FINAL ENVIRONMENTAL IMPACT STATEMENT

for the

OAHU COMMERCIAL HARBORS 2020 MASTER PLAN
IMMEDIATE PHASE

Oahu Island, Hawaii

Proposing Agency:

State Department of Transportation
Harbors Division

Accepting Authority:

Office of the Governor, State of Hawaii

Prepared By:

Wil Chee – Planning, Inc.
1400 Rycroft Street, Suite #928
Honolulu, Hawaii 96814

September 1999

DIRECTOR'S OFFICE
DEPT. OF
TRANSPORTATION
Nov 5 3 37 PM '99

EXECUTIVE CHAMBERS

HONOLULU

BENJAMIN J. CAYETANO
GOVERNOR

November 5, 1999

TO: The Honorable Kazu Hayashida, Director
Department of Transportation

FROM: Acceptance of the Final Environmental Impact Statement for the Oahu Commercial Harbors 2020 Master Plan - Immediate Phase

With this memorandum, I accept the Final Environmental Impact Statement for the Oahu Commercial Harbors 2020 Master Plan - Immediate Phase as satisfactory fulfillment of the requirements of Chapter 343, Hawaii Revised Statutes. The economic, social and environmental impacts, which will likely occur should this project be built, are adequately described in the statement. The analysis, together with the comments made by reviewers, provides useful information to policymakers and the public.

My acceptance of the statement is an affirmation of the adequacy of that statement under the applicable laws.

I find that the mitigation measures proposed in the environmental impact statement will minimize the negative impacts of the project. Therefore, I direct the Department of Transportation and/or its agents to perform these, or alternative and at least equally effective, mitigation measures at the discretion of the permitting agencies. The mitigation measures identified in the environmental impact statement are listed in the attached document.

Benjamin J. Cayetano

BENJAMIN J. CAYETANO

Attachment

c: Honorable Bruce S. Anderson, Ph.D., M.P.H.
Office of Environmental Quality Control

ATTACHMENT TO ACCEPTANCE MEMORANDUM FROM GOVERNOR BENJAMIN CAYETANO
TO KAZU HAYASHIDA, DIRECTOR, DEPARTMENT OF TRANSPORTATION
MITIGATION MEASURES
FINAL ENVIRONMENTAL IMPACT STATEMENT
OAHU COMMERCIAL HARBORS 2020 MASTER PLAN

The following list of mitigative measures identified in the final environmental impact statement will minimize the negative impacts of the project. If the project is implemented, the Department of Agriculture and/or its agents should perform these or alternative and at least equally effective mitigation measures at the discretion of the permitting agencies.

HISTORIC AND CULTURAL RESOURCES

In the event that cultural artifacts or human remains are encountered during construction activities, all operations in the vicinity of the discovery will immediately cease. The discovery and the surrounding area will be secured and protected from further damage. The State Historic Preservation Division of the Department of Land and Natural Resources will be notified and immediate consultation with the Oahu Island Burial Council will be sought before commencement of construction activities.

AESTHETIC AND VISUAL RESOURCES

During the design phase prior to implementation, consideration shall be given to retaining a "Hawaiian Sense of Place" through the use of Hawaiian architectural designs which stress features like natural ventilation, open spaces, landscaped gardens, columns, and lanais.

AQUATIC HABITAT

In order to secure habitat protection for various shorebird species which utilize the Keehi Lagoon mudflats, the final project design will avoid the mudflat areas during the construction and long-term operation of the berthing facilities.

ALIEN SPECIES

Until such time that enforceable ballast water regulations are established and promulgated, ships entering Honolulu Harbor will, when practicable, comply with the existing "voluntary ballast water guidelines" established by the United Nations International Maritime Organization (IMO). Particular attention should be given to the "Ships' Operation Procedures" contained in the IMO guidelines. This section outlines specific precautionary practices and ballast water management options. Specific procedures which would reduce the release of alien species include the following:

* Minimizing the uptake of harmful aquatic organisms, pathogens and sediments by avoidance of loading ballast in very shallow waters where propellers stir up sediments and in the darkness when bottom-dwelling organisms may rise up in the water column;
* Removing ballast sediment on a timely basis by routine cleaning of ballast tanks, when practicable, in mid-ocean and in accordance with the provisions of the ships' ballast water management plan;
* Avoiding unnecessary discharge of ballast water taken up in another port; and,
* Practicing sound ballast water management options such as deep water/open ocean ballast water exchange, non-release or minimal release of ballast water, discharge to reception facilities, and the use of emergent and new technologies and treatments.

TRAFFIC

Where necessary, the following measures will be employed to mitigate traffic impacts which may occur.

