Harbor
Tax Map Key: 1-5-42: 6 and por. 7

We have reviewed the above referenced document and have the following comments:

1. The proposed Marine Research Facility is considered a "marina accessory" which is a principal permitted use within the I-3 Waterfront Industrial District.

2. On page 27 of the DEA, the City's Grading Ordinance is incorrectly identified as Chapter 23, Revised Ordinances of Honolulu (ROH). Chapter 14, ROH is the City Grading Ordinance.

Thank you for the opportunity to comment on this matter. Should you have any questions, please contact Joan Takano of our staff at 527-5038.

Very truly yours,

DONALD A. CLEGG
Director of Land Utilization

DAC:ak
g:pier38es.jkt

JOHN WAIHEE
Governor

MARI HAMMEMANN
Director

JEANNE H. SCHULZ
Deputy Director

RICK EGGERT
Deputy Director

TAKESHI YOSHIHARA
Deputy Director

DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

Central Pacific Plaza, 220 South King Street, 11th Floor, Honolulu, Hawaii
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804 Telephone: (808) 586-2466 Fax: (808) 586-2377

Ref. No. W-1691

February 17, 1994

Mr. Donald A. Clegg, Director
City & County of Honolulu
Department of Land Utilization
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Clegg:

SUBJECT: Pier 38 Master Plan
Draft Environmental Assessment (EA)
Tax Map Key: 1-5-42:006 and 1-5-42:007 (portion)
Honolulu Harbor, Oahu, Hawaii

Thank you for your letter of December 20, 1993 regarding the subject project. Your comment that the proposed Marine Research Facility is considered a "marina accessory" and a principal permitted use with the I-3 Waterfront Industrial District is duly noted. In addition, the reference to the City's Grading Ordinance will be corrected to reflect the appropriate chapter of the Revised Ordinance of Honolulu.

We appreciate your time and effort in reviewing the Draft Environmental Assessment. Should you have any questions regarding this project, please contact Chris Chung, Waterfront Project Manager, at 586-2534.

Sincerely,

Daniel E. Orodenker
Special Assistant to the Director

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR

RECEIVED
WATERFRONT PROJECT
Dec 13 1 50 PM '93
BUSINESS & ECONOMIC DEVELOPMENT

MICHAEL STREET
MANAGER AND CHIEF ENGINEER

KENNETH E. SPRAGUE
DEPUTY DIRECTOR

December 8, 1993 ENV 93-252

Mr. Chris Chung, Project Manager
Honolulu Waterfront Project
Department of Business, Economic
Development & Tourism
State of Hawaii
Central Pacific Plaza
220 South King Street, 11th Floor
Honolulu, Hawaii 96813

Dear Mr. Chung:

Subject: Draft Environmental Assessment (DEA)
Marine Research Facility at Pier 38
TMK: 1-5-42: 6 and Por. 7

We have reviewed the subject DEA and have the following comments:

1. The DEA should address the potential impact of storm water discharge associated with construction activities on water quality of the receiving waters.

2. The DEA should also state what structural or non-structural best management practices (BMP) will be provided to control and reduce discharge of pollutants resulting from the construction activities.

3. If dewatering activity is anticipated during the construction, dewatering permits will be required by the State Department of Health as well as the City Department of Public Works.

If you have any questions, please contact Mr. Alex Ho, Environmental Engineer, at 523-4150.

Very truly yours,

C. Michael Street

C. MICHAEL STREET
Director and Chief Engineer

JOHN WAIHEE
Governor
MURRAY TOWNSEND
Director
JEANNE K. SCHULTZ
Deputy Director
RICK EGGED
Deputy Director
TAKEICHI YOSHIHARA
Deputy Director

DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

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Ref. No. W-1693

February 17, 1994

Mr. Kenneth E. Sprague
Acting Director and Chief Engineer
City & County of Honolulu
Department of Public Works
650 South Beretania Street
Honolulu, Hawaii 96813

Dear Mr. Sprague:

SUBJECT: Pier 38 Master Plan
Draft Environmental Assessment (EA)
Tax Map Key: 1-5-42:006 and 1-5-42:007 (portion)
Honolulu Harbor, Oahu, Hawaii

Thank you for your letter of December 8, 1993 regarding the subject project. We offer the following response to your comments:

1) The Final EA will discuss the potential impact of stormwater discharge associated with construction activities on water quality of the receiving water.

2) The Final EA will describe potential management practices that will be employed to control and reduce discharge of pollutants resulting from the construction activities.

3) We understand that a dewatering permit will be required if water is discharged from the proposed project during construction. This requirement will be referenced in the Final EA.

We appreciate your time and effort in reviewing the Draft Environmental Assessment. Should you have any questions regarding this project, please contact Chris Chung, Waterfront Project Manager, at 586-3534.

Sincerely,

Daniel E. Orodenker
Special Assistant to the Director

Waterfront

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU

PACIFIC PARK PLAZA
711 KAPIOLANI BOULEVARD, SUITE 1200
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR

JOSEPH M. MAGALDI, JR.
DIRECTOR

AMAR BAPPAL
DEPUTY DIRECTOR

TE-4063
HL93.1.47

RECEIVED
94 FEB 15 2:59 PM '94
DEPT. OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

December 30, 1993

Mr. Mufi Hannemann
Director
Department of Business, Economic
Development & Tourism
State of Hawaii
P.O. Box 2359
Honolulu, Hawaii 96804

Dear Mr. Hannemann:

Subject: Nimitz Highway - Pier 38 Marine Research Facility
Draft Environmental Assessment
TMK: 1-5-42: 6 and Portion of 7

This is in response to your letter dated November 26, 1993 requesting our comments on the subject Draft Environmental Assessment.

It appears that the access to this project is from Nimitz Highway which is under the jurisdiction of the State Department of Transportation. We, therefore, have no comments to offer at this time.

Should you have any questions, please contact Wayne Nakamoto of my staff at 523-4190.

Sincerely,

JOSEPH M. MAGALDI, JR.
Director

Ref. # 94-004-E
From: Dir. Off.
To: Waterfront
Coordinate with:
XC: ___ ___ TS MH
___ Draft reply for Governor's signature
___ Draft reply for Director's signature
___ Direct reply (w/box. Director)
___ Comment/Recommendation
___ Follow-up/Report
___ Your information/file
___ Keep enclosure(s)
___ Return enclosure(s)
J Other Appr. alt
Due date Jan 12, 1994

JOHN WAIHEE
Governor
MARI HANNEMANN
Director
JEANNE K. SCHULZ
Deputy Director
RICK EGGERT
Deputy Director
TAKESHI YOSHIHARA
Deputy Director

DEPARTMENT OF BUSINESS,
ECONOMIC DEVELOPMENT & TOURISM

Central Pacific Plaza, 220 South King Street, 5th Floor, Honolulu, Hawaii
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804 Telephone: (808) 586-2466 Fax: (808) 586-2377

Ref. No. W-1696

February 17, 1994

Mr. Joseph M. Magaldi, Jr., Director
City & County of Honolulu
Department of Transportation Services
711 Kapiolani Boulevard, Suite 1200
Honolulu, Hawaii 96813

Dear Mr. Magaldi:

SUBJECT: Pier 38 Master Plan
Draft Environmental Assessment (EA)
Tax Map Key: 1-5-42:006 and 1-5-42:007 (portion)
Honolulu Harbor, Oahu, Hawaii

Thank you for your letter of December 30, 1993 indicating that you have no comments regarding the subject project. We appreciate your time and effort in reviewing the Draft Environmental Assessment.

Should you have any questions regarding this project, please contact Chris Chung, Waterfront Project Manager, at 586-2534.

Sincerely,

Daniel E. Orodenker
Special Assistant to the Director

DEPARTMENT OF WASTEWATER MANAGEMENT
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR

KENNETH M. RAPPOLT
DIRECTOR

FELIX B. LIMTIACO
DEPUTY DIRECTOR

WPP 93-671

December 29, 1993

Mr. Daniel E. Orodenker
Special Assistant to the Director
Department of Business, Economic
Development & Tourism
State of Hawaii
P.O. Box 2359
Honolulu, Hawaii 96804

Attention: Mr. Chris Chung, Project Manager

Dear Mr. Orodenker:

RECEIVED
WATERFRONT PROJECT
Dec 30 9 27 AM '93
BUSINESS, ECONOMIC DEVELOPMENT

Subject: Draft Environmental Assessment for the Pier 38 Marine Research Facility, TMK: 1-5-42: 6 and Por. 7, Honolulu, Oahu, Hawaii

We have reviewed the subject draft environmental assessment in regard to the municipal wastewater facilities. The existing sewer system is inadequate to serve the proposed Pier 38 development at the present time. Completion of a relief sewer in Nimitz Highway will permit the proposed marine research facility to be connected to the City's sewer system. Design of the relief sewer is nearly completed. We anticipate construction of the project to start mid-1994 and be completed sometime in 1996.

Please incorporate the above information into the Environmental Assessment for the Pier 38 Marine Research Facility. Should you have any questions, please call Thomas Tamanaha at 523-4671.

Very truly yours,

KENNETH M. RAPPOLT
Director

JOHN WAIHEE
Governor
MUFI HANNEMANN
Director
JEANNE K. SCHULTZ
Deputy Director
RICK EGGED
Deputy Director
TAKESHI YOSHIHARA
Deputy Director

DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

Capitol Complex, Phase II, 250 South King Street, 7th Floor, Honolulu, Hawaii
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804 Telephone: (808) 586-2466 Fax: (808) 586-2377

Ref. No. W-1689

February 17, 1994

Mr. Kenneth M. Rappolt, Director
City & County of Honolulu
Department of Wastewater Management
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Rappolt:

SUBJECT: Pier 38 Master Plan
Draft Environmental Assessment (EA)
Tax Map Key: 1-5-42:006 and 1-5-42:007 (portion)
Honolulu Harbor, Oahu, Hawaii

Thank you for your letter of December 29, 1993 describing the existing municipal wastewater facilities servicing the proposed project area. The proposed development calls for the relocation of research facilities that are currently located at Kapalama (Snug Harbor) and the Kakaako Peninsula (Look Laboratory) to Pier 38. The proposed development is not anticipated to result in any significant increase in wastewater flows beyond what is currently generated at these facilities. Rather, we are proposing to relocate the source of this flow. Your comments regarding the completion of a new relief sewer will be included in the Final EA.

We appreciate your time and effort in reviewing the Draft Environmental Assessment. Should you have any questions regarding this project, please contact Chris Chung, Waterfront Project Manager, at 586-2534.

Sincerely,

Daniel E. Orodenker
Special Assistant to the Director

Hawaiian Electric Company, Inc. • PO Box 2750 • Honolulu, HI 96840-00.

