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JOHN WAIHEE
GOVERNOR

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OFC. OF ENVIR. QUALITY CONTROL

February 9, 1989

The Honorable Edward Y. Hirata, Director
Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813

Dear Mr. Hirata:

Based on the recommendation of the Office of Environmental Quality Control, I am pleased to accept the Final Environmental Impact Statement for the proposed Oahu Intraisland Ferry System as satisfactory fulfillment of the requirements of Chapter 343, Hawaii Revised Statutes, and the Executive Order of August 23, 1971. This environmental impact statement will be a useful tool in the process of deciding whether the action described therein should be allowed to proceed. My acceptance of that statement is an affirmation of the adequacy of that statement under the applicable laws, and does not constitute an endorsement of the proposed action.

When you make your decision regarding the proposed action itself, I hope you will weigh carefully whether the societal benefits justify the environmental impacts which will likely occur. These impacts are adequately described in the statement, and together with the comments made by the reviewers, will provide you with a useful analysis of alternatives to the proposed action.

With kindest regards,

Sincerely,

John Waihee

JOHN WAIHEE

bcc: Hon. John C. Lewin

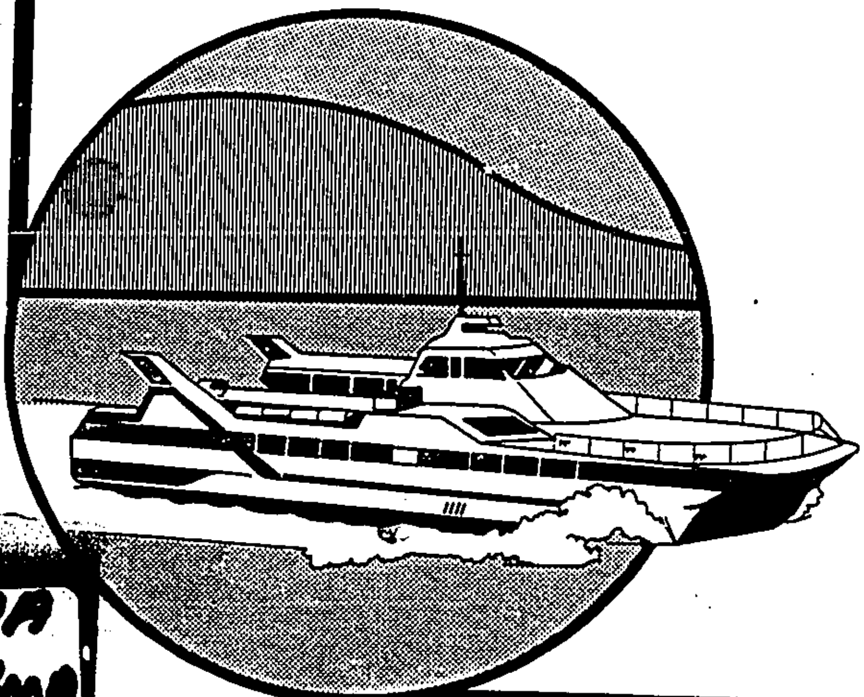
Oahu Intraisland Ferry System

Final Environmental Impact Statement

STATE DEPARTMENT OF TRANSPORTATION
Harbors Division

Prepared by:

WILSON OKAMOTO & ASSOCIATES, INC.
SEA ENGINEERING INC.



OAHU INTRAISLAND FERRY SYSTEM

FINAL ENVIRONMENTAL IMPACT STATEMENT
This environmental document is prepared pursuant
to Chapter 343, Hawaii Revised Statutes

Proposing Agency:

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HARBORS DIVISION

Accepting Authority:

GOVERNOR, STATE OF HAWAII

Responsible Official:

Edward Y. Hirata 1/19/89

EDWARD Y. HIRATA
DIRECTOR OF TRANSPORTATION

DATE

JANUARY 1989

Prepared by:

WILSON OKAMOTO & ASSOCIATES, INC.
Planners, Engineers, Architects
Honolulu, Hawaii

Sea Engineering Inc.
Waimanalo, Hawaii

PREFACE

The Department of Transportation (DOT), State of Hawaii is proposing to establish an intraisland ferry system serving the southern coastline of Oahu. Seven terminals are planned from Hawaii Kai to Barbers Point:

- Hawaii Kai in the vicinity of Maunalua Bay Beach Park;
- Downtown at Pier 8 of Honolulu Harbor, with a ferry maintenance facility at Piers 13 and 14;
- Waikiki, in the vicinity of the Ala Wai Boat Harbor and the Hilton Pier;
- Keehi Lagoon, at the South Ramp of Honolulu International Airport;
- Waipahu, at the head of Middle Loch of Pearl Harbor;
- Ewa, at the proposed Ewa Marina Development; and,
- Barbers Point, at the Barbers Point Deep Draft Harbor.

This environmental impact statement is prepared pursuant to Section 343-5, Hawaii Revised Statutes, defining actions subject to environmental impact statement requirements. Specifically, various components of the project will involve the use of State funds and State-owned land, the State Conservation District and shoreline area as defined by Section 205-31, Hawaii Revised Statutes.

In compliance with Section 11-200-7 (Administrative Rules, Department of Health (DOH)), the proposed intraisland ferry system is herein assessed as a phased agency action treated as a single action. Inasmuch as siting and designing of facilities for the various individual ferry terminals are proceeding incrementally, this EIS is comprised of seven parts, one for each of the seven planned terminals, and based on the current information available for each.

Commensurate with information currently available, each part complies with the content requirement of Section 11-200-17 (Administrative Rules, DOH). Terminals for which site selection and design have been completed are assessed in greater detail. As the remaining terminals are sited and designed, supplemental environmental assessments or, if deemed necessary, supplemental environmental impact statements shall be prepared for the individual ferry terminals.

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- Department of the Army Permit (U.S. Army Corps of Engineers Permit), together with associated certifications and approvals for:

  Federal Environmental Impact Statement, pursuant to the National Environmental Policy Act

  Hawaii Coastal Zone Management Program;

  State 401 Water Quality Program; and

- State Conservation District Use Application
- Permit for Work in the Shores and Shorewaters of the State
- City and County of Honolulu Development Plan Public Facilities Map Amendment
- City and County of Honolulu approvals under the Land Use Ordinance
- City and County of Honolulu Special Management Area Permit
- City and County of Honolulu Shoreline Setback Variance

SUMMARY SHEET

OAHU INTRAISLAND FERRY SYSTEM

Project Description: The State Department of Transportation (DOT) proposes to establish an Intraisland Ferry System for the island of Oahu. The system will be privately operated, providing service from seven terminals to be developed by the DOT.

Potential Impacts: Potential impacts of the ferry system are primarily those associated with the development of individual ferry terminals and will vary in nature and significance from terminal to terminal.

Alternatives Considered: Alternatives for the ferry system include those for the ferry vessel, terminal sites and terminal design configurations. Selection of an apparent low-bid ferry operator has determined the vessel to be used. General terminal locations have been identified, although specific site selection and terminal design will be pursued incrementally.

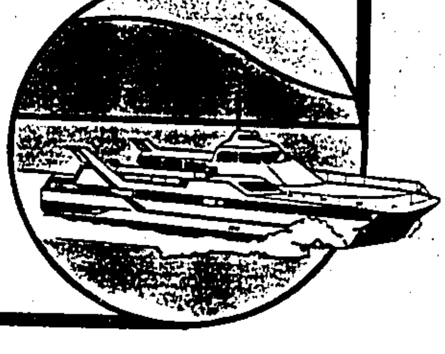
Unresolved Issues: Unresolved issues for the ferry system are primarily those associated with the development of individual ferry terminals. These may include beneficial as well as potentially adverse long and short-term environmental and socio-economic impacts which will be identified, as necessary, in the supplemental environmental documents for the various individual ferry terminals.

Compatibility with Plans and Policies: The Oahu Intraisland Ferry System is compatible with the Hawaii State Plan, the State Transportation Functional Plan, and the City and County of Honolulu General Plan. Compatibility of the ferry system with the City and County of Honolulu Development Plans for Land Use and Public Facilities as well as other pertinent public planning documents is assessed in the environmental documents for the individual ferry terminals.

Required Permits and Approvals: Permits and approvals required for the ferry system are those required for the individual ferry terminals. Depending on their location, these may include:

Part I

Maunalua Bay Terminal



PREFACE

The Department of Transportation (DOT), State of Hawaii is proposing to establish an intraisland ferry system serving the southern coastline of Oahu. Seven terminals are planned from Hawaii Kai to Barbers Point:

- Hawaii Kai in the vicinity of Maunalua Bay Beach Park;
- Downtown at Pier 8 of Honolulu Harbor, with a ferry maintenance facility at Piers 13 and 14;
- Waikiki, in the vicinity of the Ala Wai Boat Harbor and the Hilton Pier;
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This environmental impact statement is prepared pursuant to Section 343-5, Hawaii Revised Statutes, defining actions subject to environmental impact statement requirements. Specifically, various components of the project will involve the use of State funds and State-owned land, the State Conservation District and shoreline area as defined by Section 205-31, Hawaii Revised Statutes.

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Commensurate with information currently available, each part complies with the content requirement of Section 11-200-17 (Administrative Rules, DOH). Terminals for which site selection and design have been completed are assessed in greater detail. As the remaining terminals are sited and designed, supplemental environmental assessments or, if deemed necessary, supplemental environmental impact statements shall be prepared for the individual ferry terminals.

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SUMMARY SHEET

MAUNALUA BAY FERRY TERMINAL AT HAWAII KAI

Project Description: The State Department of Transportation, Harbors Division proposes to develop a ferry terminal adjacent to the Maunalua Bay Beach Park and the State Boat Launching ramp at Hawaii Kai. The terminal will occupy two acres of parcel TMK 3-9-07:34 which is owned by the State. Terminal facilities will include a passenger loading pier, shelter, 200 car parking area and driveway loop. Site improvements will also include a new shoreline revetment and widening and deepening of an existing boat channel

The ferry will be privately operated, providing service during the morning and evening commuter "rush hours" between Hawaii Kai and downtown Honolulu. The intent of the service is to offer Hawaii Kai residents an alternative mode of transportation, particularly during the planned widening of Kalanianaole Highway. As a public mass transit system, fares will be partially subsidized "in-kind" by the State, which will develop other ferry terminals for commercial use by the operator. The Maunalua Bay terminal will not be among the terminals available for commercial use.

The ferry vessel will be a "surface effect ship" which rides on a cushion of air, and attains a speed of 42 knots using a water jet propulsion system.

Potential Impacts: The intended impact of developing the ferry terminal is to offer Hawaii Kai residents an alternative mode of transportation that does not rely on Kalanianaole Highway. To the extent that residents use the ferry, traffic along the highway will also be reduced.

Potentially detrimental effects of the ferry were examined and are anticipated to be insignificant or can be minimized through mitigative measures. Although anticipated to be minimal, the degree of impact cannot be conclusively determined for effects of channel dredging on beach erosion and the likelihood of ferry vessel collision with humpback whales.

Alternatives Considered: Alternatives considered were alternate design configurations of the ferry terminal, alternative parking areas, and alternative channel alignments. A bidding process allowed for the consideration of different ferry operators and their proposed vessels.

Unresolved Issues:

Although anticipated to be minimal, project impacts on beach erosion and humpback whales have not been fully resolved. With regard to shoreline erosion, historic patterns of erosion in the area were assessed. This was supplemented by an assessment of increases in wave energy reaching the shoreline as a result of enlarging the channel, using a state-of-the-art numerical model.

The potential for collision of the ferry vessel with humpback whales, though anticipated to be minimal, cannot be determined with currently available information. Further coordination with the NMFS will be pursued as required.

Compatibility with Plans/Policies:

The Oahu Intraisland Ferry System is compatible with the Hawaii State Plan, the State Transportation Functional Plan, and the City and County of Honolulu General Plan. The ferry terminal is also a compatible use with respect to the City and County of Honolulu Development Plan Land Use Map.

Required Permits and Approvals:

Permits for development of the ferry terminal will include those for both shoreside improvements and those extending into the water. Shoreside improvements will require a Conditional Use Permit, Special Management Area Permit and Shoreline Setback Variance from the City and County of Honolulu.

Improvements extending into the water, including channel dredging, will require a Department of the Army permit with certification by the Hawaii Coastal Zone Management Program and 401 Water Quality Program, State Conservation District Use Application, and a State Permit for Work in Shore and Shorewaters.

Proposed Project

PROJECT NEED

Over the next four years, the State Department of Transportation (DOT) and the Federal Highway Administration plan to improve Kalanianaole Highway. The highway will be widened to a six lane configuration between West Hind Drive in Aina Haina and Keahole Street in Hawaii Kai. The widened highway will be bordered by sidewalks and bicycle lanes. The proposed highway action will provide much needed improvements to the existing transportation system.

The proposed Hawaii Kai to Downtown ferry service will provide an alternative transportation mode for Hawaii Kai residents wishing to avoid traffic congestion, particularly during construction of the road improvement project. It is also intended to remove commuting vehicles from the highway that would otherwise contribute to traffic congestion.

A supplemental marine bus service between these same points was one of the proposed alternatives considered, but not pursued by the State Highways Division, to reduce the expected increase in traffic congestion associated with the Kalanianaole Highway Improvement Project. The Intraisland Ferry System for Oahu will require no Federal Highway Funds and is now considered independent of the Highway Improvement Project. Upon completion of the road widening project, it is envisioned that the intraisland ferry will continue to operate to and from Hawaii Kai.

The ferry service is not anticipated to provide substantial relief of traffic congestion on Kalanianaole Highway, initially, but it will remove some commuting vehicles and provide an alternative mode of transportation for commuters wishing to avoid traffic congestion. Significantly, it will be the only mode of transportation for commuters that does not rely on Kalanianaole Highway. If ferry ridership increases beyond the preliminary estimates, reduction in traffic congestion may be realized.

A ridership survey conducted by the DOT estimates that between 250 and 450 commuters will use the ferry service daily. At this level of usage, vehicular traffic on Kalanianaole Highway during the morning "rush hours" is estimated to be reduced between 1.5% and 2.6%. If the ferry service should achieve 80% of its initial capacity (two 350-passenger vessels making a total of four trips into Downtown each morning and four trips to Hawaii Kai each evening) traffic is estimated to be reduced by approximately 6.5% in the morning. Reduction of evening traffic would be roughly on the same order of magnitude. See Appendix A. If demand warrants, additional vessels could be added to the system to increase its capacity and further reduce traffic congestion on Kalanianaole Highway.

FERRY TERMINAL

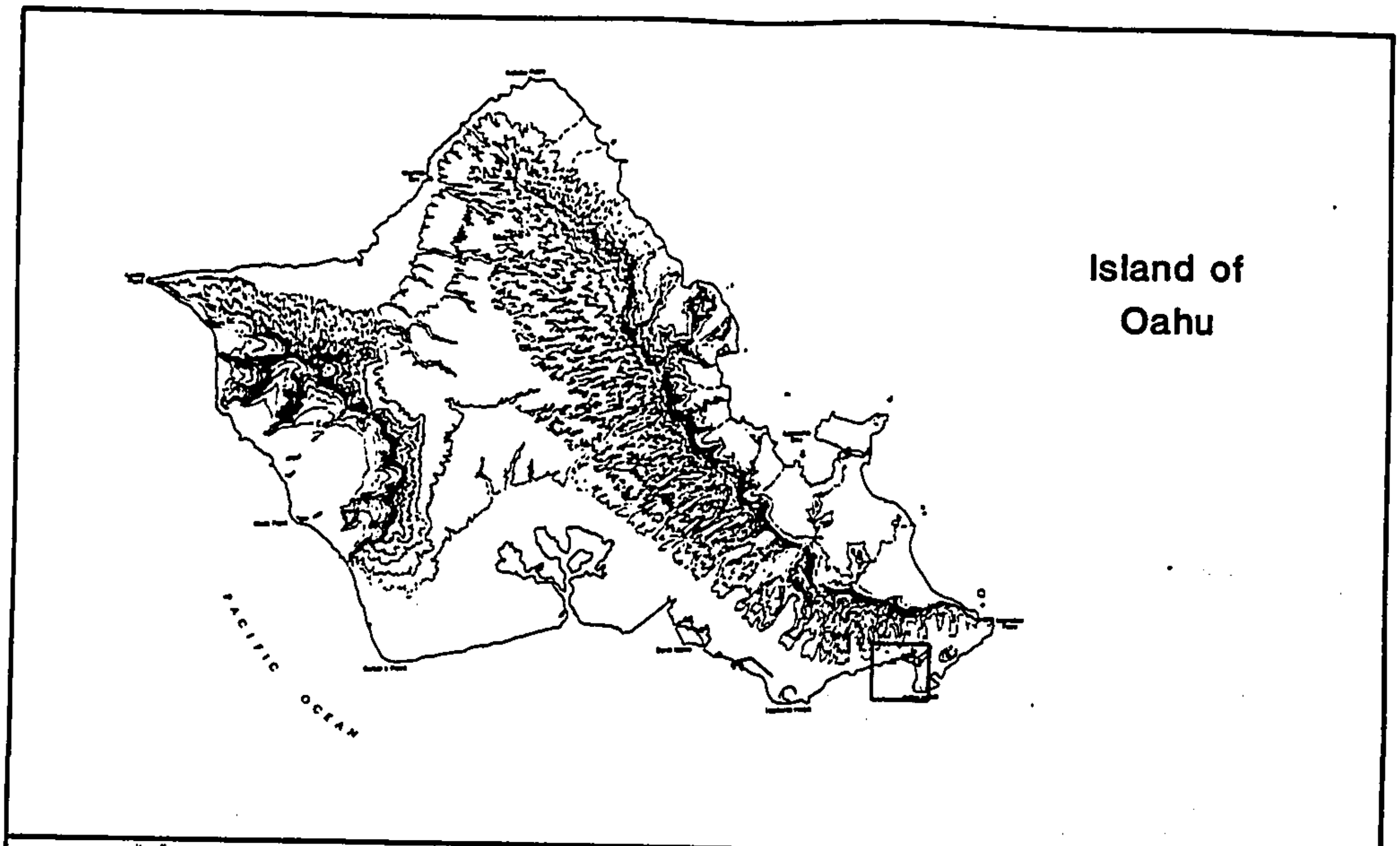
LOCATION

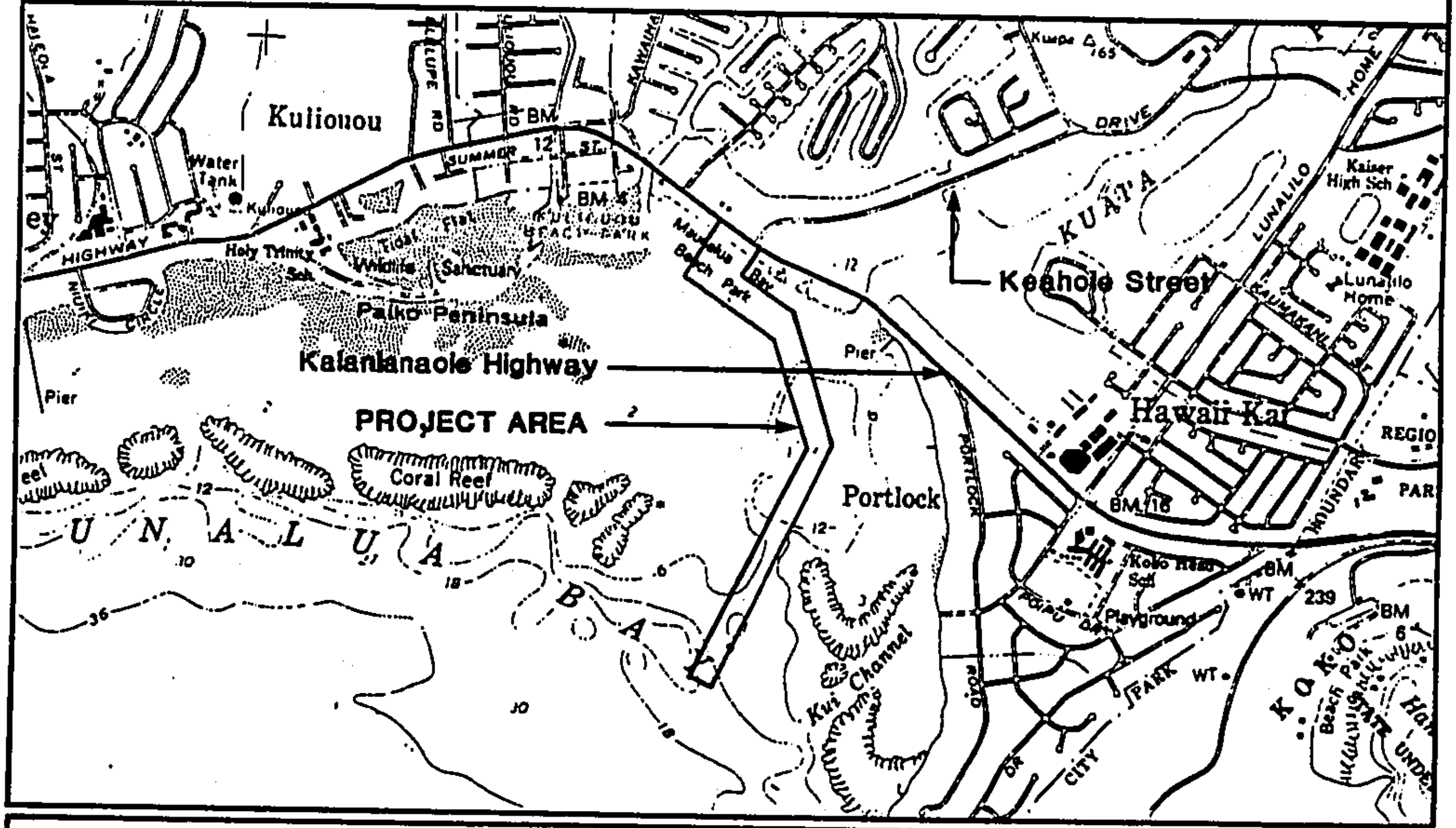
The proposed Maunalua Bay Ferry Terminal is located adjacent to Maunalua Bay Beach Park, Honolulu District, Island of Oahu, Hawaii.

Geographically, the proposed project is situated on the leeward (south) side of Oahu, approximately 10 miles east of downtown Honolulu. See Figure 1. Kuliouou is located to the west and Hawaii Kai is located to the north and east of the site. The project site is makai of Kalanianaole Highway, where it intersects Keahole Street. The existing Department of Transportation Boat Launching Ramp is adjacent to the west of the project site, the developed portion of the City and County of Honolulu Maunalua Bay Beach Park is adjacent to the east, and a strip of park lies between the site and Kalanianaole Highway to the north.

Development of the ferry terminal will primarily encompass a two acre portion of TMK 3-9-07: 34 which is owned by the State. See Figure 2. Access to the parcel from Kalanianaole Highway will be developed over an existing unpaved access opposite Keahole Street, traversing two thin strips of land under control of the City and County of Honolulu, Department of Parks and Recreation. TMK 3-9-07:08 is owned by the City and County and comprises the strip of park along the makai edge of Kalanianaole Highway. Access is permitted through the parcel where the existing unpaved access traverses it. TMK 9-9-07:11 is owned by the State and controlled by the City and County under Executive Order No. 2626. The eastern portion of the parcel contains the majority of the developed Maunalua Bay Beach Park.

The proposed Maunalua Bay Ferry Terminal will include shoreside improvements for a passenger terminal area as well as off-shore improvements for vessel access and docking. The ferry system will be privately operated and initially will include two ships providing ferry service between the Maunalua Bay terminal and Pier 8 in Honolulu Harbor during the morning and evening commuter rush hours. More vessels may be added to the ferry fleet as other terminals are developed.





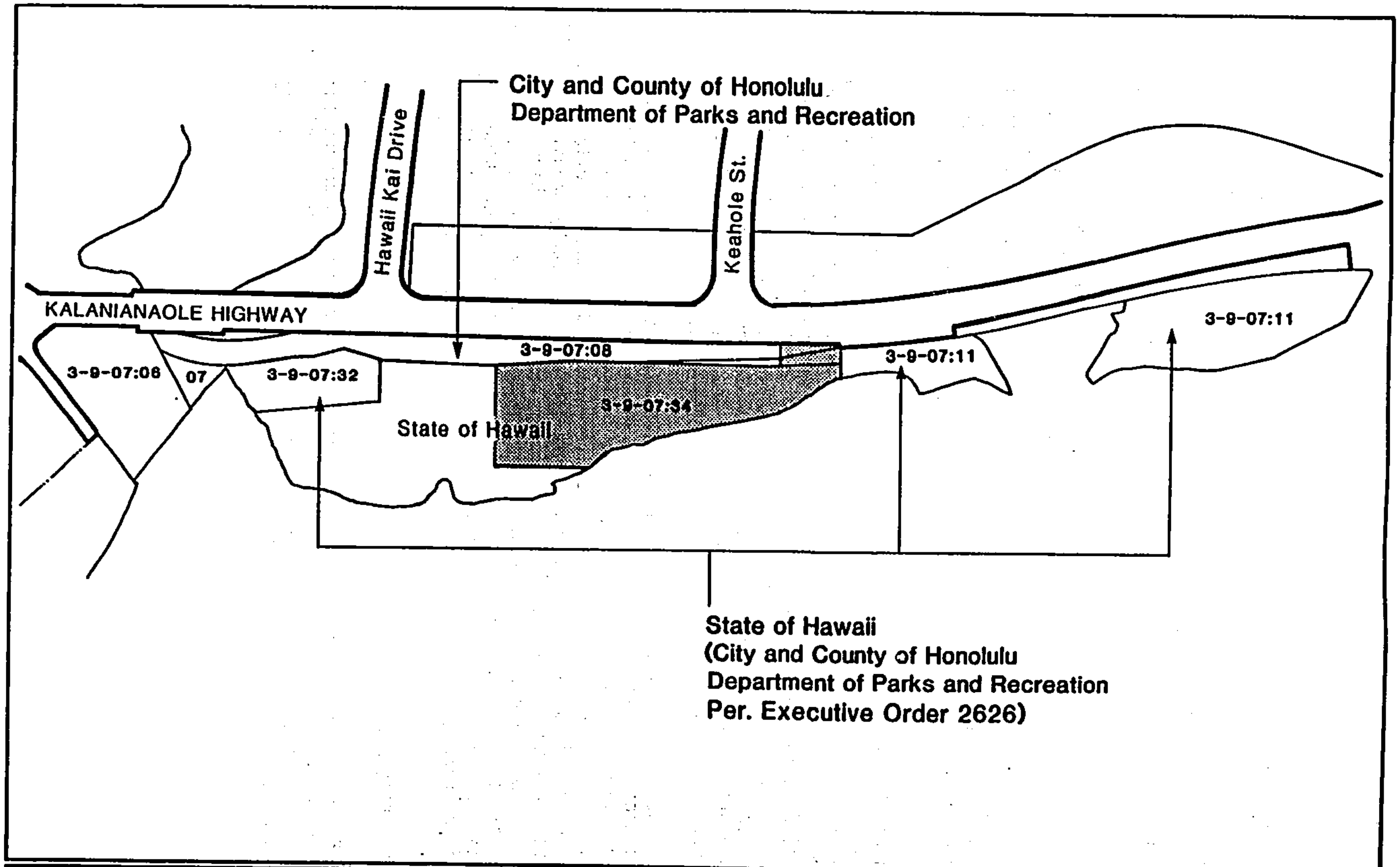
Maunalua Bay Ferry Terminal

ISLAND and LOCATION MAP

Fig. 1

Prepared for:
Department of Transportation
Harbors Division

Prepared by:
Wilson Okamoto
& Associates, Inc.



Maunalua Bay Ferry Terminal

LAND OWNERSHIP MAP

Fig. 2

Prepared for:
Department of Transportation
Harbors Division

Prepared by:
Wilson Okamoto
& Associates, Inc.

SHORESIDE IMPROVEMENTS

Shoreside improvements will include a paved driveway and parking lot, a passenger pick-up and drop-off area, passenger shelter, pier, rock revetment, landscaping and lighting. The paved driveway will be located on Kalanianaole Highway across the signalized intersection from Keahole Street. The driveway loop will provide for queuing of vehicles, including cars and buses, as they approach the passenger loading area. The parking lot will accommodate approximately 200 vehicles. See Figure 3.

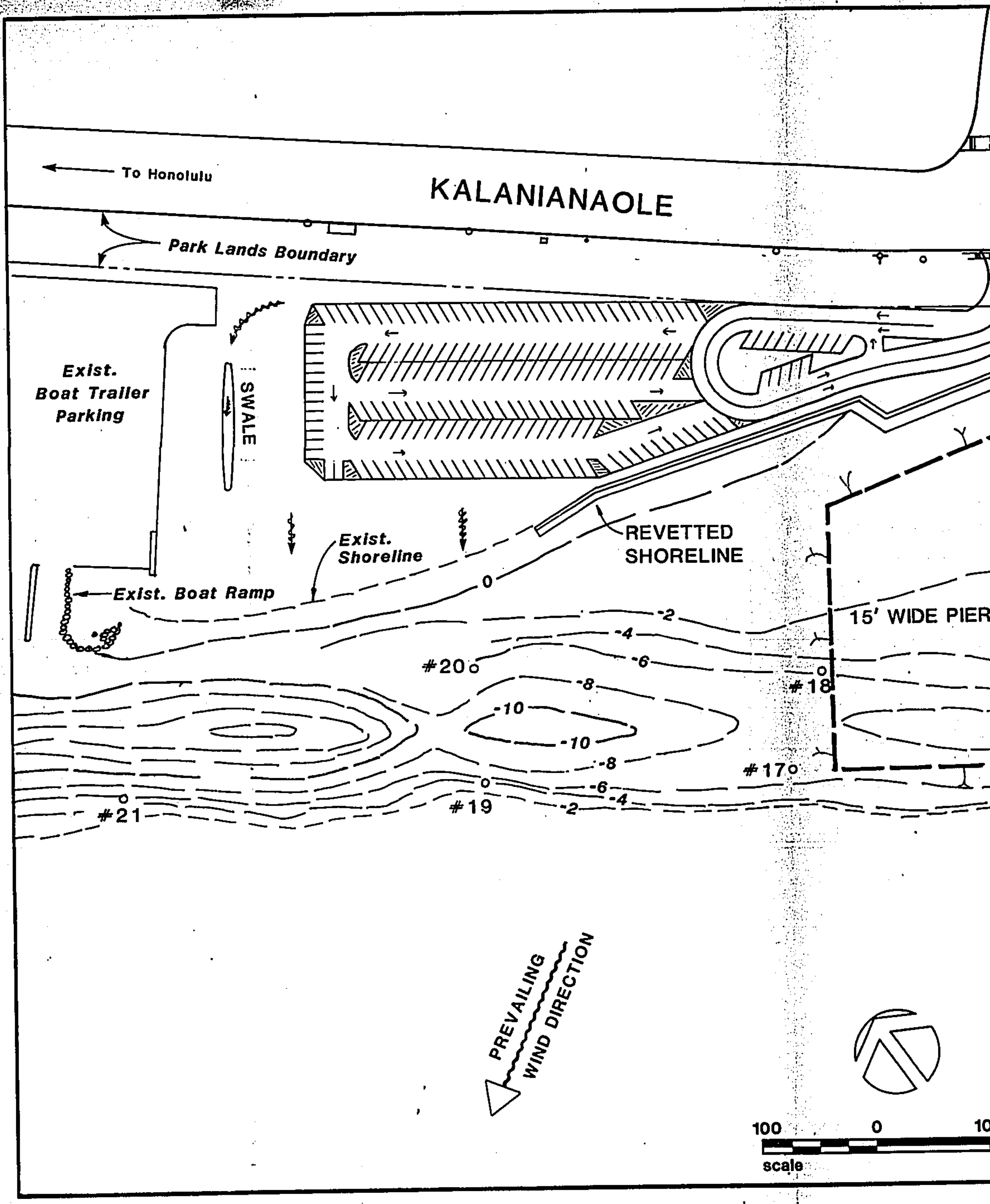
Loading and unloading of ferry passengers will be accomplished from an L-shaped pier, 15 feet wide and 200 feet long. It will be pile-supported and designed to accommodate five passengers standing abreast so as to allow simultaneous loading and unloading of the ferry, thereby minimizing the turn-around time for the ferry at the terminal. See Figure 4. The pier will be oriented to allow the ferry to dock into the prevailing wind, to minimize drift during its approach and while loading and unloading passengers.

To protect the shoreline in the vicinity of the pier from ongoing erosion, a new shoreline revetment will be constructed. The revetment will consist of rip-rap rocks constructed to tie in with and overlap the existing rock revetment. The crest of the existing shoreline revetment will be raised 2 to 2-1/2 feet to prevent the frequent wave overtopping that now occurs. The revetment will also be extended approximately 500 feet to the west to protect the site improvements. Constructed of 3-foot diameter armor stone and appropriate underlayers, the crest of the new revetment will rise to an elevation of 6 to 7 feet above mean lower low water.

Utility hook-ups to service lines in the Kalanianaole Highway right-of-way will be made for electricity to light the parking area, terminal shelter, and ferry landing; and, water for landscape irrigation, a drinking fountain and hose bib in the terminal shelter area. No sewage service will be required as the existing comfort station at the nearby Maunalua Bay Beach Park will be available and the ferry vessel will also have restrooms. Drainage from the terminal facility and parking area will sheet-flow towards Maunalua Bay. An existing swale providing drainage from the highway will be relocated slightly further west to the proposed edge of the parking lot.

CHANNEL IMPROVEMENTS

Off-shore improvements are designed to accommodate the vessel proposed for use by the apparent low-bid ferry operator. The improvements will include enlarging and deepening portions of the existing channels and constructing a new turning basin. See Figure 5 and 6.



To Honolulu
KALANIANAOLE
Park Lands Boundary
Exist.
Boat Trailer
Parking
SWALE
Exist.
Shoreline
REVETTED
SHORELINE
Exist. Boat Ramp
0
-2
-4
-6
-8
-10
-10
-8
-6
-4
-2
#20
#18
#17
#19
#21
15' WIDE PIER
PREVAILING
WIND DIRECTION
100
0
scale

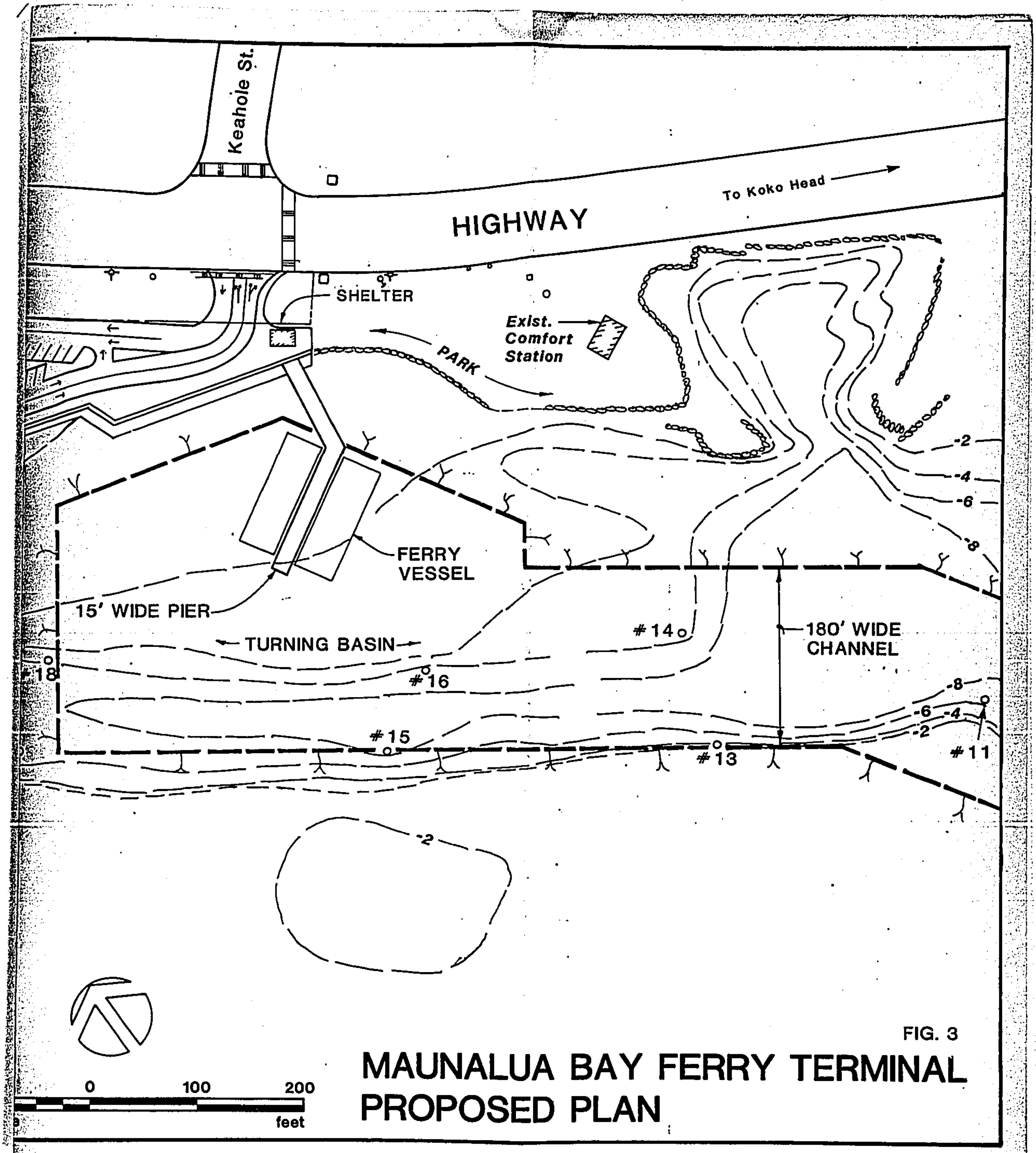
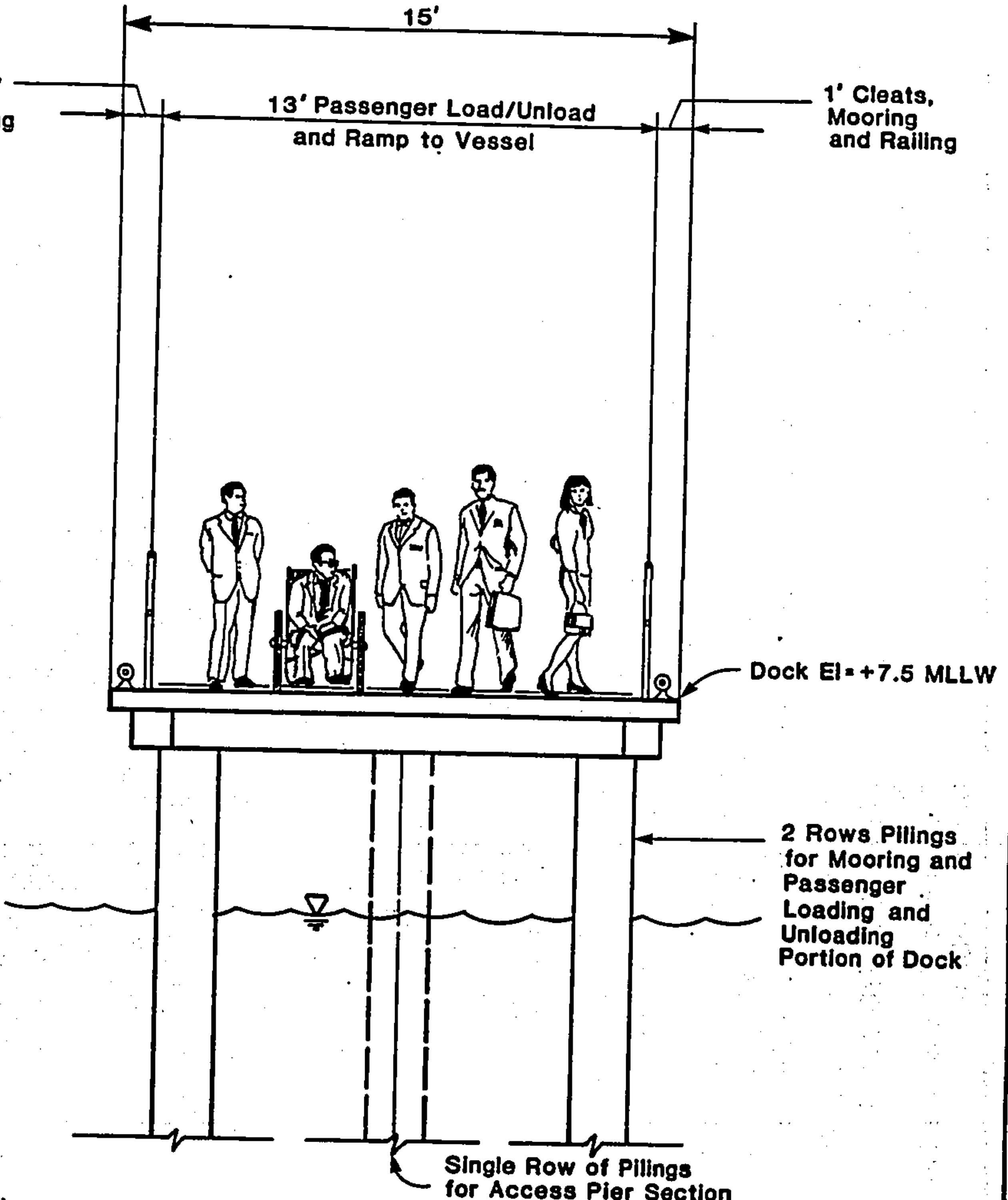


FIG. 3

MAUNALUA BAY FERRY TERMINAL PROPOSED PLAN



Maunalua Bay Ferry Terminal

TYPICAL PIER SECTION

Fig. 4

Prepared for:
Department of Transportation
Harbors Division

Prepared by:
Wilson Okamoto
& Associates, Inc.

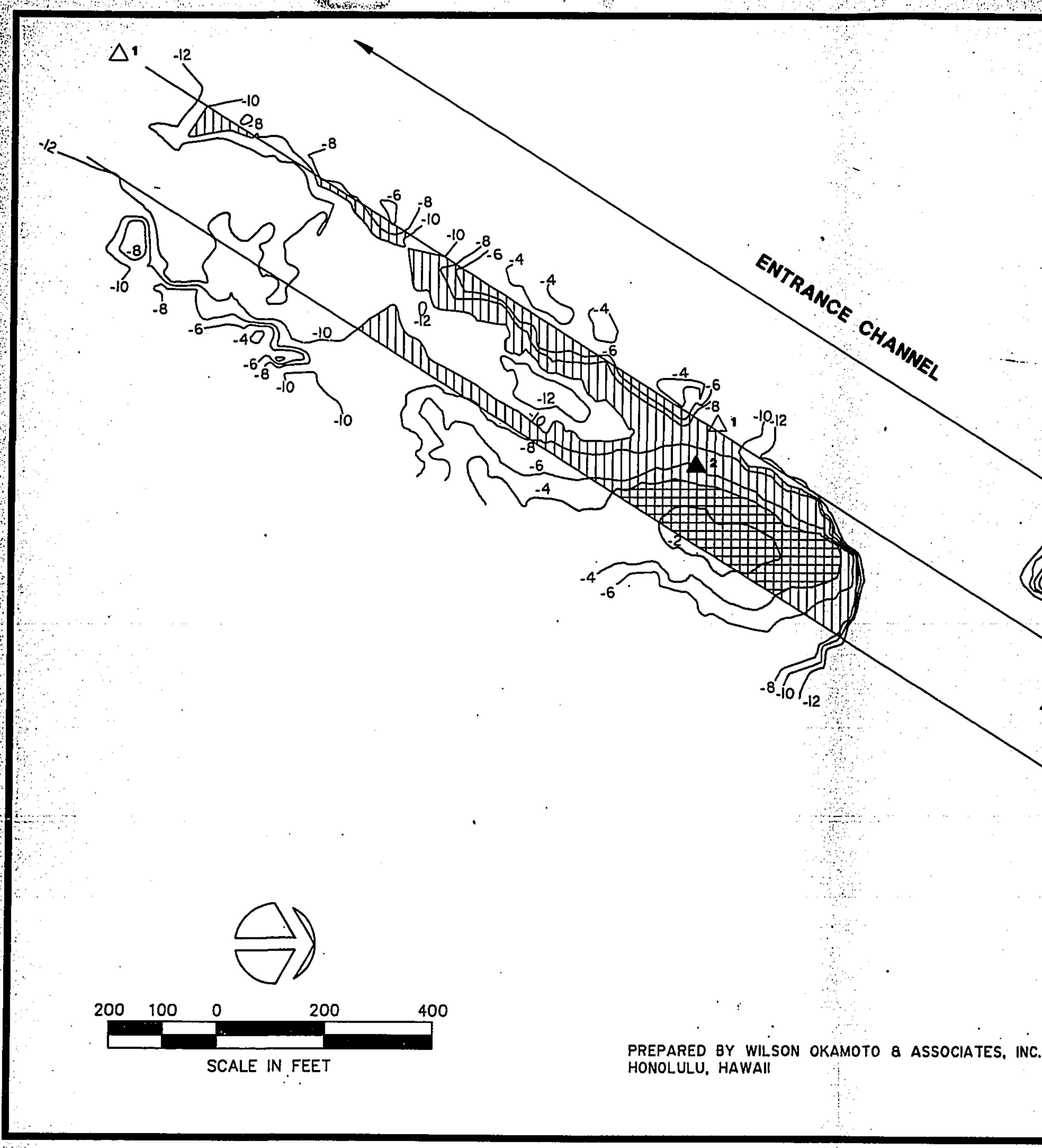
Maunalua Bay Ferry Terminal

PROPOSED IMPROVEMENTS AND EXISTING MARINA

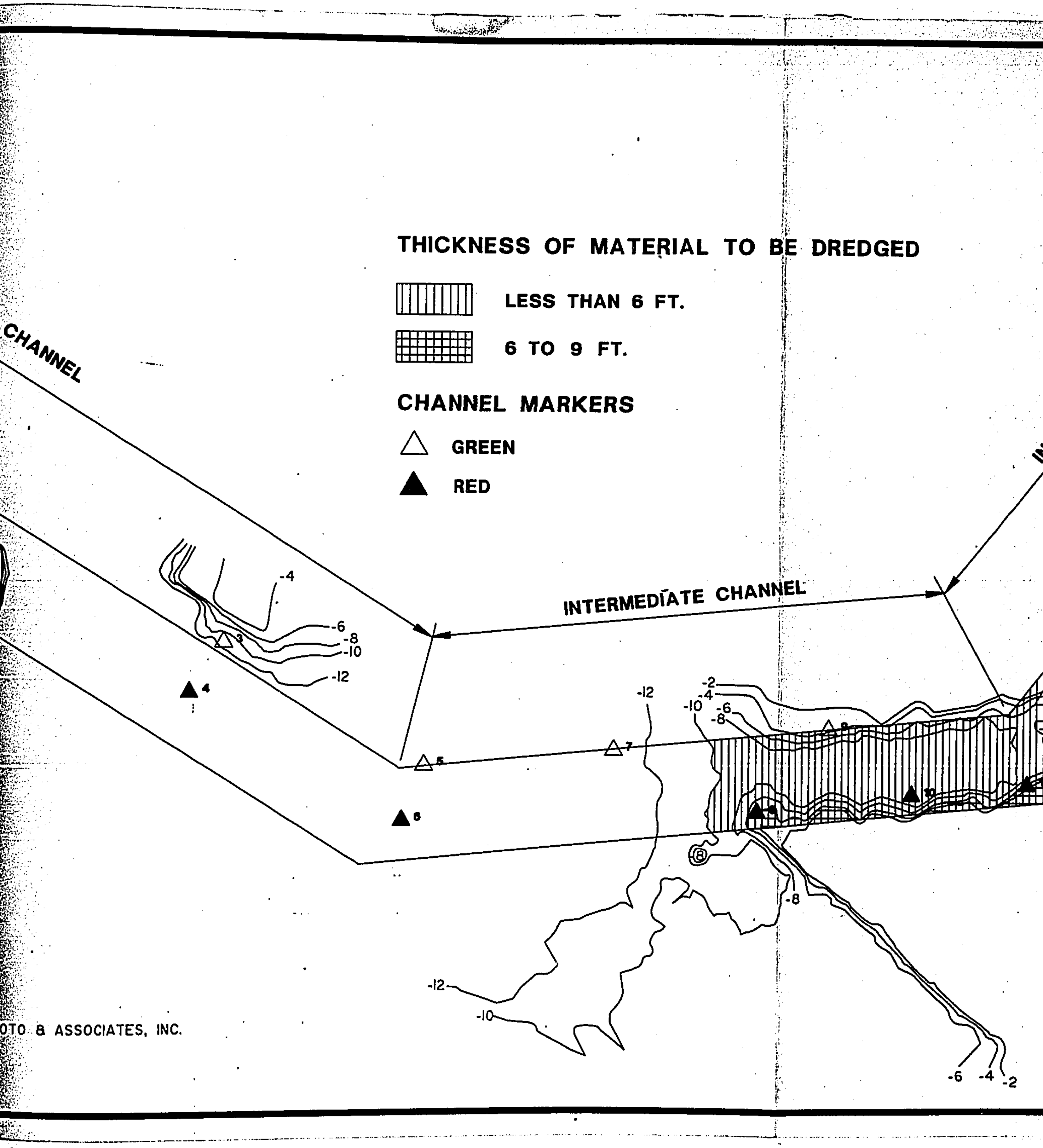
Fig. 5

Prepared for:
Department of Transportation
Harbors Division

Prepared by:
Wilson Okamoto
& Associates, Inc.



ENTRANCE CHANNEL
200 100 0 200 400
SCALE IN FEET
PREPARED BY WILSON OKAMOTO & ASSOCIATES, INC.
HONOLULU, HAWAII



THICKNESS OF MATERIAL TO BE DREDGED
LESS THAN 6 FT.
6 TO 9 FT.
CHANNEL MARKERS
GREEN
RED
CHANNEL
INTERMEDIATE CHANNEL
-4
-6
-8
-10
-12
-2
OTO & ASSOCIATES, INC.

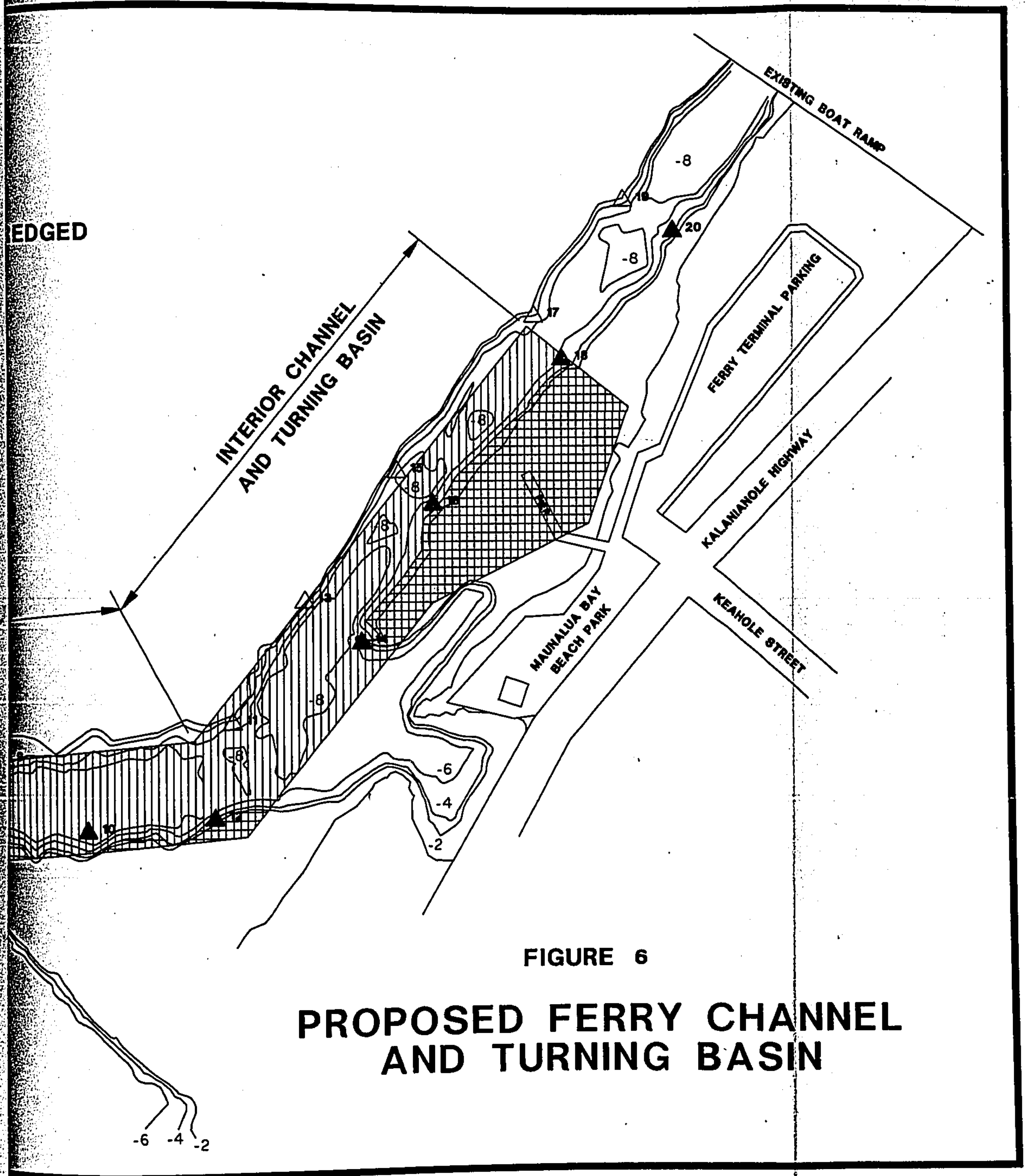


FIGURE 6

PROPOSED FERRY CHANNEL AND TURNING BASIN

Dredging will be required in two areas, one area is in the entrance channel, the other in the interior channel and turning basin. The remaining portions of the channel will only require re-marking. Due to significant public concern expressed about potential construction-related impacts associated with dredging in response to the Draft EIS, the DOT-Harbors Division has decided to reduce the proposed depth of the channel, thus reducing the volume of dredging required. This Final EIS reflects the reduced channel depth.

The entrance channel will require dredging work from marker No. 1 at the channel mouth to the sandy shoal in the vicinity of marker pair Nos. 1A and 2. This area is anticipated to produce approximately 16,800 cubic yards of material, most of which will be sand from the shoal. Very little, if any, silt will be removed from this area. Most of the material will be removed from the eastern (Portlock) side of the channel to minimize dredging volumes and impact to the benthic environment. Other dredging work will involve trimming the reef edge and bottom to achieve required width and depth. Blasting, if required on harder material, will likely be used only in this area.

The other area requiring dredging is the turning basin and interior channel. The estimated volume of material to be dredged from this area is *36,100 cubic yards*. Dredging in this area will involve removing silt from the bottom of the existing channel and trimming the edge of the reef flat on the seaward side of the channel. The proportion of silt in this area is anticipated to range from 10% to 24%.

The total estimated volume of dredging is thus 52,900 cubic yards. Dredge spoil production rates during the estimated five to seven month construction period are estimated to be 1,000 cubic yards per working day. Any blasting required will be conducted according to prescribed procedures for safety and will be timed to avoid seasonal presence of humpback whales traversing the bay. The contractor will likely dispose of most dredge spoil at the EPA approved dump site, seven miles off Honolulu Harbor. Some land disposal is possible. Material dredged from the turning basin may also be used as fill for the parking and bus turnaround areas.

Entrance Channel. The existing entrance channel will be improved from the seaward end near marker No. 1 to the beginning of the intermediate channel near markers No. 5 and No. 6 which leads to the boat launching area. This distance of approximately 2,700 feet will be 200 feet wide and 9 feet deep. The proposed entrance channel width will accommodate simultaneous passage of the ferry and a 40-foot long fishing boat with a 13-foot beam. The proposed 9-foot depth of the channel will safely accommodate the ferry vessel.

Intermediate Channel. The intermediate channel, extending 1,500 feet from channel markers No. 5 and No. 6 to markers No. 11 and No. 12, is an existing dog-leg leading from the entrance channel to the boat launching ramp. It will be 180 feet wide and 9 feet deep. The design width of the intermediate channel is also intended to allow simultaneous passage of the ferry vessel and a 40-foot fishing vessel within the calmer interior portion of bay.

<u>Interior Channel and Turning Basin</u>. A 500-foot long interior channel connects the intermediate channel to the turning basin, and extends from markers No. 11 and No. 12 to markers No. 15 and No. 16. It will have a similar dimension to the intermediate channel. The turning basin fronting the terminal is required for the ferry vessel to maneuver into and away from the pier. It will be dredged to a diameter of 200 feet and a depth of 9 feet. The turning basin is designed to minimize interference with present boat use in the channel.

PROJECT COST

The estimated project cost of the Maunalua Bay Ferry Terminal is $1.7 million. The source of funding will be the Harbor Special Fund. The Harbor Special Fund is responsible for the acquisition, construction, operation and maintenance of harbor facilities which are entirely or predominantly supported by user charges.

FERRY SYSTEM

Establishment of the Intraisland Ferry System is being pursued through a bid procedure to qualified private operators. The contract to be awarded will be for a twenty year term. Under the contract, the operator is required to provide commuter transit service during the morning and evening peak traffic periods between the Maunalua Bay terminal in Hawaii Kai and the Downtown terminal at Pier 8 in Honolulu Harbor. The DOT sought bids to determine the level of funding the operator would require to provide this service. The funding would be for eight years, with the rate fixed for the initial four years and declining thereafter to zero for another four years. The DOT would also design, secure necessary government approvals, and construct the ferry terminals. Furthermore, the operator would be permitted to engage in other commercial revenue generating operations during hours the commuter transit service is not in operation. He would be permitted to use the DOT's ferry terminals for such operations, except that he would not be allowed to use the Maunalua Bay terminal and the Ala Wai Boat Harbor, should a terminal be sited there.

A request for bids for a water transit system (Hawaii Ferry System) for Oahu was advertised in February, 1988 and bids were opened on March 7, 1988. The apparent low-bidder is San Diego Ship Building and Repair, Inc. Instead of seeking funding for providing the service, the State was pleasantly surprised that the low bidder offered to pay the State $1,200 per year for the first four years and declining to zero in a straight line for the next four years for a total payment of $7,200 over the 8 year period.

Construction of the improvements to the Downtown terminal are anticipated to be completed by December, 1989. Additional ferry terminals in the intraisland system will be developed depending on the availability of funding and approval of necessary permits.

Vessel. The vessel proposed for use by the apparent low-bid ferry operator is a "surface effect ship" which rides on a cushion of air. The vessel is 118 feet long and has a beam width of 38 feet. It has a capacity of approximately 300 passengers and an estimated speed of 42 knots (48 mph).

Two engines power fans maintaining the air cushion which is contained under the craft by two solid walls on either side and by flexible curtains fore and aft. The air cushion can be adjusted by an on-board computer to allow the ship to ride higher within wave troughs and lower over wave crests. This provides a smoother ride in rough seas. While riding on the air cushion, the ship has a draft of 1.5 feet. Off cushion, the ship draws 6 feet. Two additional engines power a water jet propulsion system which draws water from beneath the ship and discharges it in two jet streams to propel and steer the ship. There are no propellers or rudders in the water.

The vessel is highly maneuverable at all speeds as the water jets can be readily redirected, even to reverse direction without reversing engines as in a conventional, propeller driven craft. At dead stop, the ship can turn 360° within a space 1-1/2 times it length. The ferry vessel can decelerate from its top speed to a stop within 60 meters.

Because of its twin-wall hull design which minimizes water displacement, and water jet propulsion system which leaves very little of its energy behind in the water, the ferry, while on cushion, will not produce bow, stern and transverse wave patterns characteristic of monohulls and catamarans. The wake produced by the vessel is smaller than that produced by boats less than a third of its length.

The vessel will carry a full complement of navigational and safety equipment allowing both night and day operation, including times of low visibility. Safety equipment, including life preservers, fire prevention and fire fighting equipment will be inspected and standards strictly enforced by the U.S. Coast Guard. In addition, the ferry operator will provide a telephone inquiry service to apprise commuters of the status of ferry operations.

The ferry will be able to operate in all but the worst weather conditions, such as severe Kona storms. It is estimated that its "down-time" due to weather will be only 3%-5% of the days in a calendar year. On such days, the commuting public will be informed by the public service announcements on the radio that they should seek alternate transportation.

In the event that the ferry encounters trouble enroute, several maritime firms on Oahu are available and capable of providing assistance. Notably, a prototype of the ferry vessel, the SES NORCAT has never required such assistance for three years while providing twice daily round trips into the Arctic Circle in Norway.

Operation. The ferry system will operate among the seven intraisland terminals as they become operational. The schedule and routes for the ferry system have yet to be determined. The ferry vessels will operate within the State's three mile limit of jurisdiction. The Maunalua Bay to

Downtown link of the ferry system is scheduled to be the first to become operational. It will operate between the proposed Maunalua Bay Ferry Terminal and Pier 8 in Honolulu Harbor.

Piers 13 and 14 at Honolulu Harbor will be used for vessel berthing and maintenance. Two ferry vessels are anticipated to serve the Maunalua Bay to Downtown link. Each of the vessels will make two runs to the Downtown Terminal during the 3-hour morning rush hour and will make two runs each to the Maunalua Bay Terminal during the evening rush hour. The estimated travel time for each direction is 30 minutes.

The operator will not be restricted from transporting passengers on return trips from commuter runs. Conceivably, therefore, passengers, including tourists, traveling to East Honolulu in the morning and back to Honolulu in the evening could also use the ferry. They would be transported on a space available basis. No commercial bookings to reserve seats would be allowed.

As specified in the request for bids, the operator may set the regular price one-way between any two ferry landings, the price for stop-overs, if any, and the price for a round trip. However, a means shall be developed by the operator to provide holders of a valid Hawaii Driver's License a discounted fare not to exceed $2.50 one-way, available at any time on authorized ferry routes.

Relationship To Plans, Policies and Permits

PLANS

HAWAII STATE PLAN

The development of the Intraisland Ferry System is supported by the State Plan. According to Section 226-17 of the Hawaii State Plan, one of the first stated objectives regarding transportation is "to develop an integrated multi-modal transportation system that services statewide needs and promotes the efficient, economical, safe, and convenient movement of people and goods". Section 226-17 b (11) indicates that this will be achieved through "the use of low-cost, energy efficient, non-polluting means of transportation". The State shall "encourage systems that serve development need of communities".

STATE FUNCTIONAL PLAN

Development of an intraisland ferry system is also in harmony with the State Transportation Functional Plan Objective which promotes the "development of a balanced, multi-modal statewide transportation system that serves clearly identified social, economic and environmental objectives of the Hawaii State Plan".

GENERAL PLAN OF THE CITY AND COUNTY OF HONOLULU

The General Plan of the City and County of Honolulu establishes long-range objectives and policies for guiding both the quantity and quality of future growth in Oahu.

The proposed Intraisland Ferry System will facilitate implementation of the General Plan. It specifically addresses the objective to "create a transportation system which will enable people and goods to move safely, efficiently, and at a reasonable cost; serve all people, including the poor, elderly, and the physically handicapped; and offer a variety of attractive and convenient modes of travel".

LAND USE POLICIES AND ZONING

STATE LAND USE DISTRICT

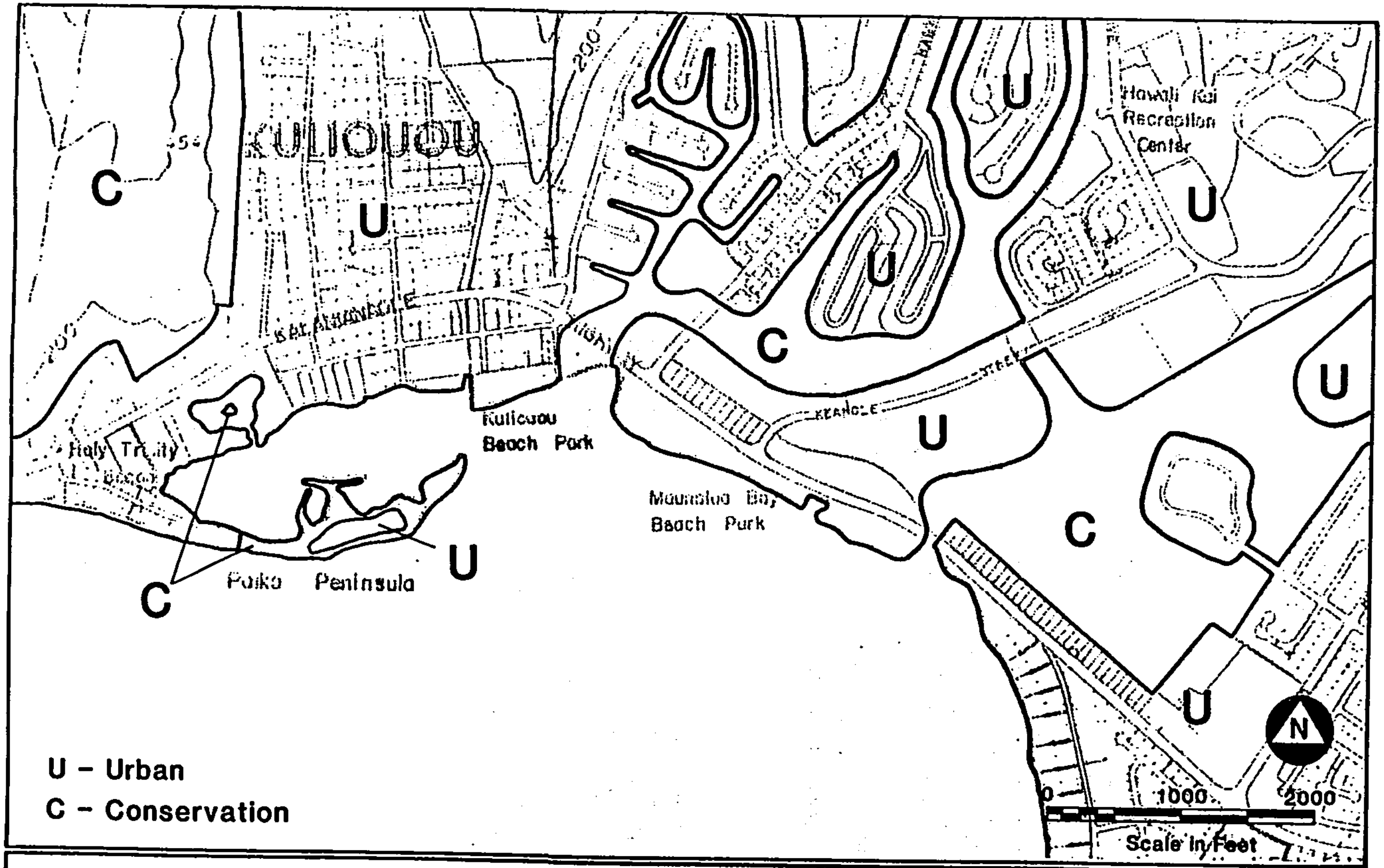
Pursuant to Hawaii Land Use Law (Chapter 205, HRS), the State Land Use Commission classifies all lands into four land use districts: urban, agricultural, conservation, and rural. Maunalua Bay Beach Park is situated within the Urban District, except for lands and submerged lands seaward of the shoreline. See Figure 16. Therefore, implementation of the Maunalua Bay Ferry Terminal will not require an amendment to the State Land Use boundaries. Development of land within the Conservation district lying seaward of the shoreline, will be discussed under the Conservation District Use Application process in the Shoreline and Environmental Permits section.

CITY AND COUNTY OF HONOLULU DEVELOPMENT PLANS

Eight development plans were established to provide detailed schemes for "implementing and accomplishing the objectives and policies of the General Plan." The development plans guide the desired sequence, patterns and characteristics for future development.

The proposed project is situated within the East Honolulu district which extends from the Waialae-Kahala area to Makapuu and whose policy is to provide for increased urbanization in this area. The development plan land use map for this region designates a portion of the site as "parks and recreation", while the boat ramp and parking area is designated as "preservation". See Figure 17. A development plan amendment to designate the site as "public facility" has been initiated.

The public facility designation encompasses public and quasi-public uses and is required for the development of a publicly or privately operated ferry terminal.



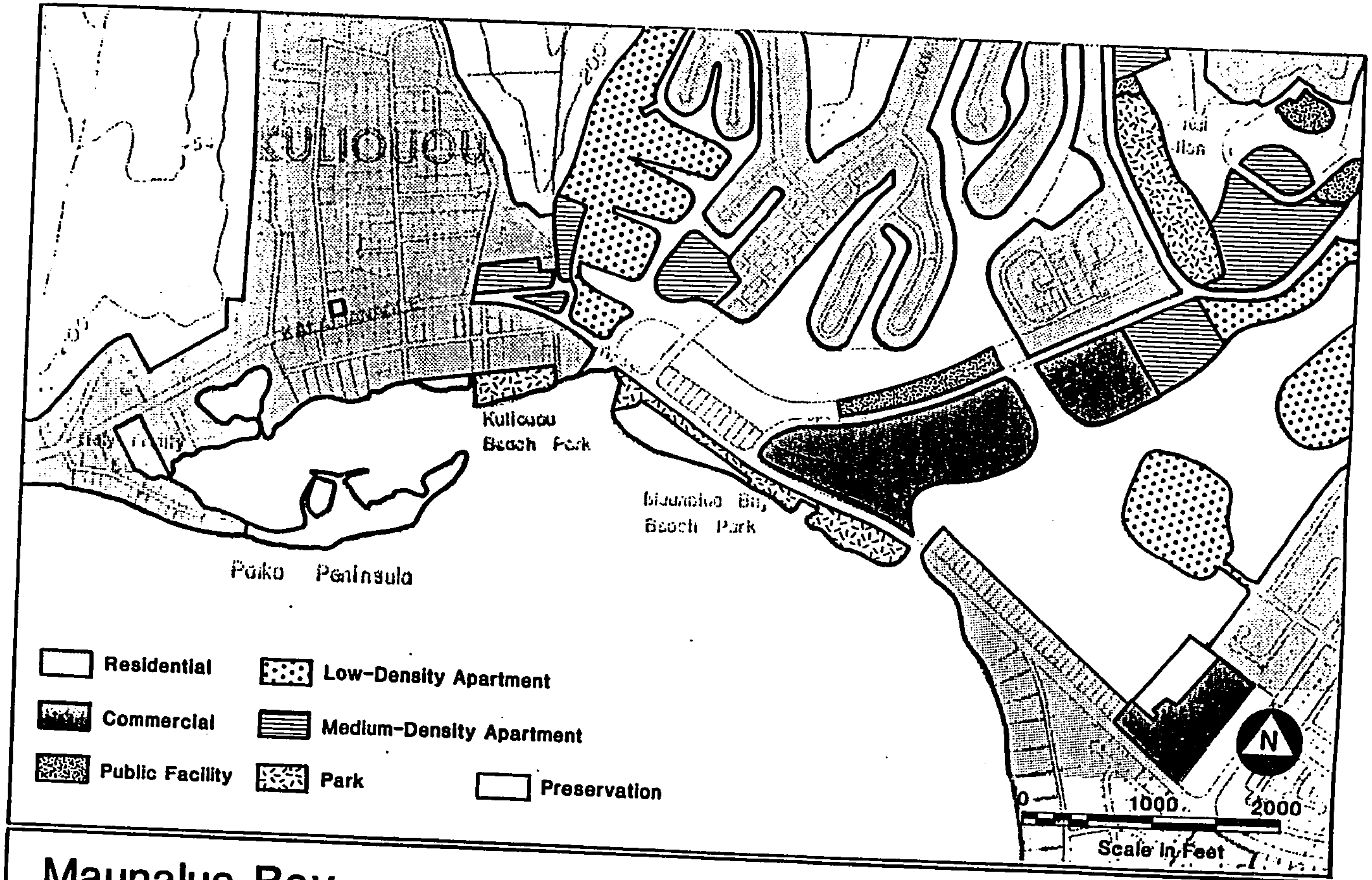
Maunalua Bay Ferry Terminal

STATE LAND USE DISTRICT

Fig. 16

Prepared for:
Department of Transportation
Harbors Division

Prepared by:
Wilson Okamoto
& Associates, Inc.



Maunalua Bay
Ferry Terminal

DEVELOPMENT PLAN LAND USE

Fig. 17

Prepared for:
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Harbors Division

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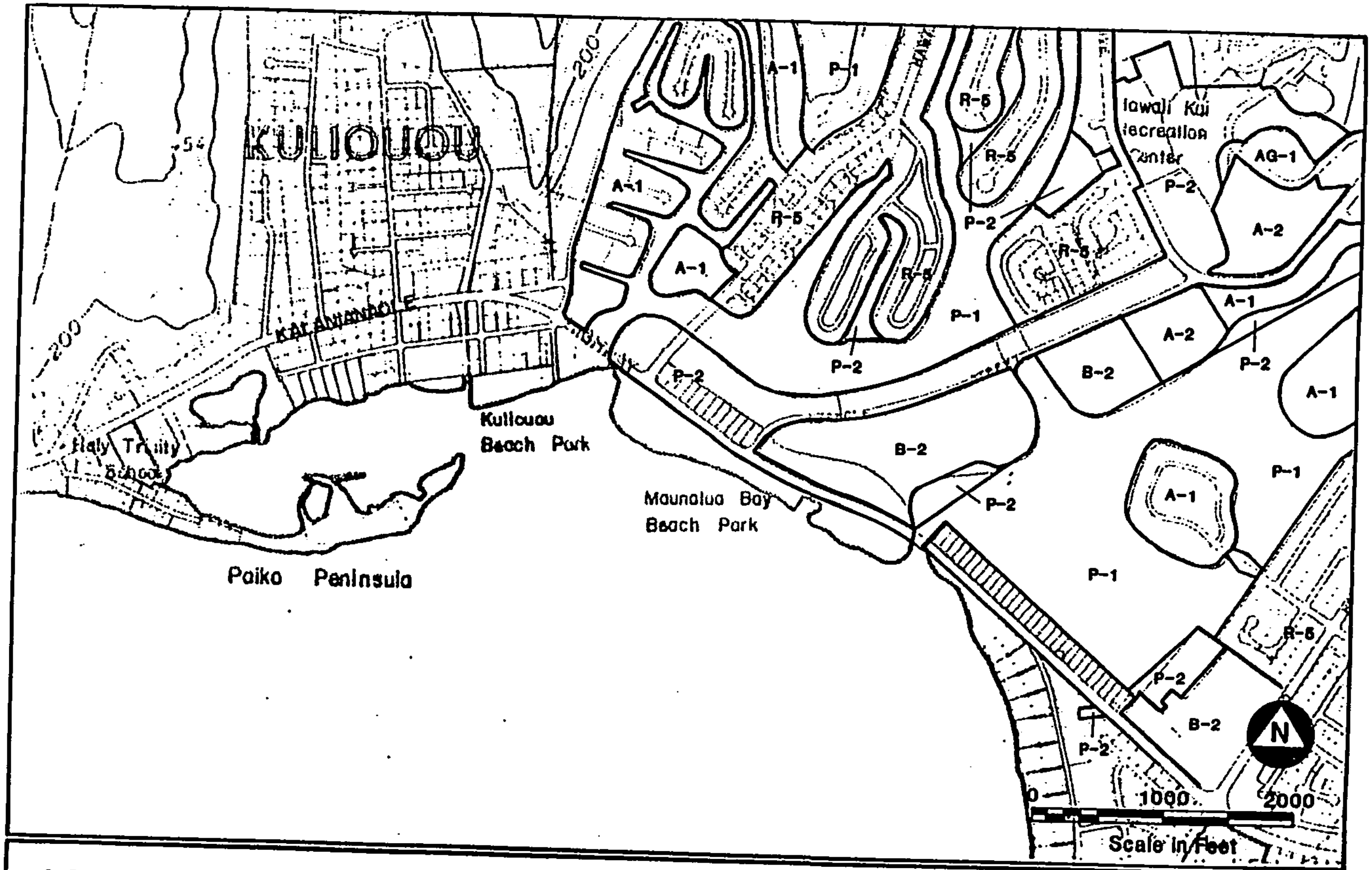
LAND USE ORDINANCE

The City and County of Honolulu Land Use Ordinance (LUO) regulates land use in accordance with adopted land use policies, including the Oahu General Plan and Development Plan.

Under the current LUO zoning, the proposed project site is designated P-2 (General Preservation District) which preserves and manages major open spaces and recreation lands and lands of scenic and other natural resource value. See Figure 18. The maximum height allowed in the General Preservation District is up to 25 feet if setbacks are provided. The proposed ferry terminal is considered a public use and can be accommodated through issuance of a Conditional Use Permit.



Maunalua Bay Ferry Terminal

LUO ZONING

Fig. 18

Prepared for:
Department of Transportation
Harbors Division

Prepared by:
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SHORELINE AND ENVIRONMENTAL PERMITS

DEPARTMENT OF THE ARMY PERMIT

The Department of the Army permit is administered by the U.S. Army Corps of Engineers, Honolulu District under Section 10 of the Rivers and Harbors Act (33 USC 403), Section 404 of the Clean Water Act (33 USC 1344) and Section 103 of the Marine Protection, Research and Sanitation Act of 1972 (33 USC 1413). The permit is required for all work within water of the United States, including ocean and coastal waters, inland and tidal waters, tidal ponds, fishponds, rivers, streams, and adjacent wetlands, perched wetlands, and intermittent streams.

Issuance of the permit is based on an evaluation of the probable impact of the proposed activity on the public interest, reflecting national concern for both protection and utilization of important resources. Factors considered include those relating to: conservation, economics, aesthetics, general environmental concerns, historic values, fish and wildlife values, flood damage prevention, land use, navigation, recreation, water supply, water quality, energy needs, safety, food production and, in general, the needs and welfare of the people.

Portions of the Ferry Terminal subject to review under the Department of the Army permit are those which involve ocean and coastal waters, including:

1. Dredging to widen and deepen the existing channel;
2. Dredging a turning basin;
3. Constructing a pier for the ferry vessel.
4. Constructing a revetment along the eroded shoreline aligned with the existing revetment.

HAWAII COASTAL ZONE MANAGEMENT PROGRAM FEDERAL CONSISTENCY REVIEW

Section 307 of the National Coastal Zone Management Act of 1972 (16 U.S.C. 1451 et. seq.) provides for State review of federal actions affecting the coastal zones of States with approved Coastal Zone Management Programs. Hawaii's Coastal Zone Management (CZM) Program, established pursuant to Chapter 205A, HRS was federally approved in 1977. It is administered by the Office of State Planning (OSP).

Among Federal actions subject to review is the issuance of permits, including the Department of the Army Permit, which will be required for offshore channel improvements, turning basin, pier and shoreline revetment construction. Before the permit can be issued, the OSP must determine its consistency with the enforceable policies of the Hawaii CZM Program. These policies encompass broad concerns such as impact on recreational resources, historic and archaeological resources, scenic and open space resources, coastal ecosystems, economic uses, coastal hazards and the management of development.

SECTION 401 WATER QUALITY CERTIFICATION

The State Department of Health is charged with the responsibility of establishing and administering a State certification system pursuant to Section 401 of the National Clean Water Act (33 USC 1344) and Section 342-32(13), HRS. Water quality certification is required of any applicant for a Federal license or permit to conduct any activity that may result in any discharge into navigable water.

CONSERVATION DISTRICT USE APPLICATION

Any use of lands, including submerged lands within the State's Conservation District, as established by the State Land Use Commission, is subject to review pursuant to Chapter 183, HRS and Title 13, Chapter 2 of the Department of Land and Natural Resources Regulations. At the terminal site, the area beyond the shoreline, defined as "the upper reaches of the wash of waves, other than storm and tidal waves, usually evidenced by the edge of vegetation growth, or the upper line of debris left by the wash of waves," is subject to review as a use in the "Resource (R) subzone of the State Conservation District (Section 13-2-13, Administrative Rules of the Department of Land and Natural Resources). Approval by the State Board of Land and Natural Resources will be required through a Conservation District Use Application for all dredging and construction beyond the shoreline.

PERMIT FOR WORK IN SHORES AND SHOREWATERS

The Shorewaters Permit is administered by the State Department of Transportation pursuant to Section 266-16, HRS and Section 19-42-161, Hawaii Administration Rules, Department of Transportation, Harbors Division.

This permit is required for any construction, dredging, or filling within the shorewaters of the State, as defined by Chapter 266, HRS.

Jurisdiction extends to shores, shorewaters, navigable streams and harbors, belonging to or controlled by the State.

Portions of the ferry terminal project subject to review include the widening and deepening of the channels, dredging the turning basin and construction of the pier and shoreline revetment. This will be reviewed via interagency coordination with the Department of Land and Natural Resources on the Conservation District Use Application. The DOT, however, could request an independent review under the Shorewaters Permit.

SPECIAL MANAGEMENT AREA (SMA) PERMIT

The Hawaii Coastal Zone Management Law (Chapter 205A, HRS) charged the Counties with designating and administering Special Management Areas (SMA) along the State's coasts. Any "development", as defined by Law, within the SMA requires an SMA permit, which is administered by the City ad County of Honolulu, Department of Land Utilization pursuant to Ordinance No. 84-4.

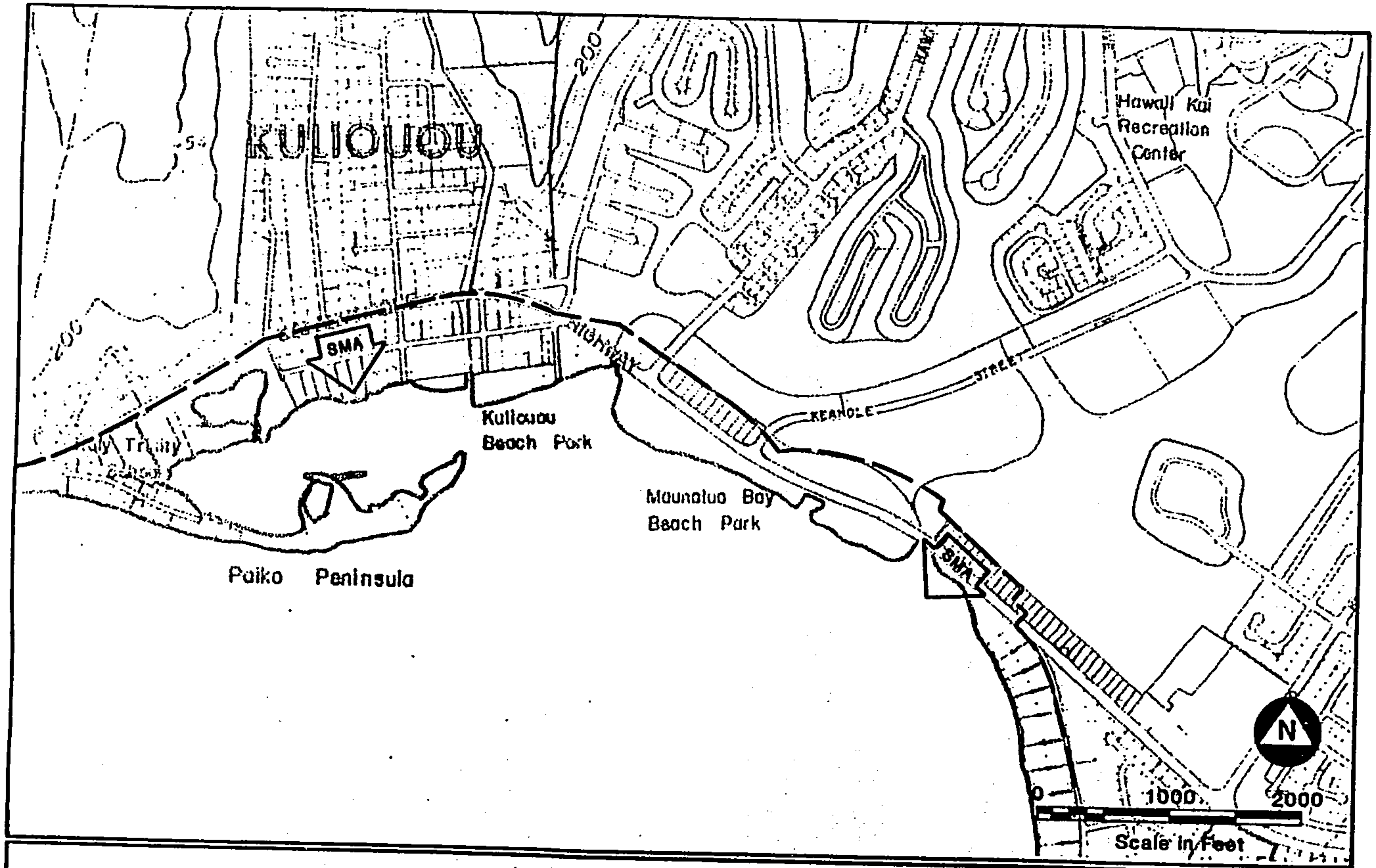
The entire project site is located within the SMA boundary and is subject to review under the SMA permit procedures. See Figure 19.

SHORELINE SETBACK VARIANCE

The State's Shoreline Setback Law, (Chapter 205, HRS) prohibits virtually any development or development-related activity including the removal of sand, rocks, soil, etc. from the shoreline setback area, a 40-foot (20 feet in some areas) strip of land along the shoreline. The Counties, however, are authorized to grant variances for construction that would encroach in the setback area. The City and County of Honolulu, Department of Land Utilization administers this variance under its shoreline setback regulations.

Variances may be granted in consideration of a structure, or activity being in the public interest, hardship to the applicant if the proposed structure or activity is not allowed and the effect a structure or activity would have on natural shoreline processes, particularly with regard to shoreline erosion.

The shoreline variance request will be processed concurrently with the Special Management Area Permit with simultaneous decision-making by the City Council.



Maunalua Bay Ferry Terminal

SMA BOUNDARY

Fig. 19

Prepared for:
Department of Transportation
Harbors Division

Prepared by:
Wilson Okamoto
& Associates, Inc.

Project Setting

HISTORY

REGIONAL DEVELOPMENT

Since approximately 947 A.D., Hawaii Kai and Maunalua was inhabited by Pacific Islanders. In 1786, Captains Portlock and Dixon, British navigators and explorers, anchored in Maunalua Bay. Captain Portlock's journal described the area as not well populated and the water supply so meager that the natives went to Honolulu to obtain water for the crew.

From 1825 to 1860, Maunalua Bay was an anchorage for whaling ships and inter-island traders. Throughout the early 1900's, Hawaii Kai and Maunalua was predominantly used for cattle ranching and some farming. There was also a fishing company as well as some truck farms operated by Hawaiians.

On April 27, 1961, Henry Kaiser signed a lease with Bishop Estate enabling him to develop the area into a planned residential development. During the past 30 years, Kaiser-Aetna Company and KACOR have been carrying out the plans proposed by Henry Kaiser. The Hawaii Kai development contains low, medium, and high density residential, commercial, recreational and public facility land uses in planned community areas. Other regionally oriented land uses include a marina, the Kuapa Kai and Koko Marina Shopping Centers, the Hawaii Kai Golf Course, Hawaii Kai Corporate Plaza, a high school and public library. Although Hawaii Kai is generally considered a low-density suburban development, it also contains areas with low and medium-density townhouses and high rise residential apartments and condominiums.

WATER-RELATED DEVELOPMENT

The reef and the shoreline in the area have been extensively modified since the 1930's. Kuapa Pond, now Hawaii Kai Marina, was originally a brackish fish pond, separated from Maunalua Bay by a narrow sand spit and rock wall. The rock wall was about 5,000 feet long and was breached by two makahas (openings to the sea). Kuapa Pond was important as a fishpond for the raising of mullet (Mugil cephlus), awa (Chanos chanos) and aholehole (Kuhlia sandvicensis) since prehistoric times and was one of the largest ponds in the Hawaiian Islands.

In the late 1930's, Kalanianaole Highway was built atop the sand spit and rock walls, widening the barrier between the pond and the sea. Two culverts were constructed to provide water exchange between the pond and the bay and the main channel at the site of the present entrance to Hawaii Kai Marina was widened to 40 feet. There existed a small, irregular channel extending seaward from the sandbar at the location of the present entrance channel. This channel was a shallow natural break in the reef, probably a drainage for the brackish water of Kuapa Pond during a lower stand of the sea. In its relatively unmodified state, Kuapa Pond probably served as a settlement basin for materials washed downstream by storm water runoff from the surrounding valleys. By trapping these materials, Kuapa Pond protected the nearby coral reefs of Maunalua Bay from damaging siltation.

During World War II, the existing natural channel was dredged to facilitate landing craft operations and to service the military installation at nearby Koko Crater. No additional dredging in the main channel has been done since that time.

Construction of the Hawaii Kai community resulted in major changes. Work commenced in 1959 with the dredging and filling of portions of Kuapa Pond. This reduced the size of Kuapa Pond from 520 acres to 260 acres; and increased its average depth from 2.5 feet to 6.5 feet. The marina is currently used for recreational boating, canoeing, water sports and fishing, and the filled portions comprise part of the residential development of Hawaii Kai.

Modification of Kuapa Pond also included widening the entrance channel to the marina from 40 feet to 250 feet and construction of the existing bridge over it. The channel width was designed to accommodate runoff from the 100-year storm. An access channel, paralleling the shore, was dredged from the main channel to the mouth of Kuliouou Stream. A secondary channel was also dredged into the west end of the marina. The dredged material was used to construct the present beach park and boat launching area at Maunalua Bay. Presently, these channels serve as collection points for the discharge of saltwater, freshwater and terrigenous materials from Paiko Lagoon, Kuliouou Stream, and Hawaii Kai Marina.

LANDWARD ENVIRONMENT

CLIMATE

The project area is located in the lee of the Koolau Mountains. The climate is characterized by mild and uniform temperatures, moderate amounts of rainfall and prevailing tradewinds. Mean monthly temperatures for February and August, the coolest and warmest months of the year, are 72 and 79 degrees, respectively. The climate is usually sunny and dry most of the year with the wettest periods occurring during the winter. Average annual rainfall is approximately 20 - 30 inches.

The prevailing winds are moderate to strong, predominantly from the north-northeast, and are funneled into the area by the Koko Head land mass and the ridges of the Koolau range. The predominant wind direction in the project area is offshore, with a slight along shore component. Although these tradewinds produce most of the annual precipitation, flood-producing rainfall occurs when Kona winds from the east-southeast prevail, with associated Kona storms. Kona winds at the site are onshore, but also with a slight along shore component.

GEOLOGY AND HYDROLOGY

The land mass comprising the Maunalua Bay region was first formed during the Tertiary and early Pleistocene eras by successive eruptions of the Koolau Volcano. The area was modified and expanded when a group of volcanic tuff and cindercones erupted from a rift line along the southeast coastline. These eruptions formed the embayment and adjacent land masses comprising Hawaii Kai, Koko Crater, and Koko Head.

Streamflows that were directed southward into the Hawaii Kai embayment and Maunalua Bay severely eroded the relatively smooth dome of the Koolau Volcano and formed the ridge and valley configuration of the area. Alluvial material from the erosion filled the inner valleys of the embayment, forming the coastal plains.

Streams originating in the Koolau Range and discharging into Maunalua Bay include: Waialaenui Stream, Wailupe Stream, Pia Stream and Kuliouou Stream.

SOILS

Soil series on the Island of Oahu are delineated on maps prepared by the U. S. Department of Agriculture, Soil Conservation Service. Soils within the project area are designated "fill land, mixed". The fill material was dredged from Kuapa Pond and existing channels. The fill material is primarily of alluvium origin which is generally only moderately permeable.

FLORA

The existing flora at the project site consist mostly of species that are typical of urban environments on Oahu. Inasmuch as the site has been developed into a park and boat launching facility, there are no rare or endangered plants. A variety of trees and shrubs have been planted in the beach park area, including spider lily, bougainvillaea, naupaka, coco palm, brassaia, autograph tree and banyan.

FAUNA

Paiko Lagoon, located to the east of the proposed Maunalua Bay Ferry Terminal, is the most significant natural feature in the general vicinity. Paiko Lagoon and the adjacent Paiko Peninsula are the only remaining waterbird habitat on the Maunalua coast and have been designated as the Paiko Lagoon Wildlife Sanctuary. The State of Hawaii improved the lagoon area as a wildlife habitat in 1970 and the lagoon has been designated as a bird and wildlife sanctuary in a recreation plan for Maunalua Bay.

According to An Ornithological Survey of Hawaiian Wet Lands, U.S. Army, Engineer District, Honolulu (1977), the interest in establishing Paiko Lagoon as a wildlife sanctuary arose from continued observation of the endangered Hawaiian Stilt feeding in the area. Counts have declined dramatically, however, from an average of 37 between 1961-67 to a maximum 6 after dredging activities in 1973. Currently, the State Department of Land and Natural Resources conducts an Annual Stilt Recruitment Survey which include Paiko lagoon. Although these "spot" counts have recorded observations when no stilts were present, it appears that between 2 and 6 stilt feed in the area.

In recent discussions with officials of the State Department of Land and Natural Resources, they expressed concern about the apparent accumulation of oil substances and other trash in the western corner of Paiko Lagoon. It was speculated that wind may be blowing floating substances and trash against the current into the Lagoon.

Mammals likely to inhabit in the region include feral cats, feral dogs, mongoose, rats, and house mice.

SHORELINE CHARACTERISTICS

SHOREFRONT FEATURES

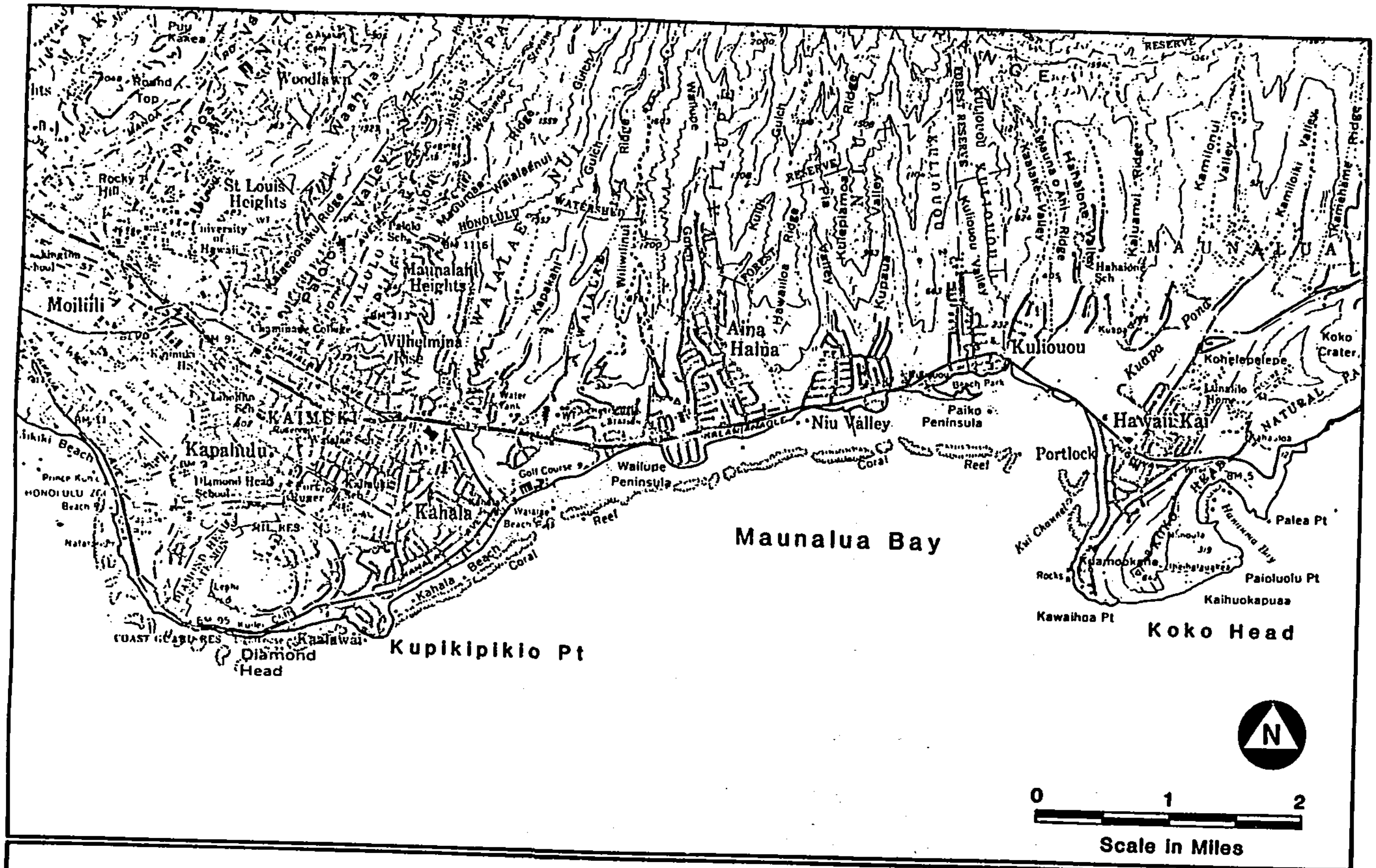
Maunalua Bay is approximately eight miles long, extending from Kupikipikio Point at Diamond Head to Koko Head. See Figure 7. In the vicinity of the proposed terminal site, shoreline conditions can be divided into several distinct sectors as described below:

Paiko Peninsula. Paiko Peninsula, at the east end of the area, is a barrier spit built by sand and rubble transported eastward on the inner reef flat. The spit is separated from land by Paiko Lagoon. The peninsula has been described as the most unstable coastal feature on Oahu. From 1928 to 1961 the peninsula grew 900 feet to the east. The seaward shoreline of the peninsula is a narrow strip of sand and rubble which is almost submerged at high tide.

Kuliouou Beach. Kuliouou Beach is the shoreline between Paiko Lagoon and the west entrance to Hawaii Kai Marina. The shoreline is a mud flat overlying an old reef area. A channel approximately parallels the shore between Kuliouou Stream and the main entrance to Hawaii Kai Marina.

Maunalua Bay Beach Park. The beach park extends from the west to the east entrance of Hawaii Kai Marina, a distance of approximately 2,500 feet. The shoreline is a mixture of coral rubble, mud and sand punctuated by the boat launching ramp and small cove toward its eastern extent. A 600-foot long section west of the cove is protected by a rock revetment.

Portlock. Portlock is a residential area between the Hawaii Kai Marina entrance channel and Portlock Point. A narrow sand beach extends 1,800 feet east of the channel. For the next 3,000 feet the shoreline is stabilized with revetments and seawalls. Beyond that the shoreline consists of low cliffs and benches.



Maunalua Bay
Ferry Terminal

MAUNALUA BAY

Fig. 7

Prepared for:
Department of Transportation
Harbors Division

Prepared by:
Wilson Okamoto
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SHORELINE PROCESSES

The shoreline of Maunalua Bay in the vicinity of the project site has been subject to changes in configuration as depicted in Figure 8, which is based on a computer-corrected digitized tracing of aerial photographs in 1974 and 1988, respectively.

Paiko Peninsula continued to grow to the north and east. The predominant sand transport along the peninsula is to the east, and then north at the tip. Much of the reef off of the peninsula has a veneer of sand and this apparently acts as a source of material for building the peninsula. The north tip of the peninsula now ends at the dredged channel off Kuliouou Stream. It can continue to grow eastward, but sand transported northward will be lost to the deeper water of the channel.

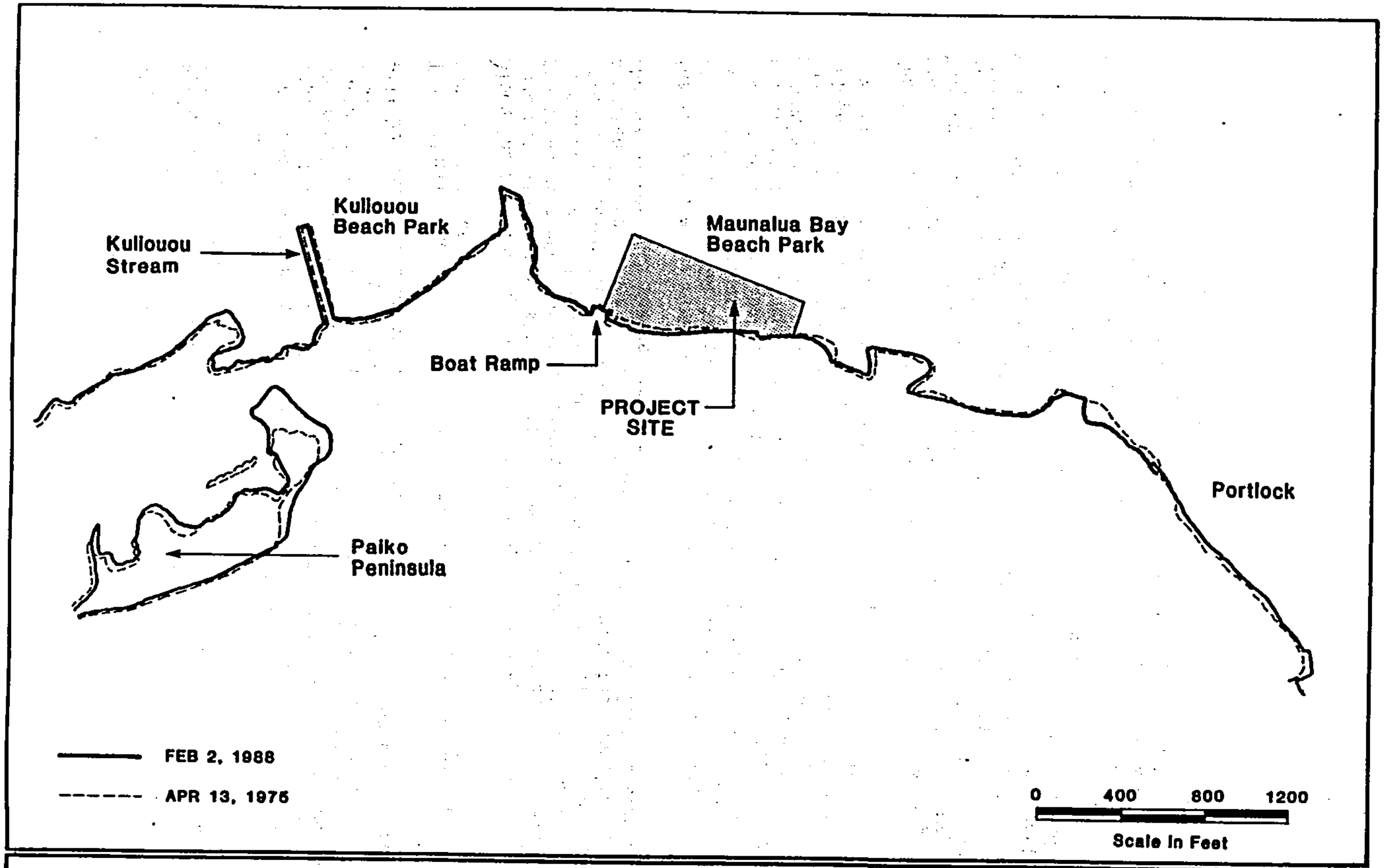
The Kuliouou Beach Park shoreline is stable, with little change registered for the study period.

Along the Maunalua Bay Beach Park shoreline, the portion west of the small cove near the comfort station has been subject to erosion and is presently protected by a 600 foot long revetment. The beach immediately west of the revetment is eroded and sediment transport is to the west. The eroded material is being deposited near the boat ramp, where the shoreline has accreted 25 feet since 1974. The shoreline from the comfort station to the marina entrance channel is stable.

The sandy shoreline along Portlock is eroding, with the exception of a 250 foot section adjacent to the bridge, which is accreting. A 20 foot recession in the vegetation line from 1974 to 1988 is typical for the eroding area. Transport of sand is in a one-way westerly direction due to the effect of predominant tradewind waves, causing eroded sand to accumulate at the west end of the beach and in the entrance channel. There is now an extensive sand bar in the marina just inshore of the bridge. The channel, once dredged to a width of 250 feet is now only 40 feet wide, which was its approximate original width.

The cause of erosion at Portlock may be due to several factors acting singly or in combination. First, dredging of the entrance channel may have created a "sink" that is removing sand from a littoral system which would otherwise maintain the beach. Second, the dredging may have interrupted the eastward migration of sand required to balance the westward migration which now dominates and results in one-way transport. A third factor may be the degradation of the reef due to siltation and the resultant loss of new sand input produced by the reef.

The outer part of the Hawaii Kai entrance channel is shoaling, with a sandbar being formed across the channel, just shoreward of where waves break on the reef adjacent to the channel. The sandbar is shallower on the east side of the channel, indicating that the sand is moving from the east side of the reef east of the channel westward into the channel.



Maunalua Bay
Ferry Terminal

Fig. 8

SHORELINE CHANGES, 1975–1988

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Harbors Division

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FLOOD HAZARD AND TSUNAMI INUNDATION

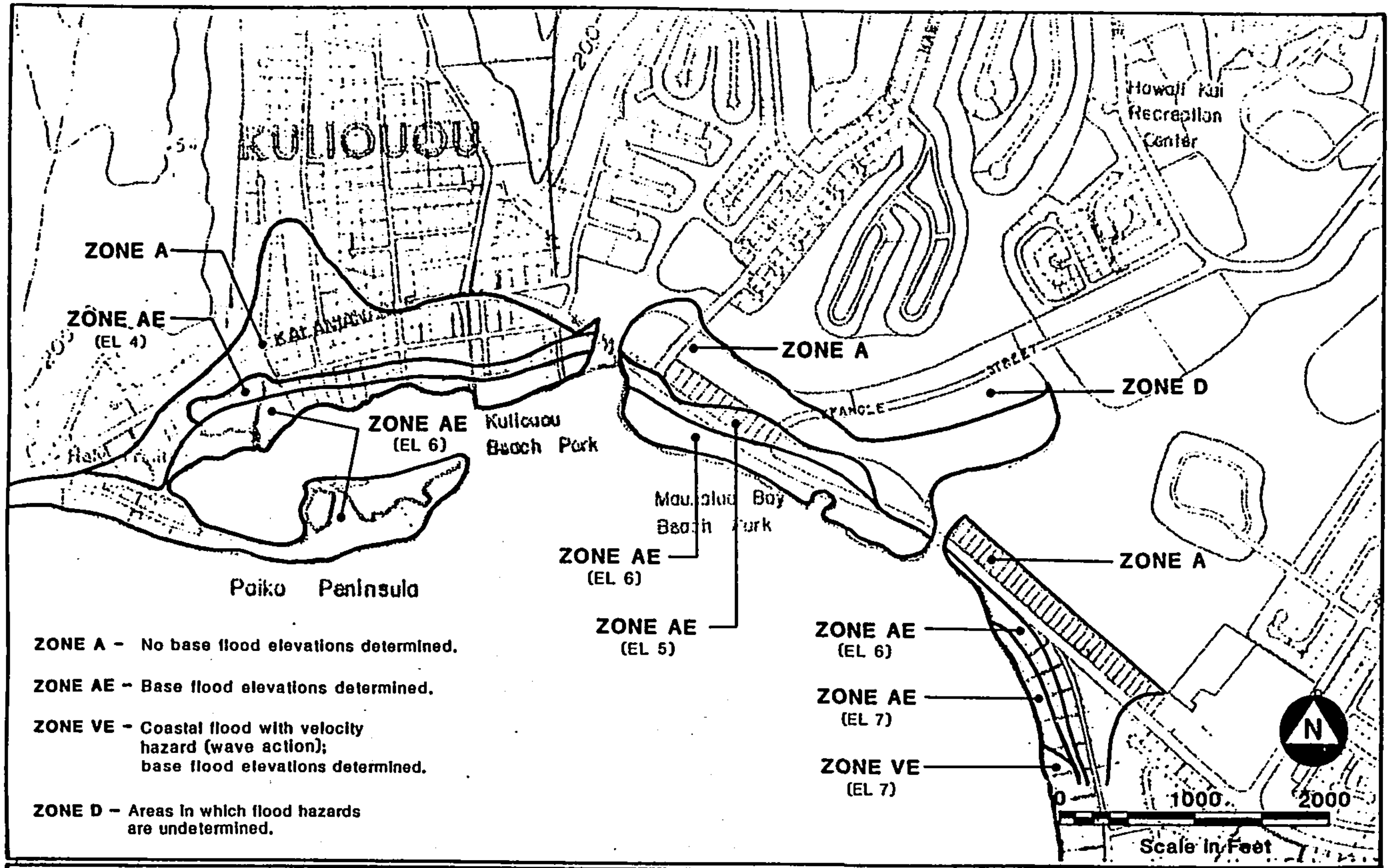
The Hawaiian Islands are subject to tsunamis generated throughout the Pacific Basin. Eighty-six tsunamis have been observed in the islands since 1813; 22 resulting in significant damage. Tsunami waves approaching the shoreline are influenced by refraction, shoaling, bottom friction, local bathymetry and coastal configuration.

According to the Flood Insurance Rate Map issued by the Federal Emergency Management Agency under the National Flood Insurance Program dated September 4, 1987, the proposed Maunalua Bay Ferry Terminal is designated within the 100 year flood area (Zone AE). See Figure 9. This flooding is associated with tsunami although the area is not threatened by the forces of "wave action."

Using the recommended methods, tsunami wave elevations at the project shoreline were calculated for various return periods:

Return Period (Yrs)	Runup Elevation Above MSL (ft.)
10	2.5
25	2.5
50	4.3
100	6.2

There are no records of bore formation in the area, so tsunamis should have the form of non-breaking fluctuations in the water level, much like rapid tidal changes. Structures in the project area may be subject to temporary inundation, and also the water velocities associated with the backflow of water during the trough periods.



Maunalua Bay Ferry Terminal

FLOOD HAZARD MAP

Fig. 9

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Harbors Division

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& Associates, Inc.

OFFSHORE CHARACTERISTICS

REEFS

A fringing reef extends 3,000 feet offshore through most of the area. Depths on the reef range from zero and five feet, with some areas baring at low tide. The reef consists generally of low relief limestone, with a veneer of sand or silt in several locations. A series of sandbars extends seaward from Paiko Peninsula, some emerging at low tide. There are extensive silt deposits on the reef section off Kuliouou Beach Park and the inner sections of the reef off Maunalua Bay Beach Park. The reef is cut by several dredge channels, as shown in Figure 10. These channels are deeper than the surrounding reef and are subject to silt deposition.

Seaward of the reef, the bottom drops gradually to a wide shelf of sand and scattered limestone formations at depths of 50 to 60 feet.

Additional discussion of reefs is contained in the subsequent section on Offshore Biology.

WAVES

The reef off Hawaii Kai is exposed to the direct approach of two types of waves from the southeast through southwest. The south swell is generated by southern hemisphere storms and is most prevalent during the months of April through October. Their approach is from the southeast through southwest sector. Typical deepwater heights of these waves are from 1 to 6 feet, with periods of 12 to 20 seconds.

Kona waves, on the other hand, are generated by the winds associated with local fronts or low pressure systems. They typically have wave periods ranging from 6 to 10 seconds and heights up to 10 feet or more.

Indirect wave exposure results from tradewind waves which are present in Hawaiian waters throughout most of the year. They are generated by tradewinds blowing over the open ocean northeast of Hawaii. Typical tradewind waves have periods of 6 to 8 seconds and heights of 4 to 8 feet.

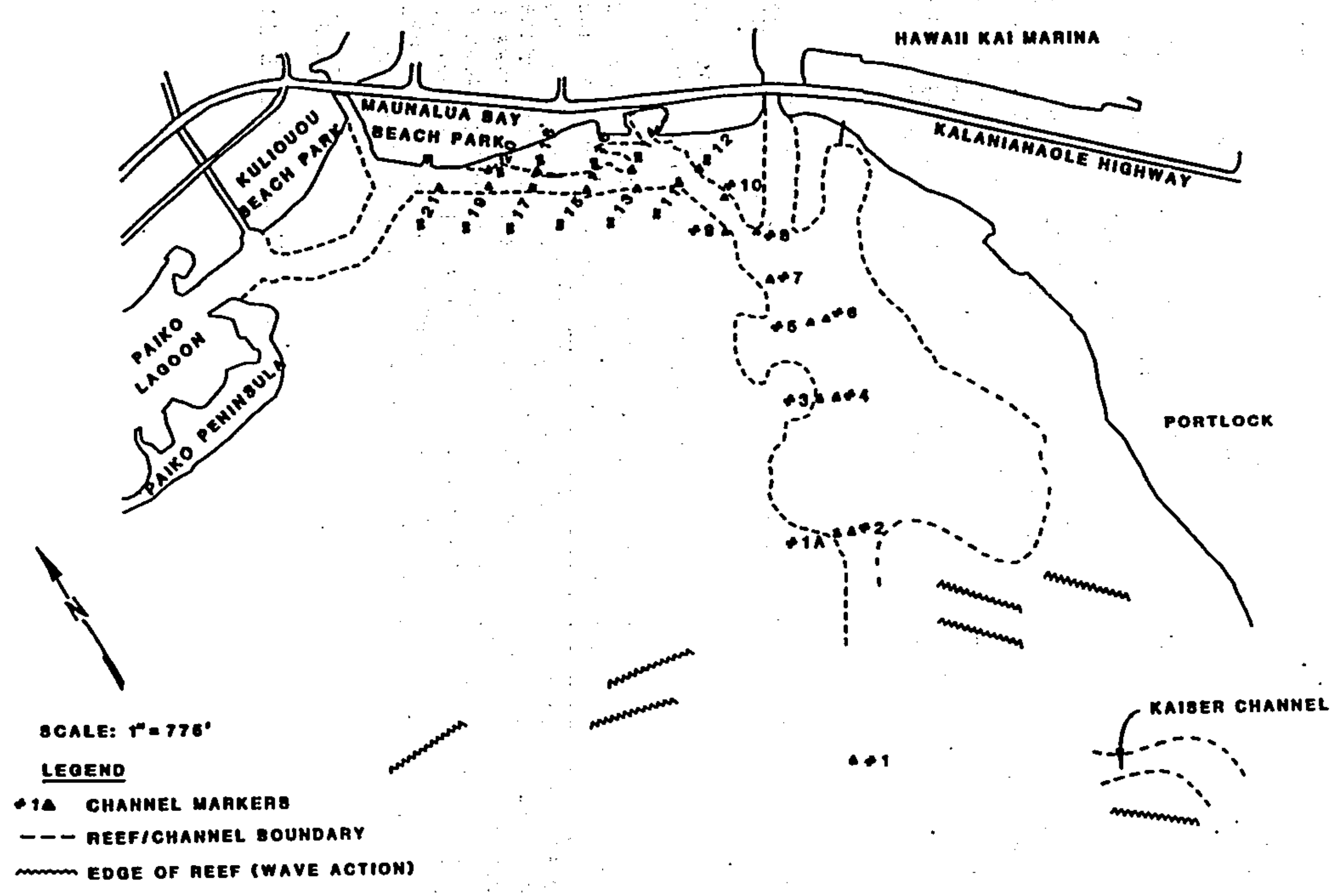

FIGURE 1 PROJECT AREA

Maunalua Bay Ferry Terminal

REEFS AND CHANNELS

Fig. 10

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Department of Transportation
Harbors Division

Prepared by:
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They approach from the north through east sector, refracting around Koko Head and the Hawaii Kai reef to Maunalua Bay. Although their approach is indirect, tradewind waves are considered a significant factor in the wave climate of the area.

Incoming deepwater waves break on the reef edge approximately 3,000 feet from shore, and as a result, little wave energy reaches the shoreline during typical conditions.

In addition to normal wave conditions, the project area is also exposed to potential severe wave attack from tropical storms and hurricanes passing south of the island. Notable hurricanes in Hawaiian waters have included Dot (1959), Nina (1957) and Iwa (1982). These hurricanes generated deepwater wave heights of approximately 25 feet and are frequently considered "design" storms for shoreline developments.

TIDES

The tides in the Hawaiian Islands are semi-diurnal, with diurnal inequalities; that is, two high and two low tides per day with varying elevations. At Honolulu Harbor, the closest tidal reference station, the following tide levels occur:

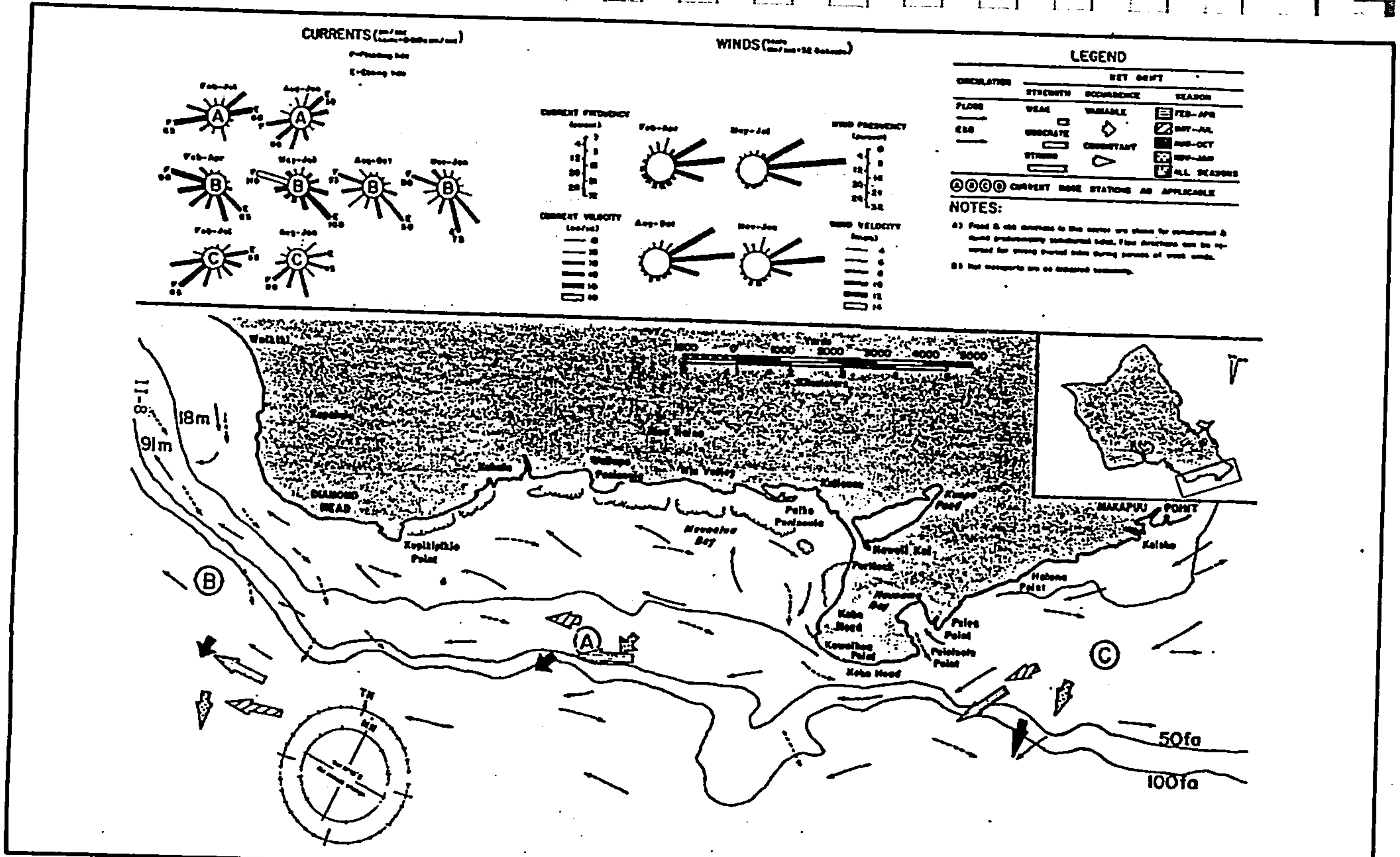
Tide Level	Feet
Mean Higher High Water (MHHW)	1.9
Mean Sea Level	0.8
Mean Lower Low Water (MLLW)	0.0

CURRENTS

Offshore currents in Maunalua Bay are predominantly wind and tide driven. As the surface layers move in response to the wind, their transport is generally to the southwest, or offshore. Responding to tidal changes, the subsurface layers flow predominantly to the west during flood tide. Ebb tide reverses the flow, with the currents moving to the east. There are times when the ebb current flow is strong enough to counteract the tradewind influence, and even the surface layers will move to the east. This condition is sometimes indicated by a slightly discolored plume of water originating from the Hawaii Kai marina outflow and extending off Hanauma Bay or Lanai Lookout.