* Operation of construction vehicles will be limited to off peak hours.
* Interisland cruise ship arrivals and departures will be scheduled during Saturday mornings and evenings, respectively.
* A shuttle bus operation between Pier 2 and adjacent shopping areas should be considered for a period of several hours before the departure of a large cruise ship to reduce the pedestrian activity and associated impacts of traffic flow at the adjacent intersections. A schedule of one shuttle bus every ten to fifteen minutes would have a minimal impact on traffic operations, but would enhance pedestrian movement and safety. This operation would best be provided by the cruise operator.
* During the design phase of the proposed projects, potential site tenants and users will be consulted to determine specific off-street parking and loading area requirements.

WATER SUPPLY

Proposed buildings and landscapes at the project sites will be designed with water saving considerations in mind. The water conservation methods which could be considered during the design phase of the proposed projects may include but are not limited to:

* Installation of water efficient fixtures
* Low-volume flush toilets and urinals
* Automatic faucets for sinks and lavoratories
* Appropriate landscape plant selection to limit water uptake
* Irrigation with nonpotable or reclaimed water

SEWER AND DRAINAGE

The increased runoff from newly paved areas at the proposed Keehi Lagoon project sites is not expected to have significant adverse impacts; however, a drainage master plan will be prepared during the design phase of the proposed projects to ensure that the future storm drainage systems are properly sized.

COASTAL AND GROUND WATERS

In accordance with Section 11-55, Hawaii Administrative Rules, the proposed harbor improvements will require National Pollutant Discharge Elimination System (NPDES) permit approvals from the Department of Health. The NPDES permit application will require the development of a Best Management Practices Plan, which will be developed prior to construction activities and which will identify the most effective erosion, sedimentation, and turbidity control measures to reduce the amount of soil and sediment accumulation in the coastal waters as a result of construction activities. Unknown factors such as pile drive size and type, construction equipment to be used, construction site staging areas, etc. would determine the most effective Best Management Practices (BMP) in mitigating construction related impacts on coastal waters. Mitigation measures may include but not be limited to:

* Silt curtains - to limit and contain the suspension of fine sediments from activities associated with piling installation.
* Drainage swales - to convey on-site runoff while limiting erosion.
* Storm drain inlet protection - filtering measures placed around inlets and drains to trap sediment, preventing it from entering inlets and receiving waters.
* Sediment traps - to retain site runoff and allow suspended sediments to settle out.
* Soil stabilization - practices designed to prevent the loss of disturbed or exposed soil areas through the use of vegetation and/or geotextiles.

ENERGY RESOURCES

Proposed project buildings, activities and site grounds will be designed with energy savings considerations in mind. Energy usage at the proposed project sites will be designed in accordance with Chapter 344 (State Environmental Policy), Chapter 226 (State Planning Act) of the Hawaii Revised Statutes, and in compliance with building codes. The energy conservation methods which could be considered during the design phase of the proposed projects may include, but are not limited to:

* Maximum cooling load through the use of site shading, orientation, and use of naturally ventilated areas.
* Use of high efficiency indoor and outdoor lamps and lighting.
* Maximum integration of day lighting in building design.
* Design mechanical systems to comply with the Honolulu Energy Code and to exceed its energy conserving requirements.
* Conformance with Hawaiian Electric Company's New Construction Demand-Side Management Program to potentially qualify for energy conservation rebates and incentives.

SOLID AND HAZARDOUS WASTE

During the design phase of the proposed improvements a construction and demolition (C&D) waste recycling plan will be developed to: (1) effectively recover building materials which could contain potentially hazardous substances (such as batteries, mercury containing thermostats, asbestos, liquid wastes, oils, paints, solvents, refrigerant fluids, tires and liquid filled transformers), and (2) prevent such materials from being disposed. The C&D recycling plan would also consider the designation of Harbors property and infrastructure development for industries such as reuse, recycling and remanufacturing that depend heavily on interisland, interstate and international shipping.

All known utilities and underground pipelines will be identified by the demolition and construction contractor and subsequently disconnected or removed prior to site work. All fuel storage tanks, hazardous materials (including asbestos building material and lead-based paint), and transformers (potential sources for polychlorinated biphenyls) present in structures planned for demolition will be managed in accordance with measures agreed upon by the Department of Health. These measures may include the removal, on-site stabilization, and if feasible recycling of hazardous materials to avoid the potential for release into the environment.

Site construction and demolition will be performed in accordance with a site-specific Health and Safety Plan.

The existing regional petroleum contamination will be addressed during the project design and construction phases and incorporated into contract and bid documents. The design and construction phases will be completed in compliance with the Department of Health's *Guidance on Construction Activities Encountering Area-Wide Petroleum Contaminated Soils* (DOH Guidance), and other applicable Federal and State laws and regulations.