RECEIVED
WATERFRONT PROJECT
DEC 29 8 21 AM '93
BUSINESS & ECONOMIC DEVELOPMENT

William A. Bonnet
Manager
Environmental Department

December 27, 1993

Mr. Chris Chung
Project Manager
Honolulu Waterfront Project
Department of Business,
Economic Development & Tourism
P.O. Box 2359
Honolulu, Hawaii 96804

Dear Mr. Chung:

Subject: **Draft Environmental Assessment for**
Pier 38 Marine Research Facility
Honolulu Harbor, Oahu, Hawaii

We have reviewed the subject assessment, and have no comments at this time on the proposed research facility. HECO shall reserve further comments pertaining to the protection of existing power lines bordering and servicing the area until construction plans are finalized. Thank you for the opportunity to comment.

Sincerely,

DEPARTMENT OF BUSINESS,
ECONOMIC DEVELOPMENT & TOURISM

Central Pacific Plaza, 220 South King Street, 9th Floor, Honolulu, Hawaii
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804 Telephone: (808) 586-2486 Fax: (808) 586-2377

Ref. No. W-1697

February 17, 1994

Mr. William A. Bonnet, Manager
Environmental Department
Hawaiian Electric Company
P.O. Box 2750
Honolulu, Hawaii 96840-0001

Dear Mr. Bonnet:

SUBJECT: Pier 38 Master Plan
Draft Environmental Assessment (EA)
Tax Map Key: 1-5-42:006 and 1-5-42:007 (portion)
Honolulu Harbor, Oahu, Hawaii

Thank you for your letter of December 27, 1993 indicating that you have no comments regarding the subject project. We appreciate your time and effort in reviewing the Draft Environmental Assessment.

Should you have any questions regarding this project, please contact Chris Chung, Waterfront Project Manager, at 586-2534.

Sincerely,

Daniel E. Orodenker
Special Assistant to the Director

January 6, 1994

Mr. Chris Chung
Project Manager
Honolulu Waterfront Project
DEPARTMENT OF BUSINESS,
ECONOMIC DEVELOPMENT & TOURISM
P. O. Box 2359
Honolulu, HI 96804

Dear Mr. Chung:

SUBJECT: Draft Environmental Assessment for the Pier 38 Marine Research Facility TMK 1-5-42:6 and 7 (portion), Honolulu Harbor, Oahu, Hawaii

Thank you for the opportunity to review and comment on the Draft Environmental Assessment for the Pier 38 Marine Research Facility. After reviewing the document, Young Brothers feels that the 100 foot maneuvering area specified by the Department of Transportation, Harbors Division on page B1 is insufficient for safe barge operation. If any significant wind is present it will have a tendency to set the barge toward Pier 39 endangering any vessels berthed there.

We recommend that the 100 foot maneuvering area be increased to 130 feet to allow an additional margin of safety in the presence of the prevailing winds. We further note that the dimensions provided by the Harbors Division represent the minimum acceptable width of the slip.

Please let us know whether this increase is possible.

Sincerely,

YOUNG BROTHERS, LIMITED

Jeffrey A. Low
Manager, Facilities & Planning

JOHN WAIHEE
Governor
MUFI HANNEMANN
Director
JEANNE K. SCHULTZ
Deputy Director
RICK EGGED
Deputy Director
TAKEMI YOSHINAGA
Deputy Director

DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

Central Pacific Plaza, 220 South King Street, 11th Floor, Honolulu, Hawaii
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804 Telephone: (808) 586-2355 Fax: (808) 586-2377

Ref. No. W-1694

February 17, 1994

Mr. Jeffrey A. Low, Manager
Facilities and Planning
Young Brothers, Limited
P.O. Box 3288
Honolulu, Hawaii 96801

Dear Mr. Low:

SUBJECT: Pier 38 Master Plan
Draft Environmental Assessment (EA)
Tax Map Key: 1-5-42:006 and 1-5-42:007 (portion)
Honolulu Harbor, Oahu, Hawaii

Thank you for your letter of January 6, 1994 regarding the subject project. Preparation of the Pier 38 Master Plan for the University of Hawaii Marine Research Facility was closely coordinated with the Department of Transportation, Harbors Division (DOT). The slip width, including the 100-ft maneuvering area, was specified by DOT to ensure safe harbor traffic. Subsequent planning and design for the facility was based on these specifications and incorporated into the final Master Plan. As such, expanding the area by an additional 30 feet is not possible. We will, however, continue to consult with DOT throughout the design phase to ensure continued safe harbor operations.

We appreciate your time and effort in reviewing the Draft Environmental Assessment. Should you have any questions regarding this project, please contact Chris Chung, Waterfront Project Manager, at 586-2534.

Sincerely,

Daniel E. Orodenker
Special Assistant to the Director

ATTACHMENT E
References

ATTACHMENT E
References

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ATTACHMENT F
Water Quality Assessment

Water Quality and Sediment Quality Analysis

Sea Engineering, Inc.
November 1993

Water Quality

Early reviews of water quality in Honolulu Harbor after the opening of the west entrance to the harbor and the deepening of Kalihi Ship Channel in 1960 are found in Ultramar Chemical Water Laboratory (1968), Cox and Gordon (1970), and Dillingham Environmental (1971). Because of improvements in analytical methods made during the 1970's, values for some parameters reported in these studies may not be comparable with more recent studies. Department of Health records provide some historical water quality data for Honolulu Harbor as shown in Table 1.

Water quality studies conducted for the Honolulu International Airport, Reef Runway Construction Project provide a one year record of water quality measurements from a station ("Station 7") at the west end of the Kapalama Basin. Samples were collected approximately monthly at several depths for the period from September 1977 through August 1978 (AECOS, 1979b). The data for "Station 7" are summarized in Table 2. The water quality criteria (DOH, 1989) clearly exceeded were turbidity and total phosphorus. Follow-up studies were reported by OI Consultants, Inc. (1986), and included a "Station D" located in the Kalihi Channel near the bascule bridge. Three samples, from the surface, mid-water, and near bottom, were collected on a single visit (July 15, 1986). The mean of these three samples is also included in Table 2.

TABLE 1.
Department of Health Water Quality Data for Honolulu Harbor; mean for January 1973 to December 1975 from the area around Pier 11 (after R. M. Towill Corp., 1982)

pH	8.03	Nitrate + Nitrate	0.013
		TKN	0.213
		Total Nitrogen	0.234
Dissolved Oxygen	6.27	Total Phosphorus	0.029
Temperature (oC)	26.2	Fecal Coliforms	1671
Turbidity (FTO)	1.88		
Total Coliforms	3941		

Units for nutrient and DO values are ppm (mg/L); coliforms are no./100 mls; Number of samples not stated, but 34 to 35 data points are stored in STORET file.

TABLE 2.
Kapalama Basin water quality measured over a one-year period in 1978-79 (AECOS, 1979b) and in July 1986 (OI Consultants, 1986)

Parameter	Geo. Mean	Range	N
Light Extinction Coefficient (m-1)	0.39	0.23 - 0.63	(11)
Turbidity (ntu)	1.6	0.9 - 5.0	(72)
(1986)	2.1		(3)
NFR (mg/L)	5.6	1.5 - 13.2	(71)
(1986)	5.33		(3)
Nitrate+Nitrate (mg N/L)	0.003	ND - 0.007	(72)
(1986)	0.001		(3)
Ammonia (mg N/L)	0.004	0.001 - 0.015	(72)
(1986)	0.016		(3)
Total N (mg N/L)	0.115	0.080 - 0.270	(72)
(1986)	0.235		(3)
Orthophosphate (mg P/L)	0.006	0.003 - 0.012	(72)
(1986)	ND		(3)
Total P (mg P/L)	0.039	0.014 - 0.101	(71)
(1986)	0.004		(3)
Chlorophyll a (ug/L)	0.15	0.06 - 1.53	(71)
(1986)	1.13		(3)

A survey of Honolulu Harbor conducted by Oceanit Laboratories, Inc. (1990) included water quality results for several stations as shown in Table 3. Values are reported as geometric means, although the number of samples collected were not given. Of relevance to the present site are the "Kalihi Channel" and "Kapalama Channel" stations, indicated on the station location map as mid-channel at the Sand Island, bascule bridge and mid-channel off Pier 29, respectively. For the period represented by these samples, the Kalihi Channel station appeared to have the worst water quality.

TABLE 3.
Summary of results from Honolulu Harbor water quality monitoring for the Aloha Tower redevelopment project (Oceanit Laboratories, 1990)

Station	Kalihi Channel	Kapalama Channel	Harbor	Main Channel
Turbidity (ntu)	3.95	0.94	0.80	0.32
TSS (=NFR)1 (mg N/L)	8.52	5.60	6.86	4.43
Nitrate + nitrite2 (mg/L)	0.003	0.003	0.004	0.004
Total Nitrogen (mg N/L)	0.125	0.100	0.112	0.100
Orthophosphate (mg P/L)	0.008	0.004	0.003	0.003
Total Phosphorus (mg P/L)	0.046	0.019	0.018	0.013
Chlorophyll α (µg/L)	0.46	0.57	0.55	0.30

1 - Total suspended solids or non-filterable residue.
2 - As "nitrate" in report.

Sediment Quality

Sediment samples were collected on October 27, 1993 from the areas proposed for dredging. A total of five core samples were obtained from the upper sediment layer and subjected to laboratory analyses for potentially toxic pollutants suspected of being present based upon previous sediment testing in the harbor and Kapalama Canal. Included were many, but not all of, the potential pollutants required for measurement under the dredged spoil disposal program administered by the U.S. Army Corps of Engineers (ACOE) and the Environmental Protection Agency (EPA). Sediment cores from Sites 2 and 3 were obtained from approximately the upper 0.6 meter of the bottom. The Site 1 sample analyzed was a composite of three cores taken to depths exceeding 1 meter in the soft muds off the mouth of Kapalama Stream.

The sample locations are described in Table 4. Table 5 provides basic information on the analytical methods and instrumentation used in the analysis of these sediments.

Table 4. Pier 38 October 1993 sediment sample descriptions.

SAMPLE ID	LOCATION	DESCRIPTION	Percent Solids	Percent silt / clay
Site 1	Off rip-rap 25 m south of Pier 38C in water depths of 2.5, 4, and 5 meters	Sample composite of three cores. Dark silt with organic matter.	37.6 %	~ 80 %
Site 2	Off Pier 38B. Water depth of 5 meters.	Dense, gray clay	50.6 %	~ 90 %
Site 3	Off middle of Pier 38A, rock wall at water depth of 5 meters.	Dense, gray clay with coral gravel %	49.0 %	~ 90 %

Table 5. Laboratory analytical methods and instruments used in the October 1993 sediment analyses.