Figure 11 shows a generalized summary of the circulation in Maunalua Bay. Notable is a flood tide eddy directly off the Hawaii Kai entrance channel. The ebb tide flow around Koko Head is also pronounced, and also follows the pattern shown in Figure 11. The overall net transport is to the west or southwest.

Currents on the reef are a function of the wind stress on the surface and water layers, the mass transport of water due to waves breaking on the



Maunalua Bay Ferry Terminal

MAUNALUA BAY CIRCULATION

Fig. 11

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outer reef, and the movement of water required to fill an empty the tidal prism on the reef flat, in Paiko Lagoon, and the Hawaii Kai Marina. Measurements by Marine Advisors (1961) and Sea Engineering, Inc. (1988) show relatively weak currents on the reef flat, ranging from 0 to 0.13 knots for all observations. The flood tide flow on the reef flat was generally eastward for both trade and calm wind conditions. The ebb tide flow was also eastward during calm wind conditions. During tradewind conditions, the ebb tide flow is deflected downwind, which results in offshore movement. Current measurements and results are described in detail in Appendix B.

WATER QUALITY

The water quality in Maunalua Bay is influenced by exchange with the Hawaii Kai Marina, the shallow bathymetry of the reef flat and by exchange with open coastal waters beyond the reef. The Department of Health, State of Hawaii classifies Hawaii Kai Marina as an "artificial basin" and in a subclass of "shallow draft recreational harbors." Maunalua Bay is classified as a "Class II nearshore reef flat" where "existing or planned harbors may be located within nearshore reef flats showing degraded habitats and only where feasible alternatives are lacking and upon written approval by the Director of Health considering environmental impact and the public interest pursuant to HRS 342-6."

The water quality parameter most directly related to specific benthic criteria is turbidity. An analysis of present turbidity levels was conducted for a comparison with historical values. See Appendix C. The results, as indicated by the geometric mean values, are presented in Table 1. In general, water quality conditions in 1973 were worse than at present. This may be due to more extensive subdivision construction and consequent exposure of erodible land in 1973 than at present. Notably, turbidity values for 1988 are likely to be higher than usual due to the continuing influence of the January 1, 1988 storm which resulted in severe runoff into Maunalua Bay. Nevertheless, the historical effect of sediment on the Maunalua Bay reef flat has been and continues to be too great for the maintenance of a normal coral reef community.

TABLE 1

MAUNALUA BAY TURBIDITY COMPARISON 1973-1988

Area	Geometric Mean Turbidity in (TU) 1973	1988
Maunalua Bay Seaward Reef	0.88	0.87
Maunalua Bay Channel	5.40	2.70
Maunalua Bay Reef Flat	----	3.00
Hawaii Kai Marina Exits	8.20	3.90

OFFSHORE BIOLOGY

Three biotopes were identified during a recent biological survey of the offshore areas in the vicinity of the project site: the reef flat biotope, the channel floor biotope, and seaward of the fringing reef, the limestone mounds biotope. See Figure 12, also Appendix D.

REEF FLAT BIOTOPE

The reef flat biotope fronts Maunalua Bay Beach Park and extends from the shoreline to the crest of the fringing reef about 3,000 feet offshore. The biotope occupies an old limestone bench covered by a veneer of fine mud and rubble which is most apparent within 800 feet of the shoreline. Further seaward, the limestone substratum is visible between pockets of muddy sand and rubble. Much of the biotope is in water less than three feet deep and is exposed at low tide.

In general, benthic communities in this biotope may be characterized as highly disturbed along the inner portions and dominated by sessile filter and suspension feeding forms. Further offshore, algae and a variety of invertebrate and fish species common to Hawaiian reefs may be found.

LIMESTONE MOUNDS BIOTOPE

The limestone mounds biotope lies seaward of the reef flat biotope, beyond the reef crest, about 3,000 feet from shore. Beginning at an average depth of 12 feet, the biotope extends seaward for approximately 1,000 feet to a depth of 20 feet or more. It is characterized by mounds or patches of limestone emerging from a sandy bottom. The mounds range in size from 30 by 50 feet to more than 100 by 300 feet. They are spaced from 100 feet to 300 feet apart.

Benthic communities in this biotope are not well developed as there is little shelter for motile forms and occasional scouring action of wave driven sand inhibits establishment of sessile forms on the mounds. A

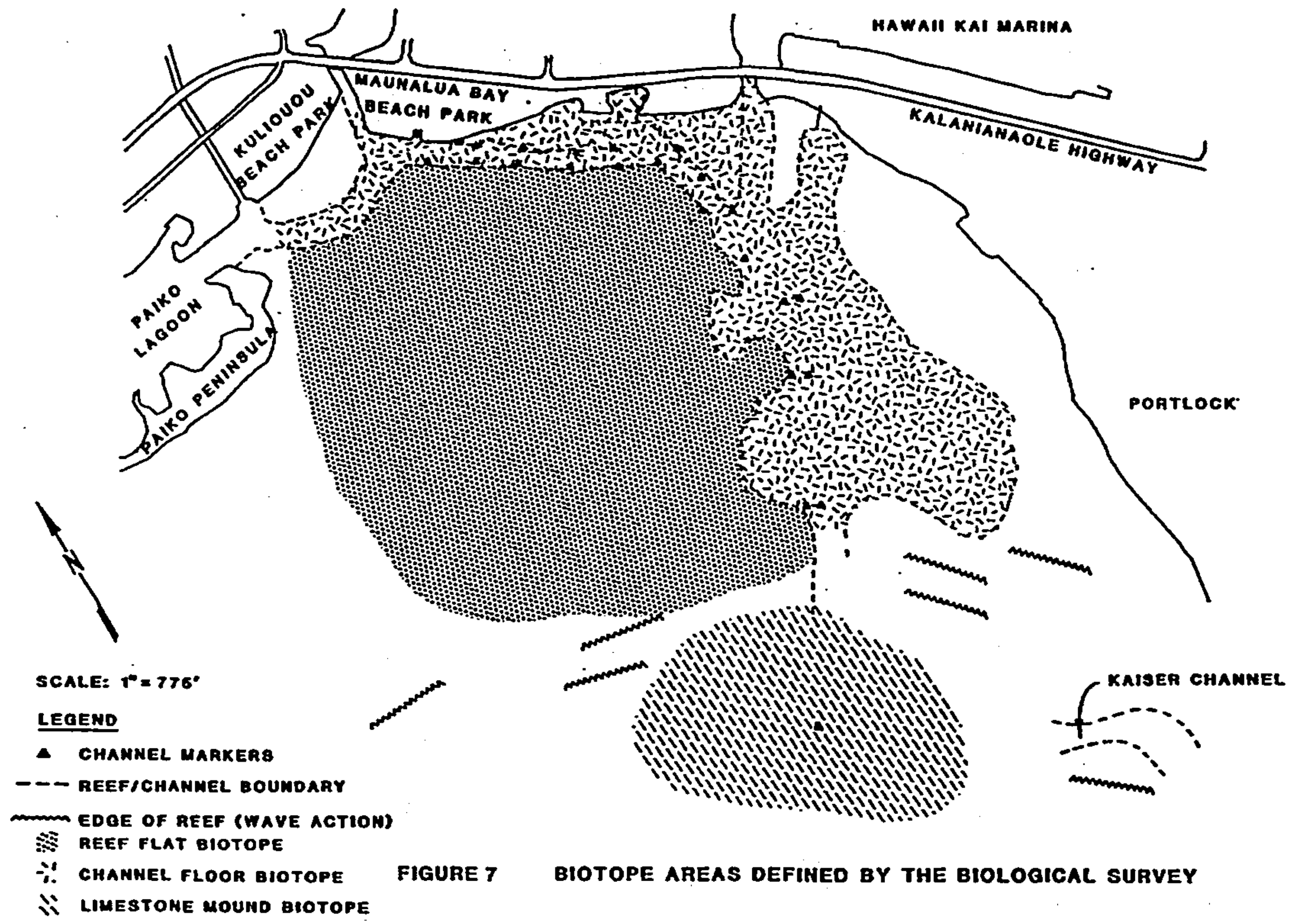

FIGURE 7 BIOTOPE AREAS DEFINED BY THE BIOLOGICAL SURVEY

Maunalua Bay Ferry Terminal

BIOTOPE DEFINED BY THE BIOLOGICAL SURVEY

Fig. 12

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Harbors Division

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number of coral species were identified, including Poritis lobata,Pocillopora meandrina, Montipora verrusoca, M. patula, and Cypastrea ocellina, although overall coverage does not exceed four percent. Macroalgae coverage is less than 8 percent. Where shelter is available, fishes may also be seen. Notable was the abundance of moray eel species found in the open. This may be due to the scarcity of shelter which would normally be sought by the eels.

CHANNEL FLOOR BIOTOPE

The channel floor biotope is restricted to the areas where channels bisect the reef flat biotope. Some of these channels are those of natural origin which have since been enlarged by dredging. The sparse life supported in this biotope reside on or in a substratum of very fine mud that may be more than three feet thick in areas. Burrows seen in this biotope include those of the shrimp Alpheus mackayi and those of larger crab species. A commensal goby, Psilogobius mainlandii, may also be present since they are known to share the burrows of Alpheus mackayi. Few other fishes were encountered in this biotope although tilapia, kaku and pua may be seen along the channel edges and fishermen reportedly catch small papio. The presence of nehu has also been reported.

BIOLOGICAL CHANGES

In general, the biological survey of the waters off of the project site suggest that the marine communities are, for the most part, poorly developed and have low diversity. These attributes are typical of marine communities exposed to or impacted by negative environmental influences which result in a reduction in species numbers and simplification of community structure and function. Overall, only two macrothalloid species, four macroinvertebrate species and two fish species were encountered while mean coral coverage was five percent. These values are extremely low relative to most Hawaiian marine habitats and suggest that marine communities in the area are severely impacted by low environmental quality.

Main sources of environmental disturbance suggested by the study are the input of freshwater and fine mud from landward sources, as well as fine carbonate material from the reef platform. High sedimentation, and periodic freshwater inundation has occurred since construction of the marina commenced in 1959. Perhaps the greatest rainfall related impact to the reef communities in this area occurred during the January 1, 1988 storm which produced the highest sustained rainfall ever recorded in East Oahu. In a 24 hour period approximately 25 inches of rain fell on the Koolau mountains in the Hawaii Kai drainage basin. The effect of the storm appears to have been aggravated by heavier than usual rainfall during the preceding two weeks which saturated the soil and resulted in massive erosion when the subsequent storm occurred. The magnitude and duration of the storm's effect were indicated by the presence of a cell of turbid water approximately three miles long and two miles wide which remained in the Maunalua Bay area for more than 45 days following the storm. It appears that the mud and large volume of freshwater which emanated from Kuliouou Stream and the Hawaii Kai marina as a result of the storm probably severely impact marine communities over much of the study area.

In relation to a study conducted by the U.S. Army Corps of Engineers in 1975 and another study conducted in that same year by ECI, significant degradation of marine communities in the study area is indicated. The ECI study reported that the shallow reef flat near the Hawaii Kai marina was inhabited by small colonies of the corals Cyphastrea ocellina and Pocillopora damicornis, six species of fish (dominated by the 'omaka) and the alga Acanthophora spicifera. Today this area is mostly covered by fine mud and only a few very small colonies of the coral Pocillopora damicornis were seen. The alga Acanthophora spicifera is still present but the 'omaka was not seen.

In 1975, ECI noted an abundance of the corals Porites compressa and Porites lobata and the alga Dictyosphaeria cavernosa growing on boulders on the western edge of the entrance channel, and particularly on a reef spur near channel marker #3. Today there are no live corals on those boulders and no Dictyosphearia cavernosa was seen. The previously reported abundance of coral on the western channel edge has declined. Some Porites compressa and P. lobata remain on the reef spur.

Declines in benthic algae are significant. The ECI study indicated algae growth approaching 100 percent in some areas and dominated by Codium edule, Halimeda sp. and Enteromorpha sp. The 1988 study found nine algal species having a mean coverage of only 0.8 percent.

With respect to fish, the ECI study recorded at least 53 species, most associated with high coral cover, particularly along the western edge of the entrance channel. The 1988 study found only two species in this area, neither of which were recorded in the previous study.

Changes in the limestone mounds biotope appear to be less pronounced over the years, probably due to its distance from sources of potential adverse impact near the shoreline. Most previously recorded species were found in the 1988 study.

The comparisons of the 1988 study with the 1975 studies suggest that considerable change has occurred in the marine communities shoreward of the Maunalua Bay fringing reef. These changes are manifested as significant decreases in species numbers and coverage, probably in response to continuing sediment stress. The changes may have occurred gradually since the time of the 1975 study or they may have been abrupt, as a result of the January 1, 1988 storm. The significant decrease in corals along the western edge of the entrance channel and the lack of any evidence of recently killed corals suggests that these changes have been chronic in nature and ongoing for some time. Irrespective of how they have occurred, the result is that the marine communities offshore of Maunalua Bay Beach park are poorly developed and the community structure suggests a highly disturbed environment.

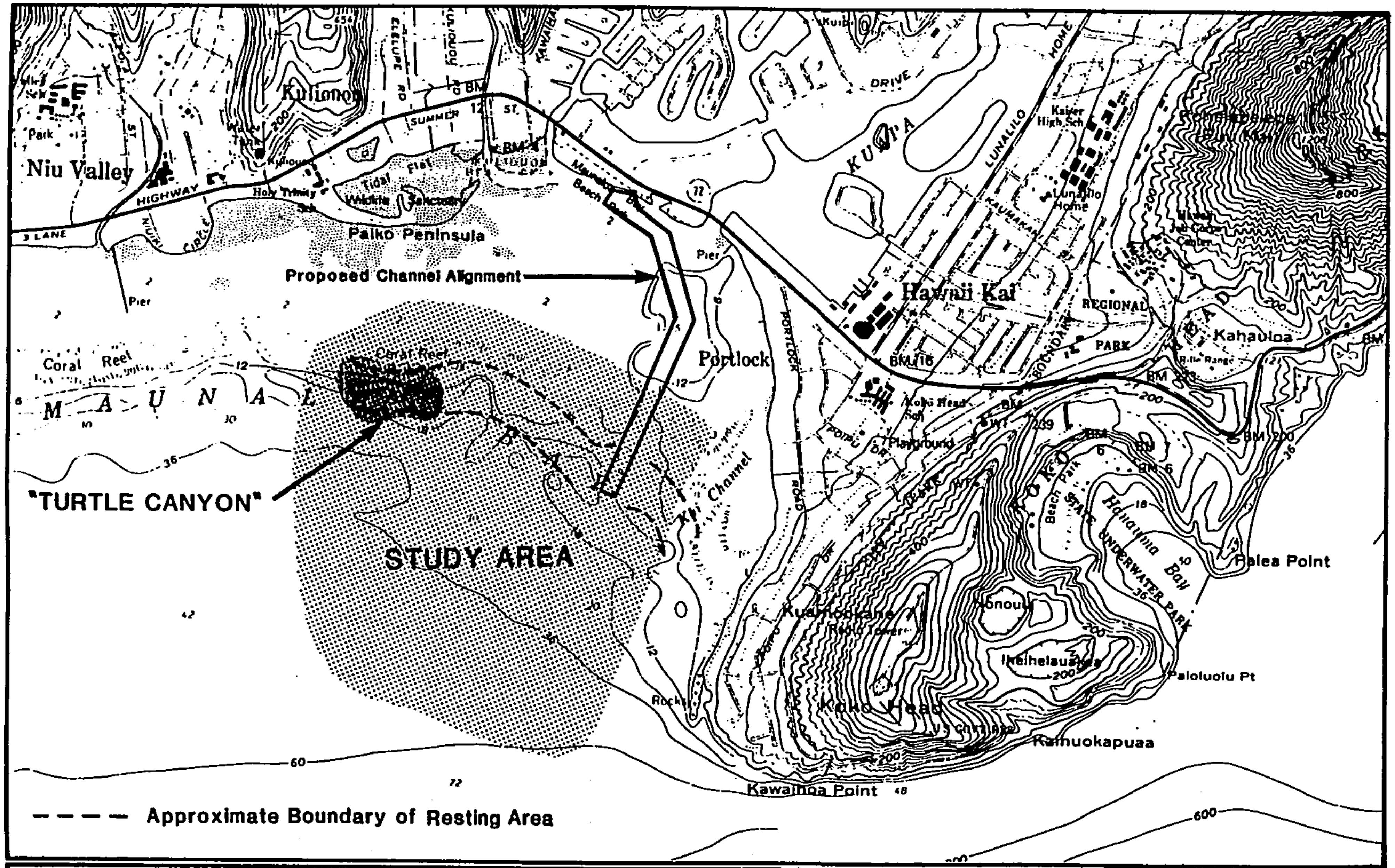
GREEN SEA TURTLE HABITATS

The green sea turtle (Chelonia mydas) is protected under the National Endangered Species Act and Hawaii statutes. This species is known to inhabit areas seaward of the fringing reefs of Maunalua Bay offshore of Hawaii Kai. A study was conducted to ascertain the relative population size of the turtles in the area, identify potential turtle resting and foraging areas, and to quantify the intensity of use of these resting and foraging areas. See Appendix E.

Approximately 316 ha (781 acres) of ocean area adjacent to and affronting the Hawaii Kai entrance channel was surveyed between the fringing reef and depths of 20 meters. See Figure 13. Green sea turtle resting habitats appear to be confined to a 250 meter wide band following the seaward edge of the emergent reef. Green sea turtles were rarely encountered outside of this area. Most of this resting area is comprised of ledges, small caves and undercuts associated with the spur and groove formations characterizing the seaward face of the fringing reef. The resting area surveyed extends approximately 1.6 km (1 mile) along the reef. Green sea turtle counts in this area consistently ranged from 26 to 29 individuals for each survey. The relatively small size of the turtles encountered (35 to 70 cm carapace length) suggest that the resting habitat is appropriate for juvenile and sub-adult stages of growth. Unlike green sea turtle resting areas observed in other Hawaiian reefs, the one at Hawaii Kai is not confined to a few specific sites along the reef but rather appears to be spread throughout the entire reef front. This may be due to the abundance of resting sites throughout the area coupled with ample foraging pastures.

A survey of potential foraging areas for the green sea turtle was conducted based on the occurrence of algae (limu) important in the green sea turtle diet. Considerable standing crops of forage algae were found both in the resting habitat as well as on the reef flat shoreward of the reef crest. These algae do not occur in the existing boat channel. Three species of algae (Acanthophora spicifera, Amansia glomerata, and Laurencia nidifaca) were found to comprise 20 percent of the coverage on the reef flat immediately shoreward of the resting habitat. These species also cover 7 percent of the substratum in the resting habitat. In addition, other species of algae known to serve as sea turtle forage were commonly encountered in these areas. These species include Caulerpa racemosa, C. taxifolia, wawe'iole (Codium edule), huna (Hypnea cerviconis) and the angiosperm Halophila ovalis.

To assess use of these potential foraging areas, surveys were conducted at first light in the morning; however, no foraging activity was witnessed.



Maunalua Bay Ferry Terminal

GREEN SEA TURTLE STUDY AREA

Fig. 13

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The turtle surveys suggest that the nearshore waters of Hawaii Kai are an important resting habitat and offer considerable forage pastures. This finding is of particular interest in light of the heavy recreational and commercial use of the area over the last decade. It is apparent that the turtles have managed to co-exist with these existing activities.

LAND USES

EXISTING LAND USES

The proposed Hawaii Kai Ferry Terminal site is located adjacent to Kalanianaole Highway, west of the main channel. Existing development includes a beach park and boat launching ramp with a paved trailer parking lot.

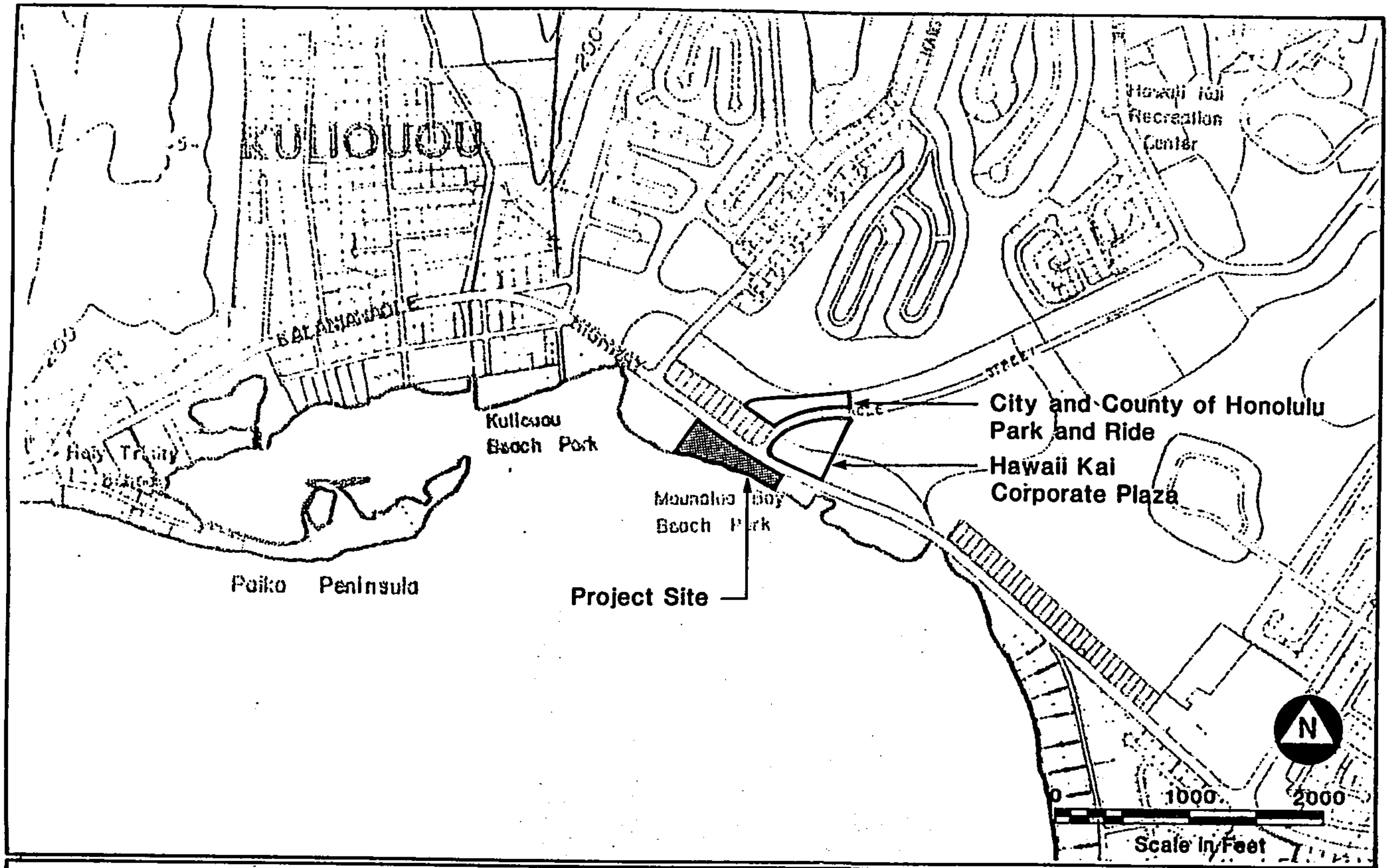
The beach park occupies a portion of a 12 acre strip of land created from material dredged out of Kuapa Pond in the 1960's. The Department of Parks and Recreation has developed a small landscaped area with picnic tables and comfort station for public use. Adjacent to the west of the park, the State Department of Transportation operates the boat launching ramp with a paved parking lot accommodating approximately 150 automobiles and boat trailers. At the west end of Maunalua Bay Beach Park, a canoe club stores and launches their canoes.

Recreation at Maunalua Bay include public, commercial and commercially promoted activities, including boating, canoeing, fishing, swimming, kayaking, diving, parasailing and jet skiing. Presently, there are five thrill-craft (jet-ski) companies, one diving company and one parasailing company operating in the Maunalua Bay area. Commercial fishing operations are also staged from the boat launching ramp.

SURROUNDING LAND USES

Land uses surrounding the proposed project site has predominantly been open space to the north and single family residences to the east and west. During the past year, KACOR has developed the parcel to the north across Kalanianaole Highway into a retail and business complex. See Figure 14. The Hawaii Kai Corporate Plaza consists of 47,170 square feet of office and retail space as well as parking for approximately 205 automobiles.

The City and County of Honolulu, Department of Transportation Services Park and Ride facility is located on the five acre parcel to the west of



Maunalua Bay Ferry Terminal

SURROUNDING LAND USES

Fig. 14

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the Hawaii Kai Corporate Plaza across Keahole Street. The facility provides free parking for approximately 140 automobiles. Access to and from the facility are provided by two driveways along Keahole Street.

SOCIOECONOMIC CHARACTERISTICS

For purpose of this report, the Hawaii Kai community is characterized based on four census tracts established by the U.S. Bureau of the Census - CT 1.02, 1.03, 1.04 and 1.05. See Figure 15.

POPULATION

The 1987 State of Hawaii Data Book gives Hawaii Kai's 1984 population as 27,074 people. Between 1970 and 1980, Hawaii Kai experienced tremendous population growth. In comparison with a 21% increase for the City and County of Honolulu, Hawaii Kai's population increased 104% during the same 10 year period.

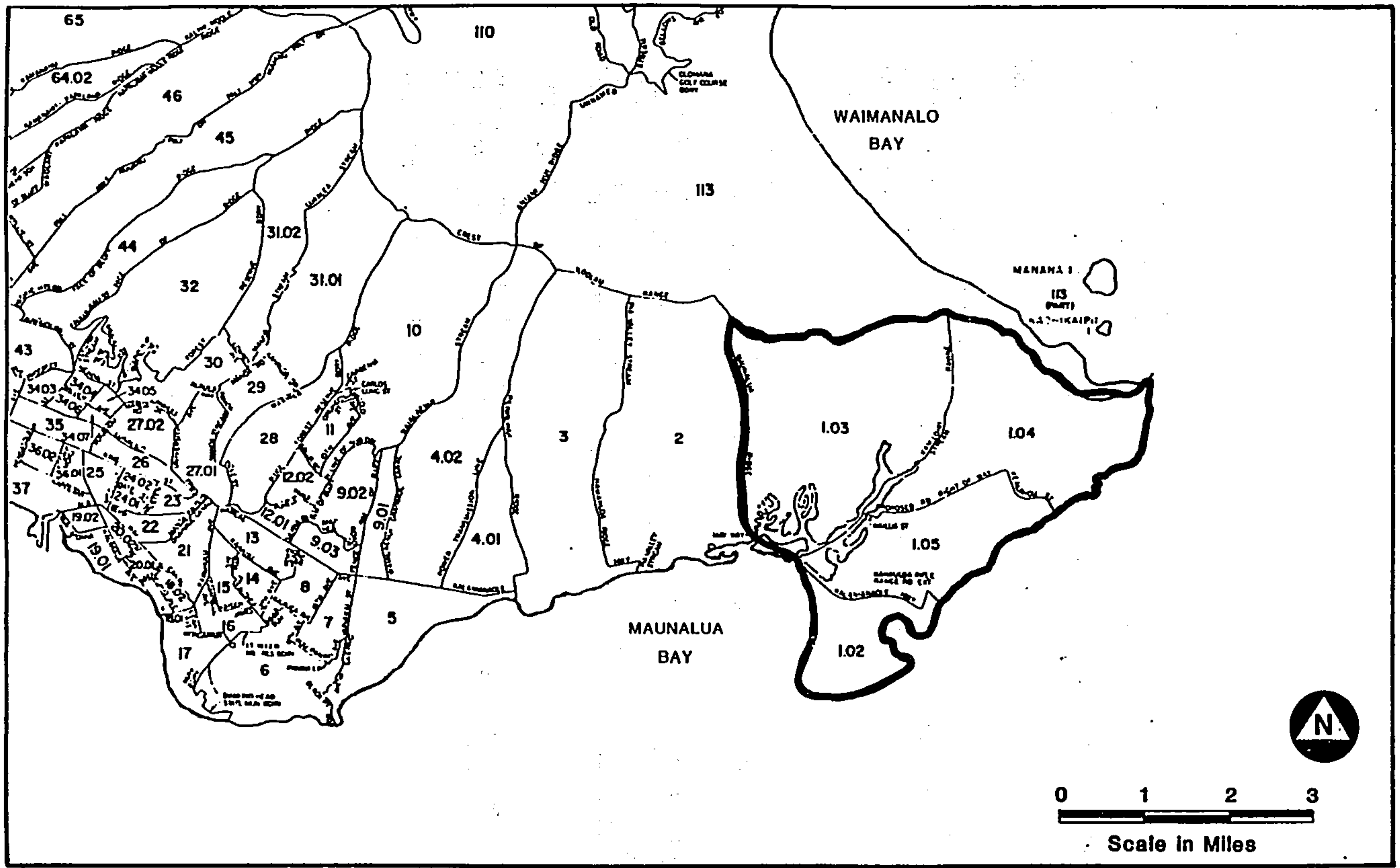
Within the study area, population growth occurred primarily in Census Tracts 1.03 and 1.04, while the more established areas in tracts 1.02 and 1.05 remained stable.

HOUSEHOLDS

In 1980, Hawaii Kai had 7,518 households with an average of persons per household ranging from 3.1 to 3.7. This is slightly higher than for the City and County of Honolulu. Census Tract 1.02 has the fewest households with only eight percent of the total.

AGE

Hawaii Kai is predominantly made up of families with members below the age of 55. The majority of adults fall in the 35 to 54 age bracket, with their children of school age between 5 and 19 years. This is especially true in census tracts 1.03 and 1.04, the more recently developed areas which also have a higher density.



Maunalua Bay Ferry Terminal

Fig. 15

1980 CENSUS TRACTS

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PLACE OF BIRTH

Approximately 52% of Hawaii Kai residents were born in Hawaii, as compared to the City and County of Honolulu's 55%. Hawaii Kai has the highest percentage of people born in other states and the lowest percentage of foreigners as compared to other census tract on Oahu.

EDUCATION

Hawaii Kai has a significantly higher percentage of persons with at least some college education. Approximately 61% of the residents attended college versus 40 % for the City and County of Honolulu.

LABOR FORCE AND OCCUPATION

The Hawaii Kai population, compared to the City and County of Honolulu, has a greater number of employable age persons. Of this number, 97.6% are employed and 2.4% unemployed. Next to Waialae-Kahala, Hawaii Kai has the second lowest unemployment rate on Oahu. A substantial portion (41%) of Hawaii Kai's employed residents are in managerial, professional specialty and professional and related services occupations. This compares to the City and County of Honolulu's 28%. Conversely, Hawaii Kai has the lowest comparative percentage of the labor force in categories of service and blue collar occupations.

With regard to income, Hawaii Kai can generally be categorized as a higher than average, affluent community. Over 50% of households had incomes over $35,000 per year in 1979, including 21% with incomes over $50,000. The median income for households of Hawaii Kai was $36,232 versus $21,077 for the City and County of Honolulu.

HOUSING CHARACTERISTICS

There are 8,000 existing housing units in Hawaii Kai, of which 1,100 are low and medium density. Owner-occupied residences account for 82% of total households versus 18% for renters.

PUBLIC FACILITIES AND SERVICES

POLICE AND FIRE PROTECTION

The Hawaii Kai Fire Station, which consists of an engine company and a hook-and-ladder unit, is located on Lunalilo Home Road approximately 2 miles from the project site. The Wailupe Fire Station, located on Kalanianaole Highway is approximately 3 miles away. The proposed project will likely be served by existing facilities.

Police services will be provided by the Honolulu Police Department. Nine police officers (three officers in three shifts) are assigned daily to patrol the Hawaii Kai area which is designated as Beats 90, 91 and 92. The nearest police station, Honolulu Police Station, is located at Pawaa Annex in Honolulu approximately 7 miles west of Hawaii Kai.

HEALTH SERVICES

Three health care facilities are located within the immediate project area. Kaiser Clinic is located in the Hawaii Kai Towne Center, Straub Clinic at the Koko Marina shopping center and the Hawaii Kai Emergency and Family Medicine Clinic in the Kuapa Kai Shopping Center.

Emergency services are offered by the Hawaii Kai Fire Station and an ambulance is stationed at the Wailupe Fire Station. The nearest hospitals are the Queens Hospital and Straub Clinic located in Honolulu.

EDUCATIONAL FACILITIES

The three public elementary schools in the project area are Hahaione, Kamiloiki and Koko Head. The closest intermediate school is Niu Valley and the nearest high school is Kaiser High located on Lunalilo Home Road.

RECREATIONAL FACILITIES

Hawaii Kai and the vicinity has an abundance of public and private recreational facilities. There are three public parks in the Hawaii Kai area: Koko Head District Park (CT 1.02), Hahaione Playground (CT 1.03) and Kamiloiki Community Park (CT 1.04). Table 2 summarizes both public and private recreation facilities in the project area. Immediately adjacent west of the proposed ferry terminal site is the State Department of Transportation boat launching ramp and boat trailer parking area.

TRANSPORTATION

Vehicular traffic in the East Honolulu area is served by a single major artery, Kalanianaole Highway. Kalanianaole Highway connects Interstate Route H-1 to Windward Oahu and is East Honolulu's primary link to major Honolulu employment centers.

Kalanianaole Highway is a divided highway in a 120-foot wide right-of-way from Interstate H-1 to Kirkwood Street. The divided section has three lanes in each direction west of West Hind Drive, and three westbound and two eastbound lanes between West Hind Drive and Kirkwood Street. Between Kirkwood Street and Hawaii Kai Drive, the roadway is a four-lane undivided highway, with left-turn lanes provided only at East Halemaumau, Hawaii Kai Drive, Keahole Street and Lunalilo Home Road.

Current roadway facilities and public transit services along Kalanianaole Highway are intensely used throughout the morning and evening peak travel periods.

UTILITIES

Water, electrical and telephone service lines are available along the Kalanianaole Highway right-of way. Drainage from the site and adjacent Kalanianaole Highway is discharged through a swale traversing the proposed parking area into Maunalua Bay. No sewerage connection is available in the immediate area: the comfort station at Maunalua Bay Beach Park is served by a cesspool.

TABLE 2

PUBLIC PARKS AND FACILITIES

HAWAII KAI AREA

EXISTING PARKS		Acreage
Hahaione Community Park		4.09
Hahaione Neighborhood Park		6.20
Kamiloiki Community Park		9.98
Kamiloiki Neighborhood Park		7.00
Koko Head District Park		50.00
Maunalua Bay Beach Park		4.00
Hanauma Bay Beach Park		8.70
Kalama Valley Community Park		6.00
	Total	95.97

UNDEVELOPED PARKS		
Koko Kai Beach Parks		1.15
Koko Head Park		1,057.15
	Total	1,058.30

Project Impacts

OVERVIEW

Anticipated impacts of the proposed project have been assessed for the long and short terms. Short term impacts, beneficial and adverse, generally result from construction related activities. Short-term impacts should persist no longer than the duration of the construction. Long-term impacts, beneficial and adverse, result from the implementation and operation of the proposed project.

SHORT-TERM IMPACTS

Construction related impacts are unavoidable but through proper application of mitigative measures, can be minimized in severity and duration.

Construction activities will typically be scheduled from 7:00 A.M. to 3:30 P.M., Monday through Friday (excluding holidays). The duration of construction and associated impacts will be contingent upon project phasing and construction methods used.

NOISE

Noise levels in the vicinity of the project site will increase as a result of operating heavy vehicles and other power equipment during construction. It shall be the contractor's responsibility to minimize noise by complying with Title 11, State Department of Health Administrative Rules, Chapter 42 - Vehicular Noise Control for Oahu and Chapter 43 - Community Noise Control for Oahu. Accordingly, the contractor shall be responsible for properly maintaining mufflers and other noise attenuating equipment. A noise permit will be required if it is anticipated that noise levels will exceed allowable limits as specified in the regulations.

While mitigative measures will be implemented, unavoidable construction-related noises could affect leisure activities at the Maunalua Bay Beach Park. These actives include picnicking, fishing, canoe paddling and kayaking. Person engaged in activities such as jet skiing and commercial fishing will probably be less aware of the noise.

AIR QUALITY

Ambient air quality is expected to temporarily decrease as a result of construction related activities. Airborne dust shall be controlled with appropriate dust control measures, such as water spraying and sprinkling.

Roads at the construction site shall be paved or frequently watered to minimize dust.

Recreational users onshore and offshore may be temporarily affected by dust generated during construction.

WATER QUALITY

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

An increase in turbidity is anticipated in the vicinity of the project site during construction. It is expected that dredging during tradewind conditions will result in a seaward moving plume of water. Once beyond the reef the turbid water will be diluted and transported toward Portlock Point. During periods of ebbing tide, the turbid water will be transported offshore and to the east. In calm conditions, transport of the plume will be due to tide generated currents. During flood tide, the plume will be transported shoreward or into the marina. During occurrence of "Kona" winds, transport will also be shoreward.

Once settled out of the water column, sediments will be deposited on the reef flat, the channel areas, and the deeper offshore bottom. Most of the sediment should settle in the immediate vicinity of the dredging; finer particles will be deposited over a wider area and will be subject to resuspension and subsequent transport.

The increase in turbidity during construction is a short term impact and is not expected to have an adverse effect on the marine environment, due to the existing degraded condition of the reef flat. The project area has been subjected to high turbidity levels in the past due to construction of Hawaii Kai, stormwater runoff during heavy rainfall, and the daily tidal exchange with Hawaii Kai Marina.

The dredging effort for the proposed channel improvements is relatively minor compared to the extensive dredging that took place in the late 1960's.

BENTHIC IMPACTS

Dredging will disturb the soft sediment deposited on the reef flat and on the channel floors, thus high turbidity levels may be expected during the construction phase. Marine communities within the fringing reef are presently subjected to considerable turbidity. This is indicated by the high proportion of suspension or filter feeding forms of invertebrate species encountered in the inner reef area. These heterotrophic forms are known to be common in areas receiving high particulate loading. Moreover, lack of algae below the five foot depth within the fringing reef margin may also be attributed to turbid conditions impeding penetration of light. Potential impacts due to turbidity could be greatest on benthic communities seaward of the reef margin in the limestone mounds biotope. However, benthic community development in the limestone mounds biotope fronting the project area does not appear to be diverse or particularly high in species numbers. Benthic community structure and coral coverage increases somewhat with greater depth offshore, but as the turbidity plume is carried seaward, dilution due to mixing and advection occurs, lessening potential impact.

FAUNA AND MARINE LIFE

Potential impacts on whales and green sea turtles could result from construction activities, including dredging, and blasting, if necessary. Complete mitigation of noise impacts on whales will be achieved by curtailing blasting during the months of November through March when they are present in Hawaiian waters. A survey of threatened green sea turtle populations in the area indicate the presence of a resting area approximately 250 meters wide along the seaward face of the fringing reef. See Appendix E. Concerns were expressed by the National Marine Fisheries Service that turtles in the area could be injured or killed by shock waves from any blasting and that siltation from dredging could adversely affect their affinity for the area as well as their food sources. With regard to turbidity, the area is presently affected by plumes emanating from the Hawaii Kai marina and Niu Stream, particularly during periods of heavy rainfall. During the surveys, turtles were observed in very turbid water, with estimated visibility of 1 meter. Despite the frequently turbid conditions which presently exist, green sea turtles and their associated forage species do not appear to be adversely affected. Apparently, the major storm of January, 1988 which generated considerable turbidity with runoff has not had any known or lasting impact on the resident Hawaii Kai turtles. Like storm events, turbidity caused by construction activities will be transitory and probably be very similar to the present situation. Thus, no lasting impacts to turtles are expected.

Blasting, if required for channel improvements, could kill nearby turtles if improperly conducted. To minimize the chances of a significant shock wave, potential mitigating measures could include drilling holes in which charges would be set and using small charges individually detonated with microsecond delays to dampen shock waves. A careful search for individual turtles and their removal from the potential blast zone (approximately 300 meters around the blast site) prior to detonation would also reduce the potential for mortality. These methods have been successfully used for blasting work at the West Beach development on Oahu to minimize disturbance of turtles. DOT is coordinating with the National Marine Fisheries Service to assure that appropriate mitigation measures are employed to protect threatened and endangered species.

Increased turbidity from construction related activities could affect the Paiko Lagoon Wildlife Sanctuary by impacting their food supply. However, the lagoon has a net seaward flow of water because of a freshwater spring feeding into it, suggesting that transport of particulate material would be out of the lagoon. Moreover, the lagoon is presently a mud basin supporting foraging species capable of surviving in this substratum type. Thus any additional turbidity, if it were to occur, would not affect the present forage base. If deemed necessary, silt curtains could be installed accross the mouth of the lagoon during construction to prevent silt from entering the lagoon.

Wind transport of floating substances or trash which apparently occurs may counteract to some degree the transport of material out of the Lagoon. While some incidental leakage of oil from construction vehicles may occur, this amount will be insignificant in relation to such leakages currently associated with boats, thrill craft, automobiles, buses and other vehicles using the area.

RECREATION/BOATING

Temporary effects on recreation will be primarily related to dredging the channel and turning basin and constructing the pier and revetment. During dredging operations, boaters, canoers, surfers, jet skiers and other water users will be required to stay clear of the dredge. Access to the shoreline and use of the channel will be permitted during construction.

The quality of fishing in the area fronting Maunalua Bay Beach Park may be affected due to the increase in noise and turbidity. The area presently receives daily high noise input from boat traffic and jet-ski operations. Following the completion of the construction phase, turbidity levels should return to present conditions.

TRAFFIC AND PARKING

During construction, trucks, heavy equipment and other vehicles will use existing roads to import materials and to access construction areas. The increased traffic from construction-related vehicles is not anticipated to be significant, but may cause some minor inconveniences in the immediate vicinity for the duration of construction. If required, flagmen shall be employed to ensure traffic safety.

Existing parking areas located within the project site will be limited during construction but adequate parking will be available in the adjacent parking lot near the boat ramp.

PUBLIC SAFETY

Necessary measures to ensure public safety will be provided throughout all phases of construction. Signs, barricades, and if necessary, police officers will be employed to adequately separate the public from construction activities. Pedestrians may be required to bypass certain construction areas, however, this may be considered a minor inconvenience of short duration.

Between working hours (nights, weekends, holidays), open excavated areas shall be secured by adequate safety signs, signals and or other safety devices.

Incidence of ciguatera poisoning have been associated with eating of fish taken in newly dredged areas. The relationship between the creation of new surfaces in benthic communities, algal growth and ciguatera in resident reef fishes, however, is highly variable. New surfaces for algal colonization in coral reefs may be brought about by dredging, construction or by storms denuding reef surfaces. The mechanisms involved with the development of ciguatera are not well known and in some cases, dredging has not resulted in a ciguatera problem. The organism identified as being responsible for the disease is Gambierdiscus toxicus. Environmental monitoring for G. toxicus can be conducted and it may provide a margin of safety for individuals consuming fishes from areas following extensive man-induced disturbance. Other ways that are being developed to alleviate the problem include use of the "poke stick" test if the flesh of individual fish has ciguatoxin and if a person is afflicted with the disease, to administer mannitol which shows promise in alleviating the symptoms. Public information programs may also be considered to apprise fishermen of potential hazards of consuming fish caught in the area during and immediately following construction.

ECONOMY

The short-term economic impacts resulting from construction include the provision of jobs to local construction workers. Local material suppliers and retail businesses may also benefit from the increased construction activities.

LONG-TERM IMPACTS

WATER QUALITY

The long-term effect of the channel alterations is expected to be negligible. After construction, there will be no change in sediment or nutrient input for the area from the present. Water quality will continue to be influenced by the outflow from Hawaii Kai Marina and the occasional runoff events during heavy rains.

The ferry vessel is designed to minimize any introduction of petrochemicals into marine waters during operation. Any incidental leakage would be minimal in relationship to discharges from existing boating activities in the bay. If deemed necessary, emergency oil spill containment equipment could be stored at the terminal. The ferry operator has also indicated that if particularly sensitive areas are to be traversed by the vessel, containment booms could be deployed to further minimize the potential for introduction of petrochemicals.

Currents should be unaffected by the dredging, except that in the areas where the cross sections of the channel are increased, the flow speeds will decrease, slightly. Overall exchange volumes between the marina, the reef flat and the ocean will not change.

FLORA AND FAUNA

Construction of the ferry terminal is not anticipated to result in adverse impacts to terrestrial flora and fauna. Since the project area is comprised of filled material, there are no rare or endangered flora species.

The survey of green sea turtles (Chelonia mydas) indicate that they are present throughout a resting area approximately 250 meters in width along the seaward edge of the fringing reef. See Appendix E. Approximately 500 meters west of the blinker buoy marking the Hawaii Kai boat entrance channel is an area known as "Turtle Canyon" which is a popular diving area for commercial dive tour operators. The survey suggests that the area does not necessarily harbor a greater concentration of turtles than the surrounding area, however, the "canyon" possesses desirable qualities for dive tours. To minimize the potential for collision in areas where turtles are present, the ferry operators will be directed to travel seaward until well clear of the known resting habitat prior to steering to the west. Such a course will also keep the rapidly moving ferry away from divers in Maunalua Bay. Notably, the turtle survey suggests that turtles in the area have flourished in spite of increasing recreational and commercial boating in the bay. Numerous small boats were observed travelling at high speed through the existing channel and seaward of it, many times flagrantly disregarding safe boating practices. No injury or mortality of green sea turtles was observed or reported to have occurred the area due to collision with boats. Observations suggest that the turtles are diving from the surface when approached by boats. Presumably, the same behavior would be help the turtles avoid the ferry vessel. DOT is coordinating with the National Marine Fisheries Service to assure that appropriate mitigation measures are employed to protect green sea turtles from collision with the ferry vessel.

Further offshore, humpback whales (Megaptera novaeangliae) are frequently seen. This endangered species migrates to the Hawaiian Islands each November and remains in island waters for calving and breeding through April when it migrates north. During the whale "season" humpbacks traverse the southern coast of Oahu, including Maunalua Bay, usually inside of the 100 fathom depth contour during the month of January through April.

Research in Maui attribute declines in nearshore whale abundance to boat traffic but the correlation has not been positively established. In 1975, a Seaflite hydrofoil reportedly passed within 250 feet of a humpback whale offshore of Olowalu, Maui and caused the whale to temporarily alter its pattern of diving behavior. Most concern regarding disturbance of whales by boats is centered on calving and nursing areas and other areas of denser concentrations, as opposed to areas where whales would be traversing, such as Maunalua Bay. Presently, considerable boat traffic occurs off of Maunalua Bay and the southern coast of Oahu as a whole, where the ferry will run, therefore the ferry will not be a significant addition to the existing traffic.

Another area of concern is the possibility of the ferry vessel colliding with a whale. Such an incident involving a hydrofoil and a gray whale occurred off of California in 1975 in which the whale was killed and the hydrofoil was damaged. In Hawaiian waters, at least three collisions have occurred between humpback whales and small craft within the last three years. In this regard, the characteristics of the proposed ferry vessel are significant. First, the speed of the vessel at 42 knots and its relatively quiet operation will lessen the possibility that a whale could detect and avoid an approaching vessel. On the other hand, the vessel offers good visibility, good maneuverability, and an emergency stopping distance of 60 meters from its top speed. Sighting of whales could also

CORRECTION

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

PUBLIC SAFETY

Necessary measures to ensure public safety will be provided throughout all phases of construction. Signs, barricades, and if necessary, police officers will be employed to adequately separate the public from construction activities. Pedestrians may be required to bypass certain construction areas, however, this may be considered a minor inconvenience of short duration.

Between working hours (nights, weekends, holidays), open excavated areas shall be secured by adequate safety signs, signals and or other safety devices.

Incidence of ciguatera poisoning have been associated with eating of fish taken in newly dredged areas. The relationship between the creation of new surfaces in benthic communities, algal growth and ciguatera in resident reef fishes, however, is highly variable. New surfaces for algal colonization in coral reefs may be brought about by dredging, construction or by storms denuding reef surfaces. The mechanisms involved with the development of ciguatera are not well known and in some cases, dredging has not resulted in a ciguatera problem. The organism identified as being responsible for the disease is *Gambierdiscus toxicus*. Environmental monitoring for *G. toxicus* can be conducted and it may provide a margin of safety for individuals consuming fishes from areas following extensive man-induced disturbance. Other ways that are being developed to alleviate the problem include use of the "poke stick" test if the flesh of individual fish has ciguatoxin and if a person is afflicted with the disease, to administer mannitol which shows promise in alleviating the symptoms. Public information programs may also be considered to apprise fishermen of potential hazards of consuming fish caught in the area during and immediately following construction.

ECONOMY

The short-term economic impacts resulting from construction include the provision of jobs to local construction workers. Local material suppliers and retail businesses may also benefit from the increased construction activities.

LONG-TERM IMPACTS

WATER QUALITY

The long-term effect of the channel alterations is expected to be negligible. After construction, there will be no change in sediment or nutrient input for the area from the present. Water quality will continue to be influenced by the outflow from Hawaii Kai Marina and the occasional runoff events during heavy rains.

The ferry vessel is designed to minimize any introduction of petrochemicals into marine waters during operation. Any incidental leakage would be minimal in relationship to discharges from existing boating activities in the bay. If deemed necessary, emergency oil spill containment equipment could be stored at the terminal. The ferry operator has also indicated that if particularly sensitive areas are to be traversed by the vessel, containment booms could be deployed to further minimize the potential for introduction of petrochemicals.

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In the event that the vessel should encounter whales, it has the advantage of a very shallow draft, only 18 inches while travelling on the air cushion. Moreoever, it has no propellers or rudders and the front and rear of the hull are flexible rubber curtains.

The probability of encounters or collisions with whales cannot be fully assessed. The ferry operator will adhere to standard operating procedures designed to preclude possible collisions with the whales and other potentially hazardous objects that could damage the vessel. During the period when Seaflite was operating, the ferry traversed on a regular basis, without incidence, the State's most significant Humpback whale calving and breeding area off of Maalaea, Maui. Inasmuch as the southern coastline of Oahu is not known for dense concentrations of whales, the proposed ferry operation is anticipated to have a much lower probability for incidences involving whales than the previous operation.

BENTHIC IMPACTS

The development of the ferry system will require dredging of the present entrance channel and a turning basin. This will result in the direct loss of benthic communities residing in the area slated for removal. The benthic communities in the affected areas are poorly developed and thus little impact is foreseen.

The widening of the entrance channel could impact the existing live coral if the western channel edge were to be dredged. Based on the presence of this coral and the need to remove less material from the eastern side, entrance channel widening will be restricted to the eastern side of the channel.

SHORELINE CHANGES

The shoreline of Kuliouou Beach Park is away from the immediate project area and will not be affected by the proposed construction.

In the area fronting Maunalua Bay Beach Park, the protective revetment for the proposed parking area will stabilize a presently eroding section of shoreline. The downdrift erosion will be shifted from the west end of the existing revetment to the west end of the revetment extension. The extent of the erosion will be similar to that which is presently occurring. The end of the extended revetment will be well away from the boat ramp and the erosion should not affect it.

The Maunalua Bay Beach Park shoreline east of the terminal site consists of revetted shoreline and a narrow sand/rubble beach. The project should have no impact on this shoreline.

The area of primary concern is the remaining sand shoreline along the Portlock residential area. As discussed previously, this area is eroding at a rate of 1.5 feet per year, and this process is expected to continue, whether or not the project is implemented. Because of this concern, the historical changes along the Portlock shoreline are described in greater detail in Appendix F.

Any effect on the Portlock shoreline would be related to one of two factors:

1. an increase in wave energy approaching the shoreline due to the increased channel dimensions; or,

2. the larger channel acting as a "sink" for sandy sediments on the reef flat.

Ferry wakes were not considered to be a problem; if they are, speed restrictions in the channel can be implemented.

A numerical model study was performed to evaluate the difference in wave heights at the shoreline before and after the proposed improvements. The modeling was performed by Dr. Charles Mader, based upon an approach described in his book "Numerical Modeling of Water Waves," published in 1988 by the University of California Press, Berkley, California. See Appendix G.

The numerical model predicted the same wave height profiles, within a 10% variation, throughout the area of interest for both the existing and proposed configuration. Mader found that the wave behavior at any location within the bay is strongly dependent upon the entire bay and upon a complicated time varying pattern of wave reflections and interactions. This may explain the small changes in predicted wave height, since the entrance channel is just a small part of the entire area. In this context, the dredging at the outer area of the existing channel will result in relatively minor changes.

While the study does not directly address the resultant change on the shoreline, it can be inferred from the study that if the increase in wave energy is minor, the impact on the shoreline should also be small. The quantity of sand transport is a function of wave height, frequency of occurrence of various heights, and the angle at which the waves strike the shoreline. The channel improvements will not change the frequency of occurrence of the deepwater wave heights or have a noticeable effect on the angle at which the waves strike the shoreline. If, as predicted by the model, the heights are within 10% of those presently occurring, there should be little change in the existing shoreline processes. It should be noted, however, that those existing processes are resulting in chronic erosion.

The above evaluation only applies to the proposed dredging for the ferry channel, which will be done at least 1,500 feet from the Portlock shoreline. Dredging in the vicinity of the bridge or the existing sand spit under the bridge could have a noticeable adverse effect on the shoreline.

Dredging of the outer ferry channel will include removal of most of the sand bar located just shoreward of navigation markers 1A and 2. In Hawaii, sand on beaches and adjacent nearshore areas are typically in some type of dynamic balance. In the Portlock area, the various sand deposits between the shoreline and the existing entrance channel are part of a system within which sand is moving between the beach and the offshore deposits. The sand bar proposed for dredging is part of the offshore deposits and while its geographic extent is small compared to the entire system and it is at the extreme end from the beach, there is no means of precisely determining its role in the sand movement system. In the worst-case scenario, removal of the sand bar could have a subtle, long-term effect of accelerating erosion. On the other hand, the portion of sand bar to be dredged may have only a small role in the system and its removal could have little effect on accelerating erosion.

Potential measures to control erosion of the Portlock beaches, regardless of whether or not it is accelerated by the proposed dredging, may include construction of groins to trap sand moving laterally along the beach and beach replenishment. In has been suggested that sand dredged from the proposed channel widening improvements be used to replenish the beach. The cost of such an operation may be prohibitive, however, and it is questionable as to whether DOT should be responsible for initiating such an action. Clearly, the DOT is not responsible for the erosion that has occurred to date and for erosion that will continue to occur should the channel not be dredged. The U.S. Army Corps of Engineers which has undertaken projects to control erosion on public beaches will not do so for beaches fronting private lands.

TSUNAMI AND STORM WAVE RUNUP

The possibility of increased storm wave or tsunami runup at the shoreline due to the increased channel size which could allow more wave energy to approach the shoreline was assessed. The numerical modeling study conducted by Mader included tsunami waves with periods of 15 minutes. For all wave periods modelled, the variations in wave heights at the shoreline were within + 10% for the before and after configurations. Based upon the results, there should be little change in wave heights or runup at the shoreline after the proposed channel improvements.

TRAFFIC

Kalanianaole Highway is a principal arterial, a State highway linking Kailua to Honolulu via Makapuu Point. Keahole Street is a four-lane primary accessway to Hawaii Kai from Kalanianaole Highway. A channelized left-turn storage lane and separate left turn signalization is available for westbound traffic on Kalanianaole Highway to turn into the park and boat launching area where the ferry terminal will be sited. This left turn movement is currently restricted from 5:00 to 8:30 AM, except on Saturdays, Sundays and holidays.

To determine the nature of traffic-related impacts of the proposed project, the signalized intersection of Kalanianaole Highway and Keahole Street was qualitatively assessed for potential traffic congestion and hazards. See Appendix H. This assessment is based on a prior study prepared for Kaiser Development Company entitled Hawaii Kai Transportation Management Study which identified future travel needs within the Hawaii Kai community and along the Kalanianaole Highway corridor between Hawaii Kai and Interstate Route H-1.

The traffic assessment indicates that the primary impact of the Maunalua Bay Ferry Terminal would be a redistribution of existing and projected traffic, as opposed to generation of "new" traffic. This finding is consistent with the assumption that the majority of commuters using the intersection to get to or depart from the ferry terminal would otherwise be entering the intersection to travel along Kalanianaole Highway. The assessment also indicates that the redistribution of traffic will not likely cause volumes to exceed the capacity of the Kalanianaole Highway/Keahole Street intersection during peak traffic hours.

To assure that traffic flow is facilitated and to minimize potential hazard, the following measures should be considered:

- Remove restriction on left turn movement from Kalanianaole Highway into the site.
- Provide left turn signalization for traffic proceeding from the site onto Kalanianaole Highway.
- Modify signing and striping along Kalanianaole Highway and Keahole Street.
- Adjust traffic signal indication timing.

AIR QUALITY

Air quality may be slightly affected by the operation of the ferry system, but the impacts are not anticipated to be significant. Predominant trade winds from the northeast will tend to blow emissions out to sea and away from populated areas.

Buses and automobiles bringing commuters into the terminal area at Maunalua Bay will be a source of air pollution, however, their presence will be a result of a change in traffic patterns as opposed to an increase in traffic, as discussed above. The ferry vessels will be an additional source of air pollution when it is at the terminal but its contribution relative to ambient levels will be minimal. In the larger sense, persons commuting on the ferry could be regarded as reducing air pollution by reducing vehicular traffic on the highway.

RECREATION

In recognition of the increasing competition for recreational space in Maunalua Bay by potentially incompatible users, the Thirteenth State Legislature requested the Department of Transportation in House Resolution 170, H.D. 1, to formulate an Ocean Recreation Management Plan aimed at reducing conflict among motorized water craft and other ocean recreation users. Pursuant to that mandate, the DOT has completed the <u>Ocean Recreation Management Plan</u> and adopted Administrative Rules clearly establishing designated areas for both commercial and recreational thrill craft users of Maunalua Bay.

The ferry system will not impact or affect implementation of the proposed <u>Ocean Recreation Management Plan</u> and the ferry operator will respect designated areas for various uses as adopted by the Administrative Rules. The ferry corridor through Maunalua Bay will only traverse the area designated for parasailing. Existing rules for operation of vessels in these waters will minimize the potential for conflict. See Figure 20.

With respect use of the channel, the proposed widening will accommodate simultaneous passage of the ferry and boats with 13-foot beams. This space will be more than adequate for passage of canoes, kayaks and surfboards. Moreover, the wake created by the ferry vessel will be less than that of boats which currently use channels in the area. Thus, implementation of the ferry system is not likely to result in a significant decrease of the supply of recreational resources.

Shoreside recreation at Maunalua Bay Beach Park will be minimally affected by the ferry operation. Intermittent noise associated with the ferry vessel will be perceived but its intensity will be comparable to or less than existing noise of traffic along the highway. See subsequent discussion of noise impacts.

While the operation of the ferry system may decrease availability of parking between commuter hours, more parking will be available outside of commuting hours, including weekends when the majority of recreational activities take place.

In regard to long-term plans for Maunalua Bay Beach Park, the Deparment of Parks and Recreation, City and County of Honolulu recognizes that the project site is under the control of the DOT-Harbors Division and that it will be used for boating-related activities. Therefore, the Parks Department has not formulated plans for uses that may be adversely affected by the activities such as the ferry terminal operation.

With regard to impacts on long-term recreational fishing, development of the Hawaii Kai ferry system could impact the quality of fishing that may occur in the area affronting the Maunalua Bay Beach Park and the Hawaii Kai Marina. During construction, fishing quality could impacted by increased noise and turbidity. With regard to noise, however, the area presently receives high noise input from boat traffic and jet-ski operations, suggesting that the impact of ferry noise on fishing may be negligible.

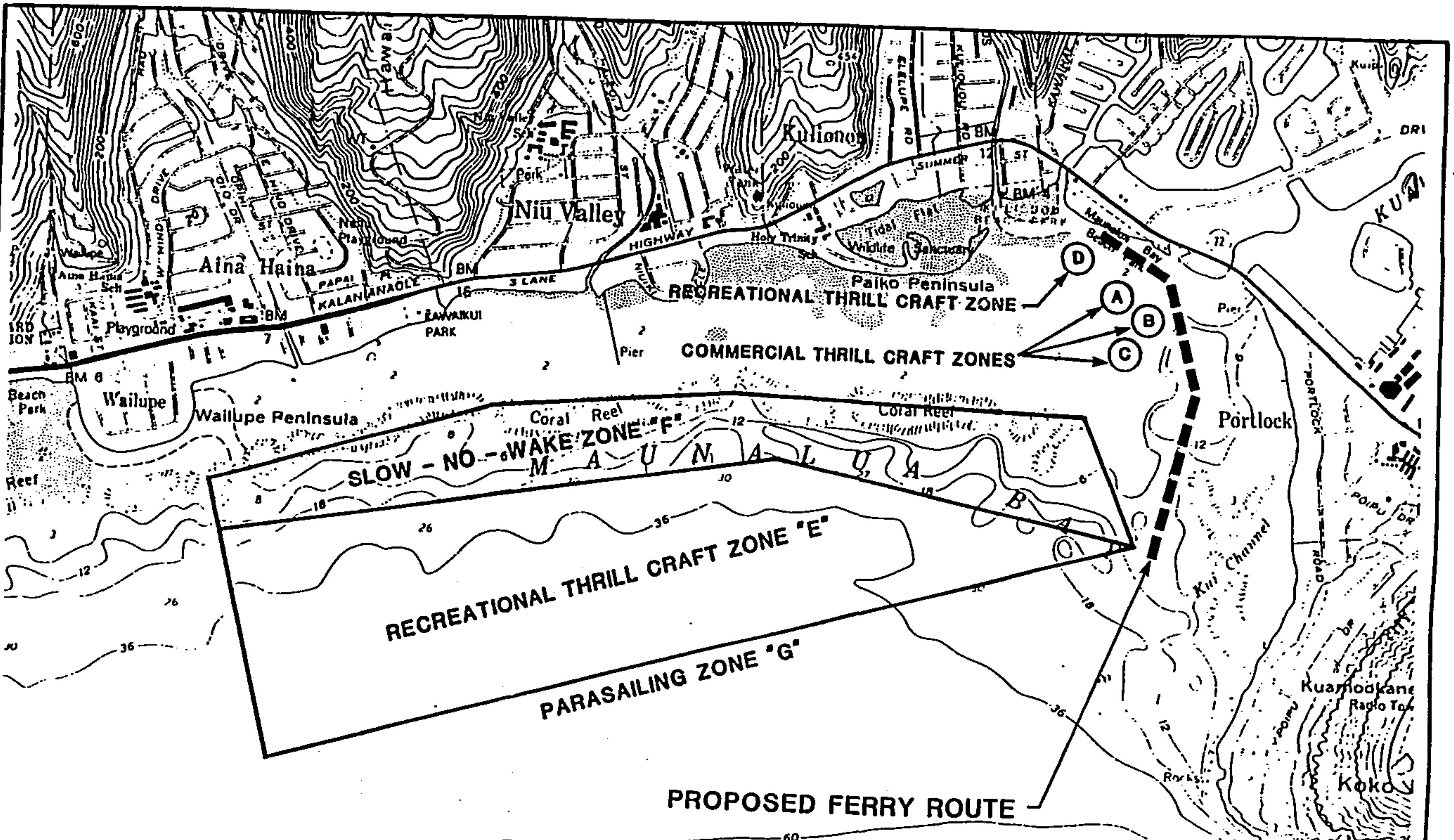
Following the completion of the construction phase, turbidity levels should return to conditions approximating the present. As noted above, the inshore area is presently quite turbid and any fish or invertebrate of commercial or recreational fishing interest, will be species tolerant of existing conditions. Thus following completion of the project, any species that is presently targeted by fishermen in the area should be present. It should be noted that during the field work no evidence of fishing in the inner reef area was noted; this may be related to the high level of use that this area receives from jet-ski operators and to the high degree of habitat degradation that has occurred in these inshore areas.

Shoreline access will not be adversely affected by the proposed ferry terminal. With the addition of the parking area, public access to the shoreline will be enhanced. Alongshore access will be interrupted by the passenger loading pier, requiring persons walking along the shoreline to go around the pier abutment. This requirement should only pose a minor inconvenience.

Offshore fishing opportunities in Maunalua Bay include an artificial reef in 10 to 15 fathoms of water apporximately one and one-fourth mile offshore of Kahala Beach. The ferry is not anticipated to transit this area.

Impact on offshore recreational areas will be minimized by establishing the ferry routes to stay clear of sailing areas, rough water swimming areas, surfing sites and other heavily used recreational areas. The vessel's ability to maneuver and to stop in short distances, as well as the good visibility available from the vessel will also enhance its ability to avoid potential conflict.

Closer inshore, the vessel can be slowed to operate safely in more congested areas. Notably, the vessel has no propellers that could inflict severe bodily injury in the event of an incident involving a swimmer.



Adapted from: Exhibit EE (August 18, 1988) Subchapter 6, Section 19-86-88 Administrative Rules, Shores and Shorewaters, Department of Transportation, Harbors Division (September 19, 1988)

Maunalua Bay Ferry Terminal

OCEAN RECREATION MANAGEMENT AREAS

Prepared for:
Department of Transportation
Harbors Division

Fig. 20

Prepared by:
Wilson Okamoto
& Associates, Inc.

NOISE

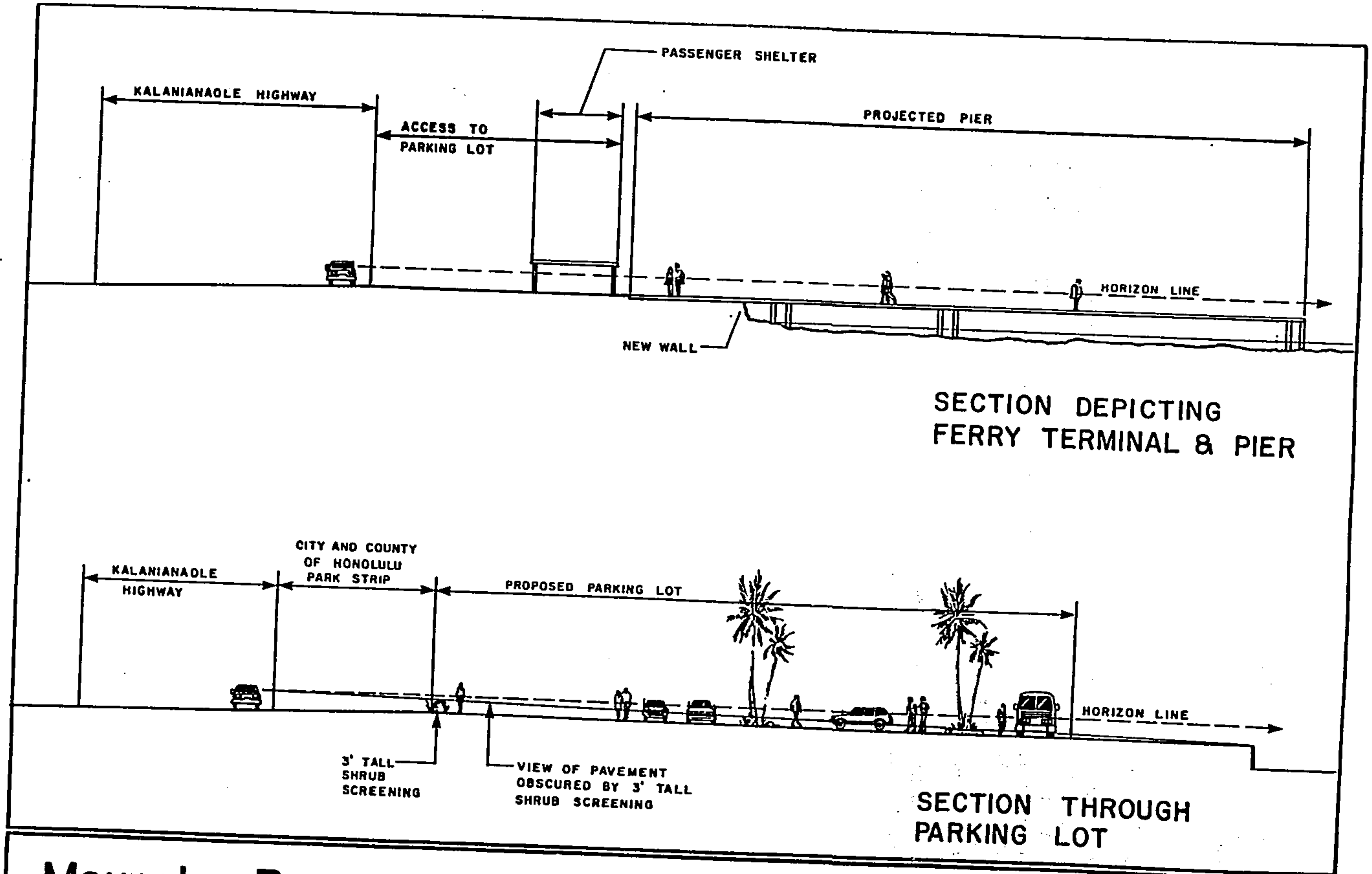
Noise will be generated when the ferry vessels approach and depart from the terminal. The loudest perceived noise will be produced for approximately two to three minutes when the vessel is maneuvering away from pierside.

Intensive noise from the ferry vessel should not be significant; however, operations may be heard from residences located east of the main entrance channel. Noise levels generated by similar vessels have been measured at 76 dbA from 50 feet astern while maneuvering and 63 dbA from 600 feet abeam while operating at full power. Noise in the passenger compartment was measured at 73 dbA. The vessel will pass no closer than 850 feet from the closest residences, and the perceived vessel noise should be less than traffic noise along Kalanianaole Highway. Moreover, since the ferries will make only four runs into the terminal during each of the two commuting periods on weekdays, the noise will not be constant. Interior noise levels within structures, including homes, will be significantly lower than exterior noise levels. The ferry operator will abide by all existing noise regulations.
Once the vessel is in open waters where it will attain its cruising speed, it will be far enough from shore that no noise will be perceived.

VISUAL QUALITY

Maunalua Bay is a predominant scenic feature within the East Honolulu area. Westbound travelers on Kalanianaole Highway have both a makai (ocean) and mauka (mountain) view, including a relatively unobstructed view of the entire bay and the Koko Marina area. Residences on the upper slopes of Hawaii Kai, Hawaii Loa Ridge, Portlock and Kuliouou also have panoramic views of Maunalua Bay. Inasmuch as the proposed ferry terminal improvements are not visually obtrusive, the overall open space character of the area will be preserved; including existing views to the bay from Kalanianaole Highway and upper slopes of hills. There will be no significant alteration of the land forms or visual environment except for the parking lot and passenger shelter, both of which have a low profile and will be landscaped. The current use of the site for parking will be essentially maintained.

A sectional view through the proposed terminal area based on planned highway and parking lot elevations, reveals that the visual impression of the site as a parking area will be retained along Kalanianaole Highway. See Figure 21. Automobiles and buses in the terminal area will be visible from the highway. The passenger shelter will be the most significant stationary vertical feature on the site. The existing comfort station has a comparable building "footprint" as the passenger shelter, although the shelter is anticipated to have a lower vertical profile. Landscaping and design of the proposed shelter will enhance its visual appeal of the terminal.



Maunalua Bay Ferry Terminal

PIER AND PARKING LOT SECTION

Fig. 21

Prepared for:
Department of Transportation
Harbors Division

Prepared by:
Wilson Okamoto
& Associates, Inc.

Between the vehicles and passenger shelter, the ocean will be visible from the top of the revetment or pier to the horizon. In the foreground, the new asphalt paving for the parking lot and vehicle queuing area can be obscured by a three foot tall shrubbery screen.

ARCHAEOLOGICAL/HISTORIC SITES

Inasmuch as Maunalua Bay project area was constructed within the past 20 years, archaeological remnants are not anticipated to be uncovered during construction. The area seaward of Kalanianaole Highway was formed from material dredged from Kuapa Kai pond. However, should archaeological remnants be unearthed, work would be halted and the State Historic Preservation Office notified to assess impacts and implement mitigative measures as deemed necessary.

There are no historic sites registered in the State or National Register of Historical Sites in or within proximity to the site.

ALTERNATIVES

NO ACTION

The Maunalua Bay to Downtown link of the Intraisland Ferry Terminal is proposed as the first phase of developing the Statewide Intraisland Ferry System. This first phase is intended both to demonstrate the feasibility for an intraisland ferry system and provide an alternative mode of transportation between Hawaii Kai and Downtown during the eight year long road widening improvements on Kalanianaole Highway. Neither of these objectives could be accomplished without construction of the proposed project.

ALTERNATIVE SITES

Alternative sites for the Maunalua Bay Ferry Terminal were sought but not found. The proposed site offers several key advantages:

1. Convenient access by a large commuting population in the Hawaii Kai area;
2. Ownership by the State which would avoid costly land acquisition;
3. Adequate land area to accommodate 200 parked cars and a vehicular queuing area for passenger drop-off and pick-up;
4. Proximity to other mass transit facilities, including bus terminals and a park-and-ride station. The majority of passengers are expected to arrive by bus.
5. Availability of the comfort station and rest area in the nearby Maunalua Bay Beach Park.

ALTERNATIVE DEVELOPMENT CONCEPTS

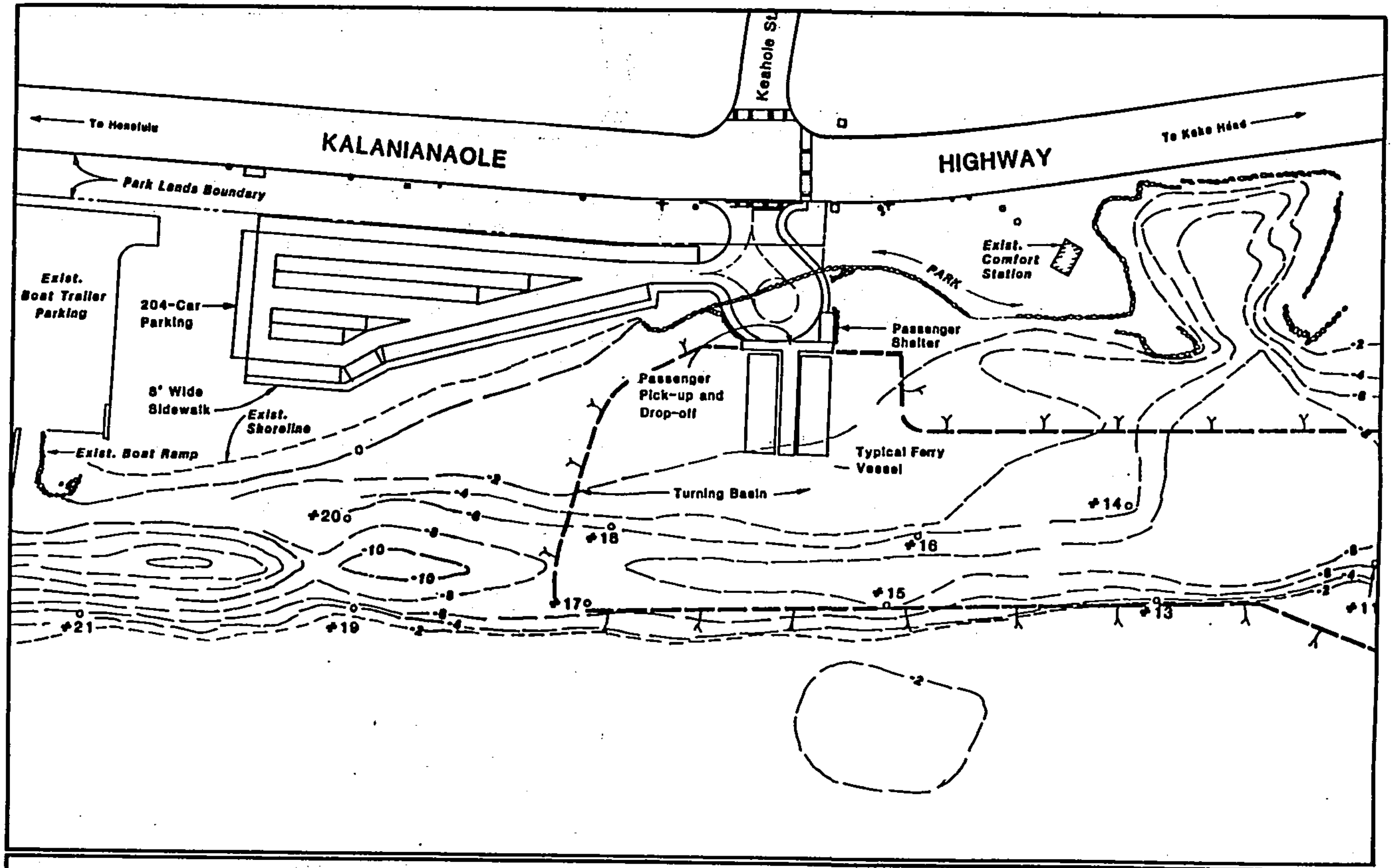
Two alternative development concepts were considered, one of which would provide slightly greater car parking capacities but would require filling within the Bay to construct a the vehicle turn-around area. See Figure 22. Filling within the Bay is considered a potential environmental drawback which would require more stringent permit review. The other alternative would omit the vehicular parking area, limiting vehicular improvements to the access driveway and turn-around area. See Figure 23. This alternative would place parking demands on existing and planned parking areas in the vicinity, including those for the existing boat launching ramp and Maunalua Bay Beach Park and the City and County Park and Ride Facility.

ALTERNATIVE CHANNEL ALIGNMENT

An alternative channel alignment to avoid the sandy shoal in the entrance channel was considered but abandoned due to two major constraints. First, the channel would have complicated navigation by requiring an "S" curve. Second, the alignment would have required more dredging on the Diamond Head side of the existing channel. Composed substantially of limestone, the reef would have required blasting and is considered of greater ecological value, with live coral growth noted.

ALTERNATIVE PARKING LOCATION

In response to a suggestion received during public consultation, the alternative of locating the parking area at the City and County of Honolulu's newly opened Park-and-Ride was considered. Although ferry passengers could not be restricted from using the facility, its distance from the ferry terminal, is regarded as adverse to ferry ridership. Based on ridership estimates of between 250 and 450 persons daily, locating the parking lot at the ferry terminal site would maximize ridership without causing serious traffic and parking problems. Should ridership prove to be significantly greater, alternative methods of transporting ferry passengers to the terminal could be considered. Such alternatives could include use of the Park-and-Ride facility.



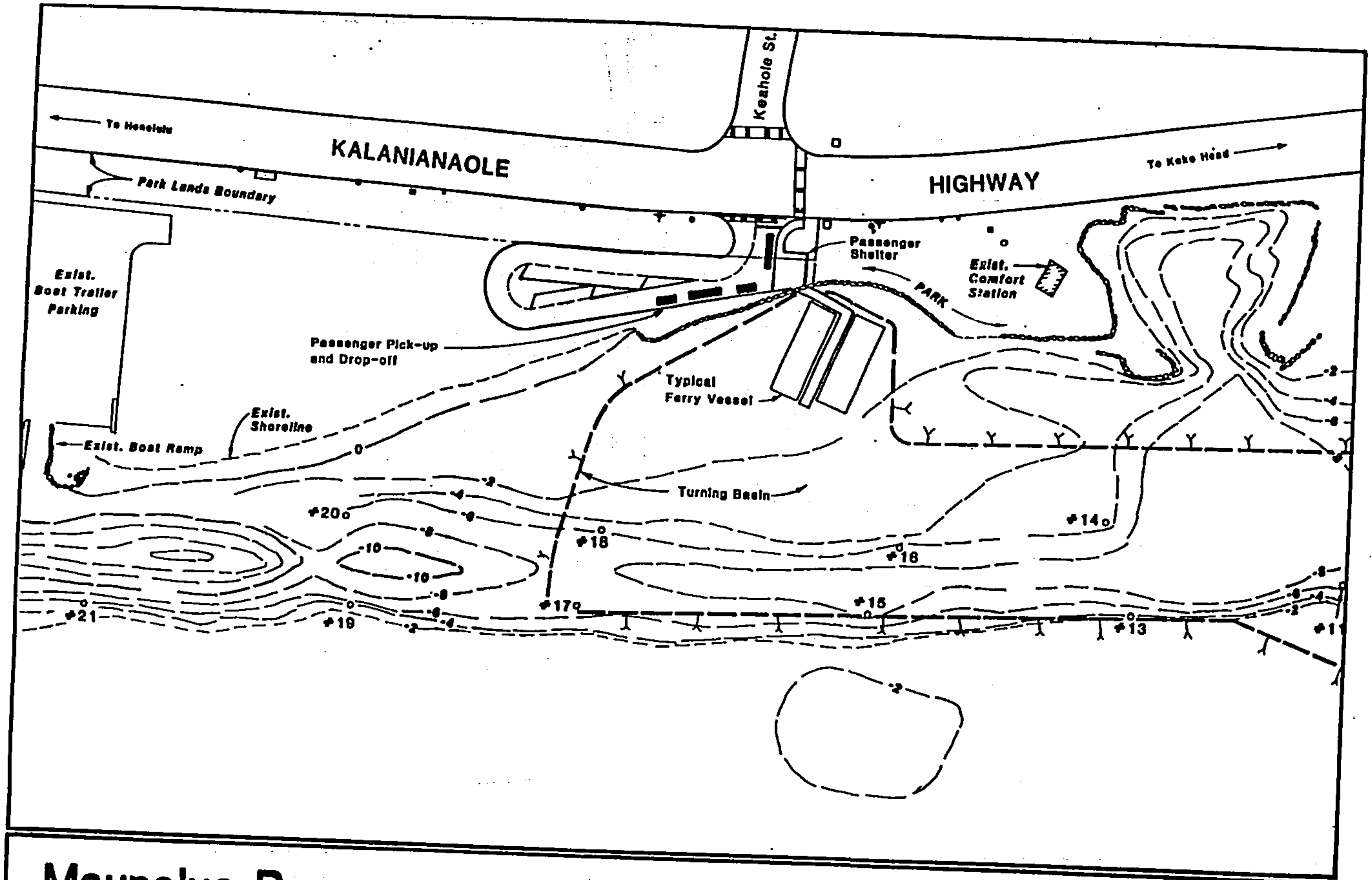
Maunalua Bay Ferry Terminal

ALTERNATIVE DEVELOPMENT CONCEPT 1

Fig. 22

Prepared for:
Department of Transportation
Harbors Division

Prepared by:
Wilson Okamoto & Associates, Inc.



Maunalua Bay Ferry Terminal

ALTERNATIVE DEVELOPMENT CONCEPT 2

Fig. 23

Prepared for:
Department of Transportation
Harbors Division

Prepared by:
Wilson Okamoto & Associates, Inc.

SHORT-TERM USE VERSUS LONG-TERM PRODUCTIVITY

SHORT-TERM USE

Implementing the proposed project will include local short-term use of the environment during the construction phase, with impacts affecting recreation and boating in the bay, Maunalua Beach Park and the boat launching ramp. The marine environment will also be temporarily disturbed. On the other hand, the project will also result in temporary economic benefits from construction expenditure and employment opportunities.

LONG-TERM PRODUCTIVITY

The land for the ferry terminal was transferred to the DOT Harbors Division for boating purposes. Its use as a ferry terminal site is consistent with this intent and will serve to enhance its long-term productivity in this regard. Channel enlargement will improve navigability and will preclude the need for further dredging should the U.S. Army Corps of Engineers renew its plans to develop a small boat harbor nearby.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Implementation of the proposed action will irretrievably commit fuel, labor, financing and materials for construction as well as labor, materials and utilities for operation and maintenance. Land and improvements for the terminal will be committed for the duration of the ferry operation. If the operation should terminate, the improvements will *not be inconsistent* with the use of the site for boating purposes. The parking area will continue to serve recreational users of the bay, and the pier could serve boaters as well as recreational fishermen and other park users.

UNRESOLVED ISSUES

Although the adverse environmental impacts of developing the ferry terminal at Maunalua Bay are anticipated to be minimal, the degree and nature of impact could not be conclusively determined in several areas of public concern.

Beach erosion along the Portlock shoreline is an on-going process. In response to concern that the proposed channel enlargement would accelerate erosion, further study of historical beach erosion in the area was conducted. In addition, a computerized numerical model of the bay was constructed to assess the impacts that channel enlargement would have on allowing more wave energy to reach the shoreline. Such energy could conceivably suspend and transport sand, thus accelerating erosion. The study indicated that the increase in wave energy will be negligible.

With regard to dredging the sandy shoal in the channel, the relationship of dynamic equilibrium between if and with the beach is uncertain. The possibility for subtle long-term accerleration of erosion exists.

The potential for collision of the ferry vessel with humpback whales, though anticipated to be less than that for a previous hydrofoil operation which recorded no incidence of collision, cannot be determined with currently available information. Further coordination with the NMFS will be pursued as required to determine if mitigation measures such aerial spotting will be required.

Consultation

AGENCY AND PUBLIC CONSULTATION

Consultation on the Intraisland Ferry System project is being pursued through the Intraisland Ferry Task Force comprised of various governmental and community representatives, a public information/ education program and meetings with various governmental agencies. These consultation efforts are summarized in Tables 3, 4 and 5.

TABLE 3

INTRAISLAND FERRY TASK FORCE MEMBERS
As of July, 1987

	NAME	ORGANIZATION
1.	Edward Uchida	Planner, Department of Transportation-Statewide Transportation Planning Office
2.	Dan Tanaka (Alt.)	Planner, Department of Transportation-Statewide Transportation Planning Office
3.	Adm. E. Alvey Wright	Project Coordinator, Department of Transportation-Statewide Transportation Planning Office
4.	Dennis O'Connor	Councilman, City and County of Honolulu
5.	Robert Dods (Alt.)	Senior Assistant for Councilman O'Conner
6.	Michelle Tucker (Alt.)	Researcher, City Council, City and County of Honolulu
7.	John Emmerson	Chief, Operations Branch, U.S. Army Corps of Engineers
8.	Dave Swenson (Alt.)	Regional Economist, U.S. Army Corps of Engineers
9.	Donna Ikeda	Senator, Hawaii State Legislature
10.	Harry Murakami	Assistant Chief for Engineering, Department of Transportation-Harbors Division
11.	David Yokoyama	Planning Engineer, Department of Transportation-Harbors Division
12.	Ron Tsuzuki	Planning Engineer, Department of Transportation-Highways Division
13.	Kenneth Au (Alt.)	Advance Planning Engineer, Department of Transportation-Highways Division
14.	Libert Landgraf	Deputy Director, Department of Land and Natural Resources
15.	Michael Yoshinaga (Alt.)	Project Coordinator, Department of Land and Natural Resources

16.	Robin Foster	Planner, Department of Land Utilization, City and County of Honolulu
17.	Verne Winquist	Planner, Department of General Planning, City and County of Honolulu
18.	Bill Medeiros (Alt.)	Planner, Department of General Planning, City and County of Honolulu
19.	Don Griffin	Planner, Department of Parks and Recreation, City and County of Honolulu
20.	Jim Ball	Project Manager, Department of Transportation Services, City and County of Honolulu
21.	Marilyn Kali	Public Information Officer, Department of Transportation-Director of Public Relations
22.	Chris Kam (Alt.)	*Information Specialist*, *Department* of Transportation-Director of Public Relations

TABLE 4

INTRAISLAND FERRY TASK FORCE MEETING DATES

May 29, 1987
June 6, 1987
June 26, 1987
August 4, 1987
September 4, 1987
November 6, 1987
March 16, 1988

PUBLIC PRESENTATIONS AND INFORMATIONAL MEETINGS

Public Information Meetings

July 1, 1987	Hawaii Kai Rotary
July 27, 1987	Hawaii Kai Neighborhood Board
August 25, 1987	Hawaii Kai Elementary School
January 7, 1988	Makakilo Elementary School
January 14, 1988	Ewa Elementary School
January 31, 1988	Waipahu Elementary School
March 22, 1988	Hawaii Kai Elementary School

Public Exhibitions and Presentations

October 15, 1987	Board of Realtors - City Affairs Comm.
December 1, 1987	Farrington High School Public Exhibit
Feb. 14-21, 1988	Kahala Mall Shopping Center
February 18, 1988	Hawaiian Canoe Program Advisory Council
February 23, 1988	Hawaii Yacht Club
March 1988	International Order of the Blue Gavel
March thru April 1988	Windward Shopping Mall
April 13, 1988	Waikiki Yacht Club
April 24, 1988	Waikiki Yacht Club
May 14-20, 1988	Pearl Ridge Shopping Center
May 18, 1988	Waterborne Transportation Conference
May 19, 1988	Pacific Congress on Marine Science & Technology

TABLE 5

GOVERNMENTAL AGENCIES CONSULTED

September 18, 1987	U.S. Army Real Estate Office
October 2, 1987	U.S. Army Corps of Engineer
October 20, 1987	U.S. Army Corps of Engineer, National Marine Fishery Service & U.S. Fish and Wildlife Service
November 18, 1987	Oahu Metropolitan Planning Organization
November 20, 1987	DOH - Water Quality Certification
November 20, 1987	U.S. Army Corps of Engineers, Planning Office
February 11, 1988	City and County of Honolulu - Department of Parks and Recreation
March 31, 1988	City and County of Honolulu - Department of Transportation Services
April 5, 1988	U.S. Army Corps of Engineers, National Marine Fishery Service, U.S. Fish and Wildlife Service & Environmental Protection Agency
May 12, 1988	Office of State Planning
May 12, 1988	Department of Land and Natural Resources - Conservation & Environmental Affairs
May 19, 1988	Office of Environmental Quality Control
May 20, 1988	City and County of Honolulu - Department of Land Utilization
May 25, 1988	Department of Land and Natural Resources - Conservation & Environmental Affairs
May 26, 1988	U.S. Army Corps of Engineers
June 2, 1988	Office of Environmental Quality Control
June 3, 1988	Department of Land and Natural Resources - Aquatic Resources
July 22, 1988	National Marine Fisheries Service U.S. Army Corps of Engineers
September 22, 1988	National Marine Fisheries Service U.S. Army Corps of Engineers Office of Environmental Quality Control Department of Land and Natural Resources

PREPARATION NOTICE COMMENTS AND RESPONSES

The following comments from governmental agencies and the general public were received on the EIS Preparation Notice for the proposed project, which was published in the July 8, 1988 issue of the OEQC Bulletin. Also included are comments received on the previous Environmental Assessment for the Maunalua Bay Ferry Terminal, availability of which for public review was published in the OEQC Bulletin on June 8, 1988. That assessment was superceded by the EIS preparation notice. Comments received after August 8, 1988 were deferred for response in the Final EIS. Both comments and responses are reproduced in this section.

Federal Agencies

National Marine Fisheries Service (Responded to by meeting held on July 22, 1988. Meeting memo reproduced).

State Agencies

Department of Land and Natural Resources (Two letters received, single encompassing response provided)

University of Hawaii at Manoa, Environmental Center

General Public

Mr. and Mrs. Marshal K. Rosa, ETAL

CORRECTION

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

TABLE 5

GOVERNMENTAL AGENCIES CONSULTED

September 18, 1987	U.S. Army Real Estate Office
October 2, 1987	U.S. Army Corps of Engineer
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May 12, 1988	Department of Land and Natural Resources - Conservation & Environmental Affairs
May 19, 1988	Office of Environmental Quality Control
May 20, 1988	City and County of Honolulu - Department of Land Utilization
May 25, 1988	Department of Land and Natural Resources - Conservation & Environmental Affairs
May 26, 1988	U.S. Army Corps of Engineers
June 2, 1988	Office of Environmental Quality Control
June 3, 1988	Department of Land and Natural Resources - Aquatic Resources
July 22, 1988	National Marine Fisheries Service U.S. Army Corps of Engineers
September 22, 1988	National Marine Fisheries Service U.S. Army Corps of Engineers Office of Environmental Quality Control Department of Land and Natural Resources

PREPARATION NOTICE COMMENTS AND RESPONSES

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State Agencies

Department of Land and Natural Resources (Two letters received, single encompassing response provided)

University of Hawaii at Manoa, Environmental Center

General Public

Mr. and Mrs. Marshal K. Rosa, ETAL

JUL 15 9 42 AM '88
HARBORS DIVISION

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Region • Western Pacific Program Office
2570 Dole St. • Honolulu, Hawaii 96822-2396

July 14, 1988 F/SWR1:ETN

RECEIVED

Mr. David Higa
Chief, Harbors Division
Department of Transportation
79 S. Nimitz. Hwy.
Honolulu, HI 96813

Dear Mr. Higa:

This is in response to the Environmental Assessment (EA) prepared for the Maunalua Bay Ferry Terminal. It is our understanding that an EIS is now being prepared by the consultants in place of the EA in order that a more complete evaluation of environmental impacts may be presented.

We have reviewed the subject EA, and provide the following for your consideration in preparing the EIS with regard to species listed under the Endangered Species Act of 1973, as amended.

Discounting the possibility of collision with a humpback whale (Megaptera novaeangliae) is not supported by the available information or proposed vessel performance specifications. Over the past two winter whale seasons there have been two collisions and a near-miss between high speed vessels and humpback whales. The proposed ferry is anticipated to travel at over 40 knots, nearly twice the speed of vessels involved in previous incidents in Hawaii.

The data used in the analysis of the potential impacts to threatened green turtles (Chelonia mydas) is inadequate. Comprehensive surveys of known and potential resting and foraging sites within Maunalua Bay should be conducted so that impacts from terminal construction, channel dredging, and ferry operations can be appropriately addressed.

In order to define the scope of the surveys and provide further information we recommend that the Department of Transportation, Harbors Division conduct a scoping meeting with participation by the National Marine Fisheries Service, Corps of Engineers, and the primary environmental consultants for the project. This would be in anticipation of Endangered Species Act coordination requirements when the Corps permit process is initiated.

Should you require further information or have any questions I can be reached at 955-8831 or at the address above.

Sincerely yours,

Eugene T. Nitta

Eugene T. Nitta
Protected Species Program

cc: COE, J. Emmerson
F/SWR34, Lecky

WILSON
OKAMOTO
& ASSOCIATES

ENGINEERS
ARCHITECTS
PLANNERS

2766-05
July 22, 1988

MEETING MEMO TO FILE

SUBJECT: Draft Environmental Impact Statement for Haunalua Bay Ferry Terminal

PERSONS PRESENT:

Mr. Harry Murakami	DOT-Harbors
Mr. Howard Miura	DOT-Harbors
Mr. Elton Teshima	DOT-Harbors
Mr. Dan Tanaka	DOT-Statewide Transportation Planning Office
Mr. Warren Kanai	US Army Corps of Engineers
Mr. Gene Nitta	National Marine Fisheries Service
Mr. John Naughton	National Marine Fisheries Service
Mr. Richard Sixberry	Department of Land and Natural Resources - Aquatic Resources
Mr. Bob Rocheleau	Sea Engineering
Dr. Richard Brock	Biology Consultant
Mr. Gary Okamoto	Wilson Okamoto & Associates
Mr. Earl Matsukawa	Wilson Okamoto & Associates

INFORMATION ITEMS:

The meeting was convened in response to a letter of July 14, 1988 from the National Marine Fisheries Service (NMFS) commenting on the Environmental Assessment for the Haunalua Bay Ferry Terminal. It was conducted as a scoping meeting with the National Marine Fisheries Service and the Corps of Engineers. The primary topics for discussion were impacts of the ferry vessel on humpback whales and green sea turtles.

HUMPBACK WHALES

1. NMFS requested that the draft EIS provide more detailed discussion of potential collision between the ferry and humpback whales. Within the last few years, during the winter whale season, approximately one collision per year has been reported. Two collisions were reported off-shore of Honokohau Harbor in Kona. Both involved dive charter boats travelling over 18 knots.

2. Currently, the data on whales is limited - recordings of sightings by private individuals and aerial surveys on a "spot-check" basis.

3. Humpback whales in Hawaii generally travel within the 50 fathom mark although the general reported area for transit is the 100 fathom mark which is recorded on most nautical charts.

4. There is particular concern with regard to calves since they would be more prone to mortality and any loss could impact future whale populations.

5. There is some study done with regard to the kinds of noise whales may be aware of and could use to avoid watercraft. Currently, there is no information available on the hearing range for humpback whales. The concern is that the hydrofoils travel relatively silently and at high speed.

GREEN SEA TURTLE

1. There is concern about the presence of turtles in Haunalua Bay in resting and foraging areas.

2. There is concern that the turtles migrate onto the reef during the night to forage. Dredging of the channel for the ferry may directly affect foraging habitats. There is concern that blasting could affect turtles present in the foraging areas as well as resting areas.

3. NMFS recommended that the DOT prepare a turtle study to address their concerns. The study will be required for NMFS to act on the Department of Army Permit. They will be willing to coordinate with DOT regarding the scope of the study.

Earl Matsukawa, Project Manager

DEPT. OF TRANS.
STATEWIDE TRANS.
PLANNING OFFICE
JUN 30 10 20 AM '88

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

WILLIAM W. PATY, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DOC.: 3690E
FILE: 88-522

JUN 30 '88

MEMORANDUM

TO: Honorable Edward Y. Hirata, Director
Department of Transportation

FROM: WILLIAM W. PATY, Chairperson
Board of Land and Natural Resources

SUBJECT: Environmental Assessment for Intra-Island Ferry System

Thank you for giving our Department the opportunity to comment on this matter.

We have reviewed the materials you submitted and have the following comments:

Your Environmental Assessment is somewhat sketchy and inconclusive on the issue of actual operation of the vessel(s) - vs. the issue of "terminals" - especially with regard to the increased probability of impact on humpback whales (especially newborns) - an endangered species and our State Marine Mammal. Recent collisions with whales illustrate the probability of "disturbance of whales", especially regarding high-speed vessels such as you are proposing, rather than the "already remote possibility of collision" suggested by your Environmental Assessment.

All future activities that may impact aquatic resource values should be submitted to the Department for review, and the necessary approval obtained for the required Conservation District Use Application(s).

Potential interference with recreational and commercial fishing should be averted as much as possible and compensated for where possible, during the operation of ferry routes and terminal facilities.

Thank you for your cooperation in this matter. Please feel free to contact me or Jay Lembeck of our Office of Conservation and Environmental Affairs, at x7837, if you have any questions.

WILLIAM W. PATY

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

STATEWIDE TRANS. PLANNING OFFICE
JUL 5 1 28 PM '88

WILLIAM W. PATY, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

JUL 1 '88

FILE: 88-526
DOC.: 3719E

The Honorable Edward Y. Hirata, Director
Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813

SUBJECT: Environmental Review - Maunalua Bay (Intra-Island) Ferry Terminal.

Dear Mr. Hirata:

Thank you for giving our Department the opportunity to comment on this matter.

We have reviewed the materials you submitted and have the following comments to offer.

The Environmental Assessment has addressed most of the potential impact and proposes mitigation measures to prevent excessive negative effects on an already stressed ecological system.

If blasting should be required, our Department should have the opportunity to review detailed blasting plans well in advance, with information on the type of charges, quantity, and expected schedule for this activity.

In addition, we anticipate that the terminal, ferry and related human activities might increase the trash, other floating debris and oil products entering Paiko Lagoon. Such trash, debris and oil products are detrimental to marine life and waterbirds as well as creating an aesthetically displeasing environment.

We require that all such materials shall be controlled and prevented from entering the marine, tidal and lagoon environments. We further require that emergency facilities, equipment and procedures - acceptable to this Department - shall be planned and implemented prior to construction, to contain and eliminate any spilled foreign materials.

Honorable Edward Y. Hirata -2- Doc. No. 3719E

Thank you again for your cooperation in this matter. Please feel free to call me or Jay Lembeck at our Office of Conservation and Environmental Affairs, at 548-7837, if you have any questions.

Very truly yours,

WILLIAM W. PATY, Chairperson
Board of Land and Natural Resources

cc: DAR, DOFAW, Land Management, State Parks/Historic Sites, DOWALD

STP 8.3073

August 15, 1988

MEMORANDUM

TO: The Honorable William W. Paty, Chairperson
Board of Land and Natural Resources

FROM: Director of Transportation

SUBJECT: ENVIRONMENTAL ASSESSMENT FOR INTRAISLAND FERRY SYSTEM AND MAUNALUA BAY FERRY TERMINAL

Thank you for your memorandum of June 30, 1988 and July 1, 1988, commenting on the environmental assessment for the Oahu Intraisland Ferry System and Maunalua Bay Ferry Terminal.

We have since decided to prepare an environmental impact statement (EIS) for the ferry proposal to address more fully the concerns expressed by your comments and other sensitive issues. The draft EIS should be available for review about October, 1988 and your comments are again welcomed. The Board of Land and Natural Resources will be involved when we submit our Conservation District Use Application for the Board's approval.

Please be assured that we will work closely with your department whenever appropriate and applicable.

Edward Y. Hirata

DT/EYH:ko/lw

cc: HAR
STP (dt)

University of Hawaii at Manoa

Environmental Center
Crawford 317 • 2550 Campus Road
Honolulu, Hawaii 96822
Telephone (808) 948-7361

2766.05
EM

August 5, 1988
PN:0063

RECEIVED

Mr. Edward Y. Hirata, Director
Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813

Dear Mr. Hirata:

Preparation Notice
Maunalua Bay Ferry Terminal
Hawaii Kai, Oahu

The Department of Transportation is proposing to establish an intra-island ferry system to serve the southern coastline of Oahu. The first phase of the project will be development of the Maunalua Bay Terminal so that the Maunalua Bay to downtown Honolulu link may be implemented. The Environmental Center has reviewed the above referenced document with the assistance of Sheila Conant, General Science; William Cathcart and Ralph Moberly, Geology & Geophysics; Jan Auyong, Sea Grant; George Curtis and Charles Mader, Joint Institute of Marine and Atmospheric Research; Peter Flachsbart, Urban and Regional Planning; and Nancy Kanyuk, Environmental Center. The following topics have been noted by our reviewers for inclusion in the EIS.

Waves, tides and shoreline processes

The discussion of waves, tides, and shoreline processes presented on pages 19 through 26 is, according to our reviewers, accurate and of generally high quality. However, it does not address or support the "Determination" on page 58 stating that "....the proposed project shall not involve substantial degradation of environmental quality." A statement of this nature requires numerical or scale modeling to determine the effect of making the channel both wider and deeper. If there is no energy change because of modifications to the channel then the longshore transport should remain as presently experienced. However, we believe that widening and deepening the channel will result in increased wave energy inside Maunalua Bay, increased wave heights, and a change in the erosion pattern along the shoreline. It may also result in increased tsunami inundation. A doubling of the depth of the channel may result in a doubling of the potential wave height inside the channel. This, in

turn, will result in higher wave heights and changed wave patterns on the shoreline. A numerical or scale model study is needed to estimate the magnitude of these actions. Currently, state of the art numerical and experimental modeling techniques exist that can give adequate relative estimates of the effects that would occur from proposed changes to the channel. Our reviewers strongly recommend that a more detailed study of these possible effects be undertaken so as to provide a substantive basis for evaluating changes that will occur. Additionally, the recommended methods and source of the tsunami wave elevation calculations cited on page 23 should be provided.

The discussion of erosion mostly centers on channel alterations and ferry operations. The document neglects to define the impacts that the ferry pier will have on longshore transport. The presence of a two hundred foot pier perpendicular to the prevailing longshore current could cause sand/sediment to accumulate at the base of the pier with erosion of the downstream side. Deposition would require periodic dredging to maintain the channel and turning basin. This in turn would result in chronic turbidity of the area, which would affect marine habitat and organisms. Conversely, implications to the coastal environment from downstream erosion should be addressed. More information on the function and operation of the silting basin (depicted in Figure 3) should be incorporated in the EIS.

Recreation

The pier and turning basin will extend out from the shoreline across the present boat channel, impeding canoe/paddle/boat traffic from the western portion of Maunalua Bay Beach Park and from Kuliouou Beach Park. This is a channel well used by the Hui Nalu Canoe Club and many others since the water area seaward generally is used by jet ski operations or is too difficult to navigate due to the shallow water depth over the old reef. The EIS should discuss the potential conflicts and hazards created by a large, commercial transport in a heavily used marine recreation area. In addition, the reference to the Department of Transportation's Ocean Recreation Motorcraft Management Plan (pp. 51-52) should be expanded. Weekday recreation is often concentrated around commuter hours (before and after work), and since ferry operations could restrict such use, a survey to determine what impacts will occur should be undertaken.

The revetment, proposed in the shoreside improvements, should minimize effects on the coast as long as the size, thickness and footing are correctly designed. Unfortunately the shoreline west of the revetted shoreline and pier will be subject to erosion. The pier may well reduce deposition to the area and wave action may erode the existing shoreline. The numerical and experimental modeling studies suggested earlier should provide data for evaluating the impacts of the proposed revetment.

Aesthetics

In general, the ferry system and associated facilities will have a high visual profile in an essentially undeveloped shoreline area. The transformation of a recreational beach into a "business" parking lot will detract from the open space environment normally available during week days. Additionally, the three foot vegetative buffer mentioned would reduce the views to the sea. In order to reduce the visual and physical impact of "park and ride" lots, our reviewers have suggested that the makai facilities be limited to the ticket booth, terminal, drop off area, bicycle parking, and pier. Automobile parking should be incorporated with and limited to the City and County's Hauka Park and Ride lot.

Parking

An argument was made that the parking lot would be available for weekend use. However, the space is already available for use. The EIS should address the impacts associated with the proposed paving of the area, and the attendent increase in runoff of rainwater into the bay along with oil and other pollutants associated with paved parking areas.

The parking lot for the facility is designed to hold a maximum of 200 vehicles. The Preparation Notice assumes that additional parking for 140 vehicles will be available at a nearby park-and-ride facility, currently under construction, and to be operated by Honolulu's Department of Transportation Services. If we assume that the combined 340 parking spaces of these two parking lots will generate 340 to 680 ferry users then we must assume that all parked vehicles represent two-person carpools, which is very optimistic. Each of the two ferries, with a maximum capacity of 300 passengers, will make two runs during the morning rush hour and two runs during the evening rush hour. Thus, the facility is designed to accommodate 1,200 passengers during morning and evening periods. These numbers assume that the other 520 to 860 passengers will arrive by bus or be dropped off by spouses or friends. This assumption should be documented in the EIS by survey research. In point of fact, the Transportation and Traffic Engineering Handbook (1976), written by the Institute of Transportation Engineers, notes that about 40% of users of a change-of-mode facility (e.g. a ferry terminal) in a suburban location arrive at the facility by automobile (pp. 699-700). This suggests that at least 480 parking spaces are needed. If the parking facility must be increased in size, then there could be concomitant environmental impacts whose magnitude will depend upon the size of the terminal.

Those passengers arriving by bus from the Kokohead direction will have to cross Kalanianaole Highway to get from the bus stop to the ferry terminal. This could cause safety problems and traffic delays at the Keahole Street intersection of the highway. These problems need to be addressed in the Draft EIS. Our reviewers have suggested restricting parking to the mauka side of the highway to reduce congestion of people entering/exiting the parking area during commuter hours. A pedestrian

crossover bridge could be constructed to reduce pedestrian/vehicular accidents and to avoid traffic holdups while pedestrians cross the highway. Other mitigation measures may be needed.

Wastewater Facilities

An existing comfort station near the proposed terminal is expected to provide restroom facilities. This comfort station is served by a cesspool, which presently may be adequate for the few people who use this area for a park and picnic facility. But to suppose that the present comfort station will service a possible 1,200 ferry users per day is not reasonable. A quantitative analysis to determine the ability of the existing facilities to handle the expected wastewater load from the terminal should be included.

Air Quality

The document states that air quality impacts "...are not anticipated to be significant. Predominant trade winds from the northeast will tend to blow emissions out to sea and away from populated areas" (p. 47). Although trade winds predominate, what will be the carbon monoxide (CO) concentration at this site or downwind when Kona winds apply? National and state air quality standards allow for only one violation of the CO standards per year. The document should indicate whether CO standards are presently in violation in this area. Our reviewers suspect that the intersection of Keahole and Kalanianaole Highway may be a carbon monoxide hot spot during reduced wind conditions, in which case, careful planning of ingress and egress access routes and siting of the ferry terminal to minimize CO exceedances will be needed.

Endangered Species

Although our reviewers contend that the 2 to 6 stilts feeding in the area might initially be bothered by construction, they believe that the noise concomitant with construction will not disturb the birds to any great extent, since stilts are known to adapt fairly quickly to such disturbances. However, more specific information should be provided on the potential impacts that construction of the ferry terminal might have on other endangered species such as turtles and whales.

Alternatives

The infrastructure required for this project, i.e., dredging, pier, parking, represents major, permanent alterations to the coastal environment of Haunalua Bay. As such, it seems imperative that the benefits that will accrue justify these irreversible actions. Therefore, a far more extensive and substantive discussion of the benefits of the ferry operation, including a full disclosure of the economics and ridership surveys, should be included in the EIS. The current document addresses only one proposed operation, with one specific vessel. The alternative section should included a discussion of other vessel types and their operational characteristics. It may well be that the currently proposed vessel is not the most suitable candidate for the actual operation due to excessive noise, operating costs, or questionable safety at high speeds. In such case a Semi-Submerged Platform (SSP) or other vessel type may be more appropriate. Additionally, if the terminal operation is successful, there are likely to be other operations proposed such as interisland ferry service. Hence, the potential impact of other operations should be considered, rather than simply one scenario.

Maunalua Bay Small Boat Harbor

From 1984 through 1986, the Corps of Engineers, with the assistance of a citizens group, met regularly to develop plans for a small boat harbor at Maunalua Bay. These plans were finalized in late 1986 but action on implementation was deferred due to administrative changes by the Corps.

Justification for Corps monies was originally based on the need for recreational boating facilities. Hence the surveys taken in the early planning stage focused on identifying recreational users. Much later, in 1986, an administrative change order to the Corps directed that all boat harbor development by the Corps be justified on the basis of commercial need. At this stage the harbor had effectively been designed, the principals in the Corps that had guided the planning were being transferred, federal funds were tight, and the project was put on hold. However, it should be noted that the proposed commercial ferry use may serve to justify federal funds for the boat harbor project if it can be shown to be compatible with existing plans for the ferry terminal. Unfortunately, the proposed terminal seems to have been designed with no recognition of the earlier studies and as presently conceived, appears to be incompatible with the small boat harbor plans.

We urge that the earlier boat harbor plans and the ferry terminal needs be considered together so as to maximize long range plans for use of Maunalua Bay and minimize expensive future alterations and subsequent environmental impacts.

Thank you for the opportunity to comment on this EIS Preparation Notice. We hope our comments will be helpful in preparing the Draft EIS.

Yours truly,

Jacquelin Miller
Associate Environmental Coordinator

cc: OEQC
✓Earl Matsukawa, Wilson Okamoto & Assoc.
L. Stephen Lau
William Coulbourn
George Curtis
Peter Flaschbart
Ralph Moberly
Jan Auyong
Charles Mader
Sheila Conant
Nancy Kanyuk

5.008(7)
3595

STP 8.3145

September 16, 1988

Ms. Jacquelin Miller
Associate Environmental Coordinator
University of Hawaii at Manoa
Environmental Center
Crawford 317, 2550 Campus Road
Honolulu, Hawaii 96822

Dear Ms. Miller:

Environmental Impact Statement Preparation Notice
Maunalua Bay Ferry Terminal
Hawaii Kai, Oahu

Thank you for your letter of August 5, 1988, on the proposed Maunalua Bay ferry terminal project.

We appreciate the thorough review by the Environmental Center and the comments provided are being utilized by our consultant to enhance the quality of the EIS. The comments were both pertinent and enlightening. You can be assured that all concerns will be thoroughly addressed and resolved as required.

As you know, the Environmental Center will have another opportunity to review the proposal when the draft EIS is circulated for review. We again welcome your comments at that time.

Very truly yours,

Edward Y. Hirata
Director of Transportation

DT:ko

cc: HAR, STP(dt)
Wilson Okamoto & Assoc.

2367

DIRECTOR'S OFFICE
JUL 6 4 03 PH '88
TRANSPORTATION

July 3, 1988

State of Hawaii,
Department of Transportation,
869 Punchbowl St.
Honolulu, Hawaii #96813.

Attention: Mr. Ed Hirata

Subject: Proposed Maunalua Bay Ferry Terminal

Dear Sirs:

We congratulate you for reconsidering your negative declaration finding for the subject Ferry Terminal.

There are many questions that have not been addressed by the E.A. prepared by Wilson Okamoto & Associates.

We feel that an E.I.S. should be required to address AND answer these (and many other) questions the public have about the proposed project. An E.A., for a project of this size, does not provide the public with sufficiently objective, qualified input.

Has a major channel ever been dredged, with major blasting involved in Hawaii, for that matter, ever been undertaken by the State WITHOUT, an E.I.S.?

When the subject ferry was originally proposed, the proponents indicated that there would be no dredging required, because the proposed craft would have a very shallow draft. However, we now find that the channel is to be dredged to a new width of 200 ft. and to a depth of 12 ft. - three times as wide and twice as deep as the existing channel. Why is dredging and blasting being considered now in our highly used recreational bay.

The proposed vessel type was not supposed to be noisy (like a hovercraft or hydrofoil) yet, lo and behold, the chosen craft IS a hovercraft!

We request that the following questions and comments be specifically addressed:

1. Sand transportation.

The question we have regarding the sand transportation along the entire Portlock beach has NOT been studied or even addressed.

We are already plagued with massive (unnatural) erosion caused by the dredging of the original channel and the Hawaii Kai Marina and, more recently (late last year, election day, to be exact), by the re-dredging of the fourth span of the bridge entrance to the Marina, undertaken by Kaiser (Kakor), in an attempt to keep the remaining span open for water traffic.

Since the original channel was the dredged, in 1968, two of these spans, since 1975, have been completely blocked AND overgrown with vegetation. The third is now completely useless for water traffic. ALL of this is due to sand transportation.

Nature wants back what we take away from her!

JUL 12 10 49 AM '88
HARBORS DIVISION

To contend that a channel 3 times the width and twice the depth of that existing will cause NO erosion effects whatsoever, is difficult to understand - and qualified engineering minds agree with us! As far as we can ascertain, the subject of the currents along the shoreline have NOT been studied.

2. Tsunami and Wave Action.

We believe the opinions of specialists, addressing the possibilities of wave and tsunami action and the possibilities of inundation and damage resulting therefrom should be obtained, due to the fact that it is proposed to triple the width of the channel, as well as doubling the channel depth, hence reducing the protection provided by the reef barrier.

3. Substantial effects on the lifestyle and character of the community.

We believe , that the whole character of the bay will be changed as a result of changing the nature of the existing small boat channel, to that of one directed to the service of a large commercial craft - and these effects will impact all of the ocean front (and others) using the bay - and this issue MUST be specifically addressed.

People in Hawaii Kai, in general, are probably not aware of the real impact this (ferry) project will have on the recreational use of the bay, from fishing, diving, swimming, kayaking, canoeing, surfing etc., to that of a commercial harbor - and of the enormous effects of the major amount of dredging and blasting, proposed to be undertaken.

4. Noise Pollution.

The question of noise levels cannot be ignored or shrugged off, simply by saying that we are already plagued by jet ski noise pollution anyway.

The DOT Harbors Division made the initial mistake of allowing commercial jet ski operators into a recreational area in the bay in the first place. Until this episode, Maunalua Bay was never a haven for tourist activities.

But with the ferry engines, air fans and propulsion jets, associated with such a craft, we are talking of a TOTALLY different order of magnitude of noise level that would certainly NEVER be permitted in ANY other *residential* area in the STATE!

The ferry project, as far as we understand, has not been coordinated with the Ocean Recreation Use Plan, now in its planning stage.

5. Endangered Species and their Habitat.

The green sea turtle, for example, is an official endangered species, with a known resting spot just outside the mouth of the existing channel. Yet only a few sentences are given to the effects of blasting (which we were originally advised would NOT be undertaken) and dredging will have on their homes and feeding areas. Traumatic blasting shocks travel great distances in oceans. It is even a well known way to fish! And our turtles will be only a *few feet* away.

The turning basin and pier are in close proximity to the Paiko Bird Sanctuary and the feeding areas of the Hawaiian Stilt (Ae'O), an endangered species.

6. Increased Traffic.

The ferry will further add to our traffic problem, by bringing more tourists into our already crowded area, plus the additional buses and vans needed to drop them off and pick them up from the terminal.

The proposed operator is not expecting to make money from the commuter resident ferry service. The buses and vans to pick up and drop off tourists will be directly in our shoreline view!

The open space of the shoreline that should be a (Maunalua Beach Bay) park, is now a sometime parking lot for tour buses etc., and should be transformed back into a park for shoreline use - and NOT a parking lot for the ferry!

7. Ridership.

The ocean between Hawaii Kai and Honolulu is quite rough. Maybe the people in the survey did say they would use the ferry - but, for those not used to rough sea rides - we doubt that many will actually continue to use it!

Admiral E. Alvey Wright, the main proponent of the project said, at the June 27, 1988 Hawaii Kai Neighborhood Board meeting, that he was not pleased with the result of the survey taken to study ridership and stated that, "if the people of Hawaii Kai don't want the ferry, they won't get it!"

We would like to see him held to this promise!

We would also like to see a thorough study of ridership done BEFORE the project proceeds further.

8. Economics.

The ferry is also supposed to be economical!

Yet who wants to afford $5 a day, $25 a week and $100- per month to ride it - with bussing costs at the other end for those who don't have offices near the ferry terminal.

The $1,700 per year, payment to the State by the operator is merely a nominal sum, but the expense to dredge and blast the channel and turning basin, construct a pier, parking lot and amenities is costly and irreversible.

This project will be funded with the State of Hawaii Taxpayers' money, but at this stage, we have no (objective) idea, whether this proposed project is *really* economically feasible. The expenditure for an E.I.S. would be well spent, if the finding is NOT in favor of completion of the project.

The State should not enter into a contract until the E.I.S. is completed.

Is it not "putting the cart before the horse" to sign a contract with the ferry builder, before the E.I.S. is completed. Would the builder (operator) be prepared to commit to the contract without the Hawaii Kai link?

The concerns regarding the time involved to complete an E.I.S. seem negligible, when compared with the lasting effects of prematurely entering into a contract that would drastically alter Maunalua Bay.

If the E.I.S. finds considerable environmental impact on the portion of the project involving Maunalua Bay, then that would end the project - not simply delay it, six months.

These are the major concerns we have about the proposed ferry project we wish to be addressed in the public hearings.

Respectfully,

Marshall K. & Barbara Anne S. Ross
6973 Kalanianaole Hwy.
Honolulu, Hawaii #96825.