The contractor shall be responsible for taking the safety, contamination management, and documentation actions required by the DOH Guidance cited above.

It is expected that most of the excavated materials will be returned to trenches and safely covered on-site. However, if some contaminated materials cannot remain on-site, they will be sampled, analyzed, and appropriately disposed of at DOH-approved facilities. Transport of the materials will also comply with State and Federal regulations regarding the transport of hazardous or petroleum contaminated materials. It is expected that a minimal amount of material will be removed from the property. Disposal of the materials will also comply with all State requirements and site-specific permits at the disposal site.

Normal operations at the proposed project sites would not expose the public or site workers to hazardous substances. Tenants on the site will be required to inform workers, through regular training sessions and use of operational manuals, about standard procedures for use of all equipment, especially equipment which may contain or use hazardous materials. Training will identify procedures to follow in the event of equipment malfunction or other emergency. Thus, no significant long-term impacts associated with exposure to hazardous materials are anticipated.

A site-specific Health and Safety Plan will be prepared prior to construction. The contractor is required to comply with all conditions of the Health and Safety Plan, which will ensure that workers will not be exposed to unacceptable safety risks.

NOISE

Properly muffled construction equipment will be required. If possible, heavy equipment and portable diesel engines and generators should be located at least 400-500 feet from residences. State Department of Health regulations controlling construction noise limits and construction curfew times will be adhered to.

AIR QUALITY

During the construction period fugitive dust control measures should be implemented to reduce the amount of particulate matter emissions. On-site dust control can be accomplished through frequent watering of unpaved roadways and areas of exposed soil. To further minimize fugitive dust emissions, the paving and/or landscaping of bare earth areas should be implemented as soon as practicable.

The off-site concrete and asphalt batching plants must be permitting by the DOH Clean Air Branch pursuant to state regulations. Issuance of the necessary permits is contingent upon the ability of the batching plants to continuously comply with both emissions and ambient air quality standards.

Department of Transportation
State of Hawaii

Prepared by:
Harbors Division

Final

Environmental Impact Statement

for

The Oahu Commercial Harbors 2020 Master Plan – Immediate Phase

Oahu Island, Hawaii

This final Environmental Impact Statement was prepared under my direction, and the information submitted, to the best of my knowledge fully addresses the document content requirements set forth in Section 11-200-17, Hawaii Administrative Rules.

9/23/99
Date

Thomas Fujikawa
Chief, Harbors Division
Department of Transportation

ADDENDUM

1.0 PROJECT SUMMARY

1.1 Summary of Probable Impacts and Mitigation Measures

Adverse impacts of greatest concern are short-term impacts associated with construction activities of the proposed harbor improvements.

The quality of near shore waters in the vicinity of proposed project areas requiring pile driving activities is likely to diminish as a result of suspension of silt, sedimentation, and elevated turbidity during construction activities. Consequently, marine biological communities in these areas would also be impacted as a result of the increase in turbidity and sedimentation rates. The impacts to the water quality and marine biota are anticipated to be minimal and short-term in duration.

The Water Quality and Marine Biological Studies conducted for this EIS concluded that any sediments that might be resuspended into the water column by construction activities would be fine to medium sands. These sands would settle out rapidly with minimal effect on the resident marine organisms. Furthermore, any construction-related, resuspended sediments and turbidity are likely to rapidly dissipate as a result of the high level of circulation in the waters around the project areas. Water quality impacts would be mitigated by the development and implementation of erosion, sedimentation, and turbidity control measures that would effectively reduce the amount of soil and sediment accumulation.

Unavoidable but temporary noise and vibration impacts may occur during the construction of the proposed harbor improvement projects. The quality of the acoustic environment may be degraded to unacceptable levels during periods of construction because noise from construction activities are predicted to be audible at adjoining properties. Project specifications will be developed which would restrict vibration levels to below those at which structural damage to adjacent structures could occur, and also to levels below those at which annoyance in surrounding areas could occur. Modifications to construction procedures would be made to keep noise and vibration at acceptable levels.

The project areas within Honolulu Harbor are not utilized or inhabited by any rare, threatened, or endangered plant or animal species as listed by the U.S. Fish and Wildlife Service. However, the tidal mudflats in Keehi Lagoon are utilized by the endangered Hawaiian stilt or 'ae'o (*Himantopus mexicanus knudseni)* and other migratory shorebird species, and on rare occasion the threatened Green Sea Turtle (*Chelonia mydas*) has also been observed around the Ke'ehi Lagoon mudflats. No adverse impacts on the Hawaiian stilts or the Green Sea Turtle are anticipated because the proposed project would not affect the existing mudflat areas. The mudflat areas will be totally avoided during both the construction stages and long-term operation of the proposed facilities.