Analysis List	Method	Reference	Instrument
TPH (Hydrocarbons)	Method 5520D/5520F	Standard Method 18th Edition (1992)	Perkin Elmer 1430 IR
Oil & Grease	Method 5520D/5520C	Standard Methods 18th Edition (1992)	Perkin Elmer 1430 IR
PAH	EPA 3550/8100	EPA (1986)	HP 5890 Series II GC with FID.
Pesticides & PCBs	EPA 8080	EPA (1986)	HP 5890 Series II GC with ECD.
Arsenic	EPA 3050/7060	EPA (1986)	TJA 8000 GFAA
Cadmium	EPA 3050/7130	EPA (1986)	TJA 8000 AA
Chromium	EPA 3050/7190	EPA (1986)	TJA 8000 AA
Copper	EPA 3050/7210	EPA (1986)	TJA 8000 AA
Lead	EPA 3050/7420	EPA (1986)	TJA 8000 AA
Mercury	EPA 7471	EPA (1986)	TJA 8000 automated cold vapor
Nickel	EPA 3050/7520	EPA (1986)	TJA 8000 AA
Silver	EPA 3050/7760	EPA (1986)	TJA 8000 AA
Zinc	EPA 3050/7950	EPA (1986)	TJA 8000 AA

EPA. 1986. Test Methods for Evaluating Solid Waste. U.S. Environmental Protection Agency, SW 846.

Table 6 presents the results of the trace and heavy metal analysis for the samples at Sites 1, 2 and 3. Three metals, copper, zince and lead, show a distinct pattern in the current samples: Site 1 levels are higher (by a factor of about 2) than Site 3 levels, and Site 3 levels are higher (by a factor of 5 for copper and zinc, and 50 for lead) than the Site 2 levels. The values at Site 2 are low for coastal sediments; the values for Site 1 are characteristic of nearshore sediments.

Table 6. Trace and heavy metals in Honolulu Harbor surface sediments off Pier 38 (Kapalama Basin)
[units = mg/kg dry wt].

	Site 1 Pier 38C	Site 2 Pier 38B	Site 3 Pier 38A
Arsenic	23.2	8.24	6.19
Cadmium	0.998	<0.036	1.22
Chromium	132	81	117
Copper	226	25.2	163
Lead	260	3.71	124
Mercury	0.762	0.0585	0.763
Nickel	75.6	66.8	72.9
Silver	0.703	<0.179	0.214
Zinc	542	53.3	322

NOTE: All values are the average of duplicate analyses.

Trace metals are frequently found in Hawaiian sediments, particularly nearshore sediments, since volcanic soils deposited from land run-off have relatively high levels of a number of such metals. A useful comparison is provided by the several studies summarized in Table 7, showing concentrations in basalt, saprolite (weathered basalt), and various deposited sediments in non-urban settings.

Table 7. Heavy metals concentrations (ppm) in basalts, soils, and stream bed and coastal sediments in Hawaii.

Metal	Koloa Basalts (1)	Koloa Saprolite (1)	Ku Tree Sediments (2)	Kahana Sediments (3)	Coastal Sediments (4)
Arsenic (As)			2-17	3-12	ND-29
Cadmium (Cd)			ND-2	ND-2	ND-10
Chromium (Cr)	400	560-860	209-403	47-147	1-122
Copper (Cu)	290	33-80	47-160	ND-160	
Mercury (Hg)			0.3-0.5	ND-0.2	ND-2
Nickel (Ni)	840	250-580	108-350	ND-350	
Lead (Pb)	12	0.5-3	21-34	5-34	5-58
Zinc (Zn)					ND-105

(1) - Patterson, 1971; basalt and weathered basalt.
(2) - AECOS, 1984; Ku Tree Reservoir sediments.
(3) - Lau, et al. , 1973; Kahana Stream sediments.
(4) - Lau, et al. , 1973; Kahana Bay sediments.

The harbor sediment samples collected in October 1993 displayed considerable variation in the amounts of organic matter as might be suspected given the locations of the cores relative to the mouth of Kapalama Canal. A general measure of the contribution of petroleum contamination to the organics in the sediments is "total petroleum hydrocarbons" (TPH) as measured by one of the methods modified from the "oil and grease" methods used on sewage and sludge samples. Oil and grease represents the material recovered from an extraction with trichlorotrifluoroethane ("freon") measured (in this case) by partition-infrared, and may include both biological lipids and mineral hydrocarbons. No chemical substance or substances are indicated by this test. Also, some volatile compounds will be lost during the test. Measurement of total petroleum hydrocarbons (TPH) is accomplished by selectively removing, by mixing with silica gel, the polar materials (presumably the fatty acids) in the extractions containing the oil and grease. What remains is termed hydrocarbons and is presumed to reflect petroleum products. Some complex aromatic compounds and non-lipid organics may also be removed by the silica gel.

For the sediment samples collected off Pier 38 in October, nearly all of the oil and grease in the sediment appears to be petroleum hydrocarbons (see Table 8). Table 9 provides comparative oil and grease and TPH values for sediments from other harbor areas in Hawaii and American Samoa. Polynuclear aromatic hydrocarbons (PAH or PNA) are present only at Site 2, and possibly at Site 3 in low (non-quantifiable) amounts. Only fluorene and chrysene were found in quantifiable amounts at Site 2. Any other PNA compounds, if present in these samples, were at concentrations below the detection limits, indicated by a less-than symbol (<) and determined specifically for these samples. However, in a few cases, as indicated by the dagger (†), small peaks corresponding to the particular PNA compounds were observed by the chemists. The size of these peaks indicate concentrations below the detection limit.

With respect to the chlorinated organics detectable by EPA Method 8080 (mostly pesticides and PCB's) only 4,4'-DDD and endosulfan (I) were detected at quantifiable concentrations, and only at Site 1. Also known as TDE and sold as Rhothane, this pesticide is usually present in the environment as a breakdown product of the more familiar insecticide DDT. Endosulfan (I) is also an insecticide, formerly known as alpha-endosulfan. No PCBs were detected in these samples.

Table 8. Organic pollutants in Honolulu Harbor surface sediments off Pier 38 (Kapalama Basin).
(units are mg/kg dry wt = ppm)

	Site 1 Kapalama Canal	Site 2 Pier 38B	Site 3 Pier 38A
Oil & Grease	870	383	181
TPH	843	350	181
PNA(PAH)			
Naphthalene	<0.00836	<0.00659	<0.00679
Acenaphthylene	<0.00836	<0.00659	<0.00679
Acenaphthene	<0.00836	<0.00659	<0.00679
Flourene	<0.00836	<0.3164	<0.00679†
Phenanthrene	<0.00836	<0.00659	<0.00679†
Anthracene	<0.00836†	<0.00659	<0.00679†
Chrysene	<0.00836	<0.00836	<0.00679
Fluoranthene	<0.00836	<0.00659	<0.00679
Pyrene	<0.00836	<0.00659	<0.00679
Benz[a]anthracene	<0.00836	<0.00659	<0.00679
Benzo[b]fluoranthene	<0.00836	<0.00659	<0.00679
Benzo[k]fluoranthene	<0.00836	<0.00659†	<0.00679
Benzo[a]pyrene	<0.00836	<0.00659	<0.00679
Indeno[1,2,3-cd]pyrene	<0.00836	<0.00659	<0.00679†
Dibenz[a,h]anthracene	<0.00836	<0.00659	<0.00679
Benzo[g,h,i]perylene	<0.00836	<0.00659	<0.00679
Chlorinated Pesticides			
Aldrin	<0.00005	<0.00004	<0.00004
alpha-BHC	<0.00005	<0.00004	<0.00004
beta-BHC	<0.00005	<0.00004	<0.00004
delta-BHC	<0.00005	<0.00004	<0.00004
gamma-BHC	<0.00005	<0.00004	<0.00004
4,4'-DDD	<5.06	<0.0004	<0.0004
4,4'-DDE	<0.00005	<0.00004	<0.00004
4,4'-DDT	<0.00005	<0.00004	<0.00004
Dieldrin	<0.00005	<0.00004	<0.00004
Endosulfan I	<0.84	<0.04	<0.04†
Endosulfan II	<0.05	<0.04	<0.04
Endosulfan sulfate	<0.05	<0.04	<0.04
Endrin	<0.05	<0.04	<0.04
Endrin aldehyde	<0.05	<0.04	<0.04
Heptachlor	<0.05	<0.04	<0.04
Heptachlor epoxide	<0.05	<0.04	<0.04
p,p'-Methoxychlor	<0.05	<0.04	<0.04
PCBs			
Aroclor 1232	<0.00006	<0.00004	<0.00004
Aroclor 1242	<0.00006	<0.00004	<0.00004
Aroclor 1254	<0.00006	<0.00004	<0.00004
Aroclor 1260	<0.00006	<0.00004	<0.00004
Aroclor 1016	<0.00006	<0.00004	<0.00004
Aroclor 1221	<0.00006	<0.00004	<0.00004
Aroclor 1248	<0.00006	<0.00004	<0.00004

† Probably present but not quantifiable.

Table 9. Ranges of oil & grease and TPH measurements from harbor sediments in the Hawaiian and Samoan Islands (after AECOS, 1990 and 1991).

Location	N	Oil & Grease (mg/kg)	TPH (mg/kg)
Honolulu Harbor	5	180 - 340	110 - 270
Pearl Harbor	5	95 - 450	54 - 360
Hilo Harbor	4	120 - 320	110 - 320
Nawiliwili Harbor	4	<50 - 93	<50 - 56
Kahului Harbor	4	73 - 220	50 - 210
Inner Pago Pago Harbor	5	300 - 7,000	<1

ATTACHMENT G
Traffic Assessment

PIER 38 MASTER PLAN TRAFFIC IMPACT STUDY

UNIVERSITY OF HAWAII MARINE RESEARCH CENTER

Prepared for

Lacayo Planning, Inc.

by

Wilbur Smith Associates

November 17, 1993

WSA

TABLE OF CONTENTS

ILLUSTRATIONS

TABLES

1. INTRODUCTION

The State of Hawaii is planning to relocate a number of the present marine research facilities to a new consolidated facility at Pier 38 in Honolulu Harbor. The new Pier 38 facility will include all of the marine research activities presently located at Snug Harbor in the Kapalama area, and a portion of the activities presently located at Kewalo Basin in Kakaako and at Makai Pier in Waimanalo.

The new Marine Research Facility will occupy a 6.35-acre site at Pier 38, which is located on the Diamond Head side of Kapalama Stream (see Figure 1). Access to the project site is provided via a 60-foot-wide roadway/utility easement that intersects Nimitz Highway opposite present Ala Kawa Street.