Edward & Harue Freeman
6977 Kalanianaole Hwy.
Honolulu, Hawaii #96825.

Georg & Leslie Kissner
281 Anapalau Pl.
Honolulu, Hawaii #96825.

Robert P. III & Mary Harbold
6321 Keokea Pl. #138
Honolulu, Hawaii #96825.

William P. & Patricia Mowat
523 Opihikao Pl.
Honolulu, Hawaii #96825.

Steve & Margie Kaiser
P.O. Box #25777
Honolulu, Hawaii #96825.

Derek B. Trotter & Charlotte Trotter
6983 Kalanianaole Hwy.
Honolulu, Hawaii #96825.

c.c. Donna Ikeda — Libert Landgraf
Robin Foster — Marvin Miura
John Emmerson — Don Griffin
Dennis O'Conner — Jackie Miller

5.008(7)
3367

STP 8.3088

August 18, 1988

Mr. and Mrs. Marshal K. Rosa, ETAL
6973 Kalanianaole Highway
Honolulu, Hawaii 96825

Proposed Maunalua Bay Ferry Terminal

Thank you for your letter of July 3, 1988, commenting on the Maunalua Bay ferry terminal project. We offer the following responses corresponding to your questions and comments:

1. Sand Transportation

The shoreline of Maunalua Bay has a history of erosion and accretion, possibly induced in part by the dredging of various channels in the area. As a result, erosion along the Portlock beachfront is a progressive process which will likely require some form of structural control in the future.

Maintenance dredging, such as conducted by HACOH in the immediate vicinity of the beachfront appears to have removed a blockage which had kept the beach in near equilibrium. Once removed, sand transport resulted in erosion. This is not the case with the proposed ferry channel. The closest point at which dredging of the ferry channel will approach the beach is approximately 800 feet.

With regard to dredging the ferry channel, concern about beach erosion centers on the amount of additional wave energy which the enlarged channel would admit into the bay, particularly the amount which would reach the shoreline. A numerical model will be constructed to project the increase in wave energy that will reach the shoreline as a basis for further assessing erosion impacts. In addition, a more in depth assessment of historical beach erosion in the area will be provided. For your information, we are currently evaluating the possibility of reducing the planned channel dimensions to minimize the dredging quantities while still maintaining a safe waterway for boaters.

2. Tsunami and Wave Action

Although the issue was not specifically addressed in the environmental assessment, initial indications are that the channel will not have significant effect on aggravating tsunami inundation along the shoreline on Maunalua Bay. To better assess potential impacts, however, the numerical model discussed above will be utilized to assess changes in tsunami and storm wave energy and wave heights at the shoreline. We do not plan to triple the existing channel width nor double its depth.

3. Lifestyle and Character of the Community

The terminal facility is of relatively small scale in relation to the recreational resources offered at Maunalua Bay. The pier and passenger terminal will be the primary new improvements in the area. The paved parking lot will occupy an area currently set aside for boat ramp use and for parking by recreationalists. We do not expect conflict of uses since recreational activities occur primarily on weekends when the ferry will not be in operation; thus, neither parking nor recreational activities will be significantly restricted.

Although much larger than boats which currently use the channels in Maunalua Bay, the ferry vessel will not alter boating and other recreation activities in the Bay. It will be confined strictly to the access channel and not where recognized water recreation activities take place. Notably, the wake created by the ferry will be much smaller than those created by boats which normally transit the area.

During construction of the ferry terminal and particularly during dredging operations in the channel, some disruption of recreational activities will occur due to turbidity, construction noise, and occasional requirements for clearing the channel area if blasting is required.

4. Noise

The bid document requires that the ferry vessel not create noise in excess of 86 dbA at a distance of 50 feet while maneuvering in the channel. The actual noise level measured during trials of a prototype of the ferry vessel was 76 dbA. At a distance of 850 feet, the closest distance at which the ferry will pass Portlock residences, the noise level is estimated to be on the order of 55 dbA. At this level, the noise generated by the ferry should not be greater than normal vehicular traffic along Kalanianaole Highway.

Coordination with the development of the Ocean Recreation Management Plan is being pursued through the Department of Transportation, Boating Branch, who are responsible for the preparation of the Plan.

5. Endangered Species

The assessment of potential blasting impacts on turtle habitats contained in the environmental assessment was based on a visual inspection of the proposed channel site, areas in which blasting may be required, and its relationship to known turtle habitats. It appears, however, from the preliminary data gathered to date, that blasting may not be required. To further assess impacts that construction of the channel may have on turtles, additional turtle counts and surveys of feeding areas will be conducted and documented. The National Marine Fisheries Service has been and will continue to be consulted regarding survey and construction methods to be used. The proximity of the Paiko Lagoon Wildlife Sanctuary to the terminal area was noted in the environmental assessment and potential impacts upon the sanctuary were discussed.

6. Traffic

As noted in the environmental assessment, commercial use of the Maunalua Bay Terminal will not be allowed under the bid document. No booking of seats will be allowed by tour companies.

The terminal area, including the proposed parking lot is controlled by the Department of Transportation under a Governor's Executive Order for boating purposes. The facility will not encroach upon land controlled by the City Department of Parks and Recreation. Use of land as a parking area will continue.

7. Ridership

The bid document for the ferry operation requires that the vessel provide "sea-kindly" service in the island waters. Sea trials of the vessel prototype were conducted to assure that it will meet the bid specifications. Notably, the vessel is equipped with a computer air cushion system designed to provide a smooth ride by responding to wave crests and troughs. A survey of the entire Hawaii Kai area was conducted in December, 1987, and the results indicated that an initial ferry ridership of between 250-450 can be expected.

8. Economics

The one way maximum fare of $2.50 was set artificially low and is well below the operator's cost to provide the ferry service. He is expected to make up this shortfall from the commercial use of his vessels during the non-commute periods (no commercial activities will be allowed from the Maunalua Bay terminal). While there is no State subsidy for the ferry, we note that the City's bus system is subsidized over $40 million annually. When considering automobile expenses such as the cost for gasoline, parking, maintenance, and insurance, the one-way $2.50 fare becomes more attractive. As an additional benefit, the commuter can make more productive use of his time traveling aboard the ferry.

The cost of the pier and attendant infrastructure will be reimbursed by landing fees paid by the operator for use of the facility.

The contract with the operator will not be issued until the environmental impact statement for the ferry proposal is finalized.

We hope these comments satisfactorily address your questions and concerns. Please feel free to contact Mr. Dan Tanaka at 548-6526 if you have any questions.

Very truly yours,

Edward Y. Hirata
Director of Transportation

ET/DT:ko

cc: HAR, STP(dt)
Adm. Wright

DRAFT ENVIRONMENTAL IMPACT STATEMENT COMMENTS AND RESPONSES

The following comments from governmental agencies and the general public were received on the Draft EIS for the proposed project, availability of which for public review was published in the October 8, 1988 issue of the OEQC Bulletin. The 45 day consultation period ended on November 22, 1988. A total of 17 comments were received.

A double asterisk (**) indicates comments to which substantive responses were required. Both comment and response letters are reproduced in this section.

A single asterisk (*) indicates letters offering "no comments" and for which no responses were provided.

<u>Federal Agencies</u>

** National Marine Fisheries Service
** U.S. Fish and Wildlife Service
** U.S. Department of the Army
** U.S. Department of the Navy
* U.S. Soil Conservation Service

<u>State Agencies</u>

* Department of Business and Economic Development - Energy Division
* Department of Business and Economic Development - Housing, Finance and Development Corporation
* Department of Defense, Office of the Adjutant General
** Department of Land and Natural Resources
** Office of State Planning
** University of Hawaii at Manoa, Environmental Center

<u>City and County of Honolulu Agencies</u>

** Department of General Planning

<u>Private Organizations</u>

* Hawaiian Electric Company, Inc.

** HITech - E. Alvey Wright (two letters received)
** San Diego Shipbuilding and Repair, Inc.

General Public

** Mr. Edward G. Freeman

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Region
300 South Ferry Street
Terminal Island, California 90731

November 14, 1988 F/SWRx2:JJN

DEPT. OF TRANS.
STATEWIDE TRANS.
PLANNING OFFICE
NOV 23 7 30 AM '88

Edward Y. Hirata
Director of Transportation
State of Hawaii
Department of Transportation
869 Punchbowl Street
Honolulu, HI 96813

Dear Mr. Hirata:

NOAA Fisheries has received and reviewed the State of Hawaii, Department of Transportation (DOT). Draft Environmental Impact Statement (DEIS) for the Oahu Intraisland Ferry System. Because of the proposed amount of in-water work which will require a Department of Army (DOA) permit, and our mandated responsibility to review DOA permits, we offer the following comments on the DEIS.

General Comments

NOAA Fisheries concurs with the State of Hawaii's decision to prepare an EIS pursuant to the Hawaii Revised Statutes for the Oahu Intraisland Ferry System. We have recommended this course of action during consultation meetings with DOT over the past year. The consultant's reports found in Appendix B,C, and D are excellent and of particular benefit to us in assessing baseline conditions prior to initiation of the proposed project.

This agency is concerned with potential impacts from construction of the Maunalua Bay Ferry Terminal, as it will require substantial amounts of dredging to create a turning basin and to widen and deepen the entrance channel. The other six proposed terminals will require a minimum of in-water work since they are within existing harbors.

Of particular concern to NOAA Fisheries is the importance of the eastern portion of Maunalua Bay to the threatened green turtle (Chelonia mydas). The proposed dredging for the Maunalua Bay Terminal may potentially destroy or modify habitat critical to this species. Consequently, we are pleased to note in the "Unresolved Issues" section of the DEIS that DOT is coordinating with NOAA Fisheries to conduct studies to more fully assess the impacts of dredging on sea turtles and their habitats. In addition this section states that further coordination with NOAA Fisheries will be required to determine the potential for collision of the ferry vessel with endangered humpback whales (Megaptera novaeangliae).

These above studies must be completed and submitted to NOAA Fisheries prior to our review of the DOA permit(s) which will be required for the intraisland ferry system project. We strongly recommend the studies be included in the EIS, as requested by NOAA Fisheries during the scoping meeting held on July 22, 1988.

Specific Comments

FLORA AND FAUNA

Page D-8, paragraph 3. In this section discussing the potential of the ferry vessel colliding with a humpback whale, consideration should be given to a transit corridor seaward of the 100 fathom isobath in order to reduce vessel-whale encounters.

Page D-8, paragraph 5. When Seaflite operated in Maalaea Bay during the humpback whale season the hydrofoil came down off the foils each time it entered the bay to reduce speed and avoid potential collisions with whales.

RECREATION

Page D-14, paragraph 2. In this section discussing offshore recreation in Maunalua Bay, reference should be made to the State of Hawaii designated artificial reef site in 10-15 fathoms of water in the western portion of the bay. This site is popular with recreational divers and to a lesser degree with commercial divers and scientific researchers. The artificial reef site should be well outside the transit corridor for the ferry vessel.

NOAA Fisheries looks forward to continued cooperation with DOT on the proposed Oahu Intraisland Ferry System. Please contact John Naughton or Gene Nitta of our Honolulu Office at 955-8831 concerning these comments and for further coordination.

Sincerely yours,

Gary Smith

E.C. Fullerton
Regional Director

cc: F/SWRx2, Naughton
EPA, Region 9 (E-4)
FWS, Honolulu
Hawaii State Div. of Aquatic Resources
Corps of Engineers, Honolulu District

JOHN WAIHEE
GOVERNOR

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

EDWARD Y. HIRATA
DIRECTOR

DEPUTY DIRECTORS
JOHN K. UCHIMA
RONALD N. HIRANO
DAN T. KOCHI
JEANNE K. SCHULTZ

IN REPLY REFER TO

December 27, 1988 HAR-EP 2649

Mr. E. C. Fullerton, Regional Director
National Marine Fisheries Service
South West Region
300 South Ferry Street
Terminal Island, CA 90731

Dear Mr. Fullerton:

Draft Environmental Impact Statement (DEIS)
for Oahu Intraisland Ferry System
(Response to: F/SWRx2:JJN)

Thank you for your comments on the subject DEIS. As requested by NOAA Fisheries during the scoping meeting of July 22, 1988, we will incorporate the results of the sea turtle study in the Final EIS. We appreciate the input provided by the National Marine Fisheries Service in formulating the scope of work for the study.

With regard to encounters between the proposed ferry vessel and humpback whales, we will coordinate with your office to discuss potential mitigating measures. We shall also revise the Final EIS to include as a potential mitigation measure, using the 100 fathom isobath as a landward boundary for the ferry route.

Operation of the proposed ferry vessel in areas where humpback whales are more densely concentrated differs from that of hydrofoils and offers greater advantages. Unlike a hydrofoil, the Surface Effect Ship (SES) proposed for use as the ferry vessel can remain on its air cushion at all speeds, including dead stop. By remaining on its air cushion, the twin hulls of the SES will extend only 18 inches into the water thereby reducing significantly the chances of a collision occurring. Moreover, the vessel will be significantly more maneuverable on the cushion and provide greater visibility to avoid potential encounters.

With regard to the designated artificial reef site in Maunalua Bay, we will revise the Final EIS to note its presence.

We look forward to continued coordination with Mr. Nitta and Mr. Naughton of your office. If you have any questions regarding the subject EIS, please contact Mr. Harry Murakami of the Harbors Division at 548-2535.

Very truly yours,

Edward Y. Hirata
Director of Transportation

United States Department of the Interior
FISH AND WILDLIFE SERVICE
PACIFIC ISLANDS OFFICE
P.O. BOX 50167
HONOLULU, HAWAII 96850

ES
Room 6307

NOV 22 1988

'88 NOV 25 P12:45

OFC. OF

Dr. Marvin T. Miura, Director
Office of Environmental Quality Control
465 South King Street, Room 104
Honolulu, Hawaii 96813

Re: Draft Environmental Impact Statement, Oahu Intraisland Ferry System, Oahu

Dear Dr. Miura:

We have reviewed the referenced document and offer the following comments for your consideration.

Our primary concern with the proposed project are potential adverse impacts to endangered waterbirds and their habitats from the construction and operation of the ferry system. In particular, the proposed ferry operation in Maunalua Bay may affect the neighboring State of Hawaii's Paiko Lagoon Wildlife Sanctuary; the proposed ferry operation in Keehi Lagoon may disturb foraging endangered Hawaiian Stilt (Himantopus mexicanus knudseni) using the surrounding mudflat habitats; and the proposed Waipahu operation may alter wetlands at Pearl Harbor and affect the Service's Pearl Harbor National Wildlife Refuge, Waiawa Unit. We recommend that detailed supplemental environmental impact statements be prepared prior to the development of the proposed Keehi and Waipahu terminals.

For the proposed Maunalua Bay Terminal, we recommend that silt curtains be deployed across the mouth of the Paiko Lagoon Wildlife Sanctuary to limit the movement of turbid water generated by dredging from entering the lagoon. In addition, oil spill containment equipment should be stored at the terminal facility in the event of an accidental spill associated with the ferry operation. This work should be done in consultation with the Department of Land and Natural Resources.

The National Marine Fisheries Service (NMFS) has expressed concern regarding potential adverse impacts to the threatened green sea turtle (Chelonia mydas) and endangered humpback whale (Megaptera novaeangliae). The recommendations of the NMFS regarding additional studies and measures to protect these species and their habitats should be fully considered and implemented by the applicant.

Re: Oahu Intraisland Ferry System

The Service will review the Department of Army permit application for this project. We appreciate the opportunity to comment.

Sincerely yours,

Ernest Kosaka
Ernest Kosaka
Field Office Supervisor
Environmental Services

cc: NMFS - WPPO
DLNR
DOT

JOHN WAIHEE
GOVERNOR

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

EDWARD Y. HIRATA
DIRECTOR

DEPUTY DIRECTORS
JOHN K. UCHIMA
RONALD N. HIRANO
DAN T. KOCHI
JEANNE K. SCHULTZ

IN REPLY REFER TO
HAR-EP 2651

December 29, 1988

Mr. Ernest Kosaka, Field Office Supervisor,
Environmental Services
United States Department of the Interior
Fish and Wildlife Service
Pacific Islands Office
P. O. Box 50167
Honolulu, Hawaii 96850

Dear Mr. Kosaka:

Draft Environmental Impact Statement (DEIS)
for Oahu Intraisland Ferry System

Thank you for your comments on the subject DEIS. With respect to potential impacts on the Paiko Lagoon Wildlife Sanctuary, we will revise the final EIS to include potential mitigation measures for the deployment of silt curtains across the mouth of Paiko Lagoon. In the event of accidental spillage associated with the ferry vessel operation, we will have oil spilled containment equipment at the terminal site. As you recommended, we shall do this in consultation with the State Department of Land and Natural Resources.

With respect to potential impacts on sea turtles and humpback whales, we will continue to coordinate potential mitigation measures with the National Marine Fisheries Service as stated in our Draft EIS.

We hope we have satisfactorily responded to your comments. If you have any further questions, please contact Mr. Harry Murakami of the Harbors Division at 548-2535.

Very truly yours,

Edward Y. Hirata
Director of Transportation

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, HONOLULU
BUILDING 230
FT. SHAFTER, HAWAII 96858-5440

REPLY TO ATTENTION OF:

November 16, 1988

Planning Branch

'88 NOV 21 A11:24

Dr. Marvin Miura
Office of Environmental
Quality Control
465 South King Street, Room 104
Honolulu, Hawaii 96813

Dear Dr. Miura:

Thank you for the opportunity to review the Draft Environmental Impact Statement (DEIS) for the proposed Oahu Intra-island Ferry System. The following comments are offered:

a. The need for a Department of the Army permit is recognized on page C-7 of the DEIS. Operations Branch has participated in pre-application meetings with the Department of Transportation. The Harbors Division should continue to coordinate with Operations Branch regarding permit requirements.

b. The flood zone information presented on page B-10 for the Maunalua Bay Ferry Terminal site is correct. According to the Flood Insurance Study for the City and County of Honolulu, the other sites are located in the following zones: Barbers Point Site, Zone AE (special flood hazard area inundated by the 100-year flood) with base flood elevation of 8 feet MSL; Ewa Site, Zone AE with base flood elevation of 6-7 feet MSL; Waikiki Site, Zone D (areas in which flood hazards are undetermined); Waipahu Site, Zone D and Zone A (special flood hazard area inundated by the 100-year flood, with no base flood elevation determined).

Sincerely,

Kisuk Cheung for
Chief, Engineering Division

Copy furnished:

Director
Hawaii State Department
of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813

JOHN WAIHEE
GOVERNOR

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

IN REPLY REFER TO
HAR-EP 2650

December 29, 1988

Mr. Kisuk Cheung, Chief
Engineering Division
Department of the Army
U.S. Army Engineer District, Honolulu
Building 230
Fort Shafter, Hawaii 96858-5440

Attention Planning Branch

Dear Mr. Cheung:

Draft Environmental Impact Statement (DEIS)
for Oahu Intraisland Ferry System - Job H. C. 1694

Thank you for your comments regarding the Department of Army permit and the information on flood zones affecting the Maunalua Bay Ferry Terminal.

We look forward in working with the Operations Branch of your office in the processing of the Department of Army permit for the Maunalua Bay Terminal.

Very truly yours,

Edward Y. Hirata
Director of Transportation

DEPARTMENT OF THE NAVY
COMMANDER
NAVAL BASE PEARL HARBOR
BOX 110
PEARL HARBOR, HAWAII 96860-5020

IN REPLY REFER TO
11010
Ser 03(09P2)/2861
18 NOV 1988

'88 NOV 21 P12:22

Marvin T. Miura, Ph.D.
Office of Environmental Quality Control
465 S. King Street, Room 104
Honolulu, Hawaii 96813

Dear Dr. Miura:

The Navy has reviewed the Environmental Impact Statement (EIS) for the Oahu Intraisland Ferry System. The Navy has no comments to offer at this time, but will comment on the supplemental documentation for the Waipahu Middle Loch terminal once specific siting and design decisions have been made.

For your information, the Navy is currently working with the State Department of Transportation in formulating a Memorandum of Understanding (MOU) concerning the use of Navy controlled lands and waters during the operation of the ferry system. Elements of the MOU on the operation of the ferry and landing should be mentioned in the supplemental documentation for the Waipahu Middle Loch terminal.

Questions should be addressed to Mr. Bill Liu at 471-3324.

Sincerely,

W. K. LIU
Assistant Base Civil Engineer
By direction of
the Commander

Copy to:
State Department of Transportation
869 Punchbowl Street
Honolulu, HI 96813

JOHN WAIHEE
GOVERNOR

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

EDWARD Y. HIRATA
DIRECTOR

IN REPLY REFER TO:

December 27, 1988

HAR-EP 2648

Commander, Naval Base Pearl Harbor
Department of the Navy
Box 110
Pearl Harbor, Hawaii 96860-5020

Attention Mr. W. K. Liu
Assistant Base Civil Engineer

Dear Sir:

Draft Environmental Impact Statement (DEIS) for Oahu Intraisland Ferry System (Response to: 11010 Ser 03 (09P2)/2861)

Thank you for your comments on the subject DEIS. We look forward to continued coordination with your office in the formulation of a Memorandum of Understanding (MOU) concerning the use of Navy-controlled lands and waters by the ferry system. Appropriate elements of the MOU will be incorporated in the environmental documentation for the Waipahu Terminal.

If you have any questions regarding the subject DEIS, please contact Mr. Harry Murakami of the Harbors Division at 548-2535.

Very truly yours,

for Edward Y. Hirata
Director of Transportation

UNITED STATES
DEPARTMENT OF
AGRICULTURE

SOIL
CONSERVATION
SERVICE

P. O. BOX 50004
HONOLULU, HAWAII
96850

November 15, 1988

DEPT. OF TRANS.
STATEWIDE TRANS.
PLANNING OFFICE
Nov 21 11 25 AM '88

Marvin Miura, Ph.D.
Office of Environmental Quality Control
465 S. King Street, Room 104
Honolulu, HI 96813

Dear Dr. Miura:

Subject: Draft Environmental Impact Statement (DEIS) –
Oahu Intraisland Ferry System, Oahu, HI

We have no comments to offer at this time, however, we would appreciate the opportunity to review the final EIS.

Sincerely,

RICHARD N. DUNCAN
State Conservationist

cc:
State Department of Transportation, 869 Punchbowl Street,
Honolulu, HI 96813

DEPARTMENT OF BUSINESS
AND ECONOMIC DEVELOPMENT
ENERGY DIVISION, 335 MERCHANT ST., RM. 110, HONOLULU, HAWAII 96813

JOHN WAIHEE
GOVERNOR
ROGER A. ULVELING
DIRECTOR
BARBARA KIM STANTON
DEPUTY DIRECTOR
LESLIE S. MATSUBARA
DEPUTY DIRECTOR

OCT 21 3 12 PM '88
HARBORS DIVISION

RECEIVED

'88 NOV 17 P3:37

OFC. ...

October 17, 1988

Dr. Marvin T. Miura
Office of Environmental Quality Control
465 South King Street, Room 104
Honolulu, Hawaii 96813

Dear Dr. Miura:

Subject: Draft Environmental Impact Statement for the Oahu Intraisland Ferry System

Thank you for the opportunity to review the Draft EIS. We have no comments to offer at this time.

Sincerely,

MAURICE H. KAYA
Energy Program Administrator

MHK/hk

cc: State Department of Transportation
Harbors Division

JOHN WAIHEE
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF BUSINESS AND ECONOMIC DEVELOPMENT
HOUSING FINANCE AND DEVELOPMENT CORPORATION
P. O. BOX 29360
HONOLULU, HAWAII 96820-1760

JOSEPH K. CONANT
EXECUTIVE DIRECTOR

IN REPLY REFER TO:

'88 NOV 23 P12:27

88:PLNG/1714B JT

November 21, 1988

Mr. Marvin T. Miura, Ph.D.
Office of Environmental Quality Control
465 South King Street, Room 104
Honolulu, Hawaii 96813

Dear Dr. Miura:

Re: Environmental Impact Statement (EIS) for
the Proposed Oahu Intraisland Ferry System

Thank you for the opportunity to review the draft EIS for the proposed project. We have no comments to offer.

Sincerely,

JOSEPH K. CONANT
Executive Director

cc: State Department of Transporation

JOHN WAIHEE
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF DEFENSE
OFFICE OF THE ADJUTANT GENERAL
3949 DIAMOND HEAD ROAD, HONOLULU, HAWAII 96816-4495

ALEXIS T. LUM
MAJOR GENERAL
ADJUTANT GENERAL

MYLES M. NAKATSU
COLONEL
DEPUTY ADJUTANT GENERAL

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Engineering Office

OCT 18 1988

Marvin T. Miura, Ph.D.
Office of Environmental Quality Control
465 S. King St., Rm 104
Honolulu, HI 96813

Dear Dr. Miura:

Oahu Intraisland Ferry System

Thank you for providing us the opportunity to review the subject project.

We have no comments to offer at this time regarding this project.

Sincerely,

Jerry M. Matsuda

Jerry M. Matsuda
Major, Hawaii Air
National Guard
Contr & Engr Officer

Enclosure

cc: State Department of Transportation

JOHN WAIHEE
GOVERNOR OF HAWAII

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

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FORESTRY AND WILDLIFE
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

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'88 NOV 28 A11:58

OFC. ...

NOV 25 1988

FILE: 89-217
DOC.: 4660E

The Honorable Marvin T. Miura, Ph.D.
Director
Office of Environmental Quality Control
465 South King St., Room 104
Honolulu, Hawaii 96813

SUBJECT: O'ahu Intraisland Ferry System

Dear Dr. Miura:

Thank you for giving our Department the opportunity to comment on this matter. We have reviewed the materials you submitted and have the following comments.

The Draft Environmental Impact Statement (DEIS) has addressed most of the expected impacts of the extensive dredging and construction required at the Maunalua Bay site. Mitigation measures have been proposed to the extent possible to prevent excessive negative effects on an already severely stressed ecological system at that site.

The DEIS states that no adverse impacts are expected at the other terminal sites described, unless activities such as dredging, construction near or in coastal waters, or other shoreline modifications become necessary.

All future activities, including blasting, that may impact aquatic resource values at the proposed terminals should be submitted to the Department for review and the necessary permits obtained.

Potential interference with recreational and commercial fishing should be averted as much as possible and compensated for wherever inevitable, during the operation of ferry routes and terminal facilities.

We note, too, that (according to the DEIS) impacts on whales and green sea turtles are still to be determined, yet those impacts are omitted in "Unresolved Issues" on the "Summary Sheet" of the DEIS. We request that mitigation plans regarding whales <u>and</u> green sea turtles are to be coordinated with both the National Marine Fisheries Service and our Office of Conservation and Environmental Affairs.

The EIS contains detailed information necessary for archaeological/historic sites review only for the Maunalua Bay Beach Park Terminal. As the terminal and support system will be located makai of Kalanianaole Highway on fill lands, we anticipate that there will be "no effect" on significant historic sites.

The Waikiki location has yet to be determined, and, therefore, we cannot assess the expected impact. There are historic sites in Waikiki which might be affected depending on terminal location.

The Downtown Terminal, Airport Terminal and Barber's Point Terminal are making use of existing facilities, and we anticipate no problems.

The Ewa Terminal at Ewa Marina cannot be assessed without more information, which, according to the EIS, will be forthcoming when design plans are completed. This location is within the One'ula Archaeological District (Site 80-12/13-2873) which has been determined eligible for listing on the National Register of Historic Places.

The Waipahu Terminal location intrudes on Site 80-13-9992, the Pearl Harbor Naval Base, a National Historic Landmark site which is listed on the National Register. Coordination with the Navy archaeologist, Dr. Robert J. Hommon, and the State Historic Sites Section is necessary.

Thank you for your cooperation in this matter. Please feel free to call me or Jay Lembeck at our Office of Conservation and Environmental Affairs, at 548-7837, if you have any questions.

Very truly yours,

WILLIAM W. PATY

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION

December 29, 1988

HAR-EP 2653

MEMORANDUM:

TO: The Honorable William W. Paty, Chairperson
Board Of Land and Natural Resources

FROM: Director of Transportation

SUBJECT: DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS) FOR OAHU INTRAISLAND FERRY SYSTEM (RESPONSE TO FILE: 89-217, DOC.: 4660E)

Thank you for your comments on the subject DEIS. We look forward to continued coordination with your department in the development of the Oahu Intraisland Ferry System. We shall be consulting with your staff in the preparation of environmental documents and permit processing as they relate to areas of concern expressed in your letter.

We appreciate the assistance your department has provided us in this most important project. If you have any questions concerning the ferry system please feel free to call Mr. Harry Murakami of our Harbors Division at 548-2535.

Edward Y. Hirata

OFFICE OF STATE PLANNING
Office of the Governor

Ref. No. P-8934

November 22, 1988

'88 NOV 28 A11:57

MEMORANDUM

TO: Dr. Marvin T. Miura, Director
Office of Environmental Quality Control

SUBJECT: Draft Environmental Impact Statement (DEIS) for the Oahu Intraisland Ferry System, Oahu

We have reviewed the subject proposal relative to the Hawaii Coastal Zone Management (CZM) Program objectives and policies. Since much of the information regarding the Downtown, Waikiki, Airport, Waipahu, Ewa, and Barbers Point terminals have not been fully identified, assessed, or resolved, we can only offer comments relative to the proposed Maunalua Bay terminal.

CZM policy calls for the provision of adequate, accessible and diverse recreational opportunities in the CZM area by encouraging expanded public recreational uses of County, State, and Federally owned or controlled shoreline lands and waters having recreational value. The proposed Hawaii Kai ferry terminal site will be developed adjacent to the Maunalua Bay Beach Park and the State boat launching ramp. Although the DEIS addresses existing offshore recreational activities and the potential impacts which may occur as a result of the proposed development, a discussion of existing shoreside activities and any potential impacts on shoreside access and use should also be provided in the EIS. The EIS should also discuss whether the proposed project is compatible with any long-range recreational plans for Maunalua Bay Beach Park.

In addition, the DEIS indicates that development of the other six ferry terminals will proceed incrementally, and as these terminals are sited and designed, supplemental environmental assessments and/or EIS's will be prepared. Given the incremental nature of this proposal, the EIS should discuss whether the economic viability of the island-wide ferry system is contingent upon development of the Hawaii Kai terminal.

Thank you for the opportunity to review this proposal. Please feel free to call our CZM office at 548-3961 if you have any questions.

Harold S. Masumoto
Harold S. Masumoto
Director

cc: Department of Transportation

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION

December 28, 1988

HAR-EP 2652

MEMORANDUM:

TO: The Honorable Harold S. Masumoto, Director
Office of State Planning

FROM: Director of Transportation

SUBJECT: DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS) FOR OAHU INTRAISLAND FERRY SYSTEM (RESPONSE TO REF. NO. P-8934)

Thank you for your comments on the subject DEIS. We acknowledge that your comments are limited to the Maunalua Bay Terminal.

We will revise the Final EIS to include a discussion of existing shoreside activities and public access. With respect to Maunalua Bay Beach Park, the City has currently developed all of the lands under their control in the immediate vicinity of the proposed ferry terminal. Discussions with the Department of Parks and Recreation indicate that planning for the park recognizes use of the proposed ferry terminal site as dedicated to maritime uses. The proposed ferry terminal would, therefore, be consistent with the recognized use of the property.

Due to the artificially set low fares, the commuter service between Maunalua Bay and Downtown Honolulu will not be economically viable. However, the operator has bid to pay the State for the privilege of providing the service. He is expected to make up the shortfall by utilizing his vessels for commercial purposes during the non-commute periods. Consequently, the economic viability of the ferry commuter service is not a consideration in the implementation of the commuter ferry project.

The Honorable Harold Masumoto, Director HAR-EP 2652
December 28, 1988
Page 2

We hope that we have satisfactorily responded to your comments. If you have any questions, please feel free to call Mr. Harry Murakami of the Harbors Division at 548-2535.

Edward Y. Hirata

University of Hawaii at Manoa

Environmental Center
Crawford 317 • 2550 Campus Road
Honolulu, Hawaii 96822
Telephone (808) 948-7361

RECEIVED

WILSON OKAMOTO & ASSOCIATES

November 22, 1988
RE:0512

Dr. Marvin Miura, Director
Office of Environmental Quality Control
465 South King Street, Room 104
Honolulu, Hawaii 96813

Dear Dr. Miura:

Draft Environmental Impact Statement
Oahu Intraisland Ferry System
Island of Oahu

The State Department of Transportation (DOT) is proposing to establish an intraisland ferry system serving the southern coastline of Oahu. Seven terminals are planned from Hawaii Kai to Barbers Point. The first phase of the project will be the development of the Maunalua Bay Terminal with the remaining terminals added incrementally. As these terminals are sited and designed, the Draft Environmental Impact Statement (EIS) notes that Supplemental Environmental Assessments or, if deemed necessary, Supplemental Environmental Impact Statements for the individual ferry terminals will be prepared. Therefore, the Environmental Center's review was basically limited to the Maunalua Bay Terminal site. This document was reviewed with the assistance of Peter Flachsbart and Karl Kim, Urban and Regional Planning; Charles Mader and George Curtis, Joint Institute of Marine and Atmospheric Research; Jan Auyong, Sea Grant; Shelia Conant, General Science; William Coulbourn, Geology and Geophysics; and C. Anna Ulaszewski, Environmental Center. The following topics have been noted by our reviewers for further consideration in the Final EIS.

<u>Waves, Tides and Shoreline Processes</u> (page B-8)

We agree with the discussion of "Shoreline Processes" cited in this section. The instability of the shoreline at Portlock and shoaling of the inlet to the Hawaii Kai Marina are problems dating from at least the early 1970's. The results of a shoreline study as conducted by Frans Gerritsen and Associates in 1972 are in complete accord with the Draft EIS now under evaluation, namely; the inlet is filling from the east, this shoaling process will continue, the filling is a result of a westward transport of sand along the beach at Portlock, and the shoreline along segments of the beach at Portlock is receding.

While the effects of deepening the channel and dredging for the turn basin on longshore transport of sand/sediment appear to be almost negligible, they are still a concern. Any removal of sand and limestone from the reef flat will tend to make conditions even more unstable. However, the relative significance of the channel dredging on the stability of the shoreline is at this point a judgement call. The relationship between water circulation and sand transport at Portlock is not sufficiently well known to be able to state with confidence what the effects, if any, will be.

The Draft EIS does not address what effects, if any, the ferry pier may have on the sediment transport. For example, since the current runs from Portlock to the Maunalua Terminal, will on going dredging and maintenance be needed to keep the terminal area passable? This would constitute an on going environmental impact and an increase in operational costs. The Final EIS should address these issues.

The proposal to dump the dredged material at an offshore disposal site is of particular concern. We strongly urge that the dredge spoils be screened for particle-size selection and the appropriate sorted components be used as beach fill at Portlock or other littoral cells in need of replenishment, rather than wasted in a disposal at sea.

<u>Comfort Station</u> (page B-29)

Concerns expressed in our earlier review, questioning the adequacy of the Comfort Station are not addressed in the Draft EIS. To reiterate: It does not seem reasonable that the existing comfort station, which is only served by a cesspool, is adequate to meet the needs of a possible 1,200 ferry users per day. A quantitative analysis to determine the ability of this existing facility to handle the expected wastewater volumes generated by the terminal users must be included in the Final EIS.

<u>Recreation</u> (page D-4)

The safety of the swimmers, divers, boaters, and jet skiers using Maunalua Bay is still a major concern. The information given on page D-8 concerning the maneuverability and visibility of the proposed vessel is enlightening; however, we are still concern about the lack of visibility during dusk and dawn operations. As mentioned in our previous comments, weekday recreation is often concentrated in the hours before and after work. There has been no discussion of the likelihood of collision nor expectancies of injuries and fatalities. Evaluation of operational risk should be more adequately covered in the Final EIS.

<u>Endangered Species</u> (page D-7 and Appendix D)

We find the data contained in Appendix D, "Maunalua Bay Biological Assessment, page 38, inadequate in regards to the green sea turtles. In response to comments made in a letter from Mr. and Mrs. Marshal K. Rosa, et al, the Department of Transportation states, "To further assess impacts that construction of the channel may have on turtles, additional turtle counts and survey of feeding areas will be conducted and documented". Therefore, until the proposed additional studies are conducted and documented, a "thorough review" of the potential impacts on the green sea turtle is not possible. (Declaratory Ruling No. 87-1, by the Environmental Council, "The inclusion of any such incomplete report in a draft environmental impacts statement compromises the intent of Chapter 343, HRS [Sec. 343-1] and the EIS Rules [Sec. 11-200-15 (a) and 17 (g)] by denying individuals the opportunity for a thorough review of the proposed action and its potential impacts.")

Air Quality (page D-11)

It is our understanding that the intersection of Keahole and Kalanianaole Highway may be a carbon monoxide hot spot during reduced wind conditions. Our previous comments expressed this concern; however, it was not addressed in this document. This is an important issue because The National and State air quality standards allow for only one violation of the CO standards per year.

Aesthetics (page D-14)

The addition of any structural complex to an essentially undeveloped shoreline area, be it "visually obtrusive" or not, will have a visual impact. Any structure or three foot tall shrubbery will have some visual impact on the shoreline and the Bay.

Alternatives (pages D-17, 18)

The alternatives section discusses some possible alternative sites, development concepts, channel alignments, and parking that might be considered in carrying out the intraisland ferry project. However, no mention is made of "alternative" transportation modes and what might be accomplished given a comparable budget. For example, what are the relative costs and benefits relevant to the expansion of the present express bus system from Hawaii Kai to downtown Honolulu? Consideration should be given to the initiation of shuttle bus ferry passenger collection systems to alleviate parking requirements in the area makai of the highway. Considering the capital subsidy that will be required to support construction, maintenance and operational aspects of the ferry system, we urge that the economics and environmental implications of alternative transportation schemes to this proposed project be examined.

Long-Term Productivity (page D-21)

In our previous comments submitted at the Preparation stage of this Draft EIS, we called attention to earlier plans by the Corps of Engineers to develop a small boat harbor at Maunalua Bay. The present Draft EIS has not addressed the small boat harbor issue except for a single sentence on page D-21. To quote from our previous statement:

"From 1984 through 1986, the Corps of Engineers, with the assistance of a citizens group, met regularly to develop plans for a small boat harbor at Maunalua Bay. These plans were finalized in late 1986 but action on implementation was deferred due to administrative changes by the Corps.

Justification for Corps monies was originally based on the need for recreational boating facilities. Hence the surveys taken in the early planning stage focussed on identifying recreational users. Much later, in 1986, an administrative change order to the Corps directed that all boat harbor development by the Corps be justified on the basis of commercial need. At this stage the harbor had efffectively been designed, the principals in the Corps that had guided the planning were being transferred, federal funds were tight, and the project was put on hold. However, it should be noted that the proposed commercial ferry use may serve to justify federal funds for the boat harbor project if it can be shown to be compatible with existing plans for the ferry terminal. Unfortunately, the proposed terminal seems to have been designed with no recognition of the earlier studies and as presently conceived, appears to be incompatible with the small boat harbor plans.

We urge that the earlier boat harbor plans and the ferry terminal needs be considered together so as to maximize long range plans for use of Maunalua Bay and minimize expensive future alterations and subsequent environmental impacts."

We should also mention that such coordination might produce some opportunity for federal funds to construct the terminal and would surely reduce potential conflicts between users.

Appendix A

The EIS makes no quantitative analysis of projected demand for parking space; however, based on data provided in Appendix A, it is estimated that the ferry will remove 182-699 cars per 3-hour commuting period from the Kalanianaole Highway. The Transportation and Traffic Engineering Handbook (1976, pp. 699-700) notes that about 40 percent of users of a change-of-mode facility in a suburban location arrived at the facility by automobile. The State DOT needs to determine if this percentage is appropriate to current practices and to the Maunalua Bay Terminal parking situation. If the 40 percent figure is correct, then at least 73-230 cars will need parking space at the terminal.

The Draft EIS designates the City and County of Honolulu's Park-and-Ride as the alternative parking location. The distance of this facility "is regarded as adverse to ferry ridership." It is suggested that, if necessary, "alternative methods of transporting ferry passengers to the terminal could be considered." This would increase the operating expenses if, for example, shuttle buses are required. Also, the addition of these buses will exacerbate the traffic congestion in the area of the terminal. It would seem appropriate to include a discussion of these other modes of access to the ferry terminal in the discussion under "alternatives"?

Assumptions should be made that not all users of the ferry will arrive by car, some will arrive by bus, and others will be dropped off by their spouse. Some users may even walk or use a bicycle to get to the terminal. The proposed plan for the facility (Figure 3) does not provide space for bicycles and we believe that this option should be made available. Also, we are concerned about the safety of the bus riders and pedestrians crossing Kalanianaole Highway, and the traffic delays at the Keahole Street intersection of the highway.

These issues were stated in our previous comments on the Preparation Notice. They are not addressed in the Draft EIS. It is essential that these important issues be covered, in detail, in the Final EIS.

We note that 68.4 percent of the people surveyed (based on the survey results conducted for DOT (Appendix A)), have expressed "zero interest" in the ferry system. The potential direct benefits, (for this initial phase of the project) are focused on those in Hawaii Kai and the downtown corridor. Also, according to a statement made on page A-12, it appears that only "residents with a valid Hawaii drivers license" will be allowed to used the ferry system. The rational of this statement is not clear. There are many residents of Hawaii who may wish to utilize the services of the ferry system who do not have a valid Hawaii drivers license. It does not seem reasonable for taxpayers to be paying for a facility that is denied to them.

Flood Hazard and Tsunami Inundation (Appendix F)

The inclusion of Appendix F "Numerical Modeling of Channel Effect on Maunalua Bay," provides beneficial information. It is our understanding that every reasonable combination of wave periods and heights have been evaluated and that the proposed channel modification appears to have little or no effect on tsunami inundation. (Please be advised that the wave period modeled in Figure 3 reflects a 1/2 minute period not 1 minute period as cited.)

We hope that these comments will be helpful in preparing the Final EIS and we look forward to the opportunity of reviewing the Supplemental Statements for the additional terminals as they become available.

Yours truly,

Jacquelin Miller

Jacquelin Miller
Associate Environmental Coordinator

cc: Department of Transportation
Earl Matsukawa, Wilson Okamoto & Assoc.
L. Stephen Lau
William Coulbourn
George Curtis
Peter Flachsbart
Jan Auyong
Charles Mader
Sheila Conant
C. Anna Ulaszewski

JOHN WAIHEE
GOVERNOR

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

EDWARD Y. HIRATA
DIRECTOR

DEPUTY DIRECTORS
JOHN K. UCHIMA
RONALD N. HIRANO
DAN T. KOCHI
JEANNE K. SCHULTZ

IN REPLY REFER TO

December 30, 1988

HAR-EP 2658

Ms. Jacquelin Miller
Associate Environmental Coordinator
Environmental Center
University of Hawaii at Manoa
Crawford 217
2550 Campus Road
Honolulu, Hawaii 96722

Dear Ms. Miller:

Draft Environmental Impact Statement (DEIS)
for Oahu Intraisland Ferry System
(Response to RE:0512)

Thank you for your comments on the subject DEIS. We acknowledge that your comments are limited to the Maunalua Bay Terminal and invite your review of subsequent environmental documents to be prepared for the remaining terminals.

We offer the following responses to your comments, respectively, by topical areas:

<u>Waves, Tides and Shoreline Processes</u>

We acknowledge your views on the uncertainty of predicting the impacts of dredging on shoreline erosion. Both the DEIS and the Final EIS identify this uncertainty as an unresolved issue.

Sediment transport volume at the ferry pier should be minimal. The deep cove just east of the comfort station acts as a barrier to sediments approaching from the east. The short length of revetted shoreline located between the cove and the dredged basin for the pier is the only source of sediments.

The notion of using sand dredged from the channel for beach replenishment was considered. The associated costs for such work

may be prohibitive, particularly in consideration of DOT's potential responsibility for beach erosion in the area. Clearly, the DOT is not responsible for historic erosion nor future erosion which is anticipated to continue even without the proposed channel widening. As you noted, the potential impact of dredging on accelerating on-going erosion appears to be almost negligible, although not quantifiable.

<u>Comfort Station</u>

As a short duration transit point for ferry passengers to be served on a regular schedule, the ferry terminal is not anticipated to place significant demand on the comfort station at the park. Moreover, the ferry vessel will have restroom facilities on-board for passenger use. By comparison, the Park-and-Ride facility at Hawaii Kai offers no restroom facilities and there are no toilets aboard City buses.

<u>Recreation</u>

The potential for accidental collision involving the ferry and recreational participants in the bay at dawn and dusk will be minimized, since the ferry is fully equipped to operate at night. A lighting system will allow the pilot to survey the path of the ferry as he maneuvers it through the channel. The ferry vessel will also be lighted so it may be easily recognized from a distance. In addition, the ferry will be operating at low speed (5 knots) on an established schedule and confined to the access channel in the bay. This will afford various recreational participants a high degree of predictability regarding the presence of the ferry vessel. The water jet propulsion system also offers a greater degree of safety as there will be no propellers in the water that could inflict severe bodily injury.

<u>Endangered Species</u>

The sea turtle study discussed in the DEIS was requested by the National Marine Fisheries Services (NMFS) as a basis for their "Section 7" review of the Department of the Army permit. The study scope was coordinated with NMFS to assure that it would meet their review needs. While the study was not completed in time for inclusion in the DEIS, it will be included in the Final EIS, as recommended by the NMFS. Any further concerns related to the study can be directed to the NMFS for their consideration.

Air Quality

The State Department of Health (DOH) has no data verifying the Keahole Street/Kalanianaole Highway intersection as a carbon monoxide "hot spot" during reduced wind conditions. Unlike large parking structures or built-up areas in which such CO "hot spots" may occur, the area is wide-open in character and well ventilated by prevailing tradewinds and other air movements. Therefore, even under reduced wind conditions, the potential creation of a CO "hot spot" is expected to be minimal. The DOH does not maintain a CO monitoring station at the intersection like it does in Waikiki and Downtown Honolulu to detect violations of air quality standards.

With respect to generation of air pollutants, the DEIS notes that the ferry terminal will result in a redistribution of traffic rather than the creation of "new" traffic. The ferry vessels will be an additional source of air pollution, but their contribution relative to ambient levels will be negligible. In the larger sense, the ferry system will reduce air pollution by removing cars from the highway.

Aesthetics

The intent of the discussion on "Visual Quality" was to describe the relative significance of impact the terminal facility would have on view planes and open space in the area. Both the text and accompanying figures indicate that the facility will have some visual impact. The degree of impact was judged to be insignificant, however, within the context of existing open space, structures and uses associated with the site.

Alternatives

The Maunalua Bay/Downtown Ferry terminals are proposed as the first link of the Oahu Intraisland Ferry System. Inasmuch as ferry system benefits will not be confined to the commuter link between Hawaii Kai and Downtown, comparisons with other modes of transit providing this link would not present a complete assessment. Within the context of this link, however, the ferry service is regarded as providing an alternative mode of transportation for commuters that does not rely on Kalanianaole Highway. It is also considered a supplement to other mass transit services, not an alternative. There are no alternative sites being considered for the Maunalua Bay Terminal at this time.

Establishment of a shuttle service to serve the ferry terminal shall be considered if ridership exceeds present projections and places excess demand on the capacity of the proposed parking lot.

Long-Term Productivity

According to the Corps of Engineers, their plan for the small boat harbor has been placed on indefinite hold, since the cost-benefit analysis under the new guidelines yields a negative balance. The proposed improvements for the ferry terminal at Maunalua Bay will not conflict with the most recent harbor layouts prepared by the Corps and would support the harbor by reducing or eliminating the need to dredge an entrance channel. The only conflict may be over the increased usage of the channel, and that should be resolved if and when planning for the small boat harbor reaches the design stage.

Appendix A

The size of the parking lot was determined largely based on the availability of space. To minimize potential adverse environmental and community impacts, alternatives for filling areas seaward of the shoreline for a larger parking area were not considered feasible. Also, a significant portion of the site is devoted to a queuing loop for passengers arriving by bus or who are being dropped off.

Based on initial ridership estimates of 250 to 450 persons per day, and using the 40 percent rate of arrival by automobile mentioned in your letter, the parking lot should be more than adequate for the high end of the ridership projection. Should ridership exceed projections, alternative methods of transporting ferry passengers to the terminal will be considered. Since a shuttle system would also result in a redistribution of traffic as opposed to creation of "new" traffic, the overall traffic levels would be unchanged or reduced as automobiles are removed from roadways. Specific improvements at the Keahole Street/Kalanianaole Highway intersection as discussed in the DEIS can improve traffic movement through the intersection.

Bicycle racks, furnished by the contractor, shall be available at all landings for those passengers who wish to bike-sail-bike.

The principal purpose of the project is to take cars off the road during commuting hours. The ferry operator shall develop a means of providing holders of a valid Hawaii driver's license a discounted fare of not greater than $2.50 one way, available at any time on authorized ferry routes. However, other users of the commuter ferry will be charged a fee set by the ferry operator. Other potential riders without a valid Hawaii driver's license, such as students and senior citizens already have reduced fares (student fares and free bus passes) on other means of mass transit.

Flood Hazard and Tsunami Inundation

Appendix F "Numerical Modeling of Channel Effect on Maunalua Bay" has been completely revised to more fully document the findings presented in the EIS.

I hope we have satisfactorily responded to your comments. We appreciate your participation in the EIS process.

Very truly yours,

Edward Y. Hirata
Director of Transportation

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

FRANK F. FASI
MAYOR

DONALD A. CLEGG
CHIEF PLANNING OFFICER

GENE CONNELL
DEPUTY CHIEF PLANNING OFFICER

DEPT. OF TRANS. STATEWIDE TRANS. PLANNING OFFICE
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DT

VH/DGP 10/88-3788

November 15, 1988

Honorable Marvin T. Miura, Director
Office of Environmental Quality Control
State of Hawaii
465 South King Street, Room 104
Honolulu, Hawaii 96813

Dear Dr. Miura:

Draft Environmental Impact Statement
<u>for the Proposed Oahu Interisland Ferry System</u>

We have reviewed the subject Draft Environmental Impact Statement (DEIS) and we are especially concerned with the Hawaii Kai Transportation Dock (marine terminal) because this facility is currently under review as an amendment to the East Honolulu DP Public Facilities Map. We expressed our specific concerns about the proposed Hawaii Kai Ferry Terminal in a letter to Mr. Edward Y. Hirata, Director, State Department of Transportation (DOT) dated October 21, 1988 (see attached copy). We find that only the Hawaii Kai Ferry Terminal part of the subject DEIS provides enough information for us to submit our review and comments. We will review each of the 6 remaining terminals as you prepare supplemental environmental assessments or EIS's. Therefore, we will limit our comments to the Hawaii Kai Ferry Terminal part of the subject DEIS.

1. Impacts on the marine environment in Maunalua Bay (especially concerning the impacts of channel dredging).

The DEIS discusses the potential effects of dredging and blasting upon whales and green sea turtles by stating that: (a) there will be no noise impacts on whales because there will be no blasting from November through March when whales are in Hawaiian waters; (2) there will be no blasting in the primary resting places of the turtles; (3) visual surveys prior to blasting and smaller blast charges <u>could</u> be used to reduce the risk to the turtles; and (4) DOT is coordinating with the National Marine Fisheries Service to obtain baseline studies of turtle habitats and food sources.

We would like an analysis in the final EIS of the effects of dredging and blasting a channel to be expanded to cover other marine species, i.e., fish, shellfish and coral. We strongly urge that visual surveys be conducted before each blast and that smaller charges be required--not optional.

2. Impact on other current aquatic activities in Maunalua Bay, i.e., the water-skiing area near the proposed ferry pier.

The DEIS states that "adoption of DOT Administrative Rules and Regulations will clearly establish designated areas for both commercial and recreational uses of Maunalua Bay." We suggest that the final EIS include maps which clearly define the areas of Maunalua Bay assigned to water skiers, jet skiers, canoers, surfers, divers, kayakers, fishers, and other ocean recreation users. Figure 19, DEIS includes a map of marine recreational activities in Maunalua Bay that does not appear to describe the full range of recreational activities occurring at the Bay (i.e. swimming, shoreline fishing, etc.) and is confusing because of the numbers used on the map to indicate depth contour lines and the numbers used to describe recreational activities are not differentiated.

3. Potential impact on marine life by the selected ferry vehicles, i.e., green sea turtles and whales.

Under "Unresolved Issues," the DEIS includes "the potential for collision of the ferry vessel with humpback whales" as an undeterminable possibility due to a current lack of information. We consider this a grave danger to both whales and ferry passengers and recommend that the final EIS include a careful scrutiny of all possible means to mitigate this potential disaster. We note with some apprehension that the ferry can decelerate from its top speed of 42 knots to a stop within 60 meters; in conditions of poor visibility, a fool proof method of spotting humpback whales would thus appear to be an absolute requirement.

4. Other potential social and economic impacts upon the current uses and users of Maunalua Bay.

The social and recreational impacts of channel dredging and other construction activities appear to occur mostly as short term impacts. For example, the noise level at the project site will rise due to the use of heavy equipment. Noise from this construction will probably bother recreational activities at Maunalua Bay Beach Park, i.e., fishing, picnicking, canoe paddling, and kayaking. There appears to be a need for a public information program to explain the potential for ciguatera poisoning from fish caught in the dredged areas.

5. Noise impacts of the proposed operation.

Noise appears to be a potential problem as the ferry arrives and departs from the pier. The DEIS states that similar vessels generate noise levels of 76 dbA fifty feet astern and 63 dbA at 600 feet abeam at full power; the DEIS also notes that the vessel will not be closer than 850 feet from any Hawaii Kai residence--presumably at reduced speed. While a noise level of 63 dbA is loud, it does not exceed the maximum noise level of 65 dbA that is acceptable to the FHA for aircraft noise in residential areas; however, it does exceed the daytime noise maximum established by the State Community Noise Control Regulations. The DEIS notes that the planned maximum schedule of four trips each during the morning and evening rush hours will only create ferry noise during the morning and evening rush hours. Excess noise at any time of the day or night may cause complaints and fines; we urge mitigation measures.

6. Total cost of the project broken down is detailed in the application.

We find no reference in the DEIS to the total cost of this Oahu Interisland Ferry system. We urge that the final EIS include an estimate of the total cost of the seven proposed ferry terminals with a breakdown for the cost of each terminal and an estimate for operating costs.

7. The impact that the project will have on reducing traffic congestion on Kalanianaole Highway.

The DEIS estimates the following reduction in traffic along Kalanianaole Highway due to ferry ridership:

a) AM peak hour

(1) with 250 ferry passengers = .9%
(2) with 450 ferry passengers = 1.6%

b) PM peak hour

(1) with 250 ferry passengers = 1.2%
(2) with 450 ferry passengers = 2.1%

c) 3 hours AM period (80% capacity) = 5.6%

d) 3 hours PM period (80% capacity) = 6.5%

While these figures are estimates of ridership potentials, even the maximum traffic reduction of 6.5% indicates that the ferry system will only supplement East Honolulu's major traffic movements by auto and bus.

8. An analysis of the cost effectiveness of this project and the cost effectiveness of other alternative transportation measures considered or proposed.

In our review of the proposed DP Public Facilities Map amendment, we require a cost/benefit analysis of the proposed reduction in Kalanianaole Highway traffic via the ferry system as well as other alternative transportation measures considered or proposed. The cost/benefit analysis should consider the following points:

a) The travel time saved (in the ferry system include travel to and from the transportation dock, wait, load, unload, and travel from downtown dock to workplace).

b) Cost including ferry fare and bus fare as required versus auto use (gas, insurance and wear and tear).

c) Total cost of developing the ferry system.

9. Under the section on Land Use Policies and Zoning, page C-2 of the DEIS, the text should indicate that a DP Public Facilities Map amendment, 87/EH-1004(IC), is being processed by the Department of General Planning to add a symbol for the proposed transportation dock. The project will not conform to the development plan until this proposed amendment is approved.

Thank you for this opportunity to comment upon the DEIS.

Sincerely,

Donald Clegg

DONALD A. CLEGG
Chief Planning Officer

DAC:js

Attachment

cc: Honorable Edward Hirata, Department of Transportation

JOHN WAIHEE
GOVERNOR

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

EDWARD Y. HIRATA
DIRECTOR

DEPUTY DIRECTORS
JOHN K. UCHIMA
RONALD N. HIRANO
DAN T. KOCHI
JEANNE K. SCHULTZ

IN REPLY REFER TO

December 30, 1988 HAR-EP 2644

Mr. Donald Clegg
Chief Planning Officer
Department of General Planning
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Clegg:

Draft Environmental Impact Statement
(DEIS) for the Oahu Intraisland Ferry
System (in Response to VW/DGP 10/88-3788)

Thank you for your comments on the subject DEIS. We have prepared and submitted Form 101 and supplemental information requested in your letter of October 21, 1988 (Ref. No. VW/DGP-I-1194) relating to our application for a Development Plan Public Facilities Map Amendment to accommodate the Maunalua Bay Ferry Terminal.

With respect to the remaining six terminals, we look forward to working with your department to assure that they are appropriately identified on the City's Development Plan Public Facilities Map, as planning for those terminals proceeds.

In response to your numbered comments to the Maunalua Bay Ferry Terminal, we offer the following, in respective order:

1. The effects of dredging and blasting on marine species other than whales and turtles are discussed in the DEIS within the context of increased turbidity associated with such activities. Specific references are made to impacts on the reef flat and benthic environment in the sections entitled "Water Quality" and "Benthic Impacts" on page D-3. The effects of blasting on species other than whales and turtles were not specifically addressed since the species affected

are not known to be rare or endangered. Blasting will likely kill fish, coral and other marine flora and fauna in the immediate vicinity of the charges. Following construction, those species are anticipated to re-establish themselves as the bay returns to pre-construction conditions. Some permanent modification of the substratum will result in changes in the availability of habitats, but this is addressed as a concern only as it may affect endangered or threatened species. Notably, the channel alignment avoids areas where significant coral growth remains.

Mitigation measures required to protect sea turtles will be determined in coordination with the National Marine Fisheries Service and the State Department of Land and Natural Resources. These may be imposed as conditions of the U. S. Department of Army permit, required for all work in waters of Maunalua Bay.

Passage of the ferry vessel will not conflict with existing recreational and commercial activities in the bay. The ferry will be confined to the existing boat channel which accommodates existing boat traffic.

2. Since publication of the DEIS, the DOT Boating Branch has finalized its Ocean Recreation Management Plan. The final maps contained in the document will be incorporated in the Final EIS and the discussion of recreational impacts revised as appropriate. To better depict the various zones designated within the bay, the figure will be adapted to exclude symbols not directly related to the discussion.

3. Various methods of mitigating the possibility of encounters between the ferry vessel and whales are being considered in discussion between the DOT and the National Marine Fisheries Service. We do not believe there is a "fool-proof" method of spotting whales or that the feasibility of the ferry service should be contingent upon such a requirement.

4. Potential mitigation measures to address the possibility of ciguatera toxicity in fish attributable to dredging were discussed in the DEIS. Implementation of appropriate mitigation measures will be pursued in the course of processing the U. S. Army Corps of Engineers Permit.

5. Noise associated with the ferry vessel is assessed on page D-14. The noise created by the ferry vessel will be limited to four instances of arrival and departure during

the morning rush hour and four instances of arrival and departure during the evening rush hour. The level of noise generated by the ferry vessel during these times is well within the acceptable limits of health and welfare as determined by the Environmental Protection Agency. The example regarding traffic on Kalanianaole Highway was presented to illustrate what residents along Portlock may encounter. Noise sensitive uses such as residential development are not anticipated to be adversely affected by noise generated during ferry vessel operations. The operator will abide by all noise regulations in effect.

6. The estimated total cost for the Oahu Intraisland Ferry System at this time is $3,310,000.

   Breakdown of cost includes:

A.	Planning for (7) Terminals	$ 500,000
B.	Design for (7) Terminals	910,000
C.	Construction for Hawaii Kai Terminal	1,400,000
D.	Construction for Barbers Point and Honolulu Harbor Terminals	500,000
E.	Construction for (4) other Terminals	N/A
F.	The Ferry Operating Cost	N/A

   The details for (4) other sites have not been determined at this time (note Item E above).

   Operating cost depends on scheduling and routing, which has yet to be determined (note Item F above).

7. The DEIS states that the ferry system is not initially anticipated to reduce traffic along Kalanianaole Highway; although it is intended to remove cars from the highway. It will provide commuters with an alternative mode of transportation that does not rely on the highway. Should ferry ridership increase, further reduction in highway traffic could be realized. The ferry system will initially supplement major traffic movements by auto and bus, but more specifically it will supplement mass transit alternatives with one which does not rely on the highway. We believe that this is a significant advantage. To state that it "only supplements" other transportation modes is an undeserving judgment.

8. Inasmuch as the ferry service is not intended to substantially relieve traffic congestion on Kalanianaole Highway, no comparative cost analysis between the project and other alternative transportation measures was considered.

9. We will revise the Final EIS to reflect the status of the DP amendment request.

We hope that we have satisfactorily responded to your comments. If you have any further questions, please feel free to contact Mr. Harry Murakami of our staff at 548-2535.

Very truly yours,

Edward Y. Hirata
Director of Transportation

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

ENV 2-1
JA/G

November 4, 1988

Mr. Marvin T. Miura, Ph.D.
Office of Environmental Quality Control
465 S. King Street, Rm 104
Honolulu, HI 96813

Dear Mr. Miura:

Subject: Draft Environmental Impact Statement for Oahu Intraisland Ferry System

We have reviewed the subject document and have no comment.

Sincerely,

William A. Bonnet
Manager, Environmental Department

cc: State Department of Transportation
869 Punchbowl Street
Honolulu, HI 96813

2766-05
EW

E. ALVEY WRIGHT, HITECH

"... to study improvements in the transportation of people, goods and information in Hawaii by the application of high technology".

922 Mokulua Drive
Kailua, HI 96734
(808) 262-7464
16 October 1988

RECEIVED
OCT 18 1988
WILSON OKAMOTO & ASSOCIATES

Mr. Earl Matsukawa
Wilson Okumoto & Associates
1150 S. King Street
Honolulu, HI 96614

Dear Sir:

Intraisland Ferry System

Your EIS predicted in the ADVERTISER (10/15) article by Andy Yamaguchi that the Hawaii Kai ferry would cut Kalanianaole traffic only 3-6%.

Please place this prediction in perspective by comparing with the increase in daily bus patronage and the percentage cut in Kalanianaole traffic, <u>since</u> the expensive park and ride facility has been open.

Additionally, your EIS gives the impression that building docks and other shoreside facilities will cost taxpayers millions. In fact, these facilities cost tsxpayers nothing. The cost is carried by Harbor Special Funds and will be amortised over the 20-year life of the contract by mooring and dockage charges to the ferry operator.

Please compare no facility, no construction, no operating, and nomaintenance cost of ferry transit with the annual taxpayer subsidy for bus transit.

Your public explanations will be appreciated.

Aloha,

E. Alvey Wright

E. Alvey Wright
Rear Admiral, USN(Ret)

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION

December 30, 1988

HAR-EP 2660

Admiral E. Alvey Wright, HITech
922 Mokulua Drive
Kailua, Hawaii 96734

Dear Admiral Wright:

Draft Environmental Impact Statement (DEIS)
for Oahu Intraisland Ferry System

Thank you for your letter of October 16, 1988 and your comments on the subject project. In response we offer the following comments:

1. The estimate of traffic reduction contained in the DEIS is based on a ridership survey conducted by the Statewide Transportation Planning (STP) office.

   The current level of bus patronage for the newly developed park and ride facility is not a true long-term representation required to make a valid prediction and comparison with the proposed ferry ridership. Recent Hawaii Kai residents are provided incentives such as free bus passes to encourage use of the park and ride facility. Perhaps, when a true bus ridership representation is established, such a comparison can be projected. However, the Maunalua Bay terminal can be regarded as providing an alternative mode of transportation for commuters that does not rely on Kalanianaole Highway and will also supplement other mass transit services.

2. With regards to the Harbor Special Fund, it is responsible for the acquisition, construction, operation and maintenance of harbor facilities which are entirely or predominantly supported by user charges. A reference to this fact will be made in the Final EIS. To state that the ferry facilities will cost taxpayers nothing, however, would be misleading since some public monies will be expended.

The DOT Harbors Division will request the upcoming Legislature to appropriate general funds for the Intraisland Ferry System.

I hope we have satisfactorily responded to your comments. If you have any questions, please feel free to contact Mr. Harry Murakami of the Harbors Division at 548-2535.

Very truly yours,

Edward Y. Hirata
Director of Transportation

E. ALVEY WRIGHT, HITech

"... to study improvements in the transportation of people, goods and information in Hawaii by the application of high technology".

922 Hokulua Drive
Kailua, HI 96734
(808) 262-7464
18 October 1988

Mr. Earl Katsukawa
Wilson Okumoto & Associates
1150 S. King Street
Honolulu, HI 96814

RECEIVED
OCT 19 1988
WILSON OKAMOTO & ASSOCIATES

Dear Sir:

Intraisland Ferry System

Your EIS calls for dredging the entrance channel in Maunalua Bay at Hawaii Kai 50 feet wider than is necessary, leading to increased beach erosion.

The present channel width is 100 feet or less, allowing 50 feet for passage in each direcion. Two ferries will never be in the entrance channel at the same time. If one way is increased from 50 to 100 feet, a total channel width of 150 feet is quite adequate for a fishing boat and ferry to pass going in opposite directions. There is no standard for Surface Effect Ships (SES). The EIS width of 200 feet might be needed for a Hovercraft but not for an SES air-cushion ferry.

Additionally, no mention is made in the EIS of the need for a navigational range for the entrance channel, like the range into Kewalo Basin. A navigational range is required at Maunalua Bay for both fishing craft and ferries.

Additionally, a specific alternative location for the Waikiki terminal, outside the Ala Wai and Hilton,area is not evaluated. Please treat Kewalo Basin, on a not-to-interfere basis with fishing craft, to thesame extent as Honolulu Harbor and Barbers Point Harbor.

Additionally, evaluation of ferry impact along the route omits the possible hazard to surfers and rough water swimmers, and possible interference with outrigger canoes and sailing craft.

Additionally, the environmental impact of rough water on passengers on board the SES ferry is not considered. This issue of seakindliness is paramount to the success of mass transit by ferry.

Your responses to the above will be appreciated.

Aloha,

E. Alvey Wright

E. Alvey Wright
Rear Admiral, USN(Ret)

JOHN WAIHEE
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION

EDWARD Y. HIRATA
DIRECTOR

DEPUTY DIRECTORS
JOHN K. UCHIMA
RONALD N. HIRANO
DAN T. KOCHI
JEANNE K. SCHULTZ

IN REPLY REFER TO

December 29, 1988 HAR-EP 2659

Admiral E. Alvey Wright, HITech
922 Mokulua Drive
Kailua, Hawaii 96734

Dear Admiral Wright:

Draft Environmental Impact Statement (DEIS)
for Oahu Intraisland Ferry System

Thank you for your letter of October 18, 1988 and your comments on the subject project. In response we offer the following comments:

1. Based on the findings of the numerical model of the proposed channel, erosion at Maunalua Bay will not necessarily be reduced by dredging a narrower channel. However, due to significant public concern expressed about potential construction-related impacts associated with the ferry channel proposed in the DEIS, the DOT Harbors Division has decided to reduce the depth of the channel to a uniform 9 feet. This change is reflected in the Final EIS for the project.

2. We agree that no standard for channel width specific to Surface Effect Ships (SES) exists. The recommendation for channel width was made in consideration of vessel beam, maneuvering lane width, ship to ship and bank clearances as provided in the Harbors Design Manual 26.1 (Department of the Navy, Naval Facilities Engineering Command, 1981).

3. The Final EIS will be revised to note that navigational aids will be installed to comply with standards of the Harbors Division and the U. S. Coast Guard.

4. Development of a ferry terminal at Kewalo Basin was not mentioned in the DEIS. Should development of a terminal at Kewalo Basin be pursued, a supplemental environmental assessment or environmental impact statement will be required.

5. The potential ferry impacts on rough water swimming areas, surfing sites, and other heavily used recreational areas are discussed on page D-14 of the DEIS.

6. The effect on passengers of traversing rough water is not considered an environmental impact of the project. The sea kindliness of the vessel is discussed on page A-13, describing the vessel to be used.

I hope we have satisfactorily responded to your comments. If you have any questions, please feel free to contact Mr. Harry Murakami of the Harbors Division at 548-2535.

Very truly yours,

Edward Y. Hirata
Director of Transportation

11 November, 1988

Mr. David K. Higa
Chief, Harbors Division
Department of Transportation
79 South Nimitz Hwy
Honolulu, Hawaii. 96813

Subj: Draft Environmental Impact Statement (EIS) for the Oahu Intraisland Ferry System, comments concerning.

Ref: Your letter dated October 17, 1988 - HAR-EP 1697.

Dear David,

We received your reference letter draft EIS two weeks ago. Please find the following comments pertaining to the subject document as you requested. Our opinions or recommendations are meant to be constructive, but we recognize that we have a limited data base of background to draw upon, so if they disagree with the concensus, please forgive us. We consider the EIS to be a fine document that appears to address the major problems at Haunalau Bay.

SAN DIEGO SHIPBUILDING & REPAIR, INC.
(619) 691-1091 • Telex No: (910) 240-4387
Foot of F Street • P.O. Box 5058, Chula Vista, California 92010

Item:	Section:	Comment:
1	Cover	We suggest a more encompassing system title for the system as previously suggested which would alter the title of the report to: "Hawaii Ocean Transit System Oahu Intraisland Routes".
2	Maunalua Bay Fig. 4	The pier as shown does not depict the fender system previously recommended by SDSR. The pier we feel might be narrow in way of a gangway that must accommodate the 2 ft. tide plus a reasonable slope for passenger safety as recommended by SDSR. The mooring cleats appear to be small for handling a ship of this size with the maximum possible wind at the worst angle. We feel the dock elevation may be incorrect considering the proposal dredged depth of water at 10 ft. above MLLW.

Page 3:

3	Haunalua Bay A-10 Entrance Channel	SDSR during meetings in Honolulu in Aug/Sept. 1988, was willing to accept a lesser channel width of 150 ft. versus 200 ft. and a guaranteed channel depth of 9 ft. versus 150 ft. That offer to save Hawaii increased dredging costs still remains with the only caveat that the State will ensure that the 9 ft. depth be periodically maintenance dredged.
4	Haunalua Bay A - 12 Ferry System	Our company's name is SAN DIEGO SHIPBUILDING & REPAIR, INC., not Ship Building or Ship Builders. We request that this minor oversight is corrected in each section of the report and in DOT files if incorrect. Thank you. We also recommend you mention that the next lowest bidder was $15,000,000 (?) more than SDSR to be paid by the State. We feel this will mitigate any vendor greed criticism, as well as possibly encouraging a cooperative effort to make the program a success and finally it shows to the people the creative approach their State officials took to

Page 4:

	solicit an entrepreneurial solution to a transportation problem, plus saved them $15,000,000.
Vessel A - 12	The ship carries 350 passengers as designed, not 300.
A - 13	The ship has two propulsion engines, not a third engine. There are also, as stated, two lift engines.
A - 13 Para 3	We suggest you add after "monohull" the words "or catamaran". It should be noted that at slow speed, the catamaran style hull (second bidder), produces an enhanced wave wake which severely impacts shore side erosion. San Francisco Bay catamaran ferries and many others are good examples. SDSR's SES will operate on a partial cushion alongside the pier and in the harbor to not only give a more comfortable ride, but also to reduce the wake dramatically. There's less wake at max

Page 5:

speed than at slower speeds but all conditions surpass equivalent monohull or catamarans.

A - 13
Para 5

Add after "transportation." The ferry operator also offers a "dial-a-ferry" phone service that gives continuous recording of schedules, sea conditions and special fare promotions".

A - 13
Para 7

It is our understanding that Haunalua Bay will not necessarily be the first terminal. Should that be stated here or is it best to keep to the original schedule for EIS purposes??

A - 13
Para 8

Add after "Pier 13" the words "and 14". SDSR in it's bid document and subsequently have requested use of piers 12 (parking), pier 13 maintenance and repair and pier 14 commercial operations which was approved by DOT.

A - 14
Para 1

The bid allows for a minimum number of runs as stated. However, the vessels speeds permits 7 trips from 6 a.m. to 9 a.m. if commuter use approaches maximum

Page 6:

capacity 2,450 possible passengers. This capacity should be stated and analyzed.

A - 14
Para 2

Suggest a clarification which may or may not be appropriate here. Based on the comment Pg. A14, Para 1, the capacity of the service clearly exceeds the minimum commuter schedule required. As stated, the use by tourists would be generally in a direction opposite to commuters thus not creating a booking or conflict with commuter issue.

5. Haunalua Bay
B - 8
Para 6

Pure opinion - we think this very important paragraph about dredging and erosion should be amplified to ensure the reader is understanding the complex theory that is being presented.

6. D - 7
Flora & Fauna
Para 2

It is suggested that the ferry operator take a "detour" to avoid the turtles. SDSR requests information as to the extent of this "detour" as it would possibly affect schedule.

Page 7:

7. D - 8 Whales Para 3

The report makes the point that there were three incidents of hitting whales in three years. On its face a remarkable record. It might also be investigated to see if out of the millions of hours of boat operation in Hawaiian waters, whether even the 3 incidents were accidents. Possibly the collisions were due to dive charter boats who were chasing the whales for the price of whale watching or just curiosity. If these incidents were partially deliberate, then all the comments about whales could be significantly mitigated.

D - 14 Noise

The noise issue has been a great concern to residents. To give this emotional topic one paragraph of explanation, we believe is too little. One letter after the EA said the boat selected was a "Hovercraft". The hovercraft as we all know is an extremely noisy vessel. This point should be responded to and

Page 8:

clarified. We believe that the one comparison given in the report has been to compare traffic noise to the ferry. The residents don't like traffic noise any better than they perceive the potential ferry noise. In the technical literature there are numerous less combatative comparisons, which we suggest be used to show how quiet this boat is at slow speeds at the distances of sound mitigation from the closest residence. We feel comparisons to "room noise" or distinguishing ferry noise from normal household sounds be used.

9. D - 21 Impacts

This may not be the correct area for this comment, but doesn't the ferry service contribute to certain emergency evacuation measures during tsunamis or hurricane warnings versus a congested highway under construction? Shouldn't this be noted?

10. E - 2 Task Force

SDSR requests membership on the permanent task force for all the ferry terminal sites. As the ferry

Page 9:

system operator, we feel our knowledge and experience would contribute to the task forces mission significantly.

11. E - 6 Preparation Comments

Some of the comments we feel have not been addressed in the new EIS from the EA comments.

a) Operations of the systems is still sketchy and mysterious. The operation is, more efficient, more reliable and cheaper than the previous hydrofoils much less any other US based ferries. Lets not be bashful, lets be proud and let the public know.

b) Whale issue needs better history and facts as previously stated.

c) The SES ferry design precludes typical ship oil product leakage. Portable oil

Page 10:

booms could be positioned on certain sensitive routes if absolutely necessary.

d) Shouldn't there be a comparison to large yachts now in Hawaii Kai as to wake, noise etc. to eliminate the large commercial vessel image?

e) Noise concerns previously questioned should be addressed in a forthright way.

12. Appendices Appendix A Reduction in Assumption

Ferry capacity is understated so therefore the analysis is likewise understated. At 80% capacity, 7 departures (maximum), the car reduction would be 211 cars/departure or 1,479 cars per a.m. or stated differently one lane of traffic is eliminated according to federal DOT highway guidelines. This calculation yields a significant reduction at 11.4 percent versus the EIS reports 5.6 percent. The p.m. reduction would be 13.2 percent versus 6.5 percent in the EIS report.

Page 11:

13.	Overall Comment	Those comments changed in the Maunalua Bay section noted previously should be changed in the entire report where applicable (several sections are repeated under each terminal).
14.	Waikiki 1 Project Description	Should Fort DeRusy be mentioned here as an alternative site to the Hilton as it was originally stated in the invitation for bid?
15.	Remainder of Ferry Terminals General	The discussions we suppose are purposely sketchy and incomplete. Will there need to be amplified data on Maunalua Bay or are they all right as written???
16.	Barbers Point	Is the ferry terminal located properly on the sketch. We understand the terminal would be in the inner harbor??

Page 12:

I look forward to your consultants feedback on the above comments. Once again we only wish to help the process if we can.

Respectfully,

W.T.Gurnee,
President.

WTG/mlg
sdsbl/m/environ.imp

cc: Mr. Carl Matsukawa
Wilson Okamata & Assoc.
Mr. Ed Hirata, Director of Transportation
Mr. Ed Uchida, Chief Planning Division
Mr. Mike Moynahan, SDSR
Admiral Alvie Wright

JOHN WAIHEE
GOVERNOR

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

EDWARD Y. HIRATA
DIRECTOR

DEPUTY DIRECTORS
JOHN K. UCHIMA
RONALD N. HIRANO
DAN T. KOCHI
JEANNE K. SCHULTZ

IN REPLY REFER TO

December 30, 1988 HAR-EP 2663

Mr. W. T. Gurnee, President
San Diego Shipbuilding and Repair, Inc.
P. O. Box 5058
Chula Vista, CA 92010

Dear Mr. Gurnee:

Draft Environmental Impact Statement (DEIS)
for the Oahu Intraisland Ferry System

Thank you for your comments on the subject DEIS. In response to your comments, we offer the following in the order presented:

1. Cover: The EIS encompasses only the Oahu Intraisland Ferry System. DOT presently has no plans to extend the service beyond the island of Oahu. Should such a service be contemplated in the future, separate environmental documentation will be required.

2. Figure 4: Figure 4 is a conceptual sketch intended to convey the scale of the pier. We are currently proceeding with Engineering design plans of the pier. Your input on the final design of the pier will be welcome.

3. Page A-10: Toward insuring safe simultaneous passage of the ferry vessel and boats typically using the Maunalua Bay channel, the widths presented in the draft EIS shall be maintained. In an effort to minimize the quantity of dredging, associated construction costs, and subsequent environmental impacts, the DOT has opted to reduce channel depth to a uniform 9 feet throughout the channel length. This change in design will be reflected in the final EIS.

4. Page A-12: The EIS will be revised to correct all

references to your company. We do not believe it is appropriate to discuss in the EIS the other bids received. The EIS is intended to disclose the environmental impacts of the project.

Page A-12: Our understanding is that the ship can accommodate 340 people in an airline type seating and an additional 10 people would be accommodated in first class seating. We will note in the Final EIS that the vessel does have an approved passenger capacity of 350 and that the ferry service can be increased to this maximum to meet ridership demands.

Page A-13: The EIS will be revised to describe the propulsion system of the ferry more accurately. We will also insert the term "catamaran" following "monohull" in the final EIS and discuss the "dial-a-ferry" phone service as a feature to be offered by the operator. The Maunalua Bay Ferry Terminal is currently being pursued as the first phase of the Oahu Intraisland Ferry System. The development of any of the other terminals can proceed should development of the Maunalua Bay terminal be delayed or abandoned.

Page A-13: The final EIS shall be revised to reflect usage of pier 14 by the ferry operator.

Page A-14: Each of the vessels will be required to make two runs each to the Downtown Terminal during the 3-hour morning peak period and two runs each to Maunalua Bay during the 3-hour evening peak period. Regardless of the ferry capacity or the direction in which ferry usage by either commuters or tourists may be demanded, the Maunalua Bay terminal will not be used for commercial transport services. Only normal public mass transit use will be permitted. Thus, while tourists may be transported to Maunalua Bay just as they could be through the City's bus system, no commercial bookings of seats will be allowed. Moreover, the terminal may not be used as a transfer area between the ferry and commercial transport services i.e. tour buses.

5. Page B-8: We feel that the draft EIS appropriately addresses erosion in the bay. Should any technical questions arise regarding erosion processes in the bay, we will provide further clarification.

6. Page D-7: The turtle studies contracted by the DOT will assist in determining appropriate ferry routes in and out of Maunalua Bay.

7. Page D-8: The three incidences involving collisions between vessels and whales were investigated by the National Marine Fisheries Service, to determine if the whales were deliberately harassed. Following the investigation, no charges were filed against any of the boat operators.

8. Page D-14: We believe the description of the surface effect ship and its noise rating provide an accurate assessment with respect to potential noise impacts. We will indicate that the perceived noise levels at the nearest residences are for the exterior environment and that noise levels within homes will be considerably lower.

9. Page D-21: The use of the ferry vessel for emergency evacuation has not been discussed to date. We will, however, present your offer for providing such services to the Oahu Civil Defense Agency.

10. Page E-2: The Intraisland Ferry Task Force is intended to promote intergovernmental coordination among represented agencies and organizations. Your expertise will be called upon as deemed necessary to facilitate the Task Force's efforts.

11. a. The EIS is intended to disclose the environmental impacts of a proposed action which, in this case, includes the proposed construction activity and the operation of the vessel proposed for use by the apparent low bidder. The bidding process described in the EIS is assumed to have resulted in the selection of the most cost-efficient ferry alternative from among those offering their services. Any claims comparing features of the SES with other types of craft would extend beyond the officially sanctioned method for selecting the ferry operator.

    b. See response to item No. 7.

    c. We will note the use of portable oil booms as a potential mitigating measure to contain oil spills along sensitive routes.

    d. At a length of 118 feet, the ferry vessel is considerably larger than the largest boats found in the bay. Such boats are generally about 35 feet in length. With respect to wake created, we will clarify on page

D-12 that the SES would create less wake than the largest boats which typically operate in Maunalua Bay.

    e. See response to item No. 8 (Page D-14).

12. Appendices: The traffic reduction assessment shall be revised in the Final EIS to reflect the approved passenger capacity of 350 persons.

13. Any changes made to general statements pertinent to all of the terminals will be uniformly revised.

14. The Fort DeRussy terminal, as identified in the bid document, and the Hilton Pier are the same. There are no other ferry terminal sites being considered for this area.

15. There was no purposeful intent to providing abbreviated descriptions of the terminal sites at Waikiki, the Airport, Waipahu, Ewa Marina and Barbers Point. Currently, there is inadequate information on the nature of improvements that will be required for the terminals and how construction may affect the respective environments. As we noted, supplemental environmental documents may be required for each of the terminal sites except Maunalua Bay. The EIS fully addresses the environmental impacts of the Maunalua Bay ferry terminal and no further environmental documentation will be required for that site.

16. In the text relating to the Barbers Point Harbor Terminal, we do not limit siting to any particular location within the harbor. While the inner harbor is currently the choice for a ferry terminal, the option of locating it elsewhere has not been foreclosed.

We hope we have satisfactorily responded to your comments. If you have any questions, please feel free to contact Mr. Harry Murakami of the Harbors Division at 548-2535.

Very truly yours,

Edward Y. Hirata

Edward Y. Hirata
Director of Transportation

DEPT. OF TRANS.
STATEWIDE TRANS.
PLANNING OFFICE
SEP 2 31 PM '88

Edward G. Freeman
6977 Kalanianaole Highway
Honolulu, Hawaii 96825.

September 7, 1988

State of Hawaii,
Department of Transportation,
869 Punchbowl St.
Honolulu, Hawaii #96813.

RECEIVED

Ref: STP 803088

Attention: Mr. Edward Y. Hirata

Proposed Maunalua Bay Ferry Terminal
Your letter to the Rosa's of August 18, 1988

Dear Mr. Hirata:

As a co-author of the Rosa's letter to you of July 3, 1988 and, as a practicing Civil Engineer (among a number of other disciplines) for close to 40 years, I wish to comment on your above response to the issues addressed therein.

Sand Transportation and the Numerical Model

The Portlock coast line did NOT have a "history of erosion" *BEFORE* KACOR dredged the old fish pond into what is now Koko Marina. The "progressive erosion" you note is the result of THAT project and THAT project alone.

When I came to live in Hawaii in 1976, the two (East end) spans of the Kalanianaole Highway bridge, over the Marina entrance, were already plugged, the Rosa's, in particular, losing an excess of 40+ ft. of their ocean frontage simply to support that useless result.

How is that you can now simply confirm that the "maintenance dredging", by KACOR (a commercial entity), "has resulted in erosion"?

How is it possible that a commercial entity (KACOR) can be permitted, without any respect for the known environmental impact ramifications, to proceed with such an action (maintenance dredging) known to cause erosion?

You concede to this fact, saying that this erosion (using your own words) "will likely require some form of structural control in the future"!? At whose cost?

Why allow it to happen in the first place? And, if you knew, or could conceive that erosion would result, why were controls NOT put in place to prevent it?

Maunalua bay does NOT have a continuous ocean shelf. It drops 300+ ft. at the reef. There is NO surrounding continuum of ocean bed to replenish what will be taken away by the dredging. Therefore, no matter where you dredge, it only HAS the shoreline to seek for its replenishment.

So, whether or not the channel is 800 ft. from the shoreline is irrelevant. Mother Nature will take back what we take away from her.

It is extremely difficult for me to understand how qualified engineers fail to recognize this. Or is this issue simply being obfuscated for the sake of the project?

Much is being said about the (magical?) numerical model, which "will be constructed" (with taxpayer's money, of course), to analyze the sand erosion, wave and tsunami action.

You comment that "initial indications are that the channel will not have any significant effect etc. ....". What indications?

I know that Wilson Okamoto & Assocs., representatives have said the same thing at the public hearings. How does ANYONE know what will have "a significant effect" without usable historical data and, indeed, a TRUE numerical model.

To construct a TRUE, representative dynamic numerical model - even for simple static analyses, such as trafficked bridges, hi-tension electric transmission wire pylons, weirs, wind action simulators and controlled wave action channels, is an incredibly difficult task, increasingly so as the dynamic factors mount.

The relatively (geometrically) simple pylon (above) for example. Take four *geometric* models for three spans, of (say) differing lengths, string (modeled) wires and blow simulated winds of variable speed and direction. The wires now begin to sway at varying frequencies. But we now find that unless we numerically model the pylon's natural frequency as a structure, its moment of inertia and various coefficient(s) of rigidity as well, our model does not return true results!

And, when our final model is complete, we find it has become complex and does not even remotely resemble a pylon. What we thought to be a simple geometric model has suddenly become extremely complex and expensively difficult to produce.

How do DOT/Wilson, Okamoto Ass., propose to create such a numerical model of which ALL elements, except the width, length, depth (and direction) of the channel, are *dynamic!?* The shoreline is not static, the waves, tides, currents, weather, winds, temperature, vessel activity and effects of the marina are ALL dynamic variables.

Such a model will be incredibly expensive, assuming it is makeable. How it will be predict the BEFORE/AFTER situations, is totally unclear! And, assuming it is built and proves our suspicions, what do we now do with this expensive monster?

Lifestyle/Character of the Community

A private boat ran over Ed Lee and killed him, despite his required diver marker flag. The driver of the boat did not know what he'd done until caught up with some two miles away. 3 years of negotiations with the DOT and another tragic death from a jet ski, finally generated six safety area (but as yet, un-policed) buoys. Commercial boats violate the designated safety area daily, but volunteer deputies cannot cite. These frequent violators, although reported, have yet to be cited.

Also please note that we DO NOT WANT commercial recreational, or water transportation vessel activities in our bay at all! We don't want our water active residents killed by a boat 25 times the size of the one that killed Ed Lee.

Noise

Although not frequent, the noise and fumes from jet skis alone, on Kona wind days, are unbearable! What the bid document says and what we will have to put up with are two different things!

Who says we have to put up with a noise "no greater than normal vehicular traffic along Kalanianaole Highway" - on BOTH sides of us!

Endangered Species

The shock waves of ANY blasting near their home or feeding areas will kill all of our turtles - and probably all the fish in the near vicinity.

Traffic

How on earth can 200 parking slots service 1200 riders both ways? Shuttle buses, (if they are ever considered) and "nowhere-to-park" riders shuttled, by wives or friends, will create an enormous traffic problem at the terminal and highway.

Ridership

I simply cannot believe what you write.

I have ridden Hovercraft around the fjords of Scandinavia and around the open Mediterranean and there's a b-i-g difference. The fjords and the Pacific ocean seas around our Hawaiian Islands, are two very different things. While computers do wonderful things, I think you'll need one with near SDI capabilities to keep this vessel "sea-kindly" around our waters!

Do you have ANY way at all, to stop the process or to penalize the contractor if the vessel proves NOT to be "sea-kindly"?

Economics

Your comment that "the fare was set artificially low" at 2.50 each way already connotes that it won't be long before it's increased. I also feel there are many, many people who DON'T commute, who own cars anyway and apportioning insurance costs, in a specific comparison as you have noted, is not fair play.

My daughter commutes daily to town. Her gas bill is less than \$60 per month and Xerox allows her company employee parking. Her maintenance runs her under \$250 every 6,000 miles - about 40 weeks of driving, or \$6.25 per week or \$25/month. Her total cost per month is \$85 and she has free mobility at both ends.

At the ferry's \$5 per day fare, that's \$25 per week and \$100-115/month *excluding* shuttle costs at both ends and - except for the 200 who got to the parking lots first - there is NO mobility at either end, I fail to see how you justify that the ferry and its \$2.50 one-way fare "becomes more attractive"!

Environmental Impact Statement

Isn't contracting with the operator "*when the environmental impact statement is finalized*" somewhat presumptuous?

What happens if it turns out that Hawaii Kai doesn't want the ferry?

Adm. Alvey Wright went on record to say that, in such a case, we wouldn't get it!

Shouldn't the contract with the operator be delayed until ALL the environmental and approval decisions regarding the ferry are made?

Contracting with the operator BEFORE the public voice is heard and/or BEFORE the environmental impact conclusions have been made and necessary permits, if any, are properly issued, would seem to be a means to "pressure" the relevant agencies to issue these permits, essentially bypassing the decision making process!.

Frankly, NONE your comments have satisfactorily addressed or answered ANY of our questions and concerns.

Respectfully,

Edward G. Freeman,
6977 Kalanianaole Hwy.
Honolulu, Hawaii 96825.

c.c. Marshall K. & Barbara Anne S. Rosa
Derek B. Trotter & Charlotte Trotter
Georg & Leslie Kissner
Robert P. III & Mary Harbold
William P. & Patricia Mowat
Steve & Margie Kaiser
M. C. (Rip) Riddle

Donna Ikeda	Libert Landgraf	Marvin Miura
Robin Foster	John Emmerson	Don Griffin
Dennis O'Conner	Jackie Miller	Fred Hemmings

JOHN WAIHEE
GOVERNOR

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

EDWARD Y. HIRATA
DIRECTOR

DEPUTY DIRECTORS
JOHN K. UCHIMA
RONALD N. HIRANO
DAN T. KOCHI
JEANNE K. SCHULTZ

IN REPLY REFER TO

December 30, 1988 HAR-EP 2647

Mr. Edward G. Freeman
6977 Kalanianaole Highway
Honolulu, Hawaii 96825

Dear Mr. Freeman:

Proposed Maunalua Bay Ferry Terminal

Thank you for your letter of September 7, 1988 and your comments on the subject project. In response we offer the following comments:

1. The history of erosion we refer to began after the dredging work conducted by Kaiser Development in the early 1950's. We believe this is consistent with your interpretation of historic erosion.

2. The recent dredging work conducted by KACOR on the mauka side of the bridge was authorized by the U. S. Army Corps of Engineers. This work is unrelated to the channel widening proposed for the ferry system. While we indicated that some form of structural control may be needed in the future, we did not attribute the ongoing erosion to KACOR's recent work.

3. The relationship of your reference to the 300-foot depth at the reef to the erosion process is unclear. The 300-foot depth contour occurs 1 1/2 miles seaward of the reef edge.

The relationship between the sandbar to be dredged for the entrance channel and erosion along the Portlock shoreline is significantly different from the dredging work conducted by KACOR. In the KACOR case, the sand accumulating on the mauka side of the bridge appears to be in equilibrium with the immediately adjacent Portlock beach. Thus, if the sand on the mauka side of the bridge is dredged, the beach along the Portlock shoreline could conceivably erode at an accelerated rate. On the other hand, the relationship

between the Portlock shoreline and the sandbar to be removed from the entrance channel is far less direct. In the Portlock area, the various sand deposits between the shoreline and the existing entrance channel are part of a system within which sand is moving between the beach and the offshore deposits. The sandbar proposed for dredging is part of the offshore deposits and while its geographic extent is small compared to the entire system and it is at the extreme end from the beach, there are no means for precisely determining its role in the sand movement system. In the worst-case scenario, removal of the sandbar could have a subtle, long-term effect of accelerating erosion. On the other hand, the portion of sandbar to be dredged may have only a small role in the system and its removal could have little effect on accelerating erosion but would add immensely to the safety of boaters by widening a very constricted area of the channel.

4. The numerical model will only be used to evaluate differences in wave energy before and after dredging. The effects which the channel may have on shoreline erosion can only be implied by the change in wave energy approaching the shoreline.

5. The numerical model is state-of-the-art, based upon a method described in "Numerical Modeling of Water Waves," by Dr. Charles L. Mader. The author is a consultant on this project. The only variables affecting wave energy input at the shoreline are waves, water depths and configuration, and bottom friction. Weather, winds, marina influences, and temperature have no bearing on the results. The model is extremely complex and has proven effective in replicating wave energy transmission in a variety in real-life harbors and channels. With respect to cost, the DOT was fortunate in that Dr. Mader was able to "piggyback" the Maunalua Bay project onto his ongoing research. This saved the State a substantial amount of the cost associated with computer usage which would otherwise be borne if the model was to be loaded and run independently.

6. The DOT recognizes the abundance of marine recreational and boating activity occurring within Maunalua Bay and is addressing potential conflicts among activities through its Ocean Recreation Management Plan. The ferry operation is being coordinated through our boating office which is

administering the Ocean Recreation Management Plan. Unlike smaller craft in the area, the ferry will be confined to the demarcated channel leading out of the bay. The channel is proposed to be widened in order to allow two-way boat traffic during periods of use by the ferry, so that recreational boaters will not be inconvenienced. The ferry will proceed out to sea before turning toward Honolulu. Activities such as snorkeling and scuba diving which may be occurring in the vicinity of the reef and other activities within Maunalua Bay are not expected to be affected by the ferry operation.

7. The noise created by the ferry vessel will be limited up to four instances of arrival and departure during the morning rush hour and four instances of arrival and departure during the evening rush hour. The level of noise generated by the ferry vessel during these times is well within the acceptable limits of health and welfare as determined by the Environmental Protection Agency. The example regarding traffic on Kalanianaole Highway was presented to illustrate what residents along Portlock may encounter.

8. The DOT is presently coordinating with the National Marine Fisheries Service to assure that impacts of dredging and blasting on turtles and their habitats will be properly assessed. The National Marine Fisheries Service through Section 7 of the Endangered Species Act will provide valuable input on the U. S. Department of Army permit required for the channel widening improvements.

9. A ridership survey conducted by DOT indicates that between 250 and 450 persons will use the shuttle during the morning and evening rush hour. The parking facility should comfortably accommodate this level of ridership as passengers are expected to arrive by several different means such as shuttle bus, city bus, "kiss and ride", car pooling, bicycling and walking. Should ridership increase substantially beyond the capacity of the parking and passenger drop-off facility, alternate means of accommodating these passengers will be explored.

10. Sea trials were conducted by DOT representatives on prototype ferry vessels and were assured that they met bid specifications.

11. The bid document states that a means shall be developed by the Contractor to provide holders of a valid Hawaii driver's license a discounted fare of not greater than $2.50 one way, available at any time on authorized ferry routes.

The $2.50 one-way fare is artificially low for several reasons:

1) It would cost the operator considerably more than the $2.50/each rider to operate the vessel.

2) There is no subsidy for the operator to provide the water-borne mass transit service (similar to the bus).

3) The cost of the ferry vessels, operations and maintenance is the responsibility of the operator.

4) The average operating cost (gas, insurance, maintenance, and parking) for a car used primarily for commuting purposes is over $5.00/day.

12. The DOT will soon be doing a public opinion survey in the Hawaii Kai area on whether the ferry terminal should be located at the proposed site at Maunalua Bay Beach Park. The DOT will formally award the operator contract when all necessary approvals are obtained.

We hope we have satisfactorily responded to your comments. If you have any questions, please feel free to contact Mr. Harry Murakami of the Harbors Division at 548-2535.

Very truly yours,

Edward Y. Hirata
Director of Transportation

REFERENCES

Aotani and Associates, A Statewide Ocean Recreation Management Plan, January 1988.

Environmental Communications, Draft Environmental Impact Statement for Hawaii Kai Marina Zoning, July 1985.

Hancock, Lambreth, Hawaii Kai: The First 20 Years, Honolulu, 1983.

Kaiser Development Company, Hawaii Kai Transportation Management Study, and Hawaii Kai Transportation Management Study Intersection Analysis Worksheets, prepared by Wilbur Smith and Associates, September 3, 1985.

Stump, Jane Barr, Our Hawaii Kai, 1981.

University of Hawaii, Department of Geography; Atlas of Hawaii, Second Edition, University of Press of Hawaii, 1983.

U.S. Army Engineer District, Honolulu; Final Environmental Statement for the Department of Army Permit Actions in the Hawaii Kai Marina, July 1975.

U.S. Department of Transportation, Federal Highway Administration; State of Hawaii Department of Transportation; Final Environmental Impact Statement and Section 4(f) Statement; February 1978.

PREPARERS OF THE EIS DOCUMENT

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Appendices

APPENDIX A

REDUCTION IN TRAFFIC ALONG KALANIANAOLE HIGHWAY DUE TO FERRY RIDERSHIP

REDUCTION IN TRAFFIC ALONG KALANIANAOLE HIGHWAY DUE TO FERRY RIDERSHIP

Traffic counts along Kalanianaole Highway at a point 750 feet east of Ainakoa Avenue were obtained from the State Department of Transportation, Highways Division. Counts used for this evaluation are for July 19, 1988.

ASSUMPTIONS AND CONSIDERATIONS:

1. 250-450 persons would ride the ferry (total one-way) i.e. 250-450 riders in morning, 250-450 riders in evening (see attached ferry ridership estimates)

2. Ferry departures at 6:00, 7:00, 8:00, 9:00 A.M. from Maunalua Bay and 3:30, 4:30, 5:30, 6:30 PM from downtown.

3. Maximum ferry capacity = 350 persons.

4. 9% of persons who would use the ferry would otherwise use the bus. Thus, calculations on ferry ridership were reduced by 9%.

5. Car occupancy of 1.25 persons/car based on rates for work-related trips in the Transportation and Traffic Engineering Handbook, Second Edition (Institute of Transportation Engineers, 1982.

6. Calculations were prepared for the following ridership scenarios:

   - 250 Ferry Passengers Daily
   - 450 Ferry Passengers Daily
   - 80% Ferry Passenger Capacity Daily

REDUCTION DURING A.M. PEAK HOUR:

Westbound traffic during A.M. peak hour (7:00 - 8:00 A.M.) = 4,993 vehicles.

250 FERRY PASSENGERS:

(0.91) (250 persons)/(4 departures) (1.25 persons/car) = 46 cars/departure
46 cars/4,993 vehicles = 0.0092

SAY 0.9 Percent

450 FERRY PASSENGERS:

(0.91) (450 persons)/(4 departures) (1.25 persons/car) = 82 cars/departure
82 cars/4,993 vehicles = 0.0164

SAY 1.6 Percent

80% FERRY PASSENGER CAPACITY:

(0.91) (1,120 persons)/(4 departures) (1.25 person/car) =
204 cars/departure
204 cars/4,993 vehicles = 0.0409

SAY 4.1 Percent

REDUCTION DURING 3 HOUR A.M. PERIOD

Westbound traffic 6:15 A.M. to 9:15 A.M.

= 12,562 Vehicles

250 FERRY PASSENGERS

(0.91) (250 persons)/(1.25 persons/car) = 182 cars
182 cars/12,562 vehicles = 0.0145

SAY 1.5 Percent

450 FERRY PASSENGERS

(0.91) (450 persons)/(1.25 persons/car) = 328 cars
328 cars/12,562 vehicles = 0/.0261

SAY 2.6 Percent

80% FERRY PASSENGER CAPACITY

(0.91) (1,120 persons)/(1.25 persons/car) = 815 cars
815 cars/12,562 vehicles = 0.0649

SAY 6.5 percent

REDUCTION DURING P.M. PEAK HOUR

Eastbound traffic during P.M. peak hour (4:45 - 5:45 PM) = 3,971 vehicles

250 FERRY PASSENGERS

46 cars/3,971 vehicles = 0.0116

SAY 1.2 Percent

450 FERRY PASSENGERS

82 cars/3,971 vehicles = 0.0206

SAY 2.1 Percent

80% FERRY PASSENGER CAPACITY

204 cars/3,971 vehicles = 0.0513

SAY 5.1 Percent

REDUCTION DURING 3-HOUR P.M. PERIOD

Eastbound traffic 3:15 P.M. to 6:15 P.M.

= 10,834 vehicles

250 FERRY PASSENGERS

182 cars/10,834 vehicles = 0.0168

SAY 1.7 Percent

450 FERRY PASSENGERS

328 cars/10,834 vehicles - 0.0303

SAY 3.0 Percent

80% FERRY PASSENGER CAPACITY

815 cars/10,834 vehicles - 0.0752

SAY 7.5 Percent

DEPARTMENT OF TRANSPORTATION
STATE OF HAWAII

FERRY RIDERSHIP ESTIMATES
(BASED ON 100% OF THE SURVEY RESULTS)

MAY 9, 1988

------------------------------ Downtown ------------------------------

Interest in ferry at various fares, among Hawaii Kai residents who work Downtown

FARE	Interest Rating	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1.00	0 Zero	559	44.3	559	44.3
	1-3 Low	80	6.3	639	50.7
	4-7 Medium	170	13.5	809	64.2
	8-10 High	452	35.8	1261	100.0
1.50	0 Zero	671	53.2	671	53.2
	1-3 Low	105	8.3	776	61.5
	4-7 Medium	226	17.9	1002	79.5
	8-10 High	259	20.5	1261	100.0
2.00	0 Zero	771	61.1	771	61.1
	1-3 Low	158	12.5	929	73.7
	4-7 Medium	204	16.2	1133	89.8
	8-10 High	128	10.2	1261	100.0
2.50	0 Zero	862	68.4	862	68.4
	1-3 Low	206	16.3	1068	84.7
	4-7 Medium	140	11.1	1208	95.8
	8-10 High	53	4.2	1261	100.0
3.00	0 Zero	975	77.3	975	77.3
	1-3 Low	187	14.8	1162	92.1
	4-7 Medium	59	4.7	1221	96.8
	8-10 High	40	3.2	1261	100.0

YOUWORK	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Central	120	3.6	120	3.6
Downtown	1261	38.0	1381	41.6
Ewa Area	32	1.0	1413	42.6
Other	1458	43.9	2871	86.5
PH/Hickm	229	6.9	3100	93.4
Waikiki	220	6.6	3320	100.0

Frequency Missing = 2

SPSWORK	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Central	101	3.0	101	3.0
Downtown	780	23.5	881	26.5
Ewa Area	16	0.5	897	27.0
No Mention	1025	30.9	1922	57.9
Other	1092	32.9	3014	90.7
PH/Hickm	115	3.5	3129	94.2
Waikiki	193	5.8	3322	100.0

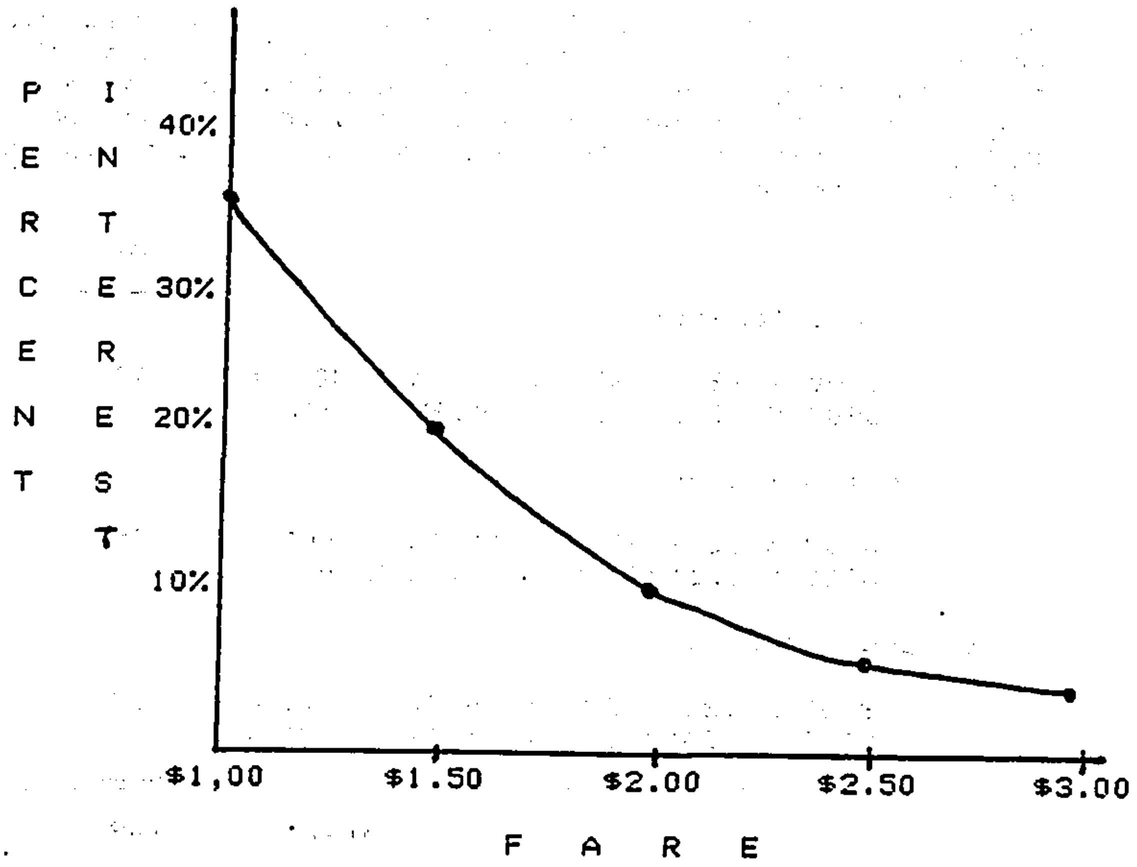
Spouses' workplace data indicate that, for any results tabulated for "respondents' working downtown" an additional 780/1261 or 62% should be applied to account for spouses who work downtown, but were not given the opportunity to input into the survey.

III. RIDERSHIP PROJECTION BASED ON $2.50 FARE HAWAII KAI TO DOWNTOWN ONLY:

Assuming 40%, 20%, and 3% ridership for high, medium, and low interest, respectively, on the low end of the ridership range, and 60%, 40%, and 7% ridership on the high end of the ridership range, and projecting for 8,900 existing households in Hawaii Kai, ridership is estimated to be:

	Low	High
o High Interest:		
8900 X 1261/3320 X 4.2% X 40% =	57	
8900 X 1261/3320 X 4.2% X 60% =		85
o Medium Interest:		
8900 X 1261/3320 X 11.1% X 20% =	75	
8900 X 1261/3320 X 11.1% X 40% =		150
o Low Interest:		
8900 X 1261/3320 X 16.3% X 3% =	17	
8900 X 1261/3320 X 16.3% X 7% =		39
Total	149	274

Increasing figures by 62% for spouses who work downtown but were not given the opportunity to input into the survey, the adjusted range would be 241-444 riders. Therefore could realize approximately 250-450 riders initially. Ridership could increase over the 20-year term of the ferry contract by the progressive transfer of patronage to a new mode of transit, and as the number of households in Hawaii Kai increase by nearly 40% within the next 20 years (DGP projection).



CHART

HIGH INTEREST

APPENDIX B

MAUNALUA BAY CURRENT MEASUREMENTS

Marine Advisers (1961) measured inshore currents for two days in April and May of 1961. Figure A-1, Appendix A, shows currents measured during a strong flood tide. Incoming current speeds in the main channel ranged up to 0.3 knots. In the channel, the strongest currents were subsurface because the surface layer was being opposed by moderate to strong tradewinds. Currents measured on the reef flat off Paiko Peninsula just prior to high tide indicated a weak flow to the east, opposing the tradewinds. Currents outside the reef flowed to the west, and were strongest at the surface due to reinforcement by the tradewinds.

Figures A-2, A-3 and A-4 show the Marine Advisers measurements taken over the upper 15 to 18 inches of water on May 2, 1961. The three figures show the change in currents during a complete flood tide cycle. Moderate to strong tradewinds were present at the time. The reversal of current directions in the main channel and on the reef between times of low water and high water can be seen on the figures. Associated dye studies indicated that the upper 2 to 6 inches of water moved southward in response to the tradewinds at all times. Reversal of flow directions in the entrance channel and on the reef seems to occur in the latter stages of the flood or ebb tide cycle.

Additional current measurements were taken in March and April 1988 in order to characterize the circulation in the channel and on the reef flat. Surface currents were measured with Rhodamine-B dye and subsurface currents were measured with drogues. The drogues measured the integrated current over the top five feet of the water column. The results, for both trade wind and calm conditions, are presented in Appendix A, figures A-5 to A-8.

Typical subsurface current speeds in the main channel are in the 0.2 to 0.3 knot range. The flow in the interior channel, paralleling Maunalua Bay Beach Park, follows the channel through the reef. The current direction becomes more variable in the outer channel, apparently because of the extensive deeper areas on both sides of the channel.

Current flow on the reef is relatively weak, ranging from 0 to 0.13 knots for all observations. The flood tide flow on the reef flat was generally eastward for both trade and calm wind conditions. The ebb tide flow was also east during calm conditions. The greatest effect of the tradewinds seemed to occur during ebb tide, when currents on the reef were deflected downwind, or offshore.