Harbors, like other port facilities, have the potential to introduce alien pest species into Hawaii. In harbor areas, the threat of alien species introduced into Hawaii's coastal

ADDENDUM

waters is always present. However, adverse impacts by alien species are not anticipated. Potential impacts would be mitigated by a combination of regulatory and technological measures described in section 3.8.

With respect to cultural resources, the project area is extensively urbanized and is situated on recently created land formed by numerous dredging and filling operations. Adverse impacts are not anticipated as no archaeological or cultural remains should be present within the proposed project areas. However, in the unlikely event cultural artifacts or human remains are inadvertently encountered during construction activities, all operations in vicinity of the discovery will immediately cease. The State Historic Preservation Division would be notified of the discovery, and immediate consultation with the Oahu Island Burial Council shall be sought before commencement of construction activities.

Other potentially adverse impacts include:

- Minor increase in stormwater runoff from paved areas, which will be mitigated by the installation of appropriate drainage systems
- An increase in the demand for utilities, which will be mitigated by energy efficient building design and energy conservation methods
- An increase in air pollution emissions from construction equipment and from increased road congestion during construction activities.
- Elevated fugitive dust levels from construction activities, although mitigation measures will be employed to ensure that dust emissions are minimal and remain at acceptable levels.
- Temporary, minor visual impacts resulting from construction activities and equipment.

Beneficial impacts will include:

- Provision of needed berthing and landside port facilities
- Modern cruise and excursion vessel port facilities which meet present industry standards
- Growth of Hawaii's tourism, commercial fishing, and shipping industries
- Employment benefits
- Local economic growth
- Increased government revenues

1.2 Alternatives Considered

The no action alternative would mean the existing operations at Honolulu Harbor would remain unchanged. Traffic congestion within Honolulu Harbor would not be alleviated. Existing vacant land areas and poorly maintained harbor facilities would remain underutilized and undeveloped. With this alternative, there would not be additional piers, storage yards, or passenger facilities to accommodate the anticipated growth of the State's tourism, commercial fishing, and shipping industries.

ADDENDUM

The no action alternative has been rejected from further consideration because; i) the goals of the 2020 PLAN would not be achieved, and ii) State and county development policies would not be implemented.

Suitable alternate locations for the proposed actions were not available. No other sites on Oahu would provide an economically feasible alternative for the proposed actions. The 2020 PLAN outlines a systematic approach for the improvement and development of Oahu's commercial harbors. The only other commercial harbor on Oahu in addition to the proposed project sites is Kewalo Basin. Kewalo Basin is not a feasible alternative as it would be unable to meet the needs of the proposed IP projects in terms of location, existing facilities, infrastructure, and economical considerations.

1.3 Unresolved Issues

The EIS consultation process yielded substantial input from government agencies, commercial businesses, private interest groups, and individuals. Comments were received on the EISPN and the Draft EIS (see Appendix A) which provided input on issues and concerns relative to the proposed action. The issues raised during the consultation program have been addressed in this Final EIS, and at this stage in the EIS process there are no outstanding issues or concerns that remain unresolved.

The State Department of Transportation – Harbors Division is aware that additional concerns regarding the proposed project may arise in the future. Therefore, the Department will continue to work with area residents and businesses, interest groups, and government agencies so that the final project plans meet project objectives and are responsive to public and agency concerns.

1.4 Compatibility with Land Use Plans and Policies and a Listing of Necessary Permits and Approvals

The proposed harbor improvements support existing plans, policies, and objectives set forth by the State of Hawaii and the City and County of Honolulu. The proposed improvements will be compatible with existing land uses in the project area and will support future land uses including residential, commercial, and industrial developments.

Applicable permits and approvals that may be required for the proposed action include:

1. Rivers Harbors Act Section 10 Permit, issued by the U.S. Army Corps of Engineers
2. Dept. of the Army Section 404 Permit, issued by the U.S. Army Corps of Engineers
3. Section 401 Water Quality Certification, issued by the State Department of Health
4. Coastal Zone Management Consistency Certification, issued by the Office of State Planning
5. Special Management Area Permit, issued by the Office of State Planning
6. Shoreline Setback Variance, issued by the Office of State Planning
7. HCDA Development Permit (for Pier 2), issued by the Hawaii Community Development Authority

ADDENDUM

8. National Pollution Discharge Elimination System (NPDES), issued by the State Department of Health
9. Noise Variance, issued by the State Department of Health
10. Permit for Air Emissions, issued by the State Department of Health
11. Water Use Permit, issued by the State Department of Land and Natural Resources
12. Environmental Review (Chapter 343, HRS), issued by the Office of Environmental Quality Control