The Pier 38 project will include berthing and support facilities for marine research ships, repair shops, research laboratories, and supporting office space. The major elements to be relocated to Pier 38 include:

- University of Hawaii Marine Center ("Snug Harbor"), now located in the Kapalama area adjacent to Sand Island Access Road, which provides port facilities and services to support marine research programs.
- J.K.K. Look Laboratory, now located at Kewalo Basin, which is used for hydraulic modeling and ocean testing, as well as laboratory classes for graduate students.
- Hawaii Undersea Research Laboratory (HURL), which operates manned and unmanned submersible vessels, is based at Makai Pier in Waimanalo.
- National Marine Minerals Technology Center (MMTC) and Hawaii Natural Energy Institute (HNEI) facilities at Look Laboratory, which are used to conduct experiments and projects.
- National Oceanic and Atmospheric Administration (NOAA) shore support for the ship "Townsend Cromwell," which is currently provided at Snug Harbor.
- National Marine Fisheries Service (NMFS) gear storage and cruise staging operations which are currently based at Kewalo Basin.

The purpose of this study is to assess the impacts of the Pier 38 project on the adjacent roadways. The analysis focuses on traffic conditions at the Pier 37/38 Access Road - Ala Kawa Street intersection with Nimitz Highway. The Pier 38 Marine Research Center is expected to be completed by year-end of 1995, which is used as the time period for this analysis.

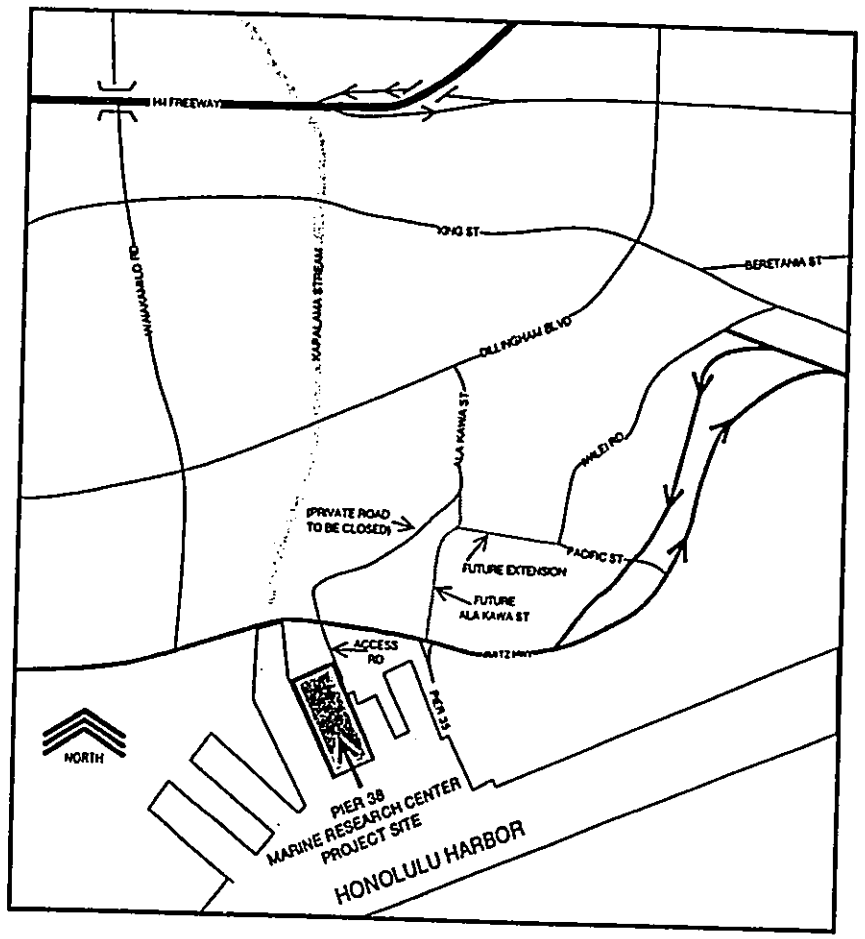

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Figure 1
SITE LOCATION

2. EXISTING CONDITIONS

The Pier 38 project site is largely unused at present. The makai two-thirds of the site was previously used by Chevron for fuel storage. The mauka one-third of the site is presently occupied by GASCO buildings and equipment, which will be relocated mauka toward the Chevron fuel storage tanks and Nimitz Highway.

The finger pier along the Pier 37 side of the property is used to berth itinerant fishing vessels.

The areas on the Diamond Head side of the Pier 37/38 Access Road are primarily used for storage. Most of this area is planned by the State for future use as a Fresh Fish Wholesale Distribution Center.

Mauka of Nimitz Highway, the Nimitz Business Center and the Xerox/GECC building are located on the Diamond Head and Ewa sides of Ala Kawa Street, respectively. The Dole Pineapple Cannery facilities and other industrial and warehousing uses are located along Ala Kawa Street.

■ Existing Roadways ■

The Pier 37/38 Access Road provides the only access to the Marine Research Center project site, and functions as a private road for access to the harbor activities. The one-block long roadway is 30 to 32 feet wide within the 60-foot wide easement, with the road striped for one lane in each direction. Raised traffic islands are provided to permit a separate channelized right-turn movement to or from Nimitz Highway.

Nimitz Highway (FAP Route 92) is a major roadway that links the Pearl Harbor area, the Honolulu International Airport area, the Honolulu Harbor, and downtown Honolulu. It provides access to the H-1 Freeway at the nearby Keehi Interchange. Nimitz Highway is a median-divided roadway with three lanes in each direction with separate left-turn lanes provided in each direction at the Pier 37/38 Access Road - Ala Kawa Street intersection. The intersection is controlled by a traffic signal.

Ala Kawa Street provides a connection between Nimitz Highway and Dillingham Boulevard, although it is primarily a privately-owned roadway intended for access to the Dole Cannery and adjacent land uses. The section through the cannery area is gated during nighttime hours. At Nimitz Highway, the street is approximately 36 feet wide, with one lane in each direction. The approach lane is sufficiently wide to allow right-turning vehicles to bypass waiting left-turn and through vehicles. Driveways to enter the Nimitz Business Center, and to enter/exit the Xerox parking lot, are located adjacent to Nimitz Highway and result in occasional disruption of traffic flow on Ala Kawa Street.

■ Existing Traffic Volumes ■

On Nimitz Highway, the closest weekday 24-hour traffic count to the project is Station SL-20 at the Kapalama Canal. The most recent count available is for April 8, 1992 when a total of 72,213 vehicles were recorded for both travel directions. No daily count information was available for the Pier 37/38 Access Road or Ala Kawa Street.

A manual count of the vehicle movements at the Nimitz Highway intersection with Pier 37/38 Access Road and Ala Kawa Street was made on October 6, 1993, for the morning and afternoon peak traffic periods. The traffic volumes for morning and afternoon peak one-hour periods are depicted in Figure 2. The morning peak hour is from 6:45 to 7:45 AM and the afternoon peak hour is from 3:45 to 4:45 PM.

The afternoon peak hour represented the highest two-way traffic volumes on Nimitz Highway and on Ala Kawa Street, while the morning peak hour resulted in the highest volumes on Pier 37/38 Access Road. One unusual feature of the traffic movements at the intersection is that about one-half of the right-turns into the Pier 37/38 Access Road and most of the straight-through movements from Pier 37/38 Access Road were vehicles using this "jug-handle" route to actually turn left from Nimitz Highway to Ala Kawa Street. Several of the right-turn vehicles also executed left-turns from Pier 37/38 Access Road, thus completing "U-turns."

■ Methodology for Analyzing Levels-of-Service ■

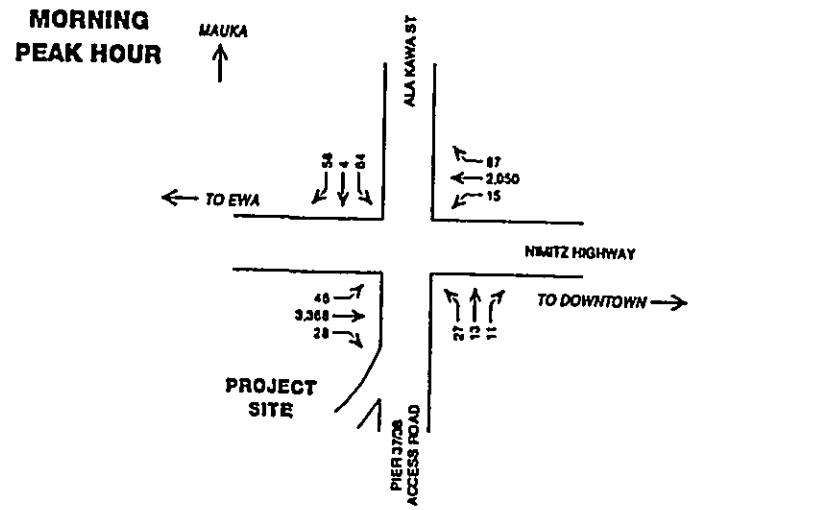
The Transportation Research Board (TRB), a division of the National Science Foundation, has developed standardized methods for use in evaluating the effectiveness and quality of service for roadways and streets. The TRB methodology for analyzing traffic signal-controlled intersections was used in evaluating present and future conditions for this study.

The TRB evaluation methods use a concept known as level-of-service (LOS). This concept describes facility operations on a letter basis from A to F, which signify excellent to unacceptable conditions, respectively. The methods generally compare traffic volumes on a facility to the facility's theoretical capacity. Capacity is estimated based on the facility's physical characteristics (e.g. number of lanes), traffic conditions (e.g. types of vehicles), and type of traffic controls. The comparisons are frequently referred to as the volume-to-capacity (V/C) ratio. The methodologies are described in the *1985 Highway Capacity Manual* (1985 HCM).[1]

The operations approach was used in analyzing the signalized intersection for this study. As with analysis of other types of traffic facilities, signalized intersection analysis also calculates the V/C ratio. Modern signals allocate time in a variety of ways, from the simplest two-phased pretime signal, to the most complex multi-phase actuated signal. Signal phasing and timing control the various traffic streams which meet at an intersection. As such, they are key in the evaluation of intersection level-of-service. While capacity is evaluated in terms of the V/C ratio, with the operations approach, level-of-service is based on average delay (seconds/vehicle) rather than the V/C ratio.

Level-of-service criteria for signalized intersections is defined in Figure 3.

[1] *Highway Capacity Manual, Special Report 209*, Transportation Research Board, 1985.



WILBUR SMITH ASSOCIATES

Figure 2
EXISTING PEAK HOUR TRAFFIC VOLUMES
Nimitz Highway at Ala Kawa Street

The **OPERATIONS LEVEL METHODOLOGY**, which is described in the Transportation Research Board's Highway Capacity Manual, defines Level of Service (LOS) for signalized intersections in terms of delay. Technically, delay is the amount of time an average vehicle must wait at an intersection before being able to pass through the intersection. For signalized intersections, the relationship between LOS and delay is based on the average stopped delay per vehicle for a fifteen minute period.