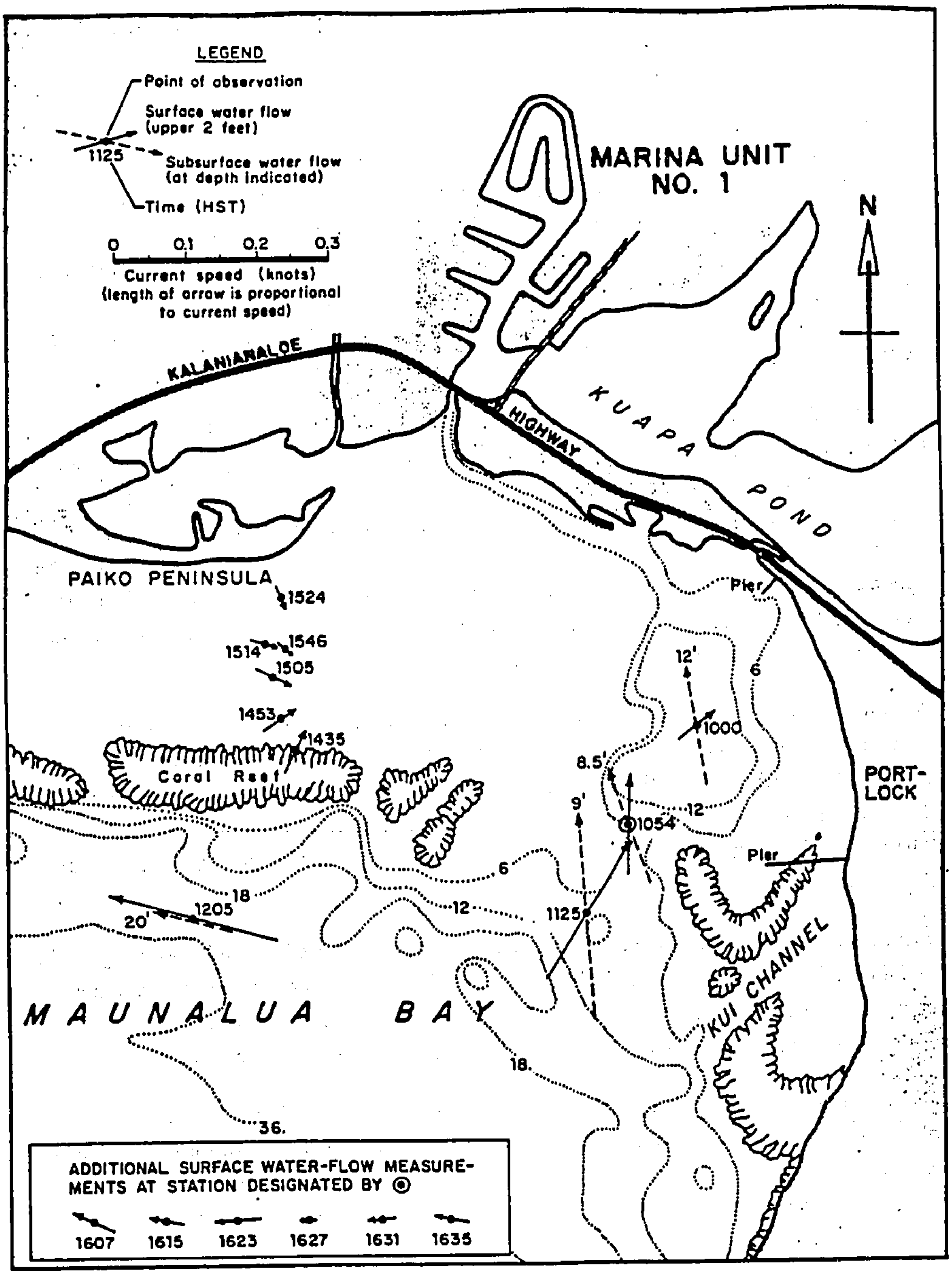


FIGURE A-1 CURRENTS ON FLOOD TIDE AND HIGH TIDE IN MAUNALUA BAY, 29 APRIL 1961
(Predicted tide: -0.2 ft. at 0905; 1.3 at 1551; 0.1 at 2220 HST)
(from Marine Advisers, 1961)

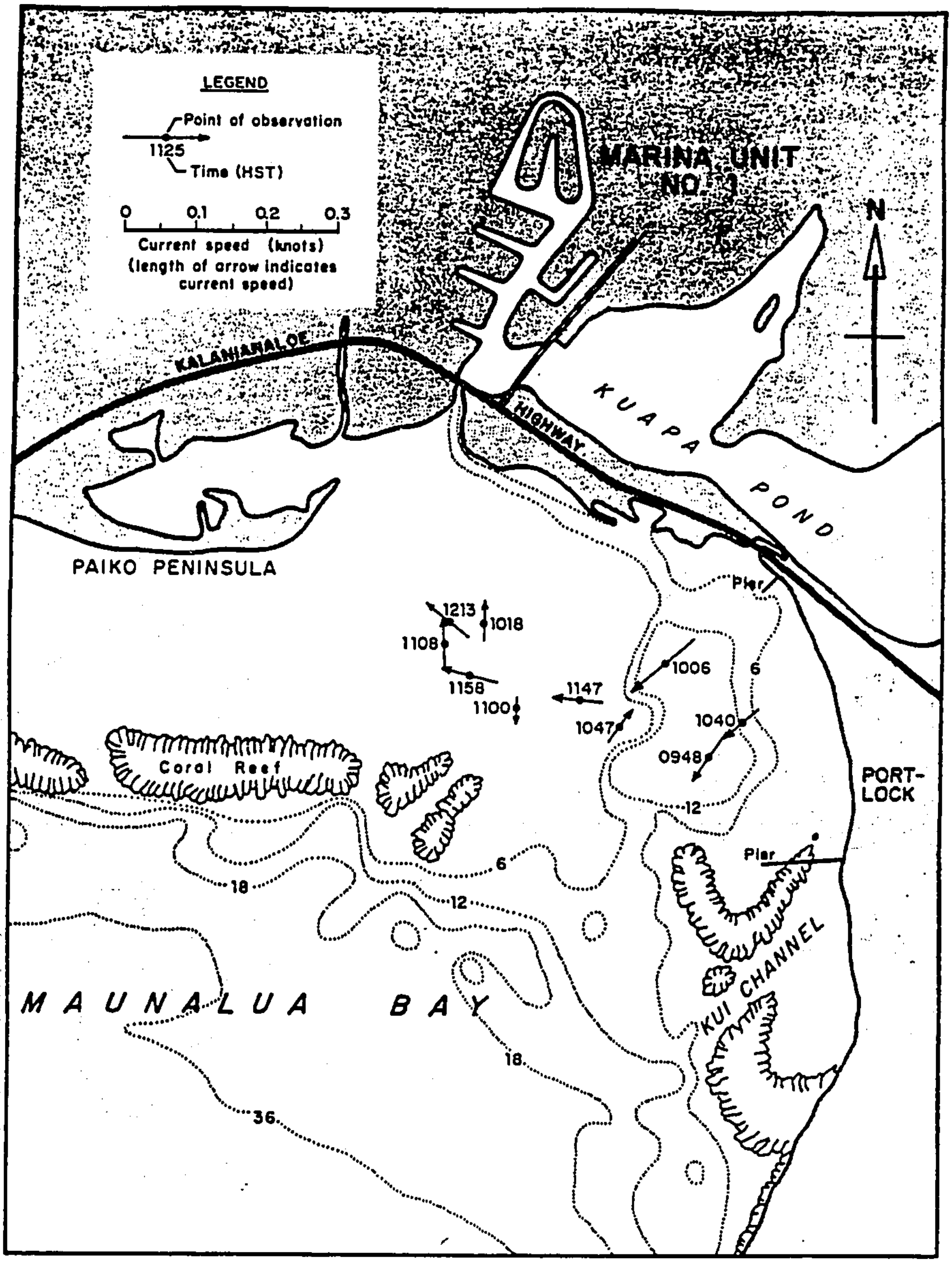


FIGURE A-2 "SURFACE" CURRENTS DURING TRANSITION FROM EBB TIDE TO FLOOD TIDE 2 MAY 1961 (Based on drogue tracking) (Predicted tide: 0.8 ft at 0451; -0.2 at 1035; 2.0 at 1750 HST) (from Marine Advisers, 1961)

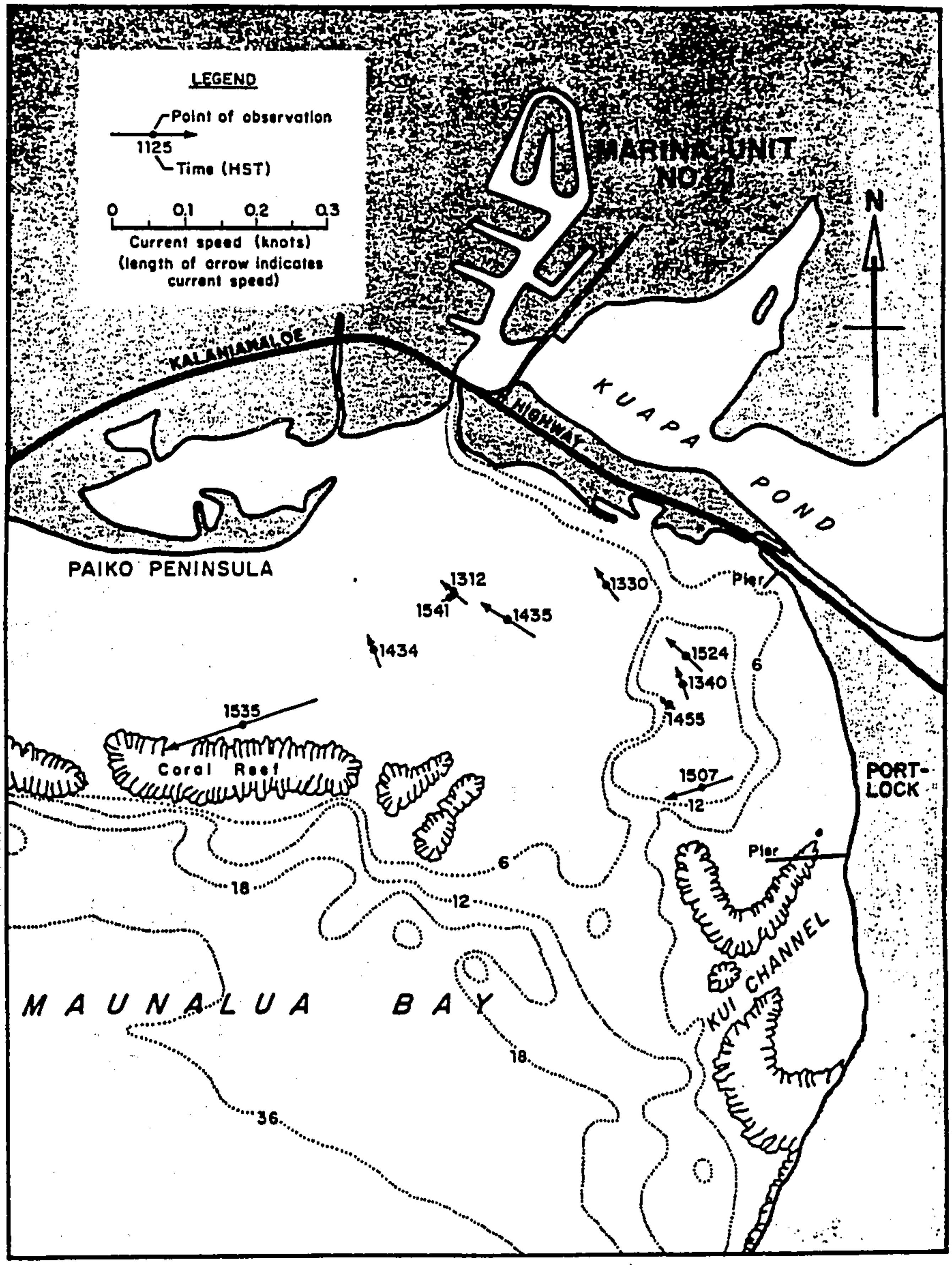


FIGURE A-3 "SURFACE" CURRENTS DURING MID FLOOD TIDE 2 MAY 1961
(Based on drogue tracking)
(Predicted tide: -0.2 ft at 1035; 2.0 at 1750 HST)
(from Marine Advisers, 1961)

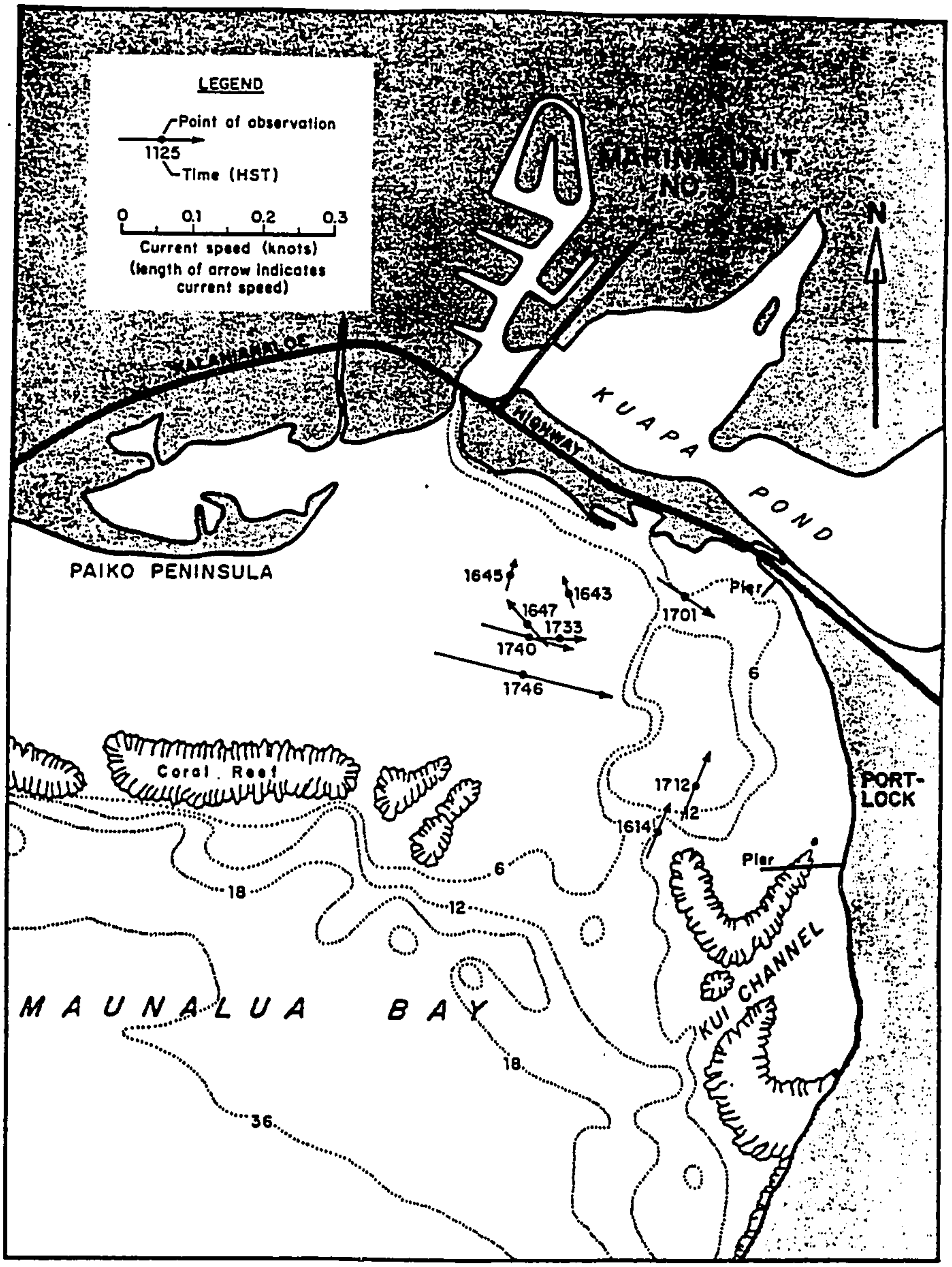


FIGURE A-4 "SURFACE" CURRENTS NEAR END OF FLOOD TIDE PERIOD
2 MAY 1961 (Based on drogue tracking)
(Predicted tide: -0.2 ft at 1035; 2.0 at 1750 HST)
(from Marine Advisers, 1961)

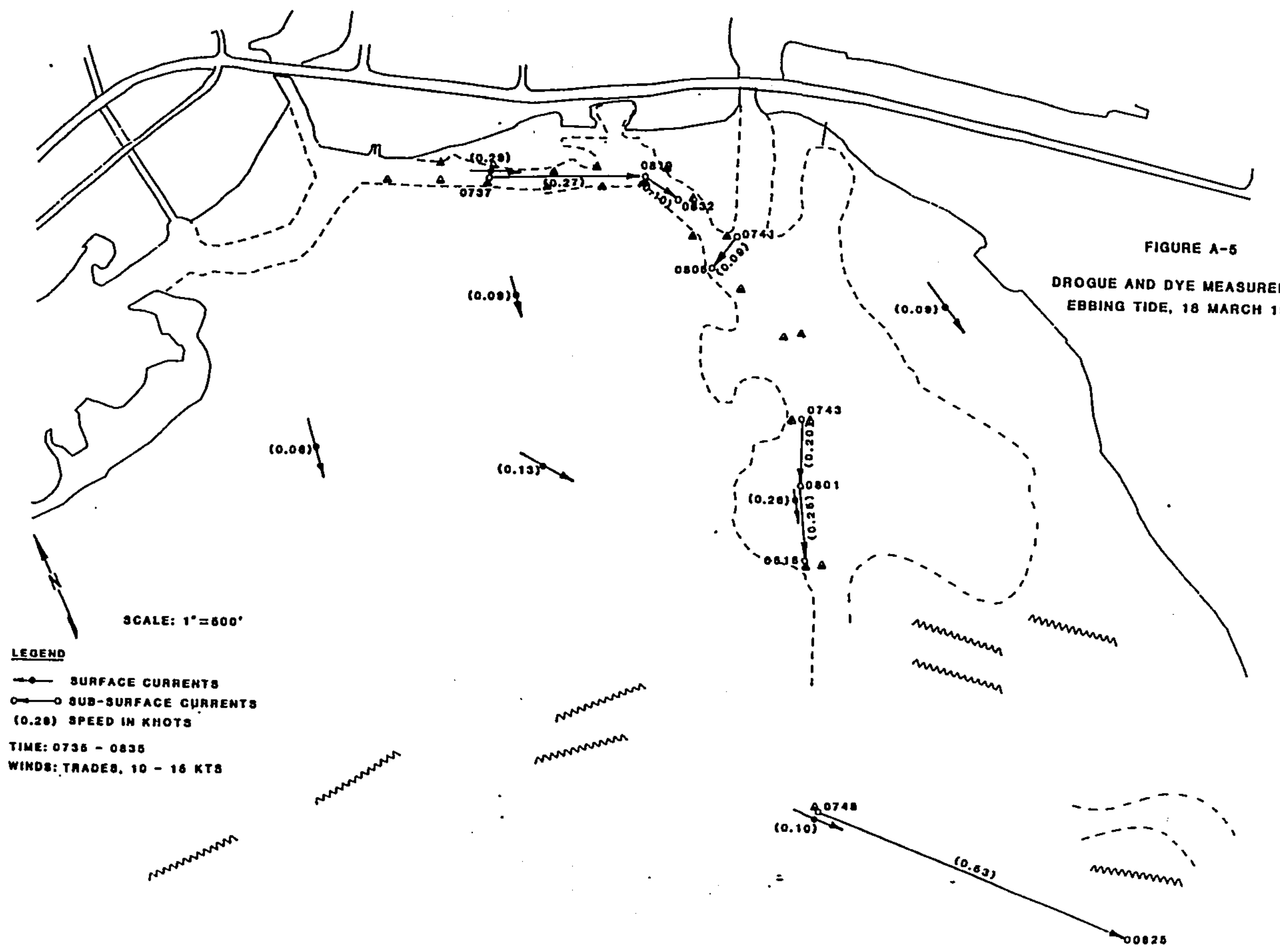


FIGURE A-5

DROGUE AND DYE MEASUREMENTS
EBBING TIDE, 18 MARCH 1988

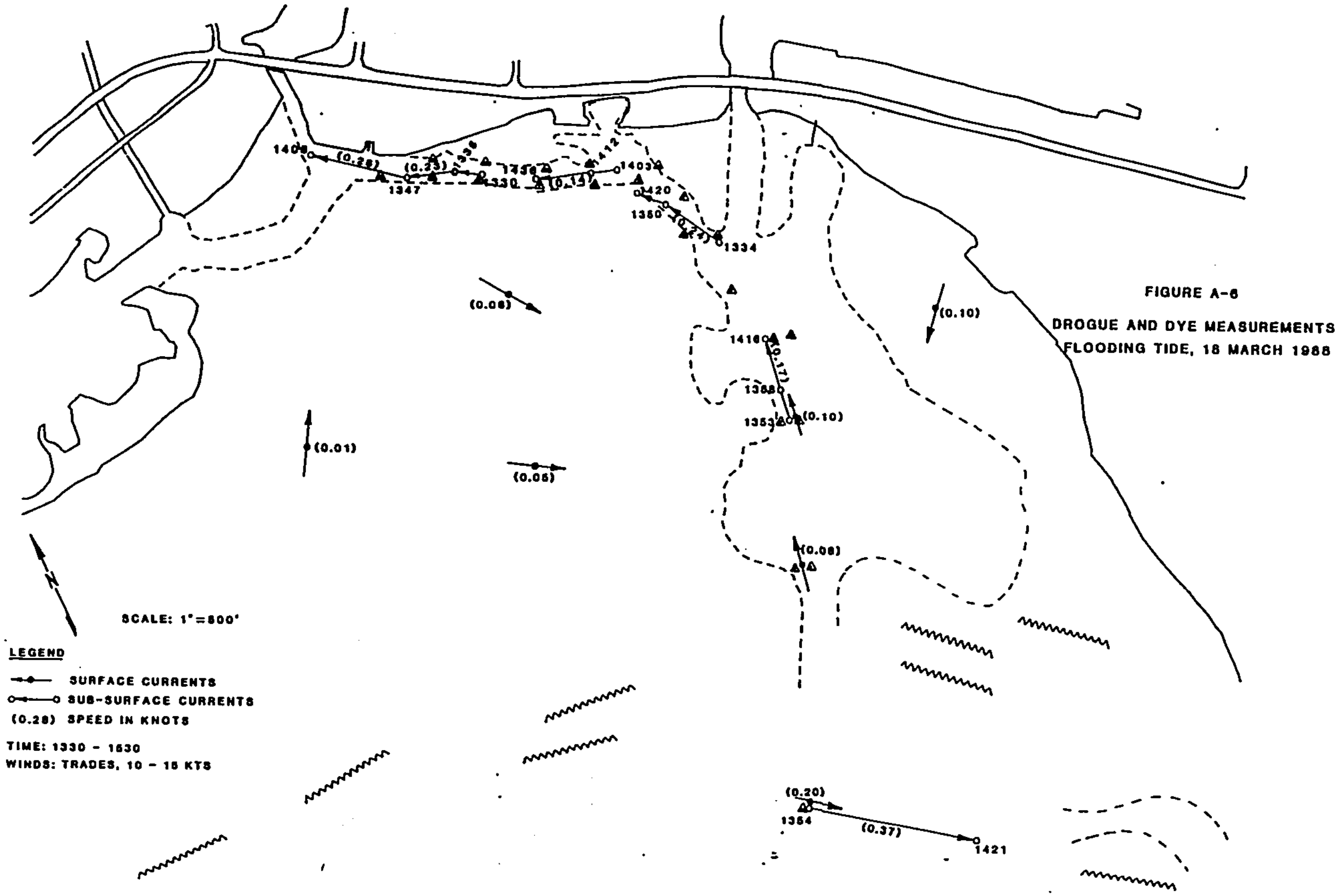


FIGURE A-6

DROGUE AND DYE MEASUREMENTS
FLOODING TIDE, 18 MARCH 1988

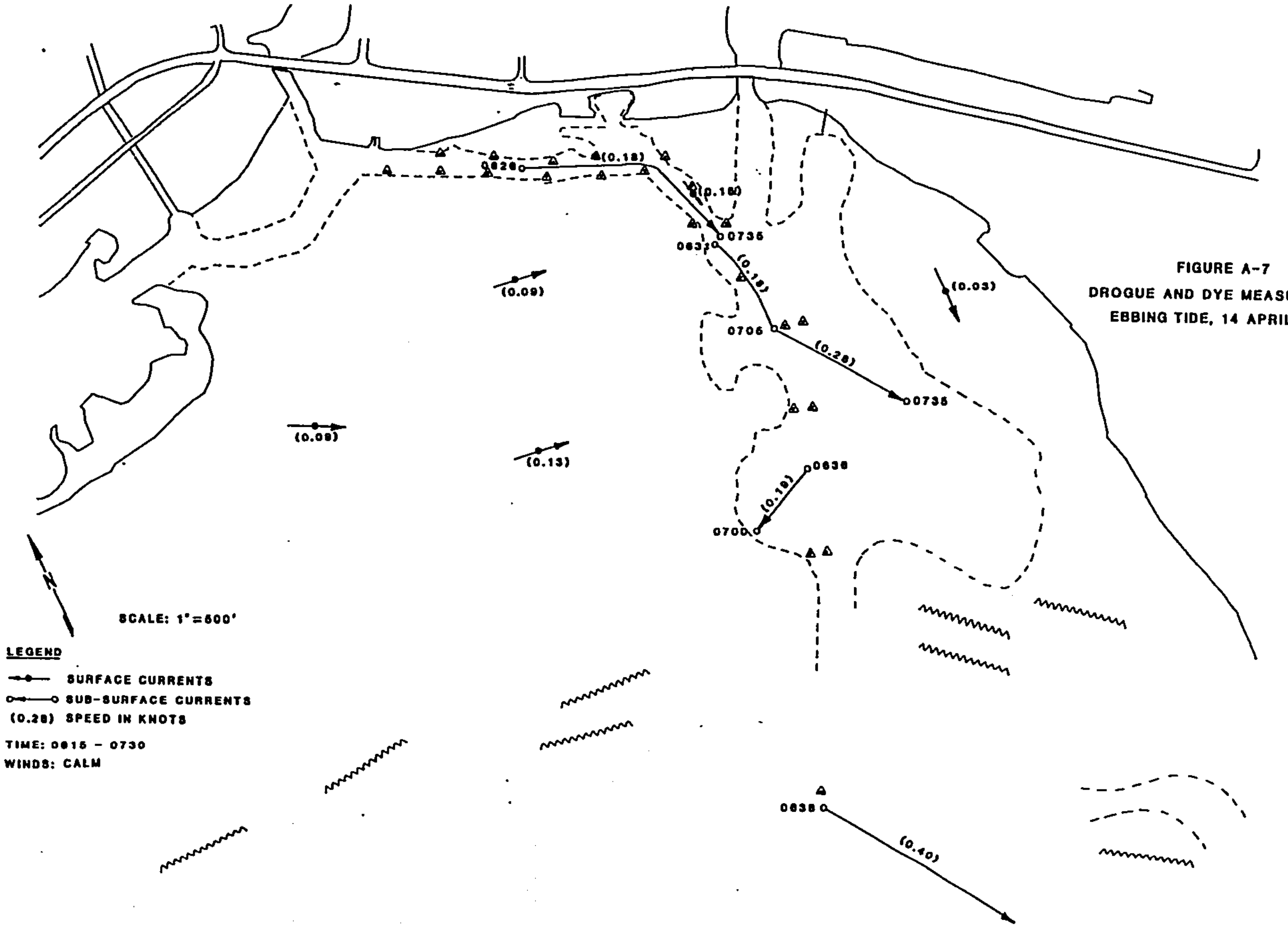


FIGURE A-7
DROGUE AND DYE MEASUREMENTS
EBBING TIDE, 14 APRIL 1988

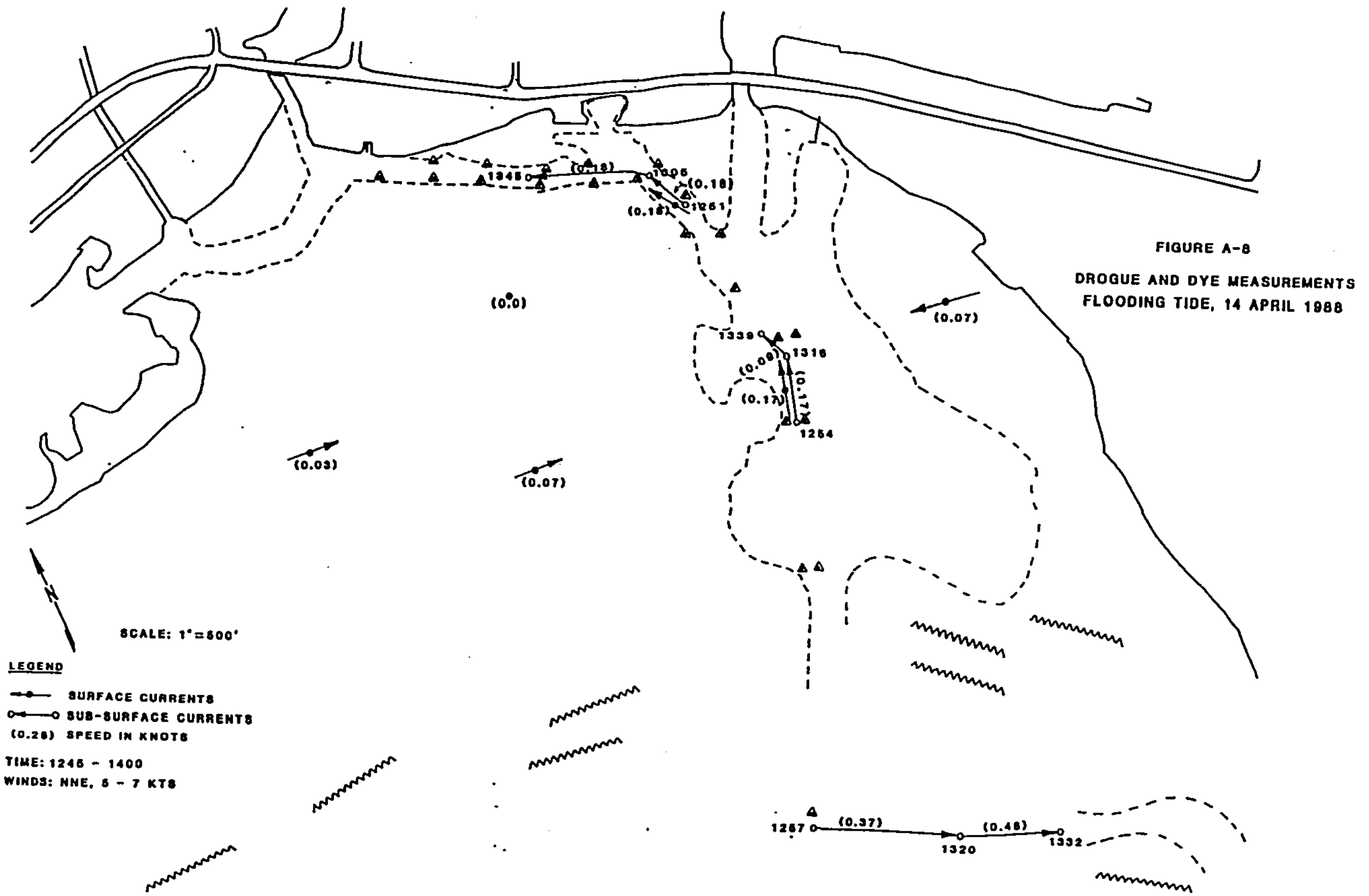


FIGURE A-8

DROGUE AND DYE MEASUREMENTS
FLOODING TIDE, 14 APRIL 1988

APPENDIX C

MAUNALUA BAY TURBIDITY DATA

GROUPING FOR TURBIDITY STATIONS

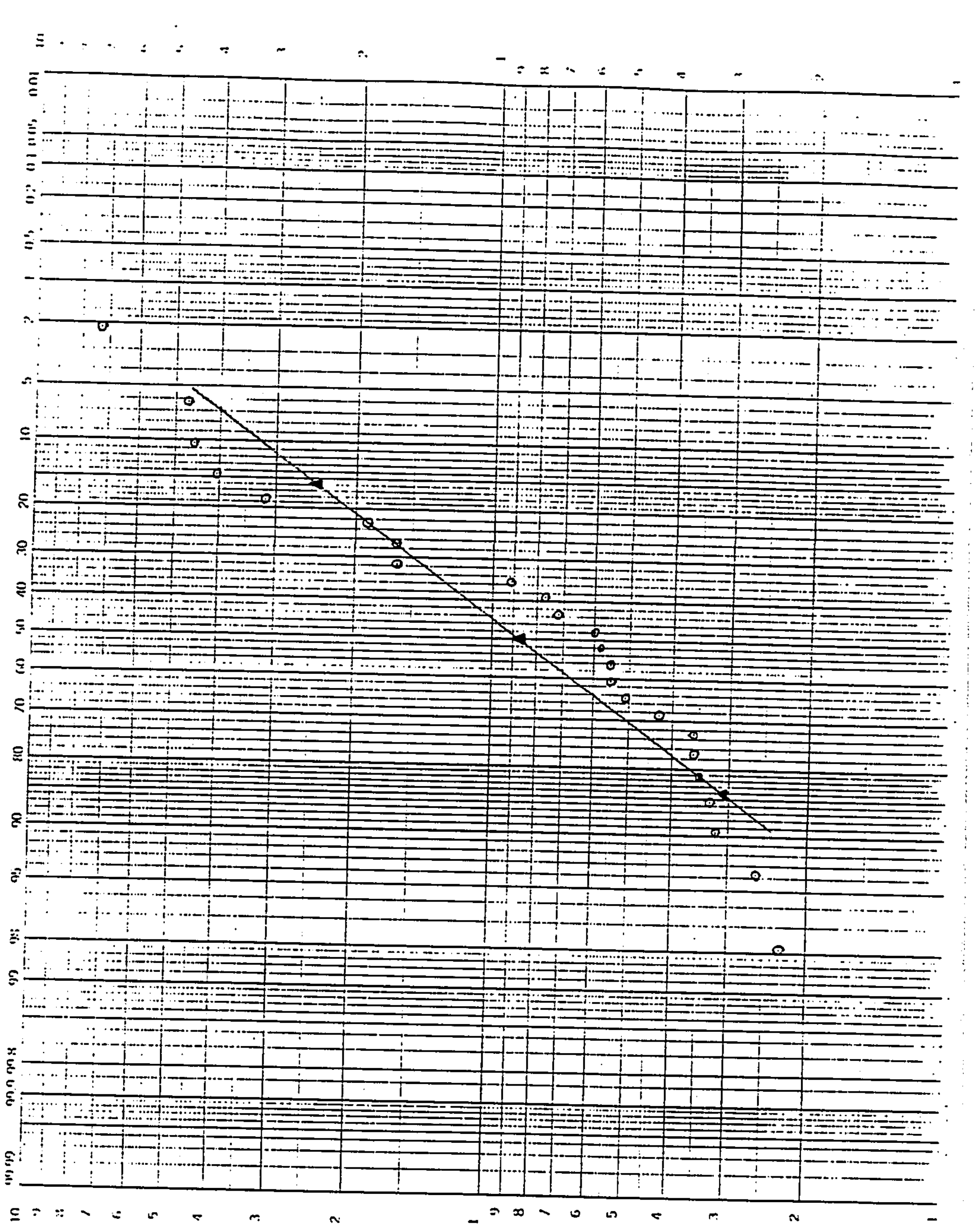
(Refer to Figure 4 in the text)

REEF FLAT	CHANNEL	MARINA ENTRANCE	SEAWARD OF REEF
1	6	5	4
2	10	9	13
3	11		14
7	12		17
8			18
15			19
16			

STUDY AREA SEAWARD WATER FROM THE REEF
DATE 3/19/88 4/13/88 AND 4/14/88
PARAMETER TURBIDITY

NUMBER OF DATA POINTS	24
MEDIAN	.590
SMALLEST VALUE	.230
LARGEST VALUE	7.320
MEAN	1.5317
STANDARD DEVIATION	1.8627
COEF. OF VARIATION	1.2161
GEOMETRIC MEAN	.8680
GEOMETRIC STANDARD DEVIATION	2.8158
84.1% FREQUENCY VE	2.4441
15.9% FREQUENCY VE	.3082

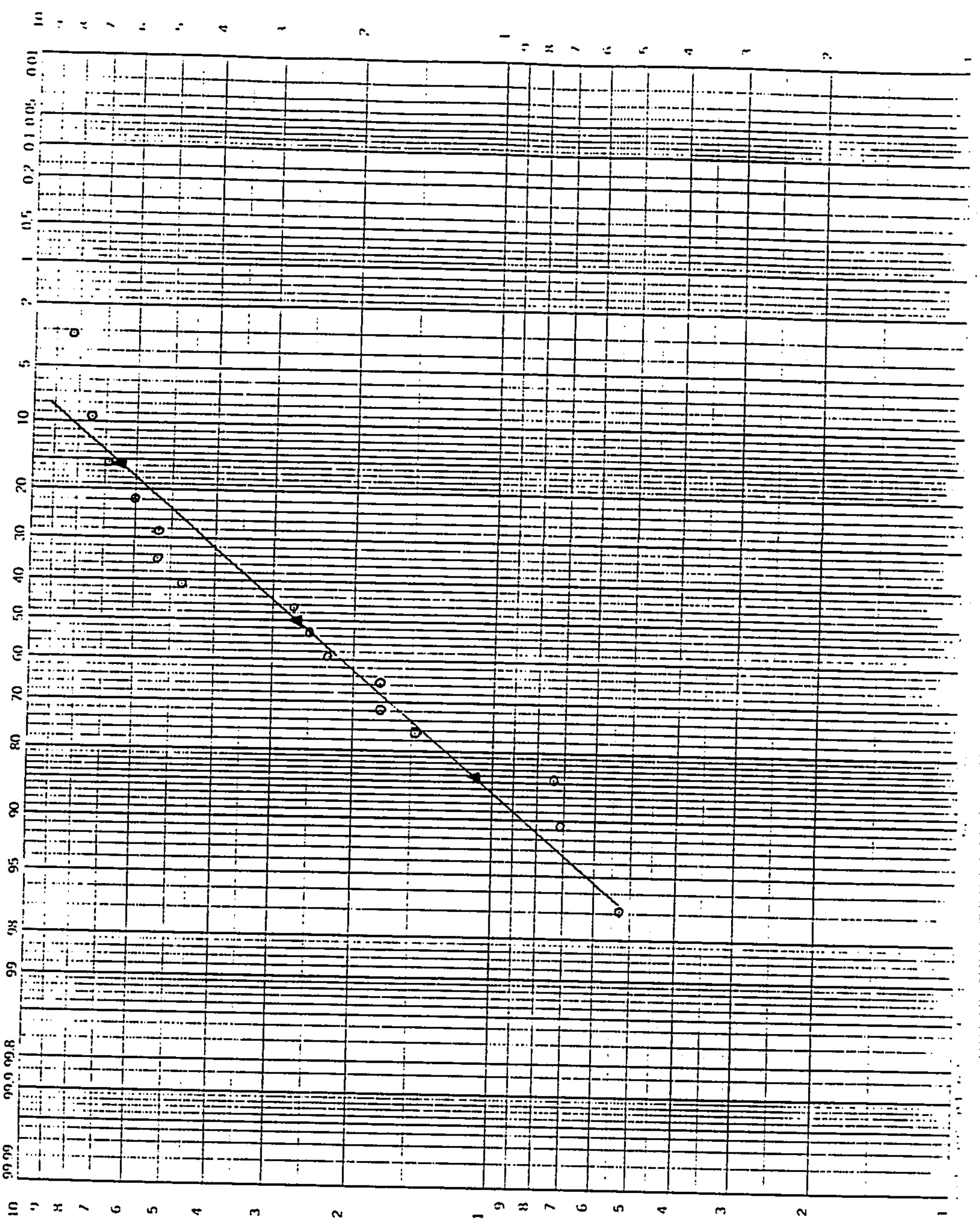
POINT	VALUE	F(I)
1	.230	.021
2	.260	.063
3	.320	.104
4	.330	.146
5	.350	.188
6	.360	.229
7	.360	.271
8	.430	.313
9	.510	.354
10	.550	.396
11	.550	.438
12	.580	.479
13	.600	.521
14	.720	.563
15	.770	.604
16	.910	.646
17	1.620	.688
18	1.630	.729
19	1.890	.771
20	3.160	.813
21	4.050	.854
22	4.560	.896
23	4.700	.938
24	7.320	.979



STUDY AREA IN THE CHANNEL
DATE 3/19/88 4/13/88 AND 4/14/88
PARAMETER TURBIDITY

NUMBER OF DATA POINTS	16
MEDIAN	2.605
SMALLEST VALUE	.530
LARGEST VALUE	8.280
MEAN	3.6644
STANDARD DEVIATION	2.6127
COEF. OF VARIATION	.7130
GEOMETRIC MEAN	2.6757
GEOMETRIC STANDARD DEVIATION	2.4419
84.1% FREQUENCY VE	6.5337
15.9% FREQUENCY VE	1.0957

POINT	VALUE	F(I)
1	.530	.031
2	.710	.094
3	.740	.156
4	1.480	.219
5	1.760	.281
6	1.760	.344
7	2.270	.406
8	2.500	.469
9	2.710	.531
10	4.720	.594
11	5.350	.656
12	5.370	.719
13	6.050	.781
14	6.890	.844
15	7.510	.906
16	8.280	.969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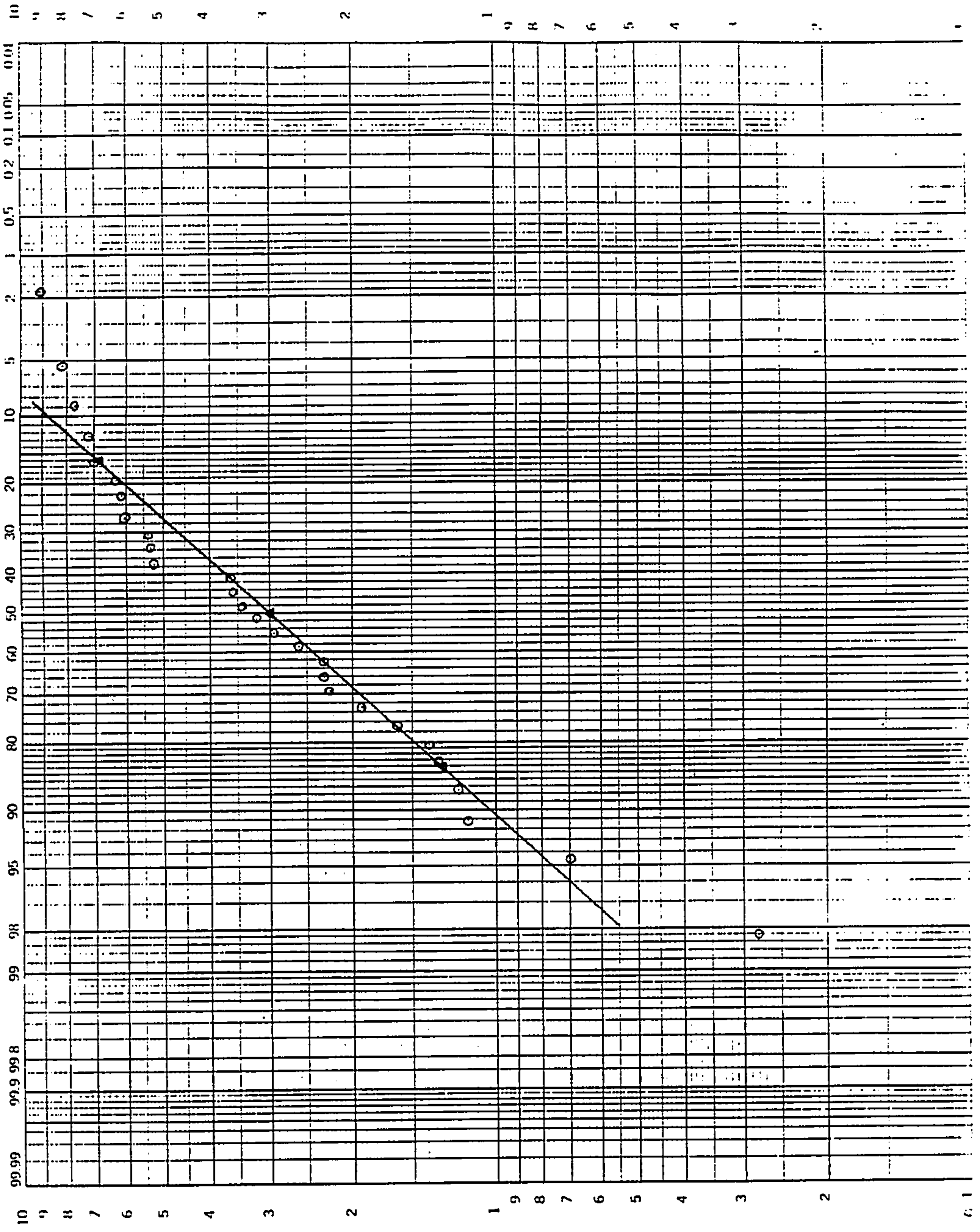
1

STUDY AREA   OVER THE REEF (MOANALUA BAY)
DATE   3/19/88 4/13/88 AND 4/14/88
PARAMETER   TURBIDITY

NUMBER OF DATA POINTS	28
MEDIAN	3.320
SMALLEST VALUE	.280
LARGEST VALUE	9.100
MEAN	3.9146
STANDARD DEVIATION	2.5383
COEF. OF VARIATION	.6484
GEOMETRIC MEAN	2.9913
GEOMETRIC STANDARD DEVIATION	2.3068
84.1% FREQUENCY VE	6.9002
15.9% FREQUENCY VE	1.2967

POINT	VALUE	F(I)
1	.280	.018
2	.700	.054
3	1.150	.089
4	1.200	.125
5	1.320	.161
6	1.380	.196
7	1.630	.232
8	1.910	.268
9	2.250	.304
10	2.300	.339
11	2.310	.375
12	2.620	.411
13	2.950	.446
14	3.200	.482
15	3.440	.518
16	3.600	.554
17	3.630	.589
18	5.250	.625
19	5.360	.661
20	5.380	.696
21	6.020	.732
22	6.130	.768
23	6.370	.804
24	7.000	.839
25	7.100	.875
26	7.750	.911
27	8.200	.946
28	9.100	.982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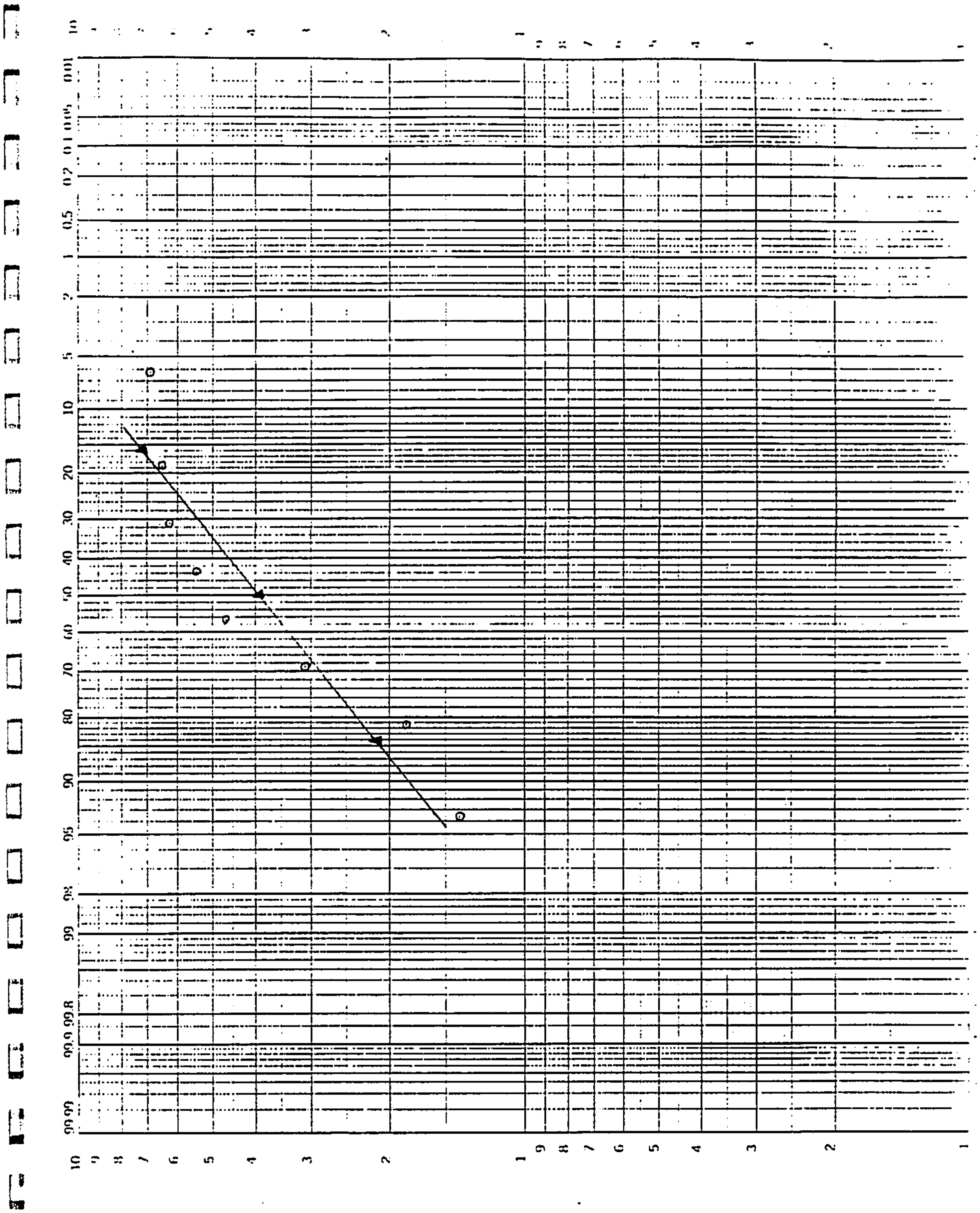
2

STUDY AREA HAWAII-KAI MARINA ENTRANCES
DATE 3/19/88 4/13/88 AND 4/14/88
PARAMETER TURBIDITY

NUMBER OF DATA POINTS	8
MEDIAN	5.865
SMALLEST VALUE	1.400
LARGEST VALUE	6.920
MEAN	4.5275
STANDARD DEVIATION	2.1613
COEF. OF VARIATION	.4774
GEOMETRIC MEAN	3.9412
GEOMETRIC STANDARD DEVIATION	1.8449
84.1% FREQUENCY VE	7.2712
15.9% FREQUENCY VE	2.1363

POINT	VALUE	F(I)
1	1.400	.063
2	1.850	.188
3	3.100	.313
4	4.690	.438
5	5.440	.563
6	6.270	.688
7	6.550	.813
8	6.920	.938



STUDY AREA MAUNALUA BAY PAST REEF
DATE 1973
PARAMETER TURBIDITY (TU)

NUMBER OF DATA POINTS	13
MEDIAN	.71
SMALLEST NUMBER	.2
LARGEST NUMBER	4.9
MEAN	1.5092
STANDARD DEVIATION	1.5696
COEF. OF VARIATION	1.0400
GEOMETRIC MEAN	.8772
GEOMETRIC STANDARD DEVIATION	3.0388
84.1% FREQUENCY VE	2.6656
15.9% FREQUENCY VE	.2887

POINT	VALUE	F(I)
1	.200	.038
2	.240	.115
3	.320	.192
4	.340	.269
5	.430	.346
6	.490	.423
7	.710	.500
8	.990	.577
9	1.800	.654
10	2.300	.731
11	2.900	.808
12	4.000	.885
13	4.900	.962

(from Sunn, Low, Tom & Hara, 1974)

STUDY AREA   MAUNALUA BAY CHANNEL
DATE   1973
PARAMETER   TURBIDITY (TU)

NUMBER OF DATA POINTS	15.0000
MEDIAN	6.6000
SMALLEST NUMBER	1.4000
LARGEST NUMBER	20.3000
MEAN	6.5800
STANDARD DEVIATION	4.4709
COEF. OF VARIATION	.6795
GEOMETRIC MEAN	5.3979
GEOMETRIC STANDARD DEVIATION	1.9664
84.1% FREQUENCY VE	10.6142
15.9% FREQUENCY VE	2.7451

POINT	VALUE	F(I)
1	1.400	.033
2	2.000	.100
3	2.400	.167
4	3.000	.233
5	5.200	.300
6	5.600	.367
7	6.200	.433
8	6.600	.500
9	6.900	.567
10	6.900	.633
11	7.100	.700
12	8.000	.767
13	8.200	.833
14	8.900	.900
15	20.300	.967

(from Sunn, Low, Tom & Hara, 1974)

STUDY AREA HAWAII KAI MARINA EXITS
DATE 1973
PARAMETER TURBIDITY (TU)

NUMBER OF DATA POINTS	27.0000
MEDIAN	8.7000
SMALLEST NUMBER	3.0000
LARGEST NUMBER	23.0000
MEAN	9.1593
STANDARD DEVIATION	4.6502
COEF. OF VARIATION	.5077
GEOMETRIC MEAN	8.1532
GEOMETRIC STANDARD DEVIATION	1.6410
84.1% FREQUENCY VE	13.3792
15.9% FREQUENCY VE	4.9685

POINT	VALUE	F(I)
1	3.000	.019
2	3.300	.056
3	3.900	.093
4	4.900	.130
5	4.900	.167
6	5.800	.204
7	5.900	.241
8	6.200	.278
9	6.700	.315
10	6.800	.352
11	6.900	.389
12	7.700	.426
13	7.700	.463
14	8.700	.500
15	8.800	.537
16	9.000	.574
17	9.700	.611
18	9.900	.648
19	10.500	.685
20	10.500	.722
21	11.000	.759
22	11.500	.796
23	13.000	.833
24	14.000	.870
25	15.000	.907
26	19.000	.944
27	23.000	.981

(from Sunn, Low, Tom & Hara, 1974)

TABLE 5. WATER QUALITY CHANGES AFTER A STORM

Station	Turbidity (FTU)			Salinity* (0/00)			Temperature* (°C)			T.N. (ug/l)			T.P. (ug/l)			T. Coliform (No./100 ml)			F. Coliform (No./100 ml)		
	Day*			Day*			Day*			Day*			Day*			Day*			Day*		
	1	3	5	1	3	5	1	3	5	1	3	5	1	3	5	1	3	5	1	3	5
1	0.35	0.35	0.45	33.90 33.79 33.87	34.05 34.04 34.05	33.68 33.73 33.78	25.42 25.40 25.35	25.08 25.50 25.55	25.70 25.68 25.50	219	214	208	7.8	44.2	14	-	-	-	-	-	-
2	2.1	6.5	7.0	33.10 33.34 33.63	32.87 33.30 33.73	33.22 33.38 33.60	25.12 25.35 25.32	25.16 24.42 24.70	25.05 25.10 25.10	270	423	455	16.3	32	24.8	< 5	< 5	< 2	< 5	< 5	< 2
3	7.1	7.0	7.6	33.45 33.30 33.45	32.42 32.50 32.52	32.89 32.90 33.30	25.20 25.10 25.24	25.25 25.10 25.02	24.98 24.90 25.05	284	626	348	35.7	78	27.9	-	-	-	-	-	-
4	9.0	5.0	8.8	31.21 31.30 32.66	32.64 32.70 33.00	32.93 32.96 33.08	25.20 25.18 25.15	25.65 25.30 25.10	25.18 25.15 25.02	656	538	298	50.4	49	40	< 100	< 5	< 2	40	< 5	4
5	27.0	13.0	16	32.48 32.44 32.44	32.88 32.80 33.00	32.58 32.66 32.55	25.53 25.58 25.62	25.74 25.53 24.65	24.75 24.66 24.65	592	443	617	107	71	71	-	-	-	-	-	-
6	25.0	9.5	14	31.04 31.04 31.30	31.55 31.36 31.40	31.09 31.80 31.82	25.00 25.04 25.00	25.80 25.86 24.99	24.70 24.75 24.85	1109	949	1042	90.7	73	55	1,000	< 10	700	200	5	600
7	33.0	18.0	20	31.00 -- 31.20	31.85 -- 31.76	31.65 -- 31.35	25.70 -- 25.70	24.98 -- 24.98	24.36 -- 24.53	1286	980	1042	118.6	79.1	98	2,000	200	900	1,000	100	800
8	16.0	10.0	15	31.85 -- 31.87	31.95 -- 32.20	32.26 -- 32.50	25.95 -- 26.00	24.04 -- 24.90	25.02 -- 24.82	475	519	508	51.2	50	47	1,000	30	1,000	500	< 10	800
9	5.1	5.0	6.2	26.08 26.20 26.40	31.92 32.04 32.00	32.20 32.30 32.35	25.30 25.32 25.30	25.78 25.60 25.36	25.10 25.02 24.90	549	380	431	47.3	71	33	< 10	< 10	< 2	40	< 10	< 2
10	4.8	3.3	6.4	31.00 31.35 31.60	32.30 32.34 31.42	32.60 32.83 32.58	26.00 26.00 26.00	26.00 25.95 24.80	26.00 25.13 25.10	466	359	477	29.5	26	24.8	-	-	-	-	-	-
11	9.0	4.0	6.5	32.70 -- 32.70	31.89 -- 31.80	32.38 -- 32.40	25.45 -- 25.50	25.76 -- 25.45	25.23 -- 25.30	388	398	304	25.6	19.4	20.2	-	-	-	-	-	-

* Days after storm, November 11, 1973.
* In situ readings taken at surface, mid-depth, and bottom.

(from Sunn, Low, Tom & Hara, 1974)

APPENDIX D

MAUNALUA BAY BIOLOGICAL ASSESSMENT

INTRODUCTION

The population of East Honolulu has grown dramatically in the last 10 years. The major road servicing this surburban area and connecting it to primary employment center, Honolulu, is the four lane Kalanianaole Highway. Traffic congestion during peak hours has prompted transportation officials to seek alternative methods of mass transit between these two points. Since Hawaii Kai is situated adjacent to the shoreline, one of the suggested alternatives is to develop an over-water ferry system. The intra-island ferry system has been selected as the most appropriate solution to alleviating the traffic problem.

On step in the implementation of such a ferry system is to construct adequate docking facilities at Maunalua Bay Beach Park in Hawaii Kai. This would include the construction of onshore facilities (passenger drop-off and waiting areas) as well as some construction activities in the water including the dredging of a turning basin, building of docking facilities and the widening of the existing boat channel. The in-water construction and dredging activities will impact surrounding marine communities. This study was undertaken to address these impacts. The study (1) reviews existing literature in an effort to describe past major construction activities that have impacted the marine ecosystem in the project area, (2) describes extant marine communities in the project area using information collected in the field, and (3) assesses possible impacts that may occur to these communities with this development.

EARLY IMPACTS

The Hawaii Kai Marina was constructed on the site of Kuapa Pond. Kuapa Pond was important as a fishpond for the raising of mullet (Mugil cephlus) 'awa (Chanos chanos) and aholehole (Kuhlia sandvicensis) since prehistoric times and was one of the largest ponds in the Hawaiian Islands (Sakoda 1975). The pond was separated from Maunalua Bay by a narrow rock-faced sand spit or wall. This wall was about 1.5km in length and was breached by two makahas (openings to the sea). In the late 1930's Kalanianaole Highway was built along this sand strip, widening the barrier between the pond and the sea. Two culverts were constructed to provide water exchange between the pond and the bay; the main channel at the site of the present entrance to Hawaii Kai Marina was increased to 12m in width. In this relatively unmodified state, Kuapa Pond probably served as a repository or settlement basin for terrigenous materials generated by storm water runoff from the surrounding valleys thus protecting the nearby coral reefs of Maunalua Bay.

Years ago channels affronting Maunalua Bay Beach Park probably existed approximately where they do today and were created by freshwater and terrigenous inputs from Kuliouou Stream and Kuapa Pond (AECOS 1979). Dredging was first undertaken on the entrance channel through the reef to Kuapa Pond during World War II to service the military installation at nearby Koko Crater. This dredging operation probably served to widen a pre-existing natural channel through the reef. Work on the Hawaii Kai Marina commenced in 1959 with the dredging of portions of Kuapa Pond. This dredging and filling resulted in the size of Kuapa Pond being reduced from 208 to 103ha; concurrently the average depth of the basin was increased from 0.75 to about 2m (Clark 1977). The marina is used for recreational boating, water sports and fishing activities and the filled portions comprise part of the residential development of Hawaii Kai. During this time the 12m wide channel into Kuapa Pond was widened from 12 to 76m and a new bridge constructed; an access channel paralleling and adjacent to the shore was cut from the boat channel easterly for 800m past the Maunalua Bay Beach Park boat ramp to the mouth of Kuliouou Stream and Paiko Lagoon. This channel is approximately 45m in width and 2.5m in depth. The material from this operation was used to create the present beach park and boat launching area at Maunalua Bay (Sakoda 1975). Presently these channels serve as collection points for the discharge of freshwater and terrigenous materials from Paiko Lagoon, Kuliouou Stream and the two marina entrances.

These construction activities altered some benthic communities by their removal; also the dredging as well as occasional runoff due to storms must have contributed to the sediment loading in the nearshore waters affronting the Hawaii Kai Marina. However, as noted by AECOS (1979), these waters were turbid prior to the dredging of the marina and disturbance to adjacent lands. The turbidity was due to the flow of water from Kuapa Pond and resuspension of fine materials on the reef flat. AECOS (1979) noted that the turbidity had not lessened following marina construction because boat traffic served to keep materials in suspension; hence visibility at that time was "limited to about 5 feet on the murky inner reef flat". These observations and the long history of construction in the area suggest that high particulate loading in the water column has been the norm for at least 50 years.

MATERIALS AND METHODS

The fieldwork that serves as the database for this study was carried out in March and April 1988. Marine communities residing in a 450m wide arc or band extending from Paiko Lagoon on the west, about 1.2km easterly along the shore and seaward in the existing boat channel for 1.3km were examined (Figure 1).

The quantitative sampling of macrofauna of marine communities presents a number of problems; many of these are related to the scale on which one wishes to quantitatively enumerate organ-

Figure 1. Approximate area encompassed by this survey of the marine communities in the area affronting Maunalua Bay Beach Park shown in crosshatching.

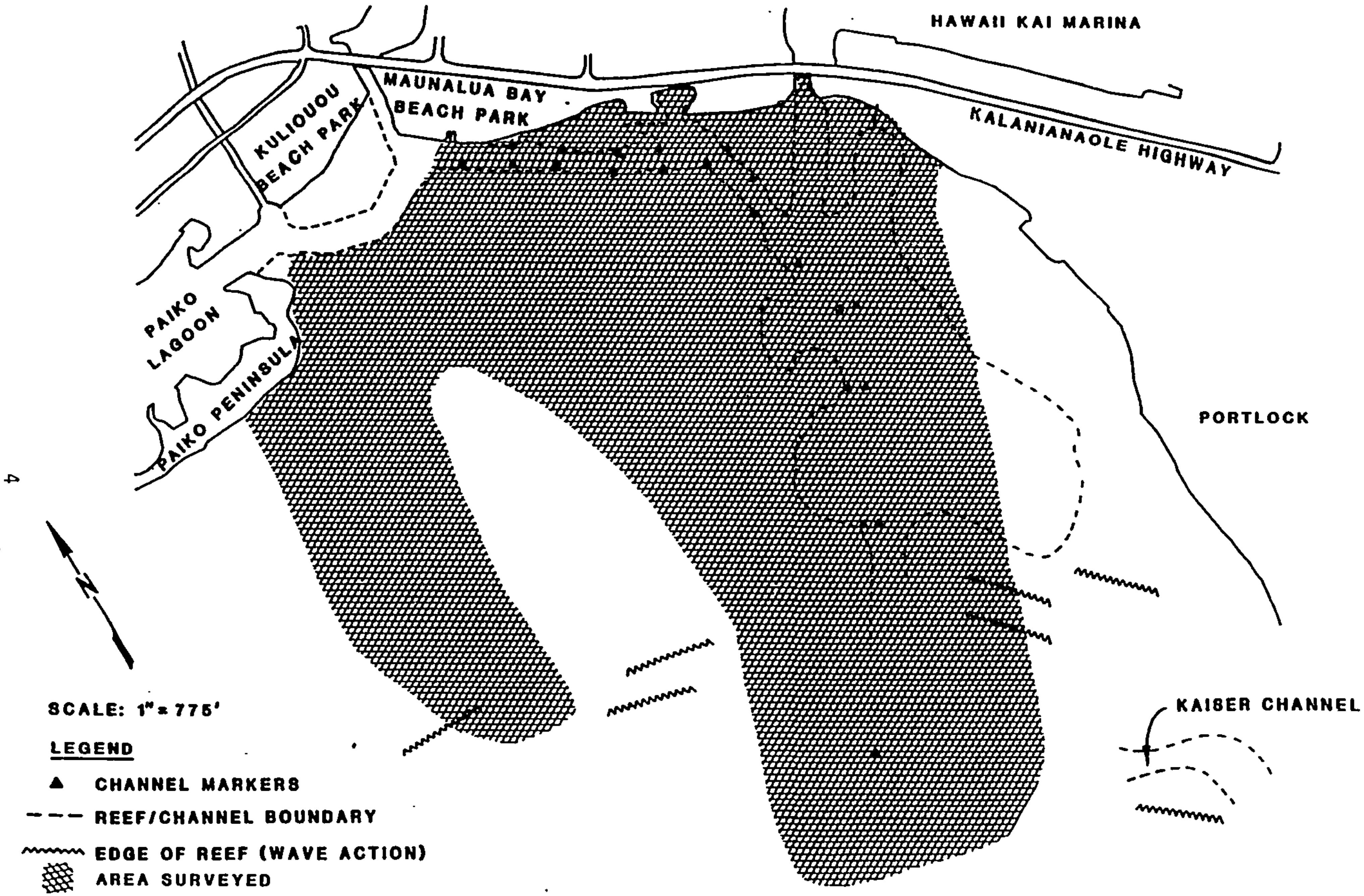


FIGURE 1 AREA ENCOMPASSED BY 1988 BIOLOGICAL SURVEY

ism abundance. Marine communities affronting the Maunalua Bay Park may be spatially defined in a range on the order of a few hundred square centimeters (such as the community residing in a Pocillopora meandrina coral head) to major biotopes covering many hectares. Recognizing this ecological characteristic, we designed a sampling program that attempted to delineate major extant communities in the limits of the study area and to quantitatively describe these communities. Thus, a number of methods were used.

To obtain an overall perspective on the extent of the major communities or "zones" occurring in the study area, a diver either swam or where shallow enough, walked over most of the study area from shore seaward to the reef crest. This exercise allowed the qualitative delineation of three major biotopes based partially on large structural elements (e.g., amount of sand, mud, hard substratum, fish abundance, coral coverage or dominant benthic species). Within each of these, stations were erected and quantitative studies were conducted, including a visual enumeration of fish, counts along benthic transect lines and cover estimates in benthic quadrats. Besides these quantitative measures, a qualitative reconnaissance was made in the vicinity of each station by swimming and noting the presence of species not encountered in the transects. Most of the assessments were carried out using SCUBA; snorkeling was used at stations situated in water less than 1.5m in depth.

The location of stations were subjectively chosen as being representative of a given biotope. Immediately following site selection, a visual fish census was undertaken to estimate the abundance of fishes. These censuses were conducted over a 20 x 4m corridor and all fishes within this area to the water's surface were counted. A single diver equipped with SCUBA, transect line, slate and pencil would enter the water, count and note all fishes in the prescribed area (method modified from Brock 1954). The 20m transect line was paid out as the census progressed, thereby avoiding any previous underwater activity in the area which could frighten wary fishes.

Fish abundance and diversity is often related to small-scale topographical relief over short linear distances. A long transect may bisect a number of topographical features (e.g., cross coral mounds, sand flats, and algal beds), thus sampling more than one community and obscuring distinctive features of individual communities. To alleviate this problem, a short transect (20m in length) has proven adequate in sampling many Hawaiian benthic communities.

Besides frightening wary fishes, other problems with the visual census technique include the underestimation of cryptic species such as moray eels (family Muraenidae) and nocturnal species, e.g., squirrelfishes (family Holocentridae), aweoweos (family Priacanthidae), etc. This problem is compounded in areas of high relief and coral coverage affording numerous shelter sites. Species lists and abundance estimates are more accurate for areas of low relief although some fishes with cryptic habits or protective coloration (e.g., the nohus, family Scorpaenidae; the flatfishes, family Bothidae) might still be missed. Obviously, the effectiveness of the visual census technique is reduced in turbid water (a major problem in the present survey) and species of fishes which move quickly and/or are very numerous may be difficult to count. Additionally, bias related to the experience of the diver conducting counts should be considered in making any comparisons between surveys or areas. In this case, the same individual (Brock) carried out all census work. In spite of the above drawbacks, the visual census technique probably provides the most accurate nondestructive assessment of diurnally active fishes presently available (Brock 1982).

After the assessment of fishes, an enumeration of epibenthic invertebrates (excluding corals) was undertaken using the same transect line as established for fishes. Exposed invertebrates usually greater than 2cm in some dimension (without disturbing the substratum) were censused in a 20 x 4 m area. As with the fish census technique, this sampling methodology is quantitative for only a few invertebrate groups, e.g., some of the echinoderms and holothurians. Most coral reef invertebrates (other than corals) are cryptic or nocturnal in their habits making accurate assessment of them in areas of topographical relief very difficult. This, coupled with the fact that the majority of these cryptic invertebrates are small necessitates the use of methodologies beyond the scope of this survey (e.g., see Brock and Brock 1977). Recognizing constraints on time and the scope of this survey, the invertebrate censusing techniques used here attempted only to assess those few macroinvertebrate species that are diurnally exposed.

Exposed sessile benthic forms such as corals and macrothalloid algae were quantitatively surveyed by use of quadrats and the point-intersect method. The point-intersect technique only notes the species of organisms or substratum type directly under a point. Along the previously set fish transect line, 40 such points were assessed (once every 50cm). These data have been converted to percentages. Quadrat sampling consisted of recording benthic organisms, algae and substratum present as a percent cover in five one-meter-square frames placed at five-meter intervals along the transect line established for fish censusing (at 0, 5, 10, 15, and 20m).

During the course of the fieldwork, notes were taken on the number of turtles seen within the study area.

Simple methods of data reduction and analysis have been used and are described where met with in the text. Diversity (H') is calculated as described by Pielou (1966), where:

$$H' = -\sum p_i \ln p_i$$

and p_i is that proportion of the individuals censused belonging to species i. This is the Shannon-Wiener index.

RESULTS

In total 3 biotopes were recognized affronting Maunalua Bay Beach Park in this study (Figure 2); these were the reef flat biotope, the channel floor biotope and the biotope of limestone mounds situated seaward of the fringing reef. Five quantitative stations were established to sample the marine communities in the reef flat and channel floor biotopes and one station sampled the biotope of limestone mounds. One small area (approximately 700m^2) that is biologically very different from surrounding communities was discerned; this area is located on the eastern side of the Hawaii Kai boat channel about 0.5km from shore and the benthos is dominated by live corals. One quantitative station was established to sample this area. Other than the channel floor biotope, the lines delineating the boundaries of the biotopes in Figure 2 are not sharp, rather there exists a zone of transition or ecotone between each biotope. The locations of the biotopes are shown in Figure 2 and Figur 3 presents the locations of the 12 quantitative stations sampled in this study. The marine communities at each station are discussed by biotope below:

Reef Flat Biotope

This biotope affronts Maunalua Bay Park and extends from the shoreline to the crest of the fringing reef about 900m offshore. the biotope is situated on an old limestone bench that has a veneer of fine terrigenous mud and rubble which is most apparent within 250m of shore; more seaward, limestone substratum is visible between pockets of muddy sand and rubble. The dimensions of these pockets of sedimentary material range from 2 x 5m to over 60 x 100m spaced 10 to 100m apart. Much of this biotope is in water less than 1m in depth and is exposed at low tide.

In general benthic communities in the reef flat biotope may be characterized as being highly disturbed along the inner portions and dominated by sessile filter and suspension feeding forms. Further offshore, the algae and a number of invertebrate and fish species that are usually seen on Hawaiian reefs may be found.

Stations 1,3,11 and 12 sampled the inner (nearshore) portions of the reef flat biotope and Station 6 was established to survey the more seaward part of this biotope. The substratum

Figure 2. Approximate boundaries of the three biotopes defined in this study. These are 1 - reef flat biotope, 2 - the channel floor biotope, and 3 - the biotope of limestone mounds. An area of high coral coverage is shown as crosshatching.

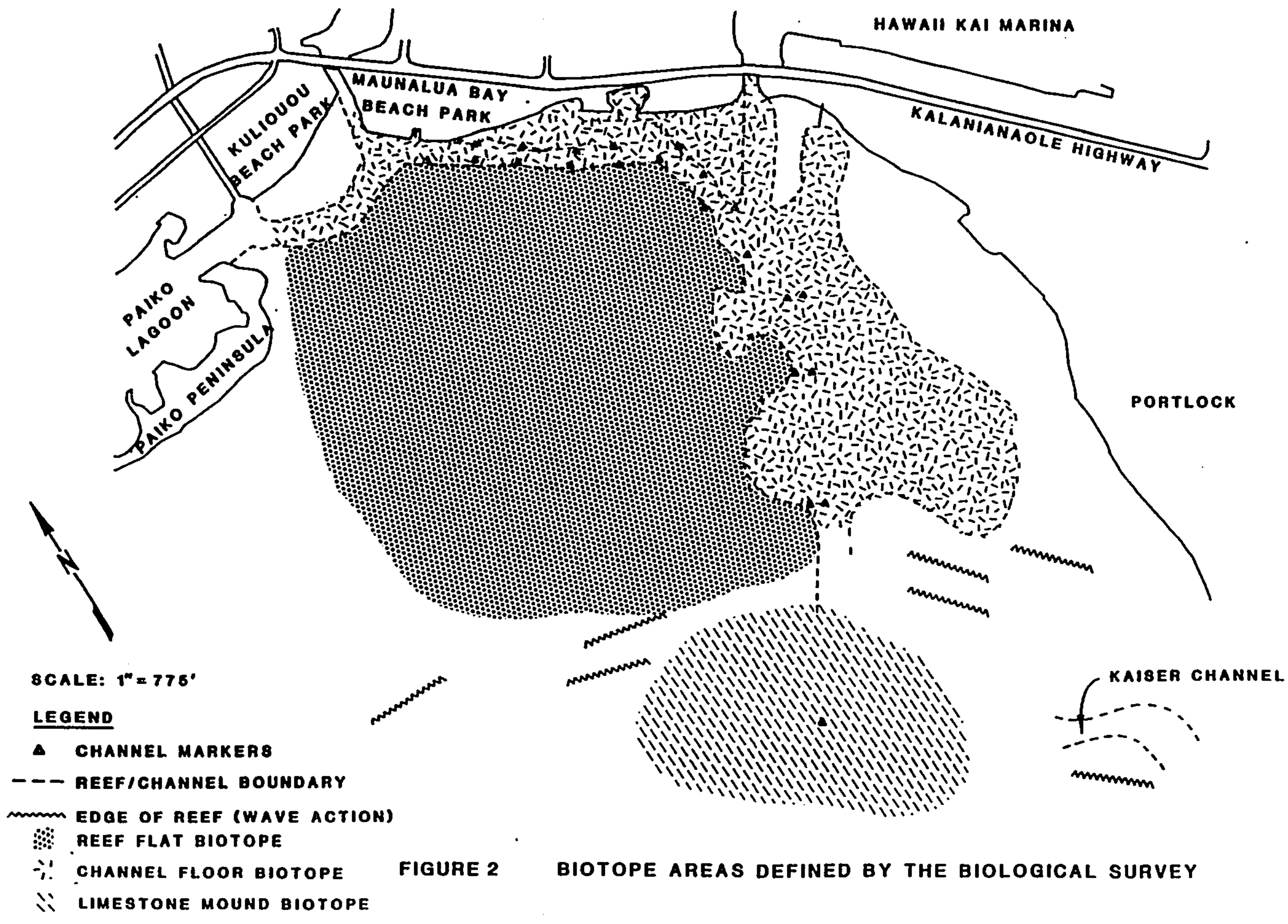


FIGURE 2 BIOTOPE AREAS DEFINED BY THE BIOLOGICAL SURVEY

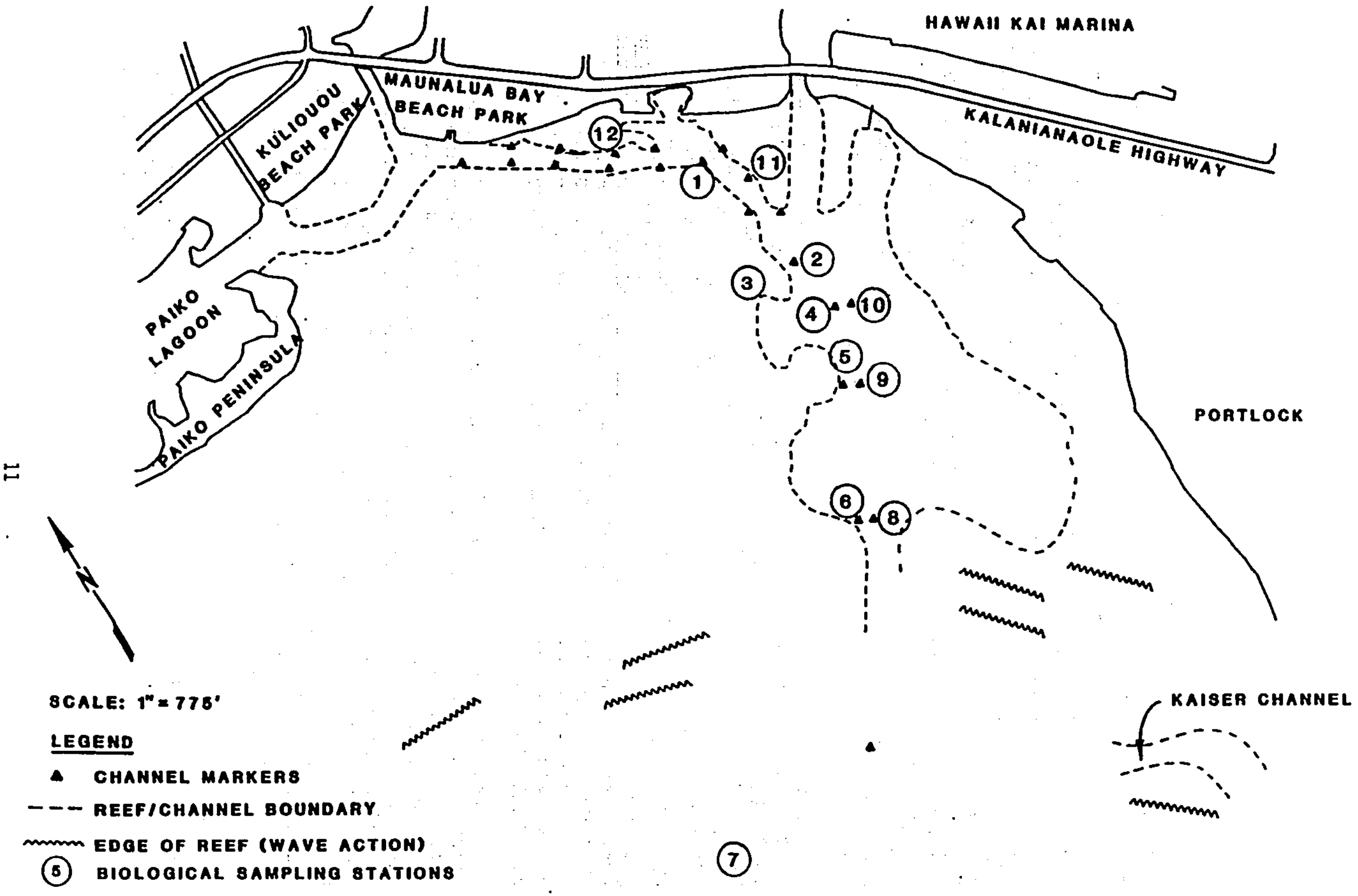


FIGURE 3 LOCATION OF QUANTITATIVE BIOLOGICAL SAMPLING STATIONS

CORRECTION

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

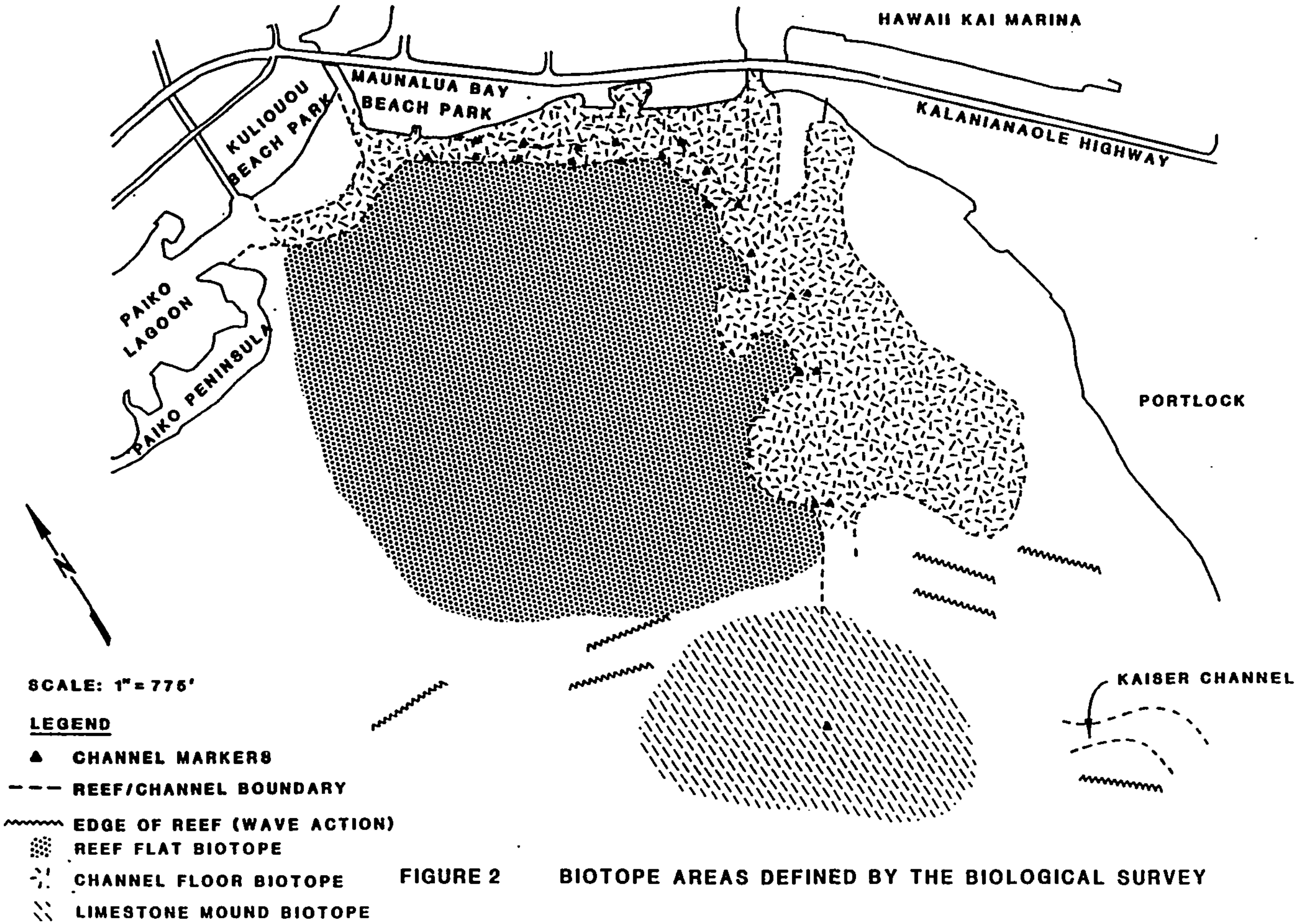


FIGURE 2 BIOTOPE AREAS DEFINED BY THE BIOLOGICAL SURVEY

Figure 3. The location of the 12 quantitative stations established to sample the marine communities in the area affronting Maunalua Bay Beach Park in this study.

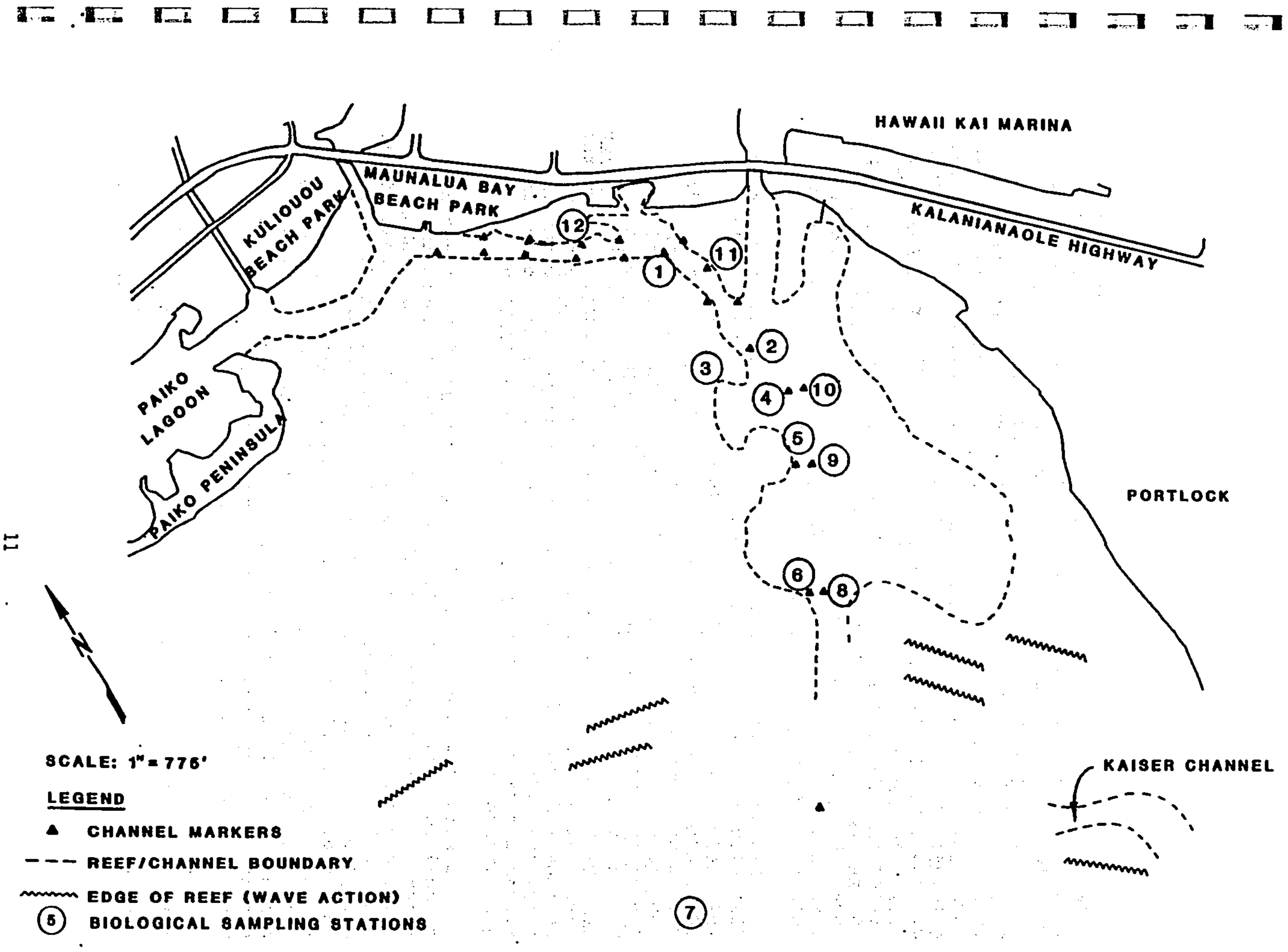


FIGURE 3 LOCATION OF QUANTITATIVE BIOLOGICAL SAMPLING STATIONS

in the inner area is dominated by mud with more rubble being apparent at the edges of the dredged channel that bisects the biotope. Where hard substratum occurs, a number of algae and sessile invertebrates can be found; dominant algal species include _Acanthophora spicifera_, _Spyridia filamentosa_, _Halimeda opuntia_ and _Hypnea musciformis_. Exposed sessile invertebrates include the soft coral (_Anthelia edmondsoni_), the feather duster worm (_Sabellastarte sanctijosephi_), the terebellid worm (_Thelepus setosus_), tubeworm (_Ficopomatus enigmaticus_), a number of sponge species (_Zygomycale parishi_, _Mycale cecilia_, _Plakortis simplex_, _Toxadocia violacea_ and several unidentified species), the rock oyster (_Ostrea sandvicensis_), bryozoans (_Schizoporella unicornis_ and _Bugula neritina_) and occasionally small colonies of the coral, _Pocillopora damicornis_. Motile invertebrates commonly seen include the swimming crab (_Thalamita integra_) and the xanthid crab (_Leptodius sanguineus_).

Fishes are not a conspicuous part of the fauna of the reef flat biotope. Species usually encountered include the o'opu (_Asterropteryx semipunctatus_), the cardinalfish (_Foa brachygramma_) and the o'ili'uwi'uwi (_Pervagor spilosoma_). Near the channel edges on the reef flat were seen juvenile kaku (_Sphyraena barracuda_), pua (_Mugil cephalus_), shortfin molly (_Poecilia mexicana_) and the tilapia (_Tilapia melanotheron_). Besides these species, fishermen "whip" for papio (omilu - _Caranx melampygus_ and threespot papio - _Carangoides orthogrammus_) on the reef flat and in the adjacent channels and net fishermen target on 'awa (_Chanos chanos_) and 'anae (_Mugil cephalus_). Occasionally, crab fishermen will set their nets in the area catching samoan and swimming crabs (_Scylla serrata_ and _Portunus sanguinolentus_).

Station 1 was established along the edge of the dredged channel adjacent to marker 11 about 95m from the shoreline (see Figure 3). The substratum at this station is mud and rubble. Water depth ranged from about 1 to 2.5m (along the channel edge). The results of the quantitative survey conducted at Station 1 are given in Table 1. The dominant macroinvertebrates encountered at this station were sponges (_Mycale cecilia_) and feather duster worms (_Sabellastarte sanctijosephi_). Only one fish species, the o'opu (_Asterropteryx semipunctatus_) was censused, but in the vicinity of this station was seen the cardinalfish (_Foa brachygramma_). During the census the visibility at Station 1 was about 15cm.

Station 3 also sampled the reef flat biotope and was established about 380m offshore near the edge of the boat channel affronting Maunalua Bay Beach Park (Figure 3). More hard substratum and less mud was present at this station than at the

Table 1. Summary of the benthic survey conducted at Station 1 affronting the Maunalua Bay Beach Park, Hawaii Kai, Oahu. Results of the 5 m^2 quadrat sampling of the benthic community present (expressed in percent cover) are given in Part A; a 40-point analysis is presented in Part B and counts of invertebrates in Part C. A short summary of the fish census is given in Part D. Water depth 1 to 2.5 m; mean coral coverage is 0% (quadrat method).

A. Quadrat Survey

Species	Quadrat Number 1	2	3	4	5
Algae					
Acanthophora spicifera			0.5		1
Soft Corals					
Anthelia edmondsoni		0.25			
Mud	46	17.75	34.5	44	87
Rubble	49	82	65	51	12
Hard Substratum	6			5	

B. 40-Point Analysis

Species	Percent of the Total
Mud	51
Rubble	49

C. Invertebrate Census (20x4 m)

Species	Number
Phylum Annelida	
Thelepus setosus	4
Sabellastarte sanctijosephi	8
Phylum Porifera	
Zygomycale parishi	2
Mycale cecilia	6

D. Fish Census (20x4 m)

1 Species
3 Individuals
Diversity (H')=0

preceding one; water depth was 1.5m and the visibility about 30cm. Table 2 presents the results of the quantitative survey conducted at Station 3. Four macrothalloid algal species were censused, and the soft coral (Anthelia edmondsoni) was present. Two coral species, Pocillopora damicornis and Montipora verrucosa, comprised a mean coverage of 0.8 percent at this station. The most abundant macroinvertebrate present was the feather duster worm (Sabellastarte sanctijosephi). Two fish species were censused and the most common was the o'opu (Asterropteryx semipunctatus). In the vicinity of this station were seen the algae, Hypnea musciformis and Avrainvillea amadelpha, as well as the 'omaka (Stethojulis balteata).

Station 11 sampled the reef flat biotope near channel marker 10 about 115m offshore (Figure 3). Water depth at this station was 0.8m and the visibility about 60cm. The substratum at this station was comprised of mud and rubble in near equal proportions. Table 3 presents the results of the quantitative survey at Station 11. Five algal species comprised a mean overall cover of about 4.9 percent; the most common species was the bubble alga, Dictyosphaeria cavernosa. One coral species, Pocillopora damiccornis, was censused and had a mean coverage of 0.5 percent. Five sponge species were present but the feather duster worm (Sabellastarte sanctijosephi) was the most abundant macroinvertebrate encountered. Four fish species were censused and the o'opu (Asterropteryx semipunctatus) was the most common. In the vicinity of this station were seen the moa (Ostracion meleagris), the mamo (Abudefduf abdominalis) and the coral Cyphastrea ocellina.

Station 12 sampled the reef flat biotope in the area proposed to become the turning basin for the intra-island ferry near present channel marker number 16. The substratum at this station is comprised of rubble and muddy sand; water depth was about 0.8m and the visibility at the time of sampling was 40cm. Table 4 presents the results of the quantitative survey carried out at Station 12. The most abundant alga present was Acanthophora spicifera and three limu (algal) species were present having an overall coverage of 15.8 percent. No live corals were encountered in the quantitative survey but nearby one small colony of Pocillopora damicornis was seen and several recently dead colonies were noted. The most abundant macroinvertebrate species in the 20 x 4m census area was the sponge, Plakortis simplex; the only other invertebrate species in this area was the ubiquitous feather duster worm (Sabellastarte sanctijosephi). The only fish species in the quantitative census was the o'opu (Asterropteryx semipunctatus). In the vicinity of this station were seen the goby (Bathygobius fuscus), the limu (Hypnea cervicornis and the swimming crab (Thalamita edwardsi).

Station 6 was established about 800m from shore near channel

Table 2. Summary of the benthic survey conducted at Station 3 affronting the Maunalua Bay Beach Park, Hawaii Kai, Oahu. Results of the 5 m^2 quadrat sampling of the benthic community present (expressed in percent cover) are given in Part A; a 40-point analysis is presented in Part B and counts of invertebrates in Part C. A short summary of the fish census is given in Part D. Water depth 1.5 m; mean coral coverage is 0.8% (quadrat method).

A. Quadrat Survey

Species	Quadrat Number 1	2	3	4	5
Algae					
Acanthophora spicifera	2				
Spyridia filamentosa		0.5			
Halimeda opuntia	2				
Sporolithon erythraeum				1	0.1
Soft Corals					
Anthelia edmondsoni	3	2			
Corals					
Montipora verrucosa	1	3			
Pocillopora damicornis				0.1	
Mud	8	6	97		
Rubble	84	48.5	3		
Hard Substratum		40		98.9	99.9

B. 40-Point Analysis

Species	Percent of the Total
Mud	26
Rubble	38
Hard Substratum	36

C. Invertebrate Census (20x4 m)

Species	Number
Phylum Annelida	
Sabellastarte sanctijosephi	16
Phylum Mollusca	
Plakobranchus ocellatus	1

D. Fish Census (20x4 m)

2 Species
4 Individuals
Diversity (H')=0.35

Table 3. Summary of the benthic survey conducted at Station 11 affronting the Maunalua Bay Beach Park, Hawaii Kai, Oahu. Results of the 5 m^2 quadrat sampling of the benthic community present (expressed in percent cover) are given in Part A; a 40-point analysis is presented in Part B and counts of invertebrates in Part C. A short summary of the fish census is given in Part D. Water depth 1 m; mean coral coverage is 0.5% (quadrat method).

A. Quadrat Survey

Species	Quadrat Number 1	2	3	4	5
Algae					
Spyridia filamentosa	0.5		1		
Hypnea musciformis	0.1		3		
Halimeda opuntia			0.1		
Dictyosphaeria cavernosa		18			
Laurencia obtusa				2	
Corals					
Pocillopora damicornis	0.01	2	0.25		
Mud	59.39	51	55.65	38	8
Rubble	40	20	40	60	92
Hard Substratum		9			

B. 40-Point Analysis

Species	Percent of the Total
Algae	
Spyridia filamentosa	1
Mud	47
Rubble	52

C. Invertebrate Census (20x4 m)

Species	Number
Phylum Porifera	
unidentified sponge sp.	1
Zygomycale parishi	4
Plakortis simplex	4
Mycale cecilia	1
Toxadocia violacea	3
Phylum Annelida	
Sabellastarte sanctijosephi	21

D. Fish Census (20x4 m)

4 Species
17 Individuals
Diversity (H')=0.62

Table 4. Summary of the benthic survey conducted at Station 12 affronting the Maunalua Bay Beach Park, Hawaii Kai, Oahu. Results of the 5 m^2 quadrat sampling of the benthic community present (expressed in percent cover) are given in Part A; a 40-point analysis is presented in Part B and counts of invertebrates in Part C. A short summary of the fish census is given in Part D. Water depth 0.8 m; mean coral coverage is 0% (quadrat method).

A. Quadrat Survey

Species	Quadrat Number 1	2	3	4	5
Algae					
Hypnea musciformis	0.5		0.1		
Acanthophora spicifera		0.1	3	65	10
Dictyosphaeria cavernosa				0.5	
Mud/Sand	64.5	24.9	11.9	12.5	65
Rubble	35	75	85	22	25

B. 40-Point Analysis

Species	Percent of the Total
Algae	
Acanthophora spicifera	7
Mud/Sand	68
Rubble	25

C. Invertebrate Census (20x4 m)

Species	Number
Phylum Porifera	
Plakortis simplex	8
Phylum Annelida	
Sabellastarte sanctijosephi	7

D. Fish Census (20x4 m)

1 Species
4 Individuals
Diversity (H')=0

marker 1 in water 2 to 3m in depth affronting the Maunalua Bay Beach Park (Figure 3). Visibility at the time of sampling was 1m. This station sampled the ecotone or zone of transition between the reef flat biotope and the biotope of limestone mounds. The station is located in the vicinity of the reef crest and is exposed to impinging surf; the substratum at this station is more typical of that found on coral reefs being comprised of sand, rubble and some live coral. In this area rubble is the dominant substratum type. Overall, coral coverage averages about 3 percent and macrothalloid algae have a mean coverage of about 1 percent. Several individual Porites lobata coral heads were seen in the area whose diameters exceeded 1.2m. Table 5 presents the quantitative information gathered at Station 6. Six coral species were found in the quadrat survey having a mean coverage of 2.6 percent. The most common coral species was Porites lobata. Interestingly, one colony of the coral Porites (Synaraea) convexa was in the census area; this species is not often encountered in the shallows of Oahu's south shore. Eight algal species were in the transect area having a mean coverage of 1.3 percent. The most common limu species was Avrainvillea amadelpha. The most abundant exposed macroinvertebrate was the green sea urchin (Echinometra mathaei); also seen was one small he'e or octopus (Octopus cyanea). Three species of fishes (4 individuals) were censused and the o'opu (Asterropteryx semipunctatus) was the most common. In the vicinity of this station were seen hinalea lau'wili (Thalassoma duperrey), ma'i'i'i (Acanthurus nigrofuscus), o'ili'uwi'uwi (Pervagor spilosoma), moa (Ostracion meleagris), black sea cucumber (Holothuria atra), soft coral (Palythoa tuberculosa), black sea urchin (Tripneustes gratilla), wana (Echinothrix diadema), white sea urchin (Pseudoboletia indiana) and the corals Psammocora (Stepanaria) stellata and Porites evermanni.

Biotope of Limestone Mounds

Seaward of the reef crest and reef flat biotope affronting the Maunalua Bay Beach Park is the biotope of limestone mounds. This biotope commences about 900m from shore in about 3.5m of water and extends seaward at least an additional 300m to a depth of 6m or more. This biotope is characterized by low mounds or patches of emergent limestone substratum that ranges in size from 10 x 15m to more than 30 x 80m. These patches are spaced from 30 to over 100m apart being separated by sand.

Benthic communities in this biotope are not well developed; little shelter or cover is available for motile forms and the scoured appearance of much of the limestone suggests that occasional wave energy must move sand over much of the limestone abrading sessile forms. A number of coral species were seen in the biotope including Porites lobata, Pocillopora meandrina, Montipora verrucosa, M. patula and Cyphastrea ocellina but

Table 5. Summary of the benthic survey conducted at Station 6 affronting the Maunalua Bay Beach Park, Hawaii Kai, Oahu. Results of the 5 m^2 quadrat sampling of the benthic community present (expressed in percent cover) are given in Part A; a 40-point analysis is presented in Part B and counts of invertebrates in Part C. A short summary of the fish census is given in Part D. Water depth 2 to 3 m; mean coral coverage is 2.6% (quadrat method).

A. Quadrat Survey

Species	Quadrat Number 1	2	3	4	5
Algae					
Sporolithon erythraeum	2				
Mesophyllum mesomorphum			0.1		
Porolithon onkodes				0.2	
P. gardineri				0.5	
Avrainvillea amadelpha	1	0.7	0.5		
Dictyota divaricata			0.1		
Amphiroa fragilissima		0.1	0.1		
unidentified Cyanophyta sp.			0.2		1
Soft Corals					
Anthelia edmondsoni			0.1	0.1	0.75
Corals					
Porites lobata	4			0.1	7
P. (Synaraea) convexa				0.3	
Montipora flabellata		0.5			
Pocillopora meandrina				0.25	
P. damicornis				0.1	
Pavona varians				0.5	
Sand	48				2
Rubble	45	98.7	98.9	97.95	89.25

B. 40-Point Analysis

Species	Percent of the Total
Corals	
Porites lobata	1
Rubble	99

C. Invertebrate Census (20x4 m)

Species	Number
Phylum Mollusca	
Octopus cyanea	1
Conus lividus	1
Phylum Echinodermata	
Echinometra mathaei	94

D. Fish Census (20x4 m)

3 Species
4 Individuals
Diversity (H')=0.69

coverage does not exceed 4 percent. Macroalgae are present but coverage is less than 8 percent. Where shelter is found in this biotope, fishes may also be seen. One interesting observation made during the survey of fish communities in this area is the high frequency of encounter with moray eel species which may be related to the scant shelter available for these normally cryptic species.

Station 7 was established to sample the biotope of limestone mounds. This station was located about 1.2km offshore of the park and about 150m WSW of the "Blinker Bouy" marking the entrance channel to the Hawaii Kai marina in 3.3m of water. The station was conducted on a emergent limestone mound approximately 100m in length and 45m in width with the long axis oriented parallel to shore. Sand isolates the limestone and the next closest emergent hard substratum is more than 60m away. Table 6 presents the results of the quantitative survey conducted at Station 7. Four species of corals were found in the quadrat survey and mean coverage was estimated at 3.2 percent with both Porites lobata and Pocillopora meandrina being about equally common. The most important alga at this station at the time of sampling was the red coralline, Sporolithon erythraeum. The most abundant invertebrate species in the census were the green sea urchin (Echinometra mathaei) and the black sea urchin (Tripneustes gratilla). Twelve species of fishes were found in the fish census and the most common species were the damselfishes, Chromis ovalis and C. vanderbilti. In the vicinity of this station were seen the humuhumu hi'u kole (Melichthys vidua), 'alo'ilo'i (Dascyllus albisella), manini (Acanthurus triosetgus), palani (A. dussumieri), pualu (A. mata), kihikihi (Zanclus cornutus), damselfish (Stegastes fasciolatus), moano (Parupeneus multifasciatus), toby (Canthigaster jactator), 'ulae (Synodus binolatus), lau wiliwili (Chaetodon miliaris), hinalea 'aki lolo (Coris gaimard), wrasse (C. venusta), puhi 'oni'o (Gymnothorax meleagris), puhis (G. eurostus, G. petelli and Gymnomuraena zebra), puhi kapa (Echidna nebulosa), snake eel (Uropterygius tigrinus), limu (Botryocladia skottsbergii), sea cucumber (Actinopyge mauritiana) and one Porites lobata coral head that was approximately 2m in diameter. Also seen in the vicinity of this station was one small (estimated straightline carapace length of 35cm) green sea turtle (Chelonia mydas).

Channel Floor Biotope

The channel floor biotope is restricted to the areas where channels bisect the reef flat biotope. Porbabaly years ago smaller channels existed approximately where they do today and were created by the discharge of low salinity water from Kuapa Pond, Paiko Lagoon and Kuliouou Stream into the reef environment. Dredging has undoubtly increased the physical size of these channels and impacted the extant biota. The communities of the chan-

Table 6. Summary of the benthic survey conducted at Station 7 affronting the Maunalua Bay Beach Park, Hawaii Kai, Oahu. Results of the 5 m^2 quadrat sampling of the benthic community present (expressed in percent cover) are given in Part A; a 40-point analysis is presented in Part B and counts of invertebrates in Part C. A short summary of the fish census is given in Part D. Water depth 5 m; mean coral coverage is 3.2% (quadrat method).

A. Quadrat Survey

Species	Quadrat Number 1	2	3	4	5
Algae					
Sporolithon erythraeum	2	1		2	12
Porolithon onkodes	1				
P. gardineri			4	0.5	
Corals					
Porites lobata	1		3	0.75	2
Pocillopora meandrina	1.5	2	0.5	2	0.1
Montipora patula			2		0.5
M. verrucosa				0.5	0.1
Sand	5	4	4		
Rubble		25			
Hard Substratum	89.5	68	86.5	94.25	85.3

B. 40-Point Analysis

Species	Percent of the Total
Algae	
Sporolithon erythraeum	4
Corals	
Porites lobata	1
Pocillopora meandrina	1
Sand	2
Rubble	7
Hard Substratum	85

C. Invertebrate Census (20x4 m)

Species	Number
Phylum Annelida	
Loimia medusa	3
Phylum Echinodermata	
Echinothrix calamaris	1
Echinostrephus aciculatum	2
Tripneustes gratilla	20
Echinometra mathaei	57
Holothuria atra	1

D. Fish Census (20x4 m)

12 Species
52 Individuals
Diversity (H')=1.89

nel floors are extremely depauperate, residing on or in a substratum of very fine mud of terrigenous origin that may be more than 1m in thickness. Invertebrates occasionally seen in this disturbed habitat include the burrows of the shrimp, Alpheus mackayi and occasionally the burrows of larger crab species (?? Thalamita integra, Scylla serrata, Portunus sanguinolentus or Podophthalmus vigil??). These larger burrows occur in estimated densities from $1/100m^2$ to $1/350m^2$; in no cases were the inhabitants seen. Few fishes are encountered in this biotope but as noted above, tilapia (Tilapia melanotheron), kaku (Sphyraena barracuda), and pua (presumably Mugil cephalus) may be seen along the channel edges on the reef flat and occasionally small papio (Caranx melampygus and Carangoides orthogrammus) are caught by fishermen there. It should be noted that no nehu (Stolephorus purpureus) were seen yet they have been seen in the area on previous occasions (personal observation). In other highly disturbed soft sediment biotopes (e.g., between the patch reefs of southern Kaneohe Bay, Smith et al. 1981) the burrows of Alpheus mackayi are often shared by a commensal goby, Psilogobius mainlandii. No Psilogobius were seen in this survey but due to their cryptic habits, the species may have been missed. Poor visibility (10 to 80cm) hampered census work near the channel floor except at Station 8 due to its distance offshore. Five stations (Numbers 2,4,8,9 and 10; see Figure 3) quantitatively sampled the channel floor biotope and only one (No. 8) was situated on sand rather than mud. Besides these stations, a qualitative reconnaissance was carried out in the channel floor biotope near Stations 11 and 12; additionally a short survey was made of the channel floor offshore of the boat ramp at Maunalua Bay Beach Park.

Station 2 was established adjacent to channel marker 7 about 310m from shore in the boat channel. Water depth at this station was 3.3m and the visibility was about 15cm The substratum at this station was a fine terrigenous mud. Table 7 presents the results of the quantitative survey carried out at this station. No fishes, limu or invertebrates were seen at this station or in the vicinity of it. The burrows of Alpheus mackayi occurred in an estimated density of $200/m^2$.

Station 4 also sampled the channel floor biotope. This station was conducted adjacent to channel marker 5 approximately 500m from shore in 4.6m of water. The substratum at this location is fine terrigenous mud and the visibility on the bottom was 10cm or less at the time of sampling. Table 8 details the information collected at this station; no fishes, invertebrates or algae were encountered in this survey but the burrows of Alpheus mackayi occurred in an estimated density of $225/m^2$.

Station 10 was established directly across the channel (to the west) of the previous station. This station was located near

Table 7. Summary of the benthic survey conducted at Station 2 affronting the Maunalua Bay Beach Park, Hawaii Kai, Oahu. Results of the 5 m^2 quadrat sampling of the benthic community present (expressed in percent cover) are given in Part A; a 40-point analysis is presented in Part B and counts of invertebrates in Part C. A short summary of the fish census is given in Part D. Water depth 3.3 m; mean coral coverage is 0% (quadrat method).

A. Quadrat Survey

Species	Quadrat Number 1	2	3	4	5
Mud	100	100	100	100	100

B. 40-Point Analysis

Species	Percent of the Total
Mud	100

C. Invertebrate Census (20x4 m)

Species	Numbers
Phylum Arthropoda	
Alpheus mackayi burrows	200/m^2

D. Fish Census (20x4 m)

No fishes seen

Table 8. Summary of the benthic survey conducted at Station 4 affronting the Maunalua Bay Beach Park, Hawaii Kai, Oahu. Results of the 5 m^2 quadrat sampling of the benthic community present (expressed in percent cover) are given in Part A; a 40-point analysis is presented in Part B and counts of invertebrates in Part C. A short summary of the fish census is given in Part D. Water depth 4.6 m; mean coral coverage is 0% (quadrat method).

A. Quadrat Survey

Species	Quadrat Number 1	2	3	4	5
Mud	100	100	100	100	100

B. 40-Point Analysis

Species	Percent of the Total
Mud	100

C. Invertebrate Census (20x4 m)

Species	Numbers
Phylum Arthropoda	
Alpheus mackayi burrows	225/m^2

D. Fish Census (20x4 m)

No fishes seen

channel marker 6 about 500m from shore in 4.5m of water. Underwater visibility at the time of sampling was about 80cm. Table 9 presents the results of the quantitative survey conducted at this station. No macroinvertebrates, fishes or algae were seen in this survey either in the 20 x 4m census area or outside of it. Again the burrows of Alpheus mackayi dominated the substratum and occurred in an estimated abundance of $190/m^2$.

Station 9 was carried out adjacent ot channel marker 4 approximately 680m from shore in 4.6m of water. Again the substratum was fine terrigenous mud and the visibility was less than 1m at the time of sampling. Table 10 presents the results of the quantitative survey carried out at this station; no fishes, invertebrates or algae were found at this station either within or outside of the census area. The burrows of Alpheus mackayi occurred in an estimated density of $200/m^2$.

Station 8 (Figure 3) was established about 800m from shore next to channel marker 2 in 2.5m of water. The substratum at this location is sand with some terrigenous mud and the underwater visibility was about 2m at the time of sampling. This change in conditions may be related to the distance of this station from land (and the discharge points of freshwater and mud) as well as because of the proximity of wave energy that improves circulation. Table 11 presents the results of the survey carried out at this station. No algae or fishes were seen in this survey but one haole crab (Portunus sanguinolentus) was found. No alpheid shrimp burrows were present probably due to the shifting nature and grain size distribution of the substratum.

A short qualitative reconnaissance of the channel floor biotope in the vicinity of channel markers 11 and 12 as well as in the area affronting the boat ramp was made. As expected, underwater visibility was poor (10 to 30cm), the substratum was comprised of fine terrigenous mud and no fishes, invertebrates or limu were seen. At all sites Alpheus mackayi burrows covered the substratum. These qualitative observations confirm the uniformity of channel floor biotope through most of the Hawaii Kai boat channel.

Station 5 was established approximately 20m east of channel marker 3 about 515m from the shore. At this point the water depth on the adjacent reef flat is about 1m; here the reef flat slopes away to about 3m in depth to the channel floor. Over a linear distance of approximately 70m along the channel edge in this area is a well-developed Porites compressa coral community. The width of the Porites band is about 10m, thus it covers about $700m^2$. Within this community coral coverage averages about 50 percent. Biologically the area was judged to be sufficiently different to warrant a more quantitative assessment; Station 5 was established to sample this community. The station sampled an

Table 9. Summary of the benthic survey conducted at Station 10 affronting the Maunalua Bay Beach Park, Hawaii Kai, Oahu. Results of the 5 m^2 quadrat sampling of the benthic community present (expressed in percent cover) are given in Part A; a 40-point analysis is presented in Part B and counts of invertebrates in Part C. A short summary of the fish census is given in Part D. Water depth 4.5 m; mean coral coverage is 0% (quadrat method).

A. Quadrat Survey

Species	Quadrat Number 1	2	3	4	5
Mud	100	100	100	100	100

B. 40-Point Analysis

Species	Percent of the Total
Mud	100

C. Invertebrate Census (20x4 m)

Species	Numbers
Phylum Arthropoda	
Alpheus mackayi burrows	190/m^2

D. Fish Census (20x4 m)

No fishes seen

Table 10. Summary of the benthic survey conducted at Station 9 affronting the Maunalua Bay Beach Park, Hawaii Kai, Oahu. Results of the 5 m^2 quadrat sampling of the benthic community present (expressed in percent cover) are given in Part A; a 40-point analysis is presented in Part B and counts of invertebrates in Part C. A short summary of the fish census is given in Part D. Water depth 4.6 m; mean coral coverage is 0% (quadrat method).

A. Quadrat Survey

Species	Quadrat Number 1	2	3	4	5
Mud	100	100	100	100	100

B. 40-Point Analysis

Species	Percent of the Total
Mud	100

C. Invertebrate Census (20x4 m)

Species	Numbers
Phylum Arthropoda	
Alpheus mackayi burrows	200/m^2

D. Fish Census (20x4 m)

No fishes seen

Table 11. Summary of the benthic survey conducted at Station 8 affronting the Maunalua Bay Beach Park, Hawaii Kai, Oahu. Results of the 5 m^2 quadrat sampling of the benthic community present (expressed in percent cover) are given in Part A; a 40-point analysis is presented in Part B and counts of invertebrates in Part C. A short summary of the fish census is given in Part D. Water depth 2.5 m; mean coral coverage is 0% (quadrat method).

A. Quadrat Survey

Species	Quadrat Number 1	2	3	4	5
Mud	100	100	100	100	100

B. 40-Point Analysis

Species	Percent of the Total
Sand/Mud	100

C. Invertebrate Census (20x4 m)

Species	Numbers
Phylum Arthropoda	
Portunus sanguinolentus	1

D. Fish Census (20x4 m)

No fishes seen

area with water depths ranging from 1 to 2.5m along the edge of the reef flat and boat channel. At the time of sampling, visibility was about 1m. Substratum at this station was primarily live coral (Porites compressa the dominant species) or limestone. On the channel floor (west of the station) the substratum was mud and on the reef flat to the east it was a mix of muddy sand and rubble.

The results of the quantitative survey carried out at Station 5 are given in Table 12. Two coral species (Porites compressa and P. lobata) were found in the quadrat survey having a mean coverage of 54 percent. The soft coral, Anthelia edmondsoni was also present as was the alga, Halimeda opuntia. Only one macroinvertebrate, the feather duster worm (Sabellastarte sanctijosephi) was encountered in the census and two species of fishes (the o'opu - Asterropteryx semipunctatus and the puhi - Echidna nebulosa) were counted in the 20 x 4m area. In the vicinity of Station 5 were seen the corals (Montipora patula, Pavona varians, Pocillopora damicornis, P. meandrina), limu (Acanthophora spicifera and Avrainvillea amadelpha), black sea urchins (Tripneustes gratilla), o'ili'uwi'uwi (Pervagor spilosoma), toby (Canthigaster jactator), lau'ipala (Zebrasoma flavescens), lau wiliwili nukunuku'oi'oi (Forcipiger flavissimus), wrasse (Labroides phthirophagus), manini (Acanthurus triostegus), puhi laumilo (Gymnothorax undulatus) and kumu (Parupeneus porphyreus).

Casual observations made during the survey work suggest that much of the study area receives heavy recreational use. The boat channels serve as the conduit for boat traffic in and out of the Hawaii Kai Marina as well as servicing the nearby boat ramp; the reef flat area serves as the location for several (up to 5?) jet-ski operators and fishermen occasionally use the shoreline. Surfers use the reef margins both to the east and west of the study site. We noted one commercial operation, a team of akule (Selar crumenophthalmus) net fishermen with a spotter plane unsuccessfully attempt to catch a school of akule just seaward of the reef affronting the Maunalua Bay Beach Park. Further seaward in the biotope of limestone mounds we saw some recreational SCUBA diving activity.

DICUSSION

This survey of the marine communities in the area affronting Maunalua Bay Beach Park has defined three biotopes based on major structural elements. These are the reef flat biotope, the channel floor biotope and seaward of the fringing reef, the biotope of limestone mounds. The quantitative data collected from the 12 stations sampling these biotopes suggest that the marine communities are for the most part, poorly developed and have low diversity. These attributes are typical of marine

Table 12. Summary of the benthic survey conducted at Station 5 affronting the Maunalua Bay Beach Park, Hawaii Kai, Oahu. Results of the 5 m^2 quadrat sampling of the benthic community present (expressed in percent cover) are given in Part A; a 40-point analysis is presented in Part B and counts of invertebrates in Part C. A short summary of the fish census is given in Part D. Water depth 1 to 2.5 m; mean coral coverage is 54% (quadrat method).

A. Quadrat Survey

Species	Quadrat Number 1	2	3	4	5
Algae					
Halimeda opuntia		0.5	0.5		
Soft Corals					
Anthelia edmondsoni		1	2.5	1	2
Corals					
Porites compressa	100	2	38	48	74
P. lobata				7	
Mud/Sand		10	3		
Rubble		3	6	5	7
Hard Substratum		83.5	50	39	17

B. 40-Point Analysis

Species	Percent of the Total
Corals	
Porites compressa	52
Mud/Sand	3
Rubble	4
Hard Substratum	41

C. Invertebrate Census (20x4 m)

Species	Number
Phylum Annelida	
Sabellastarte sanctijosephi	8

D. Fish Census (20x4 m)

2 Species
9 Individuals
Diversity (H')=0.24

communities exposed to or impacted by negative environmental influences; environmental perturbation in marine communities frequently results in a reduction in species numbers and a simplification of community structure and function (Brock and Smith 1985).

A summary of the quantitative data collected at the 12 stations examined in this study is presented in Table 13. Overall, only 2 macrothalloid algal species, 4 macroinvertebrate species and 2 fish species were encountered in the average census of 80 square meters of substratum; mean coral coverage was 5 percent. These values are extremely low relative to most Hawaiian marine habitats sampled using the same techniques and suggest that marine communities in the area are severely impacted by low environmental quality.

Sources of environmental perturbation in the study area include the input of freshwater, fine mud of terrigenous origin, and possibly pesticides as well as heavy metals. Also fine carbonate material derived from the reef platform has contributed to the local sediment loading. A perusal of the available literature (WRRC 1973, AECOS 1979) suggests that high sedimentation, and periodic freshwater inudation has been occurring since the commencement of marina construction in 1959. These impacts to the marine communities continue to occur particularly with high rainfall conditions. Perhaps the greatest rainfall related impact to the reef communities affronting the Maunalua Bay Beach Park occurred on 31 December 1987 - 1 January 1988 when the highest sustained rainfall ever recorded on East Oahu occurred. In a 24 hour period approximately 63cm (25 inches) fell on the Koolau mountains in the Hawaii Kai drainage basin. The effect of this storm was excaberated by heavier than usual rainfall during the two weeks preceding the event which probably saturated the soil. The 1 January storm triggered massive erosion in the Hawaii Kai watershed with tons of rock, sediment and personal property being carried to the sea and deposited on the reefs in Maunalua Bay and elsewhere. Some indication of the magnitude and duration of this event and its impact may be derived from the presence of a cell of turbid water approximately 3 miles in length and about 2 miles in width carrying considerable debris derived from land (presumably from Hawaii Kai) that remained in Maunalua Bay for more than 45 days following the storm. During this time, this cell oscillated under tidal influence between Waikiki and Portlock (personal observation).

While sampling the study area in March and April 1988, considerable fine mud up to 40cm in thickness was encountered over much of the inner reef flat. Very few algal or invertebrate species were seen in the mud areas. It appears that the mud and large volume of freshwater that emanated from Kuliouou Stream and the marina as a result of the storm probably severely impacted

Table 13. Summary of the number of fish, invertebrates and algal species in the 20x4 m census area at 12 stations (representing 3 biotopes) affronting the Maunalua Bay Beach Park surveyed in this study. Grand means are presented at the foot of the table.

Biotope and Location	Number of Species: Algae	Invertebrates	Fish	Coral Coverage (%)
Reef Flat				
Station 1	1	5	1	-
3	4	5	2	0.8
6	8	10	3	2.6
11	5	7	4	0.5
12	3	2	1	-
Channel Floor				
Station 2	-	1	-	-
4	-	1	-	-
8	-	1	-	-
9	-	1	-	-
10	-	1	-	-
Limestone Mounds				
Station 7	3	12	12	3.2
Coral Rich Habitat				
Station 5	1	4	2	54
Mean	2.1	4.2	2.1	5.1

marine communities over much of the study area.

In 1975 the U.S. Army Corps of Engineers noted that little biological information was available on the marine communities in the area affronting Hawaii Kai Marina or Maunalua Bay Beach Park (U.S. Army Corps of Engineers 1975). This situation has not changed much since then. The U.S. Army Corps of Engineers (1975) reported that around Paiko Lagoon one could find ghost crabs (Family Ocypodidae) and ama'ama crabs (Graspus graspus); in the lagoon were crabs (Thalamita integra, Charybdis hawaiiensis, Macropthalamus telescopis, Metopograpsus messor), alpheid shrimps, polychaete worms (Marphysa), blennies (Istiblennius gibbifrons), gobies (Bathygobius fuscus), aholehole (Kuhlia sandvicensis), mollies (Poecilia latipinna), mullet (Mugil cephalus), and awa (Chanos chanos). Also noted were a number of marine fishes within the confines of the Hawaii Kai Marina including upapalu (Apogon sp.), ala'ihi (Adioryx diadema), lau'ipala (Zebrasoma flavescens), mane'one'o (Z. veliferum), uhu (Scarus sp.), aholehole (Kuhlia sandvicensis), lae (Scromberoides laysan), hihimanu (Aetobatus narinari) and nehu (Stolephorus purpureus). Presumably these same species were present or would transit through the waters affronting the Maunalua Bay Beach Park. The report mentioned at that time, the bay waters affronting the marina were used for net, spear and pole fishing; opelu and akule fishing also occurred in the area. The only quantitative data presented (i.e., coral coverage and echinoderm abundance estimates) were made in an undefined location in 12m of water off Portlock well outside of the boundaries of the present study.

None of the fish species mentioned in the 1975 study were encountered in the present quantitative surveys. However, qualitative observations made in March 1988 noted 4 of the 15 fish species seen previously. These four species are the aholehole (Kuhlia sandvicensis), mexican molly (Poecilia mexicana not P. latipinna as previously reported), mullet (Mugil cephalus) and awa (Chanos chanos).

AECOS (1979) summarized an earlier study (ECI 1975) of the communities offshore of the Hawaii Kai Marina. This early study found that coral on the shallow reef flat near Koko Marina entrance channel occurred as small colonies (species were Cyphastrea ocellina and Pocillopora damicornis); also present were 6 species of fish (dominant species was the 'omaka or Stethojulis balteata) and the alga, Acanthophora spicifera. Today this area is mostly covered by fine mud and only a few very small colonies of the coral Pocillopora damicornis were seen. The alga Acanthophora spicifera is still found in this area but the 'omaka was absent in this survey.

AECOS (1979) further notes that "The western margin of the large, mud bottom depression inside Ku'i Channel harbors a number of coral species on large boulders. The highest coral cover occurs on a reef spur that projects into the basin. Corals are generally most abundant between 3 and 6 feet deep. Below this the bottom is too heavily silted for coral attachment and growth. Thickets of Porites compressa and large heads of Porites lobata are found on boulders on the bottom. The green alga, Dictyosphaeria cavernosa, has overgrown the lower portions of P. compressa thickets. On the shallow reef flat, only Pocillopora damicornis is common. The soft coral, Anthelia edmondsoni, is abundant on the rubble slope along the western edge of the basin." The reef spur referred to above is the same location sampled at Station 5 where some Porites compressa and P. lobata remain. Over the intervening 13 years the abundance of coral appears to have significantly decreased along the western channel edge. No live corals were found on the boulders mentioned above and no Dictyosphearia cavernosa was seen in this area during the 1988 survey.

As additional evidence of change, AECOS (1979) noted in 1975 that "...an abundance of benthic algae occurs on the shallow platform west of the Ku'i Channel. Algal growth is densest (approaching 100% cover) just behind the reef margin in the surf zone. Codium edule, Halimeda sp., and Enteromorpha sp. are the dominant species. Algal cover declines shoreward from the reef margin, The blue-green alga, Lyngbya sp. is epiphytic on much of the Halimeda. The marine angiosperm, Halophila ovalis is abundant on the silty-sand of the reef flat." Both Stations 5 and 6 in the present study were located near to the area referred to above; 9 algal species were found having a mean coverage of 0.8 percent. If the present stations are representative of the outer reef flat, algal cover has significiantly declined.

With respect to fish, AECOS (1979) stated "At least 53 fish species are recorded -- most associated with the area of high coral cover -- from the western edge of the basin inside of Ku'i Channel. Stethojulis balteata, juvenile Scarus sp., and Thalassoma duperrey are most abundant. Less common are Adioryx lacteoguttatus, Apogon maculiferus, Parupeneus porphyreus, Chaetodon trifasciatus, Dascyllus albisella, Abudefduf abdominalis, Chromis ovalis, Stegastes fasciolatus, Acanthurus nigrofuscus, A. triostegus and Ctenochaetus strigosus." In the April 1988 survey only two fish species were found in the quantitative survey at Station 5 (the same locality as above) and neither were in the previous survey. Eight other fish species were encountered in the vicinity of Station 5 in 1988 and two of these (manini - Acanthurus triosequs and kumu - Parupeneus porphyreus) were recorded in the 1975 work. In the approximate location of Station 6 (present survey) AECOS (1979) found "...only 12 fish species ...Stethojulis balteata and Thalassoma duperrey are the most abundant. Fishes are probably limited by the lack of cover and strong surge...". In 1988, three fish species were seen, one of which (the 'omaka - Stethojulis balteata) was seen 13 years earlier at this location. AECOS (1979) noted that the black sea urchin (Tripneustes gratilla) and the coral, Porites lobata were at this station in 1975; in 1988 both were also recorded.

In the biotope of limestone mounds AECOS (1979) reported that 7 coral species were present. The two most common species were Pocillopora meandrina and Porites lobata. The report also notes that the black sea urchin (Tripneustes gratilla), green sea urchin (Echinometra mathaei) and wana (Echinothrix diadema) were also in the area. The 1988 survey conducted at Station 7 in the biotope of limestone mounds found 4 coral species with a mean coverage of 3.2 percent and the same two species were most important in terms of coverage. Also present were 4 species of sea urchins. Changes in this biotope appear to have been less over the years probably due to the distance away from potential sources negative impacts (i.e., along the shoreline).

These comparisons suggest that considerable change has occurred in the marine communities shoreward of the Maunalua Bay fringing reef. These changes are manifested as significant decreases in species numbers and coverage probably in response to a lessening of water quality characteristics. The changes may have occurred gradually since the time of the 1975 study or they may have been abrupt as a result of the January 1988 storm. The significant decrease in corals along the western edge of the entrance channel and the lack of any evidence of recently killed corals suggests that these changes have been chronic in nature and ongoing for some time. Irrespective of how they have occurred, the result is the same: the extant marine communities affronting the Maunalua Bay Beach Park are poorly developed and the community structure suggests a highly disturbed environment.

Project Impacts Due to Dredging

If the proposed ferry system is developed to service Hawaii Kai, some dredging of the present entrance channel will be required; also dredging of a turning basin adjacent to the shoreline will be necessary. It is expected that approximately 60,000 cubic yards (45,875m^3) of material will be removed. This will result in the direct loss of benthic communities residing in the area slated for removal; in the proposed turning basin, benthic communities are poorly developed and thus little impact is forseen. The widening of the entrance channel could impact the existing live coral at Station 5 (Figure 3) if the western channel edge is considered for removal. Based on the presence of this coral and the need to probably remove less material from the eastern side, it is recommended that the entrance channel widening be restricted to the eastern side of the channel. Once the material is removed, it is to be dumped at the EPA approved dump site approximately 7 miles offshore of Honolulu alleviating potential impacts in the vicinity of Maunalua Bay created by the disposal of this material.