Table of Contents

1.0 PROJECT SUMMARY

PROPOSED ACTION:	Oahu Commercial Harbors 2020 Master Plan Improvements – Immediate Phase
PROPOSING AGENCY:	State of Hawaii Department of Transportation Harbors Division 79 South Nimitz Highway Honolulu, Hawaii 96813 Contact Person: Glenn Soma (808) 587-2503
ACCEPTING AUTHORITY:	Office of the Governor, State of Hawaii
EIS PREPARER:	Wil Chee – Planning, Inc. HMSA Center 1400 Rycroft Street, Suite 928 Honolulu, Hawaii 96814 Contact Person: Richard Stook (808) 955-6088
LOCATION:	Honolulu Harbor, Keehi Lagoon, and *Kalaeloa* Barbers Point Deep Draft Harbor, Island of Oahu
LAND OWNERSHIP:	State of Hawaii
TMK:	2-1-15:29,30; 2-1-01: 42, 45, 56; 1-1-76:03; 1-5-34: (various parcels); 1-5-36: (various parcels); 1-5-38: (various parcels); 2-1-01:58, 59, 60; 1-5-39: (various parcels); 1-5-32:02, 08, 17; 9-1-14:02, 08, 24.
EXISTING LAND USES:	Vacant, maritime industrial cargo and warehousing, cruise passenger operations, fishing industry operations.
PROPOSED USES:	Cruise passenger terminal, excursion vessel terminal, finger piers, lay berths, cargo terminals
LAND AREA:	Approximately 245.2 acres (Including EIS Incorporated and Exempt Honolulu Harbor Projects)

STATE LAND USE CLASSIFICATION:	Urban and Conservation Districts
DEVELOPMENT PLAN LAND USE:	Public Facilities
COUNTY ZONING:	*I-2 Intensive Industrial, I-3 Waterfront Industrial, P-I Restricted Preservation, and IMX-1 Industrial-Commercial Mixed Use*
SPECIAL DISTRICTS:	Hawaii Capital, Aloha Tower, and Chinatown Special Districts
PROPOSED ACTION:	The State Department of Transportation Harbors Division proposes to implement the immediate phase of their Oahu Commercial Harbors 2020 Master Plan by accomplishing a series of improvements to Honolulu Harbor which are scheduled to be initiated by the year *2005*.
IMPACTS:	The following studies (attached as appendices) have been conducted in conjunction with this EIS to determine the potential impacts and mitigation measures which may result from the proposed action: - Traffic Impact Assessment - Archaeological Impact Assessment - Noise Impact Assessment - Biological Impact Assessment - Water Quality Impact Assessment - Air Quality Impact Assessment

2.0 INTRODUCTION AND PROJECT DESCRIPTION

2.1 Overview

The State of Hawaii, Department of Transportation – Harbors Division (DOT-HAR) is responsible for administering the state-owned or controlled harbor facilities used by commercial cargo, passenger, and fishing operations. DOT-HAR is responsible for the control, management, use and regulation of commercial harbors and their improvements. The State of Hawaii receives the bulk of its goods through its commercial harbors, and DOT-HAR manages the

harbor traffic, berthing, landside usage, and facility development of these harbors.

DOT-HAR has developed the Oahu Commercial Harbors 2020 Master Plan (hereafter referred to as the 2020 PLAN) as an update to the Honolulu Waterfront Master Plan and the 2010 Master Plan for Barbers Point Harbor. The 2020 PLAN is a conceptual master plan that addresses Honolulu, Kewalo Basin, and *Kalaeloa* Barbers Point Harbors as dependent harbors and functions as a long-range guide for the development and enhancement of these commercial ports. The 2020 PLAN ensures Oahu's commercial harbors will be capable of meeting the expanding needs of the State's growing economy through the year 2020.

DOT - HAR proposes to implement the 2020 PLAN by accomplishing a series of improvements at Honolulu Harbor that are scheduled to be initiated by the year *2005*. These improvements are designated Immediate Phase (IP) projects. DOT-HAR has determined that an Environmental Impact Statement (EIS) will be required for the proposed IP projects.

There are four major projects proposed which will be fully examined in this EIS for their potential direct, indirect, and cumulative impacts upon the environment. These four projects are listed below:

1. Construction of a cruise passenger terminal at Pier 2
2. Construction of finger piers at Piers 12 – 16
3. Construction of an excursion vessel terminal at Piers 24 – 29
4. Construction of lay berth facilities in Keehi Lagoon (along Lagoon Drive)

In addition to the four above-referenced projects, there are several other IP projects which either fall within classes of actions considered "exempt" from the EIS review process (in accordance with HAR 11-200-8) or have already had separate environmental documents prepared for them (in accordance with Chapter 343 HRS). The latter do not qualify as exempt projects and are incorporated into this EIS by reference.