LEVEL OF SERVICE 'A' - Delay 0.0 to 5.0 seconds
Describes operations with very low delay, i.e., less than 5 seconds per vehicle. This occurs when signal progression is extremely favorable. Most vehicles arrive during the green phase and are not required to stop at all.
Corresponding V/C ratios usually range from 0.00 to 0.60.

LEVEL OF SERVICE 'B' - Delay 5.1 to 15.0 seconds
Describes operations with delay in the range of 5 to 15 seconds per vehicle generally characterized by good signal progression and/or short cycle lengths. More vehicles are required to stop than for LOS 'A' causing higher levels of average delay.
Corresponding V/C ratios usually range from 0.61 to 0.70.

LEVEL OF SERVICE 'C' - Delay 15.1 to 25.0 seconds
Describes operations with delay in the range of 15 to 25 seconds per vehicle. Occasionally, vehicles may be required to wait more than one red signal phase. The number of vehicles stopping at this level is significant although many still pass through the intersection without stopping.
Corresponding V/C ratios usually range from 0.71 to 0.80.

LEVEL OF SERVICE 'D' - Delay 25.1 to 40.0 seconds
Describes operations with delay in the range of 25 of 40 seconds per vehicle. At LOS 'D', the influence of congestion becomes more noticeable. Many vehicles stop, and the proportion of vehicles not stopping declines. The number of vehicles failing to clear the signal during the first green phase is noticeable.
Corresponding V/C ratios usually range from 0.81 to 0.90.

LEVEL OF SERVICE 'E' - Delay 40.1 to 60.0 seconds
Describes operations with delay in the range of 40 to 60 seconds per vehicle. These high delay values generally indicate poor signal progression, long cycle lengths and high V/C ratios. Vehicles frequently fail to clear the intersection during the first green phase.
Corresponding V/C ratios usually range from 0.91 to 1.00.

LEVEL OF SERVICE 'F' - Delay 60.1 seconds plus
Describes operations with delay in excess of 60 seconds per vehicle. This condition often occurs with oversaturation, i.e., when arrival flow rates exceed the capacity of the intersection.
Corresponding V/C ratios of over 1.00 are usually associated.

V/C - Volume-to-capacity ratio.
SOURCE: Transportation Research Board, "Operations Level Methodology-Signalized Intersections", Highway Capacity Manual, Special Report 209. 1985.

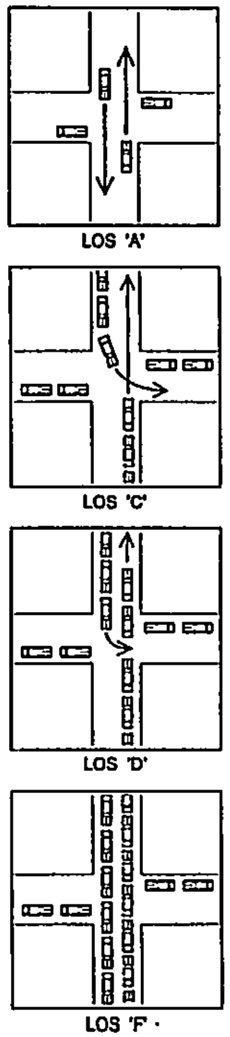


Figure 3
LEVEL OF SERVICE DIAGRAM

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■ Intersection Conditions ■

Traffic conditions were analyzed at the Nimitz Highway-Pier 37/38 Access Road Intersection in accordance with the operations analysis methodology. The analysis results, summarized in Table 1, indicate that the overall intersection is operating at very acceptable levels-of-service and acceptable capacity levels during both the morning and afternoon peak hours.

However, the analysis indicates that traffic on the Ala Kawa Street approach experiences lengthy delays in the morning (LOS E, 41 seconds average delay) and afternoon (LOS F, 108 seconds average delay) peak hours. This is largely a function of the long signal cycle length. Field observations found that most vehicles on Ala Kawa Street cleared the intersection on each signal cycle, although there were several occasions when all vehicles did not clear the intersection and had to wait for the following green phase.

Table 1

EXISTING INTERSECTION CONDITIONS
Nimitz Highway at Pier 37/38 Access Road and Ala Kawa Street

Peak Hour	V/C Ratio	Average Delay per Vehicle	LOS
Morning	0.847	9.7 seconds	B
Afternoon	0.913	15.6 seconds	C

Wilbur Smith Associates; October 1993

In the afternoon peak period, Ewa-direction traffic flow was often affected by constraints or bottlenecks beyond this intersection. The constraint (Waiakamilo Road or Sand Island Access Road intersections) was observed to often preclude Ewa-direction traffic movement though this intersection during portions of the green signal phase.

■ Public Transit Access ■

Transit access to the project site is available via TheBus Route 19, which operates along Nimitz Highway. Bus stops in each direction are located on the Diamond Head side of the Pier 37/38 Access Road Intersection.

Route 19 provides direct connection to Waikiki, Ala Moana Center, downtown Honolulu, and the airport area. Transfers to Leeward suburban routes are available near the Airport; transfers to urban trunk routes and express routes are available in the downtown area, including connections to the U.H. Manoa campus. Route 19 service frequencies approximate 20 minutes in each direction throughout the daytime hours.

3. 1995 TRAFFIC CONDITIONS WITHOUT PROJECT

The Pier 38 Marine Research Center project is planned for completion by the end of 1995. Forecast conditions are presented for year-end 1995 without the project as a base from which to identify the incremental impacts of the project.

There are no major changes anticipated in the project vicinity by the end of 1995. However, several major changes are expected to occur after 1995 which would affect conditions at the Pier 37/38 Access Road intersection with Nimitz Highway. Although these projects are not reflected in the forecasts, the nature of their effects on Pier 38 project access are discussed in this section.

■ 1995 Traffic Volumes Without Project ■

No major new development projects are anticipated for the adjacent areas by the end of 1995. Traffic increases over the next two years are expected to result from a general increase in the area's economy and travel activity, small infill development, and the completion of several projects along Nimitz Highway in the Downtown area.

Based on the State DOT count station (SL-20) at Kapalama Stream, the historic growth trend over the last 10 years has averaged 2.3 percent per year along this segment of Nimitz Highway. In addition, estimated traffic volumes for the Harbor Court and Marin Tower projects are included in the 1995 traffic forecasts for Nimitz Highway. The resultant annual growth rates amount to:

	Morning	Afternoon
Nimitz Highway	3.4%	3.3%
Ala Kawa Street	2.3%	2.4%
Pier 37/38 Access Road	3.8%	3.3%

The estimated 1995 year-end peak hour traffic volumes without the project are depicted in Figure 4.

■ Roadway Improvements ■

No significant modifications to the adjacent roadways are expected by year-end 1995.

■ 1995 Traffic Conditions ■

The analysis of 1995 traffic conditions at the intersection of Nimitz Highway with the Pier 37/38 Access Road is summarized in Table 2. The estimated traffic increases would affect intersection conditions more in the afternoon peak hour than in the morning. Although the traffic increase would not be sufficient to lower the service level, the afternoon increases would be approaching the theoretical capacity of the intersection.

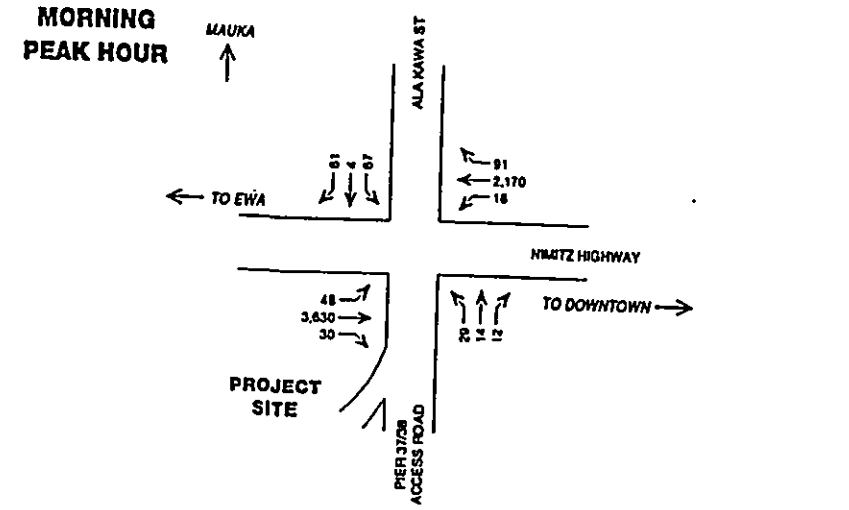


Figure 4
1995 PEAK HOUR TRAFFIC WITHOUT PROJECT
Nimitz Highway at Ala Kawa Street

WILBUR SMITH ASSOCIATES

Table 2
1995 INTERSECTION CONDITIONS WITHOUT PROJECT
Nimitz Highway at Pier 37/38 Access Road and Ala Kawa Street

Condition	V/C Ratio	Average Delay per Vehicle	LOS
Morning Peak Hour			
Existing	0.847	9.7 seconds	B
1995 Without Project	0.912	13.1 seconds	B
Afternoon Peak Hour			
Existing	0.913	15.6 seconds	C
1995 Without Project	0.977	22.6 seconds	C

Wilbur Smith Associates; October 1993

■ Projects Beyond 1995 ■

There are several projects in the planning phase that could affect conditions at Pier 37/38 Access Road intersections with Nimitz Highway. These are:

- Pier 37 Fresh Fish Wholesale Distribution Center
- Redevelopment of the Dole Food Co. Iwilei property
- Nimitz Highway Makai Viaduct project

The Fish Distribution Center is expected to be advertised by the State for development proposals in 1994. The site extends eastward from the Pier 37/38 Access Road. Access to the site could be exclusively to/from the Pier 37/38 Access Road, or could also be via the Pier 35 intersection with Nimitz Highway.

The driveway access to the Pier 37/38 Access Road could be two-way, or could be one-way as part of a one-way internal circulation layout between the Pier 37/38 and Pier 35 access points. Depending upon the traffic volumes generated by the Fish Distribution Center, and the choice of access layout, the project could result in need for improvements to the Pier 37/38 Access Road. Considerations include:

- The Fish Distribution Center driveway to Pier 37/38 Access Road should be located as far from Nimitz Highway as possible.
- If the Fish Distribution Center driveway entrance is close to the Nimitz intersections, then sufficient width may be needed for a left-turn lane into the Fish Distribution Center in order to avoid stacking inbound traffic back onto Nimitz Highway.

- If Fish Distribution Center exit volumes are high enough, the Pier 37/38 Access Road may need to be widened by about five feet to allow right-turn vehicles access to the channelized right-turn lane.

Present plans for redevelopment of the Dole Food Co. property on the mauka side of Nimitz Highway include the realignment of Ala Kawa Street to intersect Nimitz Highway at the Pier 35 intersection. This rerouting would significantly reduce traffic volumes using the mauka leg of the Pier 37/38 Access Road intersection, with the present Ala Kawa Street leg remaining for access to the Nimitz Business Center and Xerox. This should improve future conditions at the Pier 37/38 intersection.