Dredging will disturb the soft sediment deposited on the reef flat and on the channel floors, thus high turbidity conditions may be expected during this activity. Marine communities within the fringing reef are presently subjected to considerable turbidity. During the April 1988 survey, underwater visibility was often less than 30cm. Apparently, high turbidity has existed for some time in this area (WRRC 1973, ECI 1975, AECOS 1979) and in the inner bay areas, most extant species appear to be those with high tolerance to mixohaline water and low water transparency. Many of the invertebrate species encountered in the inner reef area are species known to be suspension or filter feeding forms (sponges, polychaetes, etc.). These heterotrophic forms are known to be common in areas receiving high particulate loading resulting in turbidity (Brock and Smith 1985). The high turbidity may explain the lack of algae below about 1.5m in depth within the fringing reef margin.

Dredging will temporarily increase the size of the area impacted by high turbidity. Based on current studies, it is expected that dredging during trade wind conditions will result in a plume of turbid water that will move seaward under the influence of the wind. Once offshore, the turbid water will be diluted and advected out of the area. When little or no wind is blowing and dredging is occurring, transport of the plume will be minimal with tide generated currents moving the plume. During periods of ebbing tide, the turbid water will be transported offshore and to the east and during flood tide, it will move into the marina. Potential impacts due to turbidity could be greatest on benthic communities seaward of the reef margin in the biotope of limestone mounds. However within the boundaries of the present survey, benthic community development in the biotope of limestone mounds does not appear to be diverse or particularly high in species numbers. Benthic community structure and coral coverage increases somewhat with greater depth offshore (personal observations), but as the turbidity plume is carried seaward, dilution due to mixing and advection occurs, lessening any potential impact.

Project Impacts On Fishing

The development of the Hawaii Kai ferry system could impact the quality of fishing that may occur in the area affronting the Maunalua Bay Beach Park and the Hawaii Kai Marina. During construction impacts on fishing quality could potentially occur due to increased noise and turbidity. Daily, the area presently receives high noise input from boat traffic and jet-ski operations. This suggests that the impact on noise on fishing may be negligable over present levels of impact during construction but turbidity levels are expected to increase during this period.

Following the completion of the construction phase, turbidity levels should return to conditions approximating the present. As noted above, the inshore area is presently quite turbid and any fish or invertebrate of commercial or recreational fishing interest, will be species tolerant of existing conditions. Thus following completion of the project, any species that is presently targeted by fishermen in the area should be present. It should be noted that during the field work no evidence of fishing in the inner reef area was noted; this may be related to the high level of use that this area receives from jet-ski operators and to the high degree of habitat degradation that has occurred in these inshore areas.

A highly variable relationship exists between the creation of new surfaces in benthic communities, algal growth and ciguatera in resident reef fishes (Randall 1958). New surfaces for algal colonization in coral reefs may be brought about by dredging, construction or by storms denuding reef surfaces. The mechanisms involved with the development of ciguatera are not well known and in some cases, dredging has not resulted in a ciguatera problem (Bagnis 1973). The organism identified as being responsible for the disease is _Gambierdiscus toxicus_; environmental monitoring for _G. toxicus_ can be conducted and it may provide a margin of safety for individuals consuming fishes from areas following extensive man-induced disturbance. Other ways that are being developed to alleviate the problem include use of the "poke stick" test to test if the flesh of individual fish has ciguatoxin and if a person is afflicted with the disease, to administer mannitol which shows promise in alleviating the symptoms.

Project Impacts On Paiko Lagoon Waterbird Sanctuary

The only remaining waterbird habitat along the Maunalua Bay coast is found at Paiko Lagoon about 450m to the west of the proposed ferry turning basin. The lagoon is a valuable feeding and resting area for the aeo or Hawaiian Stilt (_Himatopus mexicanus knudseni_) and has been designated as a wildlife sanctuary and refuge despite declines in the numbers of aeo using the site in recent years (AECOS 1979). The State of Hawaii improved the habitat in 1972 by limited dredging and constructing nesting islets in the lagoon. The lagoon is surrounded by dwellings on the landward (mauka) border and along the proximal part of the peninsula that forms part of the lagoon perimeter. Because Paiko Lagoon is one of the few easily accessible waterbird sanctuaries, several studies have been conducted there (Lum 1970, Allen and Lum 1972, Shallenberger 1977).

With the construction and operation of the intra-island ferry at Maunalua Bay Beach Park, potential impacts could impinge on the Paiko Lagoon waterbird sanctuary. One possible impact could be noise, but as mentioned above, considerable noise is presently generated in the area affronting the park by watercraft and jet-skis. Another impact could arise from increased turbidity levels in Paiko Lagoon generated by nearby dredging. The increased turbidity could impact the food supply of the birds. However, the lagoon has a net seaward flow of water because of a freshwater spring feeding into it, suggesting that the net transport of particulate material would be out of the lagoon. Additionally, the lagoon is presently a mud basin thus forage species are those able to survive in this substratum type. This suggests that any additional turbidity, if it were to occur, will not affect the present forage base.

Project Impacts on Whales and Turtles

Offshore and about 500m west of the blinker bouy marking the Hawaii Kai boat entrance channel is a well-known green sea turtle (Chelonia mydas) resting area. This site is known as "Turtle Canyon" and is located in water between 9 to 11m in depth (Balazs et al. 1987). Dive tour operators take their clients to this location. Balazs et al. (1987) note that the site is apparently used by juvenile turtles. One small turtle was seen in the present survey approximately 250m to the east of "Turtle Canyon".

Further offshore, humpback whales (Megaptera novaeangliae) are frequently seen. This endangered species migrates to the Hawaiian Islands each November and remains in island waters for calving and breeding through April when it migrates north (Shallenberger 1979). During the whale "season" humpbacks transit through Maunalua Bay usually inside of the 100 fathom isobath. The NMFS has maintained a list of sightings in Maunalua Bay for the last 3 or 4 years; this qualitative data has been compiled from sightings that have been made from a Wailalae Iki vantage point (Mr. J. Naughton, NMFS, personal communication). The data show consistent sightings of whales in Maunalua Bay from January though April.

Research in Maui attribute declines in nearshore whale abundance to boat traffic (Glockner-Ferrari and Ferrari 1987) but the correlation has not been positively established. Considerable boat traffic transits through Maunalua Bay at the present time.

Impacts that may occur with the construction of the ferry docking facility that could impact whales and green sea turtles include the generation of noise particularly due to blasting. Complete mitigation with respect to whales and blasting may be achieved by curtailing blasting during the months of April through October. To our knowledge no data exist showing impacts (positive or negative) with noise and the presence of green sea turtles.

Once clear of the entrance channel the route of ferry is presently unknown. However, the presence of green sea turtles thoughtout Maunalua Bay and offshore of Waikiki in waters less than 40m and the seasonal occurrence of humpback whales further offshore suggests that some thought be given to the route of the ferry. To avoid these endangered species, it is recommended that on exiting the Hawaii Kai channel, the ferry move directly seaward until well offshore prior to steering to the west and maintain a course that remains well offshore. Such a course will keep the rapidly moving ferry well away from divers in Maunalua Bay. A last recommendation might be on entering the Hawaii Kai channel that the speed of the ship be considerably slowed to reduce the propagation of waves that could erode the edges of the channel producing turbidity particularly during periods of low tide.

LITERATURE CITED

AECOS, Inc. 1979. Oahu coral reef inventory. Part B - sectional map descriptions. Prep. for U.S. Army Corps of Engineers, Pacific Ocean Division, Honolulu. 552p.

Allen, G.R. and A.L. Lum. 1972. Seasonal abundance and daily activity of Hawaiian stilts (Himantopus himantopus knudseni) at Paiko Lagoon, Oahu, 1972. Elepaio, Journal of the Hawaiian Audubon Society. Honolulu.

Bagnis, R. 1973. Dredging in the coral reef environment of the Windward Islands and the incidences of ciguatera. p. 203-212, In: Regional Symposium in Conservation of Nature - Reefs and lagoons. South Pacific Commission.

Balazs, G.H., R.G. Forsyth and A.K.H. Kam. 1987. Preliminary assessment of habitat utilization by Hawaiian green turtles in their resident foraging pastures. NOAA Tech. Memor. NMFS NOAA-TM-NMFS-SWFC-71. 107p.

Brock, R.E. 1982. A critique of the visual census method for assessing coral reef fish populations. Bull. Mar. Sci. 32:269-276.

Brock, R.E. and J.H. Brock. 1977. A method of quantitatively assessing the infaunal community residing in coral rock. Limnol. Oceanogr. 22:948-951.

Brock, R.E. and S.V. Smith. 1983. Response of coral reef crypto-faunal communities to food and space. Coral Reefs. 1:179-183.

Brock, R.E. and J.E. Norris. (In Press). An analysis of the efficacy of artificial reef designs in tropical waters. Bull. Mar. Sci.

Brock, V.E. 1954. A preliminary report on a method of estimating reef fish populations. Jour. Wildl. Mgmt. 18: 297-308.

Clark, J.R.K. 1977. The beaches of Oahu. University of Hawaii Press, Honolulu. 193p.

Dollar, S.J. 1982. Wave stress and coral community structure in Hawaii. Coral Reefs 1:71-81.

Environmental Consultants, Inc. 1975. Preliminary environmental impact studies on the marine environment at Maunalua Bay. Prep. for Kentron Hawaii, Ltd. 65p.

Glockner-Ferrari, D. and M. Ferrari. 1987. Report on the behavior of cow-calf pairs off west Maui, Hawaii. Abstract Sixth Biennial Conference on the Biology of Marine Mammals. Miami, Florida. December, 1987.

Lum, A.L. 1970. Food and feeding habits of migratory Hawaiian shorebirds, 1970. M.S. Thesis (Zoology), Univ. Hawaii, Honolulu.

Pielou, E.C. 1966. The measurement of diversity in different types of biological collection. Jour. Theoret. Biol. 13: 131-144.

Randall, J.E. 1958. A review of ciguatera, tropical fish poisoning, with a tentative explanation of its cause. Bull. Mar. Sci. Gulf Caribb. 8:236-267.

Randall, J.E. 1987. Introductions of marine fishes to the Hawaiian Islands. Bull. Mar. Sci. 41:490-502.

Risk, M.J. 1972. Fish diversity on a coral reef in the Virgin Islands. Atoll Res. Bull. 153:1-6.

Sakoda, E.T. 1975. The marine geology and sedimentology of Hawaii Kai, Kuapa Pond, and adjacent Maunalua Bay. M.S. Thesis (Geophysics), Univ. Hawaii, Honolulu. 71p.

Shallenberger, E.W. 1979. The status of Hawaiian cetaceans. Manta Corp., Prep. for U.S. Marine Mammal Commission. Washington, D.C. 103p.

Shallenberger, R.J. 1977. An ornithological survey of Hawaiian wetlands. Ahuimanu Productions. Prep. for U.S. Army Engineer District Honolulu. Part I - 131p.; Part II - 406p.

APPENDIX I

Results of the quantitative 20x4 m visual fish censuses conducted at the 12 stations affronting the Maunalua Bay Beach Park, Hawaii Kai, Oahu. No fish were observed at stations 2, 4, 8, 9 and 10, therefore these stations have been omitted. Numbers in the body of the table are counts of individual fishes. Totals and a diversity index (H') are given at the end of the table. Depths measured during the 12 surveys range from 0.5 to 5 m.

FAMILY and Species	STATION 1	3	5	6	7	11	12
ACANTHURIDAE							
Acanthurus triostegus						1	
Acanthurus nigroris					3		
APOGONIDAE							
Foa brachygramma						2	
BALISTIDAE							
Rhinecanthus rectangulus					1		
Rhinecanthus aculeatus					1		
BLENNIIDAE							
Plagiotremus ewaensis					1		
CIRRHITIDAE							
Cirrhitus pinnulatus					2		
GOBIIDAE							
Asterropteryx semipunctatus	3	3	8	2		13	4
LABRIDAE							
Stethojulis balteata				1	8		
Thalassoma duperrey					11		
Macropharyngodon geoffroy					2		
MONACANTHIDAE							
Pervagor spilosoma		1			1		
MURAENIDAE							
Echidna nebulosa			1			1	
POMACENTRIDAE							
Chromis vanderbilti					9		
Chromis ovalis					12		
Plectroglyphidodon johnstonianus					1		
TETRAODONTIDAE							
Canthigaster jactator				1			
Total Number of Species	1	2	2	3	12	4	1
Total Number of Individuals	3	4	9	4	52	17	4
Diversity (H')	0	0.35	0.24	0.69	1.89	0.62	0

APPENDIX E

GREEN SEA TURTLE STUDY

GREEN TURTLES (*CHELONIA MYDAS*) AT HAWAII KAI, HAWAII: AN ANALYSIS OF IMPACTS WITH THE DEVELOPMENT OF A FERRY SYSTEM

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INTRODUCTION

Because of declining population sizes the green sea turtle (Chelonia mydas) was granted protection under the federally mandated Endangered Species Act in 1977-78. Green turtles as adults are known to forage and rest in the shallow waters around the main Hawaiian Islands. Reproduction in the Hawaiian population occurs primarily during the summer months in the Northwest Hawaiian Islands with adults migrating during the summer months to these isolated atolls and returning in late summer or early fall. In the main Hawaiian Islands green turtles will rest along ledges or in caves in coastal waters usually from 40 to 80 feet in depth during the day. Under the cover of darkness turtles will travel inshore to shallow subtidal and intertidal habitats to forage on algae or limu (Balazs et al. 1987). The normal range of these daily movements between resting and foraging areas is about one kilometer (Balazs 1980; Balazs et al. 1987). Thus from the present state of knowledge, an ideal green turtle habitat would have the presence of appropriate offshore resting areas (caves, ledges or undercuts) being located within a kilometer or less of a sufficient abundance of appropriate forage algal species situated in shallow water. Selectivity of algal species consumed by Hawaiian green turtles appears to vary with the locality of sampling but stomach content data show Acanthophora spicifera and Amansia glomerata to be quantitatively the most important (Balazs et al. 1987); the preferences may be due to the ubiquitous distributions of these algal species.

Green turtles have long been known to occur offshore of the Hawaii Kai area in eastern Maunalua Bay, Oahu. A well known green turtle resting site occurs about 800m west of the small-boat entrance channel at Hawaii Kai just seaward of the fringing reef. In recent years dive tour operators have given the area the name "Turtle Canyon" (Balazs et al. 1987). Nearby is a surfing site called "Turtles" by surfers so named because of the green turtles regularly seen in the area (Pukui et al. 1976; AECOS 1981; Balazs et al. 1987). Balazs et al. (1987) also note that turtles were caught "in abundance" with nets set on the reef flat prior to the residential development at Hawaii Kai. Apparently, green turtles have been a common element of the fringing reefs affronting Hawaii Kai from times prior to the commencement of development in the late 1950's and early 1960's up to the present.

The population of East Honolulu has grown dramatically in the last 10 years and with this growth has come a host of problems. The major road servicing this surburban area and connecting it to the primary employment center, Honolulu, is the four lane Kalanianaole Highway. Traffic congestion during peak hours has prompted transportation officials to seek alternative methods of mass transit between these two points. Since Hawaii Kai is situated adjacent to the shoreline, one of the suggested alternatives is to develop an over-water ferry system. One step to the implementation of such a ferry system is to construct adequate docking facilities at Maunalua Bay Beach Park in Hawaii Kai. This would include the construction of onshore facilities (Passenger drop-off and waiting areas) as well as some construction activities in the water including the dredging of a turning basin, building of docking facilities and the widening of the existing boat channel. The in-water construction and dredging activities will impact surrounding marine communities as potentially will the subsequent operation of the ferry. This study was undertaken to assess the impact that the construction of the ferry facilities and later the vessel operation might have on the green turtles resident to the Hawaii Kai reefs. Specifically the objectives of this study were to:

1. Determine if appropriate green turtle resting habitat exists in the waters adjacent to the Hawaii Kai small-boat entrance channel;

2. If present, quantify the abundance of green turtles in this resting habitat and their numerical stability as well as determine the extent of this habitat;

3. Determine if appropriate foraging pastures are present within a kilometer of previously identified resting habitat and if so, quantify the use of these forage sites by turtles;

4. Quantify the quality (species) and quantity (areal coverage) of algae in the forage sites identified above;

5. Assess the potential for impact on green turtles with the construction of the ferry facilities as well as its subsequent operation.

MATERIALS AND METHODS

A number of methods and techniques were used in assessing the green turtle population at Hawaii Kai. To determine the location of appropriate green turtle resting sites, discussions were held with knowledgeable individuals; these served to pinpoint locations as well as confirm the results of our own ongoing field surveys. We searched for appropriate resting habitat by systematically towing a diver behind a vessel over much of the study area. This effort was supplemented by SCUBA surveys and surface sightings of turtles. At all times, an individual in the support vessel noted any turtles seen on the surface. If turtles were encountered either on the surface or underwater, estimates on straight line carapace lengths were made and if visually apparent, we noted the presence of deformities, tumors or tags.

As they were located, resting habitat areas were noted on a map for later determination of the areal extent of the habitat. To estimate use of resting habitat sites, we carried out timed surface surveys from an anchored vessel, noting all turtles surfacing for air. With this technique differentiation of individuals is not an easy task but may be accomplished by censusing several individuals at the surface simultaneously, by repeatedly seeing the same turtle in one location during a given survey and/or by noting individual differences in shell color, size, etc. We supplemented surface counts with underwater visual censuses using SCUBA in the Turtle Canyon area.

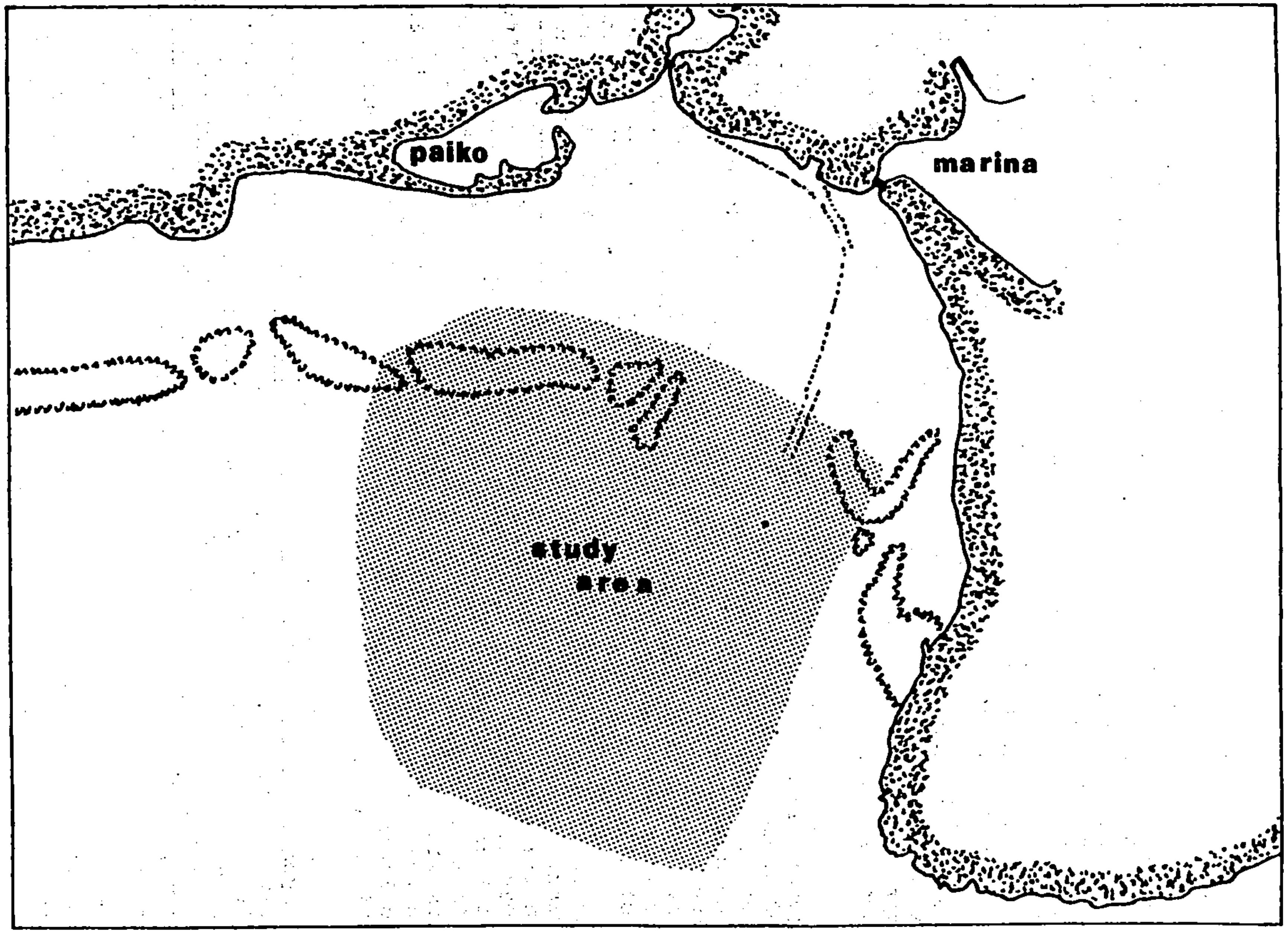
During all underwater survey work algal species and their abundance were noted. These qualitative observations were used to determine possible areas for turtle foraging. Early morning surveys were conducted at first light during high tides to ascertain the use of these and other areas by green turtles as foraging sites. Again, visual observations were made from an anchored vessel.

To quantitatively assess the macrothalloid algal communities present in candidate foraging pastures, eight stations were established through the study area. At each station six one square meter quadrats were used to sample the algae by placing a 1 x 1m frame on a 25m transect line at the 0, 5, 10, 15, 20, and 25m points; algae in the frame were identified to species and the percent cover of all species contributing at least 0.01 percent (i.e., covering at least $1cm^2$). Qualitative notes were taken on common and visually dominant algal species encountered in the vicinity of each station.

RESULTS

Field surveys were carried out on 27 and 28 December 1988 and on 4 January 1989. On the first day considerable time was spent towing a diver over much of the study area (approximately 316ha; see Figure 1). This qualitative survey covered the area just seaward of the fringing reef out to approximately the 20m isobath about 2.4km offshore; laterally, the survey covered an area approximately 1.3km to the west along the reef (at Turtle Canyon) and 300m to the east of the Hawaii Kai Entrance Channel. This survey was undertaken to determine the availability of resting habitat. During the qualitative survey two green turtles were seen; one about 100m to the east of Turtle Canyon in 6m of water and the second about 150m east of the Hawaii Kai Entrance Channel in 8m of water. Both turtles were lying near motionless on the substratum. Other than these two (which do not appear in the counts given in any of the tables below), no turtles were encountered outside of a band approximately 250m wide just seaward of the fringing reef at Hawaii Kai. Within this area we

Figure 1. Map of eastern Maunalua Bay, Oahu depicting the boundaries of the green turtle resting habitat survey (crosshatched). Scale 0.5 inch = 1km.


paiko
marina
study
area

were unable to identify any specific sites as points for resting aggregations of turtles; rather, turtles were found resting throughout the entire "band". We term this resting habitat as "diffuse" and show its location in Figure 2. In the Turtle Canyon area we did locate several shallow depressions and undercuts that on more than one occasion served as shelter for individual resting turtles. As we have identified it, the band commences at the seaward edge of the fringing reef and extends seaward through a well developed "spur and groove" zone that typifies many Hawaiian fringing reefs. It appears that the cover utilized by the turtles as resting sites is primarily confined to the spur and groove zone. Seaward of the spur and groove zone cover rapidly gives way to a flat and featureless substratum comprised of a veneer of sand overlying a hard substratum with occasional patches of emergent hard bottom. Our survey found no cover of the appropriate dimensions for resting sites seaward of the spur and groove zone.

Four stations were established seaward of the spur and groove zone to quantify the abundance of turtles; the locations of these stations are given in Figure 3. In total 29 turtles were censused on 27 December, 26 turtles on the following day and the same number were counted in the survey areas on 4 January 1989. West of the Hawaii Kai Entrance Channel the turtle resting area appeared to commence about 60m away from the channel but few turtles were seen in the area near the channel. Station 3 was established approximately 130m west of the channel entrance and about 100m seaward of the fringing reef to sample the abundance of turtles surfacing for air in the area; Table 1 presents the results of our census efforts. On 27 December we found 4 turtles in the area; on the following day there were 3 and on 4 January 1989 we counted only two turtles present. Approximately 350m west of the entrance channel a second sampling point was established to census turtles surfacing for air (Station 2). The results of the counts at this station are presented in Table 2. On the first day 7 turtles were counted, 8 individuals on the following day and the final survey found 8 turtles present at this station.

Approximately 600 west of Station 2 is Station 1 (Turtle Canyon). Because of the activity of dive tour boats which could frighten turtles surfacing for air thus making surface counts difficult, we utilized an underwater census technique as the primary method at this location. The track of the SCUBA surveys was approximately the same on all surveys. The results of the survey of Turtle Canyon are given in Table 3; on 27 December 10 turtles were seen underwater and 6 from the surface during the period of the dive. On the following day 11 turtles were encountered underwater and again 6 on the surface and on 4 January we censused 14 turtles underwater and saw 7 on the surface during the dive. All dives were approximately 60 minutes in duration and were carried out with two divers. On 4 January 1989 two

Figure 2. Map of eastern Maunalua Bay, Oahu showing the approximate boundary of the green turtle resting habitat identified in this study (dashed line) as well as the approximate area called "Turtle Canyon" (crosshatched). Scale 0.5 inch = 1km.

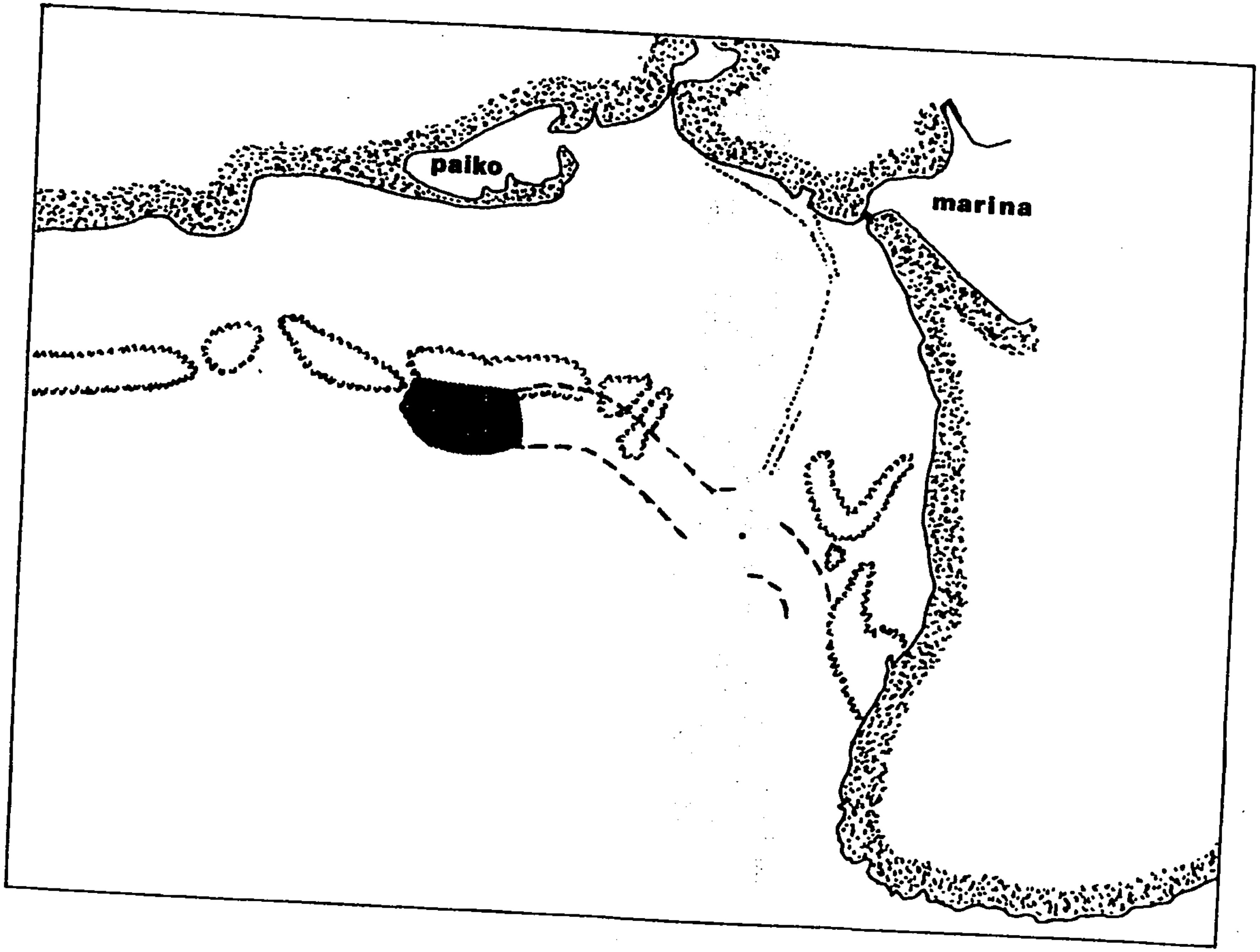
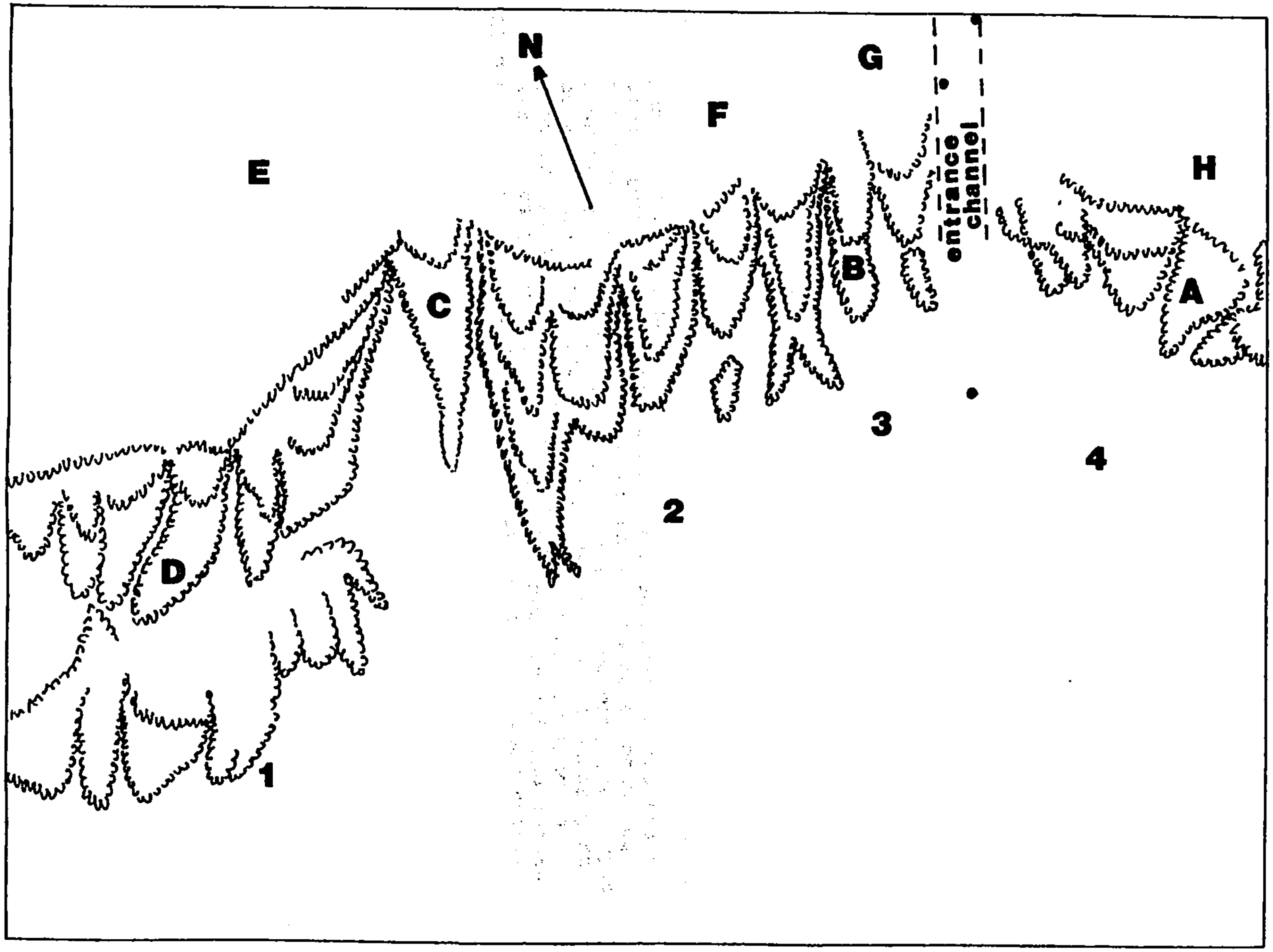

paiko
marina

Figure 3. Map of the fringing reef portion of the green turtle study area in eastern Maunalua Bay, Oahu showing the locations of the four stations (numbered 1-4) established to census turtles and the 8 stations (A through H) erected to quantitatively sample macrothalloid algal communities. Also shown are the approximate locations of the major spur and groove formations. Map redrawn from an aerial photograph. Scale 1 inch = 152m.



N
G
F
E
H
C
B
A
entrance
channel
3
4
2
D
1

Table 1. Summary of the number and percentage (in parentheses) of green turtles observed at Station 3, 130m west of the Hawaii Kai Entrance Channel and 100m seaward of the fringing reef from an anchored vessel over a 20 minute period of observation on 27, 28 December 1988 and 4 January 1989. Data presented by 10cm size classes (estimated straight line carapace length).

Date	Visibility (m)	Size Class (cm)	Number	Percentage
27 Dec	3	50-59	1	25
		60-69	3	75
		Total	4	
28 Dec	5	50-59	2	67
		60-69	1	33
		Total	3	
4 Jan	15	40-49	1	50
		50-59	1	50
		Total	2	

Table 2. Summary of the number and percentage (in parentheses) of green turtles observed at Station 2, 350m west of the Hawaii Kai Entrance Channel and 100m seaward of the fringing reef from an anchored vessel over a one hour period of observation on 27, 28 December 1988 and 4 January 1989. Data presented by 10cm size classes (estimated straight line carapace length).

Date	Visibility (m)	Size Class (cm)	Number	Percentage
27 Dec	1.5-3	50-59	1	14
		60-69	6	86
		Total	7	
28 Dec	2	40-49	1	17
		50-59	2	34
		60-69	3	49
		Total	6	
4 Jan	15	40-49	2	25
		50-59	4	50
		60-69	1	12.5
		70-79	1	12.5
		Total	8	

Table 3. Summary of the number and percentage (in parentheses) of green turtles observed in "Turtle Canyon" (Station 1) at Hawaii Kai in underwater surveys by 10cm size classes (estimated straight line carapace lengths) from the 27, 28 December 1988 and the 4 January 1989 surveys.

Date	Visibility (m)	Size Class (cm)	Number	Percentage
27 Dec	8-15	50-59	1	10
		60-69	6	60
		70-79	3	30
		Total	10	
28 Dec	12	40-49	2	18
		50-59	4	37
		60-69	3	27
		70-79	2	18
		Total	11	
4 Jan	8	40-49	1	7
		50-59	7	50
		60-69	5	36
		70-79	1	7
		Total	14	

turtles were seen in the underwater survey at Turtle Canyon with tumors (fibropapillomas); one was approximately 50cm in length and had one obvious growth near the cloacal opening (about 5cm in diameter) and the second was estimated to be about 60cm in length and had two relatively large (about 8cm in diameter) growths from the basal part of the neck. An estimated 60cm turtle was seen on 28 December with growths that matched the above turtle; it may have been the same individual. No turtles bearing tags were seen during any of the surveys at Hawaii Kai.

A fourth station (Station 4) was established approximately 170m east of the Hawaii Kai Entrance Channel about 120 seaward of the crest of the fringing reef. The results of the one hour censuses carried out at this station are given in Table 4. On 27 December eight turtles were counted and on the folowing day, six were seen. On 4 January two turtles were sighted at this station. As with the west side of the entrance channel, turtles appeared to avoid the area affronting the entrance channel and were encountered about 60 to 80m east of that area. Interestingly, the smallest turtles were seen at this station; the reason(s) for this are unknown.

During the survey for resting habitat, an effort was made to locate areas of significant algal coverage. None were found seaward of the spur and groove zone other than a large (estimated several hectare) area of _Halimeda opuntia_ in approximately 15m of water well offshore. Because of its highly calcified nature, _Halimeda opuntia_ is probably not an important green turtle forage item. In the area affronting the spur and groove zone many algal species known to be important as turtle forage were commonly encountered. Inspection of the benthic communities situated in shallow water just shoreward of the reef crest revealed the presence of a diverse high cover algal community.

Two surveys were made at first light on 28 December 1988 (tide height = +1.9 feet) and the second on 4 January 1989 (tide height = +1.6 feet). On the 28 December survey, effort focused on areas just seaward of the fringing reef. No turtles were encountered until 0735 hours albiet sampling commenced prior to first light at about 0630 hours. As with the resting habitat studies, we could not define specific areas of foraging, rather turtles were spread throughout the resting habitat. The second survey on 4 January 1989 considerable effort was put into surveying the algal bed just shoreward of the resting habitat (i.e., shoreward of the crest of the fringing reef). No turtles were seen in this area although the algal communities are diverse and dominate the substratum. As with the previous effort, turtles were not seen until about 0710 hours and all individuals were seaward of the reef crest in the spur and groove zone. The results suggest that turtles are either utilizing the forage present in the resting habitat or are feeding elsewhere at some other time.

Table 4. Summary of the number and percentage (in parentheses) of green turtles observed at Station 4, 170m east of the Hawaii Kai Entrance Channel and 120m seaward of the fringing reef from an anchored vessel over a one hour period of observation on 27, 28 December 1988 and 4 January 1989. Data presented by 10cm size classes (estimated straight line carapace length).

Date	Visibility (m)	Size Class (cm)	Number	Percentage
27 Dec	10	30-39	1	12.5
		40-49	2	25
		50-59	2	25
		60-69	3	37.5
		Total	8	
28 Dec	20	30-39	1	16.5
		40-49	4	67
		50-59	1	16.5
		Total	6	
4 Jan	12	40-49	1	50
		50-59	1	50
		Total	2	

Because green turtles appeared to spread out along the spur and groove zone seaward of the fringing reef in a "diffuse" resting area during the times of foraging surveys, and appropriate algal forage occurs through the same area, we established 8 stations to quantitatively sample the algal communities in the area. Four of these stations were located in the spur and groove habitat seaward of the reef crest (Stations A, B, C and D) and four were established shoreward of the reef crest (Stations E, F, G and H) to sample the diverse algal communities present in that area (see Figure 3).

Table 5 presents the results of the quantitative algal survey carried out at Station A. Station A was situated just seaward of the reef crest on the east (Portlock) side of the Hawaii Kai Entrance Channel (Figure 3). Water depth at this station ranged from 1.8 to 2.7m and the substratum at this station is limestone with spur and groove (channels) formations. The largest spurs are 25 to 50m in width, 20 to 60m in length and are spaced 10 to 25m apart. Between these spurs are channels with rubble and sand that range from 1.5 to 2m in depth. The orientation of the spur and groove system is perpendicular to shore and impinging surf. On the spurs are smaller channels with the same orientation; these channels range from 0.5 to 3m in width, 0.5 to 0.75m in depth, 5 to 15m in length and are spaced from 0.5 to 5m apart. Over the hard substratum are a variety of corals and a relatively low standing crop of fleshy algae. Mean algal cover was 1.9 percent and the preferred forage species, _Amansia glomerata_ comprised a coverage of 0.9 percent. In the vicinity of this station were seen _Codium edule_, _Sargassum polyphyllum_ and _Acanthophora spicifera_.

Station B was established 120m west of the entrance channel just seaward of the fringing reef in 1.5 to 4.6m of water. The substratum at this station was limestone with small spurs and grooves cut through it. The grooves or channels are from 1 to 5m wide, 3 to 15m long, up to 1.5m deep and are spaced from 5 to 30m apart. On the bottom of some channels is a veneer of sand and rubble. The channels provide some cover of the scale appropriate for small turtles. Table 6 presents the results of the quantitative survey carried out at Station B. Macroalgal coverage is low at this station with a mean coverage of 0.9 percent; _Amansia glomerata_ and _Codium edule_ comprised a mean coverage of 0.3 percent. In the vicinity of Station B were seen _Microdictyon japonicum_ and _Codium reediae_.

Station C was also established seaward of the fringing reef in the spur and groove zone about 600m west of the small-boat entrance channel in 2.4 to 4.6m of water. The substratum at this station is limestone bisected by spur and groove formations. Channels are from 1 to 15m in width, up to 2m in depth and up to 30m in length. Orientation of the channels is perpendicular to

Table 5. Results of the algal survey conducted at Station A on the east side of the Hawaii Kai Entrance Channel in the spur and groove zone, Maunalua Bay, Oahu (see Figure 3). Data in the body of the table is based on $6m^2$ of sampled substratum and are expressed as a percent cover. Water depth is 1.8 to 2.7m and the mean coverage by fleshy algal species is 1.9 percent.

SPECIES	QUADRAT NUMBER 1	2	3	4	5	6
ALGAE						
<u>Amansia glomerata</u>	0.5	3			2	
<u>Plocamium sandvicense</u>	4.5			0.5		0.5
<u>Desmia hornemannii</u>		0.1			0.1	
<u>Sporolithon erythraeum</u>	5.5	1			4	1.5
<u>Porolithon onkodes</u>	4	6	0.5	1		
<u>P.gardineri</u>					2	
SOFT CORAL						
<u>Anthelia edmondsoni</u>			0.1			
CORALS						
<u>Porites lobata</u>	3.5	5		15	1.25	
<u>P. compressa</u>	1.5		1.25			
<u>Pocillopora meandrina</u>		1.75			3	
<u>P. damicornis</u>			0.1			
<u>Montipora verrilli</u>				1		
<u>M. verrucosa</u>				0.3		
SAND						8
RUBBLE						30
HARD SUBSTRATUM	80.5	83.15	98.05	82.2	87.65	60

Table 6. Results of the algal survey conducted at Station B on the west side of the Hawaii Kai Entrance Channel in the spur and groove zone, Maunalua Bay, Oahu (see Figure 3). Data in the body of the table is based on $6m^2$ of sampled substratum and are expressed as a percent cover. Water depth is 1.5 to 4.6m and the mean coverage by fleshy algal species is 0.9 percent.

	QUADRAT NUMBER					
SPECIES	1	2	3	4	5	6
ALGAE						
Plocamium sandvicense	1	0.5			0.75	
Amansia glomerata	0.5	0.3				
Cladymenia pacifica	0.5		0.5			
Codium edule			1			
Lyngbya majuscula					0.1	
Porolithon gardineri	1	2	0.75	0.1		
P. onkodes	3	4	6	1	3	11
SOFT CORALS						
Anthelia edmondsoni				0.1		
Palythoa tuberculosa			0.5			
Zoanthus pacificus		1				
CORALS						
Porites lobata	11	1.5	4			0.1
Pocillopora meandrina			1		0.5	
Cyphastrea ocellina				0.3		
SAND				3	1	40
HARD SUBSTRATUM	83	90.7	86.25	95.5	94.65	48.9

shore. The channels are spaced from 10 to 30m apart. The intervening limestone spurs are dominated by encrusting coralline algae. Table 7 presents the results of the survey undertaken at Station C. Mean coverage by macrothalloid algae was estimated to be 24.3 percent and all of it was *Amansia glomerata*. In terms of turtle forage, *Amansia* is the dominant species. No other known turtle forage species was seen in the vicinity of this station.

Station D was carried out in the shoreward part of Turtle Canyon. This station was located approximately 1km west of the entrance channel for the Hawaii Kai marina in an area of spurs and grooves. The substratum at this station is limestone with the channels cutting through it. The spurs are 1 to 20m in width, 10 to 40m in length and are spaced from 5 to 10m apart. On the spurs are small channels that are from 0.5 to 2m wide, to 0.5m deep and up to 8m long. The orientation of the channels is approximately perpendicular to shore; water depth at this station ranges from 2.4 to 4.6m. Table 8 presents the results of the survey carried out at Station D. Mean fleshy algal coverage is estimated to be 5.1 percent with *Amansia glomerata* contributing 2.2 percent of the coverage. In the vicinity of this station several algal species that may serve as appropriate turtle forage were seen including *Caulerpa racemosa*, *C. taxifolia*, *Codium arabicum*, *Acanthophora spicifera* and *Laurencia nidifica*.

In summary, the mean coverage by flesh algal species in the four stations sampling the spur and groove habitat seaward of the reef crest was 8.1 percent. Species of known importance to green turtles (i.e., *Amansia glomerata*) comprised 6.9 percent coverage of the substratum sampled.

Inshore of the fringing reef on the shallow reef flat four stations were established to quantitatively sample the macroalgae. Station E was located inshore and slightly east of Turtle Canyon being about 840m west of the Hawaii Kai Entrance Channel (Figure 3) in 0.3 to 1m of water. The substratum at this station is a mix of emergent limestone and deeper sand/rubble channels cutting through it. The emergent limestone has an orientation perpendicular to shore and occurs on a scale of 1 to 30m wide, 3 to 70m long and spaced from 1 to 25m apart. The intervening sand channels have a similar orientation. The hard substratum is dominated by macroalgae; mean coverage for this station was 54.9 percent of which *Amansia glomerata* and *Laurencia nidifica* comprised 20.3 percent coverage. The results of the quantitative survey conducted at this station are given in Table 9. In the vicinity of this station were seen several potential algal forage species including *Codium edule*, *Caulerpa taxifolia* and the angiosperm, *Halophila ovalis*. One patch of *Halophila* was estimated to be at least 10m in diameter situated in 1m of water.

Station F was situated on the reef flat just shoreward of a shallow natural channel cutting through the fringing reef. This

Table 7. Results of the algal survey conducted at Station C on the west side of the Hawaii Kai Entrance Channel in the spur and groove zone, Maunalua Bay, Oahu (see Figure 3). Data in the body of the table is based on $6m^2$ of sampled substratum and are expressed as a percent cover. Water depth is 2.4 to 4.6m and the mean coverage by fleshy algal species is 24.3 percent.

SPECIES	QUADRAT NUMBER 1	2	3	4	5	6
ALGAE						
Amansia glomerata	80	1	9	22	34	
Porolithon gardineri	1.5	4				
P. onkodes	18.5	60	27	29		
Mesophyllum mesomorphum			1.5			
SOFT CORAL						
Anthelia edmondsoni			0.5			
CORALS						
Pavona duerdeni		0.75		13		
P. varians			6			
Pocillopora meandrina		1	1	0.5	1.5	
Porites lobata					1	
Cyphastrea ocellina				0.1		
SAND					9	100
HARD SUBSTRATUM		33.25	55	35.4	54.5	

Table 8. Results of the algal survey conducted at Station D on the west side of the Hawaii Kai Entrance Channel in the spur and groove zone, Maunalua Bay, Oahu (see Figure 3). Data in the body of the table is based on $6m^2$ of sampled substratum and are expressed as a percent cover. Water depth is 2.4 to 4.6m and the mean coverage by fleshy algal species is 5.1 percent.

SPECIES	QUADRAT NUMBER 1	2	3	4	5	6
ALGAE						
Plocamium sandvicense	2	2	5	3	0.2	
Desmia hornemannii	1	0.1	3			0.1
Amansia glomerata	3	6		2	1	1
Cladymenia pacifica		1				
Champia sp.	0.1					
Halimeda discoidea			0.5			
SOFT CORAL						
Palythoa tuberculosa	1					
CORALS						
Porites lobata	28	8	4	7	7	4.5
P. evermanni		3		9		
P. compressa	1				0.5	1
Pavona varians	2		0.5			
Pocillopora meandrina		2			0.1	1
Montipora patula		1				
M. verrucosa			3			0.1
SAND			2	2		4
RUBBLE			3	25		5
HARD SUBSTRATUM	61.9	76.9	79	52	90.3	83.3

Table 9. Results of the algal survey conducted at Station E on the west side of the Hawaii Kai Entrance Channel on the reef flat at Maunalua Bay, Oahu (see Figure 3). Data in the body of the table is based on $6m^2$ of sampled substratum and are expressed as a percent cover. Water depth is 0.3 to 1m and the mean coverage by fleshy algal species is 54.9 percent.

SPECIES	QUADRAT NUMBER 1	2	3	4	5	6
ALGAE						
Gracilaria bursapastoris	4			0.1		1
G. coronopifolia	1					0.1
Grateloupia filicina		0.1		1	0.1	
Dictyota acutiloba	6	2	14		0.5	
D. bartayresii						2
D. divaricata			0.5			
Dictyopteris australis				0.1		
D. plagiogramma			3			
Padina japonica	1	1			0.1	
Sargassum echinocarpum						20
Spacelaria furcigera			1		1	
Lyngbya majascula				2	0.1	
Amansia glomerata	0.5	65	34	41		58.9
Turbinaria ornata				1.5		
Galaxaura filamentosa			6	3		9
Hypnea musciformis				1	8	
H. cervicornis	1		0.5			
Laurencia nidifica	12	5				
Spyridia filamentosa	3		9			3
Dictyosphaeria cavernosa						1
Cladophoropsis luxurians				2		2
Oscillatoria sp.					1	
Halimeda opuntia	0.1		0.1	0.5		2
H. discoidea						1
Jania sp			2	0.1		
Avrainvillea amadelpha	1					
Ralfsia pangoensis			0.5			
SAND	18	14	3	3	80.2	
RUBBLE					9	
HARD SUBSTRATUM	52.4	12.9	26.4	44.7		

station was located about 285m west of the small-boat entrance channel in 1.2m of water. The substratum at this station is a mix of sand, rubble and hard bottom in roughly similar proportions. Table 10 presents the results of the survey carried out at Station F. The overall coverage by fleshy algal species was estimated to be 10.3 percent and Acanthophora spicifera comprised about 1.3 percent of the cover. In the vicinity of the station were seen Codium edule, C. arabicum, Pterocladia caerulescens and Amansia glomerata.

Station G was established to the west of and within 150m of the entrance channel in 0.6 to 1.2m of water (Figure 3). This station was located about 60m shoreward of the breaking surf on the fringing reef. The substratum at this station is a mix of hard substratum overlain with patches of rubble. The scale of the rubble patches are from 1 to 6m in diameter (greatest dimension) and these are spaced from 1.5 to 10m apart. Table 11 presents the results of the survey conducted at Station G. Fleshy algae were in abundance; the estimated coverage was 48 percent. Acanthophora spicifera and Laurencia nidifica comprised 43.7 percent of the coverage at this station. Interestingly, two recent introductions to the flora were present at this station; these species are Eucheuma sp. and the calcified, Avrainvillea amadelpha. It is not known if green turtles will forage on either of these algal species.

Station H was established 240m east of the entrance channel in 1 to 2m of water. The station is located just inside of the breaking surf on the fringing reef in the high energy rubble zone. The substratum at this station is primarily rubble with some sand present. Table 12 presents a summary of the quantitative survey conducted at Station H. Mean fleshy algal coverage was estimated at 0.1 percent at this station; this low coverage is probably a reflection of the high energy conditions that prevail and the unstable nature of the substratum. Shoreward of Station H the substratum grades into muddy sand which is not an appropriate substratum for macroalgae.

In summary the four stations located shoreward of the fringing reef (Stations E, F, G and H) have a mean fleshy algal coverage of 28 percent. Approximately 20 percent of the sampled substratum is covered with algal species known to be utilized by turtles; these species are Acanthophora spicifera, Laurencia nidifica and Amansia glomerata. In short, there appears to be a diverse and abundant supply of appropriate algal forage species within 250m (shoreward) of where most green turtles were sighted in this study.

An effort was made to assess the use of study area by boaters. Several categories of boaters were recognized in this study: dive boats (commercial SCUBA tours), fishing boats (both line and dive), pleasure cruisers and commercial recreational

Table 10. Results o. the algal survey conducted at Station F on the east side of the Hawaii Kai Entrance Channel on the reef flat at Maunalua Bay, Oahu (see Figure 3). Data in the body of the table is based on $6m^2$ of sampled substratum and are expressed as a percent cover. Water depth is 1.2m and the mean coverage by fleshy algal species is 10.3 percent.

	QUADRAT NUMBER					
SPECIES	1	2	3	4	5	6
ALGAE						
Asparagopsis taxiformis	17					2
Acanthophora spicifera	4.5	1		0.5		2
Padina japonica	1					0.1
Dictyota bartayresii	1	0.5	1			
D. acutiloba				2		
Dictyopteris plagiogramma		0.1		3	1.5	
Dictyosphaeria cavernosa	2				0.5	
D. versluysii						1.5
Galaxaura filamentosa	3		0.1	3		1
Oscillatoria sp.		1			4	
Spacelaria furcigera					0.5	
Lyngyba mascujula				0.5	3	3
Sargassum polyphyllum				0.5	1	
Halimeda opuntia	2	4	0.5	1.75	0.5	0.1
Jania sp.			0.1		0.1	
CORAL						
Porites compressa						2
SAND	5	75.4	58.3	50.75	48.9	50.3
RUBBLE	6	8	10	4	40	30
HARD SUBSTRATUM	69.5	10	30	34		8

Table 11. Results of the algal survey conducted at Station G on the west side of the Hawaii Kai Entrance Channel on the reef flat at Maunalua Bay, Oahu (see Figure 3). Data in the body of the table is based on $6m^2$ of sampled substratum and are expressed as a percent cover. Water depth is 0.6 to 1.2m and the mean coverage by fleshy algal species is 48 percent.

	QUADRAT NUMBER					
SPECIES	1	2	3	4	5	6
ALGAE						
Colpomenia sinuosa	0.3					
Dictyosphaeria cavernosa	7	3		0.5	1	3
Acanthophora spicifera	70	45	17		3	
Laurencia nidifica	3	6	22	31	35	30
Galaxaura filamentosa		0.75				0.5
Dictyota sandvicensis					1	0.5
D. bartayresii			0.5	4	0.5	
D. acutiloba						0.5
Turbinaria ornata					0.1	1
Eucheuma sp.			1	1		
Halimeda opuntia	4	43.25	58	7	8.5	12
H. discoidea	3					
SAND	2.5		1.5	6	1	9
RUBBLE	3	2		50.5	6	7
HARD SUBSTRATUM	7.2				43.9	36.5

Table 12. Results of the algal survey conducted at Station H on the west side of the Hawaii Kai Entrance Channel on the reef flat at Maunalua Bay, Oahu (see Figure 3). Data in the body of the table is based on $6m^2$ of sampled substratum and are expressed as a percent cover. Water depth is 1 to 2m and the mean coverage by fleshy algal species is 0.1 percent.

	QUADRAT NUMBER					
SPECIES	1	2	3	4	5	6
ALGAE						
Acanthophora spicifera	0.1					
Hypnea musciformis		0.1	0.1			
Desmia hornemannii				0.1		
Galaxaura fastigiata			0.1	0.1		
Jania sp.				0.1		
Avrainvillea amadelpha			0.1		0.1	
Porolithon gardineri		1			0.1	
Halimeda opuntia	0.1					
CORAL						
Porites compressa	0.5					
SAND	21	5	30	12	2	
RUBBLE	78.3	93.9	69.7	87.7	97.8	100

boats (i.e., parasailors, service vessels for the parasail operations, and water ski operators. On Wednesday 4 January 1989, we counted 21 different vessels transiting the Hawaii Kai Entrance Channel over an approximate 8.5 hour period (0620-1245, 1400-1630 hours). These counts are for power craft only; no attempt was made to keep track of sail craft but our casual observations suggest that sail powered craft are not common during the weekdays at Hawaii Kai. Many of the boats we counted made from 4 to 20 one-way trips in or out through the entrance channel. A conservative estimate on the number of one-way trips through the channel during this 8.5 hour period is 110. Approximately 6 of the 21 vessels were operated at high speeds on entering and exiting the channel. These latter vessels could pose a threat to resident green turtles via a collision.

About 6 vessels participate in dive charter operations out of Hawaii Kai. These vessels make anywhere from one to three trips daily to Turtle Canyon (two trips in the morning and one in the afternoon) but the use of the area is partially dependant upon weather. In a one hour sampling period from 1100 to 1200 hours on 27 December 1988, we counted six dive charter vessels anchored at Turtle Canyon with a total of 39 individuals on board. Not all passengers on a vessel will make a dive, rather one or more deckhands will stay on board to help divers in and out of the water. However, these number suggest that the Turtle Canyon area receives considerable use.

DISCUSSION

The results of this study suggest that there is a substantial resident population of green turtles seaward of the fringing reef at Hawaii Kai; our censuses found from 26 to 29 individuals on each of three identical survey efforts. These turtles appeared not to have selected a specific resting locality but rather are spread through an area of spur and groove development seaward of the reef crest and within 250m of it. Because of their apparent use of the entire area, we term the resting habitat as diffuse. Considerable appropriate algal forage exists both within this diffuse resting area as well as shoreward of it on the shallow reef flat as shown by the results of our quantitative benthic surveys.

Balazs et al. (1987) note that in two short surveys of Turtle Canyon in April and May 1985, three turtles were seen and captured for tagging and other sampling. One turtle (39.2cm straight line carapace length) sampled for stomach contents had 67 percent *Codium edule* and 33 percent *Codium arabicum*; Balazs et al (1987) note that *Codium* was not present in the area of capture and surmise that the turtle had fed elsewhere. Our survey suggests that *Codium* is by no means the dominant algal species but it occurs with some frequency both seaward and shoreward of the reef crest; Codium species were found at Stations A, B, D, E and F.

Despite the apparent abundance of green turtles and their forage in the study site, very few turtles were seen within 80m of the entrance channel to the Hawaii Kai marina. Our qualitative reconnaissance suggests that the abundance of algal forage was less in this area around the channel. We suspect that the lack of turtles in this area may be related to the considerable vessel traffic in and out of the entrance channel.

One interesting obsaervation made on this survey was the apparent small size of the turtles encountered. In total, 81 turtles were censused during our surveys: 2 turtles were estimated to be in the 30-39cm size class, 13 in the 40-49cm size class, 27 in the 50-59cm size class, 32 in the 60-69cm size class and 7 individuals in the 70-79cm size class. The calculated mean size for this sample is 58.6cm. As a comparison, green turtles censused in the West Beach, Oahu area had an estimated mean size close to 80cm. The estimation of length in the field on free swimming turtles is fraught with potential errors; but attempting to make some estimate on size provides some information that would otherwise not be available. In any case, no turtles were encountered in our survey that were estimated to be greater than 70cm in straight line carapace length. Balazs (1980) defined green turtle growth in the following way: juvenile - to 65cm straight line carapace length; subadult - 65 to 81cm straight line carapace length and adult (i.e., reproductively active) - 81cm and greater. Thus none of the turtles in the present survey were adults suggesting that the Hawaii Kai habitat is appropriate for juveniles.

Potential impacts to green turtles by the construction of the Hawaii Kai Ferry facilities relate primarily to the proposed modifications to the entrance channel because of proximity to resident turtles. One potentially adverse condition could occur with the generation of turbidity with channel dredging; it is expected that approximately 60,000 cubic yards (45,875m^3) of material will be removed. Once removed, the material will be dumped in the EPA dump site approximately 7 miles offshore of Honolulu alleviating potential impacts in the vicinity of Maunalua Bay that might otherwise be created by the disposal of this material.

Dredging will disturb the soft sediment deposited on the reef flat and on the channel floors, thus high turbidity conditions may be expected during this activity. Turtles may not favor turbid water and the increased turbidity caused by dredging could impact the algal species on which the turtles forage. However, as noted by Brock (1988a) the abundance of green turtles in an inshore resting habitat at West Beach, Oahu showed a significant inverse relationship with water clarity; thus when water clarity was high, few turtles were present. No such relationship is apparent in the present data. Marine communities both within and seaward of the fringing reef are presently subjected to considerable turbidity. Brock (1988) noted low water transparency conditions (underwater visibility less than 30cm) in the April 1988 survey near the shoreline. In the present survey seaward of the fringing reef, turbid water was often encountered on a falling tide. The underwater visibility in this turbid water was often one meter or less. Irrespective of the poor water clarity, turtles were often encountered in water with these low visibility characterisitics in the present study. Apparently high turbidity has existed for some time in this area (WRRC 1973, ECI 1975, AECOS 1979) and as noted by Brock (1988) most of the extant benthic species in the inner bay areas appear to be those with high tolerance to mixohaline water and low water transparency.

Presently occurring sources of environmental perturbation in the study area that could be impacting green turtles are the input of freshwater, fine mud of terrigenous origin, and possibly pesticides as well as heavy metals. Also fine carbonate materials derived from the reef platform are probably contributing to the local sediment loading. A perusal of the available literature (WRRC 1973, AECOS 1979) suggests that high sedimentation and periodic freshwater inudation has been occurring since the commencement of marina construction in 1959. These impacts to marine communities will continue to occur particularly with high rainfall conditions. Perhaps the greatest rainfall related impact to the reef communities in this Maunalua Bay study area occurred on 31 December 1987 - 1 January 1988 when the highest sustained rainfall ever recorded on East Oahu occurred. In a 24 hour period approximately 63cm (25 inches) fell on the Koolau Mountains in the Hawaii Kai drainage basin. The effect of this storm was excaberated by heavier than usual rainfall during the two weeks preceding the event which probably saturated the soil. The 1 January storm triggered massive erosion in the Hawaii Kai watershed with tons of rock, sediment and personal property being carried to the sea and deposited on the reefs in Maunalua Bay and elsewhere. Despite the magnitude of these potential impacts, green turtles are in residence in the fringing reef habitat and the algal communities presumably on which they feed are plentiful in the area. Like storm events, turbidity caused by the construction activities will be transitory and probably be very similar to the present situation thus no lasting impacts to the resident turtles are expected.

Channel modifications may require the use of explosives which, if improperly used could kill nearby turtles. Underwater explosions produce two types of pressure waves, the initial compression or shock wave and later the bubble-pulse or negative pressure wave (Cole 1948). The primary disturbance to the water during an explosion is the arrival of the compression wave from the reacting explosive. This disturbance is propagated through the water as a pulse of compression with a leading front which carries the greatest energy. In an uniform medium this peak pressure wave undergoes an exponential decay that is a function of the type of charge, its size and distance from the site of detonation. The peak pressure from a given charge decreases with increasing distances and the rate of energy dissipation varies with environmental conditions. Thus in open water, the peak pressure from dynamite varies inversely as the 1.15 power of distance (Hubbs and Rechnitzer 1952). The peak pressure does not bear a linear relationship to the weight of the charge but varies as the one-third power of the charge size. Therefore, a 2.2kg (5 lb) charge yields about one-third the peak pressure that a 57kg (125 lb) charge does. Hubbs and Rechnitzer (1952) found that the greatest mortality to fish exposed to explosive charges was with the negative pressure wave.

When a fish with a swimbladder or an air breathing animal with lungs swimming underwater is exposed to the compression wave of an underwater explosion, the pressure increases reducing the volume of gas in the lung or swimbladder. As the external pressure is returned to ambient, the bladder or lung expands to its previous volume; however, as the later arriving negative or decompression wave impinges on the fish or animal, the pressure drops below ambient and the gas in the organ rapidly expands and in the case of fish, creates tensile stresses in the bladder wall. If the pressure decrease is great enough, the bladder membrane will be ruptured (Yelverton et al. 1975, Wright 1982). Since the compression and decompression waves from a blast arrive within a period of a few milleseconds, the organism does not have the opportunity to adjust the gas volume to compensate for the sudden pressure changes.

If explosives are to be used to increase the channel size particularly where it cuts through the outer fringing reef, some precautions could lessen the impact to nearby resident turtles. To minimize the chances of the propagation of a significant shockwave with any explosives, mitigating measures could include (1) the use of drilled holes in setting charges which would serve to direct the shockwave vertically in the watercolumn, (2) the use of small charges individually detonated with microsecond delays which lessen the magnitude of the shockwave, (3) and a program of careful searching and removal of turtles from the nearfield (within several hundred yards of the detonation site) just prior to the detonation. These methods were recently and successfully used in shoreline explosives work at West Beach, Oahu (Brock 1988a).

Perhaps the greatest potential negative impact to green turtles resident to the fringing reefs at Hawaii Kai may come through the operation of high speed vessels in the area. Among the vessels in this category would be the proposed ferry. In the high speed movement of a vessel through a known turtle resting area, turtles could be possibly run over causing mortality. This threat has existed at Hawaii Kai for some time (since marina construction) with all of the boat traffic that presently enters and exits the marina entrance channel. Our observations suggest that many boaters comply with the rules governing the speed of craft on entering and exiting the channel but many do not. As stated above, we have no information regarding the number of collisions between boats and turtles or even if they do occur. We have never encountered a turtle that appeared to have marks to suggest having been run over and hit by a propeller. In any case, very few turtles were enountered within 80m of either side of the channel and directly seaward. We observed that on the approach of a vessel anywhere in the study area (whether it be at high speed or not) turtles on the surface immediately dove to avoid the boat. Turtles would probably respond in the same fashion on the approach of the ferry. To alleviate any potential problem with the collision of turtles and the high speed operation of the ferry, we recommend that the ferry be piloted in a straight onshore-offshore direction once having cleared the channel; this would be the shortest course to transit the area known to be used by green turtles.

A potential for negative impact on green turtles exists with the heavy use of Turtle Canyon by divers. Our one sample showed close to forty people on six vessels at Turtle Canyon; if three trips are made daily and two-thirds of the people dive on the site, then approximately 80 divers view the turtles on a daily basis. We have no information as to the carrying capacity of a green turtle resting site with respect to divers but it must be greater than this number for green turtles have remained in the area.

In conclusion, the data gathered on the resident green turtle population at Hawaii Kai in this study suggests that these juvenile turtles are apparently coexisting with man in an area that has received a considerable level of disturbance over the last thirty years. There is nothing to suggest that the population of green turtles at Hawaii Kai is declining albiet the lack of a historical database. Use of the Hawaii Kai marine facilities and resources has grown in recent years, yet the area harbors a substantial population of green turtles. Not only does the Hawaii Kai area appear to presently have considerable appropriate resting habitat in the spur and groove zone seaward of the fringing reef, but both this zone and the shoreward reef flat harbor substantial quantities of forage for turtles. It is expected that the construction of facilities and operation of a ferry at Hawaii Kai will contribute little further impact to either the resident green turtles or to their food resources.

LITERATURE CITED

AECOS, Inc. 1979. Oahu coral reef inventory. Part B - sectional map descriptions. Prepared for U.S. Army Corps of Engineers, Pacific Ocean Division, Honolulu. 552p.

AECOS, Inc. 1981. Oahu coastal zone atlas. Prepared for U.S. Army Corps of Engineers, Pacific Ocean Division, Honolulu. 93p.

Balazs, G.H. 1980. Synopsis of biological data on the green turtle in the Hawaiian Islands. NOAA Tech. Memorandum NMFS, NOAA-TM-NMFS-SWFC-7. 141p.

Balazs, G.H., R.G. Forsyth and A.K.H. Kam. 1987. Preliminary assessment of habitat utilization by Hawaiian green turtles in their resident foraging pastures. NOAA Tech. Memorandum NMFS, NOAA-TM-NMFS-SWFC-71. 107p.

Brock, R.E. 1988. Biological assessment for the proposed intra-island ferry system: Hawaii Kai terminal. Prepared for Sea Engineering, Inc., Makai Research Pier, Waimanalo, Hawaii. Environmental Assessment Co., 1804 Paula Drive, Honolulu, Hawaii. 41p.

Brock, R.E. 1988a. Green sea turtle population monitoring during blasting work at West Beach, Oahu. Final Report. Prepared for Alfred A. Yee, Division of Leo A. Daly, 500 Ala Moana Blvd., Honolulu, Hawaii. Environmental Assessment Co., 1804 Paula Drive, Honolulu, Hawaii. 15p.

Cole, R.H. 1948. Underwater explosions. Princeton University Press, Princeton, N.J. 437p.

Environmental Consultants, Inc. 1975. Preliminary environmental impact studies on the marine environment at Maunalua Bay. Prepared for Kentron Hawaii, Ltd. 65p.

Hubbs, C.L. and A.B. Rechnitzer. 1952. Report on experiments designed to determine effects of underwater explosions on fish life. Calif. Fish & Game 38:333-366.

Pukui, M.K., S.H. Elbert and E.T. Mookini. 1976. Place names of Hawaii. Univ. Hawaii Press, Honolulu. 289p.

Water Resources Research Center. 1973. The quality of coastal waters, second annual progress report. WRRC Tech. Rept. No. 31. Univ. Hawaii, Honolulu.

Wright, D.G. 1982. A discussion paper on the effects of explosions on fish and marine mammals in the waters of the Northwest Territories. Canadian Tech. Rept. of Fisheries and Aquatic Sciences No. 1052. 16p.

Yelverton, J.T., D.R. Richmond, W. Hicks, K. Saunders and E.R. Fletcher. 1975. The relationship between fish size and their response to underwater blast. Prepared for Defense Nuclear Agency. Lovelace Foundation for Medical Education and Research, Albuquerque, New Mexico. Rept. No. DNA 3767T. 44p.

APPENDIX F

DETAILED SHORELINE HISTORY IN THE VICINITY OF THE HAWAII KAI MARINA ENTRANCE

DETAILED SHORELINE HISTORY IN THE VICINITY OF THE HAWAII KAI MARINA ENTRANCE

Table 1 and Figures 1 through 4 present a detailed shoreline history of the area in the vicinity of the Hawaii Kai Marina entrance channel. The history was researched to determine the existing factors influencing the sandy Portlock shoreline, which would then provide a basis for evaluating the impacts of the channel dredging.

As described previously, Paiko Peninsula has a long history of growth toward the east, indicative of longshore transport to the east on that part of the reef. Prior to the 1960's, there was probably a two way, seasonally reversing transport along the Portlock shoreline, with the sand from the nearshore reef in a dynamic balance with the shoreline from Paiko Peninsula to Portlock. The dredging in the late 1960's essentially compartmentalized the shoreline sectors, and cut the Portlock shoreline off from sand replenishment from the west. An important factor to note, however, is that the original sand transport had to be just along the beach face near the fishpond entrance, since there was an existing natural deep channel just offshore. The dredging of the channel beneath the bridge severed this sand transport path.

The shoreline change from 1967 to 1974 (Table 1 and Figures 2 and 3) shows the resultant erosion of the Portlock shoreline. This occurred because sand transported to the west was lost in the dredged channel; there was no longer a mechanism for sand to move from the west, in the vicinity of Paiko Peninsula, to the east.

The reason for the previous accretion of the Portlock shoreline, from 1950 to 1967, is not known.. It is possible that, like many other beaches on Oahu, the shoreline was subject to long term fluctuations, and the 1950 to 1967 period just happened to be one of accretion.

The area most affected by the new channel was in the vicinity of transect 1, shown on the figures, which was the area closest to the channel. From 1967 to 1974, that area eroded approximately 40 feet. From 1974 to 1988, most of the Portlock shoreline continued to erode at rates of 1.4 to 1.8 feet per year. The area at transect 1, however, benefited from the sand supply from the east, and the shoreline has been slowly moving seaward, at a rate of approximately 0.5 feet per year. This has apparently occurred because the sand spit beneath the bridge is now approaching a stable condition. Sand transported to the west still falls into the deeper entrance channel, but the water velocity during flood and ebb tide is high enough to maintain the existing width. As the sand is flushed from the channel, it is forming a large sandbar just mauka of the bridge.

Given the existing configuration of the shoreline and the ongoing shoreline processes, even with no channel improvements for the proposed ferry system, it is likely that the eroding areas will continue to recede at a rate of approximately 1.5 feet/year. The accretion at transect 1 should continue. This area, since it is in some type of balance with the sand spit beneath the bridge, would likely be affected by any changes to either the sand spit or the sandbar inside the marina.

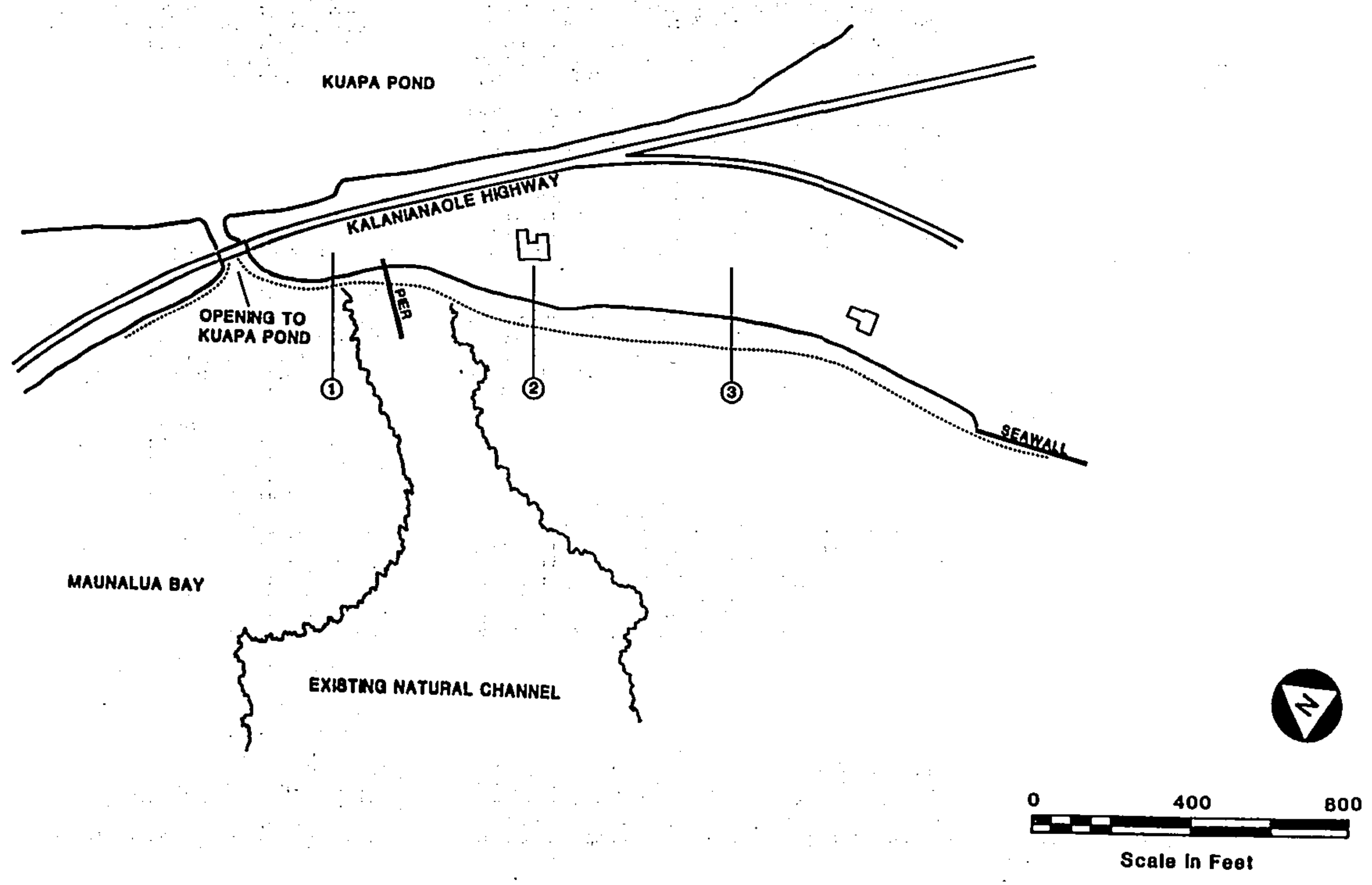
TABLE 1

SHORELINE HISTORY IN THE VICINITY OF THE HAWAII KAI MARINA ENTRANCE

DATE	CONDITION/ACTIVITY	ACTIVITY EFFECT ON SHORELINE DISCUSSION	1	2	3
Pre-1930s'	Kuapa Pond (Brackish Fish Pond) separated from Maunalua Bay by a narrow sand spit and rock wall. The pond had two openings to the sea, one at the approximate location of the present Hawaii Kai marina entrance. A narrow, irregular natural channel extended seaward through the fringing reef in the vicinity of the opening.	The shallow channel through the reef was probably a result of freshwater drainage during a previous lower stand of the sea. The seaward border of the fish pond was probably not a natural shore, but rather a man-made barrier.	n/a	n/a	n/a
Late 1930s'	Kalanianaole Highway (Kal Hwy) constructed, widening the barrier between Kuapa pond and the sea. The channel at the site of the Hawaii Kai marina entrance was widened to 40-feet and a bridge constructed.	First recorded significant alteration to the shoreline configuration and location.	n/a	n/a	n/a
Early 1940s'	Reportedly some dredging of the existing natural channel through the reef by the military, no reported alteration of the channel through the shore into Kuapa pond.	Likely no significant effect to the shore.	n/a	n/a	n/a
1950	Earliest available aerial photo of the shoreline, assumed baseline condition for evaluation of future changes (see Figure 1). The photo shows extensive residential development of the Portlock shoreline east of the Kuapa pond openings. A seawall has been constructed approximately 2,000 feet east of the opening. The sand beach appears to be 50 to 75 feet wide.	Sand appears to have constricted the originally constructed 40-foot wide opening to Kuapa pond to about 20 feet. Erosion is evident at the west end of the seawall, which, assuming a net sand transport from east to west, is typical for the downdrift end of a shoreline structure. Note that the existing natural channel thru the reef is offset 200 feet to the east of the opening to Kuapa pond.	0	0	0
1959 through the 1960s'	Hawaii Kai construction began. Dredging and filling of Kuapa pond decreased its surface area by about one-half.		n/a	n/a	n/a
	A stormwater drainage channel was constructed through the Portlock shoreline about 1,600 feet east of the opening to Kuapa pond, with a 50-foot long groin seaward of the opening.	Construction of the storm drain and groin would have a marked effect on the shoreline configuration. Chronic erosion has been recorded downdrift of the storm drain.	n/a	n/a	n/a

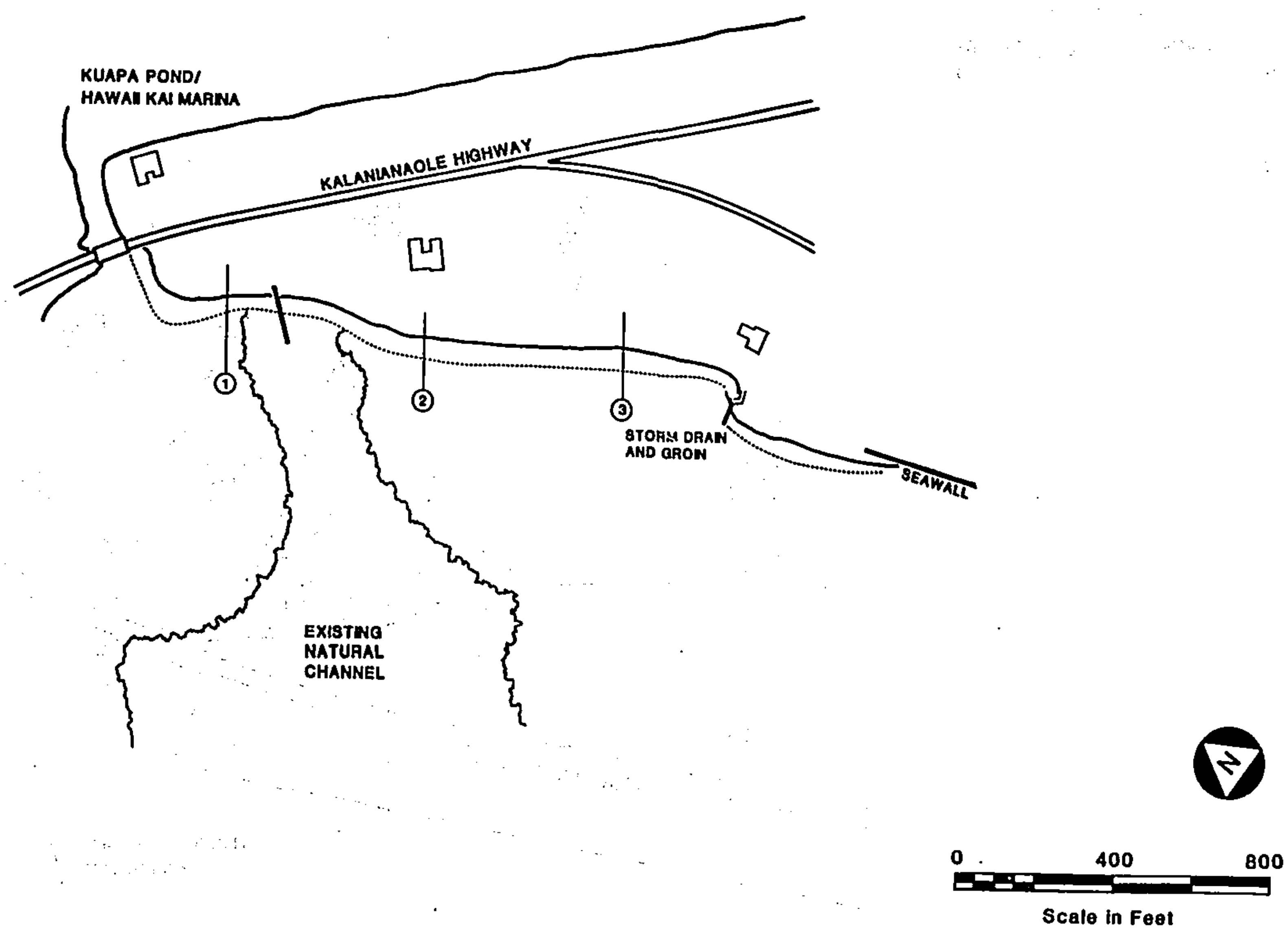
DATE	CONDITION/ACTIVITY	ACTIVITY EFFECT ON SHORELINE DISCUSSION	SHORELINE POSITION RELATIVE TO 1950 1	2	3
1967	Aerial photograph - Hawaii Kai main marina basin under construction. Sedimentation is evident on the reef flat seaward of the opening to Kuapa pond. Tidal and stormwater drainage of Kuapa pond via a narrow channel across the reef flat to the existing natural channel. The shoreline has accreted considerably since 1950, and the beach is typically 30 to 50 feet wide (see Figure 2). Some dredging of the channel under the bridge at the opening to Kuapa pond is evident, however, the bridge is still only 50 feet long.	The reason for the significant shoreline accretion is unknown. The storm drain and groin Exhibit A typical groin effect configuration when sand transport is primarily one-way along the shore, with accretion on the updrift (east) side and erosion on the downdrift (west side). Accretion along the entire shore averaged 2.5 to 3.5 feet/year.	+55' (+3.2'/yr)	+60' (+3.5'/yr)	+45' (+2.7'/yr)
1969	The bridge at the opening to Kuapa pond and Hawaii Kai Marina was lengthened to 250 feet, and the opening widened to meet the needs of the 100-year rainfall stormwater drainage. The 250-foot wide channel was dredged from the new bridge out to the existing natural channel through the reef. A channel was also dredged parallel to the shore west to the location of the existing launch ramp, and a secondary opening to the marina was constructed at the west end. Dredged material was placed makai of the highway to create the land presently used for the launch ramp and park.	Immediately after the bridge was constructed and the channel widened, sand moved into the channel from the east side and plugged the first three bays of the four bay bridge. The size of the opening into Hawaii Kai Marina is regulated by tidal hydraulics, and there is only enough tidal flow into and out of the marina to keep a 40 to 50 foot wide channel clear of sand. Up until now, there may have been some two-way sand transport along the shore, however with the widening and deepening of the channel, two-way transport was effectively blocked.	n/a	n/a	n/a
1974	Aerial photograph (Figure 3): the new bridge and new dredged channels can be clearly seen. The shoreline (vegetation line) is still well seaward of the 1950 shoreline position, however at traverse 1, the shore receded about 40 feet from its 1967 position. Downdrift (west side) erosion is also more pronounced at the storm drain and groin.	Presumably the shoreline recession at Traverse 1 is a result of the shoreline seeking a new equilibrium position following widening and deepening of the channel. Erosion at Traverse 1 near the opening to the marina averaged 5.7 feet/year, while the shoreline along the rest of the shore receded at about 1.4 feet/year.	+15 (-5.7'/yr)	+50 (-1.4'yr)	+35 (-1.4'yr)
1986	A sandbar which had formed on the marina side of the bridge was removed during maintenance dredging. No dredging was done under or seaward of the bridge.	The channel and opening to Hawaii Kai marina is relatively constant in size, maintained by tidal currents. Sand transported from east to west along the shore is either moved into the marina or offshore into the channel to form sand bars or shoaled areas. Seawalls 1,000 to 1,500 feet east of the channel to the marina were reported to have become undermined and/or fallen over at about the time of maintenance dredging. No change was noted to the shoreline immediately east of the bridge or to the sand bar plugging two-thirds of the channel.	n/a	n/a	n/a
1988	Aerial photograph (Figure 4): the photo was taken one month after a severe storm caused extensive erosion and flooding in Hawaii Kai Valley. Sediment carried out the marina entrance was deposited at a sand bar just seaward of the bridge. The sand spit which blocks the eastern half of the opening at the bridge is now heavily vegetated, and evidently very stable as the New Years Eve flood did not disturb it. At the west end of the shore, near the bridge, the shoreline has moved seaward since 1974, and on the down drift side of the storm drain/groin more erosion is evident.	The sand split plug in the eastern half of the marina entrance is a relatively stable formation, and the east to west longshore sand transport is resulting in accretion of the shoreline near the bridge, with some of the sand also being transported into the marina and some presumably being transported offshore out the entrance channel. The shoreline east of the bridge continued to recede at an average rate of about 1.5 feet/year. It is interesting to note however, that 38 years later the shoreline is still seaward of its 1950 position.	+20 (+0.4'yr)	+25 (-1.8'yr)	+15 (-1.4'/yr)

n/a – NOT AVAILABLE



SHORELINE CONDITIONS 1950

Prepared for:
DEPARTMENT OF TRANSPORTATION, HARBORS DIVISION
Prepared by:
SEA ENGINEERING, INC.



SHORELINE CONDITIONS 1967

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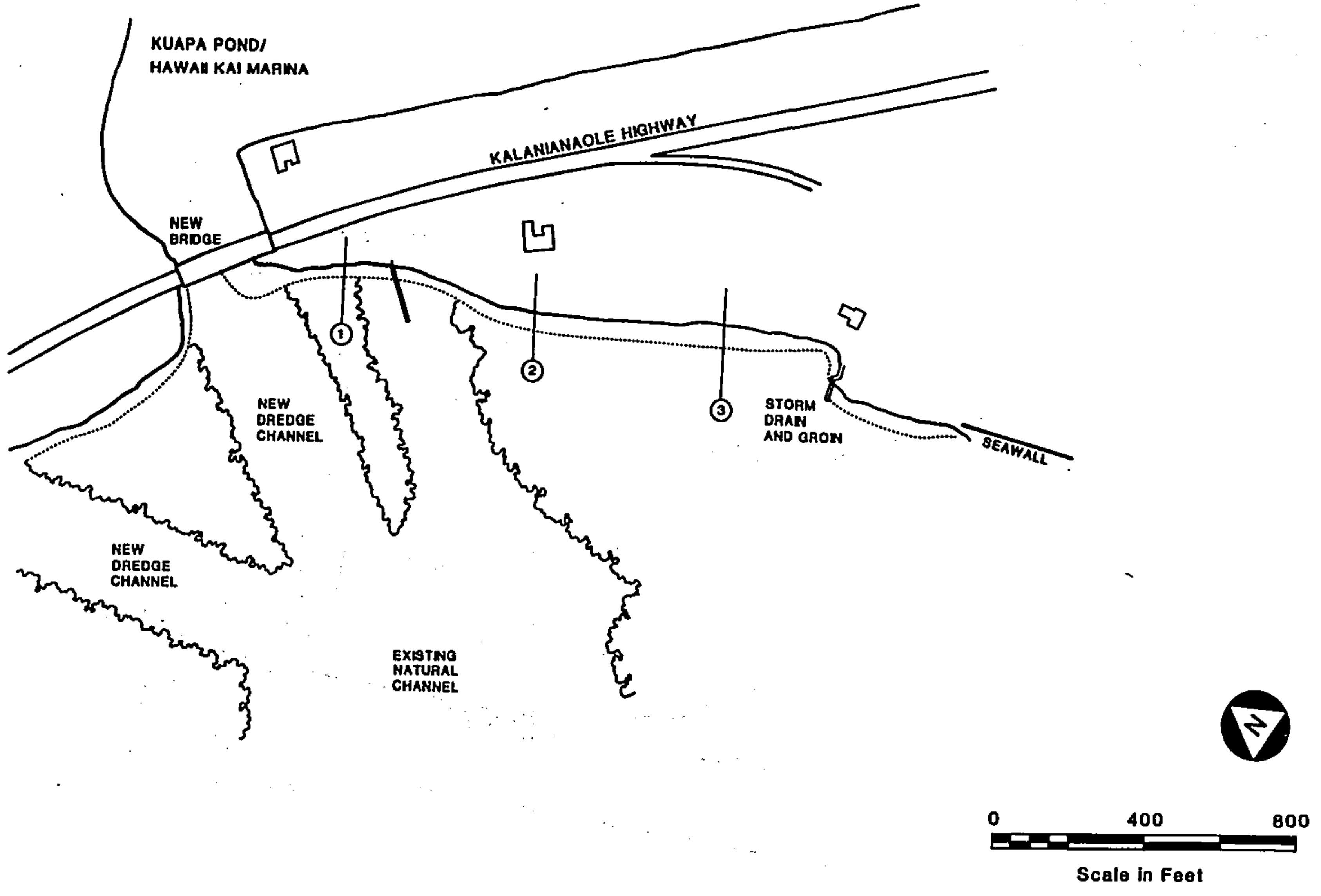
Prepared by:
SEA ENGINEERING, INC.



SHORELINE CONDITIONS 1974

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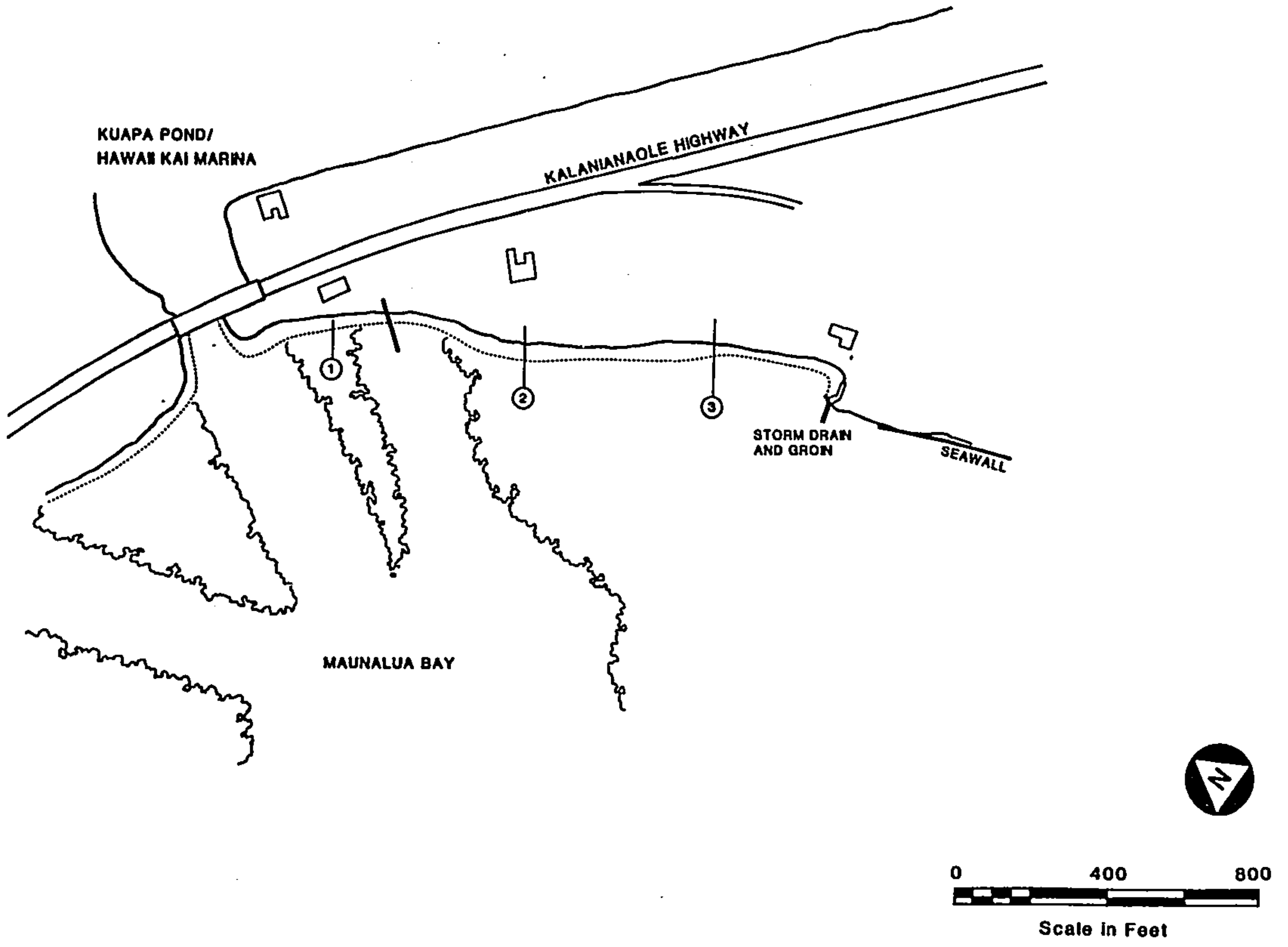

SHORELINE CONDITIONS 1988

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APPENDIX G

NUMERICAL MODELING OF CHANNEL EFFECT ON MAUNALUA BAY

NUMERICAL MODELING OF WIND WAVES
AND TSUNAMI WAVES IN MAUNALUA BAY

I. INTRODUCTION

This study was conducted in response to concerns expressed by public agencies and private citizens during the review of the Environmental Assessment for the Hawaii Kai Ferry Terminal. Dr. Charles L. Mader, President of Mader Consulting Co., a retired fellow of the Los Alamos National Laboratory and a visiting Senior Fellow of the Joint Institute for Marine and Atmospheric Research at the University of Hawaii, was retained as a consultant to develop a numerical model to assess what the relative wave height changes at the shoreline might be if the existing channel were enlarged.

II. STUDY METHODS

The model used in this study was based upon two decades of research into numerical methods for modeling water waves at Los Alamos National Laboratory. The numerical model used was an incompressible fluid dynamics model used for shallow water, long waves. Development of the model is described in detail in a book written in 1988 by Dr. Mader, "Numerical Modeling of Water Waves," and published by the University of California Press.

The computer code for application of the numerical long model is called SWAN. The SWAN code has been used to study the interaction of tsunami waves with continental slopes, shelves and harbors, for example, Hilo Bay. It has been used successfully to model the effects of tides on estuaries, the effects of harbor cuts through reefs, and the effect of waves on Rabual Harbor in Indonesia. In 1985, the SWAN code was used to evaluate various proposals for decreasing the amplitude of waves inside the small boat harbor at Waianae, Oahu. In all applications, the model has reproduced the observed water wave behavior.

The first step in the study was to obtain additional required bathymetric data. The channel area had been surveyed earlier in the design phase of the project, but more information on the reef areas was needed. The bathymetric survey covered an area approximately 5000 feet on a side. It extended through the area of interest, from the public boat ramp on the west, to Kaiser channel on the east, and offshore to the 20-foot depth contour.

The bathymetric data was used to develop the depth profiles of Maunalua Bay shown in Figures 1 and 2. Figure 1 shows the existing conditions, and Figure 2 shows the depth profile with the enlarged channel and turning basin. The main entrance channel is in the center of the figures. The channel to the boat ramp can be clearly seen, with the extensive shallow reef flat to the left. The Portlock side of the channel is more irregular, with a fairly high percentage of deep area. The flat surfaces on the extreme right of the figures are dry land.

Figure 2 shows the main channel width increased from 100 to 200 feet and its depth increased to 12 feet where it is not already deeper. The intermediate channel and interior channel is increased in width to 180 feet and increased in depth to 10 feet.

In order to provide a calibration point for the model, wave heights were measured at several locations in the area on July 21, 1988 during a south swell. The tide level was one-foot above Mean Lower Low Water (MLLW), or approximately at Mean Sea Level (MSL), and the incoming wave periods were 15 seconds. The measured heights are summarized on the following page.

LOCATION	SIGNIFICANT WAVE HEIGHTS (FT)
Nav. Marker 1	4.0
Nav. Marker 6	0.8
Nav. Marker 15	0.8
Nav. Marker 17	1.0
Shoreline at Terminal	0.5 to 1.2

The SWAN code was used to model the interaction of Maunalua Bay with waves having periods of 15, 30 and 60 seconds, and with a 15-minute period tsunami wave. The wave fronts were oriented perpendicular to the channel axis for maximum effect. Wave amplitudes of 1 to 6 feet were considered, with tides ranging from Mean Low Low Water to Mean Higher High Water, a 1.8 foot range.

In order to numerically resolve the shorter waves, the resolution of the bay was increased from the initial 48 by 47 grid (2256 cells) to a 96 by 94 grid (9024 cells) and finally to a 192 by 188 grid (36,096 cells) to obtain high resolution 15 second waves. The results in all cases were shown to be independent of the resolution by a least a factor of 2.

III. RESULTS

The numerical model reproduced the observed wave heights at various locations in the bay for a 4-foot high south swell.

Typical results from the calculations are shown in Figures 3 to 11. Figures 3, 5 and 7 show the wave height surface plots at 401, 921, and 2280 seconds, respectively, into the computer run for a 3 foot high, 30 second period wave interacting with the bay. The relatively large waves seaward of the reef edge are apparent on the left side of the figures. The effect of the reef on the incoming waves can be seen, as the heights decrease near shore. Figures 4, 6 and 8 show the wave height contour plots at the same times. Each contour line represents a height increment of 0.3 feet. Again, the relatively smaller wave heights on the reef are apparent.

Figures 9 to 11 show the wave height histories at locations 3 (Navigation Marker #6), 6 (Portlock Beach), and 7 (Portlock Beach) for a 15-second, 3 foot high wave at the time of Mean Sea Level. Figure 9 shows the time history at location 3 over a 34-minute simulated time, before and after the proposed channel enlargement. The vertical scale is in feet and the horizontal scale is in seconds. During all computer runs, it takes approximately 17 minutes after the first wave input for the bay to reach an equilibrium. This is apparently due to the entire bay acting as an interacting system, with wave reflection off the shoreline. The right side of each graph can therefore be considered representative of steady state conditions. Comparing the before and after wave heights indicates negligible change in predicted heights.

Figure 10 shows the time history at locations 6 and 7, both on the beach at Portlock. Again, both figures show the time required to reach steady state and the negligible changes in predicted wave heights.

It should be noted that the numerical model is essentially period dependent only. For larger incoming waves of the same period, the difference in heights through the study areas can be scaled proportionately.

Figures 3 to 12 are just a few typical representations of the hundred of plots generated during this study. The numerical model results, in all cases, found the same wave heights, within +10%, at the various locations in the bay for the existing configuration and the proposed enlarged channel.

These very minor changes in wave heights were at first somewhat surprising. However, an evaluation of the results indicates that the wave behavior at any particular location in the bay is a strong function of the entire bay and a complicated and time varying pattern of wave reflections and interactions. The existing channel is only one aspect of the present configuration that allows wave energy to propagate shoreward. Comparing the depth profiles in Figures 1 and 2, it can be seen that the proposed changes to the channel are relatively small when considered in the context of the entire area. This may explain the small effects on wave heights predicted by the model.

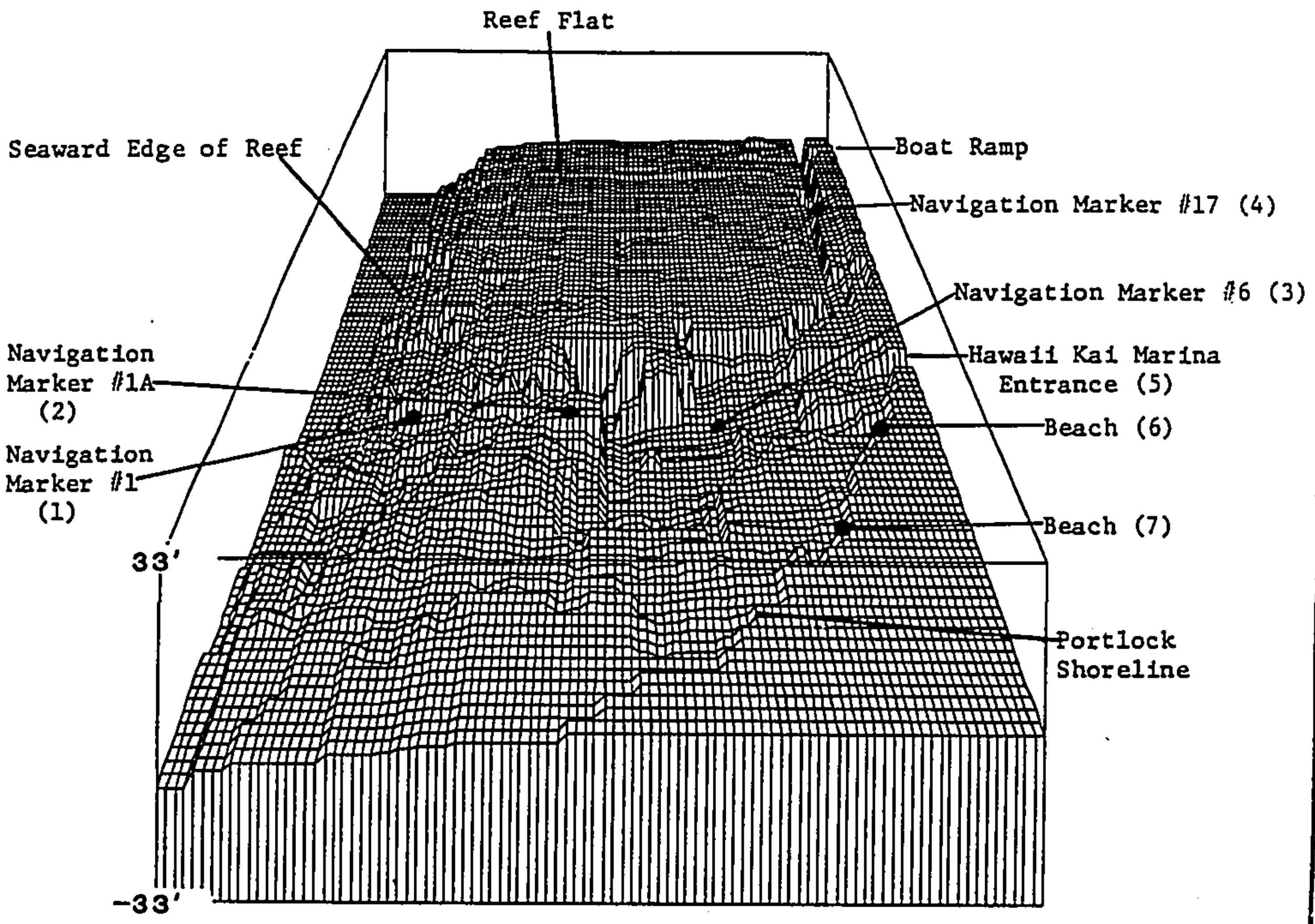


FIGURE 1

THE DEPTH PROFILE OF MAUNALUA BAY WITH THE EXISTING CHANNEL

(Numbers In Parenthesis Refer To Locations For Wave Profile Printouts)

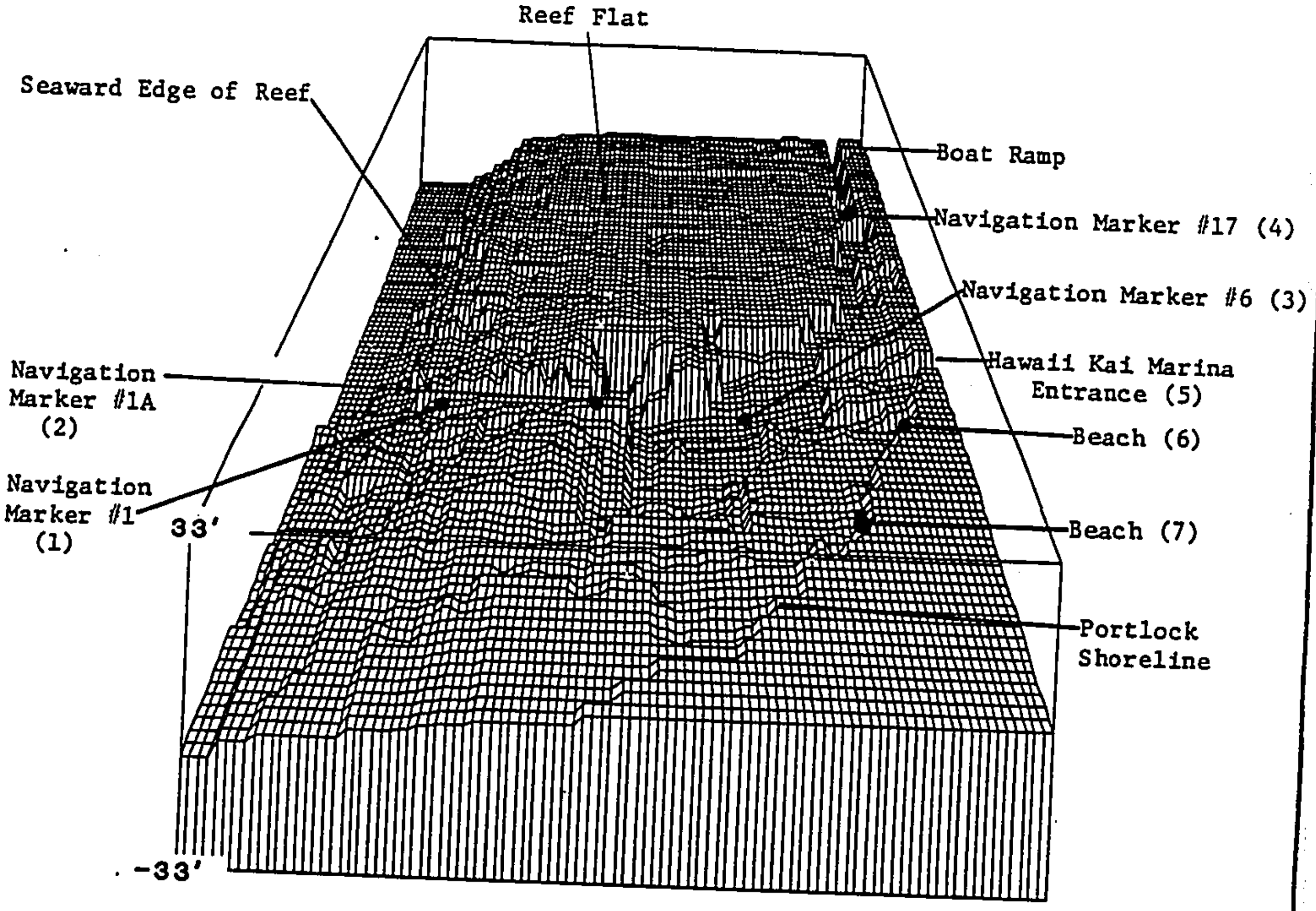


FIGURE 2

THE DEPTH PROFILE OF MAUNALUA BAY WITH THE PROPOSED ENLARGED CHANNEL

(Numbers In Parenthesis Refer To Locations For Wave Profile Printouts)

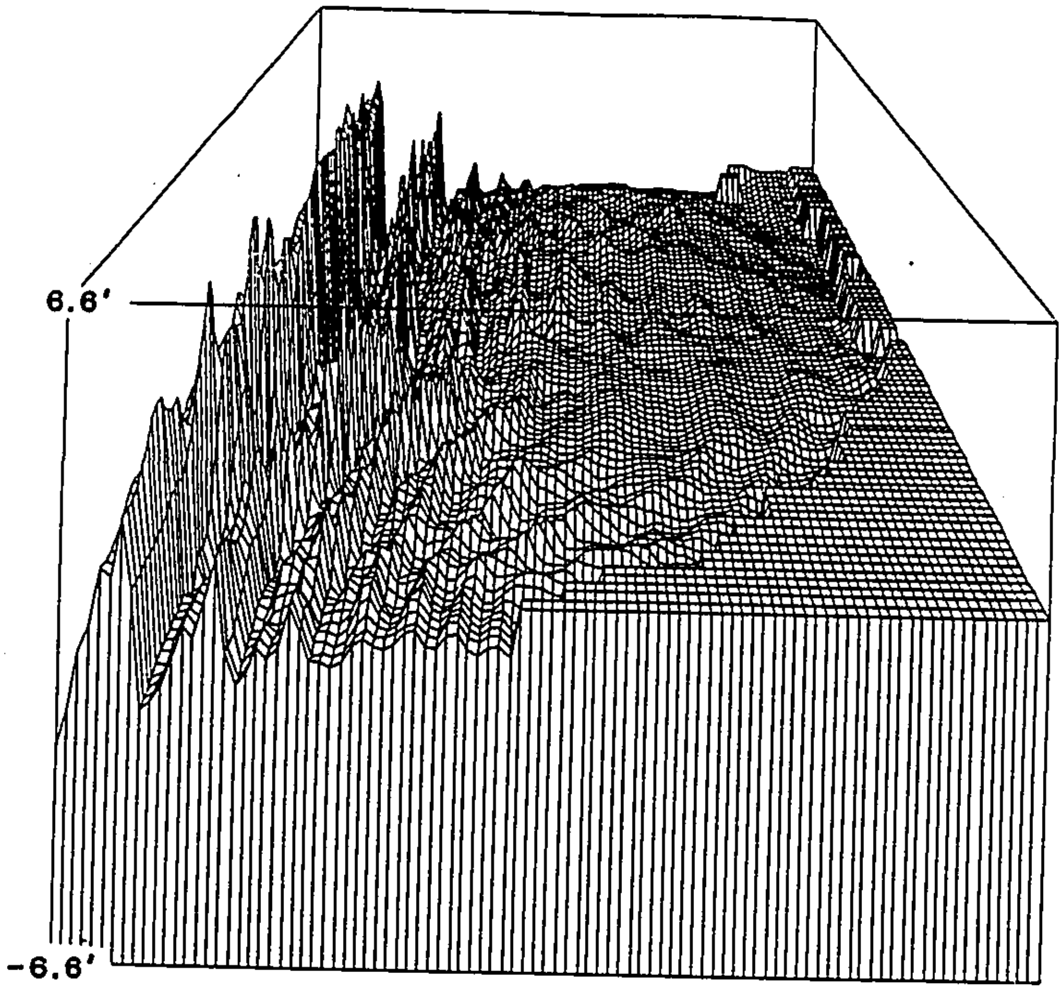


FIGURE 3

WAVE HEIGHT SURFACE

TIME : 401 SEC.

WAVE HT. : 3 FT.

WAVE PERIOD : 30 SEC.

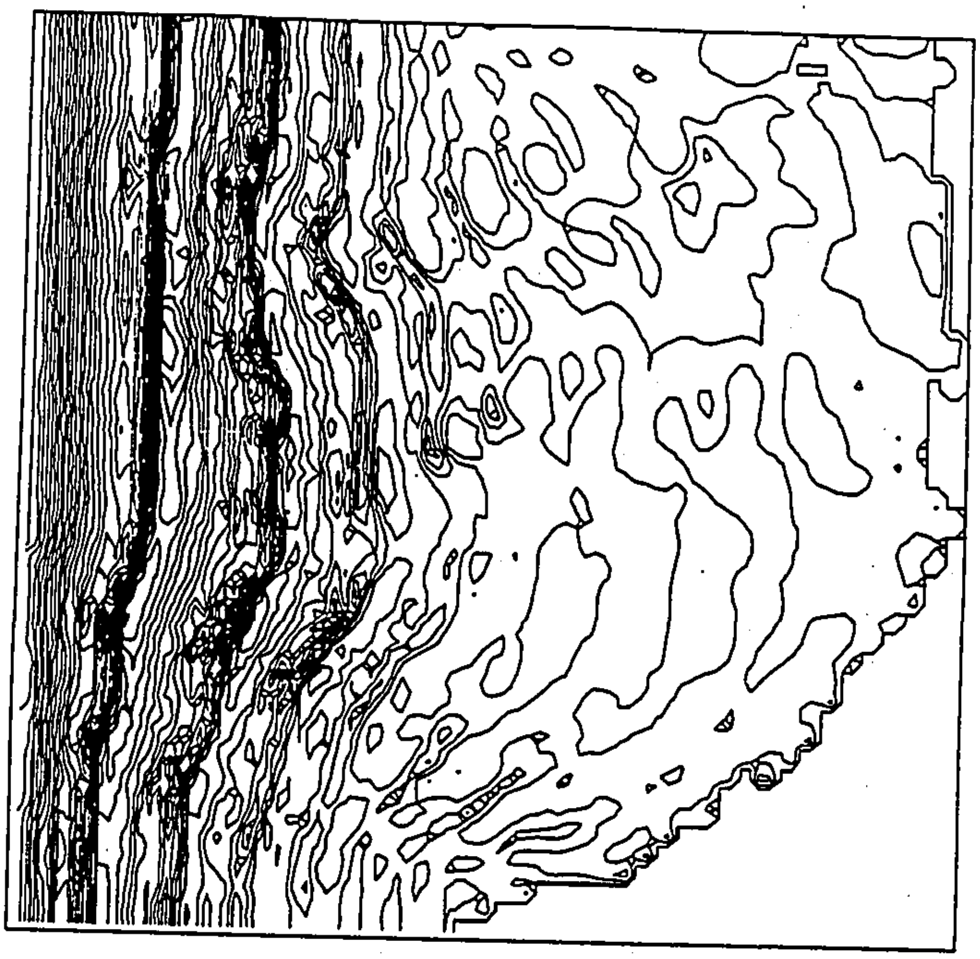


FIGURE 4

WAVE HEIGHT CONTOUR PLOT

TIME : 401 SEC.

WAVE HT. : 3 FT.

WAVE PERIOD : 30 SEC.

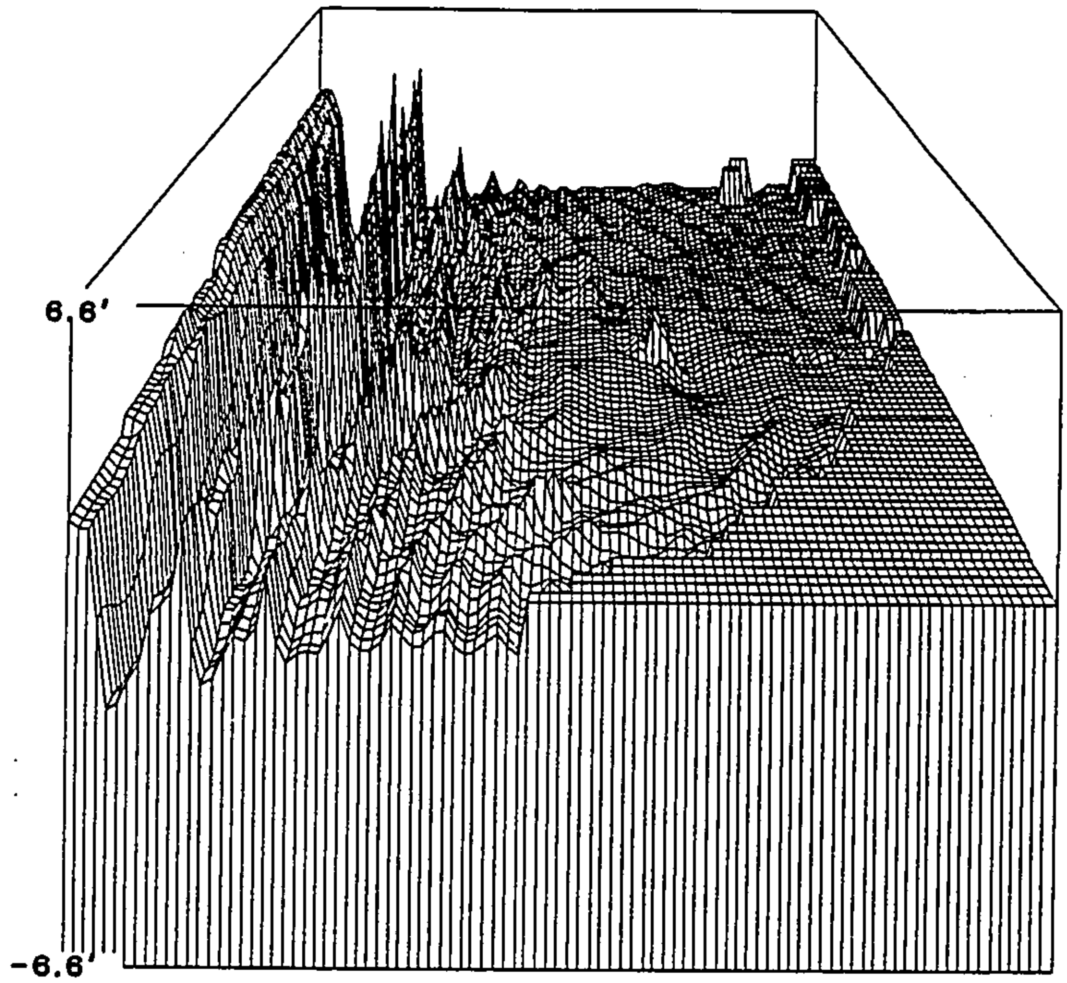


FIGURE 5

WAVE HEIGHT SURFACE PLOT

TIME : 921 SEC.

WAVE HT. : 3 FT.

WAVE PERIOD : 30 SEC.