The following IP projects are exempt from the EIS review process:

- The renovation and reconstruction of harbor facilities at Piers 5-7 (5.8 acres)
- Demolition and construction activities for the general cargo yard and construction of a ferry terminal at Piers 19-20 (4 acres).
- The extension of existing fuel lines at Piers 28-29 for bunkering purposes (0.9 acres)
- Demolition and construction activities for the neobulk cargo yard at Piers 31-34 (5 acres)

The following IP projects have been incorporated into the EIS by reference:

- The Domestic Commercial Fishing Village at Piers 36 - 38 (16.5 acres)

- Interisland Cargo Yard Improvements at Piers 39-40 (20.5 acres)
- The *Kalaeloa* Barbers Point Deep Draft Harbor Expansion Improvements (157 acres)
- *Kalaeloa* Barbers Point Harbor Perimeter Lighting (0.1 acres)

2.2 Scope and Authority

This Environmental Impact Statement (EIS) has been prepared pursuant to Chapter 343, Hawaii Revised Statutes (the EIS law) and associated Title 11, Chapter 200, Hawaii Administrative Rules, Department of Health, State of Hawaii. The use of State or county lands or funds, use of conservation lands, and use within a historic district trigger the EIS law for the proposed actions.

This EIS is intended to serve as a comprehensive environmental disclosure document. The intent of this document is to define the scope and analysis of the proposed actions and serve to ensure that comprehensive and systematic consideration is given to potential impacts of the proposed actions upon the natural and man-made environment.

2.3 Project Need and Objective

As previously mentioned, the 2020 PLAN addresses the Honolulu, Kewalo Basin and *Kalaeloa* Barbers Point Harbors as dependent harbors whose activities are closely entwined. The need for the proposed projects to be implemented in a concurrent planning effort is evidenced by the shared use of these three ports by harbor operators.

Kewalo Basin is generally reserved for commercial fishing and passenger cruise operations. Both these industries have exceeded the bounds of this harbor and are now significant users of Honolulu Harbor.

Honolulu Harbor is the hub of the State's commercial harbor operations. Essentially, all cargo destined for overseas shipment is consolidated and shipped out of the harbor, and almost all incoming overseas cargo passes through this port before being distributed throughout the State.

Presently, berthing and landside accommodations within Honolulu Harbor are reaching capacity therefore vessel traffic, lack of berths, and insufficient operational space are a daily problem. Thus the proposed expansion of commercial Harbor facilities in Ke'ehi Lagoon.

Kalaeloa Barbers Point Harbor, which provides maritime access for Oahu's growing central and leeward communities, was designed to alleviate some of Honolulu Harbor's congestion. However, *Kalaeloa* Barbers Point Harbor has already replaced Kahului Harbor as the State's second busiest harbor, and it is experiencing scheduling problems as well.

The 2020 PLAN addresses these existing problems by serving as a long-range planning guide for the development of safe, efficient, and economically viable harbor facilities.

Major objectives of the 2020 PLAN include:

- The proper development of Oahu's commercial harbors, thereby facilitating maritime shipments of the essential commodities required by the State of Hawaii and its citizenry.

- Optimal utilization of land and water resources committed to marine cargo, passenger, and fishing operations in an economically responsible manner.

- Provision of and access to terminals, and other harbor facilities in locations along the Honolulu waterfront, at *Kalaeloa* Barbers Point and other locations in a manner that best relates to and serves Hawaii's port system in an efficient, safe and secure manner.

- Minimization of impacts on environmental quality and recreational opportunities contiguous with port facilities.