The State DOT is studying the potential for an elevated roadway viaduct for high occupancy vehicles (HOV) along this section of Nimitz Highway, as well as alternatives to this project. Construction of a Nimitz Highway project could either improve or worsen traffic conditions along Nimitz Highway, at the Pier 37/38 Access Road intersection, dependent upon the type and limits of the project eventually constructed.

4. 1995 TRAFFIC CONDITIONS WITH THE PIER 38 PROJECT

The new University of Hawaii Marine Research Center facility at Pier 38 is intended to accommodate the present Snug Harbor operations, which will be displaced by redevelopment of the Kapalama portion of Honolulu Harbor as a private cargo facility. The new Pier 38 facility will also allow the relocation and integration of related University and Federally-operated marine research facilities at this site. The major elements planned for relocation to Pier 38 include the following:

- University of Hawaii Marine Center (Snug Harbor), now located adjacent to the Sand Island Access Road, which provides port facilities and services to support marine research programs.
- J.K.K. Look Laboratory, now located at Kewalo Basin, which is used for hydraulic modelling and ocean testing, as well as laboratory classes for graduate students.
- Hawaii Undersea Research Laboratory (HURL), now based at Waimanalo Makai Pier, which operates manned and unmanned submersible vessels.
- National Oceanic and Atmospheric Administration (NOAA) shore support for the ship "Townsend Cromwell," which is currently located at Snug Harbor.
- National Marine Fisheries Service (NMFS) gear storage and cruise staging operations currently located at Kewalo Basin.

The Pier 38 project is planned for completion and occupancy around the end of 1995.

For purpose of this analysis, all of the Pier 38 project trips are considered to be "new" trips along Nimitz Highway. In actuality, many of the present trips to the existing Snug Harbor and Look Laboratory facilities likely use Nimitz Highway.

■ Project Description ■

The new Marine Research Facility will occupy a 6.35-acre area on the Ewa side of the makai end of the Pier 37/38 Access Road. GASCO will continue to occupy the parcel between the project site and the Chevron fuel storage tanks, while the vacant area on the Diamond Head side of the Pier 37/38 Access Road will be developed in the future as a fresh fish wholesale distribution center.

The Marine Research Center will include berthing and marine support facilities for marine research ships, repair shops, research laboratories, storage areas, and supporting office space. The project site will include approximately 71,000 sq. ft. of building and covered storage area, plus parking for 114 vehicles.[2] Approximately one-half of the site will be used as open storage or staging areas. The site layout plan is depicted in Figure 5.

[2] The large number of parking spaces was based on available area, not by ordinance requirements or anticipated normal parking needs.

PIER 38 MASTER PLAN TRAFFIC IMPACT STUDY

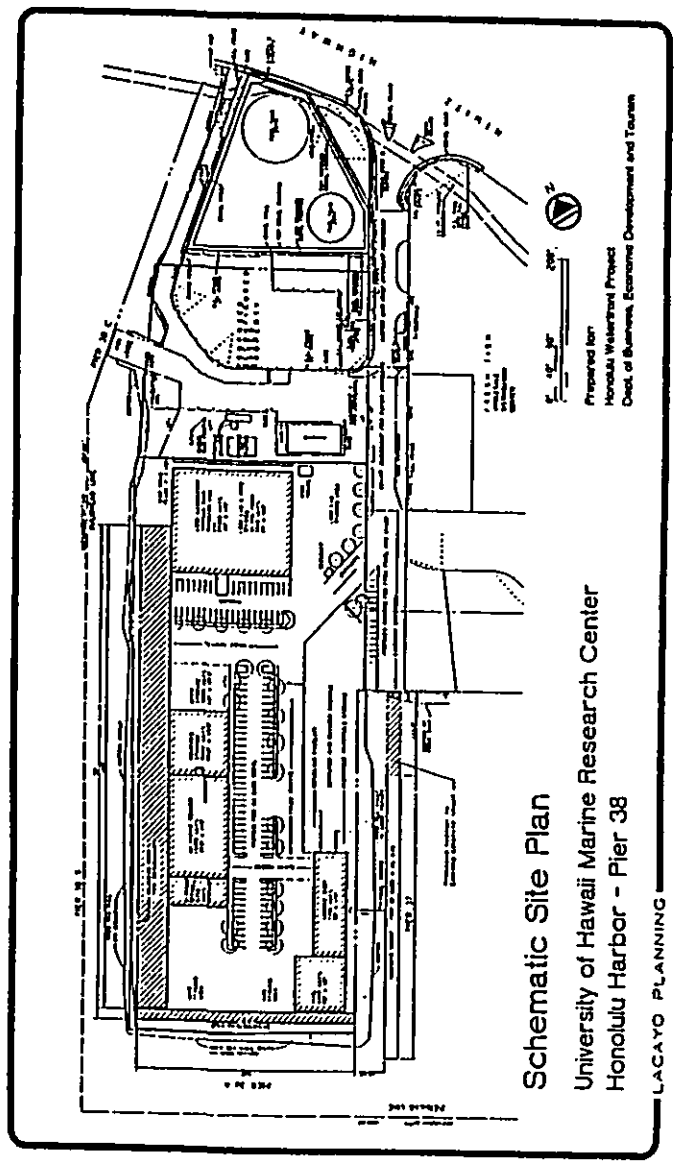


Figure 5
SCHEMATIC SITE PLAN

Three U.H. ocean-going research vessels will be based at Pier 38. These are the Kaimikai-O-Kanaloa, Moana Wave, and Kila. The first two vessels are at sea two-thirds to three-quarters of the year, while the Kila is a smaller vessel for use in local waters. The Townsend Cromwell, the NOAA ocean-going vessel, is at sea two-thirds of the year.

With completion of the Pier 38 facility, the shore staff based at the facility is estimated at 52 full-time equivalent employees, which is slighily more than the present staff of the operations planned for relocation to Pier 38. Ship's crews for the three UH vessels totals 35 persons, plus 5 ship-based marine technicians. The Townsend Cromwell has a crew of 21.

Pier 38 will also accommodate visiting research vessels. However, the visiting ships will typically be berthed at Pier 38 when one or more of the U.H. vessels is out at sea. Since the crew sizes of the visiting ships are approximately the same as those of the U.H. vessels, no significant increase in total crew population at Pier 38 is anticipated when a visiting research vessel is berthed there.

The normal work hours for the Marine Center are weekdays between 7:00 AM and 3:30 PM; for Look Laboratory, the work hours are weekdays from 7:30 AM until 4:30 PM.

Trip Generation

Given the unique characteristics of the Pier 38 facility, the estimated numbers of vehicle trips were based on trip rates developed for the existing travel characteristics of the site occupants, rather than using standard trip factors. The trip rates are based on the numbers of employees and daily visitors. The key inputs and assumptions are:

- For shore employees, 90 percent would arrive and depart in the peak one-hour morning and afternoon periods, respectively.
- For employees, 90 percent would drive.
- For ship's crew, the peak hour trip rate would be one-half that of shore staff since one-half live on-board while in port.[3]
- For visitors, 20 percent would arrive and depart in the peak one-hour morning and afternoon periods, respectively.
- For employees and visitors, the ratio of peak to off-peak direction traffic would be 5-to-1, about the same as for office or industrial uses.

The resultant trip rates for the morning and afternoon peak hours are presented in Table 3.

The estimated numbers of morning and afternoon peak hour vehicle trips are representative of a typical weekday. The key assumptions and inputs are:

[3] Source: Discussion with Marine Center staff.

Table 3

VEHICLE TRIP GENERATION RATES AND ESTIMATED TRIPS
Pier 38 Master Plan Traffic Impact Study

Item	Units	Morning Peak Hour		Afternoon Peak Hour	
		To Project	From Project	To Project	From Project
TRIP RATES					
Shore Staff	Employees[1]	0.81	0.16	0.16	0.81
Ship Crews	Employees	0.40	0.08	0.08	0.40
Visitors	Daily Visitors	0.20	0.04	0.04	0.20
VEHICLE TRIPS					
U.H. Marine Center/NOAA					
Shore Staff	20 Employees	16	3	3	16
Ship Crews	40 Employees[2]	16	3	3	16
Visitors	30 Visitors	6	1	1	6
	Subtotal	38	7	7	38
HURL					
Staff	13 Employees	11	2	2	11
MMTC					
Staff	8 Employees	7	1	1	7
Look Laboratory					
Staff	11 Employees	9	2	2	9
Visitors	15 Daily Visitors	3	1	1	3
	Subtotal	12	3	3	12
	Totals	68	13	13	68

(1) Equivalent full-time employees.
(2) Ship crews reflect 3 U.H research vessels: Kaimikai-O-Kanaloa, Moana Wave, & Kila - in port.

Wilbur Smith Associates; October 1993.

- All shore staff are at work, plus the crews of the three U.H. research ships. This represents a higher than average traffic condition, but not the highest.
- Daily visitor vehicles amount to 30 for the Marine Center and 15 for Look Laboratory, which represent the high end of the daily range.[4] Visitor vehicles include deliveries and researchers not based at the Pier 38 facility.
- No laboratory class traffic arrives/departs in peak hours. These classes are not held every academic quarter, and may not coincide with work shift changes.[5]
- Employee trips for all of the various operations fall into a common peak hour.

As summarized in Table 3, these assumptions result in weekday trip estimates of 68 entering and 13 exiting vehicles in the morning peak hour, and 13 entering and 68 exiting vehicles afternoon per hour. The U.H. Marine Center operations would contribute slightly over one-half of the trips.