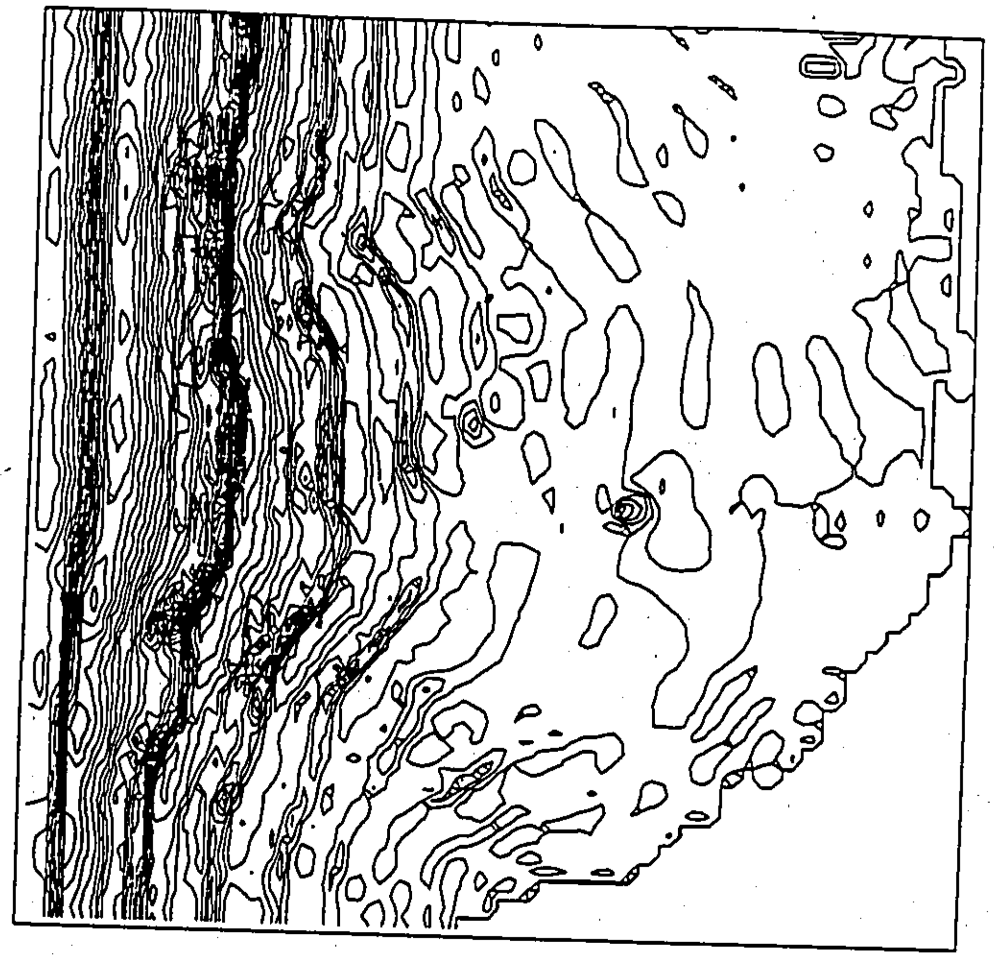


FIGURE 6

WAVE HEIGHT CONTOUR PLOT

TIME : 921 SEC.

WAVE HT. : 3 FT.

WAVE PERIOD : 30 SEC.

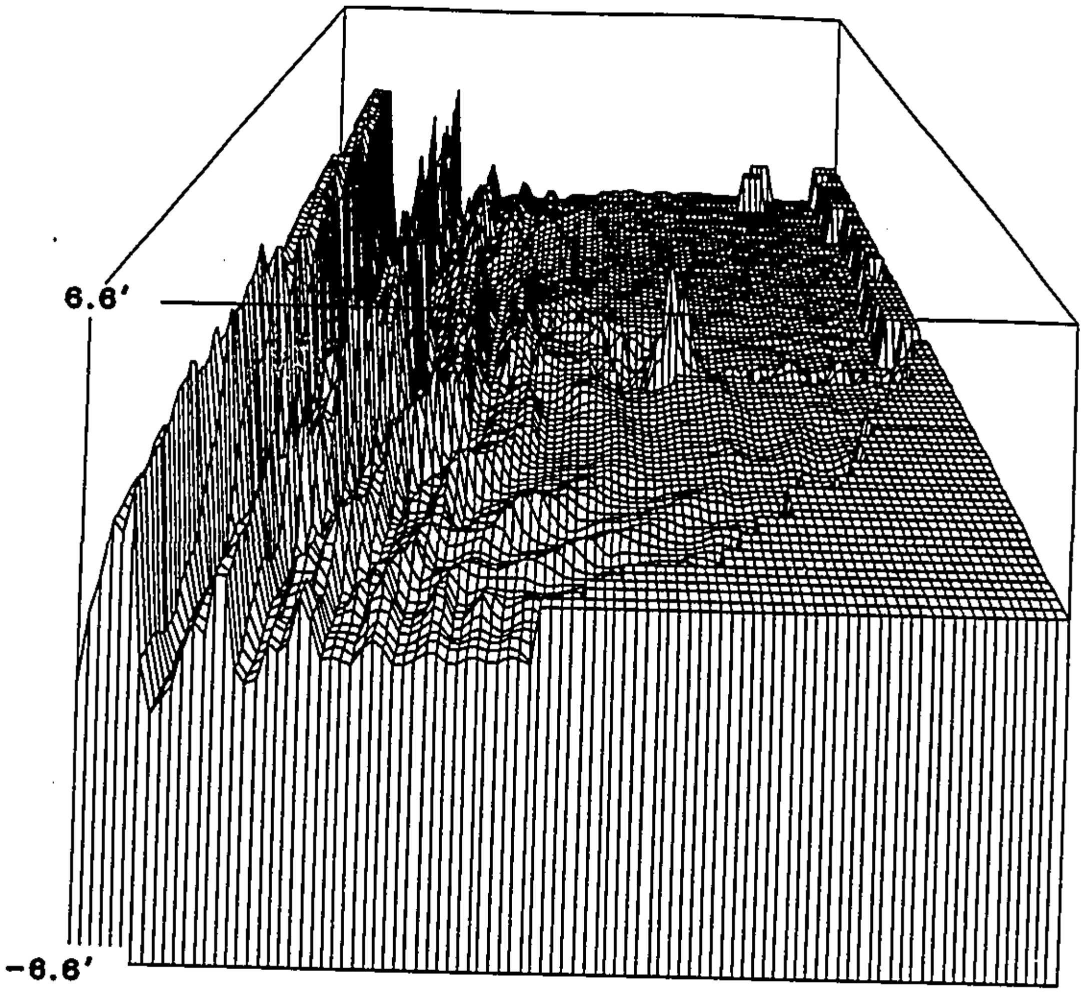


FIGURE 7

WAVE HEIGHT SURFACE PLOT

TIME : 2281 SEC.

WAVE HT. : 3 FT.

WAVE PERIOD :30 SEC.

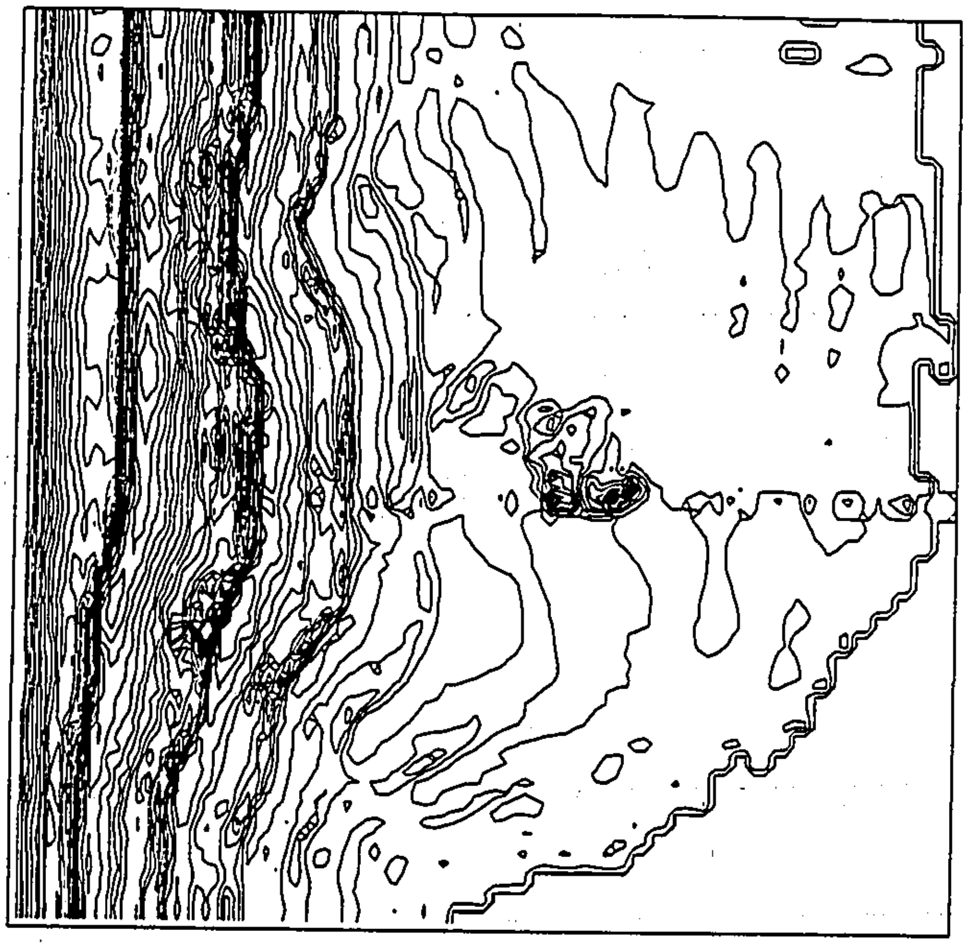


FIGURE 8

WAVE HEIGHT CONTOUR PLOT

TIME : 2281 SEC.

WAVE HT. : 3 FT.

WAVE PERIOD : 30 SEC.

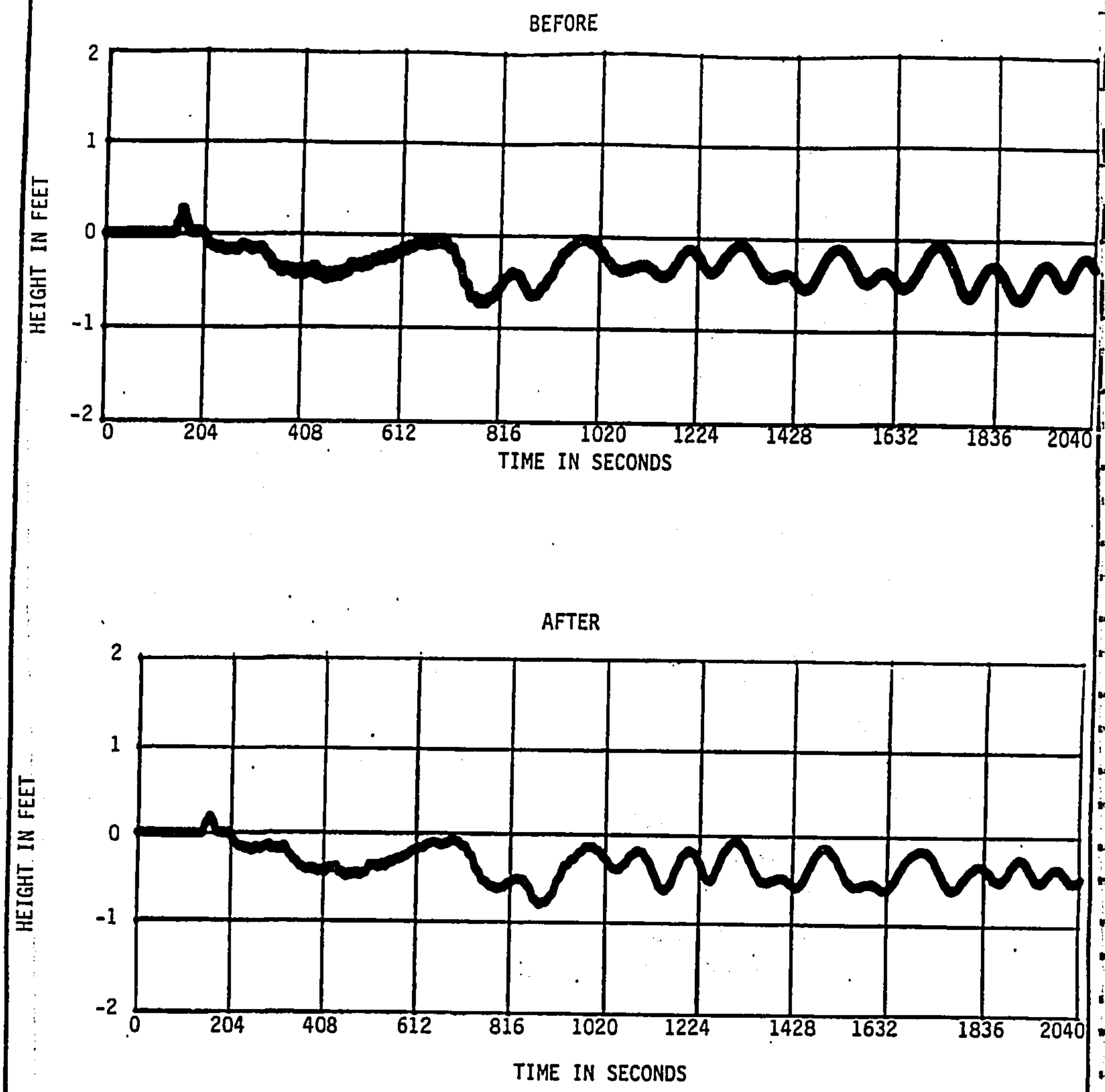
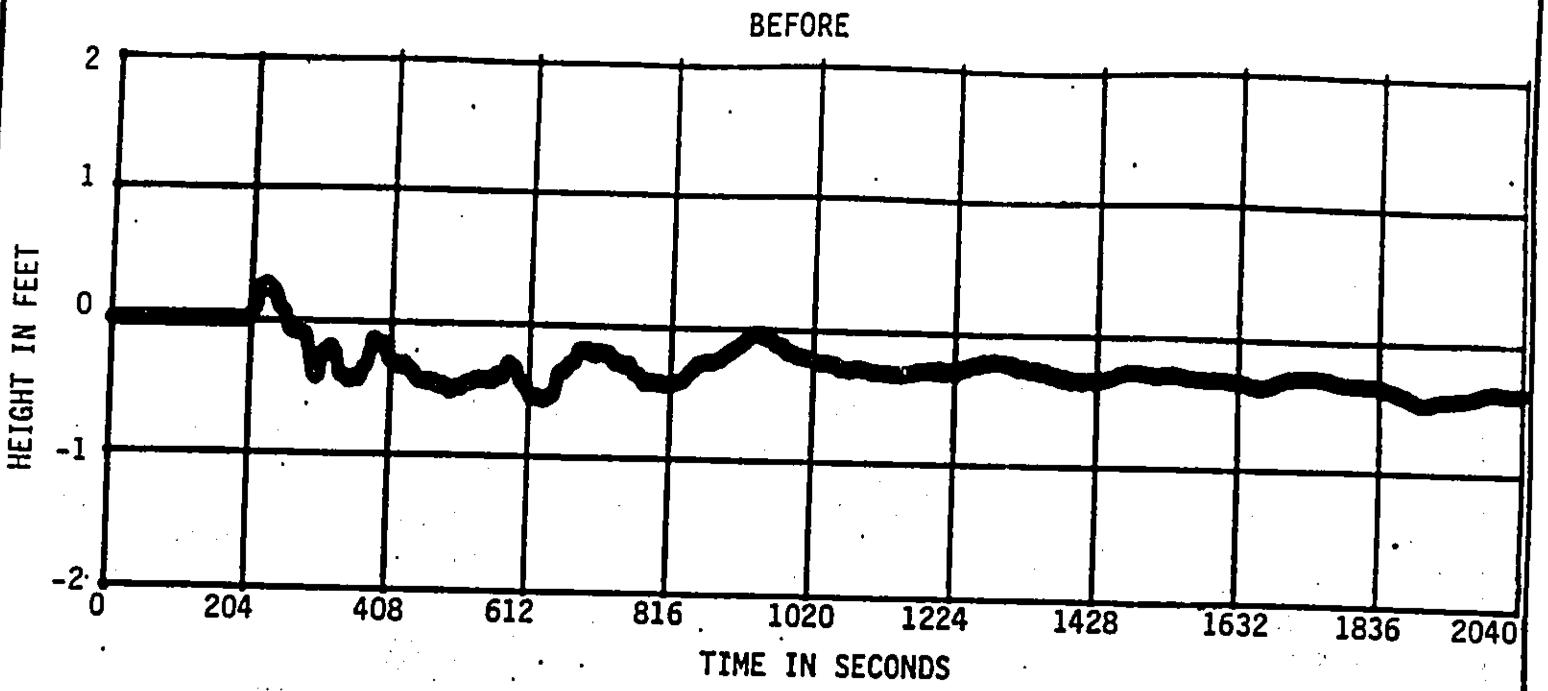


FIGURE 9

WAVE HEIGHT HISTORY AT LOCATION 3 (Navigation Marker 6)

PROPOSED CHANNEL ENLARGEMENT FOR AN INCOMING WAVE

3 FEET HIGH WITH A 15 SECOND PERIOD



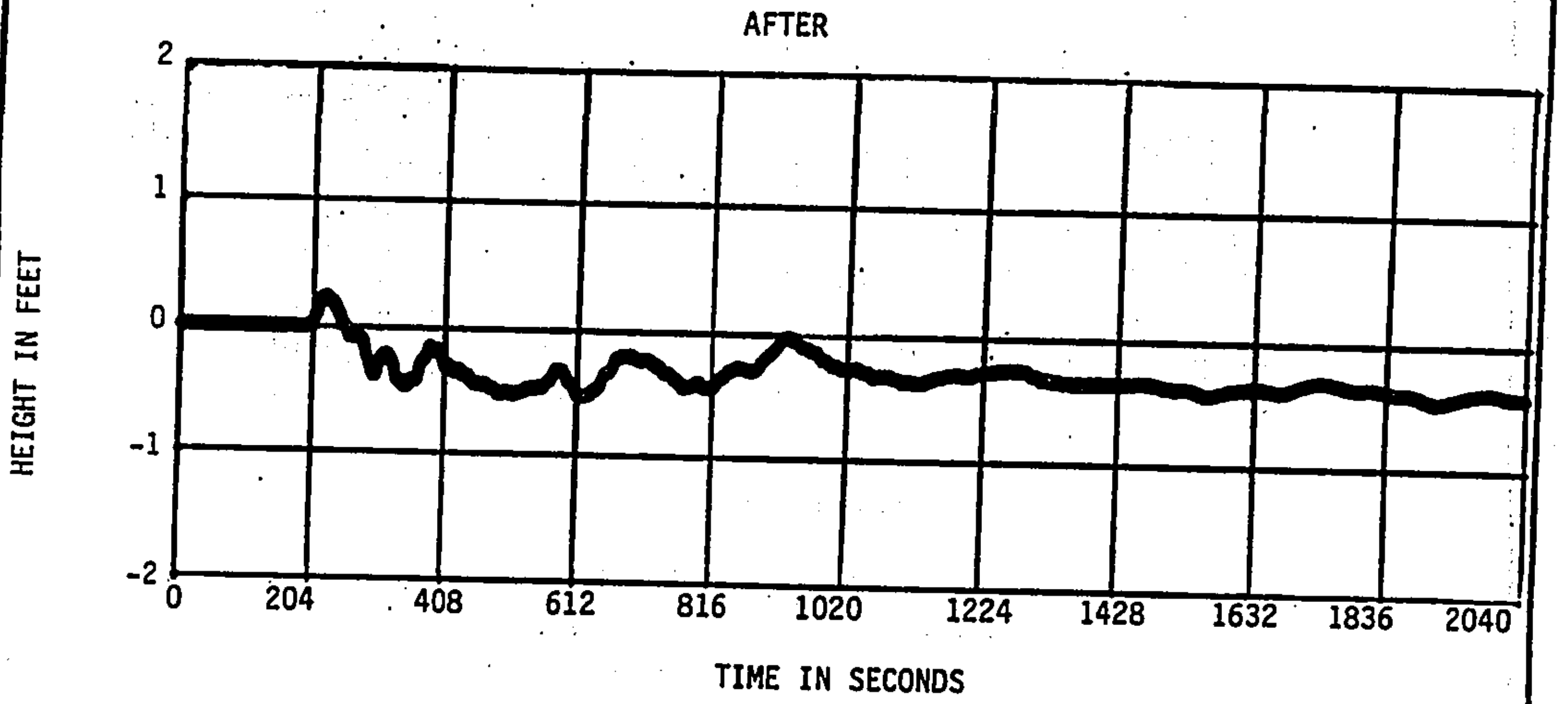


FIGURE 10

WAVE HEIGHT HISTORY AT LOCATION 6 (Portlock Beach)

PROPOSED CHANNEL ENLARGEMENT FOR AN INCOMING WAVE

3 FEET HIGH WITH A 15 SECOND PERIOD

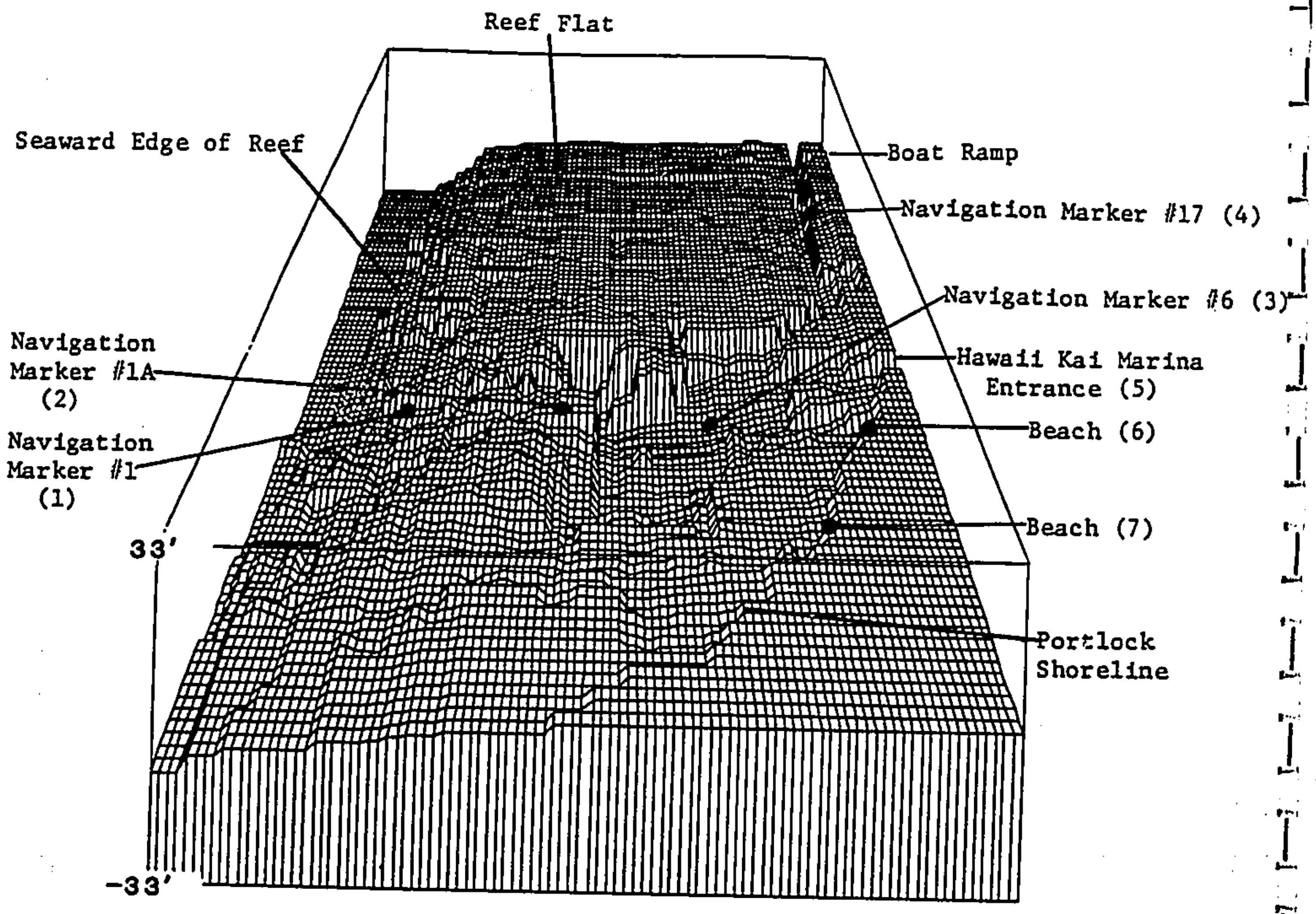


FIGURE 1

THE DEPTH PROFILE OF MAUNALUA BAY WITH THE EXISTING CHANNEL

(Numbers In Parenthesis Refer To Locations For Wave Profile Printouts)

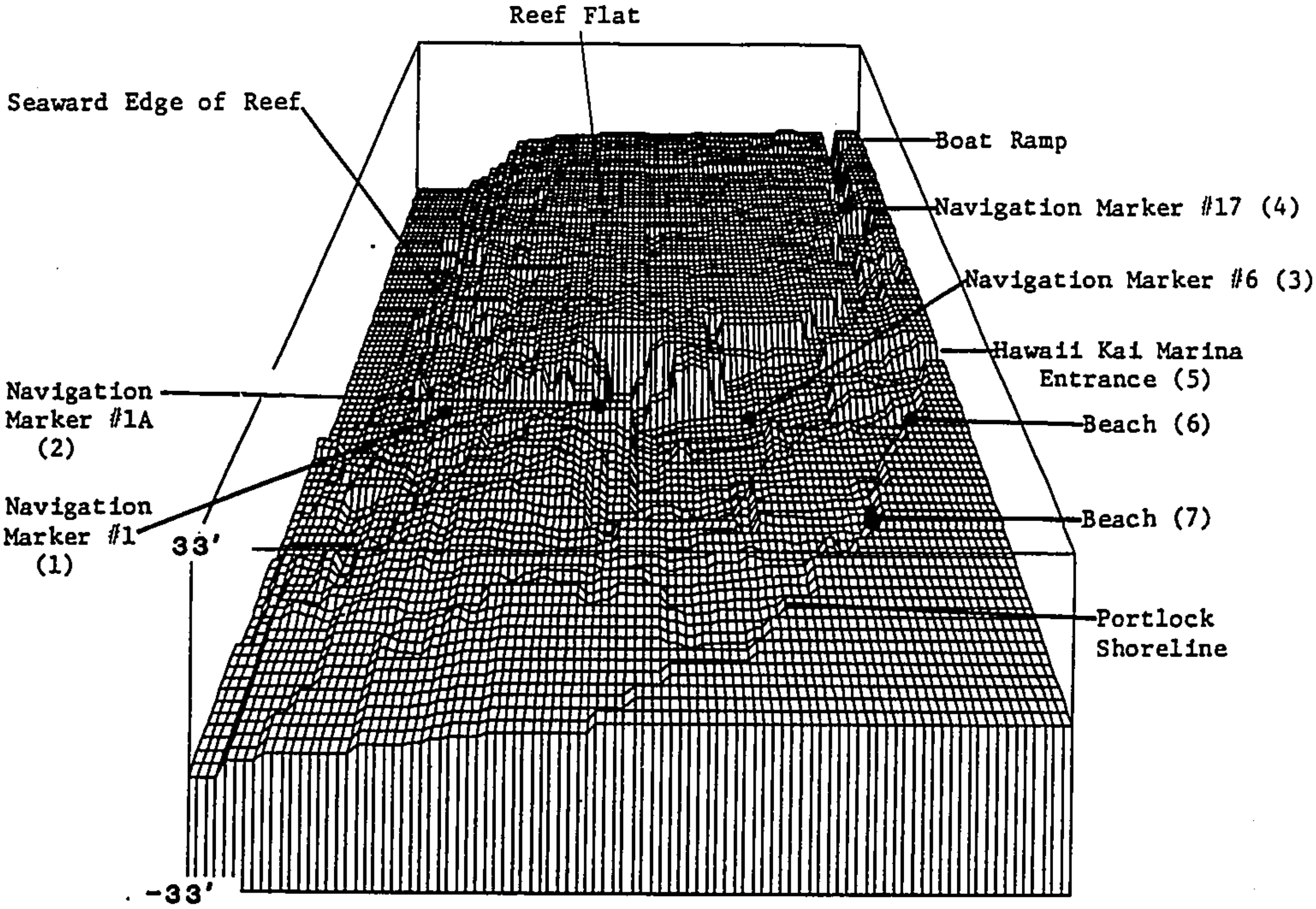


FIGURE 2

THE DEPTH PROFILE OF MAUNALUA BAY WITH THE PROPOSED ENLARGED CHANNEL

(Numbers In Parenthesis Refer To Locations For Wave Profile Printouts)

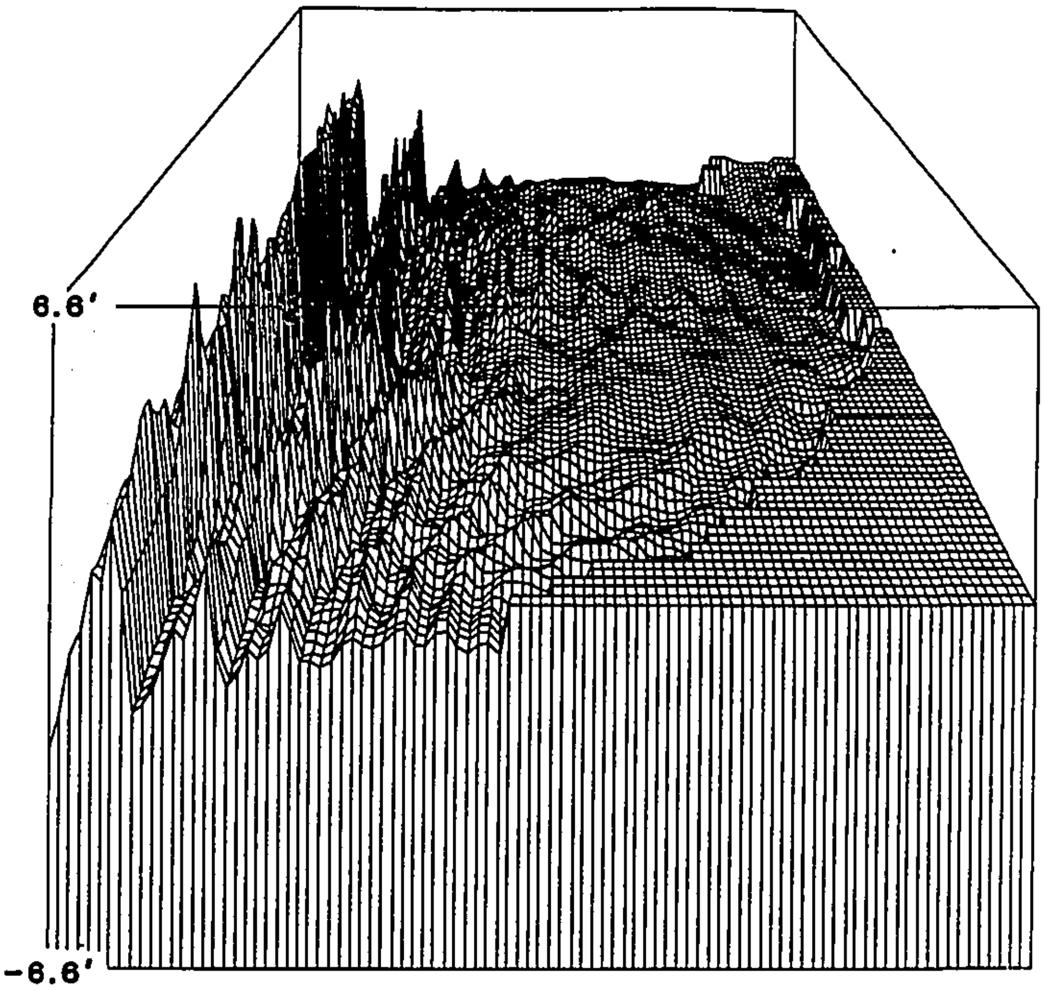


FIGURE 3

WAVE HEIGHT SURFACE

TIME : 401 SEC.

WAVE HT. : 3 FT.

WAVE PERIOD : 30 SEC.

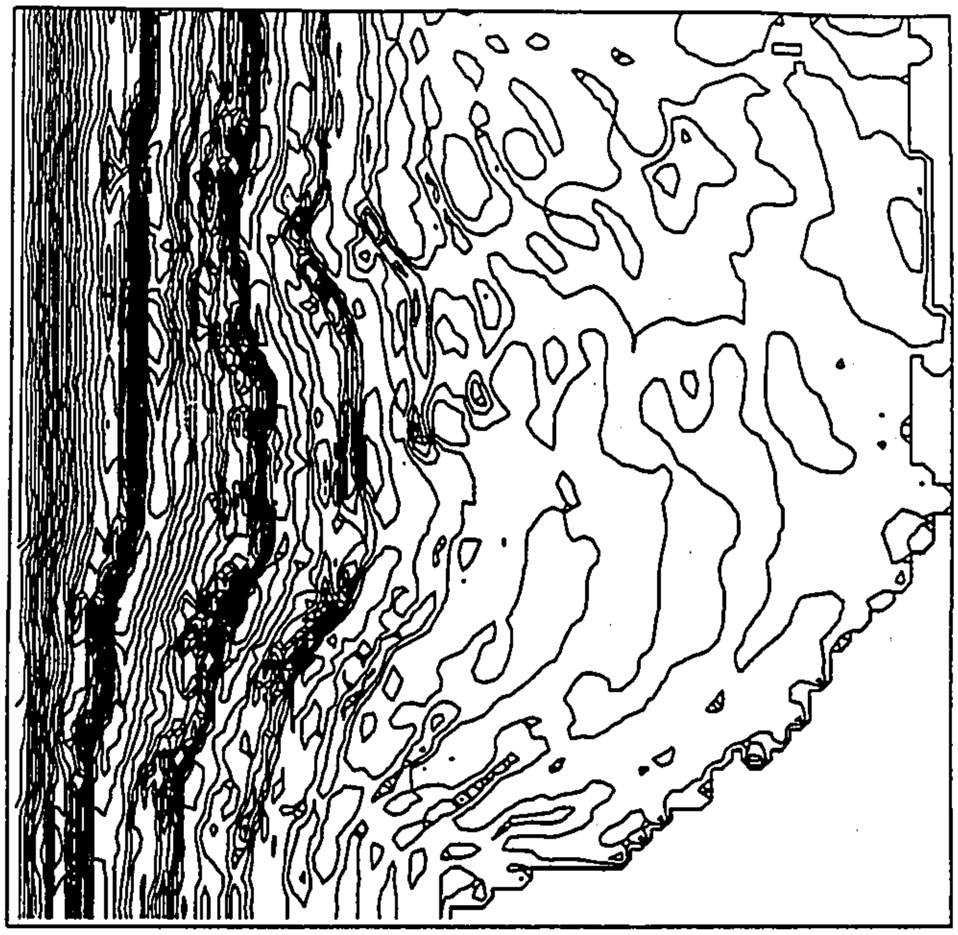


FIGURE 4

WAVE HEIGHT CONTOUR PLOT

TIME : 401 SEC.

WAVE HT. : 3 FT.

WAVE PERIOD : 30 SEC.

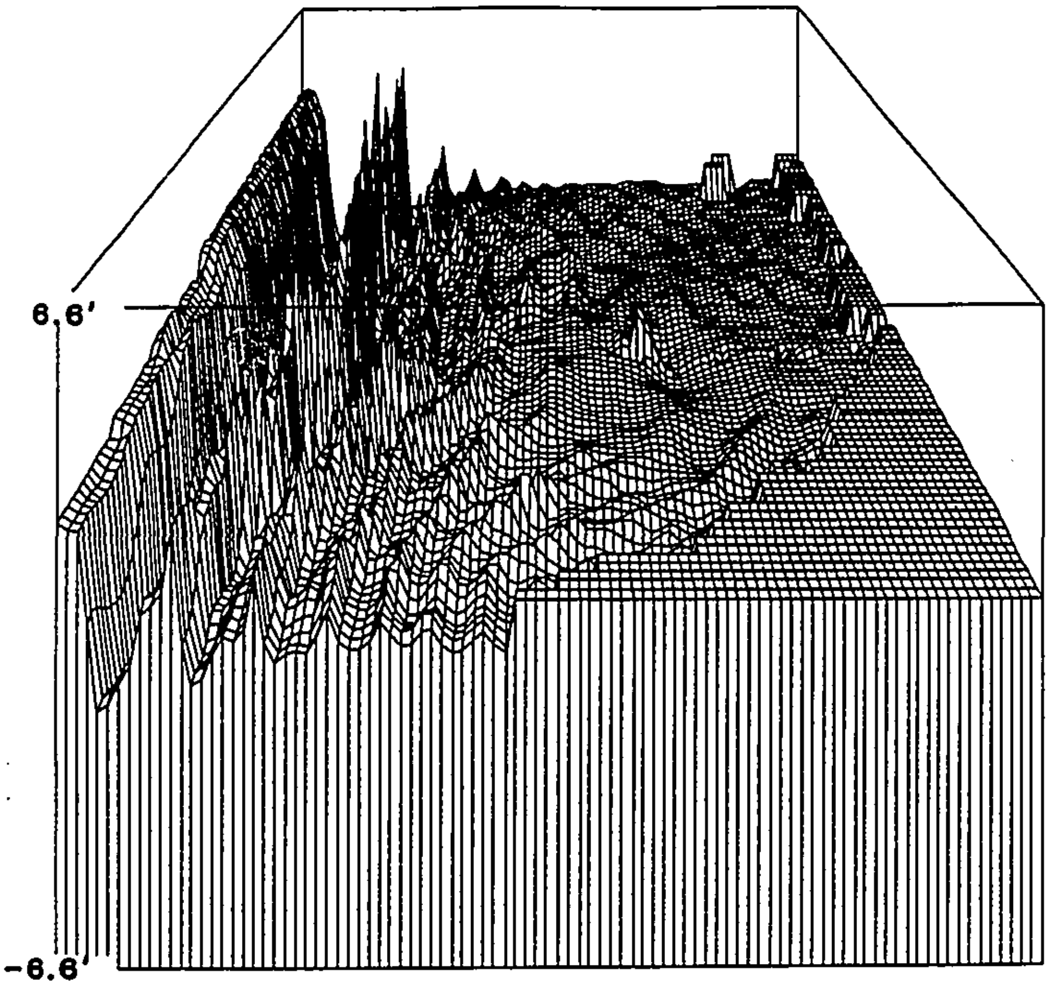


FIGURE 5

WAVE HEIGHT SURFACE PLOT

TIME : 921 SEC.

WAVE HT. : 3 FT.

WAVE PERIOD : 30 SEC.

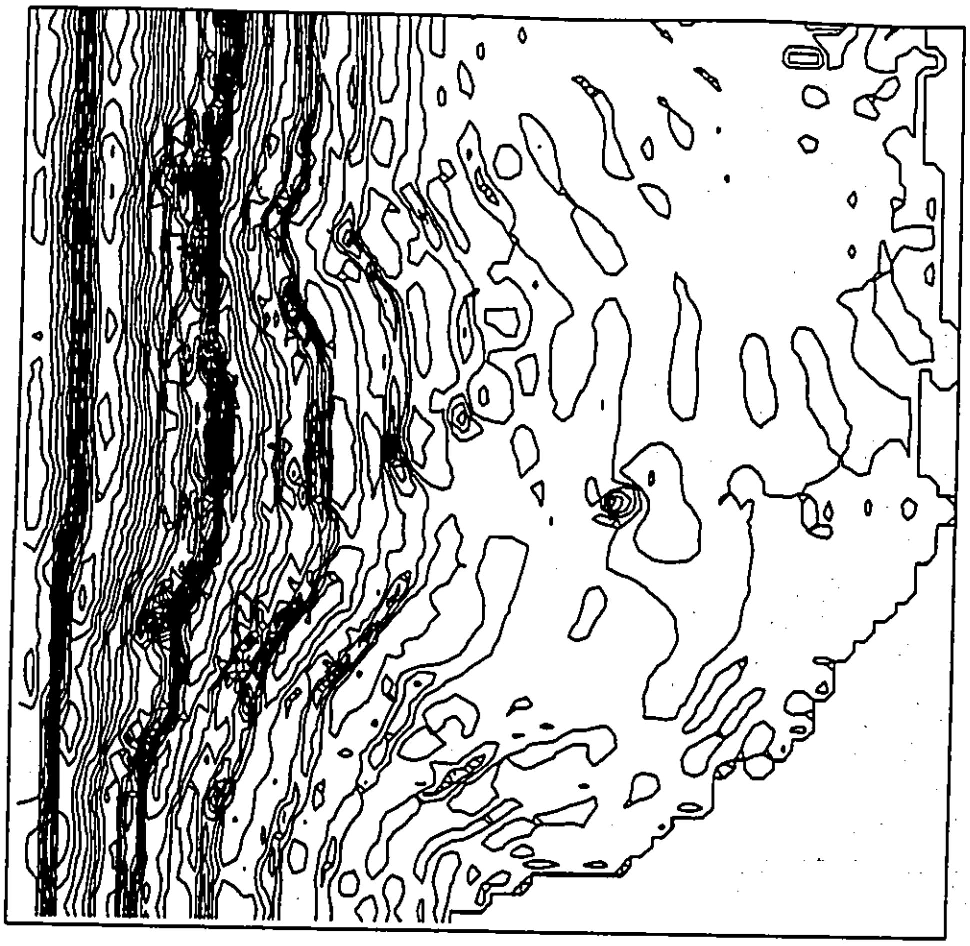


FIGURE 6

WAVE HEIGHT CONTOUR PLOT

TIME : 921 SEC.

WAVE HT. : 3 FT.

WAVE PERIOD : 30 SEC.

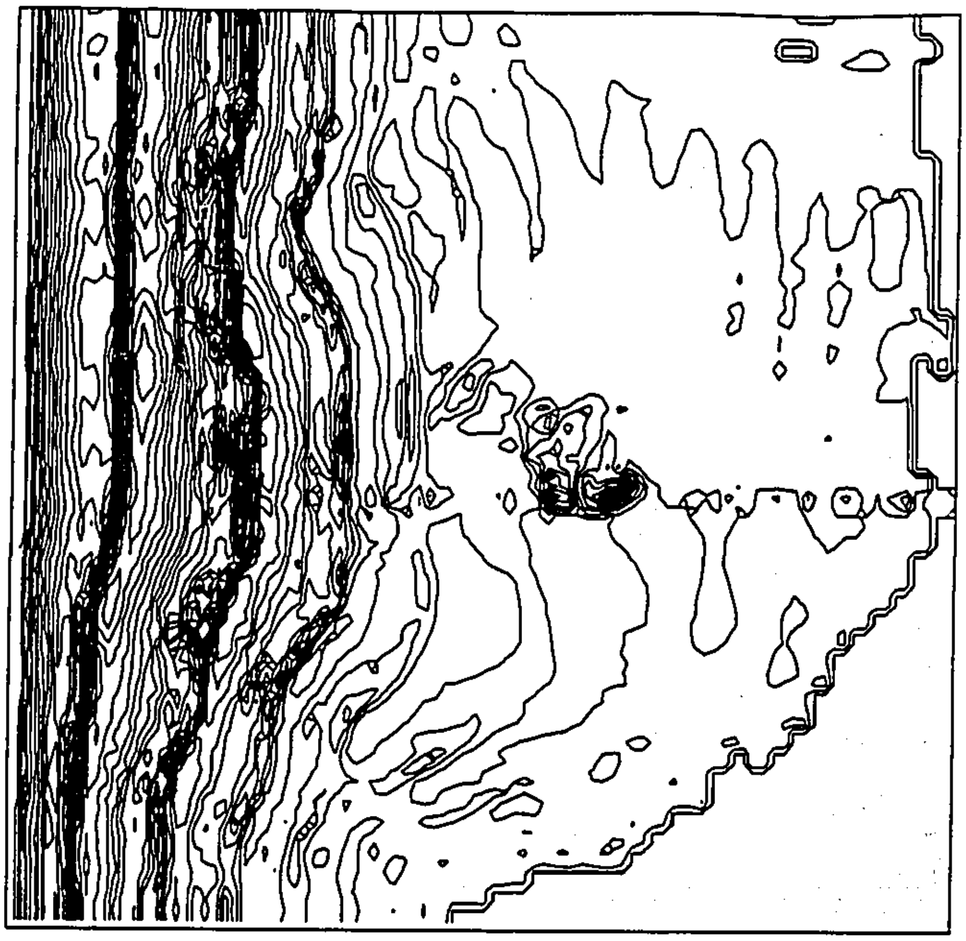


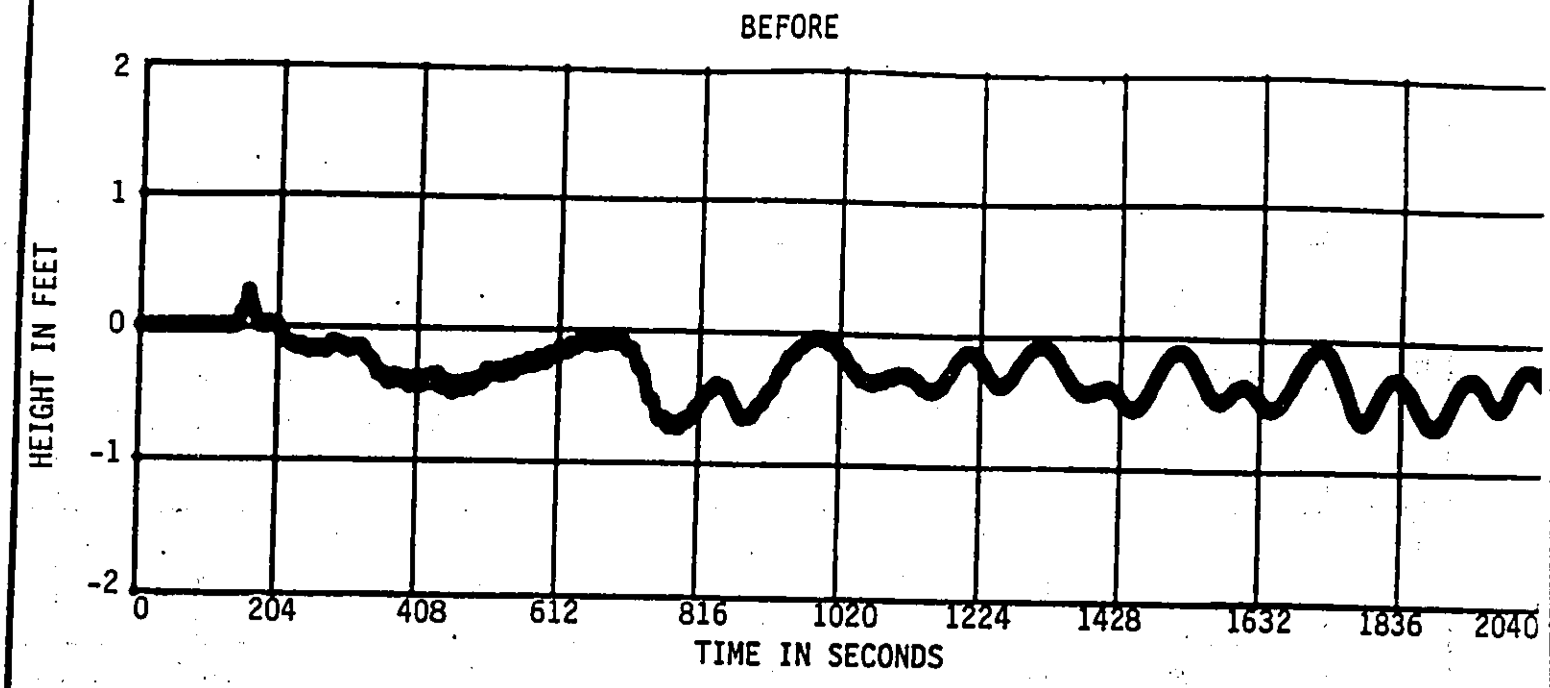
FIGURE 8

WAVE HEIGHT CONTOUR PLOT

TIME : 2281 SEC.

WAVE HT. : 3 FT.

WAVE PERIOD : 30 SEC.



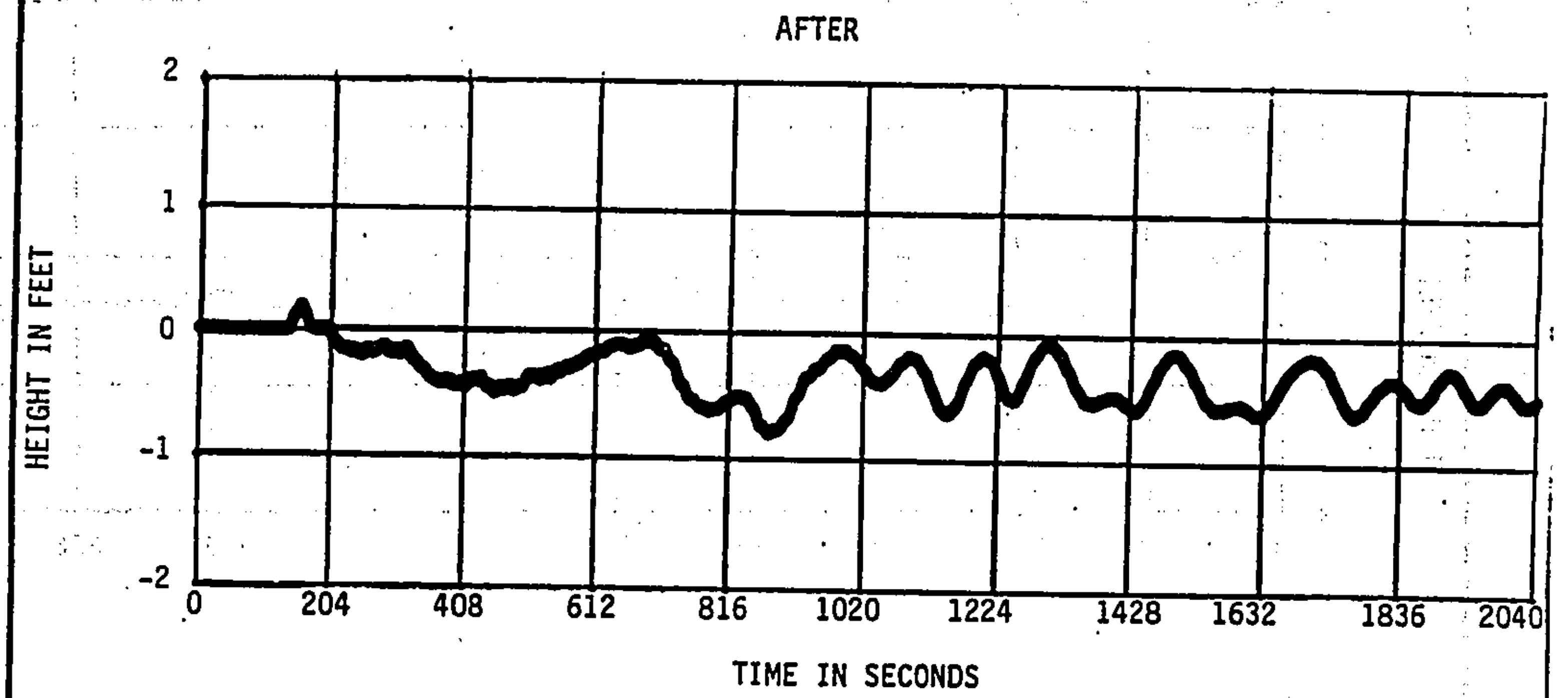


FIGURE 9

WAVE HEIGHT HISTORY AT LOCATION 3 (Navigation Marker 6)

PROPOSED CHANNEL ENLARGEMENT FOR AN INCOMING WAVE

3 FEET HIGH WITH A 15 SECOND PERIOD

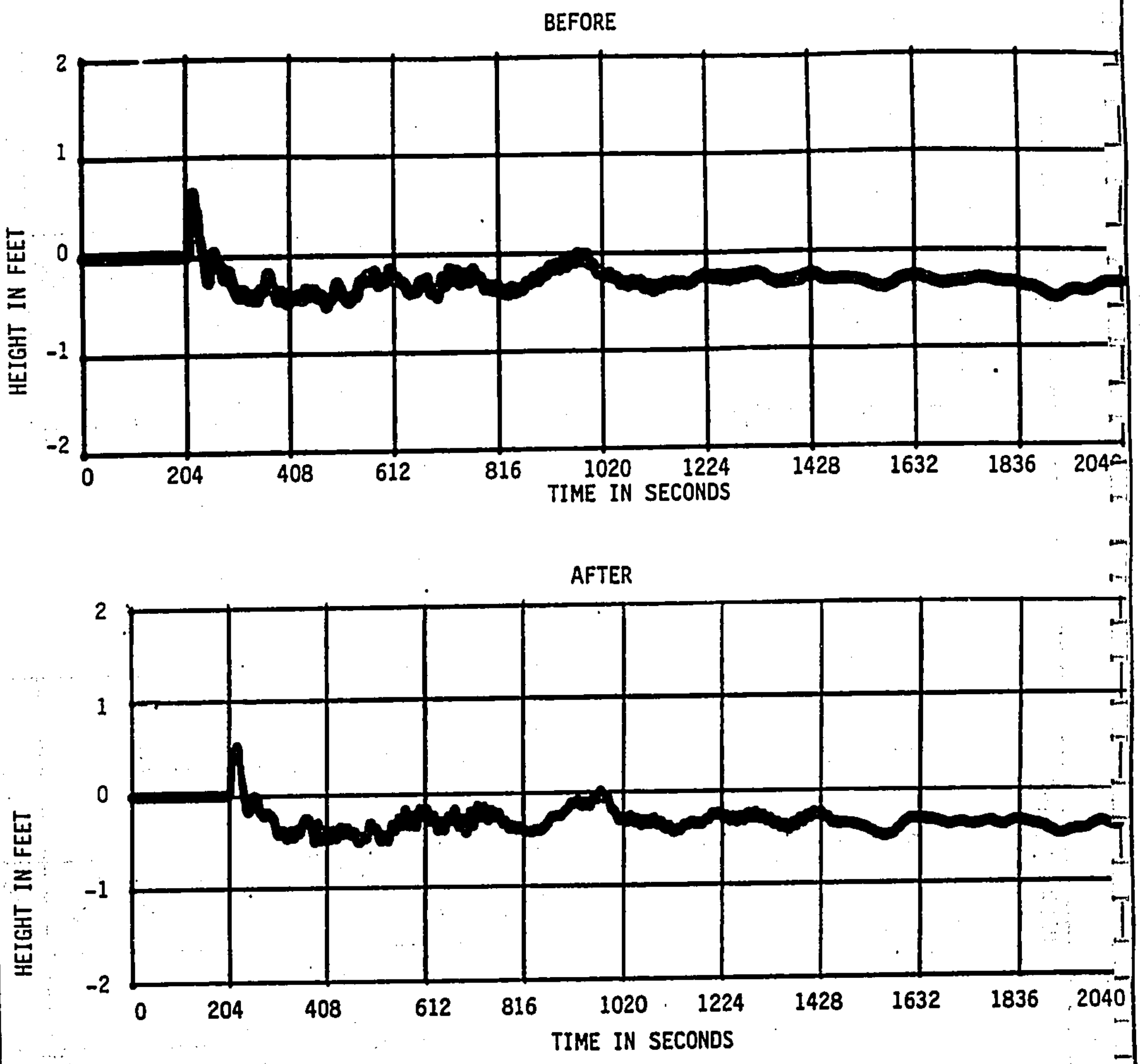


FIGURE 11

WAVE HEIGHT HISTORY AT LOCATION 7 (Portlock Beach)

PROPOSED CHANNEL ENLARGEMENT FOR AN INCOMING WAVE

3 FEET HIGH WITH A 15 SECOND PERIOD

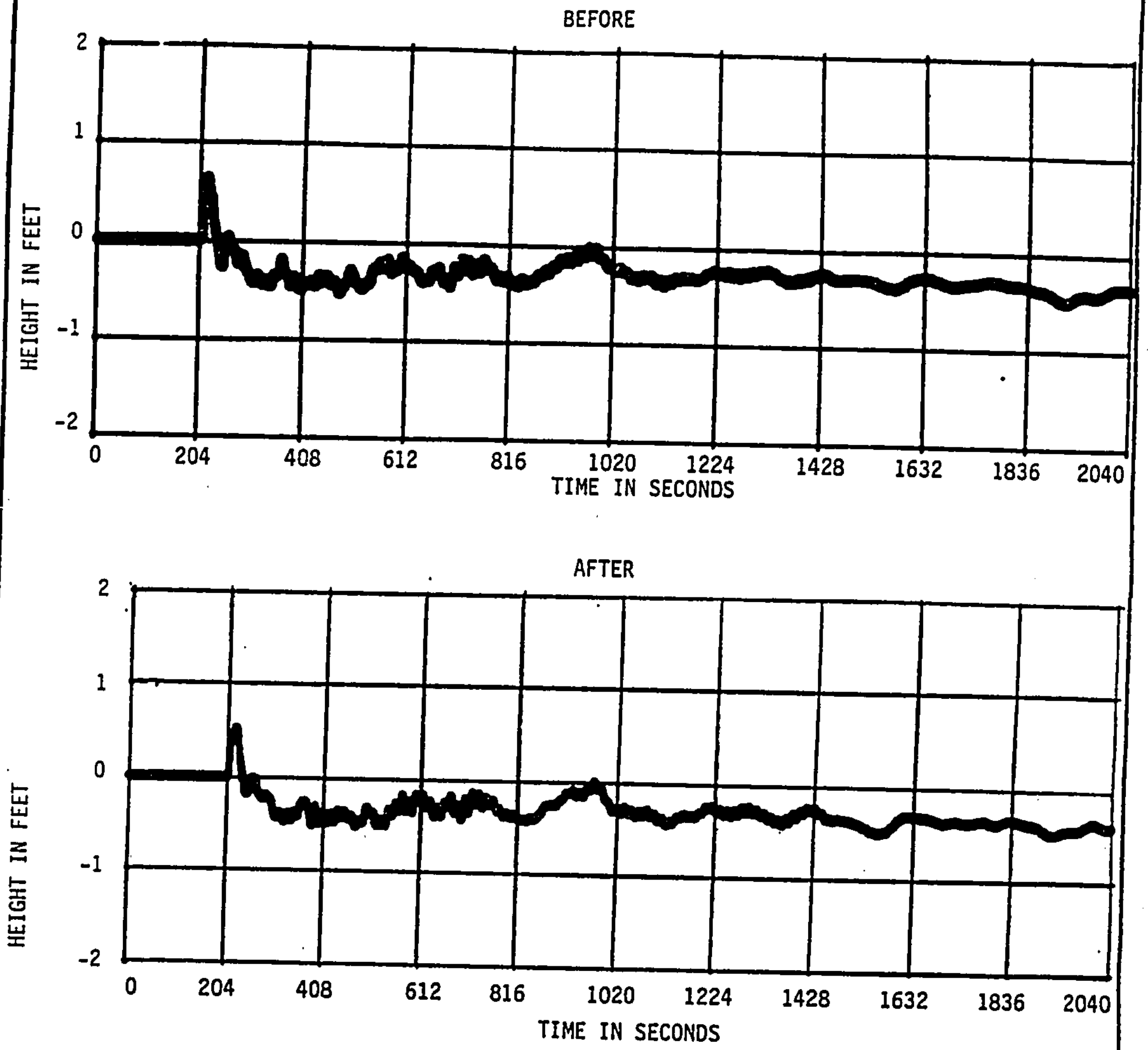


FIGURE 11

WAVE HEIGHT HISTORY AT LOCATION 7 (Portlock Beach)

PROPOSED CHANNEL ENLARGEMENT FOR AN INCOMING WAVE

3 FEET HIGH WITH A 15 SECOND PERIOD

APPENDIX H

MAUNALUA BAY FERRY TERMINAL
TRAFFIC IMPACT ASSESSMENT FOR
INTERSECTION OF KALANIANAOLE HIGHWAY AND KEAHOLE STREET

MAUNALUA BAY FERRY TERMINAL
TRAFFIC IMPACT ASSESSMENT FOR
INTERSECTION OF KALANIANAOLE HIGHWAY AND KEAHOLE STREET

Kalanianaole Highway is a principal arterial, a State highway linking Kailua to Honolulu via Makapuu Point. Keahole Street is a four-lane primary accessway to Hawaii Kai from Kalanianaole Highway. A channelized left-turn storage lane and separate left turn signalization is available for westbound traffic on Kalanianaole Highway to turn into the park and boat launching area where the ferry terminal will be sited. This left turn movement is currently restricted from 5:00 to 8:30 AM, except on Saturdays, Sundays and holidays.

To determine the nature of traffic related impacts of the proposed project, the signalized intersection of Kalanianaole Highway and Keahole Street was qualitatively assessed for potential traffic congestion and hazards. The assessment is based on a prior study prepared for Kaiser Development Company entitled Hawaii Kai Transportation Management Study and Hawaii Kai Transportation Management Study Intersection Analysis Worksheets (prepared by Wilbur Smith and Associates September 3, 1985). The study identified future travel needs within the Hawaii Kai community and along the Kalanianaole Highway corridor between Hawaii Kai and Interstate Route H-1. Increased travel anticipated from additional residential and commercial development within Hawaii Kai, other new developments identified in the East Honolulu area, and increased tourist/recreational travel along Kalanianaole Highway was reflected in this study which assessed traffic conditions in the year 1994. The study recommended implementation of a transportation program including ridesharing measures to encourage increased use of buses, vanpools and carpools, and roadway modifications to provide sufficient capacity at traffic bottlenecks.

At the Kalanianaole Highway/Keahole Street intersection, the Hawaii Kai Transportation Management Study projected that by 1994, left-turn movement from Kalanianaole Highway to Keahole Street could exceed intersection capacity during the evening peak hour of traffic if no mitigation measures were implemented. To alleviate this condition, the study recommended the addition of a second left turn lane along Kalanianaole Highway for eastbound traffic turning onto Keahole Street. Development of this second left turn lane is presently proceeding. Operation of the intersection during the 1994 morning peak hour of traffic is not anticipated to exceed capacity. Based on these findings, operation of the intersection is not anticipated to exceed capacity in the year 1994, exclusive of ferry terminal development.

The Hawaii Kai Transportation Management Study did not specifically consider development of the ferry terminal which is projected to be operational in 1989. Based on the study, however, a traffic assessment assuming the operation of the ferry terminal anticipates that it will not increase traffic to a level which would exceed the capacity of the Kalanianaole Highway/Keahole Street intersection. The primary anticipated traffic impact of the project will be a redistribution of traffic at the intersection. The ferry terminal is not anticipated to generate a significant volume of "new" traffic inasmuch as ferry users during the peak hour are assumed to consist primarily of commuters who would otherwise enter the subject intersection to travel along Kalanianaole Highway if the project were not developed.

Among ferry users whose associated traffic pattern would be redistributed without the likelihood of exceeding intersection capacity are residents of Hawaii Kai, Kalama Valley and Portlock, both east and south of the ferry terminal area, who normally commute along Kalanianaole Highway through the Keahole Street intersection, and residents who live in the Hawaii Kai area north of the intersection who normally commute along Keahole Street and Kalanianaole Highway. Instead of continuing along their normal route, ferry users would be diverted to the ferry terminal. Drivers who would drop-off these ferry users are assumed to return to residences or visit commercial establishments in Hawaii Kai and are likely to travel in traffic lanes opposing the flow of peak traffic, i.e., eastbound along Kalanianaole Highway and northbound along Keahole Street during the morning peak hour. Thus, they would not contribute significantly to the primary flow of traffic. The anticipated redistribution of traffic associated with ferry users who reside south, east and north of the intersection of Kalanianaole Highway and Keahole Street is shown in Table 1.

Ferry users whose associated traffic may increase projected traffic volumes are residents of Kuliouou and Niu Valley or other areas west of the subject intersection who would not normally use the Kalanianaole Highway/Keahole Street intersection. These ferry users would generate additional traffic along Kalanianaole Highway at the intersection, however, their traffic pattern would be opposite the primary flow of morning and afternoon traffic and, therefore, should not contribute significantly to the primary flow. If these ferry users are dropped off at the ferry terminal, traffic would probably be added to the primary traffic flow direction along Kalanianaole Highway as drivers return to residences. This additional traffic is not anticipated to be of a volume which would result in a major adverse impact at the intersection of Kalanianaole Highway and Keahole Street.

Adverse traffic impacts along Kalanianaole Highway are not anticipated as a result of development of the proposed project. Assuming operation of the ferry system at capacity during the morning and evening peak traffic hours, a reduction in traffic along Kalanianaole Highway may be anticipated. While additional traffic would be generated by residents who live west of the ferry terminal, the reduction in traffic associated with residents who live north, east and south of the ferry terminal is anticipated to exceed generated traffic and result in a net decrease in traffic along Kalanianaole Highway. It is also noted that drivers returning to residences in the Kuliouou and Niu Valley areas west of the ferry terminal are anticipated to travel only a short distance along Kalanianaole Highway to return to these residences.

The State of Hawaii, Department of Transportation, Highways Division is planning the addition of two traffic lanes along Kalanianaole Highway for

TABLE 1

ANTICIPATED REDISTRIBUTION OF TRAFFIC AT THE INTERSECTION OF KALANIANAOLE HIGHWAY AND KEAHOLE STREET

MORNING PEAK TRAFFIC HOUR

Traffic Movement Without Project	Traffic Movement With Project
Right Turn from Keahole Street to Kalanianaole Highway	Southbound Through at Keahole Street to Ferry Terminal
Westbound Through Along Kalanianaole Highway	Left Turn from Kalanianaole Highway to Ferry Terminal

EVENING PEAK TRAFFIC HOUR

Traffic Movement Without Project	Traffic Movement With Project
Left Turn from Kalanianaole Highway to Keahole Street	Northbound Through at Keahole Street from Ferry Terminal
Eastbound Through Along Kalanianaole Highway	Right Turn from Ferry Terminal To Kalanianaole Highway

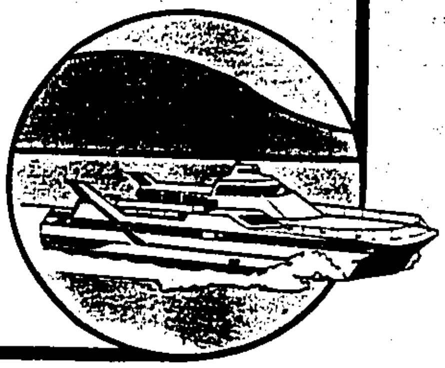
high occupancy vehicles (HOV) in the roadway median between the Interstate Route H-1 freeway and Hawaii Kai. These improvements would extend east past the intersection of Kalanianaole Highway and Keahole Street. Construction of improvements in the vicinity of the subject intersection is planned to begin in 1991. It is noted that traffic congestion may be anticipated during construction of these improvements in the vicinity of the subject intersection. Upon completion of construction, however, operation of the intersection can be anticipated to improve.

To assure that traffic flow is facilitated and to minimize potential hazard at the Kalanianaole Highway/Keahole Street intersection, the following measures should be considered:

- Remove restriction on left turn movement from Kalanianaole Highway into the site.
- Provide left turn signalization for traffic proceeding from the site onto Kalanianaole Highway.
- Modify signing and striping along Kalanianaole Highway and Keahole Street.
- Adjust traffic signal indication timing.

Part II

Downtown Terminal



PREFACE

The Department of Transportation (DOT), State of Hawaii is proposing to establish an intraisland ferry system serving the southern coastline of Oahu. Seven terminals are planned from Hawaii Kai to Barbers Point:

- Hawaii Kai in the vicinity of Maunalua Bay Beach Park;
- Downtown at Pier 8 of Honolulu Harbor, with a ferry maintenance facility at Piers 13 and 14;
- Waikiki, in the vicinity of the Ala Wai Boat Harbor and the Hilton Pier;
- Keehi Lagoon, at the South Ramp of Honolulu International Airport;
- Waipahu, at the head of Middle Loch of Pearl Harbor;
- Ewa, at the proposed Ewa Marina Development; and,
- Barbers Point, at the Barbers Point Deep Draft Harbor.

This environmental impact statement is prepared pursuant to Section 343-5, Hawaii Revised Statutes, defining actions subject to environmental impact statement requirements. Specifically, various components of the project will involve the use of State funds and State-owned land, the State Conservation District and shoreline area as defined by Section 205-31, Hawaii Revised Statutes.

In compliance with Section 11-200-7 (Administrative Rules, Department of Health (DOH)), the proposed intraisland ferry system is herein assessed as a phased agency action treated as a single action. Inasmuch as siting and designing of facilities for the various individual ferry terminals are proceeding incrementally, this EIS is comprised of seven parts, one for each of the seven planned terminals, and based on the current information available for each.

Commensurate with information currently available, each part complies with the content requirement of Section 11-200-17 (Administrative Rules, DOH). Terminals for which site selection and design have been completed are assessed in greater detail. As the remaining terminals are sited and designed, supplemental environmental assessments or, if deemed necessary, supplemental environmental impact statements shall be prepared for the individual ferry terminals.

TABLE OF CONTENTS

SUMMARY SHEET

DOWNTOWN FERRY TERMINAL AT PIER 8 OF HONOLULU HARBOR

Project Description: The State Department of Transportation, Harbors Division proposes to develop a ferry terminal at Pier 8 and a ferry maintenance facility at Piers 13 and 14 in Honolulu Harbor. The improvements at Pier 8 will primarily be interior renovations to accommodate passenger handling facilities at a site which has previously accommodated such facilities. Improvements at Piers 13 and 14 have yet to be determined but will be consistent with the maritime use of the harbor.

Potential Impacts: Potential impacts of the development will be negligible.

Alternatives Considered: Alternative pier locations for the ferry terminal and maintenance area in Honolulu Harbor were considered by the DOT, however, the proposed sites proved most advantageous from the perspective of harbor administration and proximity to Downtown employment centers.

Unresolved Issues: None.

Compatibility with Plans and Policies: The Oahu Intraisland Ferry System is compatible with the Hawaii State Plan, the State Transportation Functional Plan, and the City and County of Honolulu General Plan. The ferry terminal and maintenance facilities are compatible uses with respect to the State Land Use District. The terminal will require designation as a "public facility" on the City and County of Honolulu Development Plan Land Use Map and a Conditional Use Permit under City zoning.

Required Permits and Approvals: Permits other than the Conditional Use Permit will only be required if improvements extend into the water, in which case these may include the Department of Army permit, with certification by the Hawaii Coastal Zone Management Program and 401 Water Quality Program, and the State Permit for Work in Shores and Shorewaters.

PROPOSED PROJECT

PROJECT NEED

Transit systems for the Island of Oahu are envisioned to be comprised of three modes: bus, water and rail. Mass transit by water is the only alternative which can relieve traffic congestion on the existing highway system without large investment in infrastructure.

From Hawaii Kai in East Honolulu to downtown Honolulu, only Kalanianaole Highway provides direct access as it passes through and alongside residential areas. Already heavily congested during commuting hours, the highway will be reconstructed over a period of about eight years during which congestion will be exacerbated. Paralleling the highway is the ocean, which offers the opportunity for development of an alternative water route.

From fast-growing West Honolulu, Interstate Route H-1 and other highways must loop around Pearl Harbor, because neither a bridge nor a tunnel across the entrance channel is feasible. Eight eastbound freeway lanes converge into three at Middle Street, well short of downtown Honolulu. An ocean ferry route would by-pass Pearl Harbor and the highway bottleneck from Middle Street into Downtown.

From Honolulu International Airport to Waikiki, the most direct route is along Nimitz Highway, which is less than scenic and has resisted aesthetic upgrading. An ocean route, with Diamond Head off the bow, will be far more in keeping with the desired first impression of Hawaii for visitors.

FERRY TERMINAL

Location. The proposed Downtown terminal will be located at Pier 8 in the Honolulu Harbor. Piers 13 and 14 are proposed as a vessel berthing and maintenance area. See Figures 1 and 2. Both sites are owned by the State of Hawaii.

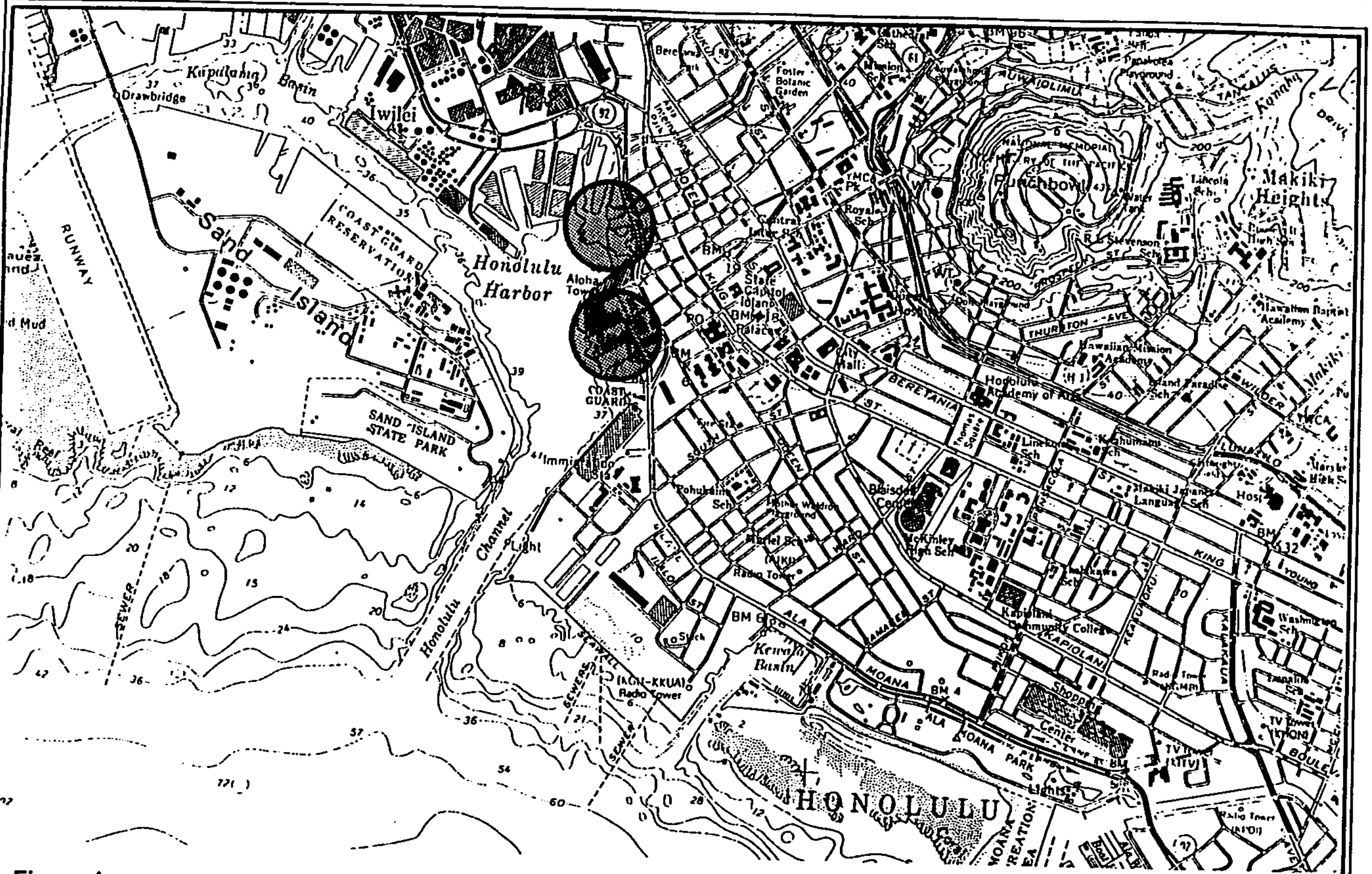


Figure 1
DOWNTOWN TERMINAL
Intra-Island Ferry System

Prepared for:
DEPARTMENT OF TRANSPORTATION, HARBORS DIVISION
Prepared by:
WILSON OKAMOTO & ASSOCIATES, INC.

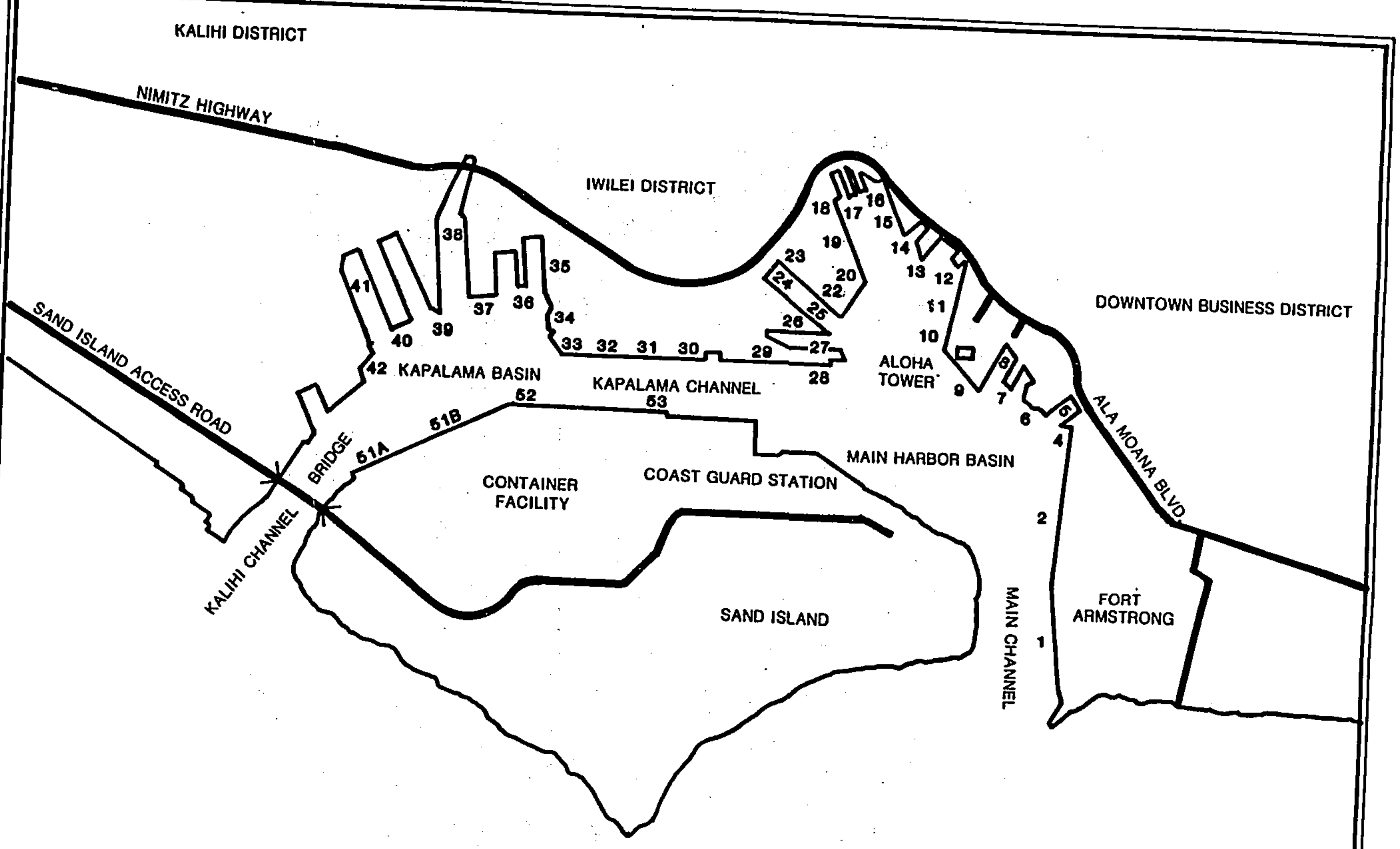


Figure 2
HONOLULU HARBOR

Intra-Island Ferry System

Prepared for:
DEPARTMENT OF TRANSPORTATION, HARBORS DIVISION
Prepared by:
WILSON OKAMOTO & ASSOCIATES, INC.

Improvements. Improvements at Piers 8 to accommodate the ferry terminal will be confined primarily to interior renovations of existing structures for servicing passengers. No significant improvements will be required to accommodate vessel maintenance at Piers 13 and 14.

FERRY SYSTEM

Establishment of the Intraisland Ferry System is being pursued through a bid procedure to qualified private operators. The contract to be awarded will be for a twenty year term. Under the contract, the operator is required to provide commuter transit service during the morning and evening peak traffic periods between the Maunalua Bay terminal in Hawaii Kai and the Downtown terminal at Pier 8 in Honolulu Harbor, at a fare not greater than $2.50 one-way for residents with a valid Hawaii drivers license. Due to anticipated budgetary deficits resulting from this service, the DOT sought bids to determine the level of funding the operator would require. The funding would be for eight years, with the rate fixed for the initial four years and declining thereafter to zero for another four years. The DOT would also design, secure necessary government approvals, and construct the ferry terminals. Furthermore, the operator would be permitted to engage in other commercial revenue generating operations during hours the commuter transit service is not in operation. He would be permitted to use the DOT's ferry terminals for such operations, except that he would not be allowed to use the Maunalua Bay terminal and the Ala Wai Boat Harbor, should a terminal be sited there.

Bids were opened on March 7, 1988; the apparent low-bidder is San Diego Shipbuilding and Repair, Inc. Instead of seeking funding for providing the service, the State was pleasantly surprised that the low bidder offered to pay the State $1,200 per year for the first four years and declining to zero in a straight line for the next four years for a total payment of $7,200 over the 8 year period.

Construction of the improvements to the Downtown terminal are anticipated to be completed by December, 1989. Two ferry vessels are required initially to serve the Maunalua Bay to Downtown commuter transit link. Additional ferry terminals in the intraisland system will be developed depending on the availability of funding and approval of necessary permits.

Vessel. The vessel proposed for use by the apparent low-bid ferry operator is a "surface effect ship" which rides on a cushion of air. The vessel is 118 feet long and has a beam width of 38 feet. It has a capacity of approximately 350 passengers and an estimated speed of 42 knots (48 mph).

Two engines power fans maintaining the air cushion which is contained under the craft by two solid walls on either side and by curtains fore and aft. The air cushion can be adjusted by an on-board computer to allow the ship to ride higher within wave troughs and lower over wave crests. This provides a smoother ride in rough seas. While riding on the air cushion, the ship has a draft of 1.5 feet. Off cushion, the ship draws 6 feet. Two additional engines power a water jet propulsion system which draws water from beneath the ship and discharges it in two jet streams to propel and steer the ship. There are no propellers in the water. The water jet propulsion and steering system allows the ship to turn 360° within a space 1-1/2 times its length at dead stop.

Operation. The ferry system will operate among the seven intraisland terminals as they become operational. The schedule and routes for the ferry system have yet to be determined. The Maunalua Bay to Downtown link of the ferry system is scheduled to be the first to become operational. It will operate between the proposed Maunalua Bay Ferry Terminal and Pier 8 in Honolulu Harbor.

Piers 13 and 14 at Honolulu Harbor will be used for vessel berthing and maintenance. Two ferry vessels are anticipated to serve the Maunalua Bay to Downtown link. Each of the vessels will make two runs to the Downtown Terminal during the 3-hour morning rush hour and will make two runs each to the Maunalua Bay Terminal during the evening rush hour. The estimated travel time for each direction is 30 minutes.

Inasmuch as the proposed commuter service between Maunalua Bay and Downtown is anticipated to operate at a fiscal loss, the Department of Transportation has indicated that the operator may use Honolulu Harbor facilities for commercial operations, however commercial operations to and from the Maunalua Bay Ferry Terminal will not be allowed.

The operator will not be restricted from transporting passengers on return trips from commuter runs. Conceivably, therefore, passengers, including tourists, traveling to East Honolulu in the morning and back to Honolulu in the evening could also use the ferry. They would be transported on a space available basis. No commercial bookings to reserve seats would be allowed.

PROJECT SETTING

EXISTING CONDITIONS

Honolulu Harbor is situated on a narrow coastal plain on the southern coast of Oahu. Honolulu Harbor is located makai of Nimitz Highway between *Fort Armstrong and Keehi Boat Harbor. See Figure 1.*

Among the ten largest container handling ports in the United States, Honolulu Harbor is the principal deep-water port of the State of Hawaii. It is the primary shipping link between Hawaii, the Mainland U.S., the Far East and the entire Pacific Rim. It also serves as the hub for marine passenger and cargo service to the Neighbor Islands.

Honolulu Harbor is administered by the Department of Transportation Harbors Division and comprises 234.2 acres. Controlling depths range from 35.0 feet to 36.2 feet. Fully developed with wharfs, no natural shoreline remains and the area is devoid of vegetation except for landscaping.

The Main Channel, known as the Fort Armstrong Channel, is the primary entry and exit point to Honolulu Harbor. Spoils from the dredging were deposited off-shore, forming the existing Sand Island in the center of the harbor which, along with a fringing reef, serves to protect the harbor from ocean swells. The main channel connects with the main Harbor basin, Kapalama Channel, Kapalama Basin and the Kalihi Channel. See Figure 2. The Sand Island Access Road drawbridge over the Kalihi Channel was permanently fixed in place to allow for the uninterrupted flow of containers to and from Sand Island. Thirty berthing facilities with over 22,500 linear feet of cargo handling pier are found along the two basins, Kapalama Channel, and the eastern side of Fort Armstrong Channel.

ACCESS

Access to the site is available via Nimitz Highway. Nimitz Highway is a ten to six-lane arterial running from Bishop Street to Plantation Drive at Pearl Harbor.

RELATIONSHIP TO PLANS, POLICIES AND PERMITS

PLANS

Hawaii State Plan. The development of the Oahu Intraisland Ferry System is supported by the State Plan. According to Section 226-17 of the Hawaii State Plan, one of the first stated objectives regarding transportation is "*to develop an integrated multi-modal transportation system that services* statewide needs and promotes the efficient, economical, safe, and convenient movement of people and goods". Section 226-17 b (11) indicates that this will be achieved through "the use of low-cost, energy efficient, non-polluting means of transportation". The State shall "encourage systems that serve development need of communities".

State Transportation Functional Plan. Development of an intraisland ferry system is also in harmony with the State Transportation Functional Plan Objective which promotes the "development of a balanced, multi-modal statewide transportation system that serves clearly identified social, economic and environmental objectives of the Hawaii State Plan".

General Plan of the City and County of Honolulu. The General Plan of the City and County of Honolulu establishes long-range objectives and policies for guiding both the quantity and quality of future growth in Oahu.

The proposed Intraisland Ferry System will facilitate implementation of the General Plan. It specifically addresses the objective to "create a transportation system which will enable people and goods to move safely, efficiently, and at a reasonable cost; serve all people, including the poor, elderly, and the physically handicapped; and offer a variety of attractive and convenient modes of travel".

LAND USE POLICIES AND ZONING

State Land Use District. Pursuant to Hawaii Land Use Law (Chapter 205, HRS), the State Land Use Commission classifies all lands into four land use districts: urban, agricultural, conservation, and rural. Lands within

Honolulu Harbor are designated "Urban" on the State Land Use District Map. The proposed ferry terminal is a permitted use under the "Urban" designation.

City and County of Honolulu Development Plans. Eight development plans were established to provide detailed schemes for "implementing and accomplishing the objectives and policies of the General Plan." The development plans guide the desired sequence, patterns and characteristics for future development. The City and County of Honolulu Land Use Development Plan Map designates Pier 8 as "Commercial" while Piers 13 and 14 are designated as "Public Facility". A development plan amendment to designate the ferry terminal at Pier 8 as "public facility" will be required. The proposed maintenance area at Piers 13 and 14 is permitted under the "Public Facility" designation.

City and County of Honolulu Land Use Ordinance. The City and County of Honolulu Land Use Ordinance (LUO) regulates land use in accordance with adopted land use policies, including the Oahu General Plan and Development Plan. Under the current Land Use Ordinance, Pier 8 is zoned "Central Business Mixed Use District BMX-4," in which the proposed ferry terminal would require a Conditional Use Permit.

SHORELINE AND ENVIRONMENTAL PERMITS

Department of Army Permit. The Department of the Army permit is administered by the U.S. Army Corps of Engineers, Honolulu District under Section 10 of the Rivers and Harbors Act (33 USC 403), Section 404 of the Clean Water Act (33 USC 1344) and Section 103 of the Marine Protection, Research and Sanitation Act of 1972 (33 USC 1413). The permit is required for all work within water of the United States, including ocean and coastal waters, inland and tidal waters, tidal ponds, fishponds, rivers, streams, and adjacent wetlands, perched wetlands, and intermittent streams.

Issuance of the permit is based on an evaluation of the probable impact of the proposed activity on the public interest, reflecting national concern for both protection and utilization of important resources. Factors considered include those relating to: conservation, economics, aesthetics, general environmental concerns, historic values, fish and wildlife values, flood damage prevention, land use, navigation, recreation, water supply, water quality, energy needs, safety, food production and, in general, the needs and welfare of the people.

Portions of the ferry terminal potentially subject to review under the Department of the Army permit would include those improvements extending into the water.

Hawaii Coastal Zone Management Program Federal Consistency Review. Section 307 of the National Coastal Zone Management Act of 1972 (16 U.S.C. 1451 et. seq.) provides for State review of federal actions affecting the coastal zones of States with approved Coastal Zone Management Programs. Hawaii's Coastal Zone Management (CZM) Program, established pursuant to Chapter 205A, HRS was federally approved in 1977. It is administered by the Office of State Planning (OSP).

Among Federal actions subject to review is the issuance of permits, including the Department of the Army Permit. Before the permit can be issued, the OSP must determine its consistency with the enforceable policies of the Hawaii CZM Program. These policies encompass broad concerns such as impact on recreational resources, historic and archaeological resources, scenic and open space resources, coastal ecosystems, economic uses, coastal hazards and the management of development.

Section 401 Water Quality Certification. The State Department of Health is charged with the responsibility of establishing and administering a State certification system pursuant to Section 401 of the National Clean Water Act (33 USC 1344) and Section 342-32(13), HRS. Water quality certification is required of any applicant for a Federal license or permit to conduct any activity that may result in any discharge into navigable water.

Permit for Work in Shores and Shorewaters. The Shorewaters Permit is administered by the State Department of Transportation pursuant to Section 266-16, HRS and Section 19-42-161, Hawaii Administration Rules, Department of Transportation, Harbors Division.

This permit is required for any construction, dredging, or filling within the shorewaters of the State, as defined by Chapter 266, HRS. Jurisdiction extends to shores, shorewaters, navigable streams and harbors, belonging to or controlled by the State.

Portions of the ferry terminal project subject to review would only include improvements extending into the water.

PROJECT IMPACTS

SHORT AND LONG TERM IMPACTS

No adverse short or long term impacts of ferry terminal and maintenance facility development are anticipated due to the compatible uses and facilities existing at Honolulu Harbor. Construction activities should have minimal impacts within the industrial harbor setting. Use of the terminal for passenger services will be compatible with on-going harbor functions.

ALTERNATIVES

Selection of the terminal site was based upon the availability of space and proximity to Downtown commuter destinations. No other sites are being considered for the Downtown terminal.

SHORT-TERM USE VERSUS LONG-TERM PRODUCTIVITY

The proposed project will not have any impact on the long-term productivity of Pier 8 or Piers 13 and 14.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Although the labor and materials used to construct the improvements at Piers 8, 13 and 14 will be irretrievably committed, both facilities will be available for future use, without substantial loss of long-term productivity should the proposed use be terminated in the future.

MITIGATION MEASURES

Construction methods and materials shall conform with municipal building codes. No special mitigation measures will be required.

UNRESOLVED ISSUES

No unresolved issues have been identified.

CONSULTATION

Consultation on the Intraisland Ferry System project is being pursued through the Intraisland Ferry Task Force comprised of various governmental and community representatives. A public information/education presentation was also prepared for display at various public locations. These consultation efforts are summarized in Tables 1 and 2.

Public comments were also solicited on the Oahu Intraisland Ferry System Draft Environmental Impact Statement, pursuant to Chapter 343, HRS. Availability of the document for public review was published in the OEQC Bulletin on October 8, 1988. All comments received within the public comment period as well as responses to those comments are contained in Part I - Maunalua Bay Terminal. Comments and responses pertaining to the Downtown Terminal are reproduced herein.

TABLE 1

INTRAISLAND FERRY TASK FORCE MEMBERS
As of July, 1987

	NAME	ORGANIZATION
1.	Edward Uchida	Planner, Department of Transportation-Statewide Transportation Planning Office
2.	Dan Tanaka (Alt.)	Planner, Department of Transportation-Statewide Transportation Planning Office
3.	Adm. E. Alvey Wright	Project Coordinator, Department of Transportation-Statewide Transportation Planning Office
4.	Dennis O'Connor	Councilman, City and County of Honolulu
5.	Robert Dods (Alt.)	Senior Assistant for Councilman O'Conner
6.	Michelle Tucker (Alt.)	Researcher, City Council, City and County of Honolulu
7.	John Emmerson	Chief, Operations Branch, U.S. Army Corps of Engineers
8.	Dave Swenson (Alt.)	Regional Economist, U.S. Army Corps of Engineers
9.	Donna Ikeda	Senator, Hawaii State Legislature
10.	Harry Murakami	Assistant Chief for Engineering, Department of Transportation-Harbors Division
11.	David Yokoyama	Planning Engineer, Department of Transportation-Harbors Division
12.	Ron Tsuzuki	Planning Engineer, Department of Transportation-Highways Division
13.	Kenneth Au (Alt.)	Advance Planning Engineer, Department of Transportation-Highways Division
14.	Libert Landgraf	Deputy Director, Department of Land and Natural Resources
15.	Michael Yoshinaga (Alt.)	Project Coordinator, Department of Land and Natural Resources

16.	Robin Foster	Planner, Department of Land Utilization, City and County of Honolulu
17.	Verne Winquist	Planner, Department of General Planning, City and County of Honolulu
18.	Bill Medeiros (Alt.)	Planner, Department of General Planning, City and County of Honolulu
19.	Don Griffin	Planner, Department of Parks and Recreation, City and County of Honolulu
20.	Jim Ball	Project Manager, Department of Transportation Services, City and County of Honolulu
21.	Marilyn Kali	Public Information Officer, Department of Transportation-Director of Public Relations
22.	Chris Kam (Alt.)	Information Specialist, Department of Transportation-Director of Public Relations

TABLE 2

INTRAISLAND FERRY TASK FORCE MEETING DATES

May 29, 1987
June 6, 1987
June 26, 1987
August 4, 1987
September 4, 1987
November 6, 1987
March 16, 1988

PUBLIC PRESENTATIONS AND INFORMATIONAL MEETINGS

Public Information Meetings

July 1, 1987	Hawaii Kai Rotary
July 27, 1987	Hawaii Kai Neighborhood Board
August 25, 1987	Hawaii Kai Elementary School
January 7, 1988	Makakilo Elementary School
January 14, 1988	Ewa Elementary School
January 31, 1988	Waipahu Elementary School
March 22, 1988	Hawaii Kai Elementary School

Public Exhibitions and Presentations

October 15, 1987	Board of Realtors - City Affairs Comm.
December 1, 1987	Farrington High School Public Exhibit
Feb. 14-21, 1988	Kahala Mall Shopping Center
February 18, 1988	Hawaiian Canoe Program Advisory Council
February 23, 1988	Hawaii Yacht Club
March 1988	International Order of the Blue Gavel
March thru April 1988	Windward Shopping Mall
April 13, 1988	Waikiki Yacht Club
April 24, 1988	Waikiki Yacht Club
May 14-20, 1988	Pearl Ridge Shopping Center
May 18, 1988	Waterborne Transportation Conference
May 19, 1988	Pacific Congress on Marine Science & Technology

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JOHN WAIHEE
GOVERNOR OF HAWAII

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

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WILLIAM W. PATY, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

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CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

FILE: 89-217
DOC.: 4660E

The Honorable Marvin T. Miura, Ph.D.
Director
Office of Environmental Quality Control
465 South King St., Room 104
Honolulu, Hawaii 96813

SUBJECT: O'ahu Intraisland Ferry System

Dear Dr. Miura:

Thank you for giving our Department the opportunity to comment on this matter. We have reviewed the materials you submitted and have the following comments.

The Draft Environmental Impact Statement (DEIS) has addressed most of the expected impacts of the extensive dredging and construction required at the Maunalua Bay site. Mitigation measures have been proposed to the extent possible to prevent excessive negative effects on an already severely stressed ecological system at that site.

The DEIS states that no adverse impacts are expected at the other terminal sites described, unless activities such as dredging, construction near or in coastal waters, or other shoreline modifications become necessary.

All future activities, including blasting, that may impact aquatic resource values at the proposed terminals should be submitted to the Department for review and the necessary permits obtained.

Potential interference with recreational and commercial fishing should be averted as much as possible and compensated for wherever inevitable, during the operation of ferry routes and terminal facilities.

We note, too, that (according to the DEIS) impacts on whales and green sea turtles are still to be determined, yet those impacts are omitted in "Unresolved Issues" on the "Summary Sheet" of the DEIS. We request that mitigation plans regarding whales and green sea turtles are to be coordinated with both the National Marine Fisheries Service and our Office of Conservation and Environmental Affairs.

The EIS contains detailed information necessary for archaeological/historic sites review only for the Maunalua Bay Beach Park Terminal. As the terminal and support system will be located makai of Kalanianaole Highway on fill lands, we anticipate that there will be "no effect" on significant historic sites.

The Waikiki location has yet to be determined, and, therefore, we cannot assess the expected impact. There are historic sites in Waikiki which might be affected depending on terminal location.

The Downtown Terminal, Airport Terminal and Barber's Point Terminal are making use of existing facilities, and we anticipate no problems.

The Ewa Terminal at Ewa Marina cannot be assessed without more information, which, according to the EIS, will be forthcoming when design plans are completed. This location is within the One'ula Archaeological District (Site 80-12/13-2873) which has been determined eligible for listing on the National Register of Historic Places.

The Waipahu Terminal location intrudes on Site 80-13-9992, the Pearl Harbor Naval Base, a National Historic Landmark site which is listed on the National Register. Coordination with the Navy archaeologist, Dr. Robert J. Hommon, and the State Historic Sites Section is necessary.

Thank you for your cooperation in this matter. Please feel free to call me or Jay Lembeck at our Office of Conservation and Environmental Affairs, at 548-7837, if you have any questions.

Very truly yours,

WILLIAM W. PATY

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION

December 29, 1988

HAR-EP 2653

MEMORANDUM:

TO: The Honorable William W. Paty, Chairperson
Board Of Land and Natural Resources

FROM: Director of Transportation

SUBJECT: DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)
FOR OAHU INTRAISLAND FERRY SYSTEM
(RESPONSE TO FILE: 89-217, DOC.: 4660E)

Thank you for your comments on the subject DEIS. We look forward to continued coordination with your department in the development of the Oahu Intraisland Ferry System. We shall be consulting with your staff in the preparation of environmental documents and permit processing as they relate to areas of concern expressed in your letter.

We appreciate the assistance your department has provided us in this most important project. If you have any questions concerning the ferry system please feel free to call Mr. Harry Murakami of our Harbors Division at 548-2535.

Edward Y. Hirata

11 November, 1988

Mr. David K. Higa
Chief, Harbors Division
Department of Transportation
79 South Nimitz Hwy
Honolulu, Hawaii. 96813

Subj: Draft Environmental Impact Statement (EIS) for the Oahu Intraisland Ferry System, comments concerning.

Ref: Your letter dated October 17, 1988 - HAR-EP 1697.

Dear David,

We received your reference letter draft EIS two weeks ago. Please find the following comments pertaining to the subject document as you requested. Our opinions or recommendations are meant to be constructive, but we recognize that we have a limited data base of background to draw upon, so if they disagree with the concensus, please forgive us. We consider the EIS to be a fine document that appears to address the major problems at Haunalau Bay.

SAN DIEGO SHIPBUILDING & REPAIR, INC.
(619) 691-1091 • Telex No (910) 240 4387
Foot of F Street • P.O. Box 5058, Chula Vista, California 92010

Page 2:

Item:	Section:	Comment:
1	Cover	We suggest a more encompassing system title for the system as previously suggested which would alter the title of the report to: "Hawaii Ocean Transit System Oahu Intraisland Routes".
2	Haunalua Bay Fig. 4	The pier as shown does not depict the fender system previously recommended by SDSR. The pier we feel might be narrow in way of a gangway that must accommodate the 2 ft. tide plus a reasonable slope for passenger safety as recommended by SDSR. The mooring cleats appear to be small for handling a ship of this size with the maximum possible wind at the worst angle. We feel the dock elevation may be incorrect considering the proposal dredged depth of water at 10 ft. above MLLW.

Page 3:

3	Haunalua Bay A-10 Entrance Channel	SDSR during meetings in Honolulu in Aug/ Sept. 1988, was willing to accept a lesser channel width of 150 ft. versus 200 ft. and a guaranteed channel depth of 9 ft. versus 150 ft. That offer to save Hawaii increased dredging costs still remains with the only caveat that the State will ensure that the 9 ft. depth be periodically maintenance dredged.
4	Maunalua Bay A - 12 Ferry System	Our company's name is SAN DIEGO SHIPBUILDING & REPAIR, INC., not Ship Building or Ship Builders. We request that this minor oversight is corrected in each section of the report and in DOT files if incorrect. Thank you. We also recommend you mention that the next lowest bidder was $15,000,000 (?) more than SDSR to be paid by the State. We feel this will mitigate any vendor greed criticism, as well as possibly encouraging a cooperative effort to make the program a success and finally it shows to the people the creative approach their State officials took to

Page 4:

	solicit an entrepreneurial solution to a transportation problem, plus saved them $15,000,000.
Vessel A - 12	The ship carries 350 passengers as designed, not 300.
A - 13	The ship has two propulsion engines, not a third engine. There are also, as stated, two lift engines.
A - 13 Para 3	We suggest you add after "monohull" the words "or catamaran". It should be noted that at slow speed, the catamaran style hull (second bidder), produces an enhanced wave wake which severely impacts shore side erosion. San Francisco Bay catamaran ferries and many others are good examples. SDSR's SES will operate on a partial cushion alongside the pier and in the harbor to not only give a more comfortable ride, but also to reduce the wake dramatically. There's less wake at max

Page 5:

speed than at slower speeds but all conditions surpass equivalent monohull or catamarans.

A - 13
Para 5

Add after "transportation." The ferry operator also offers a "dial-a-ferry" phone service that gives continuous recording of schedules, sea conditions and special fare promotions".

A - 13
Para 7

It is our understanding that Maunalua Bay will not necessarily be the first terminal. Should that be stated here or is it best to keep to the original schedule for EIS purposes??

A - 13
Para 8

Add after "Pier 13" the words "and 14". SDSR in it's bid document and subsequently have requested use of piers 12 (parking), pier 13 maintenance and repair and pier 14 commercial operations which was approved by DOT.

A - 14
Para 1

The bid allows for a minimum number of runs as stated. However, the vessels speeds permits 7 trips from 6 a.m. to 9 a.m. if commuter use approaches maximum

Page 6:

capacity 2,450 possible passengers. This capacity should be stated and analyzed.

A - 14
Para 2

Suggest a clarification which may or may not be appropriate here. Based on the comment Pg. A14, Para 1, the capacity of the service clearly exceeds the minimum commuter schedule required. As stated, the use by tourists would be generally in a direction opposite to commuters thus not creating a booking or conflict with commuter issue.

5. Maunalua Bay
B - 8
Para 6

Pure opinion - we think this very important paragraph about dredging and erosion should be amplified to ensure the reader is understanding the complex theory that is being presented.

6. D - 7
Flora & Fauna
Para 2

It is suggested that the ferry operator take a "detour" to avoid the turtles. SDSR requests information as to the extent of this "detour" as it would possibly affect schedule.

Page 7:

7.	D - 8 Whales Para 3	The report makes the point that there were three incidents of hitting whales in three years. On its face a remarkable record. It might also be investigated to see if out of the millions of hours of boat operation in Hawaiian waters, whether even the 3 incidents were accidents. Possibly the collisions were due to dive charter boats who were chasing the whales for the price of whale watching or just curiosity. If these incidents were partially deliberate, then all the comments about whales could be significantly mitigated.
	D - 14 Noise	The noise issue has been a great concern to residents. To give this emotional topic one paragraph of explanation, we believe is too little. One letter after the EA said the boat selected was a "Hovercraft". The hovercraft as we all know is an extremely noisy vessel. This point should be responded to and

Page 8:

		clarified. We believe that the one comparison given in the report has been to compare traffic noise to the ferry. The residents don't like traffic noise any better than they perceive the potential ferry noise. In the technical literature there are numerous less combatative comparisons, which we suggest be used to show how quiet this boat is at slow speeds at the distances of sound mitigation from the closest residence. We feel comparisons to "room noise" or distinguishing ferry noise from normal household sounds be used.
9.	D - 21 Impacts	This may not be the correct area for this comment, but doesn't the ferry service contribute to certain emergency evacuation measures during tsunamis or hurricane warnings versus a congested highway under construction? Shouldn't this be noted?
10.	E - 2 Task Force	SDSR requests membership on the permanent task force for all the ferry terminal sites. As the ferry

Page 9:

system operator, we feel our knowledge and experience would contribute to the task forces mission significantly.

11. E - 6 Preparation Comments

Some of the comments we feel have not been addressed in the new EIS from the EA comments.

a) Operations of the systems is still sketchy and mysterious. The operation is, more efficient, more reliable and cheaper than the previous hydrofoils much less any other US based ferries. Lets not be bashful, lets be proud and let the public know.

b) Whale issue needs better history and facts as previously stated.

c) The SES ferry design precludes typical ship oil product leakage. Portable oil

Page 10:

booms could be positioned on certain sensitive routes if absolutely necessary.

d) Shouldn't there be a comparison to large yachts now in Hawaii Kai as to wake, noise etc. to eliminate the large commercial vessel image?

e) Noise concerns previously questioned should be addressed in a forthright way.

12. Appendices Appendix A Reduction in Assumption

Ferry capacity is understated so therefore the analysis is likewise understated. At 80% capacity, 7 departures (maximum), the car reduction would be 211 cars/departure or 1,479 cars per a.m. or stated differently one lane of traffic is eliminated according to federal DOT highway guidelines. This calculation yields a significant reduction at 11.4 percent versus the EIS reports 5.6 percent. The p.m. reduction would be 13.2 percent versus 6.5 percent in the EIS report.

Page 11:

13.	Overall Comment	Those comments changed in the Maunalua Bay section noted previously should be changed in the entire report where applicable (several sections are repeated under each terminal).
14.	Waikiki 1 Project Description	Should Fort DeRusy be mentioned here as an alternative site to the Hilton as it was originally stated in the invitation for bid?
15.	Remainder of Ferry Terminals General	The discussions we suppose are purposely sketchy and incomplete. Will there need to be amplified data on Maunalua Bay or are they all right as written???
16.	Barbers Point	Is the ferry terminal located properly on the sketch. We understand the terminal would be in the inner harbor??

Page 12:

I look forward to your consultants feedback on the above comments. Once again we only wish to help the process if we can.

Respectfully,

W.T.Gurney,
President.
WTG/mlg
sdsbl/m/environ.imp

cc: Mr. Carl Matsukawa
Wilson Okamata & Assoc.
Mr. Ed Hirata, Director of Transportation
Mr. Ed Uchida, Chief Planning Division
Mr. Mike Moynahan, SDSR
Admiral Alvie Wright

JOHN WAIHEE
GOVERNOR

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

EDWARD Y. HIRATA
DIRECTOR

DEPUTY DIRECTORS
JOHN K. UCHIMA
RONALD N. HIRANO
DAN T. KOCHI
JEANNE K. SCHULTZ

IN REPLY REFER TO

December 30, 1988

HAR-EP 2663

Mr. W. T. Gurnee, President
San Diego Shipbuilding and Repair, Inc.
P. O. Box 5058
Chula Vista, CA 92010

Dear Mr. Gurnee:

Draft Environmental Impact Statement (DEIS)
for the Oahu Intraisland Ferry System

Thank you for your comments on the subject DEIS. In response to your comments, we offer the following in the order presented:

1. Cover: The EIS encompasses only the Oahu Intraisland Ferry System. DOT presently has no plans to extend the service beyond the island of Oahu. Should such a service be contemplated in the future, separate environmental documentation will be required.

2. Figure 4: Figure 4 is a conceptual sketch intended to convey the scale of the pier. We are currently proceeding with Engineering design plans of the pier. Your input on the final design of the pier will be welcome.

3. Page A-10: Toward insuring safe simultaneous passage of the ferry vessel and boats typically using the Maunalua Bay channel, the widths presented in the draft EIS shall be maintained. In an effort to minimize the quantity of dredging, associated construction costs, and subsequent environmental impacts, the DOT has opted to reduce channel depth to a uniform 9 feet throughout the channel length. This change in design will be reflected in the final EIS.

4. Page A-12: The EIS will be revised to correct all

references to your company. We do not believe it is appropriate to discuss in the EIS the other bids received. The EIS is intended to disclose the environmental impacts of the project.

Page A-12: Our understanding is that the ship can accommodate 340 people in an airline type seating and an additional 10 people would be accommodated in first class seating. We will note in the Final EIS that the vessel does have an approved passenger capacity of 350 and that the ferry service can be increased to this maximum to meet ridership demands.

Page A-13: The EIS will be revised to describe the propulsion system of the ferry more accurately. We will also insert the term "catamaran" following "monohull" in the final EIS and discuss the "dial-a-ferry" phone service as a feature to be offered by the operator. The Maunalua Bay Ferry Terminal is currently being pursued as the first phase of the Oahu Intraisland Ferry System. The development of any of the other terminals can proceed should development of the Maunalua Bay terminal be delayed or abandoned.

Page A-13: The final EIS shall be revised to reflect usage of pier 14 by the ferry operator.

Page A-14: Each of the vessels will be required to make two runs each to the Downtown Terminal during the 3-hour morning peak period and two runs each to Maunalua Bay during the 3-hour evening peak period. Regardless of the ferry capacity or the direction in which ferry usage by either commuters or tourists may be demanded, the Maunalua Bay terminal will not be used for commercial transport services. Only normal public mass transit use will be permitted. Thus, while tourists may be transported to Maunalua Bay just as they could be through the City's bus system, no commercial bookings of seats will be allowed. Moreover, the terminal may not be used as a transfer area between the ferry and commercial transport services i.e. tour buses.

5. Page B-8: We feel that the draft EIS appropriately addresses erosion in the bay. Should any technical questions arise regarding erosion processes in the bay, we will provide further clarification.

6. Page D-7: The turtle studies contracted by the DOT will assist in determining appropriate ferry routes in and out of Maunalua Bay.

7. Page D-8: The three incidences involving collisions between vessels and whales were investigated by the National Marine Fisheries Service, to determine if the whales were deliberately harassed. Following the investigation, no charges were filed against any of the boat operators.

8. Page D-14: We believe the description of the surface effect ship and its noise rating provide an accurate assessment with respect to potential noise impacts. We will indicate that the perceived noise levels at the nearest residences are for the exterior environment and that noise levels within homes will be considerably lower.

9. Page D-21: The use of the ferry vessel for emergency evacuation has not been discussed to date. We will, however, present your offer for providing such services to the Oahu Civil Defense Agency.

10. Page E-2: The Intraisland Ferry Task Force is intended to promote intergovernmental coordination among represented agencies and organizations. Your expertise will be called upon as deemed necessary to facilitate the Task Force's efforts.

11. a. The EIS is intended to disclose the environmental impacts of a proposed action which, in this case, includes the proposed construction activity and the operation of the vessel proposed for use by the apparent low bidder. The bidding process described in the EIS is assumed to have resulted in the selection of the most cost-efficient ferry alternative from among those offering their services. Any claims comparing features of the SES with other types of craft would extend beyond the officially sanctioned method for selecting the ferry operator.

    b. See response to item No. 7.

    c. We will note the use of portable oil booms as a potential mitigating measure to contain oil spills along sensitive routes.

    d. At a length of 118 feet, the ferry vessel is considerably larger than the largest boats found in the bay. Such boats are generally about 35 feet in length. With respect to wake created, we will clarify on page

D-12 that the SES would create less wake than the largest boats which typically operate in Maunalua Bay.

    e. See response to item No. 8 (Page D-14).

12. Appendices: The traffic reduction assessment shall be revised in the Final EIS to reflect the approved passenger capacity of 350 persons.

13. Any changes made to general statements pertinent to all of the terminals will be uniformly revised.

14. The Port DeRussy terminal, as identified in the bid document, and the Hilton Pier are the same. There are no other ferry terminal sites being considered for this area.

15. There was no purposeful intent to providing abbreviated descriptions of the terminal sites at Waikiki, the Airport, Waipahu, Ewa Marina and Barbers Point. Currently, there is inadequate information on the nature of improvements that will be required for the terminals and how construction may affect the respective environments. As we noted, supplemental environmental documents may be required for each of the terminal sites except Maunalua Bay. The EIS fully addresses the environmental impacts of the Maunalua Bay ferry terminal and no further environmental documentation will be required for that site.

16. In the text relating to the Barbers Point Harbor Terminal, we do not limit siting to any particular location within the harbor. While the inner harbor is currently the choice for a ferry terminal, the option of locating it elsewhere has not been foreclosed.

We hope we have satisfactorily responded to your comments. If you have any questions, please feel free to contact Mr. Harry Murakami of the Harbors Division at 548-2535.

Very truly yours,

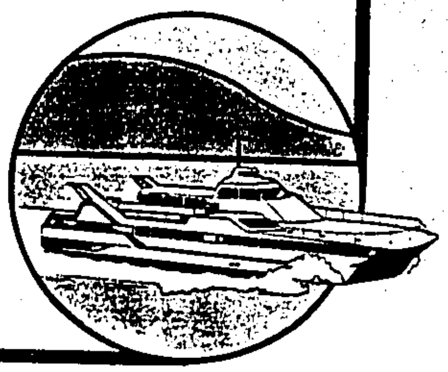
Edward Y. Hirata
Director of Transportation

REFERENCES

State of Hawaii Department of Transportation, Port Hawaii Handbook 1988-1989, 1988.

Part III

Waikiki Terminal



PREFACE

The Department of Transportation (DOT), State of Hawaii is proposing to establish an intraisland ferry system serving the southern coastline of Oahu. Seven terminals are planned from Hawaii Kai to Barbers Point:

- Hawaii Kai in the vicinity of Maunalua Bay Beach Park;
- Downtown at Pier 8 of Honolulu Harbor, with a ferry maintenance facility at Piers 13 and 14;
- Waikiki, in the vicinity of the Ala Wai Boat Harbor and the Hilton Pier;
- Keehi Lagoon, at the South Ramp of Honolulu International Airport;
- Waipahu, at the head of Middle Loch of Pearl Harbor;
- Ewa, at the proposed Ewa Marina Development; and,
- Barbers Point, at the Barbers Point Deep Draft Harbor.

This environmental impact statement is prepared pursuant to Section 343-5, Hawaii Revised Statutes, defining actions subject to environmental impact statement requirements. Specifically, various components of the project will involve the use of State funds and State-owned land, the State Conservation District and shoreline area as defined by Section 205-31, Hawaii Revised Statutes.

In compliance with Section 11-200-7 (Administrative Rules, Department of Health (DOH)), the proposed intraisland ferry system is herein assessed as a phased agency action treated as a single action. Inasmuch as siting and designing of facilities for the various individual ferry terminals are proceeding incrementally, this EIS is comprised of seven parts, one for each of the seven planned terminals, and based on the current information available for each.

Commensurate with information currently available, each part complies with the content requirement of Section 11-200-17 (Administrative Rules, DOH). Terminals for which site selection and design have been completed are assessed in greater detail. As the remaining terminals are sited and designed, supplemental environmental assessments or, if deemed necessary, supplemental environmental impact statements shall be prepared for the individual ferry terminals.

TABLE OF CONTENTS

SUMMARY SHEET

WAIKIKI FERRY TERMINAL

Project Description:	The State Department of Transportation, Harbors Division proposes to develop a ferry terminal at Waikiki in the vicinity of Ala Wai Boat Harbor or the Hilton Pier. The specific site of the ferry terminal within this general area and its design have yet to be determined.
Potential Impacts:	Environmental impacts of developing the ferry terminal at Waikiki will be minimized if dredging proves unnecessary and the terminal facilities are limited in scale. At the Ala Wai Boat Harbor, the ferry operation will have insignificant impacts within the context of existing boating activity. At Hilton Pier, the potential for conflict with abundant recreational activities exists. Other potential impacts may include those related to noise, vehicular traffic and parking.
Alternatives Considered:	Alternative locations for the Waikiki terminal and its design, including any supporting facilities have yet to be determined and assessed.
Unresolved Issues:	Location and design of the ferry terminal and coordination with the appropriate State agencies or private landowners to assure compatibility among existing, planned and proposed uses have yet to be pursued. Environmental impacts of developing and operating the ferry terminal have yet to be identified, assessed and resolved.
Compatibility with Plans and Policies:	The Oahu Intraisland Ferry System is compatible with the Hawaii State Plan, the State Transportation Functional Plan, and the City and County of Honolulu General Plan. The ferry terminal is also a compatible use with respect to the City and County of Honolulu Development Plan Land Use Map and zoning.
Required Permits and Approvals:	Permits for development of the ferry terminal will likely include those for both shoreside improvements and those extending into the water. Shoreside improvements will require a Major Special Design permit, Special Management Area

permit and, if the improvements will lie within 40 feet of the shoreline, a Shoreline Setback Variance from the City and County of Honolulu. Improvements extending into the water will likely require a Department of the Army permit with certification by the Hawaii Coastal Zone Management Program and 401 Water Quality Program, a State Permit for Work in Shore and Shorewaters and, depending upon the location of the development, a State Conservation District Use Application.

PROPOSED PROJECT

PROJECT NEED

Transit systems for the Island of Oahu are envisioned to be comprised of three modes: bus, water and rail. Mass transit by water is the only alternative which can relieve traffic congestion on the existing highway system without large investment in infrastructure.

From Hawaii Kai in East Honolulu to downtown Honolulu, only Kalanianaole Highway provides direct access as it passes through and alongside residential areas. Already heavily congested during commuting hours, the highway will be reconstructed over a period of about eight years during which congestion will be exacerbated. Paralleling the highway is the ocean, which offers the opportunity for development of an alternative water route.

From fast-growing West Honolulu, Interstate Route H-1 and other highways must loop around Pearl Harbor, because neither a bridge nor a tunnel across the entrance channel is feasible. Eight eastbound freeway lanes converge into three at Middle Street, well short of downtown Honolulu. An ocean ferry route would by-pass Pearl Harbor and the highway bottleneck from Middle Street into Downtown.

From Honolulu International Airport to Waikiki, the most direct route is along Nimitz Highway, which is less than scenic and has resisted aesthetic upgrading. An ocean route, with Diamond Head off the bow, will be far more in keeping with the desired first impression of Hawaii for visitors.

FERRY TERMINAL

Location. Two possible locations for the Waikiki terminal under consideration are the Ala Wai Boat Harbor and the Hilton Pier. The Ala Wai Boat Harbor is located between Waikiki Beach and Ala Moana Beach Park. Hilton Pier is located off the Hilton Hawaiian Hotel between the Ala Wai

Boat Harbor and Fort DeRussy Park. The pier is privately owned. See Figure 1.

Improvements. The improvements required for the Waikiki ferry terminal have yet to be determined. Depending on the site selected, offshore dredging and shoreside improvements may be required.

FERRY SYSTEM

Operation. Operation of the Intraisland Ferry System is being pursued through a bid procedure to qualified private operators. The contract to be awarded will be for a twenty year term. Under the contract, the operator is required to provide commuter transit service during the morning and evening peak traffic periods between the Maunalua Bay terminal in Hawaii Kai and the Downtown terminal at Pier 8 in Honolulu Harbor, at a fare not greater than $2.50 one-way for residents with a valid Hawaii drivers license. Toward subsidizing this service, the DOT will design, secure necessary government approvals, and construct the ferry terminals. The operator would be permitted to engage in commercial revenue generating operations during hours the commuter transit service is not in operation. He would be permitted to use the DOT's ferry terminals for such operations, except that he would not be allowed to use the Maunalua Bay terminal and the Ala Wai Boat Harbor, should a terminal be sited there.

Construction of the improvements to the Downtown terminal are anticipated to be completed by December, 1989. Piers 13 and 14 at Honolulu Harbor will be used for vessel berthing and maintenance. Additional ferry terminals in the intraisland system will be developed depending on the availability of funding and approval of necessary permits. The ferry system will serve the seven intraisland terminals as they become operational. The schedule and routes for the ferry system have yet to be determined.