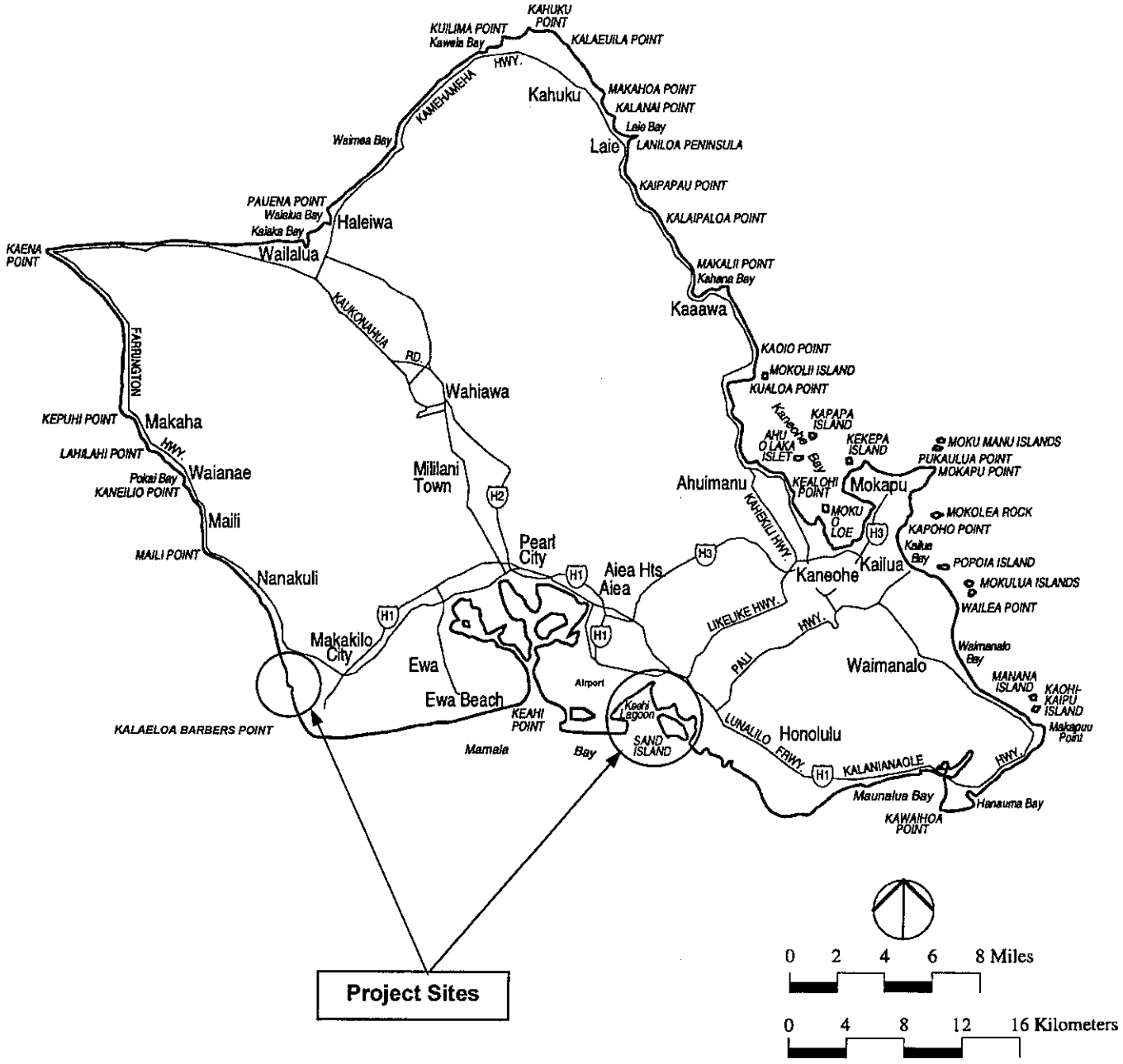
In summary, implementation of the 2020 PLAN to begin improvements to Oahu's commercial harbors is necessary considering Hawaii imports 80 percent of its food and merchandise and approximately 99 percent of these imports – food, clothing, building materials, cars, fuel – is shipped by sea (HDOT, 1997). As a result of Hawaii's geographic isolation, ocean shipping is the state's primary life-sustaining enterprise and there are no feasible alternatives to this procurement process.