Trip Distribution

Estimates of the directional distribution of trips to and from the project were based upon the traffic volumes on the other three legs of the Nimitz Highway intersection with Pier 37/38 Access Road. The resultant proportional distributions are:

To/From	Morning	Afternoon
Nimitz Highway Ewa of Site	60%	51%
Nimitz Highway Diamond Head of Site	38	47
Ala Kawa Street	2	2
Total	100%	100%

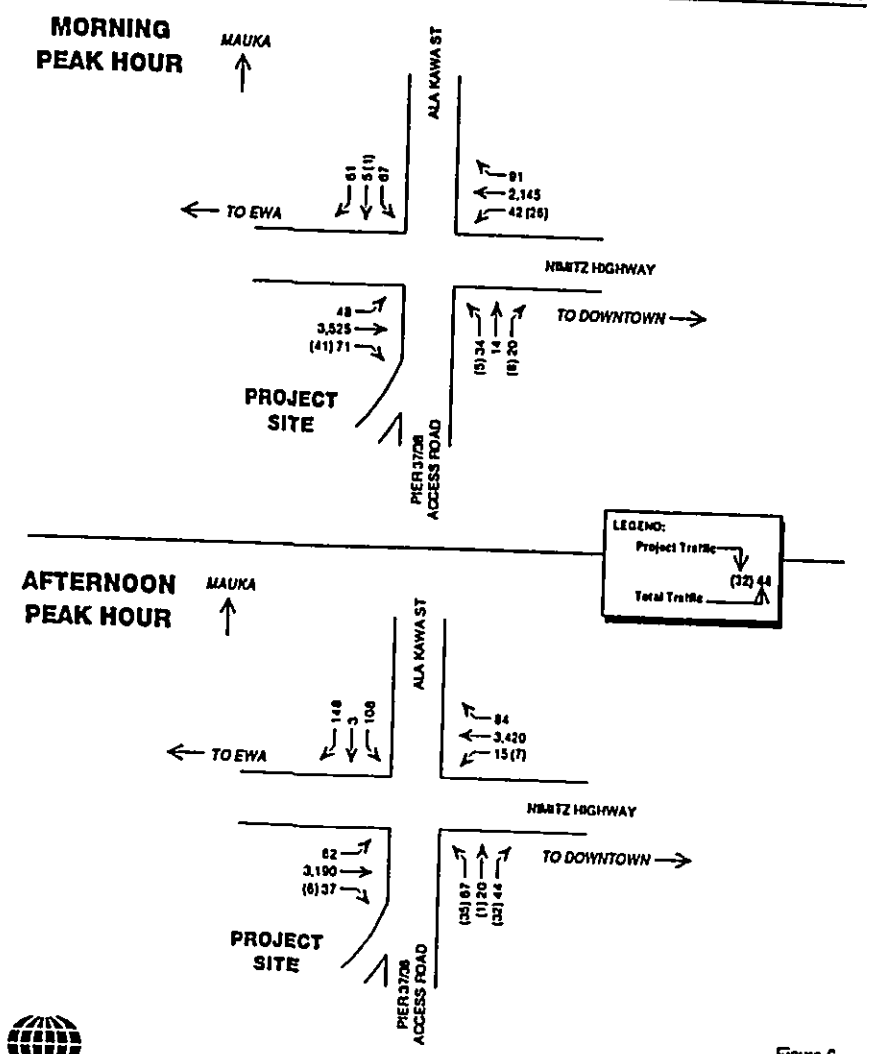
Traffic Increases

For the purpose of this analysis, the peak traffic hour of the Pier 38 facility was assumed to coincide with the highest peak hour volumes on Nimitz Highway. The estimated project vehicle trips were assigned to the Nimitz Highway intersection based on the distribution percentages. The resultant peak hour traffic volumes at the intersection of Nimitz Highway and the Pier 37/38 Access Road are depicted in Figure 6, with the estimated project-related traffic volumes noted in parenthesis.

The project would result in only small increases on the intersection legs, other than the Pier 37/38 Access Road. The proportional increases, relative to 1995 without the project, are:

[4] Source: Discussion with Marine Center and Look Laboratory staff.

[5] Ibid.



WSA WILBUR SMITH ASSOCIATES

Figure 6
1995 PEAK HOUR TRAFFIC WITH PROJECT
Nimitz Highway at Ala Kawa Street

- 76.0% to 77.0% on the Pier 37/38 Access Road
- 0.6% to 0.8% on Nimitz Highway
- 0.2% to 0.4% on Ala Kawa Street

Intersection Conditions

The analysis of 1995 traffic conditions with the project was made assuming no changes in the layout of the Nimitz Highway intersection with the Pier 37/38 Access Road. The analysis results, summarized in Table 4, indicate that the intersection would operate at the same service levels with or without the project (LOS B in the morning and LOS C in the afternoon). The project would increase the estimated average vehicle delay by about 0.9 seconds per vehicle during the peak traffic hours.

Table 4
1995 INTERSECTION CONDITIONS WITH PROJECT
Nimitz Highway at Pier 37/38 Access Road and Ala Kawa Street

Condition	V/C Ratio	Average Delay per Vehicle	LOS
Morning Peak Hour			
Existing	0.847	9.7 seconds	B
1995 Without Project	0.912	13.1 seconds	B
1995 With Project	0.930	14.0 seconds	B
Afternoon Peak Hour			
Existing	0.913	15.6 seconds	C
1995 Without Project	0.977	22.6 seconds	C
1995 With Project	0.981	23.5 seconds	C

Wilbur Smith Associates; October 1993

The project would primarily affect the intersection V/C ratio during the morning peak hour when arriving traffic would increase the critical Ewa-direction left-turn volume at the intersection. The morning increase from 0.912 to 0.93 would still be within the theoretical capacity of the intersection. The afternoon traffic increase would have little effect on the V/C ratio since left-turn traffic exiting the Pier 37/38 Access Road would overlap with the much higher existing left-turning traffic from Ala Kawa Street. However, afternoon traffic volumes would approach the theoretical capacity of the intersection either with or without the project.

Mitigation Actions

No mitigation actions appear needed to increase the capacity of the Nimitz Highway-Pier 37/38 Access Road intersection as a result of the Pier 38 project. Future traffic levels along Nimitz Highway are expected to approach intersection capacity with or without the Pier 38 project, and improvements are warranted as part of an overall Nimitz Highway corridor improvement project.

The Ewa-direction left-turn lane on Nimitz Highway at the Pier 37/38 Access Road should be lengthened to accommodate the increase in left-turn traffic. The present length of the storage lane approximates 75 feet. With the forecast traffic and a continuation of a 150-second morning signal cycle, the storage lane should be lengthened to a minimum of 100 feet, and desirably to 125 feet, to minimize blockage of the through lane by waiting left-turn vehicles.

The future location of access to the Fresh Fish Wholesale Distribution Center to/from Pier 37/38 Access Road could worsen the intersection conditions described herein, as well as introducing traffic conflicts along the access road. Possible mitigative actions are discussed on Page 3-2.

APPENDIX

Intersection Analysis Worksheets

1985 HCM: SIGNALIZED INTERSECTIONS
SUMMARY REPORT

INTERSECTION..NIMITZ HWY/ALA KAUA ST
AREA TYPE.....OTHER
ANALYST.....STB
DATE.....10/8/90
TIME.....AM
COMMENT.....NHAEXAM EXISTING

	VOLUMES					GEOMETRY							
	EB	WB	NB	SB		EB		WB		NB		SB	
LT	46	15	27	64	L	12.0	L	12.0	LTR	15.0	LTR	15.0	
TH	3368	2050	13	4	T	12.0	T	12.0		12.0		12.0	
RT	0	87	0	58	T	12.0	T	12.0		12.0		12.0	
RR	0	5	0	30	TR	12.0	TR	12.0		12.0		12.0	
						12.0		12.0		12.0		12.0	
						12.0		12.0		12.0		12.0	

ADJUSTMENT FACTORS

	GRADE (%)	HV (%)	ADJ Y/N	PKG Nm	BUSES Nb	PHF	PEDS	PED. Y/N	BUT. min T	ARR. TYPE
EB	0.00	6.00	N	0	0	0.98	0	N	9.6	3
WB	0.00	8.00	N	0	0	0.92	0	N	9.6	3
NB	0.00	2.00	N	0	0	0.90	0	N	26.5	3
SB	0.00	2.00	N	0	0	0.90	0	N	26.5	3

SIGNAL SETTINGS — CYCLE LENGTH = 150.0

		PH-1	PH-2	PH-3	PH-4			PH-1	PH-2	PH-3	PH-4
EB	LT	X	X			NB	LT	X			
	TH		X	X			TH	X			
	RT		X	X			RT	X			
	PD						PD	X			
WB	LT	X				SB	LT	X			
	TH			X			TH	X			
	RT			X			RT	X			
	PD						PD	X			
GREEN		5.0	8.0	106.0	0.0	GREEN		17.0	0.0	0.0	0.0
YELLOW		0.0	4.0	5.0	0.0	YELLOW		5.0	0.0	0.0	0.0

LEVEL OF SERVICE

	LANE GRP.	V/C	G/C	DELAY	LOS	APP. DELAY	APP. LOS
EB	L	0.303	0.093	48.6	E	9.4	A
	TR	0.902	0.300	8.9	B		
WB	L	0.745	0.013	106.5	F	8.5	A
	TR	0.687	0.720	7.8	B		
NB	LTR	0.198	0.127	39.0	D	38.0	D
SB	LTR	0.511	0.127	41.0	E	41.0	E

INTERSECTION: Delay = 9.7 (sec/veh) V/C = 0.847 LOS = A

1985 HCM: SIGNALIZED INTERSECTIONS
SUMMARY REPORT

****

INTERSECTION..NIMITZ HWY/ALA KAWA ST
AREA TYPE.....OTHER
ANALYST.....BTB
DATE.....10/8/93
TIME.....AM
COMMENT.....NHAWOAM 1995 WITHOUT PROJECT

	VOLUMES					GEOMETRY					
	EB	WB	NB	SB		EB		WB		NB		SB
LT	48	16	29	67	L	12.0	L	12.0	LTR	15.0	LTR	15.0
TH	3630	2170	14	4	T	12.0	T	12.0		12.0		12.0
RT	0	91	0	61	T	12.0	T	12.0		12.0		12.0
RR	0	5	0	30	TR	12.0	TR	12.0		12.0		12.0
						12.0		12.0		12.0		12.0
						12.0		12.0		12.0		12.0

ADJUSTMENT FACTORS

	GRADE (%)	HV (%)	ADJ Y/N	PKG Nm	BUSES Nb	PHF	PEDS	PED. Y/N	BUT. min T	ARR. TYPE
EB	0.00	6.00	N	0	0	0.98	0	N	9.6	3
WB	0.00	8.00	N	0	0	0.92	0	N	9.6	3
NB	0.00	2.00	N	0	0	0.90	0	N	26.5	3
SB	0.00	2.00	N	0	0	0.90	0	N	26.5	3

SIGNAL SETTINGS — CYCLE LENGTH = 150.0

		PH-1	PH-2	PH-3	PH-4			PH-1	PH-2	PH-3	PH-4
EB	LT	X	X			NB	LT	X			
	TH		X	X			TH	X			
	RT		X	X			RT	X			
	PD						PD	X			
WB	LT	X				SB	LT	X			
	TH			X			TH	X			
	RT			X			RT	X			
	PD						PD	X			
GREEN		5.0	9.0	106.0	0.0	GREEN		17.0	0.0	0.0	0.0
YELLOW		0.0	4.0	5.0	0.0	YELLOW		5.0	0.0	0.0	0.0

LEVEL OF SERVICE

	LANE GRP.	V/C	G/C	DELAY	LOS	APP. DELAY	APP. LOS
EB	L	0.316	0.093	48.7	E	14.6	B
	TR	0.972	0.800	14.2	B		
WB	L	0.795	0.013	119.9	F	9.1	A
	TR	0.727	0.720	9.4	B		
NB	LTR	0.216	0.127	38.1	D	38.1	D
SB	LTR	0.545	0.127	41.6	E	41.6	E