Vessel. The vessel proposed for use by the apparent low-bid ferry operator is a "surface effect ship" which rides on a cushion of air. The vessel is 118 feet long and has a beam width of 38 feet. It has a capacity of approximately 350 passengers and an estimated speed of 42 knots (48 mph).

Two engines power fans maintaining the air cushion which is contained under the craft by two solid walls on either side and by curtains fore and aft. The air cushion can be adjusted by an on-board computer to allow the ship to ride higher within wave troughs and lower over wave crests. This provides a smoother ride in rough seas. While riding on the air cushion, the ship has a draft of 1.5 feet. Off cushion, the ship draws 6 feet. Two additional engines power a water jet propulsion system which draws water from beneath the ship and discharges it in two jet streams to propel and steer the ship. There are no propellers in the water. The water jet propulsion and steering system allows the ship to turn 360° within a space 1-1/2 times its length at dead stop.

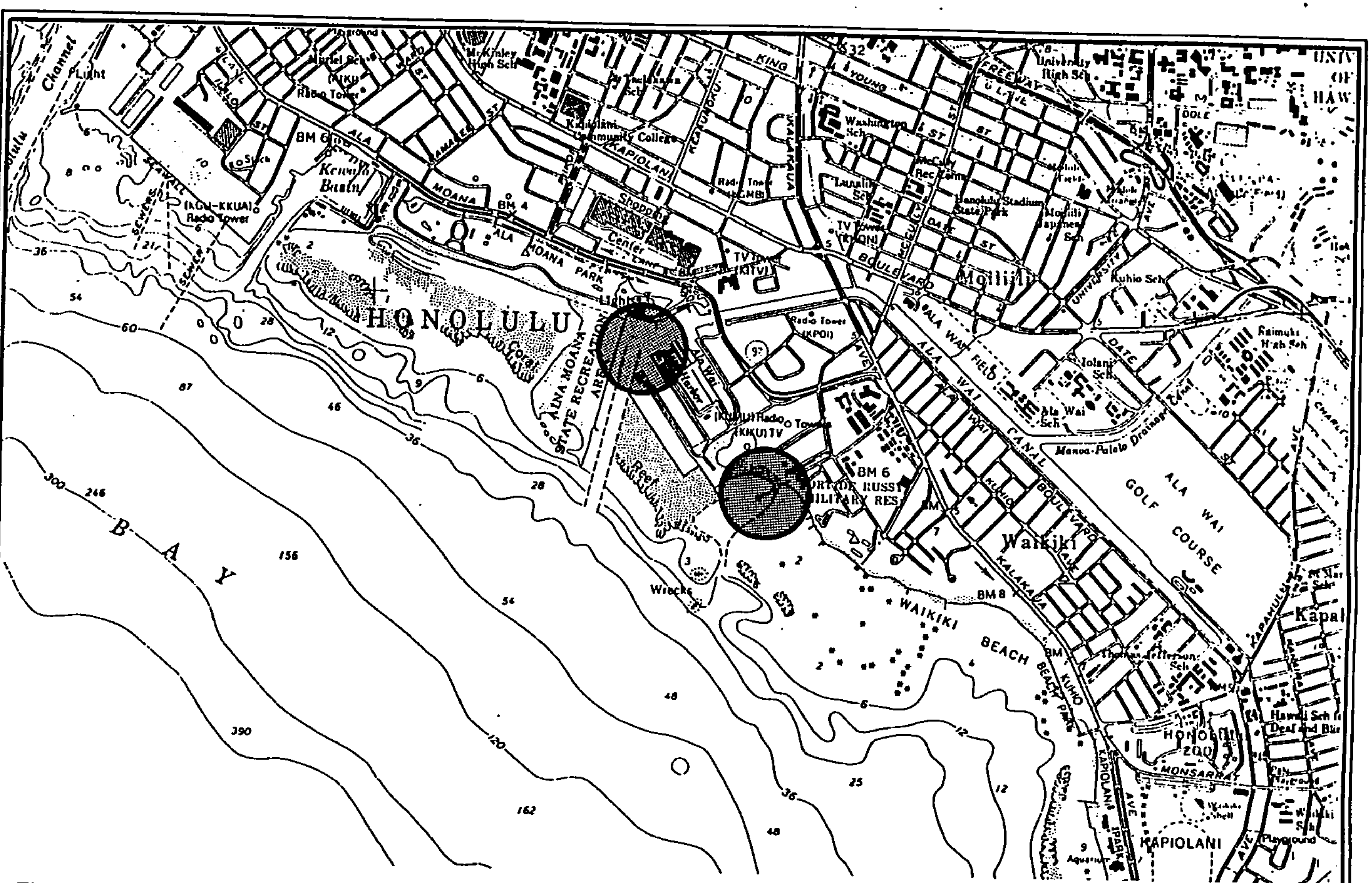


Figure 1
WAIKIKI TERMINAL

Intra-Island Ferry System

Prepared for:
DEPARTMENT OF TRANSPORTATION, HARBORS DIVISION
Prepared by:
WILSON OKAMOTO & ASSOCIATES, INC.

PROJECT SETTING

ALA WAI BOAT HARBOR

Ala Wai Boat Harbor is administered by Department of Transportation, Harbors Division. The harbor was originally constructed from a barge channel built by the U.S. Armed Forces in the early 1920's. Through the years, dredging for harbor improvements provided fill for Ala Moana Shopping Center and Magic Island Beach Park.

The Ala Wai Boat Harbor encompasses 31 acres and is fully developed with slips for 633 vessels. It also includes such facilities as a marina, boat ramp, bathhouse, restrooms, showers and parking. One of the most popular places for small boat activities on Oahu, several yacht clubs are headquartered in the vicinity. Marine supplies and complete repair facilities are available in the harbor including a sailmaker, and radio repair service.

No natural shoreline remains and the area is generally devoid of vegetation except for landscaping.

HILTON PIER

Hilton Pier was constructed in the early 1950's and is owned by the Hilton Corporation.

The Hilton Pier is used exclusively by Hilton Rainbow I Catamaran tours for loading and unloading catamaran passengers.

The sandy beach adjacent to Hilton Pier is predominantly used for sunbathing and storing commercial recreational equipment while the shoreline near the heliport is rocky and generally unused. A surfing area is located to the west of the heliport.

SURROUNDING LAND USES

Land uses surrounding both sites are predominantly hotels and tourist oriented facilities. The Hilton Hawaiian Village, Ilikai Hotel, and Ilikai Marina Hotel border the north edge of the harbor and Hilton Pier. The Yacht Harbor Plaza, hotel-condominium is currently under construction adjacent to the Ilikai Hotel on the north side of the Ala Wai Boat Harbor. Fort DeRussy Park is located to the northeast and the Department of Transportation heliport is to the south of both terminal sites. Magic Island Beach Park is across the harbor on the west.

Recreational and commercial activities in the area surrounding Hilton Pier include, sunbathing, swimming, fishing, and water cycling on rental craft. Canoes, catamarans, surfers and boogie boarders use this area to access the open ocean.

ACCESS

The major arterial nearest both sites is Ala Moana Boulevard. Ala Moana Boulevard is a six-lane divided roadway running from Ala Wai Boulevard to Bishop Street where it becomes Nimitz Highway. The Ala Wai Boat Harbor is accessible from Hobron Lane while Hilton Pier is accessible through Kalia Road. The Ala Wai Boat Harbor parking lot offers the only public parking in the vicinity of the proposed terminal vicinity. For Hilton Pier, approximately 20 parking stalls near the Hale Koa Hotel are provided for park users.

RELATIONSHIP TO PLANS, POLICIES AND PERMITS

PLANS

Hawaii State Plan. The development of the Oahu Intraisland Ferry System is supported by the State Plan. According to Section 226-17 of the Hawaii State Plan, one of the first stated objectives regarding transportation is "to develop an integrated multi-modal transportation system that services statewide needs and promotes the efficient, economical, safe, and convenient movement of people and goods". Section 226-17 b (11) indicates that this will be achieved through "the use of low-cost, energy efficient, non-polluting means of transportation". The State shall "encourage systems that serve development need of communities".

State Transportation Functional Plan. Development of an intraisland ferry system is also in harmony with the State Transportation Functional Plan Objective which promotes the "development of a balanced, multi-modal statewide transportation system that serves clearly identified social, economic and environmental objectives of the Hawaii State Plan".

General Plan of the City and County of Honolulu. The General Plan of the City and County of Honolulu establishes long-range objectives and policies for guiding both the quantity and quality of future growth in Oahu.

The proposed Intraisland Ferry System will facilitate implementation of the General Plan. It specifically addresses the objective to "create a transportation system which will enable people and goods to move safely, efficiently, and at a reasonable cost; serve all people, including the poor, elderly, and the physically handicapped; and offer a variety of attractive and convenient modes of travel".

LAND USE POLICIES AND ZONING

State Land Use District. Pursuant to Hawaii Land Use Law (Chapter 205, HRS), the State Land Use Commission classifies all lands into four land use districts: urban, agricultural, conservation, and rural. Ala Wai Boat

Harbor and Hilton Pier are within an "Urban" designation on the State Land Use District map. The proposed ferry terminal is a permitted use under the "Urban" designation.

City and County of Honolulu Development Plan. Eight development plans were established to provide detailed schemes for "implementing and accomplishing the objectives and policies of the General Plan." The development plans guide the desired sequence, patterns and characteristics for future development. The City and County of Honolulu Land Use Development Plan map designates the Ala Wai Boat Harbor and Hilton Pier as "Public Facility", under which ferry terminal development is permitted.

City and County of Honolulu Land Use Ordinance. With regard to the City and County of Honolulu Land Use Ordinance, both Ala Wai Boat Harbor and Hilton Pier lie within the Waikiki Special Design District. In general, the purpose of the Waikiki Special Design District is to guide the development of Waikiki with due consideration to optimum community benefits. The alternative project sites are designated "Public Precinct", in which the proposed ferry terminal is a permitted use requiring design review under a Major Special Design permit.

SHORELINE AND ENVIRONMENTAL PERMITS

Department of Army Permit. The Department of the Army permit is administered by the U.S. Army Corps of Engineers, Honolulu District under Section 10 of the Rivers and Harbors Act (33 USC 403), Section 404 of the Clean Water Act (33 USC 1344) and Section 103 of the Marine Protection, Research and Sanitation Act of 1972 (33 USC 1413). The permit is required for all work within water of the United States, including ocean and coastal waters, inland and tidal waters, tidal ponds, fishponds, rivers, streams, and adjacent wetlands, perched wetlands, and intermittent streams.

Issuance of the permit is based on an evaluation of the probable impact of the proposed activity on the public interest, reflecting national concern for both protection and utilization of important resources. Factors considered include those relating to: conservation, economics, aesthetics, general environmental concerns, historic values, fish and wildlife values, flood damage prevention, land use, navigation, recreation, water supply, water quality, energy needs, safety, food production and, in general, the needs and welfare of the people.

Portions of the ferry terminal potentially subject to review under the Department of the Army permit would include those improvements extending into the water.

Hawaii Coastal Zone Management Program Federal Consistency Review. Section 307 of the National Coastal Zone Management Act of 1972 (16 U.S.C. 1451 et. seq.) provides for State review of federal actions affecting the coastal zones of States with approved Coastal Zone Management Programs.

Hawaii's Coastal Zone Management (CZM) Program, established pursuant to Chapter 205A, HRS was federally approved in 1977. It is administered by the Office of State Planning (OSP).

Among Federal actions subject to review is the issuance of permits, including the Department of the Army Permit, which will be required for improvements extending into the water. Before the permit can be issued, the OSP must determine its consistency with the enforceable policies of the Hawaii CZM Program. These policies encompass broad concerns such as impact on recreational resources, historic and archaeological resources, scenic and open space resources, coastal ecosystems, economic uses, coastal hazards and the management of development.

Section 401 Water Quality Certification. The State Department of Health is charged with the responsibility of establishing and administering a State certification system pursuant to Section 401 of the National Clean Water Act (33 USC 1344) and Section 342-32(13), HRS. Water quality certification is required of any applicant for a Federal license or permit to conduct any activity that may result in any discharge into navigable water. This includes the Department of Army Permit.

Special Management Area (SMA) Permit. The Hawaii Coastal Zone Management Law (Chapter 205A, HRS) charged the Counties with designating and administering Special Management Areas (SMA) along the State's coasts. Any "development", as defined by Law, within the SMA requires an SMA permit, which is administered by the City and County of Honolulu, Department of Land Utilization pursuant to Ordinance No. 84-4.

Both project sites are located within the SMA boundary and subject to review under the SMA permit procedures.

Shoreline Setback Variance. The State's Shoreline Setback Law, (Chapter 205, HRS) prohibits virtually any development or development-related activity including the removal of sand, rocks, soil, etc. from the shoreline setback area, a 40-foot (20 feet in some areas) strip of land along the shoreline. The Counties, however, are authorized to grant variances for construction that would encroach in the setback area. The City and County of Honolulu, Department of Land Utilization administers this variance under its shoreline setback regulations.

Variances may be granted in consideration of a structure, or activity being in the public interest, hardship to the applicant if the proposed structure or activity is not allowed and the effect a structure or activity would have on natural shoreline processes, particularly with regard to shoreline erosion.

The shoreline variance request can be processed concurrently with the Special Management Area Permit with simultaneous decision-making by the City Council.

The Shoreline Setback Variance will be required for the ferry terminal if improvements encroach in the shoreline setback area.

Conservation District Use Application. Any use of lands, including submerged lands within the State's Conservation District, as established by the State Land Use Commission, is subject to review pursuant to Chapter 183, HRS and Title 13, Chapter 2 of the Department of Land and Natural Resources Regulations. At the terminal site, the area beyond the shoreline, defined as "the upper reaches of the wash of waves, other than storm and tidal waves, usually evidenced by the edge of vegetation growth, or the upper line of debris left by the wash of waves," is subject to review as a use in the "Resource (R) subzone of the State Conservation District (Section 13-2-13, Administrative Rules of the Department of Land and Natural Resources). Approval by the State Board of Land and Natural Resources will be required through a Conservation District Use Application for all dredging and construction beyond the shoreline.

Permit for Work in Shores and Shorewaters. The Shorewaters Permit is administered by the State Department of Transportation pursuant to Section 266-16, HRS and Section 19-42-161, Hawaii Administration Rules, Department of Transportation, Harbors Division.

This permit is required for any construction, dredging, or filling within the shorewaters of the State, as defined by Chapter 266, HRS. Jurisdiction extends to shores, shorewaters, navigable streams and harbors, belonging to or controlled by the State.

DOT review of this permit is normally conducted via interagency coordination with the Department of Land and Natural Resources on the Conservation District Use Application. The DOT, however, could request an independent review.

Portions of the ferry terminal project subject to review include improvements extending into the water.

PROJECT IMPACTS

SHORT AND LONG TERM IMPACTS

Environmental impacts related to development of either site will be minimized if dredging is unnecessary and terminal facilities are limited in scale. At the Ala Wai Boat Harbor, ferry operation should have insignificant impacts in the context of existing boating activity. At the Hilton Pier, however, conflict may occur due to the abundance of swimmers, surfers and recreational craft rented by tourists. Parking would generally be unavailable at either site due to existing demand in the area. Other impacts may be related to noise and vehicular traffic.

ALTERNATIVES

Alternative sites for the ferry terminal at Waikiki to be considered include the Hilton Pier and locations within Ala Wai Boat Harbor. Alternative improvements for the ferry, passenger servicing parking and access will also be considered as project planning proceeds.

SHORT-TERM USE VERSUS LONG-TERM PRODUCTIVITY

The trade-off between short-term use versus the long-term productivity of developing the ferry terminal, if any, will be determined when the site is selected and improvements designed. Generally, both the Hilton Pier and Ala Wai Boat Harbor are existing facilities which can accommodate the ferry terminal without major modification. Therefore, the proposed use would not necessarily impose restrictions on their long-term productivity.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Although the labor and materials required to construct any necessary improvements to accommodate the ferry terminal will be irretrievably committed, both facilities will be available for future use, without substantial loss of long-term productivity should the proposed used be terminated.

MITIGATION MEASURES

Mitigation measures will be considered in light of project impacts identified as ferry terminal site selection proceeds and it is designed.

UNRESOLVED ISSUES

Selection of the Waikiki ferry terminal site and its design have yet to be resolved. In general, the area considered for the terminal raises questions regarding vehicular access and parking, if required. Other considerations at the Hilton Pier site include impacts on existing recreation and noise.

CONSULTATION

Consultation on the Intraisland Ferry System project is being pursued through the Intraisland Ferry Task Force comprised of various governmental and community representatives. A public information/education presentation was also prepared for display at various public locations. These consultation efforts are summarized in Tables 1 and 2.

Public comments were also solicited on the Oahu Intraisland Ferry System Draft Environmental Impact Statement, pursuant to Chapter 343, HRS. Availability of the document for public review was published in the OEQC Bulletin on October 8, 1988. All comments received within the public comment period as well as responses to those comments are contained in Part I - Maunalua Bay Terminal. Comments and responses pertaining to the Waikiki Terminal are reproduced herein.

TABLE 1

INTRAISLAND FERRY TASK FORCE MEMBERS
As of July, 1987

	NAME	ORGANIZATION
1.	Edward Uchida	Planner, Department of Transportation-Statewide Transportation Planning Office
2.	Dan Tanaka (Alt.)	Planner, Department of Transportation-Statewide Transportation Planning Office
3.	Adm. E. Alvey Wright	Project Coordinator, Department of Transportation-Statewide Transportation Planning Office
4.	Dennis O'Connor	Councilman, City and County of Honolulu
5.	Robert Dods (Alt.)	Senior Assistant for Councilman O'Conner
6.	Michelle Tucker (Alt.)	Researcher, City Council, City and County of Honolulu
7.	John Emmerson	Chief, Operations Branch, U.S. Army Corps of Engineers
8.	Dave Swenson (Alt.)	Regional Economist, U.S. Army Corps of Engineers
9.	Donna Ikeda	Senator, Hawaii State Legislature
10.	Harry Murakami	Assistant Chief for Engineering, Department of Transportation-Harbors Division
11.	David Yokoyama	Planning Engineer, Department of Transportation-Harbors Division
12.	Ron Tsuzuki	Planning Engineer, Department of Transportation-Highways Division
13.	Kenneth Au (Alt.)	Advance Planning Engineer, Department of Transportation-Highways Division
14.	Libert Landgraf	Deputy Director, Department of Land and Natural Resources
15.	Michael Yoshinaga (Alt.)	Project Coordinator, Department of Land and Natural Resources

16.	Robin Foster	Planner, Department of Land Utilization, City and County of Honolulu
17.	Verne Winquist	Planner, Department of General Planning, City and County of Honolulu
18.	Bill Medeiros (Alt.)	Planner, Department of General Planning, City and County of Honolulu
19.	Don Griffin	Planner, Department of Parks and Recreation, City and County of Honolulu
20.	Jim Ball	Project Manager, Department of Transportation Services, City and County of Honolulu
21.	Marilyn Kali	Public Information Officer, Department of Transportation-Director of Public Relations
22.	Chris Kam (Alt.)	Information Specialist, Department of Transportation-Director of Public Relations

TABLE 2

INTRAISLAND FERRY TASK FORCE MEETING DATES

May 29, 1987
June 6, 1987
June 26, 1987
August 4, 1987
September 4, 1987
November 6, 1987
March 16, 1988

PUBLIC PRESENTATIONS AND INFORMATIONAL MEETINGS

Public Information Meetings

July 1, 1987	Hawaii Kai Rotary
July 27, 1987	Hawaii Kai Neighborhood Board
August 25, 1987	Hawaii Kai Elementary School
January 7, 1988	Makakilo Elementary School
January 14, 1988	Ewa Elementary School
January 31, 1988	Waipahu Elementary School
March 22, 1988	Hawaii Kai Elementary School

Public Exhibitions and Presentations

October 15, 1987	Board of Realtors - City Affairs Comm.
December 1, 1987	Farrington High School. Public Exhibit
Feb. 14-21, 1988	Kahala Mall Shopping Center
February 18, 1988	Hawaiian Canoe Program Advisory Council
February 23, 1988	Hawaii Yacht Club
March 1988	International Order of the Blue Gavel
March thru April 1988	Windward Shopping Mall
April 13, 1988	Waikiki Yacht Club
April 24, 1988	Waikiki Yacht Club
May 14-20, 1988	Pearl Ridge Shopping Center
May 18, 1988	Waterborne Transportation Conference
May 19, 1988	Pacific Congress on Marine Science & Technology

DEPARTMENT OF THE ARMY
U. S. ARMY ENGINEER DISTRICT, HONOLULU
BUILDING 230
FT. SHAFTER, HAWAII 96858-5440

REPLY TO ATTENTION OF:

November 16, 1988

Planning Branch

'88 NOV 21 A11:24

Dr. Marvin Miura
Office of Environmental
Quality Control
465 South King Street, Room 104
Honolulu, Hawaii 96813

Dear Dr. Miura:

Thank you for the opportunity to review the Draft Environmental Impact Statement (DEIS) for the proposed Oahu Intra-island Ferry System. The following comments are offered:

a. The need for a Department of the Army permit is recognized on page C-7 of the DEIS. Operations Branch has participated in pre-application meetings with the Department of Transportation. The Harbors Division should continue to coordinate with Operations Branch regarding permit requirements.

b. The flood zone information presented on page B-10 for the Maunalua Bay Ferry Terminal site is correct. According to the Flood Insurance Study for the City and County of Honolulu, the other sites are located in the following zones: Barbers Point Site, Zone AE (special flood hazard area inundated by the 100-year flood) with base flood elevation of 8 feet MSL; Ewa Site, Zone AE with base flood elevation of 6-7 feet MSL; Waikiki Site, Zone D (areas in which flood hazards are undetermined); Waipahu Site, Zone D and Zone A (special flood hazard area inundated by the 100-year flood, with no base flood elevation determined).

Sincerely,

James S. Nakason
Kisuk Cheung for
Chief, Engineering Division

Copy furnished:

Director
Hawaii State Department
of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813

JOHN WAIHEE
GOVERNOR

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

EDWARD Y. HIRATA
DIRECTOR

DEPUTY DIRECTORS
JOHN K. UCHIMA
RONALD N. HIRANO
DAN T. KOCHI
JEANNE K. SCHULTZ

IN REPLY REFER TO
HAR-EP 2650

December 29, 1988

Mr. Kisuk Cheung, Chief
Engineering Division
Department of the Army
U.S. Army Engineer District, Honolulu
Building 230
Fort Shafter, Hawaii 96858-5440

Attention Planning Branch

Dear Mr. Cheung:

Draft Environmental Impact Statement (DEIS)
for Oahu Intraisland Ferry System - Job H. C. 1694

Thank you for your comments regarding the Department of Army permit and the information on flood zones affecting the Maunalua Bay Ferry Terminal.

We look forward in working with the Operations Branch of your office in the processing of the Department of Army permit for the Maunalua Bay Terminal.

Very truly yours,

Edward Y. Hirata
Director of Transportation

127

JOHN WAIHEE
GOVERNOR OF HAWAII

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

WILLIAM W. PATY, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES
LIBERT K. LANDGRAF
MANABU TAGOMORI
RUSSELL N. FUKUMOTO

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

'88 NOV 28 A11:58

NOV 25 1988

FILE: 89-217
DOC.: 4660E

The Honorable Marvin T. Miura, Ph.D.
Director
Office of Environmental Quality Control
465 South King St., Room 104
Honolulu, Hawaii 96813

SUBJECT: O'ahu Intraisland Ferry System

Dear Dr. Miura:

Thank you for giving our Department the opportunity to comment on this matter. We have reviewed the materials you submitted and have the following comments.

The Draft Environmental Impact Statement (DEIS) has addressed most of the expected impacts of the extensive dredging and construction required at the Maunalua Bay site. Mitigation measures have been proposed to the extent possible to prevent excessive negative effects on an already severely stressed ecological system at that site.

The DEIS states that no adverse impacts are expected at the other terminal sites described, unless activities such as dredging, construction near or in coastal waters, or other shoreline modifications become necessary.

All future activities, including blasting, that may impact aquatic resource values at the proposed terminals should be submitted to the Department for review and the necessary permits obtained.

Potential interference with recreational and commercial fishing should be averted as much as possible and compensated for wherever inevitable, during the operation of ferry routes and terminal facilities.

We note, too, that (according to the DEIS) impacts on whales and green sea turtles are still to be determined, yet those impacts are omitted in "Unresolved Issues" on the "Summary Sheet" of the DEIS. We request that mitigation plans regarding whales and green sea turtles are to be coordinated with both the National Marine Fisheries Service and our Office of Conservation and Environmental Affairs.

The EIS contains detailed information necessary for archaeological/historic sites review only for the Maunalua Bay Beach Park Terminal. As the terminal and support system will be located makai of Kalanianaole Highway on fill lands, we anticipate that there will be "no effect" on significant historic sites.

The Waikiki location has yet to be determined, and, therefore, we cannot assess the expected impact. There are historic sites in Waikiki which might be affected depending on terminal location.

The Downtown Terminal, Airport Terminal and Barber's Point Terminal are making use of existing facilities, and we anticipate no problems.

The Ewa Terminal at Ewa Marina cannot be assessed without more information, which, according to the EIS, will be forthcoming when design plans are completed. This location is within the One'ula Archaeological District (Site 80-12/13-2873) which has been determined eligible for listing on the National Register of Historic Places.

The Waipahu Terminal location intrudes on Site 80-13-9992, the Pearl Harbor Naval Base, a National Historic Landmark site which is listed on the National Register. Coordination with the Navy archaeologist, Dr. Robert J. Hommon, and the State Historic Sites Section is necessary.

Thank you for your cooperation in this matter. Please feel free to call me or Jay Lembeck at our Office of Conservation and Environmental Affairs, at 548-7837, if you have any questions.

Very truly yours,

WILLIAM W. PATY

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION

December 29, 1988

HAR-EP 2653

MEMORANDUM:

TO: The Honorable William W. Paty, Chairperson
Board Of Land and Natural Resources

FROM: Director of Transportation

SUBJECT: DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS) FOR OAHU INTRAISLAND FERRY SYSTEM (RESPONSE TO FILE: 89-217, DOC.: 4660E)

Thank you for your comments on the subject DEIS. We look forward to continued coordination with your department in the development of the Oahu Intraisland Ferry System. We shall be consulting with your staff in the preparation of environmental documents and permit processing as they relate to areas of concern expressed in your letter.

We appreciate the assistance your department has provided us in this most important project. If you have any questions concerning the ferry system please feel free to call Mr. Harry Murakami of our Harbors Division at 548-2535.

Edward Y. Hirata

E. ALVEY WRIGHT, HITECH

"... to study improvements in the transportation of people, goods and information in Hawaii by the application of high technology".

922 Mokulua Drive
Kailua, HI 96734
(808) 262-7464
18 October 1988

Mr. Earl Matsukawa
Wilson Okamoto & Associates
1150 S. King Street
Honolulu, HI 96814

RECEIVED
OCT 19 1988
WILSON OKAMOTO & ASSOCIATES

Dear Sir:

Intraisland Ferry System

Your EIS calls for dredging the entrance channel in Maunalua Bay at Hawaii Kai 50 feet wider than is necessary, leading to increased beach erosion.

The present channel width is 100 feet or less, allowing 50 feet for passage in each direcion. Two ferries will never be in the entrance channel at the same time. If one way is increased from 50 to 100 feet, a total channel width of 150 feet is quite adequate for a fishing boat and ferry to pass going in opposite directions. There is no standard for Surface Effect Ships (SES). The EIS width of 200 feet might be needed for a Hovercraft but not for an SES air-cushion ferry.

Additionally, no mention is made in the EIS of the need for a navigational range for the entrance channel, like the range into Kewalo Basin. A navigational range is required at Maunalua Bay for both fishing craft and ferries.

Additionally, a specific alternative location for the Waikiki terminal, outside the Ala Wai and Hilton,area is not evaluated. Please treat Kewalo Basin, on a not-to-interfere basis with fishing craft, to thesame extent as Honolulu Harbor and Barbers Point Harbor.

Additionally, evaluation of ferry impact along the route omits the possible hazard to surfers and rough water swimmers, and possible interference with outrigger canoes and sailing craft.

Additionally, the environmental impact of rough water on passengers on board the SES ferry is not considered. This issue of seasickness is paramount to the success of mass transit by ferry.

Your responses to the above will be appreciated.

Aloha,

E. Alvey Wright

E. Alvey Wright
Rear Admiral, USN(Ret)

JOHN WAIHEE
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION

EDWARD Y. HIRATA
DIRECTOR

DEPUTY DIRECTORS
JOHN K. UCHIMA
RONALD N. HIRANO
DAN T. KOCHI
JEANNE K. SCHULTZ

IN REPLY REFER TO

December 29, 1988 HAR-EP 2659

Admiral E. Alvey Wright, HITech
922 Mokulua Drive
Kailua, Hawaii 96734

Dear Admiral Wright:

Draft Environmental Impact Statement (DEIS)
for Oahu Intraisland Ferry System

Thank you for your letter of October 18, 1988 and your comments on the subject project. In response we offer the following comments:

1. Based on the findings of the numerical model of the proposed channel, erosion at Maunalua Bay will not necessarily be reduced by dredging a narrower channel. However, due to significant public concern expressed about potential construction-related impacts associated with the ferry channel proposed in the DEIS, the DOT Harbors Division has decided to reduce the depth of the channel to a uniform 9 feet. This change is reflected in the Final EIS for the project.

2. We agree that no standard for channel width specific to Surface Effect Ships (SES) exists. The recommendation for channel width was made in consideration of vessel beam, maneuvering lane width, ship to ship and bank clearances as provided in the Harbors Design Manual 26.1 (Department of the Navy, Naval Facilities Engineering Command, 1981).

3. The Final EIS will be revised to note that navigational aids will be installed to comply with standards of the Harbors Division and the U. S. Coast Guard.

4. Development of a ferry terminal at Kewalo Basin was not mentioned in the DEIS. Should development of a terminal at Kewalo Basin be pursued, a supplemental environmental assessment or environmental impact statement will be required.

5. The potential ferry impacts on rough water swimming areas, surfing sites, and other heavily used recreational areas are discussed on page D-14 of the DEIS.

6. The effect on passengers of traversing rough water is not considered an environmental impact of the project. The sea kindliness of the vessel is discussed on page A-13, describing the vessel to be used.

I hope we have satisfactorily responded to your comments. If you have any questions, please feel free to contact Mr. Harry Murakami of the Harbors Division at 548-2535.

Very truly yours,

Edward Y. Hirata
Director of Transportation

SAN DIEGO • SHIPBUILDING & REPAIR, INC.

11 November, 1988

Mr. David K. Higa
Chief, Harbors Division
Department of Transportation
79 South Nimitz Hwy
Honolulu, Hawaii. 96813

Subj: Draft Environmental Impact Statement (EIS) for the Oahu Intraisland Ferry System, comments concerning.

Ref: Your letter dated October 17, 1988 - HAR-EP 1697.

Dear David,

We received your reference letter draft EIS two weeks ago. Please find the following comments pertaining to the subject document as you requested. Our opinions or recommendations are meant to be constructive, but we recognize that we have a limited data base of background to draw upon, so if they disagree with the concensus, please forgive us. We consider the EIS to be a fine document that appears to address the major problems at Maunalau Bay.

SAN DIEGO SHIPBUILDING & REPAIR, INC.
(619) 691-1091 • Telex No: (910) 240-4387
Foot of F Street • P.O. Box 5058, Chula Vista, California 92010

Item:	Section:	Comment:
1	Cover	We suggest a more encompassing system title for the system as previously suggested which would alter the title of the report to: "Hawaii Ocean Transit System Oahu Intraisland Routes".
2	Maunalua Bay Fig. 4	The pier as shown does not depict the fender system previously recommended by SDSR. The pier we feel might be narrow in way of a gangway that must accommodate the 2 ft. tide plus a reasonable slope for passenger safety as recommended by SDSR. The mooring cleats appear to be small for handling a ship of this size with the maximum possible wind at the worst angle. We feel the dock elevation may be incorrect considering the proposal dredged depth of water at 10 ft. above MLLW.

Page 3:

3	Haunalua Bay A-10 Entrance Channel	SDSR during meetings in Honolulu in Aug/ Sept. 1988, was willing to accept a lesser channel width of 150 ft. versus 200 ft. and a guaranteed channel depth of 9 ft. versus 150 ft. That offer to save Hawaii increased dredging costs still remains with the only caveat that the State will ensure that the 9 ft. depth be periodically maintenance dredged.
4	Haunalua Bay A - 12 Ferry System	Our company's name is SAN DIEGO SHIPBUILDING & REPAIR, INC., not Ship Building or Ship Builders. We request that this minor oversight is corrected in each section of the report and in DOT files if incorrect. Thank you. We also recommend you mention that the next lowest bidder was $15,000,000 (?) more than SDSR to be paid by the State. We feel this will mitigate any vendor greed criticism, as well as possibly encouraging a cooperative effort to make the program a success and finally it shows to the people the creative approach their State officials took to

Page 4:

	solicit an entrepreneurial solution to a transportation problem, plus saved them $15,000,000.
Vessel A - 12	The ship carries 350 passengers as designed, not 300.
A - 13	The ship has two propulsion engines, not a third engine. There are also, as stated, two lift engines.
A - 13 Para 3	We suggest you add after "monohull" the words "or catamaran". It should be noted that at slow speed, the catamaran style hull (second bidder), produces an enhanced wave wake which severely impacts shore side erosion. San Francisco Bay catamaran ferries and many others are good examples. SDSR's SES will operate on a partial cushion alongside the pier and in the harbor to not only give a more comfortable ride, but also to reduce the wake dramatically. There's less wake at max

Page 5:

speed than at slower speeds but all conditions surpass equivalent monohull or catamarans.

A - 13 Para 5 — Add after "transportation." The ferry operator also offers a "dial-a-ferry" phone service that gives continuous recording of schedules, sea conditions and special fare promotions".

A - 13 Para 7 — It is our understanding that Maunalua Bay will not necessarily be the first terminal. Should that be stated here or is it best to keep to the original schedule for EIS purposes??

A - 13 Para 8 — Add after "Pier 13" the words "and 14". SDSR in it's bid document and subsequently have requested use of piers 12 (parking), pier 13 maintenance and repair and pier 14 commercial operations which was approved by DOT.

A - 14 Para 1 — The bid allows for a minimum number of runs as stated. However, the vessels speeds permits 7 trips from 6 a.m. to 9 a.m. if commuter use approaches maximum

Page 6:

capacity 2,450 possible passengers. This capacity should be stated and analyzed.

A - 14 Para 2 — Suggest a clarification which may or may not be appropriate here. Based on the comment Pg. A14, Para 1, the capacity of the service clearly exceeds the minimum commuter schedule required. As stated, the use by tourists would be generally in a direction opposite to commuters thus not creating a booking or conflict with commuter issue.

5. Maunalua Bay B - 8 Para 6 — Pure opinion - we think this very important paragraph about dredging and erosion should be amplified to ensure the reader is understanding the complex theory that is being presented.

6. D - 7 Flora & Fauna Para 2 — It is suggested that the ferry operator take a "detour" to avoid the turtles. SDSR requests information as to the extent of this "detour" as it would possibly affect schedule.

Page 7:

7. D - 8 Whales Para 3

The report makes the point that there were three incidents of hitting whales in three years. On its face a remarkable record. It might also be investigated to see if out of the millions of hours of boat operation in Hawaiian waters, whether even the 3 incidents were accidents. Possibly the collisions were due to dive charter boats who were chasing the whales for the price of whale watching or just curiosity. If those incidents were partially deliberate, then all the comments about whales could be significantly mitigated.

D - 14 Noise

The noise issue has been a great concern to residents. To give this emotional topic one paragraph of explanation, we believe is too little. One letter after the EA said the boat selected was a "Hovercraft". The hovercraft as we all know is an extremely noisy vessel. This point should be responded to and

Page 8:

clarified. We believe that the one comparison given in the report has been to compare traffic noise to the ferry. The residents don't like traffic noise any better than they perceive the potential ferry noise. In the technical literature there are numerous less combatative comparisons, which we suggest be used to show how quiet this boat is at slow speeds at the distances of sound mitigation from the closest residence. We feel comparisons to "room noise" or distinguishing ferry noise from normal household sounds be used.

9. D - 21 Impacts

This may not be the correct area for this comment, but doesn't the ferry service contribute to certain emergency evacuation measures during tsunamis or hurricane warnings versus a congested highway under construction? Shouldn't this be noted?

10. E - 2 Task Force

SDSR requests membership on the permanent task force for all the ferry terminal sites. As the ferry

Page 9:

system operator, we feel our knowledge and experience would contribute to the task forces mission significantly.

11. E - 6 Preparation Comments

Some of the comments we feel have not been addressed in the new EIS from the EA comments.

a) Operations of the systems is still sketchy and mysterious. The operation is, more efficient, more reliable and cheaper than the previous hydrofoils much less any other US based ferries. Lets not be bashful, lets be proud and let the public know.

b) Whale issue needs better history and facts as previously stated.

c) The SES ferry design precludes typical ship oil product leakage. Portable oil

Page 10:

booms could be positioned on certain sensitive routes if absolutely necessary.

d) Shouldn't there be a comparison to large yachts now in Hawaii Kai as to wake, noise etc. to eliminate the large commercial vessel image?

e) Noise concerns previously questioned should be addressed in a forthright way.

12. Appendices Appendix A Reduction in Assumption

Ferry capacity is understated so therefore the analysis is likewise understated. At 80% capacity, 7 departures (maximum), the car reduction would be 211 cars/departure or 1,479 cars per a.m. or stated differently one lane of traffic is eliminated according to federal DOT highway guidelines. This calculation yields a significant reduction at 11.4 percent versus the EIS reports 5.6 percent. The p.m. reduction would be 13.2 percent versus 6.5 percent in the EIS report.

Page 11:

13.	Overall Comment	Those comments changed in the Maunalua Bay section noted previously should be changed in the entire report where applicable (several sections are repeated under each terminal).
14.	Waikiki 1 Project Description	Should Fort DeRusy be mentioned here as an alternative site to the Hilton as it was originally stated in the invitation for bid?
15.	Remainder of Ferry Terminals General	The discussions we suppose are purposely sketchy and incomplete. Will there need to be amplified data on Maunalua Bay or are they all right as written???
16.	Barbers Point	Is the ferry terminal located properly on the sketch. We understand the terminal would be in the inner harbor??

Page 12:

I look forward to your consultants feedback on the above comments. Once again we only wish to help the process if we can.

Respectfully,

W.T.Gurnee,
President.
WTG/mlg
sdsbl/m/environ.imp

cc: Mr. Carl Matsukawa
Wilson Okamata & Assoc.
Mr. Ed Hirata, Director of Transportation
Mr. Ed Uchida, Chief Planning Division
Mr. Mike Moynahan, SDSR
Admiral Alvie Wright

JOHN WAIHEE
GOVERNOR

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

EDWARD Y. HIRATA
DIRECTOR

DEPUTY DIRECTORS
JOHN K. UCHIMA
RONALD N. HIRANO
DAN T. KOCHI
JEANNE K. SCHULTZ

IN REPLY REFER TO

December 30, 1988

HAR-EP 2663

Mr. W. T. Gurnee, President
San Diego Shipbuilding and Repair, Inc.
P. O. Box 5058
Chula Vista, CA 92010

Dear Mr. Gurnee:

Draft Environmental Impact Statement (DEIS)
for the Oahu Intraisland Ferry System

Thank you for your comments on the subject DEIS. In response to your comments, we offer the following in the order presented:

1. Cover: The EIS encompasses only the Oahu Intraisland Ferry System. DOT presently has no plans to extend the service beyond the island of Oahu. Should such a service be contemplated in the future, separate environmental documentation will be required.

2. Figure 4: Figure 4 is a conceptual sketch intended to convey the scale of the pier. We are currently proceeding with Engineering design plans of the pier. Your input on the final design of the pier will be welcome.

3. Page A-10: Toward insuring safe simultaneous passage of the ferry vessel and boats typically using the Maunalua Bay channel, the widths presented in the draft EIS shall be maintained. In an effort to minimize the quantity of dredging, associated construction costs, and subsequent environmental impacts, the DOT has opted to reduce channel depth to a uniform 9 feet throughout the channel length. This change in design will be reflected in the final EIS.

4. Page A-12: The EIS will be revised to correct all

references to your company. We do not believe it is appropriate to discuss in the EIS the other bids received. The EIS is intended to disclose the environmental impacts of the project.

Page A-12: Our understanding is that the ship can accommodate 340 people in an airline type seating and an additional 10 people would be accommodated in first class seating. We will note in the Final EIS that the vessel does have an approved passenger capacity of 350 and that the ferry service can be increased to this maximum to meet ridership demands.

Page A-13: The EIS will be revised to describe the propulsion system of the ferry more accurately. We will also insert the term "catamaran" following "monohull" in the final EIS and discuss the "dial-a-ferry" phone service as a feature to be offered by the operator. The Maunalua Bay Ferry Terminal is currently being pursued as the first phase of the Oahu Intraisland Ferry System. The development of any of the other terminals can proceed should development of the Maunalua Bay terminal be delayed or abandoned.

Page A-13: The final EIS shall be revised to reflect usage of pier 14 by the ferry operator.

Page A-14: Each of the vessels will be required to make two runs each to the Downtown Terminal during the 3-hour morning peak period and two runs each to Maunalua Bay during the 3-hour evening peak period. Regardless of the ferry capacity or the direction in which ferry usage by either commuters or tourists may be demanded, the Maunalua Bay terminal will not be used for commercial transport services. Only normal public mass transit use will be permitted. Thus, while tourists may be transported to Maunalua Bay just as they could be through the City's bus system, no commercial bookings of seats will be allowed. Moreover, the terminal may not be used as a transfer area between the ferry and commercial transport services i.e. tour buses.

5. Page B-8: We feel that the draft EIS appropriately addresses erosion in the bay. Should any technical questions arise regarding erosion processes in the bay, we will provide further clarification.

6. Page D-7: The turtle studies contracted by the DOT will assist in determining appropriate ferry routes in and out of Maunalua Bay.

7. Page D-8: The three incidences involving collisions between vessels and whales were investigated by the National Marine Fisheries Service, to determine if the whales were deliberately harassed. Following the investigation, no charges were filed against any of the boat operators.

8. Page D-14: We believe the description of the surface effect ship and its noise rating provide an accurate assessment with respect to potential noise impacts. We will indicate that the perceived noise levels at the nearest residences are for the exterior environment and that noise levels within homes will be considerably lower.

9. Page D-21: The use of the ferry vessel for emergency evacuation has not been discussed to date. We will, however, present your offer for providing such services to the Oahu Civil Defense Agency.

10. Page E-2: The Intraisland Ferry Task Force is intended to promote intergovernmental coordination among represented agencies and organizations. Your expertise will be called upon as deemed necessary to facilitate the Task Force's efforts.

11. a. The EIS is intended to disclose the environmental impacts of a proposed action which, in this case, includes the proposed construction activity and the operation of the vessel proposed for use by the apparent low bidder. The bidding process described in the EIS is assumed to have resulted in the selection of the most cost-efficient ferry alternative from among those offering their services. Any claims comparing features of the SES with other types of craft would extend beyond the officially sanctioned method for selecting the ferry operator.

    b. See response to item No. 7.

    c. We will note the use of portable oil booms as a potential mitigating measure to contain oil spills along sensitive routes.

    d. At a length of 118 feet, the ferry vessel is considerably larger than the largest boats found in the bay. Such boats are generally about 35 feet in length. With respect to wake created, we will clarify on page

D-12 that the SES would create less wake than the largest boats which typically operate in Maunalua Bay.

    e. See response to item No. 8 (Page D-14).

12. Appendices: The traffic reduction assessment shall be revised in the Final EIS to reflect the approved passenger capacity of 350 persons.

13. Any changes made to general statements pertinent to all of the terminals will be uniformly revised.

14. The Port DeRussy terminal, as identified in the bid document, and the Hilton Pier are the same. There are no other ferry terminal sites being considered for this area.

15. There was no purposeful intent to providing abbreviated descriptions of the terminal sites at Waikiki, the Airport, Waipahu, Ewa Marina and Barbers Point. Currently, there is inadequate information on the nature of improvements that will be required for the terminals and how construction may affect the respective environments. As we noted, supplemental environmental documents may be required for each of the terminal sites except Maunalua Bay. The EIS fully addresses the environmental impacts of the Maunalua Bay ferry terminal and no further environmental documentation will be required for that site.

16. In the text relating to the Barbers Point Harbor Terminal, we do not limit siting to any particular location within the harbor. While the inner harbor is currently the choice for a ferry terminal, the option of locating it elsewhere has not been foreclosed.

We hope we have satisfactorily responded to your comments. If you have any questions, please feel free to contact Mr. Harry Murakami of the Harbors Division at 548-2535.

Very truly yours,

Edward Y. Hirata
Director of Transportation

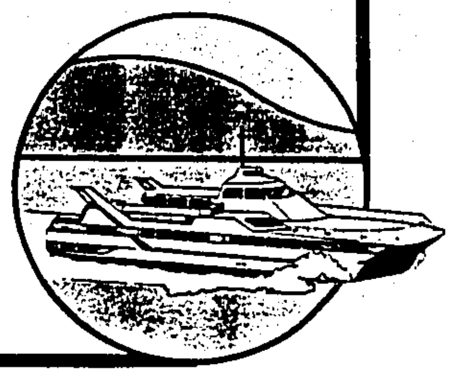
REFERENCES

State of Hawaii Department of Transportation, Draft Environmental Impact Statement Improvements at Ala Wai Boat Harbor, August 1971.

VTN Pacific, Revised Environmental Impact Statement for the Ala Moana Canal, January 1981.

Part IV

Airport Terminal



PREFACE

The Department of Transportation (DOT), State of Hawaii is proposing to establish an intraisland ferry system serving the southern coastline of Oahu. Seven terminals are planned from Hawaii Kai to Barbers Point:

- Hawaii Kai in the vicinity of Maunalua Bay Beach Park;
- Downtown at Pier 8 of Honolulu Harbor, with a ferry maintenance facility at Piers 13 and 14;
- Waikiki, in the vicinity of the Ala Wai Boat Harbor and the Hilton Pier;
- Keehi Lagoon, at the South Ramp of Honolulu International Airport;
- Waipahu, at the head of Middle Loch of Pearl Harbor;
- Ewa, at the proposed Ewa Marina Development; and,
- Barbers Point, at the Barbers Point Deep Draft Harbor.

This environmental impact statement is prepared pursuant to Section 343-5, Hawaii Revised Statutes, defining actions subject to environmental impact statement requirements. Specifically, various components of the project will involve the use of State funds and State-owned land, the State Conservation District and shoreline area as defined by Section 205-31, Hawaii Revised Statutes.

In compliance with Section 11-200-7 (Administrative Rules, Department of Health (DOH)), the proposed intraisland ferry system is herein assessed as a phased agency action treated as a single action. Inasmuch as siting and designing of facilities for the various individual ferry terminals are proceeding incrementally, this EIS is comprised of seven parts, one for each of the seven planned terminals, and based on the current information available for each.

Commensurate with information currently available, each part complies with the content requirement of Section 11-200-17 (Administrative Rules, DOH). Terminals for which site selection and design have been completed are assessed in greater detail. As the remaining terminals are sited and designed, supplemental environmental assessments or, if deemed necessary, supplemental environmental impact statements shall be prepared for the individual ferry terminals.

TABLE OF CONTENTS

SUMMARY SHEET

AIRPORT FERRY TERMINAL AT KEEHI LAGOON

Project Description: The State Department of Transportation, Harbors Division proposes to develop a ferry terminal at the Honolulu International Airport in the area known as South Ramp on the banks of Keehi Lagoon. The landward area is planned for development of aviation related uses by the State Department of Transportation, Airports Division while a marina has been proposed for the shorefront area by the Harbors Division. The specific site of the ferry terminal within this general area and its design have yet to be determined.

Potential Impacts: Potential environmental impacts of developing and operating the ferry terminal will be negligible within the context of the existing, planned and proposed developments in the area. Coordination with appropriate State agencies will be pursued to assure compatibility of uses.

Alternatives Considered: Alternative locations for the terminal within the South Ramp/Keehi Lagoon developments and its design, including any supporting facilities have yet to be determined and assessed.

Unresolved Issues: Location and design of the ferry terminal and have yet to be determined. No significant unresolved issues have been identified. Through coordination with the appropriate State agencies, compatibility among existing, planned and proposed uses at South Ramp and Keehi Lagoon can be assured.

Compatibility with Plans and Policies: The Oahu Intraisland Ferry System is compatible with the Hawaii State Plan, the State Transportation Functional Plan, and the City and County of Honolulu General Plan. The ferry terminal is also a compatible use with respect to the City and County of Honolulu Development Plan Land Use Map. Compatibility with the <u>Ke'ehi Lagoon Recreation Plan</u> will be pursued through coordination with the appropriate agencies of the

Department of Transportation Harbors Division and Airports Division.

Required Permits and Approvals:

Permits for development of the ferry terminal will likely include those for both shoreside improvements and those extending into the water. Shoreside improvements may required rezoning in addition to a City and County of Honolulu Special Management Area permit and, if the improvements will lie within 40 feet of the shoreline, a Shoreline Setback Variance, also from the City and County of Honolulu. Improvements extending into the water will likely require a Department of the Army permit with certification by the Hawaii Coastal Zone Management Program and 401 Water Quality Program, State Conservation District Use Application, and a State Permit for Work in Shore and Shorewaters.

PROPOSED PROJECT

PROJECT NEED

Transit systems for the Island of Oahu are envisioned to be comprised of three modes: bus, water and rail. Mass transit by water is the only alternative which can relieve traffic congestion on the existing highway system without large investment in infrastructure.

From Hawaii Kai in East Honolulu to downtown Honolulu, only Kalanianaole Highway provides direct access as it passes through and alongside residential areas. Already heavily congested during commuting hours, the highway will be reconstructed over a period of about eight years during which congestion will be exacerbated. Paralleling the highway is the ocean, which offers the opportunity for development of an alternative water route.

From fast-growing West Honolulu, Interstate Route H-1 and other highways must loop around Pearl Harbor, because neither a bridge nor a tunnel across the entrance channel is feasible. Eight eastbound freeway lanes converge into three at Middle Street, well short of downtown Honolulu. An ocean ferry route would by-pass Pearl Harbor and the highway bottleneck from Middle Street into Downtown.

From Honolulu International Airport to Waikiki, the most direct route is along Nimitz Highway, which is less than scenic and has resisted aesthetic upgrading. An ocean route, with Diamond Head off the bow, will be far more in keeping with the desired first impression of Hawaii for visitors.

FERRY TERMINAL

<u>Location</u>. Keehi Lagoon is a sheltered embayment located approximately midway between Pearl Harbor and Honolulu Harbor. It is a triangle-shaped body of water bordered by a shallow fringing reef flat to the south, Honolulu International Airport, including the Reef Runway, to the

CORRECTION

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

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Location. Keehi Lagoon is a sheltered embayment located approximately midway between Pearl Harbor and Honolulu Harbor. It is a triangle-shaped body of water bordered by a shallow fringing reef flat to the south, Honolulu International Airport, including the Reef Runway, to the west and Sand Island to the east. The proposed ferry terminal site is on the makai side of Lagoon Drive. See Figure 1.

The entire site and most of the perimeter shoreline is owned by the State of Hawaii. Governor's Executive Order (G.E.O) No. 3202 sets aside the majority of the lagoon water area under the management and control of the DOT, Airports and Harbors Division; G.E.O. No. 3201 sets aside airport lands under the management of the DOT Airports Division; G.E.O. No. 2704 sets aside Sand Island park shoreline under the management and control of the Department of Land and Natural Resources; and G.E.O. Nos. 2526 and 2636 set aside the eastern shoreline along Sand Island Access Road under the management and control DOT, Harbors Division.

<u>Improvements</u>. The improvements required for the Airport ferry terminal have yet to be determined. Depending on the site selected, offshore dredging and shoreside improvements may be required.

<u>FERRY SYSTEM</u>

<u>Operation</u>. Operation of the Intraisland Ferry System is being pursued through a bid procedure to qualified private operators. The contract to be awarded will be for a twenty year term. Under the contract, the operator is required to provide commuter transit service during the morning and evening peak traffic periods between the Maunalua Bay terminal in Hawaii Kai and the Downtown terminal at Pier 8 in Honolulu Harbor, at a fare not greater than $2.50 one-way for residents with a valid Hawaii drivers license. Toward subsidizing this service, the DOT will design, secure necessary government approvals, and construct the ferry terminals. The operator would be permitted to engage in commercial revenue generating operations during hours the commuter transit service is not in operation. He would be permitted to use the DOT's ferry terminals for such operations, except that he would not be allowed to use the Maunalua Bay terminal and the Ala Wai Boat Harbor, should a terminal be sited there.

Construction of the improvements to the Downtown terminal are anticipated to be completed by December, 1989. Piers 13 and 14 at Honolulu Harbor will be used for vessel berthing and maintenance. Additional ferry terminals in the intraisland system will be developed depending on the availability of funding and approval of necessary permits. The ferry system will serve the seven intraisland terminals as they become operational. The schedule and routes for the ferry system have yet to be determined.

<u>Vessel</u>. The vessel proposed for use by the apparent low-bid ferry operator is a "surface effect ship" which rides on a cushion of air. The vessel is 118 feet long and has a beam width of 38 feet. It has a capacity of approximately 350 passengers and an estimated speed of 42 knots (48 mph).

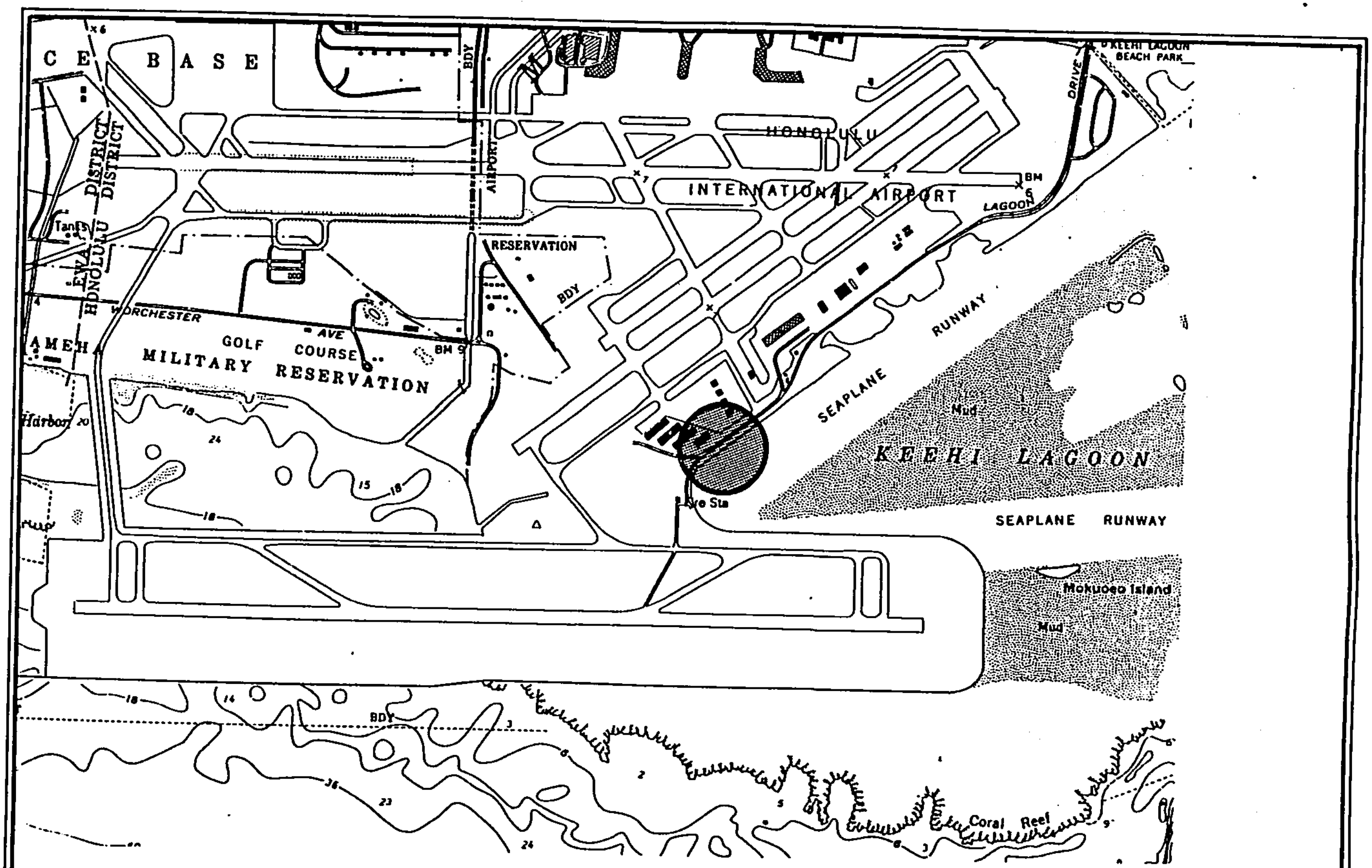


Figure 1
AIRPORT TERMINAL
Intra-Island Ferry System

Prepared for:
DEPARTMENT OF TRANSPORTATION, HARBORS DIVISION
Prepared by:
WILSON OKAMOTO & ASSOCIATES, INC.

Two engines power fans maintaining the air cushion which is contained under the craft by two solid walls on either side and by curtains fore and aft. The air cushion can be adjusted by an on-board computer to allow the ship to ride higher within wave troughs and lower over wave crests. This provides a smoother ride in rough seas. While riding on the air cushion, the ship has a draft of 1.5 feet. Off cushion, the ship draws 6 feet. Two additional engines power a water jet propulsion system which draws water from beneath the ship and discharges it in two jet streams to propel and steer the ship. There are no propellers in the water. The water jet propulsion and steering system allows the ship to turn 360° within a space 1-1/2 times its length at dead stop.

PROJECT SETTING

HISTORY

In 1925, the Territory of Hawaii acquired Keehi Lagoon and adjacent land for construction of John Rodgers Airport. By 1940, air transportation had grown and the U. S. Congress authorized dredging of Keehi Lagoon to construct seaplane runways. By 1944, the U. S. Navy had completed construction of major airport terminals and the seaplane facilities. Three seaplane runways were constructed. The runways are 1,000 feet wide, 10 feet deep and 2.9, 3.0, and 2.25 miles long. Approximately one third of Keehi Lagoon prior to 1940 became filled land. From that time until now, Keehi Lagoon has remained much as it is with the exception of the construction of the Reef Runway in 1977.

The Reef Runway was constructed to alleviate aircraft noise and safety concerns over metropolitan Honolulu, provide more flexibility for aircraft takeoff and landings, and increase airfield capacity.

EXISTING CONDITIONS

The shoreline areas are filled lands which have been created by major dredging and construction activities. The surface of the fill area is comprised of piles of soil, rock and miscellaneous debris. Surface elevations vary from 0.0 to approximately 20 feet above sea level.

Surface vegetation consists of generally sparse low-lying grasses and weeds.

Keehi Lagoon is presently used for a number of water recreational activities, including canoe racing, water skiing, boating, fishing, jet skiing and parasailing. Jet skiing and parasailing are primarily commercially promoted.

The land area mauka of the existing Lagoon Drive is presently used by aviation support businesses and organizations. The land area makai of

Lagoon Drive was once utilized as a taxiway and docking facility for seaplanes.

ACCESS

Keehi Lagoon can be accessed from Interstate Route H-1 and Nimitz Highway via Lagoon Drive. Lagoon Drive narrows from a four lane, divided roadway to a two lane, undivided roadway. The two lane section, which fronts the proposed terminal site, continues west and terminates approximately 800 feet east of the Reef Runway Fire Station Access Road.

RELATIONSHIP TO PLANS, POLICIES AND PERMITS

PLANS

Hawaii State Plan. The development Oahu Intraisland Ferry System is supported by the State Plan. According to Section 226-17 of the Hawaii State Plan, one of the first stated objectives regarding transportation is "to develop an integrated multi-modal transportation system that services statewide needs and promotes the efficient, economical, safe, and convenient movement of people and goods". Section 226-17 b (11) indicates that this will be achieved through "the use of low-cost, energy efficient, non-polluting means of transportation". The State shall "encourage systems that serve development need of communities".

State Transportation Functional Plan. Development of an intraisland ferry system is also in harmony with the State Transportation Functional Plan Objective which promotes the "development of a balanced, multi-modal statewide transportation system that serves clearly identified social, economic and environmental objectives of the Hawaii State Plan".

General Plan of the City and County of Honolulu. The General Plan of the City and County of Honolulu establishes long-range objectives and policies for guiding both the quantity and quality of future growth in Oahu.

The proposed Intraisland Ferry System will facilitate implementation of the General Plan. It specifically addresses the objective to "create a transportation system which will enable people and goods to move safely, efficiently, and at a reasonable cost; serve all people, including the poor, elderly, and the physically handicapped; and offer a variety of attractive and convenient modes of travel".

Ke'ehi Lagoon Recreational Plan. The Ke'ehi Lagoon Recreation Plan (State of Hawaii Department of Transportation, 1987) updates the 1977 plan to meet newly recognized community needs related to the growth of ocean recreation and commercial development. The updated plan recommends specific site plans for various locations within Keehi Lagoon. The plans include the development of a marina along the east shore of the lagoon where the project site is located. The proposed ferry terminal may be incorporated into the design of the marina facility or it may be auctioned publicly for private development. The Fourteenth State Legislature recently passed a bill which allows the State to contract a private firm to develop commercial, recreational and light industrial activities at the 300 acre site.

LAND USE POLICIES AND ZONING

State Land Use District. Pursuant to Hawaii Land Use Law (Chapter 205, HRS), the State Land Use Commission classifies all lands into four land use districts: urban, agricultural, conservation, and rural. The area along Lagoon Drive is designated "Urban" on the State Land Use District Map. The proposed ferry terminal is permitted under the "Urban" designation.

City and County of Honolulu Development Plan. Eight development plans were established to provide detailed schemes for "implementing and accomplishing the objectives and policies of the General Plan." The development plans guide the desired sequence, patterns and characteristics for future development. The City and County of Honolulu Land Use Development Plan Map designates the site as "Public Facility" under which the ferry terminal is a permitted use.

City and County of Honolulu Land Use Ordinance. The City and County of Honolulu Land Use Ordinance (LUO) regulates land use in accordance with adopted land use policies, including the Oahu General Plan and Development Plan. Under the current Land Use Ordinance, the site is zoned "Industrial I-2" and will likely require rezoning to "Waterfront Industrial I-3 to be accommodated.

SHORELINE AND ENVIRONMENTAL PERMITS

Department of Army Permit. The Department of the Army permit is administered by the U.S. Army Corps of Engineers, Honolulu District under Section 10 of the Rivers and Harbors Act (33 USC 403), Section 404 of the Clean Water Act (33 USC 1344) and Section 103 of the Marine Protection, Research and Sanitation Act of 1972 (33 USC 1413). The permit is required for all work within water of the United States, including ocean and coastal waters, inland and tidal waters, tidal ponds, fishponds, rivers, streams, and adjacent wetlands, perched wetlands, and intermittent streams.

Issuance of the permit is based on an evaluation of the probable impact of the proposed activity on the public interest, reflecting national concern for both protection and utilization of important resources. Factors considered include those relating to: conservation, economics, aesthetics, general environmental concerns, historic values, fish and wildlife values, flood damage prevention, land use, navigation, recreation, water supply, water quality, energy needs, safety, food production and, in general, the needs and welfare of the people.

Portions of the ferry terminal potentially subject to review under the Department of the Army permit would include those improvements extending into the water.

Hawaii Coastal Zone Management Program Federal Consistency Review. Section 307 of the National Coastal Zone Management Act of 1972 (16 U.S.C. 1451 et. seq.) provides for State review of federal actions affecting the coastal zones of States with approved Coastal Zone Management Programs. Hawaii's Coastal Zone Management (CZM) Program, established pursuant to Chapter 205A, HRS was federally approved in 1977. It is administered by the Office of State Planning (OSP).

Among Federal actions subject to review is the issuance of permits, including the Department of the Army Permit, which will be required for improvements extending into the water. Before the permit can be issued, the OSP must determine its consistency with the enforceable policies of the Hawaii CZM Program. These policies encompass broad concerns such as impact on recreational resources, historic and archaeological resources, scenic and open space resources, coastal ecosystems, economic uses, coastal hazards and the management of development.

Section 401 Water Quality Certification. The State Department of Health is charged with the responsibility of establishing and administering a State certification system pursuant to Section 401 of the National Clean Water Act (33 USC 1344) and Section 342-32(13), HRS. Water quality certification is required of any applicant for a Federal license or permit to conduct any activity that may result in any discharge into navigable water. This includes the Department of Army Permit.

Special Management Area (SMA) Permit. The Hawaii Coastal Zone Management Law (Chapter 205A, HRS) charged the Counties with designating and administering Special Management Areas (SMA) along the State's coasts. Any "development", as defined by Law, within the SMA requires an SMA permit, which is administered by the City and County of Honolulu, Department of Land Utilization pursuant to Ordinance No. 84-4.

The project site is located within the SMA boundary and subject to review under the SMA permit procedures.

Shoreline Setback Variance. The State's Shoreline Setback Law, (Chapter 205, HRS) prohibits virtually any development or development-related activity including the removal of sand, rocks, soil, etc. from the shoreline setback area, a 40-foot (20 feet in some areas) strip of land along the shoreline. The Counties, however, are authorized to grant variances for construction that would encroach in the setback area. The City and County of Honolulu, Department of Land Utilization administers this variance under its shoreline setback regulations.

Variances may be granted in consideration of a structure, or activity being in the public interest, hardship to the applicant if the proposed structure or activity is not allowed and the effect a structure or activity would have on natural shoreline processes, particularly with regard to shoreline erosion.

The shoreline variance request can be processed concurrently with the Special Management Area Permit with simultaneous decision-making by the City Council.

The Shoreline Setback Variance may be required for the ferry terminal, depending on the location of proposed improvements.

Conservation District Use Application. Any use of lands, including submerged lands within the State's Conservation District, as established by the State Land Use Commission, is subject to review pursuant to Chapter 183, HRS and Title 13, Chapter 2 of the Department of Land and Natural Resources Regulations. At the terminal site, the area beyond the shoreline, defined as "the upper reaches of the wash of waves, other than storm and tidal waves, usually evidenced by the edge of vegetation growth, or the upper line of debris left by the wash of waves," is subject to review as a use in the "Resource (R) subzone of the State Conservation District (Section 13-2-13, Administrative Rules of the Department of Land and Natural Resources). Approval by the State Board of Land and Natural Resources will be required through a Conservation District Use Application for all dredging and construction beyond the shoreline.

Permit for Work in Shores and Shorewaters. The Shorewaters Permit is administered by the State Department of Transportation pursuant to Section 266-16, HRS and Section 19-42-161, Administration Rules, Department of Transportation, Harbors Division.

This permit is required for any construction, dredging, or filling within the shorewaters of the State, as defined by Chapter 266, HRS. Jurisdiction extends to shores, shorewaters, navigable streams and harbors, belonging to or controlled by the State.

DOT review of this permit is normally conducted via interagency coordination with the Department of Land and Natural Resources on the Conservation District Use Application. The DOT, however, could request an independent review.

Portions of the ferry terminal project subject to review include improvements extending into the water.

PROJECT IMPACTS

SHORT AND LONG TERM IMPACTS

Environmental impacts related to development of the site will be minimized if dredging is unnecessary and terminal facilities are limited in scale. Impacts to recreational activities are not anticipated due to compatibility of the ferry terminal with the proposed marina development at Ke'ehi Lagoon.

ALTERNATIVES

Alternative sites for the ferry terminal at Keehi Lagoon have yet to be identified for consideration. Alternative improvements for ferry docking, passenger servicing, parking and access will also be considered as project planning proceeds.

SHORT-TERM USE VERSUS LONG-TERM PRODUCTIVITY

The proposed project will not have any substantial impact on the long-term productivity of Keehi Lagoon.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Although the labor and materials used to construct the improvements at the Keehi Lagoon terminal site will be irretrievably committed, the facility will be available for future use, without substantial loss of long-term productivity should the proposed use be terminated.

MITIGATION MEASURES

Mitigation measures will be considered in light of project impacts identified as ferry terminal site selection proceeds and it is designed.

UNRESOLVED ISSUES

No significant unresolved issues have been identified. With proper planning, including continued consultation through the Intraisland Ferry Task Force, potential issues and concerns associated with development of the proposed facility will likely be satisfactorily resolved.

CONSULTATION

Consultation on the Intraisland Ferry System project is being pursued through the Intraisland Ferry Task Force comprised of various governmental and community representatives. A public information/education presentation was also prepared for display at various public locations. These consultation efforts are summarized in Tables 1 and 2.

Public comments were also solicited on the *Oahu Intraisland Ferry System* Draft Environmental Impact Statement, pursuant to Chapter 343, HRS. Availability of the document for public review was published in the OEQC Bulletin on October 8, 1988. All comments received within the public comment period as well as responses to those comments are contained in Part I - Maunalua Bay Terminal. Comments and responses pertaining to the Airport Terminal are reproduced herein.

TABLE 1

INTRAISLAND FERRY TASK FORCE MEMBERS
As of July, 1987

	NAME	ORGANIZATION
1.	Edward Uchida	Planner, Department of Transportation-Statewide Transportation Planning Office
2.	Dan Tanaka (Alt.)	Planner, Department of Transportation-Statewide Transportation Planning Office
3.	Adm. E. Alvey Wright	Project Coordinator, Department of Transportation-Statewide Transportation Planning Office
4.	Dennis O'Connor	Councilman, City and County of Honolulu
5.	Robert Dods (Alt.)	Senior Assistant for Councilman O'Conner
6.	Michelle Tucker (Alt.)	Researcher, City Council, City and County of Honolulu
7.	John Emmerson	Chief, Operations Branch, U.S. Army Corps of Engineers
8.	Dave Swenson (Alt.)	Regional Economist, U.S. Army Corps of Engineers
9.	Donna Ikeda	Senator, Hawaii State Legislature
10.	Harry Murakami	Assistant Chief for Engineering, Department of Transportation-Harbors Division
11.	David Yokoyama	Planning Engineer, Department of Transportation-Harbors Division
12.	Ron Tsuzuki	Planning Engineer, Department of Transportation-Highways Division
13.	Kenneth Au (Alt.)	Advance Planning Engineer, Department of Transportation-Highways Division
14.	Libert Landgraf	Deputy Director, Department of Land and Natural Resources
15.	Michael Yoshinaga (Alt.)	Project Coordinator, Department of Land and Natural Resources

16.	Robin Foster	Planner, Department of Land Utilization, City and County of Honolulu
17.	Verne Winquist	Planner, Department of General Planning, City and County of Honolulu
18.	Bill Medeiros (Alt.)	Planner, Department of General Planning, City and County of Honolulu
19.	Don Griffin	Planner, Department of Parks and Recreation, City and County of Honolulu
20.	Jim Ball	Project Manager, Department of Transportation Services, City and County of Honolulu
21.	Marilyn Kali	Public Information Officer, Department of Transportation-Director of Public Relations
22.	Chris Kam (Alt.)	Information Specialist, Department of Transportation-Director of Public Relations

TABLE 2

INTRAISLAND FERRY TASK FORCE MEETING DATES

May 29, 1987
June 6, 1987
June 26, 1987
August 4, 1987
September 4, 1987
November 6, 1987
March 16, 1988

PUBLIC PRESENTATIONS AND INFORMATIONAL MEETINGS

<u>Public Information Meetings</u>

July 1, 1987	Hawaii Kai Rotary
July 27, 1987	Hawaii Kai Neighborhood Board
August 25, 1987	Hawaii Kai Elementary School
January 7, 1988	Makakilo Elementary School
January 14, 1988	Ewa Elementary School
January 31, 1988	Waipahu Elementary School
March 22, 1988	Hawaii Kai Elementary School

<u>Public Exhibitions and Presentations</u>

October 15, 1987	Board of Realtors - City Affairs Comm.
December 1, 1987	Farrington High School Public Exhibit
Feb. 14-21, 1988	Kahala Mall Shopping Center
February 18, 1988	Hawaiian Canoe Program Advisory Council
February 23, 1988	Hawaii Yacht Club
March 1988	International Order of the Blue Gavel
March thru April 1988	Windward Shopping Mall
April 13, 1988	Waikiki Yacht Club
April 24, 1988	Waikiki Yacht Club
May 14-20, 1988	Pearl Ridge Shopping Center
May 18, 1988	Waterborne Transportation Conference
May 19, 1988	Pacific Congress on Marine Science & Technology

United States Department of the Interior
FISH AND WILDLIFE SERVICE
PACIFIC ISLANDS OFFICE
P O BOX 50187
HONOLULU, HAWAII 96850

ES
Room 6307

NOV 22 1988

'88 NOV 25 P12:45

OFC. OF

Dr. Marvin T. Miura, Director
Office of Environmental Quality Control
465 South King Street, Room 104
Honolulu, Hawaii 96813

Re: Draft Environmental Impact Statement, Oahu Intraisland Ferry System, Oahu

Dear Dr. Miura:

We have reviewed the referenced document and offer the following comments for your consideration.

Our primary concern with the proposed project are potential adverse impacts to endangered waterbirds and their habitats from the construction and operation of the ferry system. In particular, the proposed ferry operation in Maunalua Bay may affect the neighboring State of Hawaii's Paiko Lagoon Wildlife Sanctuary; the proposed ferry operation in Keehi Lagoon may disturb foraging endangered Hawaiian Stilt (Himantopus mexicanus knudseni) using the surrounding mudflat habitats; and the proposed Waipahu operation may alter wetlands at Pearl Harbor and affect the Service's Pearl Harbor National Wildlife Refuge, Waiawa Unit. We recommend that detailed supplemental environmental impact statements be prepared prior to the development of the proposed Keehi and Waipahu terminals.

For the proposed Maunalua Bay Terminal, we recommend that silt curtains be deployed across the mouth of the Paiko Lagoon Wildlife Sanctuary to limit the movement of turbid water generated by dredging from entering the lagoon. In addition, oil spill containment equipment should be stored at the terminal facility in the event of an accidental spill associated with the ferry operation. This work should be done in consultation with the Department of Land and Natural Resources.

The National Marine Fisheries Service (NMFS) has expressed concern regarding potential adverse impacts to the threatened green sea turtle (Chelonia mydas) and endangered humpback whale (Megaptera novaeangliae). The recommendations of the NMFS regarding additional studies and measures to protect these species and their habitats should be fully considered and implemented by the applicant.

Re: Oahu Intraisland Ferry System

The Service will review the Department of Army permit application for this project. We appreciate the opportunity to comment.

Sincerely yours,

Ernest Kosaka

Ernest Kosaka
Field Office Supervisor
Environmental Services

cc: NMFS - WPPO
DLNR
DOT

JOHN WAIHEE
GOVERNOR

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

EDWARD Y. HIRATA
DIRECTOR

DEPUTY DIRECTORS
JOHN K. UCHIMA
RONALD N. HIRANO
DAN T. KOCHI
JEANNE K. SCHULTZ

IN REPLY REFER TO
HAR-EP 2651

December 29, 1988

Mr. Ernest Kosaka, Field Office Supervisor,
Environmental Services
United States Department of the Interior
Fish and Wildlife Service
Pacific Islands Office
P. O. Box 50167
Honolulu, Hawaii 96850

Dear Mr. Kosaka:

Draft Environmental Impact Statement (DEIS)
for Oahu Intraisland Ferry System

Thank you for your comments on the subject DEIS. With respect to potential impacts on the Paiko Lagoon Wildlife Sanctuary, we will revise the final EIS to include potential mitigation measures for the deployment of silt curtains across the mouth of Paiko Lagoon. In the event of accidental spillage associated with the ferry vessel operation, we will have oil spilled containment equipment at the terminal site. As you recommended, we shall do this in consultation with the State Department of Land and Natural Resources.

With respect to potential impacts on sea turtles and humpback whales, we will continue to coordinate potential mitigation measures with the National Marine Fisheries Service as stated in our Draft EIS.

We hope we have satisfactorily responded to your comments. If you have any further questions, please contact Mr. Harry Murakami of the Harbors Division at 548-2535.

Very truly yours,

Edward Y. Hirata
Director of Transportation

JOHN WAIHEE
GOVERNOR OF HAWAII

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

WILLIAM W. PATY, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES
LIBERT K. LANDGRAF
MANABU TAGOMORI
RUSSELL N. FUKUMOTO

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

'88 NOV 28 A11:58

NOV 25 1988

FILE: 89-217
DOC.: 4660E

The Honorable Marvin T. Miura, Ph.D.
Director
Office of Environmental Quality Control
465 South King St., Room 104
Honolulu, Hawaii 96813

SUBJECT: O'ahu Intraisland Ferry System

Dear Dr. Miura:

Thank you for giving our Department the opportunity to comment on this matter. We have reviewed the materials you submitted and have the following comments.

The Draft Environmental Impact Statement (DEIS) has addressed most of the expected impacts of the extensive dredging and construction required at the Maunalua Bay site. Mitigation measures have been proposed to the extent possible to prevent excessive negative effects on an already severely stressed ecological system at that site.

The DEIS states that no adverse impacts are expected at the other terminal sites described, unless activities such as dredging, construction near or in coastal waters, or other shoreline modifications become necessary.

All future activities, including blasting, that may impact aquatic resource values at the proposed terminals should be submitted to the Department for review and the necessary permits obtained.

Potential interference with recreational and commercial fishing should be averted as much as possible and compensated for wherever inevitable, during the operation of ferry routes and terminal facilities.

We note, too, that (according to the DEIS) impacts on whales and green sea turtles are still to be determined, yet those impacts are omitted in "Unresolved Issues" on the "Summary Sheet" of the DEIS. We request that mitigation plans regarding whales and green sea turtles are to be coordinated with both the National Marine Fisheries Service and our Office of Conservation and Environmental Affairs.

The EIS contains detailed information necessary for archaeological/historic sites review only for the Maunalua Bay Beach Park Terminal. As the terminal and support system will be located makai of Kalanianaole Highway on fill lands, we anticipate that there will be "no effect" on significant historic sites.

The Waikiki location has yet to be determined, and, therefore, we cannot assess the expected impact. There are historic sites in Waikiki which might be affected depending on terminal location.

The Downtown Terminal, Airport Terminal and Barber's Point Terminal are making use of existing facilities, and we anticipate no problems.

The Ewa Terminal at Ewa Marina cannot be assessed without more information, which, according to the EIS, will be forthcoming when design plans are completed. This location is within the One'ula Archaeological District (Site 80-12/13-2873) which has been determined eligible for listing on the National Register of Historic Places.

The Waipahu Terminal location intrudes on Site 80-13-9992, the Pearl Harbor Naval Base, a National Historic Landmark site which is listed on the National Register. Coordination with the Navy archaeologist, Dr. Robert J. Hommon, and the State Historic Sites Section is necessary.

Thank you for your cooperation in this matter. Please feel free to call me or Jay Lembeck at our Office of Conservation and Environmental Affairs, at 548-7837, if you have any questions.

Very truly yours,

WILLIAM W. PATY

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION

December 29, 1988

HAR-EP 2653

MEMORANDUM:

TO: The Honorable William W. Paty, Chairperson
Board Of Land and Natural Resources

FROM: Director of Transportation

SUBJECT: DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS) FOR OAHU INTRAISLAND FERRY SYSTEM (RESPONSE TO FILE: 89-217, DOC.: 4660E)

Thank you for your comments on the subject DEIS. We look forward to continued coordination with your department in the development of the Oahu Intraisland Ferry System. We shall be consulting with your staff in the preparation of environmental documents and permit processing as they relate to areas of concern expressed in your letter.

We appreciate the assistance your department has provided us in this most important project. If you have any questions concerning the ferry system please feel free to call Mr. Harry Murakami of our Harbors Division at 548-2535.

Edward Y. Hirata

11 November, 1988

Mr. David K. Higa
Chief, Harbors Division
Department of Transportation
79 South Nimitz Hwy
Honolulu, Hawaii. 96813

Subj: Draft Environmental Impact Statement (EIS) for the Oahu Intraisland Ferry System, comments concerning.

Ref: Your letter dated October 17, 1988 - HAR-EP 1697.

Dear David,

We received your reference letter draft EIS two weeks ago. Please find the following comments pertaining to the subject document as you requested. Our opinions or recommendations are meant to be constructive, but we recognize that we have a limited data base of background to draw upon, so if they disagree with the concensus, please forgive us. We consider the EIS to be a fine document that appears to address the major problems at Maunalau Bay.

SAN DIEGO SHIPBUILDING & REPAIR, INC.
(619) 691-1091 • Telex No: (910) 240 4387
Foot of F Street • P.O. Box 5058, Chula Vista, California 92010

Page 2:

Item:	Section:	Comment:
1	Cover	We suggest a more encompassing system title for the system as previously suggested which would alter the title of the report to: "Hawaii Ocean Transit System Oahu Intraisland Routes".
2	Maunalua Bay Fig. 4	The pier as shown does not depict the fender system previously recommended by SDSR. The pier we feel might be narrow in way of a gangway that must accommodate the 2 ft. tide plus a reasonable slope for passenger safety as recommended by SDSR. The mooring cleats appear to be small for handling a ship of this size with the maximum possible wind at the worst angle. We feel the dock elevation may be incorrect considering the proposal dredged depth of water at 10 ft. above MLLW.

Page 3:

3	Maunalua Bay A-10 Entrance Channel	SDSR during meetings in Honolulu in Aug/ Sept. 1988, was willing to accept a lesser channel width of 150 ft. versus 200 ft. and a guaranteed channel depth of 9 ft. versus 150 ft. That offer to save Hawaii increased dredging costs still remains with the only caveat that the State will ensure that the 9 ft. depth be periodically maintenance dredged.
4	Maunalua Bay A - 12 Ferry System	Our company's name is SAN DIEGO SHIPBUILDING & REPAIR, INC., not Ship Building or Ship Builders. We request that this minor oversight is corrected in each section of the report and in DOT files if incorrect. Thank you. We also recommend you mention that the next lowest bidder was $15,000,000 (?) more than SDSR to be paid by the State. We feel this will mitigate any vendor greed criticism, as well as possibly encouraging a cooperative effort to make the program a success and finally it shows to the people the creative approach their State officials took to

Page 4:

	solicit an entrepreneurial solution to a transportation problem, plus saved them $15,000,000.
Vessel A - 12	The ship carries 350 passengers as designed, not 300.
A - 13	The ship has two propulsion engines, not a third engine. There are also, as stated, two lift engines.
A - 13 Para 3	We suggest you add after "monohull" the words "or catamaran". It should be noted that at slow speed, the catamaran style hull (second bidder), produces an enhanced wave wake which severely impacts shore side erosion. San Francisco Bay catamaran ferries and many others are good examples. SDSR's SES will operate on a partial cushion alongside the pier and in the harbor to not only give a more comfortable ride, but also to reduce the wake dramatically. There's less wake at max

Page 5:

speed than at slower speeds but all conditions surpass equivalent monohull or catamarans.

A - 13 Para 5	Add after "transportation." The ferry operator also offers a "dial-a-ferry" phone service that gives continuous recording of schedules, sea conditions and special fare promotions".
A - 13 Para 7	It is our understanding that Maunalua Bay will not necessarily be the first terminal. Should that be stated here or is it best to keep to the original schedule for EIS purposes??
A - 13 Para 8	Add after "Pier 13" the words "and 14". SDSR in it's bid document and subsequently have requested use of piers 12 (parking), pier 13 maintenance and repair and pier 14 commercial operations which was approved by DOT.
A - 14 Para 1	The bid allows for a minimum number of runs as stated. However, the vessels speeds permits 7 trips from 6 a.m. to 9 a.m. if commuter use approaches maximum

Page 6:

capacity 2,450 possible passengers. This capacity should be stated and analyzed.

A - 14 Para 2	Suggest a clarification which may or may not be appropriate here. Based on the comment Pg. A14, Para 1, the capacity of the service clearly exceeds the minimum commuter schedule required. As stated, the use by tourists would be generally in a direction opposite to commuters thus not creating a booking or conflict with commuter issue.
5. Maunalua Bay B - 8 Para 6	Pure opinion - we think this very important paragraph about dredging and erosion should be amplified to ensure the reader is understanding the complex theory that is being presented.
6. D - 7 Flora & Fauna Para 2	It is suggested that the ferry operator take a "detour" to avoid the turtles. SDSR requests information as to the extent of this "detour" as it would possibly affect schedule.

Page 7:

7. D - 8
Whales
Para 3

The report makes the point that there were three incidents of hitting whales in three years. On its face a remarkable record. It might also be investigated to see if out of the millions of hours of boat operation in Hawaiian waters, whether even the 3 incidents were accidents. Possibly the collisions were due to dive charter boats who were chasing the whales for the price of whale watching or just curiosity. If these incidents were partially deliberate, then all the comments about whales could be significantly mitigated.

D - 14
Noise

The noise issue has been a great concern to residents. To give this emotional topic one paragraph of explanation, we believe is too little. One letter after the EA said the boat selected was a "Hovercraft". The hovercraft as we all know is an extremely noisy vessel. This point should be responded to and

Page 8:

clarified. We believe that the one comparison given in the report has been to compare traffic noise to the ferry. The residents don't like traffic noise any better than they perceive the potential ferry noise. In the technical literature there are numerous less combatative comparisons, which we suggest be used to show how quiet this boat is at slow speeds at the distances of sound mitigation from the closest residence. We feel comparisons to "room noise" or distinguishing ferry noise from normal household sounds be used.

9. D - 21
Impacts

This may not be the correct area for this comment, but doesn't the ferry service contribute to certain emergency evacuation measures during tsunamis or hurricane warnings versus a congested highway under construction? Shouldn't this be noted?

10. E - 2
Task Force

SDSR requests membership on the permanent task force for all the ferry terminal sites. As the ferry

Page 9:

system operator, we feel our knowledge and experience would contribute to the task forces mission significantly.

11. E - 6 Preparation Comments

Some of the comments we feel have not been addressed in the new EIS from the EA comments.

a) Operations of the systems is still sketchy and mysterious. The operation is, more efficient, more reliable and cheaper than the previous hydrofoils much less any other US based ferries. Lets not be bashful, lets be proud and let the public know.

b) Whale issue needs better history and facts as previously stated.

c) The SES ferry design precludes typical ship oil product leakage. Portable oil

Page 10:

booms could be positioned on certain sensitive routes if absolutely necessary.

d) Shouldn't there be a comparison to large yachts now in Hawaii Kai as to wake, noise etc. to eliminate the large commercial vessel image?

e) Noise concerns previously questioned should be addressed in a forthright way.

12. Appendices Appendix A Reduction in Assumption

Ferry capacity is understated so therefore the analysis is likewise understated. At 80% capacity, 7 departures (maximum), the car reduction would be 211 cars/departure or 1,479 cars per a.m. or stated differently one lane of traffic is eliminated according to federal DOT highway guidelines. This calculation yields a significant reduction at 11.4 percent versus the EIS reports 5.6 percent. The p.m. reduction would be 13.2 percent versus 6.5 percent in the EIS report.

Page 11:

13.	Overall Comment	Those comments changed in the Haunalua Bay section noted previously should be changed in the entire report where applicable (several sections are repeated under each terminal).
14.	Waikiki 1 Project Description	Should Fort DeRusy be mentioned here as an alternative site to the Hilton as it was originally stated in the invitation for bid?
15.	Remainder of Ferry Terminals General	The discussions we suppose are purposely sketchy and incomplete. Will there need to be amplified data on Haunalua Bay or are they all right as written???
16.	Barbers Point	Is the ferry terminal located properly on the sketch. We understand the terminal would be in the inner harbor??

Page 12:

I look forward to your consultants feedback on the above comments. Once again we only wish to help the process if we can.

Respectfully,

W.T.Gurnee,
President.
WTG/mlg
sdsbl/m/environ.imp

cc: Mr. Carl Matsukawa
Wilson Okamoto & Assoc.
Mr. Ed Hirata, Director of Transportation
Mr. Ed Uchida, Chief Planning Division
Mr. Mike Moynahan, SDSR
Admiral Alvie Wright

JOHN WAIHEE
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION

EDWARD Y. HIRATA
DIRECTOR

IN REPLY REFER TO

December 30, 1988 HAR-EP 2663

Mr. W. T. Gurnee, President
San Diego Shipbuilding and Repair, Inc.
P. O. Box 5058
Chula Vista, CA 92010

Dear Mr. Gurnee:

Draft Environmental Impact Statement (DEIS)
for the Oahu Intraisland Ferry System

Thank you for your comments on the subject DEIS. In response to your comments, we offer the following in the order presented:

1. Cover: The EIS encompasses only the Oahu Intraisland Ferry System. DOT presently has no plans to extend the service beyond the island of Oahu. Should such a service be contemplated in the future, separate environmental documentation will be required.

2. Figure 4: Figure 4 is a conceptual sketch intended to convey the scale of the pier. We are currently proceeding with Engineering design plans of the pier. Your input on the final design of the pier will be welcome.

3. Page A-10: Toward insuring safe simultaneous passage of the ferry vessel and boats typically using the Maunalua Bay channel, the widths presented in the draft EIS shall be maintained. In an effort to minimize the quantity of dredging, associated construction costs, and subsequent environmental impacts, the DOT has opted to reduce channel depth to a uniform 9 feet throughout the channel length. This change in design will be reflected in the final EIS.

4. Page A-12: The EIS will be revised to correct all

references to your company. We do not believe it is appropriate to discuss in the EIS the other bids received. The EIS is intended to disclose the environmental impacts of the project.

Page A-12: Our understanding is that the ship can accommodate 340 people in an airline type seating and an additional 10 people would be accommodated in first class seating. We will note in the Final EIS that the vessel does have an approved passenger capacity of 350 and that the ferry service can be increased to this maximum to meet ridership demands.

Page A-13: The EIS will be revised to describe the propulsion system of the ferry more accurately. We will also insert the term "catamaran" following "monohull" in the final EIS and discuss the "dial-a-ferry" phone service as a feature to be offered by the operator. The Maunalua Bay Ferry Terminal is currently being pursued as the first phase of the Oahu Intraisland Ferry System. The development of any of the other terminals can proceed should development of the Maunalua Bay terminal be delayed or abandoned.

Page A-13: The final EIS shall be revised to reflect usage of pier 14 by the ferry operator.

Page A-14: Each of the vessels will be required to make two runs each to the Downtown Terminal during the 3-hour morning peak period and two runs each to Maunalua Bay during the 3-hour evening peak period. Regardless of the ferry capacity or the direction in which ferry usage by either commuters or tourists may be demanded, the Maunalua Bay terminal will not be used for commercial transport services. Only normal public mass transit use will be permitted. Thus, while tourists may be transported to Maunalua Bay just as they could be through the City's bus system, no commercial bookings of seats will be allowed. Moreover, the terminal may not be used as a transfer area between the ferry and commercial transport services i.e. tour buses.

5. Page B-8: We feel that the draft EIS appropriately addresses erosion in the bay. Should any technical questions arise regarding erosion processes in the bay, we will provide further clarification.

6. Page D-7: The turtle studies contracted by the DOT will assist in determining appropriate ferry routes in and out of Maunalua Bay.

7. <u>Page D-8</u>: The three incidences involving collisions between vessels and whales were investigated by the National Marine Fisheries Service, to determine if the whales were deliberately harassed. Following the investigation, no charges were filed against any of the boat operators.

8. <u>Page D-14</u>: We believe the description of the surface effect ship and its noise rating provide an accurate assessment with respect to potential noise impacts. We will indicate that the perceived noise levels at the nearest residences are for the exterior environment and that noise levels within homes will be considerably lower.

9. <u>Page D-21</u>: The use of the ferry vessel for emergency evacuation has not been discussed to date. We will, however, present your offer for providing such services to the Oahu Civil Defense Agency.

10. <u>Page E-2</u>: The Intraisland Ferry Task Force is intended to promote intergovernmental coordination among represented agencies and organizations. Your expertise will be called upon as deemed necessary to facilitate the Task Force's efforts.

11. a. The EIS is intended to disclose the environmental impacts of a proposed action which, in this case, includes the proposed construction activity and the operation of the vessel proposed for use by the apparent low bidder. The bidding process described in the EIS is assumed to have resulted in the selection of the most cost-efficient ferry alternative from among those offering their services. Any claims comparing features of the SES with other types of craft would extend beyond the officially sanctioned method for selecting the ferry operator.

b. See response to item No. 7.

c. We will note the use of portable oil booms as a potential mitigating measure to contain oil spills along sensitive routes.

d. At a length of 118 feet, the ferry vessel is considerably larger than the largest boats found in the bay. Such boats are generally about 35 feet in length. With respect to wake created, we will clarify on page

D-12 that the SES would create less wake than the largest boats which typically operate in Maunalua Bay.

e. See response to item No. 8 (Page D-14).

12. <u>Appendices</u>: The traffic reduction assessment shall be revised in the Final EIS to reflect the approved passenger capacity of 350 persons.

13. Any changes made to general statements pertinent to all of the terminals will be uniformly revised.

14. The Port DeRussy terminal, as identified in the bid document, and the Hilton Pier are the same. There are no other ferry terminal sites being considered for this area.

15. There was no purposeful intent to providing abbreviated descriptions of the terminal sites at Waikiki, the Airport, Waipahu, Ewa Marina and Barbers Point. Currently, there is inadequate information on the nature of improvements that will be required for the terminals and how construction may affect the respective environments. As we noted, supplemental environmental documents may be required for each of the terminal sites except Maunalua Bay. The EIS fully addresses the environmental impacts of the Maunalua Bay ferry terminal and no further environmental documentation will be required for that site.

16. In the text relating to the Barbers Point Harbor Terminal, we do not limit siting to any particular location within the harbor. While the inner harbor is currently the choice for a ferry terminal, the option of locating it elsewhere has not been foreclosed.

We hope we have satisfactorily responded to your comments. If you have any questions, please feel free to contact Mr. Harry Murakami of the Harbors Division at 548-2535.

Very truly yours,

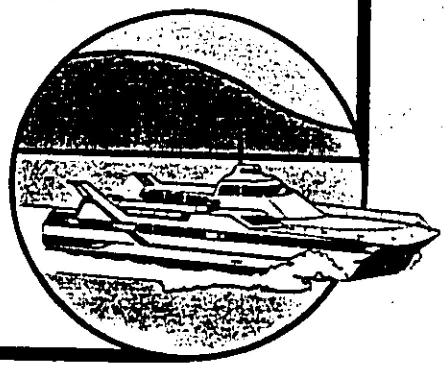
Edward Y. Hirata
Director of Transportation

REFERENCES

Edward K. Noda and Associates and Eugene P. Dashiell, AICP, Ke'ehi Lagoon Recreation Plan Update, January 1988.

Part V

Waipahu Terminal



PREFACE

The Department of Transportation (DOT), State of Hawaii is proposing to establish an intraisland ferry system serving the southern coastline of Oahu. Seven terminals are planned from Hawaii Kai to Barbers Point:

- Hawaii Kai in the vicinity of Maunalua Bay Beach Park;
- Downtown at Pier 8 of Honolulu Harbor, with a ferry maintenance facility at Piers 13 and 14;
- Waikiki, in the vicinity of the Ala Wai Boat Harbor and the Hilton Pier;
- Keehi Lagoon, at the South Ramp of Honolulu International Airport;
- Waipahu, at the head of Middle Loch of Pearl Harbor;
- Ewa, at the proposed Ewa Marina Development; and,
- Barbers Point, at the Barbers Point Deep Draft Harbor.

This environmental impact statement is prepared pursuant to Section 343-5, Hawaii Revised Statutes, defining actions subject to environmental impact statement requirements. Specifically, various components of the project will involve the use of State funds and State-owned land, the State Conservation District and shoreline area as defined by Section 205-31, Hawaii Revised Statutes.

In compliance with Section 11-200-7 (Administrative Rules, Department of Health (DOH)), the proposed intraisland ferry system is herein assessed as a phased agency action treated as a single action. Inasmuch as siting and designing of facilities for the various individual ferry terminals are proceeding incrementally, this EIS is comprised of seven parts, one for each of the seven planned terminals, and based on the current information available for each.

Commensurate with information currently available, each part complies with the content requirement of Section 11-200-17 (Administrative Rules, DOH). Terminals for which site selection and design have been completed are assessed in greater detail. As the remaining terminals are sited and designed, supplemental environmental assessments or, if deemed necessary, supplemental environmental impact statements shall be prepared for the individual ferry terminals.

TABLE OF CONTENTS

SUMMARY SHEET

WAIPAHU FERRY TERMINAL AT MIDDLE LOCH

Project Description: The State Department of Transportation, Harbors Division proposes to develop a ferry terminal at the Waipahu, along the shoreline of Middle Loch of Pearl Harbor near the proposed Waterfront Manor Condominium Project. The specific site of the terminal and its design have yet to be determined.

Potential Impacts: Potential impacts of developing the ferry terminal will depend in large part upon its design requirements. Evironmental impacts are anticipated to be of greater significance if substantial dredging is required. Improvements will require consideration of the proposed residential development and existing wildlife refuge in the vicinity.

Alternatives Considered: Alternative locations for the terminal within the area, as well as access and supporting facilities, have yet to be determined and assessed.

Unresolved Issues: The potential environmental impacts of the development, including those upon the wildlife refuge, access, neighboring landowners and farming tenants the developer of the proposed residential development as well as the University of Hawaii West Oahu Campus and Leeward Community College have yet to be resolved.

Compatibility with Plans and Policies: The Oahu Intraisland Ferry System is compatible with the Hawaii State Plan, the State Transportation Functional Plan, and the City and County of Honolulu General Plan. An amendment to the City and County of Honolulu Development Plan Land Use Map and rezoning will be required to accommodate the ferry terminal.

Required Permits and Approvals: Permits for development of the ferry terminal will likely include those for both shoreside improvements and those extending into the water. Shoreside improvements will likely require rezoning by the City and County of Honolulu. Improvements extending into the water will require the Department of Army permit with certification by the Hawaii Coastal Zone Management Program and 401 Water Quality Program, and the State Permit for Work in Shores and Shorewaters.

PROPOSED PROJECT

PROJECT NEED

Transit systems for the Island of Oahu are envisioned to be comprised of three modes: bus, water and rail. Mass transit by water is the only alternative which can relieve traffic congestion on the existing highway system without large investment in infrastructure.

From Hawaii Kai in East Honolulu to downtown Honolulu, only Kalanianaole Highway provides direct access as it passes through and alongside residential areas. Already heavily congested during commuting hours, the highway will be reconstructed over a period of about eight years during which congestion will be exacerbated. Paralleling the highway is the ocean, which offers the opportunity for development of an alternative water route.

From fast-growing West Honolulu, Interstate Route H-1 and other highways must loop around Pearl Harbor, because neither a bridge nor a tunnel across the entrance channel is feasible. Eight eastbound freeway lanes converge into three at Middle Street, well short of downtown Honolulu. An ocean ferry route would by-pass Pearl Harbor and the highway bottleneck from Middle Street into Downtown.

From Honolulu International Airport to Waikiki, the most direct route is along Nimitz Highway, which is less than scenic and has resisted aesthetic upgrading. An ocean route, with Diamond Head off the bow, will be far more in keeping with the desired first impression of Hawaii for visitors.

FERRY TERMINAL

<u>Location</u>. The proposed Waipahu terminal site is generally located between the Waipio Peninsula and the Pearl City Peninsula, along the shoreline of Pearl Harbor's Middle Loch. See Figure 1.

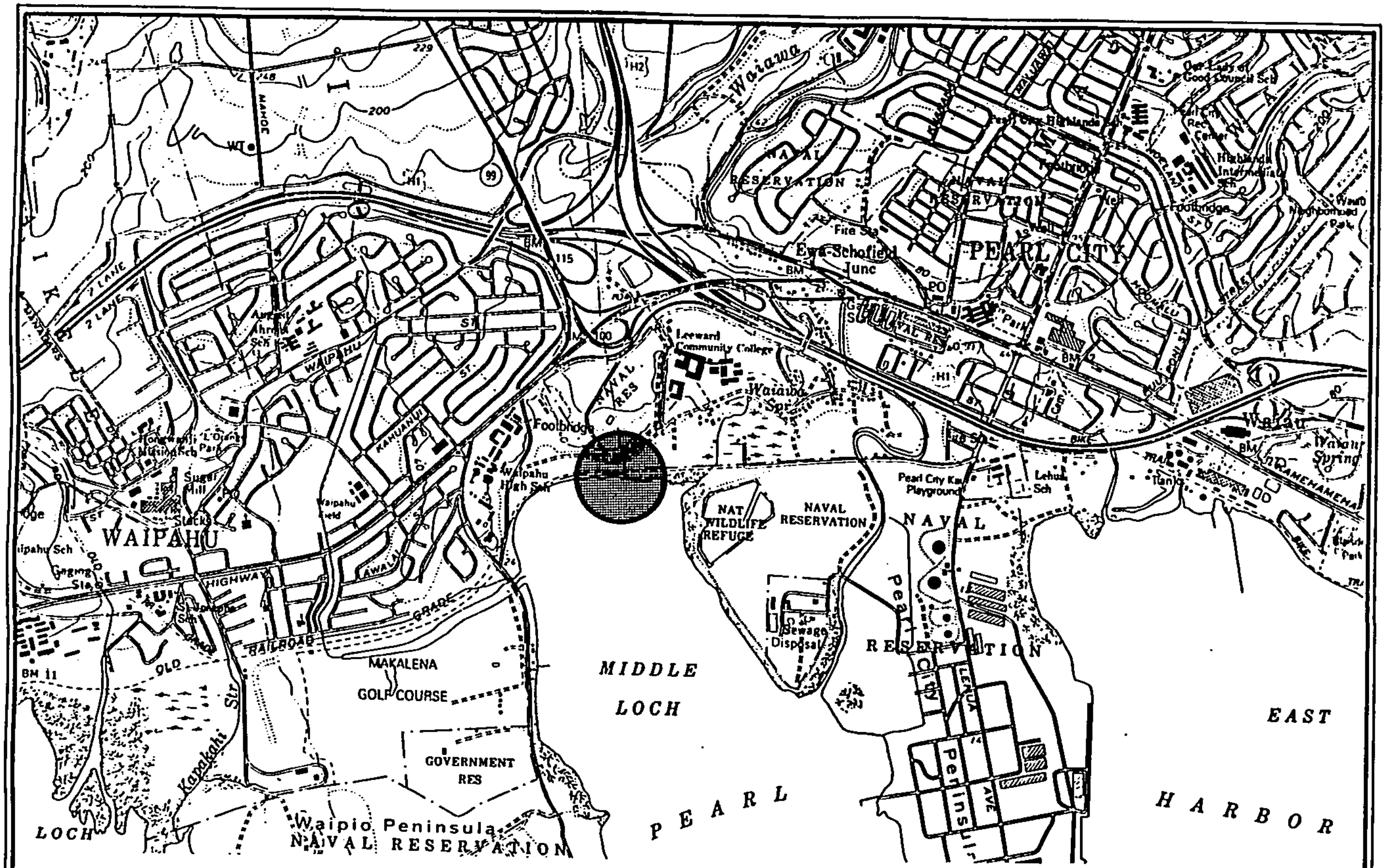


Figure 1

WAIPAHU TERMINAL

Intra-Island Ferry System

Prepared for:
DEPARTMENT OF TRANSPORTATION, HARBORS DIVISION
Prepared by:
WILSON OKAMOTO & ASSOCIATES, INC.

The mauka portion of the site is owned by a private developer who has plans to construct 863 condominium units in five ten-story buildings on the sites. The makai portion is owned by Hawaiian Electric Company.

Improvements. The improvements required for the Waipahu ferry terminal have yet to be determined. Depending on the site selected, offshore dredging and shoreside improvements may be required.

FERRY SYSTEM

Operation. Operation of the Intraisland Ferry System is being pursued through a bid procedure to qualified private operators. The contract to be awarded will be for a twenty year term. Under the contract, the operator is required to provide commuter transit service during the morning and evening peak traffic periods between the Maunalua Bay terminal in Hawaii Kai and the Downtown terminal at Pier 8 in Honolulu Harbor, at a fare not greater than $2.50 one-way for residents with a valid Hawaii drivers license. Toward subsidizing this service, the DOT will design, secure necessary government approvals, and construct the ferry terminals. The operator would be permitted to engage in commercial revenue generating operations during hours the commuter transit service is not in operation. He would be permitted to use the DOT's ferry terminals for such operations, except that he would not be allowed to use the Maunalua Bay terminal and the Ala Wai Boat Harbor, should a terminal be sited there.

Construction of the improvements to the Downtown terminal are anticipated to be completed by December, 1989. Piers 13 and 14 at Honolulu Harbor will be used for vessel berthing and maintenance. Additional ferry terminals in the intraisland system will be developed depending on the availability of funding and approval of necessary permits. The ferry system will serve the seven intraisland terminals as they become operational. The schedule and routes for the ferry system have yet to be determined.

Vessel. The vessel proposed for use by the apparent low-bid ferry operator is a "surface effect ship" which rides on a cushion of air. The vessel is 118 feet long and has a beam width of 38 feet. It has a capacity of approximately 350 passengers and an estimated speed of 42 knots (48 mph).

Two engines power fans maintaining the air cushion which is contained under the craft by two solid walls on either side and by curtains fore and aft. The air cushion can be adjusted by an on-board computer to allow the ship to ride higher within wave troughs and lower over wave crests. This provides a smoother ride in rough seas. While riding on the air cushion, the ship has a draft of 1.5 feet. Off cushion, the ship draws 6 feet. Two additional engines power a water jet propulsion system which draws water from beneath the ship and discharges it in two jet streams to propel and steer the ship. There are no propellers in the water. The water jet propulsion and steering system allows the ship to turn 360° within a space 1-1/2 times its length at dead stop.

PROJECT SETTING

LAND USE

The site is currently undeveloped. Recreational fishing is done from the shoreline. The area is overgrown with trees and shrubs such as kiawe, koa haole, and mangrove.

Land uses surrounding the immediate proposed project site include watercress and ung choi cultivation. Leeward Community College and University of Hawaii West Oahu Campus is located to the northeast, while Waipahu High School is located to the northwest of the proposed site.

The Pearl Harbor National Wildlife Refuge consists of 61 acres of man-made wetland habitat in two separated units on the south shore of Oahu. These units were created in an effort to compensate for loss of stilt feeding habitat when the Reef Runway was constructed. The Waiawa or Pearl City unit (24.5 acres) is located near the east shore of Middle Loch, southwest of the proposed Waipahu Terminal. Nesting islands have been provided. The refuge is managed by the U.S. Fish and Wildlife Service under a use agreement with the U.S. Navy.

The State of Hawaii has established an energy corridor from Campbell Industrial Park to Sand Island for the purpose of providing a right-of-way for transmission of energy-related products. This corridor includes a 100-feet offshore easement from Campbell Industrial Park to Sand Island. The "landside" segment of the corridor runs adjacent to the proposed site and is utilized by GASCO, Chevron and HIRI Refinery.

ACCESS

The major highway system serving the ferry terminal is Farrington Highway. Waipio Access Road leads to a small dirt road along Middle Loch which currently serves as the primary access road to the site.

RELATIONSHIP TO PLANS, POLICIES AND PERMITS

PLANS

Hawaii State Plan. The development Oahu Intraisland Ferry System is supported by the State Plan. According to Section 226-17 of the Hawaii State Plan, one of the first stated objectives regarding transportation is "to develop an integrated multi-modal transportation system that services statewide needs and promotes the efficient, economical, safe, and convenient movement of people and goods". Section 226-17 b (11) indicates that this will be achieved through "the use of low-cost, energy efficient, non-polluting means of transportation". The State shall "encourage systems that serve development need of communities".

State Transportation Functional Plan. Development of an intraisland ferry system is also in harmony with the State Transportation Functional Plan Objective which promotes the "development of a balanced, multi-modal statewide transportation system that serves clearly identified social, economic and environmental objectives of the Hawaii State Plan".

General Plan of the City and County of Honolulu. The General Plan of the City and County of Honolulu establishes long-range objectives and policies for guiding both the quantity and quality of future growth in Oahu.

The proposed Intraisland Ferry System will facilitate implementation of the General Plan. It specifically addresses the objective to "create a transportation system which will enable people and goods to move safely, efficiently, and at a reasonable cost; serve all people, including the poor, elderly, and the physically handicapped; and offer a variety of attractive and convenient modes of travel".

LAND USE POLICIES AND ZONING

State Land Use District. Pursuant to Hawaii Land Use Law (Chapter 205, HRS), the State Land Use Commission classifies all lands into four land use districts: urban, agricultural, conservation, and rural. Lands along

CORRECTION

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

PROJECT SETTING

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Middle Loch are designated "Urban" on the State Land Use District Map. The proposed ferry terminal is permitted under the "Urban" designation.

City and County of Honolulu Development Plan. Eight development plans were established to provide detailed schemes for "implementing and accomplishing the objectives and policies of the General Plan." The development plans guide the desired sequence, patterns and characteristics for future development. The City and County of Honolulu Land Use Development Plan Map designates the site as "Agriculture". A development plan amendment to designate the site as "Public Facility" will be required. The adjacent parcel to the west is designated as "Medium Density Apartment" while the northern parcel is designated "Industrial".

City and County of Honolulu Land Use Ordinance. Under the current Land Use Ordinance, the site is zoned "Apartment A2." Rezoning of will likely be required to accommodate the ferry terminal.

SHORELINE AND ENVIRONMENTAL PERMITS

Department of Army Permit. The Department of the Army permit is administered by the U.S. Army Corps of Engineers, Honolulu District under Section 10 of the Rivers and Harbors Act (33 USC 403), Section 404 of the Clean Water Act (33 USC 1344) and Section 103 of the Marine Protection, Research and Sanitation Act of 1972 (33 USC 1413). The permit is required for all work within water of the United States, including ocean and coastal waters, inland and tidal waters, tidal ponds, fishponds, rivers, streams, and adjacent wetlands, perched wetlands, and intermittent streams.

Issuance of the permit is based on an evaluation of the probable impact of the proposed activity on the public interest, reflecting national concern for both protection and utilization of important resources. Factors considered include those relating to: conservation, economics, aesthetics, general environmental concerns, historic values, fish and wildlife values, flood damage prevention, land use, navigation, recreation, water supply, water quality, energy needs, safety, food production and, in general, the needs and welfare of the people.

Portions of the ferry terminal potentially subject to review under the Department of the Army permit would include those improvements extending into the water.

Hawaii Coastal Zone Management Program Federal Consistency Review. Section 307 of the National Coastal Zone Management Act of 1972 (16 U.S.C. 1451 et. seq.) provides for State review of federal actions affecting the coastal zones of States with approved Coastal Zone Management Programs. Hawaii's Coastal Zone Management (CZM) Program, established pursuant to Chapter 205A, HRS was federally approved in 1977. It is administered by the Office of State Planning (OSP).

Among Federal actions subject to review is the issuance of permits, including the Department of the Army Permit, which will be required for improvements extending into the water. Before the permit can be issued, the OSP must determine its consistency with the enforceable policies of the Hawaii CZM Program. These policies encompass broad concerns such as impact on recreational resources, historic and archaeological resources, scenic and open space resources, coastal ecosystems, economic uses, coastal hazards and the management of development.

Section 401 Water Quality Certification. The State Department of Health is charged with the responsibility of establishing and administering a State certification system pursuant to Section 401 of the National Clean Water Act (33 USC 1344) and Section 342-32(13), HRS. Water quality certification is required of any applicant for a Federal license or permit to conduct any activity that may result in any discharge into navigable water. This includes the Department of Army Permit.

Permit for Work in Shores and Shorewaters. The Shorewaters Permit is administered by the State Department of Transportation pursuant to Section 266-16, HRS and Section 19-42-161, Hawaii Administration Rules, Department of Transportation, Harbors Division.

This permit is required for any construction, dredging, or filling within the shorewaters of the State, as defined by Chapter 266, HRS. Jurisdiction extends to shores, shorewaters, navigable streams and harbors, belonging to or controlled by the State.

DOT review of this permit is normally conducted via interagency coordination with the Department of Land and Natural Resources on the Conservation District Use Application. The DOT, however, could request an independent review.

Portions of the ferry terminal project subject to review include improvements extending into the water.

PROJECT IMPACTS

SHORT AND LONG TERM IMPACTS

Environmental impacts related to development of the site will be less significant if dredging is minimized and terminal facilities are limited in scale. Potential impacts may be associated with the nearby wildlife refuge and the overall change in character of the area from predominantly agricultural use to public facility. The nature and magnitude of impact will be determined as the site for the ferry terminal is determined and it is designed.

ALTERNATIVES

Alternative sites for the ferry terminal at Middle Loch have yet to be identified for consideration. Alternative improvements for ferry docking, passenger servicing, parking and access will also be considered as project planning proceeds.

SHORT-TERM USE VERSUS LONG-TERM PRODUCTIVITY

The tradeoff between the short-term use of the site as a ferry terminal versus the long-term productivity of the area will be determined when the site for the terminal is selected and as its designed.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Labor and materials used to construct the improvements at Middle Loch will be irretrievably committed. Moreover, the agricultural character of the area will be changed by the terminal facility, although this impact will be offset somewhat if the proposed condominium development is implemented. It is unlikely that the site will be fully restored to present conditions.

MITIGATION MEASURES

Mitigation measures will be considered in light of project impacts identified as ferry terminal site selection proceeds and it is designed.

UNRESOLVED ISSUES

Selection of the Waipahu ferry terminal site and its design has yet to be resolved. In general, the area being considered for the terminal raises questions regarding vehicular access and parking, and environmental impacts.

CONSULTATION

Consultation on the Intraisland Ferry System project is being pursued through the Intraisland Ferry Task Force comprised of various governmental and community representatives. A public information/education presentation was also prepared for display at various public locations. These consultation efforts are summarized in Tables 1 and 2.

Public comments were also solicited on the Oahu Intraisland Ferry System Draft Environmental Impact Statement, pursuant to Chapter 343, HRS. Availability of the document for public review was published in the OEQC Bulletin on October 8, 1988. All comments received within the public comment period as well as responses to those comments are contained in Part I - Maunalua Bay Terminal. Comments and responses pertaining to the Waipahu Terminal are reproduced herein.

TABLE 1

INTRAISLAND FERRY TASK FORCE MEMBERS
As of July, 1987

	NAME	ORGANIZATION
1.	Edward Uchida	Planner, Department of Transportation-Statewide Transportation Planning Office
2.	Dan Tanaka (Alt.)	Planner, Department of Transportation-Statewide Transportation Planning Office
3.	Adm. E. Alvey Wright	Project Coordinator, Department of Transportation-Statewide Transportation Planning Office
4.	Dennis O'Connor	Councilman, City and County of Honolulu
5.	Robert Dods (Alt.)	Senior Assistant for Councilman O'Conner
6.	Michelle Tucker (Alt.)	Researcher, City Council, City and County of Honolulu
7.	John Emmerson	Chief, Operations Branch, U.S. Army Corps of Engineers
8.	Dave Swenson (Alt.)	Regional Economist, U.S. Army Corps of Engineers
9.	Donna Ikeda	Senator, Hawaii State Legislature
10.	Harry Murakami	Assistant Chief for Engineering, Department of Transportation-Harbors Division
11.	David Yokoyama	Planning Engineer, Department of Transportation-Harbors Division
12.	Ron Tsuzuki	Planning Engineer, Department of Transportation-Highways Division
13.	Kenneth Au (Alt.)	Advance Planning Engineer, Department of Transportation-Highways Division
14.	Libert Landgraf	Deputy Director, Department of Land and Natural Resources
15.	Michael Yoshinaga (Alt.)	Project Coordinator, Department of Land and Natural Resources

16.	Robin Foster	Planner, Department of Land Utilization, City and County of Honolulu
17.	Verne Winquist	Planner, Department of General Planning, City and County of Honolulu
18.	Bill Medeiros (Alt.)	Planner, Department of General Planning, City and County of Honolulu
19.	Don Griffin	Planner, Department of Parks and Recreation, City and County of Honolulu
20.	Jim Ball	Project Manager, Department of Transportation Services, City and County of Honolulu
21.	Marilyn Kali	Public Information Officer, Department of Transportation-Director of Public Relations
22.	Chris Kam (Alt.)	Information Specialist, Department of Transportation-Director of Public Relations

TABLE 2

INTRAISLAND FERRY TASK FORCE MEETING DATES

May 29, 1987
June 6, 1987
June 26, 1987
August 4, 1987
September 4, 1987
November 6, 1987
March 16, 1988

PUBLIC PRESENTATIONS AND INFORMATIONAL MEETINGS

Public Information Meetings

July 1, 1987	Hawaii Kai Rotary
July 27, 1987	Hawaii Kai Neighborhood Board
August 25, 1987	Hawaii Kai Elementary School
January 7, 1988	Makakilo Elementary School
January 14, 1988	Ewa Elementary School
January 31, 1988	Waipahu Elementary School
March 22, 1988	Hawaii Kai Elementary School

Public Exhibitions and Presentations

October 15, 1987	Board of Realtors - City Affairs Comm.
December 1, 1987	Farrington High School. Public Exhibit
Feb. 14-21, 1988	Kahala Mall Shopping Center
February 18, 1988	Hawaiian Canoe Program Advisory Council
February 23, 1988	Hawaii Yacht Club
March 1988	International Order of the Blue Gavel
March thru April 1988	Windward Shopping Mall
April 13, 1988	Waikiki Yacht Club
April 24, 1988	Waikiki Yacht Club
May 14-20, 1988	Pearl Ridge Shopping Center
May 18, 1988	Waterborne Transportation Conference
May 19, 1988	Pacific Congress on Marine Science & Technology

United States Department of the Interior
FISH AND WILDLIFE SERVICE
PACIFIC ISLANDS OFFICE
P.O. BOX 50167
HONOLULU, HAWAII 96850

ES
Room 6307

NOV 22 1988

'88 NOV 25 P12:45

Dr. Marvin T. Miura, Director
Office of Environmental Quality Control
465 South King Street, Room 104
Honolulu, Hawaii 96813

Re: Draft Environmental Impact Statement, Oahu Intraisland Ferry System, Oahu

Dear Dr. Miura:

We have reviewed the referenced document and offer the following comments for your consideration.

Our primary concern with the proposed project are potential adverse impacts to endangered waterbirds and their habitats from the construction and operation of the ferry system. In particular, the proposed ferry operation in Maunalua Bay may affect the neighboring State of Hawaii's Paiko Lagoon Wildlife Sanctuary; the proposed ferry operation in Keehi Lagoon may disturb foraging endangered Hawaiian Stilt (Himantopus mexicanus knudseni) using the surrounding mudflat habitats; and the proposed Waipahu operation may alter wetlands at Pearl Harbor and affect the Service's Pearl Harbor National Wildlife Refuge, Waiawa Unit. We recommend that detailed supplemental environmental impact statements be prepared prior to the development of the proposed Keehi and Waipahu terminals.

For the proposed Maunalua Bay Terminal, we recommend that silt curtains be deployed across the mouth of the Paiko Lagoon Wildlife Sanctuary to limit the movement of turbid water generated by dredging from entering the lagoon. In addition, oil spill containment equipment should be stored at the terminal facility in the event of an accidental spill associated with the ferry operation. This work should be done in consultation with the Department of Land and Natural Resources.