INTERSECTION: Delay = 13.1 (sec/veh) V/C = 0.912 LOS = B

1985 HCM: SIGNALIZED INTERSECTIONS
SUMMARY REPORT

****

INTERSECTION..NIMITZ HWY/ALA KAWA ST
AREA TYPE.....OTHER
ANALYST.....BTB
DATE.....10/8/93
TIME.....AM
COMMENT.....NHAWPAM 1995 WITH PROJECT

	VOLUMES					GEOMETRY					
	EB	WB	NB	SB		EB		WB		NB		SB
LT	48	42	34	67	L	12.0	L	12.0	LTR	15.0	LTR	15.0
TH	3630	2170	14	5	T	12.0	T	12.0		12.0		12.0
RT	0	91	0	61	T	12.0	T	12.0		12.0		12.0
RR	0	5	0	30	TR	12.0	TR	12.0		12.0		12.0
						12.0		12.0		12.0		12.0
						12.0		12.0		12.0		12.0

ADJUSTMENT FACTORS

	GRADE (%)	HV (%)	ADJ Y/N	PKG Nm	BUSES Nb	PHF	PEDS	PED. Y/N	BUT. min T	ARR. TYPE
EB	0.00	6.00	N	0	0	0.98	0	N	9.6	3
WB	0.00	8.00	N	0	0	0.92	0	N	9.6	3
NB	0.00	2.00	N	0	0	0.90	0	N	26.5	3
SB	0.00	2.00	N	0	0	0.90	0	N	26.5	3

SIGNAL SETTINGS — CYCLE LENGTH = 150.0

		PH-1	PH-2	PH-3	PH-4			PH-1	PH-2	PH-3	PH-4
EB	LT	X	X			NB	LT	X			
	TH		X	X			TH	X			
	RT		X	X			RT	X			
	PD						PD	X			
WB	LT	X				SB	LT	X			
	TH			X			TH	X			
	RT			X			RT	X			
	PD						PD	X			
GREEN		7.0	8.0	106.0	0.0	GREEN		15.0	0.0	0.0	0.0
YELLOW		0.0	4.0	5.0	0.0	YELLOW		5.0	0.0	0.0	0.0

LEVEL OF SERVICE

	LANE GRP.	V/C	G/C	DELAY	LOS	APP. DELAY	APP. LOS
EB	L	0.277	0.107	47.1	E	14.6	B
	TR	0.972	0.800	14.2	B		
WB	L	1.043	0.027	180.0	F	11.3	B
	TR	0.727	0.720	9.4	B		
NB	LTR	0.272	0.113	39.5	D	39.5	D
SB	LTR	0.605	0.113	44.1	E	44.1	E

INTERSECTION: Delay = 14.0 (sec/veh) V/C = 0.950 LOS = B

1985 HCM: SIGNALIZED INTERSECTIONS
SUMMARY REPORT

INTERSECTION..NIMITZ HWY/ALA KAWA ST
AREA TYPE.....OTHER
ANALYST.....STB
DATE.....10/8/93
TIME.....PM
COMMENT.....NHAEXPM EXISTING

	VOLUMES EB	WB	NB	SB		GEOMETRY EB		WB		NB		SB
LT	59	7	30	141	: L	12.0	L	12.0	LTR	15.0	LTR	15.0
TH	3020	3240	18	3	: T	12.0	T	12.0		12.0		12.0
RT	0	80	0	103	: T	12.0	T	12.0		12.0		12.0
RR	0	10	0	70	: TR	12.0	TR	12.0		12.0		12.0
					:	12.0		12.0		12.0		12.0
					:	12.0		12.0		12.0		12.0

ADJUSTMENT FACTORS

	GRADE (%)	HV (%)	ADJ PKG Y/N	PKG Nm	BUSES Nb	PHF	PEDS	PED. Y/N	BUT. min T	ARR. TYPE
EB	0.00	3.00	N	0	0	0.93	0	N	9.6	3
WB	0.00	3.00	N	0	0	0.96	0	N	9.6	3
NB	0.00	0.00	N	0	0	0.90	0	N	26.5	3
SB	0.00	0.00	N	0	0	0.95	0	N	26.5	3

SIGNAL SETTINGS — CYCLE LENGTH = 210.0

		PH-1	PH-2	PH-3	PH-4			PH-1	PH-2	PH-3	PH-4
EB	LT	X	X			NB	LT	X			
	TH		X	X			TH	X			
	RT		X	X			RT	X			
	PD						PD	X			
WB	LT	X				SB	LT	X			
	TH			X			TH	X			
	RT			X			RT	X			
	PD						PD	X			
GREEN		5.0	11.0	157.0	0.0	GREEN		22.0	0.0	0.0	0.0
YELLOW		0.0	4.0	5.0	0.0	YELLOW		5.0	0.0	0.0	0.0

LEVEL OF SERVICE

	LANE GRP.	V/C	G/C	DELAY	LOS	APP. DELAY	APP. LOS
EB	L	0.465	0.081	71.9	F	7.7	B
	TR	0.811	0.829	6.8	B		
WB	L	0.455	0.010	90.1	F	17.8	C
	TR	0.945	0.757	17.7	C		
NB	LTR	0.269	0.119	54.5	E	54.5	E
SB	LTR	1.018	0.119	108.4	F	108.4	F

INTERSECTION: Delay = 15.6 (sec/veh) V/C = 0.913 LOS = C

1985 HCM: SIGNALIZED INTERSECTIONS
SUMMARY REPORT

INTERSECTION..NIMITZ HWY/ALA KAWA ST
AREA TYPE.....OTHER
ANALYST.....STB
DATE.....10/8/93
TIME.....PM
COMMENT.....NHAWOPM 1995 WITHOUT PROJECT

	VOLUMES EB	WB	NB	SB		GEOMETRY EB		WB		NB		SB
LT	62	8	32	108	: L	12.0	L	12.0	LTR	15.0	LTR	15.0
TH	3190	3490	19	3	: T	12.0	T	12.0		12.0		12.0
RT	0	84	0	148	: T	12.0	T	12.0		12.0		12.0
RR	0	10	0	75	: TR	12.0	TR	12.0		12.0		12.0
					:	12.0		12.0		12.0		12.0
					:	12.0		12.0		12.0		12.0

ADJUSTMENT FACTORS

	GRADE (%)	HV (%)	ADJ PKG Y/N	PKG Nm	BUSES Nb	PHF	PEDS	PED. Y/N	BUT. min T	ARR. TYPE
EB	0.00	3.00	N	0	0	0.93	0	N	9.6	3
WB	0.00	3.00	N	0	0	0.96	0	N	9.6	3
NB	0.00	0.00	N	0	0	0.90	0	N	26.5	3
SB	0.00	0.00	N	0	0	0.95	0	N	26.5	3

SIGNAL SETTINGS — CYCLE LENGTH = 210.0

		PH-1	PH-2	PH-3	PH-4			PH-1	PH-2	PH-3	PH-4
EB	LT	X	X			NB	LT	X			
	TH		X	X			TH	X			
	RT		X	X			RT	X			
	PD						PD	X			
WB	LT	X				SB	LT	X			
	TH			X			TH	X			
	RT			X			RT	X			
	PD						PD	X			
GREEN		5.0	11.0	157.0	0.0	GREEN		22.0	0.0	0.0	0.0
YELLOW		0.0	4.0	5.0	0.0	YELLOW		5.0	0.0	0.0	0.0

LEVEL OF SERVICE

	LANE GRP.	V/C	G/C	DELAY	LOS	APP. DELAY	APP. LOS
EB	L	0.489	0.081	72.4	F	9.1	B
	TR	0.856	0.829	9.0	B		
WB	L	0.519	0.010	96.6	F	30.2	D
	TR	1.017	0.757	30.1	D		
NB	LTR	0.283	0.119	55.6	E	55.6	E
SB	LTR	1.052	0.119	118.6	F	118.6	F

INTERSECTION: Delay = 22.6 (sec/veh) V/C = 0.977 LOS = C

1985 HCM: SIGNALIZED INTERSECTIONS
SUMMARY REPORT

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INTERSECTION..NIMITZ HWY/ALA KAWA ST
AREA TYPE.....OTHER
ANALYST.....BTB
DATE.....10/8/93
TIME.....PM
COMMENT.....NHAWPM 1995 WITH PROJECT

	VOLUMES					GEOMETRY							
	EB	WB	NB	SB		EB		WB		NB		SB	
LT	62	15	57	108	: L	12.0	L	12.0	LTR	15.0	LTR	15.0	
TH	3190	3490	20	3	: T	12.0	T	12.0		12.0		12.0	
RT	0	84	0	148	: T	12.0	T	12.0		12.0		12.0	
RR	0	10	0	70	: TR	12.0	TR	12.0		12.0		12.0	
					:	12.0		12.0		12.0		12.0	
					:	12.0		12.0		12.0		12.0	

ADJUSTMENT FACTORS

	GRADE (%)	HV (%)	ADJ Y/N	PKG Nm	BUSES Nb	PHF	PEDS	PED. Y/N	BUT. min T	ARR. TYPE
EB	0.00	3.00	N	0	0	0.93	0	N	9.6	3
WB	0.00	3.00	N	0	0	0.96	0	N	9.6	3
NB	0.00	0.00	N	0	0	0.90	0	N	26.5	3
SB	0.00	0.00	N	0	0	0.95	0	N	26.5	3

SIGNAL SETTINGS — CYCLE LENGTH = 210.0

		PH-1	PH-2	PH-3	PH-4			PH-1	PH-2	PH-3	PH-4
EB	LT	X	X			NB	LT	X			
	TH		X	X			TH	X			
	RT		X	X			RT	X			
	PD						PD	X			
WB	LT	X				SB	LT	X			
	TH			X			TH	X			
	RT			X			RT	X			
	PD						PD	X			
GREEN		5.0	11.0	157.0	0.0	GREEN		22.0	0.0	0.0	0.0
YELLOW		0.0	4.0	5.0	0.0	YELLOW		5.0	0.0	0.0	0.0

LEVEL OF SERVICE

	LANE GRP.	V/C	G/C	DELAY	LOS	APP. DELAY	APP. LOS
EB	L	0.489	0.081	72.4	F	9.1	B
	TR	0.856	0.329	8.0	B		
WB	L	0.974	0.010	236.6	F	30.9	D
	TR	1.017	0.757	30.1	D		
NB	LTR	0.677	0.119	64.1	F	64.1	F
SB	LTR	1.087	0.119	131.3	F	131.3	F

INTERSECTION: Delay = 25.5 (sec/veh) V/C = 0.981 LOS = C