The National Marine Fisheries Service (NMFS) has expressed concern regarding potential adverse impacts to the threatened green sea turtle (Chelonia mydas) and endangered humpback whale (Megaptera novaeangliae). The recommendations of the NMFS regarding additional studies and measures to protect these species and their habitats should be fully considered and implemented by the applicant.

Re: Oahu Intraisland Ferry System

The Service will review the Department of Army permit application for this project. We appreciate the opportunity to comment.

Sincerely yours,

Ernest Kosaka

Ernest Kosaka
Field Office Supervisor
Environmental Services

cc: NMFS - WPPO
DLNR
DOT

JOHN WAIHEE
GOVERNOR

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

EDWARD Y. HIRATA
DIRECTOR

DEPUTY DIRECTORS
JOHN K. UCHIMA
RONALD N. HIRANO
DAN T. KOCHI
JEANNE K. SCHULTZ

IN REPLY REFER TO
HAR-EP 2651

December 29, 1988

Mr. Ernest Kosaka, Field Office Supervisor,
Environmental Services
United States Department of the Interior
Fish and Wildlife Service
Pacific Islands Office
P. O. Box 50167
Honolulu, Hawaii 96850

Dear Mr. Kosaka:

Draft Environmental Impact Statement (DEIS)
for Oahu Intraisland Ferry System

Thank you for your comments on the subject DEIS. With respect to potential impacts on the Paiko Lagoon Wildlife Sanctuary, we will revise the final EIS to include potential mitigation measures for the deployment of silt curtains across the mouth of Paiko Lagoon. In the event of accidental spillage associated with the ferry vessel operation, we will have oil spilled containment equipment at the terminal site. As you recommended, we shall do this in consultation with the State Department of Land and Natural Resources.

With respect to potential impacts on sea turtles and humpback whales, we will continue to coordinate potential mitigation measures with the National Marine Fisheries Service as stated in our Draft EIS.

We hope we have satisfactorily responded to your comments. If you have any further questions, please contact Mr. Harry Murakami of the Harbors Division at 548-2535.

Very truly yours,

Edward Y. Hirata
Director of Transportation

DEPARTMENT OF THE ARMY
U. S. ARMY ENGINEER DISTRICT, HONOLULU
BUILDING 230
FT. SHAFTER, HAWAII 96858-5440

REPLY TO ATTENTION OF:

November 16, 1988

Planning Branch

'88 NOV 21 A11:24

Dr. Marvin Miura
Office of Environmental
Quality Control
465 South King Street, Room 104
Honolulu, Hawaii 96813

Dear Dr. Miura:

Thank you for the opportunity to review the Draft Environmental Impact Statement (DEIS) for the proposed Oahu Intra-island Ferry System. The following comments are offered:

a. The need for a Department of the Army permit is recognized on page C-7 of the DEIS. Operations Branch has participated in pre-application meetings with the Department of Transportation. The Harbors Division should continue to coordinate with Operations Branch regarding permit requirements.

b. The flood zone information presented on page B-10 for the Maunalua Bay Ferry Terminal site is correct. According to the Flood Insurance Study for the City and County of Honolulu, the other sites are located in the following zones: Barbers Point Site, Zone AE (special flood hazard area inundated by the 100-year flood) with base flood elevation of 8 feet MSL; Ewa Site, Zone AE with base flood elevation of 6-7 feet MSL; Waikiki Site, Zone D (areas in which flood hazards are undetermined); Waipahu Site, Zone D and Zone A (special flood hazard area inundated by the 100-year flood, with no base flood elevation determined).

Sincerely,

James S Nakasone

Kisuk Cheung fw
Chief, Engineering Division

Copy furnished:

Director
Hawaii State Department
of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813

JOHN WAIHEE
GOVERNOR

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

EDWARD Y. HIRATA
DIRECTOR

DEPUTY DIRECTORS
JOHN K. UCHIMA
RONALD N. HIRANO
DAN T. KOCHI
JEANNE K. SCHULTZ

IN REPLY REFER TO
HAR-EP 2650

December 29, 1988

Mr. Kisuk Cheung, Chief
Engineering Division
Department of the Army
U.S. Army Engineer District, Honolulu
Building 230
Port Shafter, Hawaii 96858-5440

Attention Planning Branch

Dear Mr. Cheung:

Draft Environmental Impact Statement (DEIS)
for Oahu Intraisland Ferry System - Job H. C. 1694

Thank you for your comments regarding the Department of Army permit and the information on flood zones affecting the Maunalua Bay Ferry Terminal.

We look forward in working with the Operations Branch of your office in the processing of the Department of Army permit for the Maunalua Bay Terminal.

Very truly yours,

Edward Y. Hirata
Director of Transportation

DEPARTMENT OF THE NAVY
COMMANDER
NAVAL BASE PEARL HARBOR
BOX 110
PEARL HARBOR, HAWAII 96860-5020

IN REPLY REFER TO
11010
Ser 03(09P2)/2861
18 NOV 1988

'88 NOV 21 P12:22

Marvin T. Miura, Ph.D.
Office of Environmental Quality Control
465 S. King Street, Room 104
Honolulu, Hawaii 96813

Dear Dr. Miura:

The Navy has reviewed the Environmental Impact Statement (EIS) for the Oahu Intraisland Ferry System. The Navy has no comments to offer at this time, but will comment on the supplemental documentation for the Waipahu Middle Loch terminal once specific siting and design decisions have been made.

For your information, the Navy is currently working with the State Department of Transportation in formulating a Memorandum of Understanding (MOU) concerning the use of Navy controlled lands and waters during the operation of the ferry system. Elements of the MOU on the operation of the ferry and landing should be mentioned in the supplemental documentation for the Waipahu Middle Loch terminal.

Questions should be addressed to Mr. Bill Liu at 471-3324.

Sincerely,

W. K. LIU
Assistant Base Civil Engineer
By direction of
the Commander

Copy to:
State Department of Transportation
869 Punchbowl Street
Honolulu, HI 96813

JOHN WAIHEE
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION

EDWARD Y. HIRATA
DIRECTOR

IN REPLY REFER TO:

December 27, 1988

HAR-EP 2648

Commander, Naval Base Pearl Harbor
Department of the Navy
Box 110
Pearl Harbor, Hawaii 96860-5020

Attention Mr. W. K. Liu
Assistant Base Civil Engineer

Dear Sir:

Draft Environmental Impact Statement (DEIS) for Oahu Intraisland Ferry System (Response to: 11010 Ser 03 (09P2)/2861)

Thank you for your comments on the subject DEIS. We look forward to continued coordination with your office in the formulation of a Memorandum of Understanding (MOU) concerning the use of Navy-controlled lands and waters by the ferry system. Appropriate elements of the MOU will be incorporated in the environmental documentation for the Waipahu Terminal.

If you have any questions regarding the subject DEIS, please contact Mr. Harry Murakami of the Harbors Division at 548-2535.

Very truly yours,

Edward Y. Hirata
Director of Transportation

127

JOHN WAIHEE
GOVERNOR OF HAWAII

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

WILLIAM W. PATY, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES
LIBERT K. LANDGRAF
MANABU TAGOMORI
RUSSELL N. FUKUMOTO

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

'88 NOV 28 A11:58

NOV 25 1988

FILE: 89-217
DOC.: 4660E

The Honorable Marvin T. Miura, Ph.D.
Director
Office of Environmental Quality Control
465 South King St., Room 104
Honolulu, Hawaii 96813

SUBJECT: O'ahu Intraisland Ferry System

Dear Dr. Miura:

Thank you for giving our Department the opportunity to comment on this matter. We have reviewed the materials you submitted and have the following comments.

The Draft Environmental Impact Statement (DEIS) has addressed most of the expected impacts of the extensive dredging and construction required at the Maunalua Bay site. Mitigation measures have been proposed to the extent possible to prevent excessive negative effects on an already severely stressed ecological system at that site.

The DEIS states that no adverse impacts are expected at the other terminal sites described, unless activities such as dredging, construction near or in coastal waters, or other shoreline modifications become necessary.

All future activities, including blasting, that may impact aquatic resource values at the proposed terminals should be submitted to the Department for review and the necessary permits obtained.

Potential interference with recreational and commercial fishing should be averted as much as possible and compensated for wherever inevitable, during the operation of ferry routes and terminal facilities.

We note, too, that (according to the DEIS) impacts on whales and green sea turtles are still to be determined, yet those impacts are omitted in "Unresolved Issues" on the "Summary Sheet" of the DEIS. We request that mitigation plans regarding whales and green sea turtles are to be coordinated with both the National Marine Fisheries Service and our Office of Conservation and Environmental Affairs.

The EIS contains detailed information necessary for archaeological/historic sites review only for the Maunalua Bay Beach Park Terminal. As the terminal and support system will be located makai of Kalanianaole Highway on fill lands, we anticipate that there will be "no effect" on significant historic sites.

The Waikiki location has yet to be determined, and, therefore, we cannot assess the expected impact. There are historic sites in Waikiki which might be affected depending on terminal location.

The Downtown Terminal, Airport Terminal and Barber's Point Terminal are making use of existing facilities, and we anticipate no problems.

The Ewa Terminal at Ewa Marina cannot be assessed without more information, which, according to the EIS, will be forthcoming when design plans are completed. This location is within the One'ula Archaeological District (Site 80-12/13-2873) which has been determined eligible for listing on the National Register of Historic Places.

The Waipahu Terminal location intrudes on Site 80-13-9992, the Pearl Harbor Naval Base, a National Historic Landmark site which is listed on the National Register. Coordination with the Navy archaeologist, Dr. Robert J. Hommon, and the State Historic Sites Section is necessary.

Thank you for your cooperation in this matter. Please feel free to call me or Jay Lembeck at our Office of Conservation and Environmental Affairs, at 548-7837, if you have any questions.

Very truly yours,

WILLIAM W. PATY

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION

December 29, 1988 HAR-EP 2653

<u>MEMORANDUM</u>:

TO: The Honorable William W. Paty, Chairperson
Board Of Land and Natural Resources

FROM: Director of Transportation

SUBJECT: DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)
FOR OAHU INTRAISLAND FERRY SYSTEM
(RESPONSE TO FILE: 89-217, DOC.: 4660E)

Thank you for your comments on the subject DEIS. We look forward to continued coordination with your department in the development of the Oahu Intraisland Ferry System. We shall be consulting with your staff in the preparation of environmental documents and permit processing as they relate to areas of concern expressed in your letter.

We appreciate the assistance your department has provided us in this most important project. If you have any questions concerning the ferry system please feel free to call Mr. Harry Murakami of our Harbors Division at 548-2535.

Edward Y. Hirata

11 November, 1988

Mr. David K. Higa
Chief, Harbors Division
Department of Transportation
79 South Nimitz Hwy
Honolulu, Hawaii. 96813

Subj: Draft Environmental Impact Statement (EIS) for the Oahu Intraisland Ferry System, comments concerning.

Ref: Your letter dated October 17, 1988 - HAR-EP 1697.

Dear David,

We received your reference letter draft EIS two weeks ago. Please find the following comments pertaining to the subject document as you requested. Our opinions or recommendations are meant to be constructive, but we recognize that we have a limited data base of background to draw upon, so if they disagree with the concensus, please forgive us. We consider the EIS to be a fine document that appears to address the major problems at Maunalau Bay.

SAN DIEGO SHIPBUILDING & REPAIR, INC.
(619) 691-1091 • Telex No. (910) 240-4387
Foot of F Street • P.O. Box 5058, Chula Vista, California 92010

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Item:	Section:	Comment:
1	Cover	We suggest a more encompassing system title for the system as previously suggested which would alter the title of the report to: "Hawaii Ocean Transit System Oahu Intraisland Routes".
2	Maunalua Bay Fig. 4	The pier as shown does not depict the fender system previously recommended by SDSR. The pier we feel might be narrow in way of a gangway that must accommodate the 2 ft. tide plus a reasonable slope for passenger safety as recommended by SDSR. The mooring cleats appear to be small for handling a ship of this size with the maximum possible wind at the worst angle. We feel the dock elevation may be incorrect considering the proposal dredged depth of water at 10 ft. above MLLW.

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3	Maunalua Bay A-10 Entrance Channel	SDSR during meetings in Honolulu in Aug/ Sept. 1988, was willing to accept a lesser channel width of 150 ft. versus 200 ft. and a guaranteed channel depth of 9 ft. versus 150 ft. That offer to save Hawaii increased dredging costs still remains with the only caveat that the State will ensure that the 9 ft. depth be periodically maintenance dredged.
4	Maunalua Bay A - 12 Ferry System	Our company's name is SAN DIEGO SHIPBUILDING & REPAIR, INC., not Ship Building or Ship Builders. We request that this minor oversight is corrected in each section of the report and in DOT files if incorrect. Thank you. We also recommend you mention that the next lowest bidder was $15,000,000 (?) more than SDSR to be paid by the State. We feel this will mitigate any vendor greed criticism, as well as possibly encouraging a cooperative effort to make the program a success and finally it shows to the people the creative approach their State officials took to

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	solicit an entrepreneurial solution to a transportation problem, plus saved them $15,000,000.
Vessel A - 12	The ship carries 350 passengers as designed, not 300.
A - 13	The ship has two propulsion engines, not a third engine. There are also, as stated, two lift engines.
A - 13 Para 3	We suggest you add after "monohull" the words "or catamaran". It should be noted that at slow speed, the catamaran style hull (second bidder), produces an enhanced wave wake which severely impacts shore side erosion. San Francisco Bay catamaran ferries and many others are good examples. SDSR's SES will operate on a partial cushion alongside the pier and in the harbor to not only give a more comfortable ride, but also to reduce the wake dramatically. There's less wake at max

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	speed than at slower speeds but all conditions surpass equivalent monohull or catamarans.
A - 13 Para 5	Add after "transportation." The ferry operator also offers a "dial-a-ferry" phone service that gives continuous recording of schedules, sea conditions and special fare promotions".
A - 13 Para 7	It is our understanding that Haunalua Bay will not necessarily be the first terminal. Should that be stated here or is it best to keep to the original schedule for EIS purposes??
A - 13 Para 8	Add after "Pier 13" the words "and 14". SDSR in it's bid document and subsequently have requested use of piers 12 (parking), pier 13 maintenance and repair and pier 14 commercial operations which was approved by DOT.
A - 14 Para 1	The bid allows for a minimum number of runs as stated. However, the vessels speeds permits 7 trips from 6 a.m. to 9 a.m. if commuter use approaches maximum

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		capacity 2,450 possible passengers. This capacity should be stated and analyzed.
	A - 14 Para 2	Suggest a clarification which may or may not be appropriate here. Based on the comment Pg. A14, Para 1, the capacity of the service clearly exceeds the minimum commuter schedule required. As stated, the use by tourists would be generally in a direction opposite to commuters thus not creating a booking or conflict with commuter issue.
5.	Haunalua Bay B - 8 Para 6	Pure opinion - we think this very important paragraph about dredging and erosion should be amplified to ensure the reader is understanding the complex theory that is being presented.
6.	D - 7 Flora & Fauna Para 2	It is suggested that the ferry operator take a "detour" to avoid the turtles. SDSR requests information as to the extent of this "detour" as it would possibly affect schedule.

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7.	D - 8 Whales Para 3	The report makes the point that there were three incidents of hitting whales in three years. On its face a remarkable record. It might also be investigated to see if out of the millions of hours of boat operation in Hawaiian waters, whether even the 3 incidents were accidents. Possibly the collisions were due to dive charter boats who were chasing the whales for the price of whale watching or just curiosity. If these incidents were partially deliberate, then all the comments about whales could be significantly mitigated.
	D - 14 Noise	The noise issue has been a great concern to residents. To give this emotional topic one paragraph of explanation, we believe is too little. One letter after the EA said the boat selected was a "Hovercraft". The hovercraft as we all know is an extremely noisy vessel. This point should be responded to and

Page 8:

		clarified. We believe that the one comparison given in the report has been to compare traffic noise to the ferry. The residents don't like traffic noise any better than they perceive the potential ferry noise. In the technical literature there are numerous less combatative comparisons, which we suggest be used to show how quiet this boat is at slow speeds at the distances of sound mitigation from the closest residence. We feel comparisons to "room noise" or distinguishing ferry noise from normal household sounds be used.
9.	D - 21 Impacts	This may not be the correct area for this comment, but doesn't the ferry service contribute to certain emergency evacuation measures during tsunamis or hurricane warnings versus a congested highway under construction? Shouldn't this be noted?
10.	E - 2 Task Force	SDSR requests membership on the permanent task force for all the ferry terminal sites. As the ferry

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system operator, we feel our knowledge and experience would contribute to the task forces mission significantly.

11. E - 6 Preparation Comments

Some of the comments we feel have not been addressed in the new EIS from the CA comments.

a) Operations of the systems is still sketchy and mysterious. The operation is, more efficient, more reliable and cheaper than the previous hydrofoils much less any other US based ferries. Lets not be bashful, lets be proud and let the public know.

b) Whale issue needs better history and facts as previously stated.

c) The SES ferry design precludes typical ship oil product leakage. Portable oil

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booms could be positioned on certain sensitive routes if absolutely necessary.

d) Shouldn't there be a comparison to large yachts now in Hawaii Kai as to wake, noise etc. to eliminate the large commercial vessel image?

e) Noise concerns previously questioned should be addressed in a forthright way.

12. Appendices Appendix A Reduction in Assumption

Ferry capacity is understated so therefore the analysis is likewise understated. At 80% capacity, 7 departures (maximum), the car reduction would be 211 cars/departure or 1,479 cars per a.m. or stated differently one lane of traffic is eliminated according to federal DOT highway guidelines. This calculation yields a significant reduction at 11.4 percent versus the EIS reports 5.6 percent. The p.m. reduction would be 13.2 percent versus 6.5 percent in the EIS report.

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13.	Overall Comment	Those comments changed in the Maunalua Bay section noted previously should be changed in the entire report where applicable (several sections are repeated under each terminal).
14.	Waikiki 1 Project Description	Should Fort DeRusy be mentioned here as an alternative site to the Hilton as it was originally stated in the invitation for bid?
15.	Remainder of Ferry Terminals General	The discussions we suppose are purposely sketchy and incomplete. Will there need to be amplified data on Maunalua Bay or are they all right as written???
16.	Barbers Point	Is the ferry terminal located properly on the sketch. We understand the terminal would be in the inner harbor??

Page 12:

I look forward to your consultants feedback on the above comments. Once again we only wish to help the process if we can.

Respectfully,

W.T.Gurney,
President.

WTG/mlg
sdsbl/m/environ.imp

cc: Mr. Earl Matsukawa
Wilson Okamata & Assoc.
Mr. Ed Hirata, Director of Transportation
Mr. Ed Uchida, Chief Planning Division
Mr. Mike Moynahan, SDSR
Admiral Alvie Wright

JOHN WAIHEE
GOVERNOR

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

EDWARD Y. HIRATA
DIRECTOR

DEPUTY DIRECTORS
JOHN K. UCHIMA
RONALD N. HIRANO
DAN T. KOCHI
JEANNE K. SCHULTZ

IN REPLY REFER TO:

December 30, 1988 HAR-EP 2663

Mr. W. T. Gurnee, President
San Diego Shipbuilding and Repair, Inc.
P. O. Box 5058
Chula Vista, CA 92010

Dear Mr. Gurnee:

Draft Environmental Impact Statement (DEIS)
for the Oahu Intraisland Ferry System

Thank you for your comments on the subject DEIS. In response to your comments, we offer the following in the order presented:

1. Cover: The EIS encompasses only the Oahu Intraisland Ferry System. DOT presently has no plans to extend the service beyond the island of Oahu. Should such a service be contemplated in the future, separate environmental documentation will be required.

2. Figure 4: Figure 4 is a conceptual sketch intended to convey the scale of the pier. We are currently proceeding with Engineering design plans of the pier. Your input on the final design of the pier will be welcome.

3. Page A-10: Toward insuring safe simultaneous passage of the ferry vessel and boats typically using the Maunalua Bay channel, the widths presented in the draft EIS shall be maintained. In an effort to minimize the quantity of dredging, associated construction costs, and subsequent environmental impacts, the DOT has opted to reduce channel depth to a uniform 9 feet throughout the channel length. This change in design will be reflected in the final EIS.

4. Page A-12: The EIS will be revised to correct all

references to your company. We do not believe it is appropriate to discuss in the EIS the other bids received. The EIS is intended to disclose the environmental impacts of the project.

Page A-12: Our understanding is that the ship can accommodate 340 people in an airline type seating and an additional 10 people would be accommodated in first class seating. We will note in the Final EIS that the vessel does have an approved passenger capacity of 350 and that the ferry service can be increased to this maximum to meet ridership demands.

Page A-13: The EIS will be revised to describe the propulsion system of the ferry more accurately. We will also insert the term "catamaran" following "monohull" in the final EIS and discuss the "dial-a-ferry" phone service as a feature to be offered by the operator. The Maunalua Bay Ferry Terminal is currently being pursued as the first phase of the Oahu Intraisland Ferry System. The development of any of the other terminals can proceed should development of the Maunalua Bay terminal be delayed or abandoned.

Page A-13: The final EIS shall be revised to reflect usage of pier 14 by the ferry operator.

Page A-14: Each of the vessels will be required to make two runs each to the Downtown Terminal during the 3-hour morning peak period and two runs each to Maunalua Bay during the 3-hour evening peak period. Regardless of the ferry capacity or the direction in which ferry usage by either commuters or tourists may be demanded, the Maunalua Bay terminal will not be used for commercial transport services. Only normal public mass transit use will be permitted. Thus, while tourists may be transported to Maunalua Bay just as they could be through the City's bus system, no commercial bookings of seats will be allowed. Moreover, the terminal may not be used as a transfer area between the ferry and commercial transport services i.e. tour buses.

5. Page B-8: We feel that the draft EIS appropriately addresses erosion in the bay. Should any technical questions arise regarding erosion processes in the bay, we will provide further clarification.

6. Page D-7: The turtle studies contracted by the DOT will assist in determining appropriate ferry routes in and out of Maunalua Bay.

7. Page D-8: The three incidences involving collisions between vessels and whales were investigated by the National Marine Fisheries Service, to determine if the whales were deliberately harassed. Following the investigation, no charges were filed against any of the boat operators.

8. Page D-14: We believe the description of the surface effect ship and its noise rating provide an accurate assessment with respect to potential noise impacts. We will indicate that the perceived noise levels at the nearest residences are for the exterior environment and that noise levels within homes will be considerably lower.

9. Page D-21: The use of the ferry vessel for emergency evacuation has not been discussed to date. We will, however, present your offer for providing such services to the Oahu Civil Defense Agency.

10. Page E-2: The Intraisland Ferry Task Force is intended to promote intergovernmental coordination among represented agencies and organizations. Your expertise will be called upon as deemed necessary to facilitate the Task Force's efforts.

11. a. The EIS is intended to disclose the environmental impacts of a proposed action which, in this case, includes the proposed construction activity and the operation of the vessel proposed for use by the apparent low bidder. The bidding process described in the EIS is assumed to have resulted in the selection of the most cost-efficient ferry alternative from among those offering their services. Any claims comparing features of the SES with other types of craft would extend beyond the officially sanctioned method for selecting the ferry operator.

   b. See response to item No. 7.

   c. We will note the use of portable oil booms as a potential mitigating measure to contain oil spills along sensitive routes.

   d. At a length of 118 feet, the ferry vessel is considerably larger than the largest boats found in the bay. Such boats are generally about 35 feet in length. With respect to wake created, we will clarify on page D-12 that the SES would create less wake than the largest boats which typically operate in Maunalua Bay.

   e. See response to item No. 8 (Page D-14).

12. Appendices: The traffic reduction assessment shall be revised in the Final EIS to reflect the approved passenger capacity of 350 persons.

13. Any changes made to general statements pertinent to all of the terminals will be uniformly revised.

14. The Fort DeRussy terminal, as identified in the bid document, and the Hilton Pier are the same. There are no other ferry terminal sites being considered for this area.

15. There was no purposeful intent to providing abbreviated descriptions of the terminal sites at Waikiki, the Airport, Waipahu, Ewa Marina and Barbers Point. Currently, there is inadequate information on the nature of improvements that will be required for the terminals and how construction may affect the respective environments. As we noted, supplemental environmental documents may be required for each of the terminal sites except Maunalua Bay. The EIS fully addresses the environmental impacts of the Maunalua Bay ferry terminal and no further environmental documentation will be required for that site.

16. In the text relating to the Barbers Point Harbor Terminal, we do not limit siting to any particular location within the harbor. While the inner harbor is currently the choice for a ferry terminal, the option of locating it elsewhere has not been foreclosed.

We hope we have satisfactorily responded to your comments. If you have any questions, please feel free to contact Mr. Harry Murakami of the Harbors Division at 548-2535.

Very truly yours,

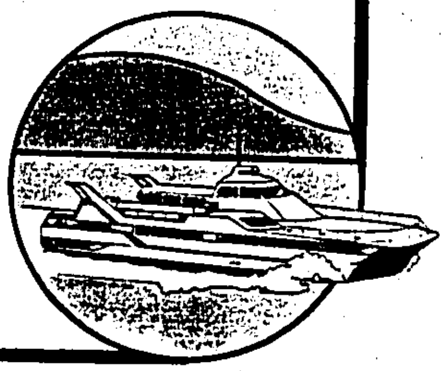
Edward Y. Hirata
Director of Transportation

REFERENCES

Environmental Communications, Final Environmental Impact Statement for the Proposed Waterfront Manor Condominium Project, December 1983.

Part VI

Ewa Terminal



PREFACE

The Department of Transportation (DOT), State of Hawaii is proposing to establish an intraisland ferry system serving the southern coastline of Oahu. Seven terminals are planned from Hawaii Kai to Barbers Point:

- Hawaii Kai in the vicinity of Maunalua Bay Beach Park;
- Downtown at Pier 8 of Honolulu Harbor, with a ferry maintenance facility at Piers 13 and 14;
- Waikiki, in the vicinity of the Ala Wai Boat Harbor and the Hilton Pier;
- Keehi Lagoon, at the South Ramp of Honolulu International Airport;
- Waipahu, at the head of Middle Loch of Pearl Harbor;
- Ewa, at the proposed Ewa Marina Development; and,
- Barbers Point, at the Barbers Point Deep Draft Harbor.

This environmental impact statement is prepared pursuant to Section 343-5, Hawaii Revised Statutes, defining actions subject to environmental impact statement requirements. Specifically, various components of the project will involve the use of State funds and State-owned land, the State Conservation District and shoreline area as defined by Section 205-31, Hawaii Revised Statutes.

In compliance with Section 11-200-7 (Administrative Rules, Department of Health (DOH)), the proposed intraisland ferry system is herein assessed as a phased agency action treated as a single action. Inasmuch as siting and designing of facilities for the various individual ferry terminals are proceeding incrementally, this EIS is comprised of seven parts, one for each of the seven planned terminals, and based on the current information available for each.

Commensurate with information currently available, each part complies with the content requirement of Section 11-200-17 (Administrative Rules, DOH). Terminals for which site selection and design have been completed are assessed in greater detail. As the remaining terminals are sited and designed, supplemental environmental assessments or, if deemed necessary, supplemental environmental impact statements shall be prepared for the individual ferry terminals.

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SUMMARY SHEET

EWA FERRY TERMINAL AT EWA MARINA

Project Description:	The State Department of Transportation, Harbors Division proposes to develop a ferry terminal at the proposed Ewa Marina Community. The specific site of the terminal and its design have yet to be determined.
Potential Impacts:	Potential environmental impacts will be negligible assuming that construction of the proposed Ewa Marina development has been completed.
Alternatives Considered:	Alternative locations for the terminal within the Ewa Marina development and its design, including any supporting facilities have yet to be determined and assessed.
Unresolved Issues:	Location and design of the ferry terminal and coordination with the landowner and developer of the Ewa Marina community have yet to be resolved.
Compatibility with Plans and Policies:	The Oahu Intraisland Ferry System is compatible with the Hawaii State Plan, the State Transportation Functional Plan, and the City and County of Honolulu General Plan. After required land use approvals for the Ewa Marina project are secured, the ferry terminal shall be a compatible use with respect to the State Land Use District, City and County of Honolulu Development Plan Land Use Map and zoning.
Required Permits and Approvals:	Permits for development of the ferry terminal will likely include those for both shoreside improvements and those extending into the water. Shoreside improvements are likely to require a Special Management Area permit and, if the improvements will lie within 40 feet of the shoreline, a Shoreline Setback Variance from the City and County of Honolulu. Improvements extending into the water will likely require a Department of the Army permit with certification by the Hawaii Coastal Zone Management Program and 401 Water Quality Program, a State Permit for Work in Shore and Shorewaters and, depending upon the location of the development, a State Conservation District Use Application.

PROPOSED PROJECT

PROJECT NEED

Transit systems for the Island of Oahu are envisioned to be comprised of three modes: bus, water and rail. Mass transit by water is the only alternative which can relieve traffic congestion on the existing highway system without large investment in infrastructure.

From Hawaii Kai in East Honolulu to downtown Honolulu, only Kalanianaole Highway provides direct access as it passes through and alongside residential areas. Already heavily congested during commuting hours, the highway will be reconstructed over a period of about eight years during which congestion will be exacerbated. Paralleling the highway is the ocean, which offers the opportunity for development of an alternative water route.

From fast-growing West Honolulu, Interstate Route H-1 and other highways must loop around Pearl Harbor, because neither a bridge nor a tunnel across the entrance channel is feasible. Eight eastbound freeway lanes converge into three at Middle Street, well short of downtown Honolulu. An ocean ferry route would by-pass Pearl Harbor and the highway bottleneck from Middle Street into Downtown.

From Honolulu International Airport to Waikiki, the most direct route is along Nimitz Highway, which is less than scenic and has resisted aesthetic upgrading. An ocean route, with Diamond Head off the bow, will be far more in keeping with the desired first impression of Hawaii for visitors.

FERRY TERMINAL

Location. Ewa Marina is a proposed self-contained, marine recreation-related community for 15,000 residents at Ewa Beach in Leeward Oahu. The development will encompass approximately 735 acres and will include a 115 acre marina and waterway system. The marina and waterway system will open

CORRECTION

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

SUMMARY SHEET

EWA FERRY TERMINAL AT EWA MARINA

Project Description: The State Department of Transportation, Harbors Division proposes to develop a ferry terminal at the proposed Ewa Marina Community. The specific site of the terminal and its design have yet to be determined.

Potential Impacts: Potential environmental impacts will be negligible assuming that construction of the proposed Ewa Marina development has been completed.

Alternatives Considered: Alternative locations for the terminal within the Ewa Marina development and its design, including any supporting facilities have yet to be determined and assessed.

Unresolved Issues: Location and design of the ferry terminal and coordination with the landowner and developer of the Ewa Marina community have yet to be resolved.

Compatibility with Plans and Policies: The Oahu Intraisland Ferry System is compatible with the Hawaii State Plan, the State Transportation Functional Plan, and the City and County of Honolulu General Plan. After required land use approvals for the Ewa Marina project are secured, the ferry terminal shall be a compatible use with respect to the State Land Use District, City and County of Honolulu Development Plan Land Use Map and zoning.

Required Permits and Approvals: Permits for development of the ferry terminal will likely include those for both shoreside improvements and those extending into the water. Shoreside improvements are likely to require a Special Management Area permit and, if the improvements will lie within 40 feet of the shoreline, a Shoreline Setback Variance from the City and County of Honolulu. Improvements extending into the water will likely require a Department of the Army permit with certification by the Hawaii Coastal Zone Management Program and 401 Water Quality Program, a State Permit for Work in Shore and Shorewaters and, depending upon the location of the development, a State Conservation District Use Application.

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Transit systems for the Island of Oahu are envisioned to be comprised of three modes: bus, water and rail. Mass transit by water is the only alternative which can relieve traffic congestion on the existing highway system without large investment in infrastructure.

From Hawaii Kai in East Honolulu to downtown Honolulu, only Kalanianaole Highway provides direct access as it passes through and alongside residential areas. Already heavily congested during commuting hours, the highway will be reconstructed over a period of about eight years during which congestion will be exacerbated. Paralleling the highway is the ocean, which offers the opportunity for development of an alternative water route.

From fast-growing West Honolulu, Interstate Route H-1 and other highways must loop around Pearl Harbor, because neither a bridge nor a tunnel across the entrance channel is feasible. Eight eastbound freeway lanes converge into three at Middle Street, well short of downtown Honolulu. An ocean ferry route would by-pass Pearl Harbor and the highway bottleneck from Middle Street into Downtown.

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FERRY TERMINAL

Location. Ewa Marina is a proposed self-contained, marine recreation-related community for 15,000 residents at Ewa Beach in Leeward Oahu. The development will encompass approximately 735 acres and will include a 115 acre marina and waterway system. The marina and waterway system will open to the ocean at the present mouth of Kaloi Gulch drainageway, west of the existing Oneula Beach Park. See Figure 1.

The land is owned by Campbell Estate and is proposed for development by MSM Associates.

Improvements. The improvements required for the Ewa Marina ferry terminal have yet to be determined. Assuming that the ferry terminal, is developed within the marina, only shoreside improvements will be required.

FERRY SYSTEM

Operation. Operation of the Intraisland Ferry System is being pursued through a bid procedure to qualified private operators. The contract to be awarded will be for a twenty year term. Under the contract, the operator is required to provide commuter transit service during the morning and evening peak traffic periods between the Maunalua Bay terminal in Hawaii Kai and the Downtown terminal at Pier 8 in Honolulu Harbor, at a fare not greater than $2.50 one-way for residents with a valid Hawaii drivers license. Toward subsidizing this service, the DOT will design, secure necessary government approvals, and construct the ferry terminals. The operator would be permitted to engage in commercial revenue generating operations during hours the commuter transit service is not in operation. He would be permitted to use the DOT's ferry terminals for such operations, except that he would not be allowed to use the Maunalua Bay terminal and the Ala Wai Boat Harbor, should a terminal be sited there.

Construction of the improvements to the Downtown terminal are anticipated to be completed by December, 1989. Piers 13 and 14 at Honolulu Harbor will be used for vessel berthing and maintenance. Additional ferry terminals in the intraisland system will be developed depending on the availability of funding and approval of necessary permits. The ferry system will serve the seven intraisland terminals as they become operational. The schedule and routes for the ferry system have yet to be determined.

Vessel. The vessel proposed for use by the apparent low-bid ferry operator is a "surface effect ship" which rides on a cushion of air. The vessel is 118 feet long and has a beam width of 38 feet. It has a capacity of approximately 350 passengers and an estimated speed of 42 knots (48 mph).

Two engines power fans maintaining the air cushion which is contained under the craft by two solid walls on either side and by curtains fore and aft. The air cushion can be adjusted by an on-board computer to allow the ship to ride higher within wave troughs and lower over wave crests. This provides a smoother ride in rough seas. While riding on the air cushion, the ship has a draft of 1.5 feet. Off cushion, the ship draws 6 feet. Two additional engines power a water jet propulsion system

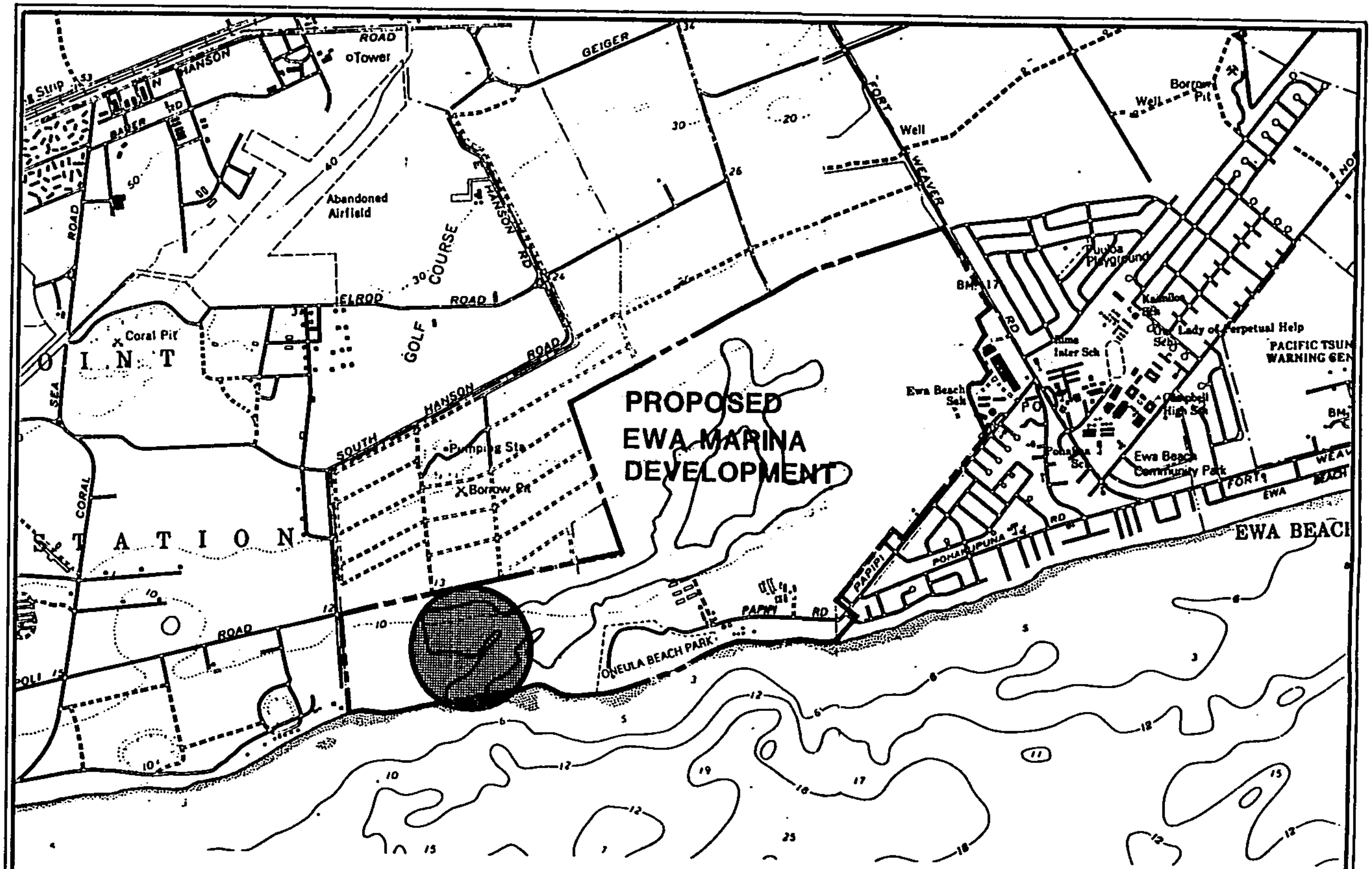


Figure 1
EWA TERMINAL
Intra-Island Ferry System

Prepared for:
DEPARTMENT OF TRANSPORTATION, HARBORS DIVISION
Prepared by:
WILSON OKAMOTO & ASSOCIATES, INC.

which draws water from beneath the ship and discharges it in two jet streams to propel and steer the ship. There are no propellers in the water. The water jet propulsion and steering system allows the ship to turn 360° within a space 1-1/2 times its length at dead stop.

PROJECT SETTING

PROPOSED EWA MARINA DEVELOPMENT

The proposed Ewa Marina Community is a planned, marine-oriented community for 15,000 residents. The total area of the proposed development is about 735 acres. The development will consist of 4,850 residential units among 25 different development ares. A 1,510 slip marina will be constructed within a 115 acre waterway. The marina will open to the ocean, affording access for public marina users and private residential users. About 58 acres of commercial development are also planned.

The entire project will be developed in two increments. Increment I will consist of about 169 acres. Increment II will consist of about 566 acres.

The marina will be excavated into the existing land, which ranges in elevation from 8 to 12 feet above Mean Sea Level (MSL). Marina depths will range from 12 to 8 feet below MSL. The proposed entrance channel will be 400 feet wide and approximately 2,900 feet long. The seaward end of the channel will be 20 feet deep over a length of 1,000 feet, while the remainder of the channel will be 15 feet deep, except the area inside the breakwater which will be 12 feet deep.

EXISTING CONDITIONS

The proposed site of the Ewa Marina Community is basically flat, rising gently to an elevation of approximately 20 feet above sea level at its northern boundary, approximately one mile from the ocean. The site is generally underlain by coral/algal reef rock, and overlain by a 18-24 inch layer of soil formed by a combination of coastal deposits and mill mud from the old Ewa Mill wash water. Vegetation consists mainly of very dense brush and kiawe, with a few groups of palm trees and clusters of hau bush. Common bird species are present as well as some game species. The northern two-thirds of the site is used for growing sugar cane by lessee and operator, Oahu Sugar Company, Ltd. Other tenants include a few chicken farmers and residents on month-to-month leases.

ACCESS

The primary access route for the Ewa Marina Community will be Fort Weaver Road to Papipi Road. In the future, a new North-South Connector Road roughly paralleling Fort Weaver Road on the west is planned. The new road will connect the Ewa Marina Community with Interstate Route H-1. Within the Ewa Marina community, various roadways and streets will be developed to serve internal traffic.

RELATIONSHIP TO PLANS, POLICIES AND PERMITS

PLANS

Hawaii State Plan. The development Oahu Intraisland Ferry System is supported by the State Plan. According to Section 226-17 of the Hawaii State Plan, one of the first stated objectives regarding transportation is "to develop an integrated multi-modal transportation system that services statewide needs and promotes the efficient, economical, safe, and convenient movement of people and goods". Section 226-17 b (11) indicates that this will be achieved through "the use of low-cost, energy efficient, non-polluting means of transportation". The State shall "encourage systems that serve development need of communities".

State Transportation Functional Plan. Development of an intraisland ferry system is also in harmony with the State Transportation Functional Plan Objective which promotes the "development of a balanced, multi-modal statewide transportation system that serves clearly identified social, economic and environmental objectives of the Hawaii State Plan".

General Plan of the City and County of Honolulu. The General Plan of the City and County of Honolulu establishes long-range objectives and policies for guiding both the quantity and quality of future growth in Oahu.

The proposed Intraisland Ferry System will facilitate implementation of the General Plan. It specifically addresses the objective to "create a transportation system which will enable people and goods to move safely, efficiently, and at a reasonable cost; serve all people, including the poor, elderly, and the physically handicapped; and offer a variety of attractive and convenient modes of travel".

LAND USE POLICIES AND ZONING

State Land Use District. Pursuant to Hawaii Land Use Law (Chapter 205, HRS), the State Land Use Commission classifies all lands into four land use districts: urban, agricultural, conservation, and rural. The Ewa

Marina Community is designated "Urban" on the State Land Use District Map. The proposed ferry terminal is permitted under the "Urban" designation.

City and County of Honolulu Development Plan. Eight development plans were established to provide detailed schemes for "implementing and accomplishing the objectives and policies of the General Plan." The development plans guide the desired sequence, patterns and characteristics for future development. With respect to the City and County of Honolulu Land Use Development Plan Map, the proposed ferry terminal will be compatible with areas of the Ewa Marina Development designated "Public Facility," which includes land surrounding the proposed boat harbor. If located in other areas of the marina, a development plan amendment to the "Public Facility" designation may be required.

City and County of Honolulu Land Use Ordinance. The City and County of Honolulu Land Use Ordinance (LUO) regulates land use in accordance with adopted land use policies, including the Oahu General Plan and Development Plan. Development of the Ewa Marina community will require various rezoning approvals. Depending on the site selected for the ferry terminal, the facility may be a permitted use, a conditional use or it may require a zone change.

SHORELINE AND ENVIRONMENTAL PERMITS

Department of Army Permit. The Department of the Army permit is administered by the U.S. Army Corps of Engineers, Honolulu District under Section 10 of the Rivers and Harbors Act (33 USC 403), Section 404 of the Clean Water Act (33 USC 1344) and Section 103 of the Marine Protection, Research and Sanitation Act of 1972 (33 USC 1413). The permit is required for all work within water of the United States, including ocean and coastal waters, inland and tidal waters, tidal ponds, fishponds, rivers, streams, and adjacent wetlands, perched wetlands, and intermittent streams.

Issuance of the permit is based on an evaluation of the probable impact of the proposed activity on the public interest, reflecting national concern for both protection and utilization of important resources. Factors considered include those relating to: conservation, economics, aesthetics, general environmental concerns, historic values, fish and wildlife values, flood damage prevention, land use, navigation, recreation, water supply, water quality, energy needs, safety, food production and, in general, the needs and welfare of the people.

Portions of the ferry terminal potentially subject to review under the Department of the Army permit would include those improvements extending into the water.

Hawaii Coastal Zone Management Program Federal Consistency Review. Section 307 of the National Coastal Zone Management Act of 1972 (16 U.S.C. 1451 et. seq.) provides for State review of federal actions affecting the coastal zones of States with approved Coastal Zone Management Programs. Hawaii's Coastal Zone Management (CZM) Program, established pursuant to Chapter 205A, HRS was federally approved in 1977. It is administered by the Office of State Planning (OSP).

Among Federal actions subject to review is the issuance of permits, including the Department of the Army Permit, which will be required for improvements extending into the water. Before the permit can be issued, the OSP must determine its consistency with the enforceable policies of the Hawaii CZM Program. These policies encompass broad concerns such as impact on recreational resources, historic and archaeological resources, scenic and open space resources, coastal ecosystems, economic uses, coastal hazards and the management of development.

Section 401 Water Quality Certification. The State Department of Health is charged with the responsibility of establishing and administering a State certification system pursuant to Section 401 of the National Clean Water Act (33 USC 1344) and Section 342-32(13), HRS. Water quality certification is required of any applicant for a Federal license or permit to conduct any activity that may result in any discharge into navigable water. This includes the Department of Army Permit.

Special Management Area (SMA) Permit. The Hawaii Coastal Zone Management Law (Chapter 205A, HRS) charged the Counties with designating and administering Special Management Areas (SMA) along the State's coasts. Any "development", as defined by Law, within the SMA requires an SMA permit, which is administered by the City and County of Honolulu, Department of Land Utilization pursuant to Ordinance No. 84-4.

The project may be subject to review through the SMA permit if it is located in the SMA.

Shoreline Setback Variance. The State's Shoreline Setback Law, (Chapter 205, HRS) prohibits virtually any development or development-related activity including the removal of sand, rocks, soil, etc. from the shoreline setback area, a 40-foot (20 feet in some areas) strip of land along the shoreline. The Counties, however, are authorized to grant variances for construction that would encroach in the setback area. The City and County of Honolulu, Department of Land Utilization administers this variance under its shoreline setback regulations.

Variances may be granted in consideration of a structure, or activity being in the public interest, hardship to the applicant if the proposed structure or activity is not allowed and the effect a structure or activity would have on natural shoreline processes, particularly with regard to shoreline erosion.

The shoreline variance request can be processed concurrently with the Special Management Area Permit with simultaneous decision-making by the City Council.

The Shoreline Setback Variance may be required for the ferry terminal, depending on the location of proposed improvements.

Conservation District Use Application. Any use of lands, including submerged lands within the State's Conservation District, as established by the State Land Use Commission, is subject to review pursuant to Chapter 183, HRS and Title 13, Chapter 2 of the Department of Land and Natural Resources Regulations. At the terminal site, the area beyond the shoreline, defined as "the upper reaches of the wash of waves, other than storm and tidal waves, usually evidenced by the edge of vegetation growth, or the upper line of debris left by the wash of waves," is subject to review as a use in the "Resource (R) subzone of the State Conservation District (Section 13-2-13, Administrative Rules of the Department of Land and Natural Resources). Approval by the State Board of Land and Natural Resources will be required through a Conservation District Use Application for all dredging and construction beyond the shoreline.

Permit for Work in Shores and Shorewaters. The Shorewaters Permit is administered by the State Department of Transportation pursuant to Section 266-16, HRS and Section 19-42-161, Hawaii Administration Rules, Department of Transportation, Harbors Division.

This permit is required for any construction, dredging, or filling within the shorewaters of the State, as defined by Chapter 266, HRS. Jurisdiction extends to shores, shorewaters, navigable streams and harbors, belonging to or controlled by the State.

DOT review of this permit is normally conducted via interagency coordination with the Department of Land and Natural Resources on the Conservation District Use Application. The DOT, however, could request an independent review.

Portions of the ferry terminal project subject to review include improvements extending into the water.

PROJECT IMPACTS

SHORT AND LONG TERM IMPACTS

Development of the ferry terminal at Ewa Marina assumes prior development of the proposed community. While a variety of environmental impacts have been identified for that development, they will be negligible with regard to the ferry terminal once the marina is developed. Instead, potential impacts of the ferry terminal will be those associated with its development within the context of the Ewa Marina Community, including impacts such as vessel noise and traffic.

ALTERNATIVES

Alternative sites for the ferry terminal at Ewa Marina have yet to be identified for consideration. Alternative improvements for ferry docking, passenger servicing, parking and access will also be considered as project planning proceeds.

SHORT-TERM USE VERSUS LONG-TERM PRODUCTIVITY

The proposed project will not have any substantial impact on the long-term productivity of Ewa Marina, if and when that community is developed.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Although the labor and materials used to construct the improvements at the Ewa terminal site will be irretrievably committed, the facility will be available for future use or conversion to a different use, without substantial loss of long-term productivity should the proposed use be terminated in the future.

MITIGATION MEASURES

Mitigation measures will be considered in light of project impacts identified as ferry terminal site selection proceeds and it is designed.

UNRESOLVED ISSUES

No significant unresolved issues have been identified. With proper planning, including continued consultation through the Intraisland Ferry Task Force, potential issues and concerns associated with development of the proposed facility will likely be satisfactorily resolved.

CONSULTATION

Consultation on the Intraisland Ferry System project is being pursued through the Intraisland Ferry Task Force comprised of various governmental and community representatives. A public information/education presentation was also prepared for display at various public locations. These consultation efforts are summarized in Tables 1 and 2.

Public comments were also solicited on the Oahu Intraisland Ferry System Draft Environmental Impact Statement, pursuant to Chapter 343, HRS. Availability of the document for public review was published in the OEQC Bulletin on October 8, 1988. All comments received within the public comment period as well as responses to those comments are contained in Part I - Maunalua Bay Terminal. Comments and responses pertaining to the Ewa Marina Terminal are reproduced herein.

TABLE 1

INTRAISLAND FERRY TASK FORCE MEMBERS
As of July, 1987

	NAME	ORGANIZATION
1.	Edward Uchida	Planner, Department of Transportation-Statewide Transportation Planning Office
2.	Dan Tanaka (Alt.)	Planner, Department of Transportation-Statewide Transportation Planning Office
3.	Adm. E. Alvey Wright	Project Coordinator, Department of Transportation-Statewide Transportation Planning Office
4.	Dennis O'Connor	Councilman, City and County of Honolulu
5.	Robert Dods (Alt.)	Senior Assistant for Councilman O'Conner
6.	Michelle Tucker (Alt.)	Researcher, City Council, City and County of Honolulu
7.	John Emmerson	Chief, Operations Branch, U.S. Army Corps of Engineers
8.	Dave Swenson (Alt.)	Regional Economist, U.S. Army Corps of Engineers
9.	Donna Ikeda	Senator, Hawaii State Legislature
10.	Harry Murakami	Assistant Chief for Engineering, Department of Transportation-Harbors Division
11.	David Yokoyama	Planning Engineer, Department of Transportation-Harbors Division
12.	Ron Tsuzuki	Planning Engineer, Department of Transportation-Highways Division
13.	Kenneth Au (Alt.)	Advance Planning Engineer, Department of Transportation-Highways Division
14.	Libert Landgraf	Deputy Director, Department of Land and Natural Resources
15.	Michael Yoshinaga (Alt.)	Project Coordinator, Department of Land and Natural Resources

16.	Robin Foster	Planner, Department of Land Utilization, City and County of Honolulu
17.	Verne Winquist	Planner, Department of General Planning, City and County of Honolulu
18.	Bill Medeiros (Alt.)	Planner, Department of General Planning, City and County of Honolulu
19.	Don Griffin	Planner, Department of Parks and Recreation, City and County of Honolulu
20.	Jim Ball	Project Manager, Department of Transportation Services, City and County of Honolulu
21.	Marilyn Kali	Public Information Officer, Department of Transportation-Director of Public Relations
22.	Chris Kam (Alt.)	Information Specialist, Department of Transportation-Director of Public Relations

TABLE 2

INTRAISLAND FERRY TASK FORCE MEETING DATES

May 29, 1987
June 6, 1987
June 26, 1987
August 4, 1987
September 4, 1987
November 6, 1987
March 16, 1988

PUBLIC PRESENTATIONS AND INFORMATIONAL MEETINGS

Public Information Meetings

July 1, 1987	Hawaii Kai Rotary
July 27, 1987	Hawaii Kai Neighborhood Board
August 25, 1987	Hawaii Kai Elementary School
January 7, 1988	Makakilo Elementary School
January 14, 1988	Ewa Elementary School
January 31, 1988	Waipahu Elementary School
March 22, 1988	Hawaii Kai Elementary School

Public Exhibitions and Presentations

October 15, 1987	Board of Realtors - City Affairs Comm.
December 1, 1987	Farrington High School. Public Exhibit
Feb. 14-21, 1988	Kahala Mall Shopping Center
February 18, 1988	Hawaiian Canoe Program Advisory Council
February 23, 1988	Hawaii Yacht Club
March 1988	International Order of the Blue Gavel
March thru April 1988	Windward Shopping Mall
April 13, 1988	Waikiki Yacht Club
April 24, 1988	Waikiki Yacht Club
May 14-20, 1988	Pearl Ridge Shopping Center
May 18, 1988	Waterborne Transportation Conference
May 19, 1988	Pacific Congress on Marine Science & Technology

DEPARTMENT OF THE ARMY
U. S. ARMY ENGINEER DISTRICT, HONOLULU
BUILDING 230
FT. SHAFTER, HAWAII 96858-5440

REPLY TO ATTENTION OF:

November 16, 1988

Planning Branch

'88 NOV 21 A11:24

Dr. Marvin Miura
Office of Environmental
Quality Control
465 South King Street, Room 104
Honolulu, Hawaii 96813

Dear Dr. Miura:

Thank you for the opportunity to review the Draft Environmental Impact Statement (DEIS) for the proposed Oahu Intra-island Ferry System. The following comments are offered:

a. The need for a Department of the Army permit is recognized on page C-7 of the DEIS. Operations Branch has participated in pre-application meetings with the Department of Transportation. The Harbors Division should continue to coordinate with Operations Branch regarding permit requirements.

b. The flood zone information presented on page B-10 for the Maunalua Bay Ferry Terminal site is correct. According to the Flood Insurance Study for the City and County of Honolulu, the other sites are located in the following zones: Barbers Point Site, Zone AE (special flood hazard area inundated by the 100-year flood) with base flood elevation of 8 feet MSL; Ewa Site, Zone AE with base flood elevation of 6-7 feet MSL; Waikiki Site, Zone D (areas in which flood hazards are undetermined); Waipahu Site, Zone D and Zone A (special flood hazard area inundated by the 100-year flood, with no base flood elevation determined).

Sincerely,

James S. Nakasone
Kisuk Cheung for
Chief, Engineering Division

Copy furnished:

Director
Hawaii State Department
of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813

JOHN WAIHEE
GOVERNOR

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

EDWARD Y. HIRATA
DIRECTOR

DEPUTY DIRECTORS
JOHN K. UCHIMA
RONALD N. HIRANO
DAN T. KOCHI
JEANNE K. SCHULTZ

IN REPLY REFER TO
HAR-EP 2650

December 29, 1988

Mr. Kisuk Cheung, Chief
Engineering Division
Department of the Army
U.S. Army Engineer District, Honolulu
Building 230
Fort Shafter, Hawaii 96858-5440

Attention Planning Branch

Dear Mr. Cheung:

Draft Environmental Impact Statement (DEIS)
for Oahu Intraisland Ferry System - Job H. C. 1694

Thank you for your comments regarding the Department of Army permit and the information on flood zones affecting the Haunalua Bay Ferry Terminal.

We look forward in working with the Operations Branch of your office in the processing of the Department of Army permit for the Maunalua Bay Terminal.

Very truly yours,

Edward Y. Hirata
Director of Transportation

JOHN WAIHEE
GOVERNOR OF HAWAII

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

WILLIAM W. PATY, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

'88 NOV 28 A11:58

NOV 25 1988

FILE: 89-217
DOC.: 4660E

The Honorable Marvin T. Miura, Ph.D.
Director
Office of Environmental Quality Control
465 South King St., Room 104
Honolulu, Hawaii 96813

SUBJECT: O'ahu Intraisland Ferry System

Dear Dr. Miura:

Thank you for giving our Department the opportunity to comment on this matter. We have reviewed the materials you submitted and have the following comments.

The Draft Environmental Impact Statement (DEIS) has addressed most of the expected impacts of the extensive dredging and construction required at the Maunalua Bay site. Mitigation measures have been proposed to the extent possible to prevent excessive negative effects on an already severely stressed ecological system at that site.

The DEIS states that no adverse impacts are expected at the other terminal sites described, unless activities such as dredging, construction near or in coastal waters, or other shoreline modifications become necessary.

All future activities, including blasting, that may impact aquatic resource values at the proposed terminals should be submitted to the Department for review and the necessary permits obtained.

Potential interference with recreational and commercial fishing should be averted as much as possible and compensated for wherever inevitable, during the operation of ferry routes and terminal facilities.

We note, too, that (according to the DEIS) impacts on whales and green sea turtles are still to be determined, yet those impacts are omitted in "Unresolved Issues" on the "Summary Sheet" of the DEIS. We request that mitigation plans regarding whales and green sea turtles are to be coordinated with both the National Marine Fisheries Service and our Office of Conservation and Environmental Affairs.

The EIS contains detailed information necessary for archaeological/historic sites review only for the Maunalua Bay Beach Park Terminal. As the terminal and support system will be located makai of Kalanianaole Highway on fill lands, we anticipate that there will be "no effect" on significant historic sites.

The Waikiki location has yet to be determined, and, therefore, we cannot assess the expected impact. There are historic sites in Waikiki which might be affected depending on terminal location.

The Downtown Terminal, Airport Terminal and Barber's Point Terminal are making use of existing facilities, and we anticipate no problems.

The Ewa Terminal at Ewa Marina cannot be assessed without more information, which, according to the EIS, will be forthcoming when design plans are completed. This location is within the One'ula Archaeological District (Site 80-12/13-2873) which has been determined eligible for listing on the National Register of Historic Places.

The Waipahu Terminal location intrudes on Site 80-13-9992, the Pearl Harbor Naval Base, a National Historic Landmark site which is listed on the National Register. Coordination with the Navy archaeologist, Dr. Robert J. Hommon, and the State Historic Sites Section is necessary.

Thank you for your cooperation in this matter. Please feel free to call me or Jay Lembeck at our Office of Conservation and Environmental Affairs, at 548-7837, if you have any questions.

Very truly yours,

WILLIAM W. PATY

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION

December 29, 1988

HAR-EP 2653

MEMORANDUM:

TO: The Honorable William W. Paty, Chairperson
Board Of Land and Natural Resources

FROM: Director of Transportation

SUBJECT: DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS) FOR OAHU INTRAISLAND FERRY SYSTEM (RESPONSE TO FILE: 89-217, DOC.: 4660E)

Thank you for your comments on the subject DEIS. We look forward to continued coordination with your department in the development of the Oahu Intraisland Ferry System. We shall be consulting with your staff in the preparation of environmental documents and permit processing as they relate to areas of concern expressed in your letter.

We appreciate the assistance your department has provided us in this most important project. If you have any questions concerning the ferry system please feel free to call Mr. Harry Murakami of our Harbors Division at 548-2535.

Edward Y. Hirata

11 November, 1988

Mr. David K. Higa
Chief, Harbors Division
Department of Transportation
79 South Nimitz Hwy
Honolulu, Hawaii. 96813

Subj: Draft Environmental Impact Statement (EIS) for the Oahu Intraisland Ferry System, comments concerning.

Ref: Your letter dated October 17, 1988 - HAR-EP 1697.

Dear David,

We received your reference letter draft EIS two weeks ago. Please find the following comments pertaining to the subject document as you requested. Our opinions or recommendations are meant to be constructive, but we recognize that we have a limited data base of background to draw upon, so if they disagree with the concensus, please forgive us. We consider the EIS to be a fine document that appears to address the major problems at Haunalau Bay.

SAN DIEGO SHIPBUILDING & REPAIR, INC.
(619) 691-1091 • Telex No: (910) 240-4387
Foot of F Street • P.O. Box 5058, Chula Vista, California 92010

Item:	Section:	Comment:
1	Cover	We suggest a more encompassing system title for the system as previously suggested which would alter the title of the report to: "Hawaii Ocean Transit System Oahu Intraisland Routes".
2	Maunalua Bay Fig. 4	The pier as shown does not depict the fender system previously recommended by SDSR. The pier we feel might be narrow in way of a gangway that must accommodate the 2 ft. tide plus a reasonable slope for passenger safety as recommended by SDSR. The mooring cleats appear to be small for handling a ship of this size with the maximum possible wind at the worst angle. We feel the dock elevation may be incorrect considering the proposal dredged depth of water at 10 ft. above MLLW.

Page 3:

3	Maunalua Bay A-10 Entrance Channel	SDSR during meetings in Honolulu in Aug/ Sept. 1988, was willing to accept a lesser channel width of 150 ft. versus 200 ft. and a guaranteed channel depth of 9 ft. versus 150 ft. That offer to save Hawaii increased dredging costs still remains with the only caveat that the State will ensure that the 9 ft. depth be periodically maintenance dredged.
4	Maunalua Bay A - 12 Ferry System	Our company's name is SAN DIEGO SHIPBUILDING & REPAIR, INC., not Ship Building or Ship Builders. We request that this minor oversight is corrected in each section of the report and in DOT files if incorrect. Thank you. We also recommend you mention that the next lowest bidder was $15,000,000 (?) more than SDSR to be paid by the State. We feel this will mitigate any vendor greed criticism, as well as possibly encouraging a cooperative effort to make the program a success and finally it shows to the people the creative approach their State officials took to

Page 4:

	solicit an entrepreneurial solution to a transportation problem, plus saved them $15,000,000.
Vessel A - 12	The ship carries 350 passengers as designed, not 300.
A - 13	The ship has two propulsion engines, not a third engine. There are also, as stated, two lift engines.
A - 13 Para 3	We suggest you add after "monohull" the words "or catamaran". It should be noted that at slow speed, the catamaran style hull (second bidder), produces an enhanced wave wake which severely impacts shore side erosion. San Francisco Bay catamaran ferries and many others are good examples. SDSR's SES will operate on a partial cushion alongside the pier and in the harbor to not only give a more comfortable ride, but also to reduce the wake dramatically. There's less wake at max

Page 5:

	speed than at slower speeds but all conditions surpass equivalent monohull or catamarans.
A - 13 Para 5	Add after "transportation." The ferry operator also offers a "dial-a-ferry" phone service that gives continuous recording of schedules, sea conditions and special fare promotions".
A - 13 Para 7	It is our understanding that Haunalua Bay will not necessarily be the first terminal. Should that be stated here or is it best to keep to the original schedule for EIS purposes??
A - 13 Para 8	Add after "Pier 13" the words "and 14". SDSR in it's bid document and subsequently have requested use of piers 12 (parking), pier 13 maintenance and repair and pier 14 commercial operations which was approved by DOT.
A - 14 Para 1	The bid allows for a minimum number of runs as stated. However, the vessels speeds permits 7 trips from 6 a.m. to 9 a.m. if commuter use approaches maximum

Page 6:

		capacity 2,450 possible passengers. This capacity should be stated and analyzed.
	A - 14 Para 2	Suggest a clarification which may or may not be appropriate here. Based on the comment Pg. A14, Para 1, the capacity of the service clearly exceeds the minimum commuter schedule required. As stated, the use by tourists would be generally in a direction opposite to commuters thus not creating a booking or conflict with commuter issue.
5.	Haunalua Bay B - 8 Para 6	Pure opinion - we think this very important paragraph about dredging and erosion should be amplified to ensure the reader is understanding the complex theory that is being presented.
6.	D - 7 Flora & Fauna Para 2	It is suggested that the ferry operator take a "detour" to avoid the turtles. SDSR requests information as to the extent of this "detour" as it would possibly affect schedule.

Page 7:

7. D - 8 Whales Para 3

The report makes the point that there were three incidents of hitting whales in three years. On its face a remarkable record. It might also be investigated to see if out of the millions of hours of boat operation in Hawaiian waters, whether even the 3 incidents were accidents. Possibly the collisions were due to dive charter boats who were chasing the whales for the price of whale watching or just curiosity. If those incidents were partially deliberate, then all the comments about whales could be significantly mitigated.

D - 14 Noise

The noise issue has been a great concern to residents. To give this emotional topic one paragraph of explanation, we believe is too little. One letter after the EA said the boat selected was a "Hovercraft". The hovercraft as we all know is an extremely noisy vessel. This point should be responded to and

Page 8:

clarified. We believe that the one comparison given in the report has been to compare traffic noise to the ferry. The residents don't like traffic noise any better than they perceive the potential ferry noise. In the technical literature there are numerous less combatative comparisons, which we suggest be used to show how quiet this boat is at slow speeds at the distances of sound mitigation from the closest residence. We feel comparisons to "room noise" or distinguishing ferry noise from normal household sounds be used.

9. D - 21 Impacts

This may not be the correct area for this comment, but doesn't the ferry service contribute to certain emergency evacuation measures during tsunamis or hurricane warnings versus a congested highway under construction? Shouldn't this be noted?

10. E - 2 Task Force

SDSR requests membership on the permanent task force for all the ferry terminal sites. As the ferry

system operator, we feel our knowledge and experience would contribute to the task forces mission significantly.

11. E - 6 Preparation Comments

Some of the comments we feel have not been addressed in the new EIS from the EA comments.

a) Operations of the systems is still sketchy and mysterious. The operation is, more efficient, more reliable and cheaper than the previous hydrofoils much less any other US based ferries. Lets not be bashful, lets be proud and let the public know.

b) Whale issue needs better history and facts as previously stated.

c) The SES ferry design precludes typical ship oil product leakage. Portable oil

booms could be positioned on certain sensitive routes if absolutely necessary.

d) Shouldn't there be a comparison to large yachts now in Hawaii Kai as to wake, noise etc. to eliminate the large commercial vessel image?

e) Noise concerns previously questioned should be addressed in a forthright way.

12. Appendices Appendix A Reduction in Assumption

Ferry capacity is understated so therefore the analysis is likewise understated. At 80% capacity, 7 departures (maximum), the car reduction would be 211 cars/departure or 1,479 cars per a.m. or stated differently one lane of traffic is eliminated according to federal DOT highway guidelines. This calculation yields a significant reduction at 11.4 percent versus the EIS reports 5.6 percent. The p.m. reduction would be 13.2 percent versus 6.5 percent in the EIS report.

Page 11:

13.	Overall Comment	Those comments changed in the Maunalua Bay section noted previously should be changed in the entire report where applicable (several sections are repeated under each terminal).
14.	Waikiki 1 Project Description	Should Fort DeRusy be mentioned here as an alternative site to the Hilton as it was originally stated in the invitation for bid?
15.	Remainder of Ferry Terminals General	The discussions we suppose are purposely sketchy and incomplete. Will there need to be amplified data on Maunalua Bay or are they all right as written???
16.	Barbers Point	Is the ferry terminal located properly on the sketch. We understand the terminal would be in the inner harbor??

Page 12:

I look forward to your consultants feedback on the above comments. Once again we only wish to help the process if we can.

Respectfully,

W.T.Gurney,
President.
WTG/mlg
sdsbl/m/environ.imp

cc: Mr. Carl Matsukawa
Wilson Okamata & Assoc.
Mr. Ed Hirata, Director of Transportation
Mr. Ed Uchida, Chief Planning Division
Mr. Mike Moynahan, SDSR
Admiral Alvie Wright

JOHN WAIHEE
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION

EDWARD Y. HIRATA
DIRECTOR

IN REPLY REFER TO

December 30, 1988 HAR-EP 2663

Mr. W. T. Gurnee, President
San Diego Shipbuilding and Repair, Inc.
P. O. Box 5058
Chula Vista, CA 92010

Dear Mr. Gurnee:

Draft Environmental Impact Statement (DEIS)
for the Oahu Intraisland Ferry System

Thank you for your comments on the subject DEIS. In response to your comments, we offer the following in the order presented:

1. Cover: The EIS encompasses only the Oahu Intraisland Ferry System. DOT presently has no plans to extend the service beyond the island of Oahu. Should such a service be contemplated in the future, separate environmental documentation will be required.

2. Figure 4: Figure 4 is a conceptual sketch intended to convey the scale of the pier. We are currently proceeding with Engineering design plans of the pier. Your input on the final design of the pier will be welcome.

3. Page A-10: Toward insuring safe simultaneous passage of the ferry vessel and boats typically using the Maunalua Bay channel, the widths presented in the draft EIS shall be maintained. In an effort to minimize the quantity of dredging, associated construction costs, and subsequent environmental impacts, the DOT has opted to reduce channel depth to a uniform 9 feet throughout the channel length. This change in design will be reflected in the final EIS.

4. Page A-12: The EIS will be revised to correct all

references to your company. We do not believe it is appropriate to discuss in the EIS the other bids received. The EIS is intended to disclose the environmental impacts of the project.

Page A-12: Our understanding is that the ship can accommodate 340 people in an airline type seating and an additional 10 people would be accommodated in first class seating. We will note in the Final EIS that the vessel does have an approved passenger capacity of 350 and that the ferry service can be increased to this maximum to meet ridership demands.

Page A-13: The EIS will be revised to describe the propulsion system of the ferry more accurately. We will also insert the term "catamaran" following "monohull" in the final EIS and discuss the "dial-a-ferry" phone service as a feature to be offered by the operator. The Maunalua Bay Ferry Terminal is currently being pursued as the first phase of the Oahu Intraisland Ferry System. The development of any of the other terminals can proceed should development of the Maunalua Bay terminal be delayed or abandoned.

Page A-13: The final EIS shall be revised to reflect usage of pier 14 by the ferry operator.

Page A-14: Each of the vessels will be required to make two runs each to the Downtown Terminal during the 3-hour morning peak period and two runs each to Maunalua Bay during the 3-hour evening peak period. Regardless of the ferry capacity or the direction in which ferry usage by either commuters or tourists may be demanded, the Maunalua Bay terminal will not be used for commercial transport services. Only normal public mass transit use will be permitted. Thus, while tourists may be transported to Maunalua Bay just as they could be through the City's bus system, no commercial bookings of seats will be allowed. Moreover, the terminal may not be used as a transfer area between the ferry and commercial transport services i.e. tour buses.

5. Page B-8: We feel that the draft EIS appropriately addresses erosion in the bay. Should any technical questions arise regarding erosion processes in the bay, we will provide further clarification.

6. Page D-7: The turtle studies contracted by the DOT will assist in determining appropriate ferry routes in and out of Maunalua Bay.

7. Page D-8: The three incidences involving collisions between vessels and whales were investigated by the National Marine Fisheries Service, to determine if the whales were deliberately harassed. Following the investigation, no charges were filed against any of the boat operators.

8. Page D-14: We believe the description of the surface effect ship and its noise rating provide an accurate assessment with respect to potential noise impacts. We will indicate that the perceived noise levels at the nearest residences are for the exterior environment and that noise levels within homes will be considerably lower.

9. Page D-21: The use of the ferry vessel for emergency evacuation has not been discussed to date. We will, however, present your offer for providing such services to the Oahu Civil Defense Agency.

10. Page E-2: The Intraisland Ferry Task Force is intended to promote intergovernmental coordination among represented agencies and organizations. Your expertise will be called upon as deemed necessary to facilitate the Task Force's efforts.

11. a. The EIS is intended to disclose the environmental impacts of a proposed action which, in this case, includes the proposed construction activity and the operation of the vessel proposed for use by the apparent low bidder. The bidding process described in the EIS is assumed to have resulted in the selection of the most cost-efficient ferry alternative from among those offering their services. Any claims comparing features of the SES with other types of craft would extend beyond the officially sanctioned method for selecting the ferry operator.

    b. See response to item No. 7.

    c. We will note the use of portable oil booms as a potential mitigating measure to contain oil spills along sensitive routes.

    d. At a length of 118 feet, the ferry vessel is considerably larger than the largest boats found in the bay. Such boats are generally about 35 feet in length. With respect to wake created, we will clarify on page

D-12 that the SES would create less wake than the largest boats which typically operate in Maunalua Bay.

    e. See response to item No. 8 (Page D-14).

12. Appendices: The traffic reduction assessment shall be revised in the Final EIS to reflect the approved passenger capacity of 350 persons.

13. Any changes made to general statements pertinent to all of the terminals will be uniformly revised.

14. The Fort DeRussy terminal, as identified in the bid document, and the Hilton Pier are the same. There are no other ferry terminal sites being considered for this area.

15. There was no purposeful intent to providing abbreviated descriptions of the terminal sites at Waikiki, the Airport, Waipahu, Ewa Marina and Barbers Point. Currently, there is inadequate information on the nature of improvements that will be required for the terminals and how construction may affect the respective environments. As we noted, supplemental environmental documents may be required for each of the terminal sites except Maunalua Bay. The EIS fully addresses the environmental impacts of the Maunalua Bay ferry terminal and no further environmental documentation will be required for that site.

16. In the text relating to the Barbers Point Harbor Terminal, we do not limit siting to any particular location within the harbor. While the inner harbor is currently the choice for a ferry terminal, the option of locating it elsewhere has not been foreclosed.

We hope we have satisfactorily responded to your comments. If you have any questions, please feel free to contact Mr. Harry Murakami of the Harbors Division at 548-2535.

Very truly yours,

Edward Y. Hirata
Director of Transportation

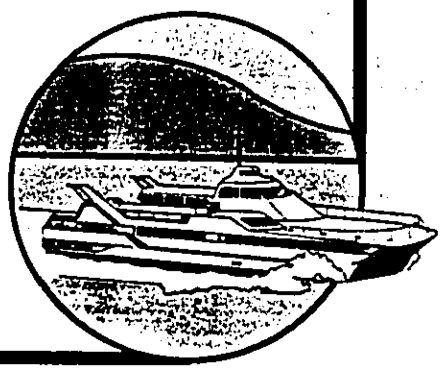
REFERENCES

Group Architects Collaborative, Inc., Environmental Impact Statement for the Proposed Ewa Marina Community Project, November, 1980.

MSM & Associates (prepared by Dames and Moore) Final Addendum to the Final EIS, Ewa Marina Community, Increment II, July, 1986.

Part VII

Barbers Point Terminal



PREFACE

The Department of Transportation (DOT), State of Hawaii is proposing to establish an intraisland ferry system serving the southern coastline of Oahu. Seven terminals are planned from Hawaii Kai to Barbers Point:

- Hawaii Kai in the vicinity of Maunalua Bay Beach Park;
- Downtown at Pier 8 of Honolulu Harbor, with a ferry maintenance facility at Piers 13 and 14;
- Waikiki, in the vicinity of the Ala Wai Boat Harbor and the Hilton Pier;
- Keehi Lagoon, at the South Ramp of Honolulu International Airport;
- Waipahu, at the head of Middle Loch of Pearl Harbor;
- Ewa, at the proposed Ewa Marina Development; and,
- Barbers Point, at the Barbers Point Deep Draft Harbor.

This environmental impact statement is prepared pursuant to Section 343-5, Hawaii Revised Statutes, defining actions subject to environmental impact statement requirements. Specifically, various components of the project will involve the use of State funds and State-owned land, the State Conservation District and shoreline area as defined by Section 205-31, Hawaii Revised Statutes.

In compliance with Section 11-200-7 (Administrative Rules, Department of Health (DOH)), the proposed intraisland ferry system is herein assessed as a phased agency action treated as a single action. Inasmuch as siting and designing of facilities for the various individual ferry terminals are proceeding incrementally, this EIS is comprised of seven parts, one for each of the seven planned terminals, and based on the current information available for each.

Commensurate with information currently available, each part complies with the content requirement of Section 11-200-17 (Administrative Rules, DOH). Terminals for which site selection and design have been completed are assessed in greater detail. As the remaining terminals are sited and designed, supplemental environmental assessments or, if deemed necessary, supplemental environmental impact statements shall be prepared for the individual ferry terminals.

TABLE OF CONTENTS

SUMMARY SHEET

BARBERS POINT FERRY TERMINAL AT BARBERS POINT HARBOR

Project Description:	The State Department of Transportation, Harbors Division proposes to develop a ferry terminal at the Barbers Point Deep Draft Harbor. The specific nature of improvements have yet to be determined but will be consistent with the maritime use of the harbor.
Potential Impacts:	Potential impacts of the development will be negligible within the context of existing and planned harbor development.
Alternatives Considered:	Location and design of the ferry terminal and have yet to be determined. No significant unresolved issues have been identified. Through coordination with the appropriate State agencies, compatibility among existing, planned and proposed uses at the Barbers Point Deep Draft Harbor can be assured.
Unresolved Issues:	None.
Compatibility with Plans and Policies:	The Oahu Intraisland Ferry System is compatible with the Hawaii State Plan, the State Transportation Functional Plan, and the City and County of Honolulu General Plan. The ferry terminal is a compatible use with respect to the State Land Use District, City and County of Honolulu Development Plan Land Use Map and zoning.
Required Permits and Approvals:	Permits for development of the ferry terminal may be required, depending upon the nature of improvements proposed. Shoreside improvements may require a City and County of Honolulu Special Management Area Permit. If the improvements will lie within 40 feet of the shoreline, a Shoreline Setback Variance, also from the City and County of Honolulu may be required. If improvements extend into the water, permits required will likely include a Department of the Army permit with certification by the Hawaii Coastal Zone Management Program and 401 Water Quality Program, and a State Permit for Work in Shore and Shorewaters.

PROPOSED PROJECT

PROJECT NEED

Transit systems for the Island of Oahu are envisioned to be comprised of three modes: bus, water and rail. Mass transit by water is the only alternative which can relieve traffic congestion on the existing highway system without large investment in infrastructure.

From Hawaii Kai in East Honolulu to downtown Honolulu, only Kalanianaole Highway provides direct access as it passes through and alongside residential areas. Already heavily congested during commuting hours, the highway will be reconstructed over a period of about eight years during which congestion will be exacerbated. Paralleling the highway is the ocean, which offers the opportunity for development of an alternative water route.

From fast-growing West Honolulu, Interstate Route H-1 and other highways must loop around Pearl Harbor, because neither a bridge nor a tunnel across the entrance channel is feasible. Eight eastbound freeway lanes converge into three at Middle Street, well short of downtown Honolulu. An ocean ferry route would by-pass Pearl Harbor and the highway bottleneck from Middle Street into Downtown.

From Honolulu International Airport to Waikiki, the most direct route is along Nimitz Highway, which is less than scenic and has resisted aesthetic upgrading. An ocean route, with Diamond Head off the bow, will be far more in keeping with the desired first impression of Hawaii for visitors.

FERRY TERMINAL

Location. Located near the southwest tip of the Island of Oahu, Barbers Point Harbor is Oahu's second deep draft commercial harbor. See Figure 1. Campbell Industrial Park abuts the south and east boundary of the harbor, while the West Beach Development is located on the northwest boundary.

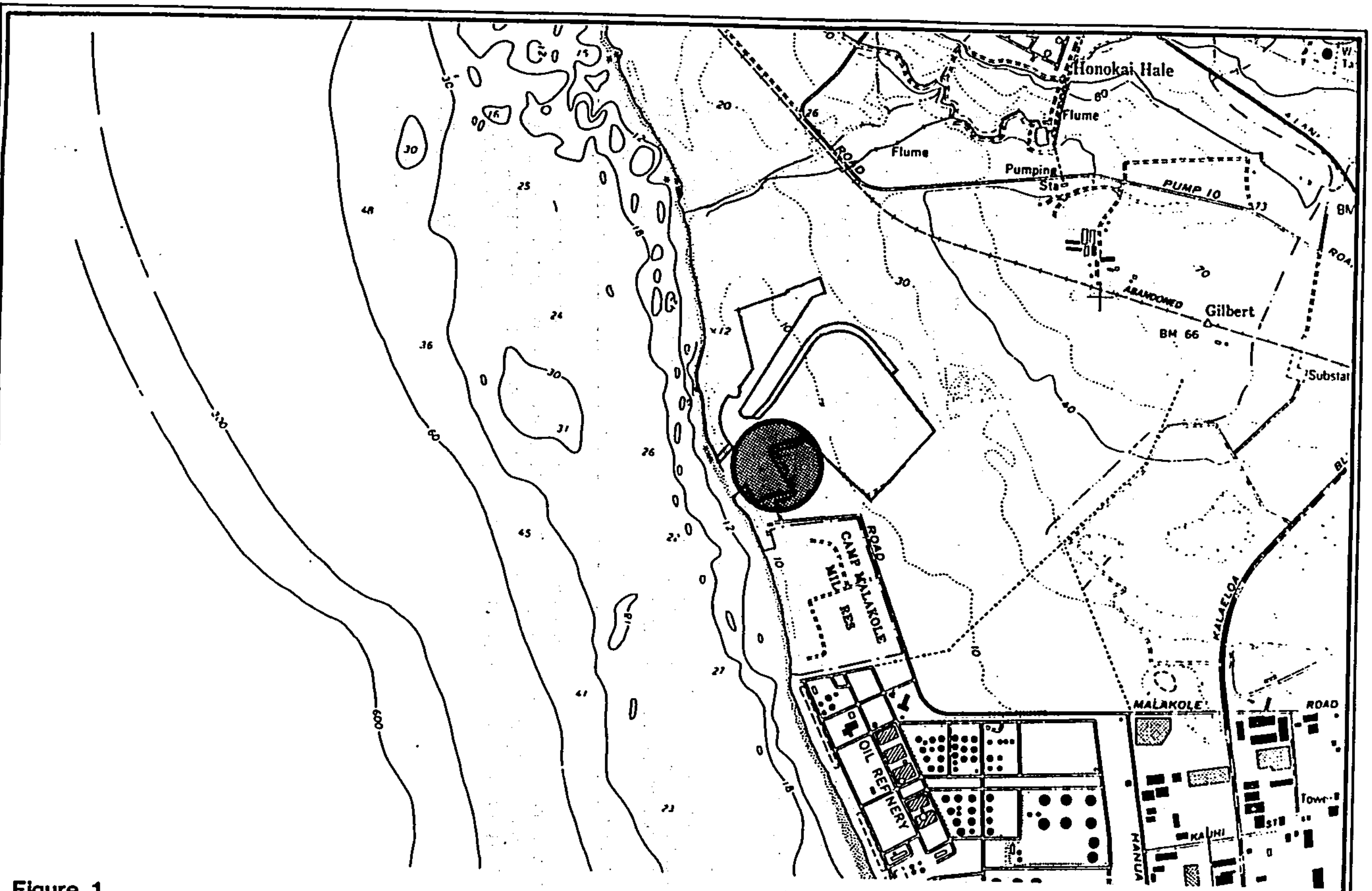


Figure 1
BARBERS POINT TERMINAL
Intra-Island Ferry System

Prepared for:
DEPARTMENT OF TRANSPORTATION, HARBORS DIVISION
Prepared by:
WILSON OKAMOTO & ASSOCIATES, INC.

The Hawaiian Electric Company's Kahe Power Plant is located approximately 0.5 miles to the north, across Interstate Route H-1.

The entire area was owned by Campbell Estate which has granted the land to the State of Hawaii in exchange for approximately 90 percent of the sales proceeds from the coralline material dredged from the channel and harbor.

Improvements. The improvements required for the Barbers Point ferry terminal have yet to be determined. Due to the availability of existing harbor facilities at the Barbers Point Deep Draft Harbor and the West Beach marina, no dredging will likely be required. Improvements for vehicular access, parking and passenger servicing have yet to be determined.

FERRY SYSTEM

Operation. Operation of the Intraisland Ferry System is being pursued through a bid procedure to qualified private operators. The contract to be awarded will be for a twenty year term. Under the contract, the operator is required to provide commuter transit service during the morning and evening peak traffic periods between the Maunalua Bay terminal in Hawaii Kai and the Downtown terminal at Pier 8 in Honolulu Harbor, at a fare not greater than $2.50 one-way for residents with a valid Hawaii drivers license. Toward subsidizing this service, the DOT will design, secure necessary government approvals, and construct the ferry terminals. The operator would be permitted to engage in commercial revenue generating operations during hours the commuter transit service is not in operation. He would be permitted to use the DOT's ferry terminals for such operations, except that he would not be allowed to use the Maunalua Bay terminal and the Ala Wai Boat Harbor, should a terminal be sited there.

Construction of the improvements to the Downtown terminal are anticipated to be completed by December, 1989. Piers 13 and 14 at Honolulu Harbor will be used for vessel berthing and maintenance. Additional ferry terminals in the intraisland system will be developed depending on the availability of funding and approval of necessary permits. The ferry system will serve the seven intraisland terminals as they become operational. The schedule and routes for the ferry system have yet to be determined.

Vessel. The vessel proposed for use by the apparent low-bid ferry operator is a "surface effect ship" which rides on a cushion of air. The vessel is 118 feet long and has a beam width of 38 feet. It has a capacity of approximately 350 passengers and an estimated speed of 42 knots (48 mph).

Two engines power fans maintaining the air cushion which is contained under the craft by two solid walls on either side and by curtains fore and aft. The air cushion can be adjusted by an on-board computer to allow the ship to ride higher within wave troughs and lower over wave crests. This provides a smoother ride in rough seas. While riding on the air cushion, the ship has a draft of 1.5 feet. Off cushion, the ship draws 6 feet. Two additional engines power a water jet propulsion system which draws water from beneath the ship and discharges it in two jet streams to propel and steer the ship. There are no propellers in the water. The water jet propulsion and steering system allows the ship to turn 360° within a space 1-1/2 times its length at dead stop.

PROJECT SETTING

EXISTING CONDITIONS

The Barbers Point Harbor basin was dredged at the site of a former barge harbor, a portion of which has been incorporated in the harbor configuration. The area encompassed by Barbers Point Harbor is 92 acres and 38 feet deep. The first increment was completed in 1985 at a cost of $50 million. Approximately 10 million cubic feet of coral was removed to form the harbor basin and entrance channel. The harbor is equipped with 4,700 feet of wave absorbers, berthing areas and navigation aids.

The site is characterized by relatively gentle slopes, with scattered mounds and depressions.

Vegetation in the Barbers Point Harbor area is characteristic of that found in dry areas of Oahu. Major vegetation along the beach strand include species growing in areas strongly influenced by the sea. Inasmuch as the site has been developed into a harbor, there are no rare or endangered plants remaining in the vicinity of the proposed terminal. Wildlife in the project area is affected by the low rainfall, scarcity of vegetation and the high level of disturbance to the natural setting. Potential inhabitants may include feral cats and dogs, mongoose, mice and various common bird species.

LAND USE

A ship repair company, Marisco, Ltd., currently operates a 8,000-ton floating dry dock capable of handling vessels up to 78 feet wide and over 500 feet long. Future development at Barbers Point Harbor will include a 1,600-foot pier, a container yard and bulk cargo facilities, storage areas, a back-up yard and myriad ship support activities.

Oil refineries and petroleum storage tanks lie to the south on Campbell Industrial Park lands. West Beach Development is a self-contained resort complex on 640 acres of land. Currently under construction, the project includes 1,680 residential units, 7,520 hotel/condominium units, a marina, a lagoon system, tourist recreational-commercial center, park, shopping centers, a golf course, a school and other necessary support facilities.

ACCESS

Barbers Point Harbor can be accessed from Interstate Route H-1 on Kalaeloa Boulevard then Malakoe Street.

RELATIONSHIP TO PLANS, POLICIES AND PERMITS

PLANS

Hawaii State Plan. The development Oahu Intraisland Ferry System is supported by the State Plan. According to Section 226-17 of the Hawaii State Plan, one of the first stated objectives regarding transportation is "to develop an integrated multi-modal transportation system that services statewide needs and promotes the efficient, economical, safe, and convenient movement of people and goods". Section 226-17 b (11) indicates that this will be achieved through "the use of low-cost, energy efficient, non-polluting means of transportation". The State shall "encourage systems that serve development need of communities".

State Transportation Functional Plan. Development of an intraisland ferry system is also in harmony with the State Transportation Functional Plan Objective which promotes the "development of a balanced, multi-modal statewide transportation system that serves clearly identified social, economic and environmental objectives of the Hawaii State Plan".

General Plan of the City and County of Honolulu. The General Plan of the City and County of Honolulu establishes long-range objectives and policies for guiding both the quantity and quality of future growth in Oahu.

The proposed Intraisland Ferry System will facilitate implementation of the General Plan. It specifically addresses the objective to "create a transportation system which will enable people and goods to move safely, efficiently, and at a reasonable cost; serve all people, including the poor, elderly, and the physically handicapped; and offer a variety of attractive and convenient modes of travel".

LAND USE POLICIES AND ZONING

State Land Use District. Pursuant to Hawaii Land Use Law (Chapter 205, HRS), the State Land Use Commission classifies all lands into four land use districts: urban, agricultural, conservation, and rural. The site along the eastern edge of the harbor is designated "Urban" on the State Land Use District Map. The proposed ferry terminal is considered a permitted use.

City and County of Honolulu Development Plan. Eight development plans were established to provide detailed schemes for "implementing and accomplishing the objectives and policies of the General Plan." The development plans guide the desired sequence, patterns and characteristics for future development. The City and County of Honolulu Land Use Development Plan Map designates the site as "Public Facility" under which the ferry is a permitted use.

City and County of Honolulu Land Use Ordinance. The City and County of Honolulu Land Use Ordinance (LUO) regulates land use in accordance with adopted land use policies, including the Oahu General Plan and Development Plan. Under the current Land Use Ordinance, the site is zoned " Industrial I-3." The proposed ferry terminal would be a permitted use under this designation.

SHORELINE AND ENVIRONMENTAL PERMITS

Department of Army Permit. The Department of the Army permit is administered by the U.S. Army Corps of Engineers, Honolulu District under Section 10 of the Rivers and Harbors Act (33 USC 403), Section 404 of the Clean Water Act (33 USC 1344) and Section 103 of the Marine Protection, Research and Sanitation Act of 1972 (33 USC 1413). The permit is required for all work within water of the United States, including ocean and coastal waters, inland and tidal waters, tidal ponds, fishponds, rivers, streams, and adjacent wetlands, perched wetlands, and intermittent streams.

Issuance of the permit is based on an evaluation of the probable impact of the proposed activity on the public interest, reflecting national concern for both protection and utilization of important resources. Factors considered include those relating to: conservation, economics, aesthetics, general environmental concerns, historic values, fish and wildlife values, flood damage prevention, land use, navigation, recreation, water supply, water quality, energy needs, safety, food production and, in general, the needs and welfare of the people.

Portions of the ferry terminal potentially subject to review under the Department of the Army permit would include those improvements extending into the water

Hawaii Coastal Zone Management Program Federal Consistency Review. Section 307 of the National Coastal Zone Management Act of 1972 (16 U.S.C. 1451 et. seq.) provides for State review of federal actions affecting the coastal zones of States with approved Coastal Zone Management Programs. Hawaii's Coastal Zone Management (CZM) Program, established pursuant to Chapter 205A, HRS was federally approved in 1977. It is administered by the Office of State Planning (OSP). Among Federal actions subject to review is the issuance of permits, including the Department of the Army Permit, which will be required for offshore channel improvements, turning basin, pier and shoreline revetment construction. Before the permit can be issued, the OSP must determine its consistency with the enforceable policies of the Hawaii CZM Program. These policies encompass broad concerns such as impact on recreational resources, historic and archaeological resources, scenic and open space resources, coastal ecosystems, economic uses, coastal hazards and the management of development.

Section 401 Water Quality Certification. The State Department of Health is charged with the responsibility of establishing and administering a State certification system pursuant to Section 401 of the National Clean Water Act (33 USC 1344) and Section 342-32(13), HRS. Water quality certification is required of any applicant for a Federal license or permit to conduct any activity that may result in any discharge into navigable water.

Special Management Area (SMA) Permit. The Hawaii Coastal Zone Management Law (Chapter 205A, HRS) charged the Counties with designating and administering Special Management Areas (SMA) along the State's coasts. Any "development", as defined by Law, within the SMA requires an SMA permit, which is administered by the City and County of Honolulu, Department of Land Utilization pursuant to Ordinance No. 84-4.

The project site will likely be located within the SMA boundary and subject to review under the SMA permit procedures.

Shoreline Setback Variance. The State's Shoreline Setback Law, (Chapter 205, HRS) prohibits virtually any development or development-related activity including the removal of sand, rocks, soil, etc. from the shoreline setback area, a 40-foot (20 feet in some areas) strip of land along the shoreline. The Counties, however, are authorized to grant variances for construction that would encroach in the setback area. The City and County of Honolulu, Department of Land Utilization administers this variance under its shoreline setback regulations.

Variances may be granted in consideration of a structure, or activity being in the public interest, hardship to the applicant if the proposed structure or activity is not allowed and the effect a structure or activity would have on natural shoreline processes, particularly with regard to shoreline erosion.

The shoreline variance request can be processed concurrently with the Special Management Area Permit with simultaneous decision-making by the City Council.

The Shoreline Setback Variance may be required for the ferry terminal, depending on the location of proposed improvements.

Permit for Work in Shores and Shorewaters. The Shorewaters Permit is administered by the State Department of Transportation pursuant to Section 266-16, HRS and Section 19-42-161, Hawaii Administration Rules, Department of Transportation, Harbors Division.

This permit is required for any construction, dredging, or filling within the shorewaters of the State, as defined by Chapter 266, HRS. Jurisdiction extends to shores, shorewaters, navigable streams and harbors, belonging to or controlled by the State.

Portions of the ferry terminal project subject to review include any improvements extending into the water.

PROJECT IMPACTS

SHORT AND LONG TERM IMPACTS

No adverse short or long term impacts are anticipated due to the compatible uses and facilities at Barbers Point Deep Draft Harbor. Construction activities should have minimal impacts within the industrial harbor setting.

ALTERNATIVES

Alternative sites for the ferry terminal at Barbers Point have yet to be identified for consideration. Alternative improvements for ferry docking, passenger servicing, parking and access will also be considered as project planning proceeds.

SHORT-TERM USE VERSUS LONG-TERM PRODUCTIVITY

The proposed project will not have any impact on the long-term productivity of the Barbers Point Deep Draft Harbor.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Although the labor and materials used to construct the improvements at the ferry terminal will be irretrievably committed, it will be available for future use, without substantial loss of long-term productivity should the proposed use be terminated.

MITIGATION MEASURES

Construction methods and materials shall conform with municipal building codes. No special mitigation measures will be required.

UNRESOLVED ISSUES

No unresolved issues have been identified.

CONSULTATION

Consultation on the Intraisland Ferry System project is being pursued. through the Intraisland Ferry Task Force comprised of various governmental and community representatives. A public information/education presentation was also prepared for display at various public locations. These consultation efforts are summarized in Tables 1 and 2.

Public comments were also solicited on the Oahu Intraisland Ferry System Draft Environmental Impact Statement, pursuant to Chapter 343, HRS. Availability of the document for public review was published in the OEQC Bulletin on October 8, 1988. All comments received within the public comment period as well as responses to those comments are contained in Part I - Maunalua Bay Terminal. Comments and responses pertaining to the Barbers Point Terminal are reproduced herein.

TABLE 1

INTRAISLAND FERRY TASK FORCE MEMBERS
As of July, 1987

	NAME	ORGANIZATION
1.	Edward Uchida	Planner, Department of Transportation-Statewide Transportation Planning Office
2.	Dan Tanaka (Alt.)	Planner, Department of Transportation-Statewide Transportation Planning Office
3.	Adm. E. Alvey Wright	Project Coordinator, Department of Transportation-Statewide Transportation Planning Office
4.	Dennis O'Connor	Councilman, City and County of Honolulu
5.	Robert Dods (Alt.)	Senior Assistant for Councilman O'Conner
6.	Michelle Tucker (Alt.)	Researcher, City Council, City and County of Honolulu
7.	John Emmerson	Chief, Operations Branch, U.S. Army Corps of Engineers
8.	Dave Swenson (Alt.)	Regional Economist, U.S. Army Corps of Engineers
9.	Donna Ikeda	Senator, Hawaii State Legislature
10.	Harry Murakami	Assistant Chief for Engineering, Department of Transportation-Harbors Division
11.	David Yokoyama	Planning Engineer, Department of Transportation-Harbors Division
12.	Ron Tsuzuki	Planning Engineer, Department of Transportation-Highways Division
13.	Kenneth Au (Alt.)	Advance Planning Engineer, Department of Transportation-Highways Division
14.	Libert Landgraf	Deputy Director, Department of Land and Natural Resources
15.	Michael Yoshinaga (Alt.)	Project Coordinator, Department of Land and Natural Resources

16.	Robin Foster	Planner, Department of Land Utilization, City and County of Honolulu
17.	Verne Winquist	Planner, Department of General Planning, City and County of Honolulu
18.	Bill Medeiros (Alt.)	Planner, Department of General Planning, City and County of Honolulu
19.	Don Griffin	Planner, Department of Parks and Recreation, City and County of Honolulu
20.	Jim Ball	Project Manager, Department of Transportation Services, City and County of Honolulu
21.	Marilyn Kali	Public Information Officer, Department of Transportation-Director of Public Relations
22.	Chris Kam (Alt.)	Information Specialist, Department of Transportation-Director of Public Relations

TABLE 2

INTRAISLAND FERRY TASK FORCE MEETING DATES

May 29, 1987
June 6, 1987
June 26, 1987
August 4, 1987
September 4, 1987
November 6, 1987
March 16, 1988

PUBLIC PRESENTATIONS AND INFORMATIONAL MEETINGS

Public Information Meetings

July 1, 1987	Hawaii Kai Rotary
July 27, 1987	Hawaii Kai Neighborhood Board
August 25, 1987	Hawaii Kai Elementary School
January 7, 1988	Makakilo Elementary School
January 14, 1988	Ewa Elementary School
January 31, 1988	Waipahu Elementary School
March 22, 1988	Hawaii Kai Elementary School

Public Exhibitions and Presentations

October 15, 1987	Board of Realtors - City Affairs Comm.
December 1, 1987	Farrington High School. Public Exhibit
Feb. 14-21, 1988	Kahala Mall Shopping Center
February 18, 1988	Hawaiian Canoe Program Advisory Council
February 23, 1988	Hawaii Yacht Club
March 1988	International Order of the Blue Gavel
March thru April 1988	Windward Shopping Mall
April 13, 1988	Waikiki Yacht Club
April 24, 1988	Waikiki Yacht Club
May 14-20, 1988	Pearl Ridge Shopping Center
May 18, 1988	Waterborne Transportation Conference
May 19, 1988	Pacific Congress on Marine Science & Technology

DEPARTMENT OF THE ARMY
U. S. ARMY ENGINEER DISTRICT, HONOLULU
BUILDING 230
FT. SHAFTER, HAWAII 96858-5440

REPLY TO
ATTENTION OF:

Planning Branch

November 16, 1988

RECEIVED

'88 NOV 21 A11:24

Dr. Marvin Miura
Office of Environmental
  Quality Control
465 South King Street, Room 104
Honolulu, Hawaii 96813

Dear Dr. Miura:

Thank you for the opportunity to review the Draft Environmental Impact Statement (DEIS) for the proposed Oahu Intra-island Ferry System. The following comments are offered:

a. The need for a Department of the Army permit is recognized on page C-7 of the DEIS. Operations Branch has participated in pre-application meetings with the Department of Transportation. The Harbors Division should continue to coordinate with Operations Branch regarding permit requirements.

b. The flood zone information presented on page B-10 for the Maunalua Bay Ferry Terminal site is correct. According to the Flood Insurance Study for the City and County of Honolulu, the other sites are located in the following zones: Barbers Point Site, Zone AE (special flood hazard area inundated by the 100-year flood) with base flood elevation of 8 feet MSL; Ewa Site, Zone AE with base flood elevation of 6-7 feet MSL; Waikiki Site, Zone D (areas in which flood hazards are undetermined); Waipahu Site, Zone D and Zone A (special flood hazard area inundated by the 100-year flood, with no base flood elevation determined).

Sincerely,

James S Nakason for
Kisuk Cheung
Chief, Engineering Division

Copy furnished:

Director
Hawaii State Department
  of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813

JOHN WAIHEE
GOVERNOR

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

EDWARD Y. HIRATA
DIRECTOR

DEPUTY DIRECTORS
JOHN K. UCHIMA
RONALD N. HIRANO
DAN T. KOCHI
JEANNE K. SCHULTZ

IN REPLY REFER TO
HAR-EP 2650

December 29, 1988

Mr. Kisuk Cheung, Chief
Engineering Division
Department of the Army
U.S. Army Engineer District, Honolulu
Building 230
Fort Shafter, Hawaii 96858-5440

Attention Planning Branch

Dear Mr. Cheung:

Draft Environmental Impact Statement (DEIS)
for Oahu Intraisland Ferry System - Job H. C. 1694

Thank you for your comments regarding the Department of Army permit and the information on flood zones affecting the Maunalua Bay Ferry Terminal.

We look forward in working with the Operations Branch of your office in the processing of the Department of Army permit for the Maunalua Bay Terminal.

Very truly yours,

Edward Y. Hirata
Director of Transportation

JOHN WAIHEE
GOVERNOR OF HAWAII

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

WILLIAM W. PATY, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES
LIBERT K. LANDGRAF
MANABU TAGOMORI
RUSSELL N. FUKUMOTO

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

RECEIVED
'88 NOV 28 A11:58
OFC. OF ENVIRONMENTAL QUALITY CONTROL

NOV 25 1988

FILE: 89-217
DOC.: 4660E

The Honorable Marvin T. Miura, Ph.D.
Director
Office of Environmental Quality Control
465 South King St., Room 104
Honolulu, Hawaii 96813

SUBJECT: O'ahu Intraisland Ferry System

Dear Dr. Miura:

Thank you for giving our Department the opportunity to comment on this matter. We have reviewed the materials you submitted and have the following comments.

The Draft Environmental Impact Statement (DEIS) has addressed most of the expected impacts of the extensive dredging and construction required at the Maunalua Bay site. Mitigation measures have been proposed to the extent possible to prevent excessive negative effects on an already severely stressed ecological system at that site.

The DEIS states that no adverse impacts are expected at the other terminal sites described, unless activities such as dredging, construction near or in coastal waters, or other shoreline modifications become necessary.

All future activities, including blasting, that may impact aquatic resource values at the proposed terminals should be submitted to the Department for review and the necessary permits obtained.

Potential interference with recreational and commercial fishing should be averted as much as possible and compensated for wherever inevitable, during the operation of ferry routes and terminal facilities.

We note, too, that (according to the DEIS) impacts on whales and green sea turtles are still to be determined, yet those impacts are omitted in "Unresolved Issues" on the "Summary Sheet" of the DEIS. We request that mitigation plans regarding whales and green sea turtles are to be coordinated with both the National Marine Fisheries Service and our Office of Conservation and Environmental Affairs.

The EIS contains detailed information necessary for archaeological/historic sites review only for the Maunalua Bay Beach Park Terminal. As the terminal and support system will be located makai of Kalanianaole Highway on fill lands, we anticipate that there will be "no effect" on significant historic sites.

The Waikiki location has yet to be determined, and, therefore, we cannot assess the expected impact. There are historic sites in Waikiki which might be affected depending on terminal location.

The Downtown Terminal, Airport Terminal and Barber's Point Terminal are making use of existing facilities, and we anticipate no problems.

The Ewa Terminal at Ewa Marina cannot be assessed without more information, which, according to the EIS, will be forthcoming when design plans are completed. This location is within the One'ula Archaeological District (Site 80-12/13-2873) which has been determined eligible for listing on the National Register of Historic Places.

The Waipahu Terminal location intrudes on Site 80-13-9992, the Pearl Harbor Naval Base, a National Historic Landmark site which is listed on the National Register. Coordination with the Navy archaeologist, Dr. Robert J. Hommon, and the State Historic Sites Section is necessary.

Thank you for your cooperation in this matter. Please feel free to call me or Jay Lembeck at our Office of Conservation and Environmental Affairs, at 548-7837, if you have any questions.

Very truly yours,

WILLIAM W. PATY

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION

December 29, 1988 HAR-EP 2653

MEMORANDUM:

TO: The Honorable William W. Paty, Chairperson
Board Of Land and Natural Resources

FROM: Director of Transportation

SUBJECT: DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)
FOR OAHU INTRAISLAND FERRY SYSTEM
(RESPONSE TO FILE: 89-217, DOC.: 4660E)

Thank you for your comments on the subject DEIS. We look forward to continued coordination with your department in the development of the Oahu Intraisland Ferry System. We shall be consulting with your staff in the preparation of environmental documents and permit processing as they relate to areas of concern expressed in your letter.

We appreciate the assistance your department has provided us in this most important project. If you have any questions concerning the ferry system please feel free to call Mr. Harry Murakami of our Harbors Division at 548-2535.

Edward Y. Hirata

for

11 November, 1988

Mr. David K. Higa
Chief, Harbors Division
Department of Transportation
79 South Nimitz Hwy
Honolulu, Hawaii. 96813

Subj: Draft Environmental Impact Statement (EIS) for the Oahu Intraisland Ferry System, comments concerning.

Ref: Your letter dated October 17, 1988 - HAR-EP 1697.

Dear David,

We received your reference letter draft EIS two weeks ago. Please find the following comments pertaining to the subject document as you requested. Our opinions or recommendations are meant to be constructive, but we recognize that we have a limited data base of background to draw upon, so if they disagree with the concensus, please forgive us. We consider the EIS to be a fine document that appears to address the major problems at Haunalau Bay.

SAN DIEGO SHIPBUILDING & REPAIR, INC.
(619) 691-1091 • Telex No. (910) 240-4387
Foot of F Street • P.O. Box 5058, Chula Vista, California 92010

Page 2:

Item:	Section:	Comment:
1	Cover	We suggest a more encompassing system title for the system as previously suggested which would alter the title of the report to: "Hawaii Ocean Transit System Oahu Intraisland Routes".
2	Haunalua Bay Fig. 4	The pier as shown does not depict the fender system previously recommended by SDSR. The pier we feel might be narrow in way of a gangway that must accommodate the 2 ft. tide plus a reasonable slope for passenger safety as recommended by SDSR. The mooring cleats appear to be small for handling a ship of this size with the maximum possible wind at the worst angle. We feel the dock elevation may be incorrect considering the proposal dredged depth of water at 10 ft. above MLLW.

Page 3:

3	Maunalua Bay A-10 Entrance Channel	SDSR during meetings in Honolulu in Aug/ Sept. 1988, was willing to accept a lesser channel width of 150 ft. versus 200 ft. and a guaranteed channel depth of 9 ft. versus 150 ft. That offer to save Hawaii increased dredging costs still remains with the only caveat that the State will ensure that the 9 ft. depth be periodically maintenance dredged.
4	Maunalua Bay A - 12 Ferry System	Our company's name is SAN DIEGO SHIPBUILDING & REPAIR, INC., not Ship Building or Ship Builders. We request that this minor oversight is corrected in each section of the report and in DOT files if incorrect. Thank you. We also recommend you mention that the next lowest bidder was $15,000,000 (?) more than SDSR to be paid by the State. We feel this will mitigate any vendor greed criticism, as well as possibly encouraging a cooperative effort to make the program a success and finally it shows to the people the creative approach their State officials took to

Page 4:

	solicit an entrepreneurial solution to a transportation problem, plus saved them $15,000,000.
Vessel A - 12	The ship carries 350 passengers as designed, not 300.
A - 13	The ship has two propulsion engines, not a third engine. There are also, as stated, two lift engines.
A - 13 Para 3	We suggest you add after "monohull" the words "or catamaran". It should be noted that at slow speed, the catamaran style hull (second bidder), produces an enhanced wave wake which severely impacts shore side erosion. San Francisco Bay catamaran ferries and many others are good examples. SDSR's SES will operate on a partial cushion alongside the pier and in the harbor to not only give a more comfortable ride, but also to reduce the wake dramatically. There's less wake at max

Page 5:

	speed than at slower speeds but all conditions surpass equivalent monohull or catamarans.
A - 13 Para 5	Add after "transportation." The ferry operator also offers a "dial-a-ferry" phone service that gives continuous recording of schedules, sea conditions and special fare promotions".
A - 13 Para 7	It is our understanding that Maunalua Bay will not necessarily be the first terminal. Should that be stated here or is it best to keep to the original schedule for EIS purposes??
A - 13 Para 8	Add after "Pier 13" the words "and 14". SDSR in it's bid document and subsequently have requested use of piers 12 (parking), pier 13 maintenance and repair and pier 14 commercial operations which was approved by DOT.
A - 14 Para 1	The bid allows for a minimum number of runs as stated. However, the vessels speeds permits 7 trips from 6 a.m. to 9 a.m. if commuter use approaches maximum

Page 6:

	capacity 2,450 possible passengers. This capacity should be stated and analyzed.
A - 14 Para 2	Suggest a clarification which may or may not be appropriate here. Based on the comment Pg. A14, Para 1, the capacity of the service clearly exceeds the minimum commuter schedule required. As stated, the use by tourists would be generally in a direction opposite to commuters thus not creating a booking or conflict with commuter issue.
5. Maunalua Bay B - 8 Para 6	Pure opinion - we think this very important paragraph about dredging and erosion should be amplified to ensure the reader is understanding the complex theory that is being presented.
6. D - 7 Flora & Fauna Para 2	It is suggested that the ferry operator take a "detour" to avoid the turtles. SDSR requests information as to the extent of this "detour" as it would possibly affect schedule.

Page 7:

7. D - 8 Whales Para 3

The report makes the point that there were three incidents of hitting whales in three years. On its face a remarkable record. It might also be investigated to see if out of the millions of hours of boat operation in Hawaiian waters, whether even the 3 incidents were accidents. Possibly the collisions were due to dive charter boats who were chasing the whales for the price of whale watching or just curiosity. If these incidents were partially deliberate, then all the comments about whales could be significantly mitigated.

D - 14 Noise

The noise issue has been a great concern to residents. To give this emotional topic one paragraph of explanation, we believe is too little. One letter after the EA said the boat selected was a "Hovercraft". The hovercraft as we all know is an extremely noisy vessel. This point should be responded to and

Page 8:

clarified. We believe that the one comparison given in the report has been to compare traffic noise to the ferry. The residents don't like traffic noise any better than they perceive the potential ferry noise. In the technical literature there are numerous less combatative comparisons, which we suggest be used to show how quiet this boat is at slow speeds at the distances of sound mitigation from the closest residence. We feel comparisons to "room noise" or distinguishing ferry noise from normal household sounds be used.

9. D - 21 Impacts

This may not be the correct area for this comment, but doesn't the ferry service contribute to certain emergency evacuation measures during tsunamis or hurricane warnings versus a congested highway under construction? Shouldn't this be noted?

10. E - 2 Task Force

SDSR requests membership on the permanent task force for all the ferry terminal sites. As the ferry

Page 9:

system operator, we feel our knowledge and experience would contribute to the task forces mission significantly.

11. E - 6 Preparation Comments

Some of the comments we feel have not been addressed in the new EIS from the EA comments.

a) Operations of the systems is still sketchy and mysterious. The operation is, more efficient, more reliable and cheaper than the previous hydrofoils much less any other US based ferries. Lets not be bashful, lets be proud and let the public know.

b) Whale issue needs better history and facts as previously stated.

c) The SES ferry design precludes typical ship oil product leakage. Portable oil booms could be positioned on certain sensitive routes if absolutely necessary.

Page 10:

d) Shouldn't there be a comparison to large yachts now in Hawaii Kai as to wake, noise etc. to eliminate the large commercial vessel image?

e) Noise concerns previously questioned should be addressed in a forthright way.

12. Appendices Appendix A Reduction in Assumption

Ferry capacity is understated so therefore the analysis is likewise understated. At 80% capacity, 7 departures (maximum), the car reduction would be 211 cars/departure or 1,479 cars per a.m. or stated differently one lane of traffic is eliminated according to federal DOT highway guidelines. This calculation yields a significant reduction at 11.4 percent versus the EIS reports 5.6 percent. The p.m. reduction would be 13.2 percent versus 6.5 percent in the EIS report.

Page 11:

13.	Overall Comment	Those comments changed in the Maunalua Bay section noted previously should be changed in the entire report where applicable (several sections are repeated under each terminal).
14.	Waikiki 1 Project Description	Should Fort DeRusy be mentioned here as an alternative site to the Hilton as it was originally stated in the invitation for bid?
15.	Remainder of Ferry Terminals General	The discussions we suppose are purposely sketchy and incomplete. Will there need to be amplified data on Maunalua Bay or are they all right as written???
16.	Barbers Point	Is the ferry terminal located properly on the sketch. We understand the terminal would be in the inner harbor??

Page 12:

I look forward to your consultants feedback on the above comments. Once again we only wish to help the process if we can.

Respectfully,

W.T.Gurnee,
President.
WTG/mlg
sdsbl/m/environ.imp

cc: Mr. Carl Matsukawa
Wilson Okamata & Assoc.
Mr. Ed Hirata, Director of Transportation
Mr. Ed Uchida, Chief Planning Division
Mr. Mike Moynahan, SDSR
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IN REPLY REFER TO

December 30, 1988 HAR-EP 2663

Mr. W. T. Gurnee, President
San Diego Shipbuilding and Repair, Inc.
P. O. Box 5058
Chula Vista, CA 92010

Dear Mr. Gurnee:

Draft Environmental Impact Statement (DEIS)
for the Oahu Intraisland Ferry System

Thank you for your comments on the subject DEIS. In response to your comments, we offer the following in the order presented:

1. Cover: The EIS encompasses only the Oahu Intraisland Ferry System. DOT presently has no plans to extend the service beyond the island of Oahu. Should such a service be contemplated in the future, separate environmental documentation will be required.

2. Figure 4: Figure 4 is a conceptual sketch intended to convey the scale of the pier. We are currently proceeding with Engineering design plans of the pier. Your input on the final design of the pier will be welcome.

3. Page A-10: Toward insuring safe simultaneous passage of the ferry vessel and boats typically using the Maunalua Bay channel, the widths presented in the draft EIS shall be maintained. In an effort to minimize the quantity of dredging, associated construction costs, and subsequent environmental impacts, the DOT has opted to reduce channel depth to a uniform 9 feet throughout the channel length. This change in design will be reflected in the final EIS.

4. Page A-12: The EIS will be revised to correct all

references to your company. We do not believe it is appropriate to discuss in the EIS the other bids received. The EIS is intended to disclose the environmental impacts of the project.

Page A-12: Our understanding is that the ship can accommodate 340 people in an airline type seating and an additional 10 people would be accommodated in first class seating. We will note in the Final EIS that the vessel does have an approved passenger capacity of 350 and that the ferry service can be increased to this maximum to meet ridership demands.

Page A-13: The EIS will be revised to describe the propulsion system of the ferry more accurately. We will also insert the term "catamaran" following "monohull" in the final EIS and discuss the "dial-a-ferry" phone service as a feature to be offered by the operator. The Maunalua Bay Ferry Terminal is currently being pursued as the first phase of the Oahu Intraisland Ferry System. The development of any of the other terminals can proceed should development of the Maunalua Bay terminal be delayed or abandoned.

Page A-13: The final EIS shall be revised to reflect usage of pier 14 by the ferry operator.

Page A-14: Each of the vessels will be required to make two runs each to the Downtown Terminal during the 3-hour morning peak period and two runs each to Maunalua Bay during the 3-hour evening peak period. Regardless of the ferry capacity or the direction in which ferry usage by either commuters or tourists may be demanded, the Maunalua Bay terminal will not be used for commercial transport services. Only normal public mass transit use will be permitted. Thus, while tourists may be transported to Maunalua Bay just as they could be through the City's bus system, no commercial bookings of seats will be allowed. Moreover, the terminal may not be used as a transfer area between the ferry and commercial transport services i.e. tour buses.

5. Page B-8: We feel that the draft EIS appropriately addresses erosion in the bay. Should any technical questions arise regarding erosion processes in the bay, we will provide further clarification.

6. Page D-7: The turtle studies contracted by the DOT will assist in determining appropriate ferry routes in and out of Maunalua Bay.

7. Page D-8: The three incidences involving collisions between vessels and whales were investigated by the National Marine Fisheries Service, to determine if the whales were deliberately harassed. Following the investigation, no charges were filed against any of the boat operators.

8. Page D-14: We believe the description of the surface effect ship and its noise rating provide an accurate assessment with respect to potential noise impacts. We will indicate that the perceived noise levels at the nearest residences are for the exterior environment and that noise levels within homes will be considerably lower.

9. Page D-21: The use of the ferry vessel for emergency evacuation has not been discussed to date. We will, however, present your offer for providing such services to the Oahu Civil Defense Agency.

10. Page E-2: The Intraisland Ferry Task Force is intended to promote intergovernmental coordination among represented agencies and organizations. Your expertise will be called upon as deemed necessary to facilitate the Task Force's efforts.

11. a. The EIS is intended to disclose the environmental impacts of a proposed action which, in this case, includes the proposed construction activity and the operation of the vessel proposed for use by the apparent low bidder. The bidding process described in the EIS is assumed to have resulted in the selection of the most cost-efficient ferry alternative from among those offering their services. Any claims comparing features of the SES with other types of craft would extend beyond the officially sanctioned method for selecting the ferry operator.

    b. See response to item No. 7.

    c. We will note the use of portable oil booms as a potential mitigating measure to contain oil spills along sensitive routes.

    d. At a length of 118 feet, the ferry vessel is considerably larger than the largest boats found in the bay. Such boats are generally about 35 feet in length. With respect to wake created, we will clarify on page

D-12 that the SES would create less wake than the largest boats which typically operate in Maunalua Bay.

    e. See response to item No. 8 (Page D-14).

12. Appendices: The traffic reduction assessment shall be revised in the Final EIS to reflect the approved passenger capacity of 350 persons.

13. Any changes made to general statements pertinent to all of the terminals will be uniformly revised.

14. The Fort DeRussy terminal, as identified in the bid document, and the Hilton Pier are the same. There are no other ferry terminal sites being considered for this area.

15. There was no purposeful intent to providing abbreviated descriptions of the terminal sites at Waikiki, the Airport, Waipahu, Ewa Marina and Barbers Point. Currently, there is inadequate information on the nature of improvements that will be required for the terminals and how construction may affect the respective environments. As we noted, supplemental environmental documents may be required for each of the terminal sites except Maunalua Bay. The EIS fully addresses the environmental impacts of the Maunalua Bay ferry terminal and no further environmental documentation will be required for that site.

16. In the text relating to the Barbers Point Harbor Terminal, we do not limit siting to any particular location within the harbor. While the inner harbor is currently the choice for a ferry terminal, the option of locating it elsewhere has not been foreclosed.

We hope we have satisfactorily responded to your comments. If you have any questions, please feel free to contact Mr. Harry Murakami of the Harbors Division at 548-2535.

Very truly yours,

Edward Y. Hirata

Edward Y. Hirata
Director of Transportation

REFERENCES

M & E Pacific, Inc., Environmental Impact Statement for the Barbers Point Deep Draft Harbor on Oahu, June 1978.

State of Hawaii Department of Transportation, Port Hawaii Handbook 1988-1989, 1988.

END

CERTIFICATION

I HEREBY CERTIFY THAT THE MICROPHOTOGRAPH APPEARING IN THIS REEL OF FILM ARE TRUE COPIES OF THE ORIGINAL DOCUMENTS.

2006

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