2.4 Project Location

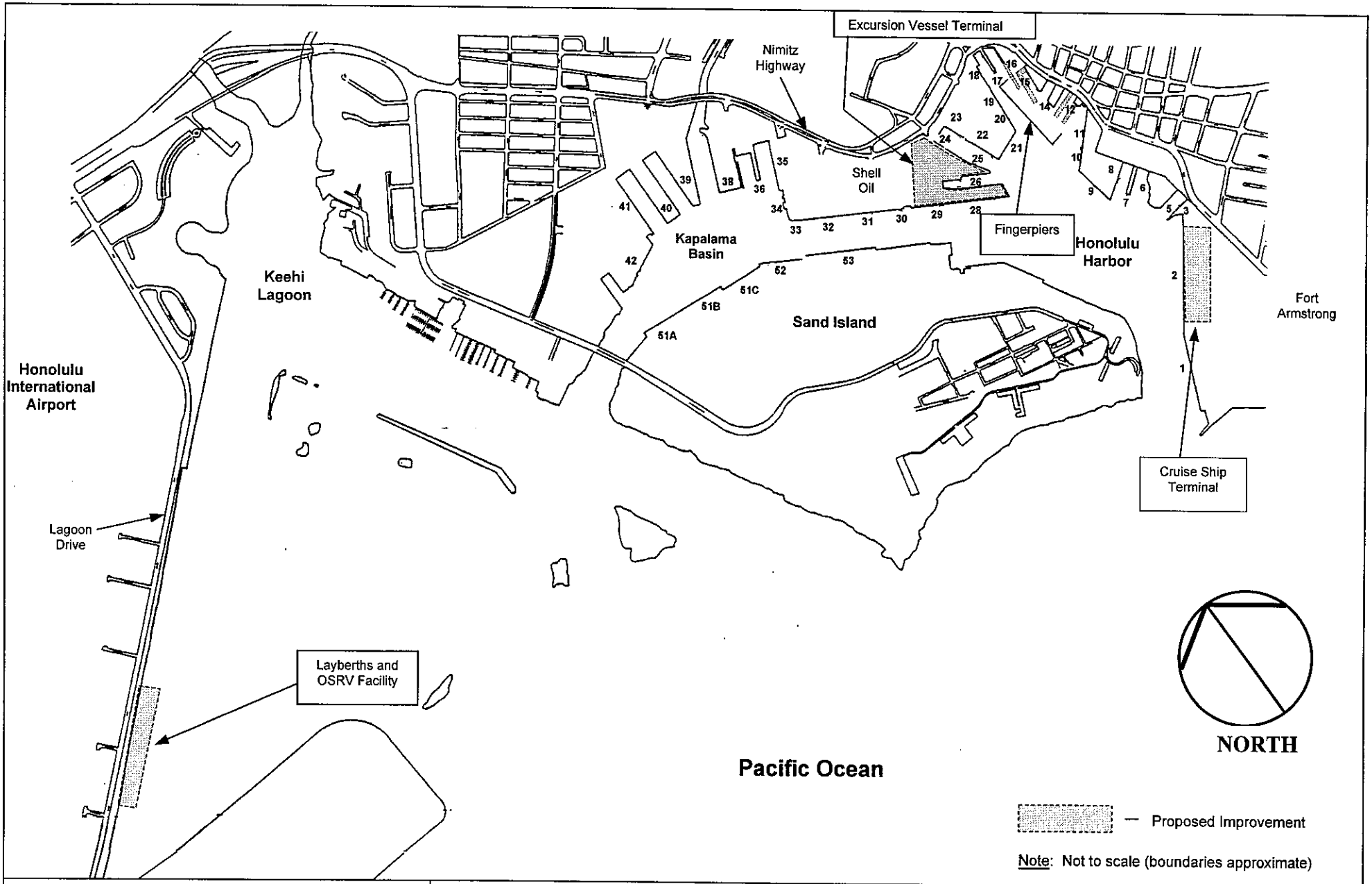
Proposed project areas are located on the southern shores of Oahu makai (seaward) of the Downtown Honolulu and Airport vicinities, and at *Kalaeloa* Barbers Point on Oahu's Leeward Shore (Figure 2-1).

Three of the four proposed major improvement projects addressed in this EIS are located at Honolulu Harbor (cruise passenger terminal at Pier 2, finger piers at Piers 12-16, excursion vessel terminal at Piers 24-29), and the fourth is located at Keehi Lagoon along Lagoon Drive (layberth and *OSRV* facility construction). (Figure 2-2).

The locations of the proposed cruise passenger terminal, finger piers, and excursion vessel terminal are situated within a large area bounded on the north by Nimitz Highway, on the south by Honolulu Harbor proper, on the east by Fort Armstrong, and on the west by Chevron and Shell Oil Co. Properties.



FINAL ENVIRONMENTAL IMPACT STATEMENT For THE OAHU COMMERCIAL HARBORS 2020 MASTERPLAN – IMMEDIATE PHASE	**Figure 2 - 1** **Project Location Map**	Prepared for: State of Hawaii Department of Transportation Harbors Division Prepared by: Wil Chee – Planning, Inc.



FINAL ENVIRONMENTAL IMPACT STATEMENT

FOR

THE OAHU COMMERCIAL HARBORS 2020 MASTERPLAN
IMMEDIATE PHASE

Figure 2 – 2

Project Site Map

Prepared for: State of Hawaii
Department of Transportation
Harbors Division

Prepared by: Wil Chee – Planning, Inc.

Keehi Lagoon is situated on the south shore of Oahu between Honolulu Harbor and the Honolulu International Airport. The location of the proposed lay berth facilities is in an area along Lagoon Drive adjacent to the Airport. The site is bounded by the airport on the North, the Department of Transportation – Airport Division's Fire Response Facility on the West, the privately owned Island Services Seaplane business on the east and Keehi Lagoon on the south.

The proposed project area is located within *I-2 Intensive Industrial, I-3 Waterfront Industrial, P-I Restricted Preservation, and IMX-1 Industrial-Commercial Mixed Use* zones. Figure 2-3 depicts the project area and surrounding land-use designations. Locations of the exempt and EIS Incorporated IP projects are illustrated in figures 2-4 and 2-5.

2.5 Existing Conditions and Surrounding Land Use

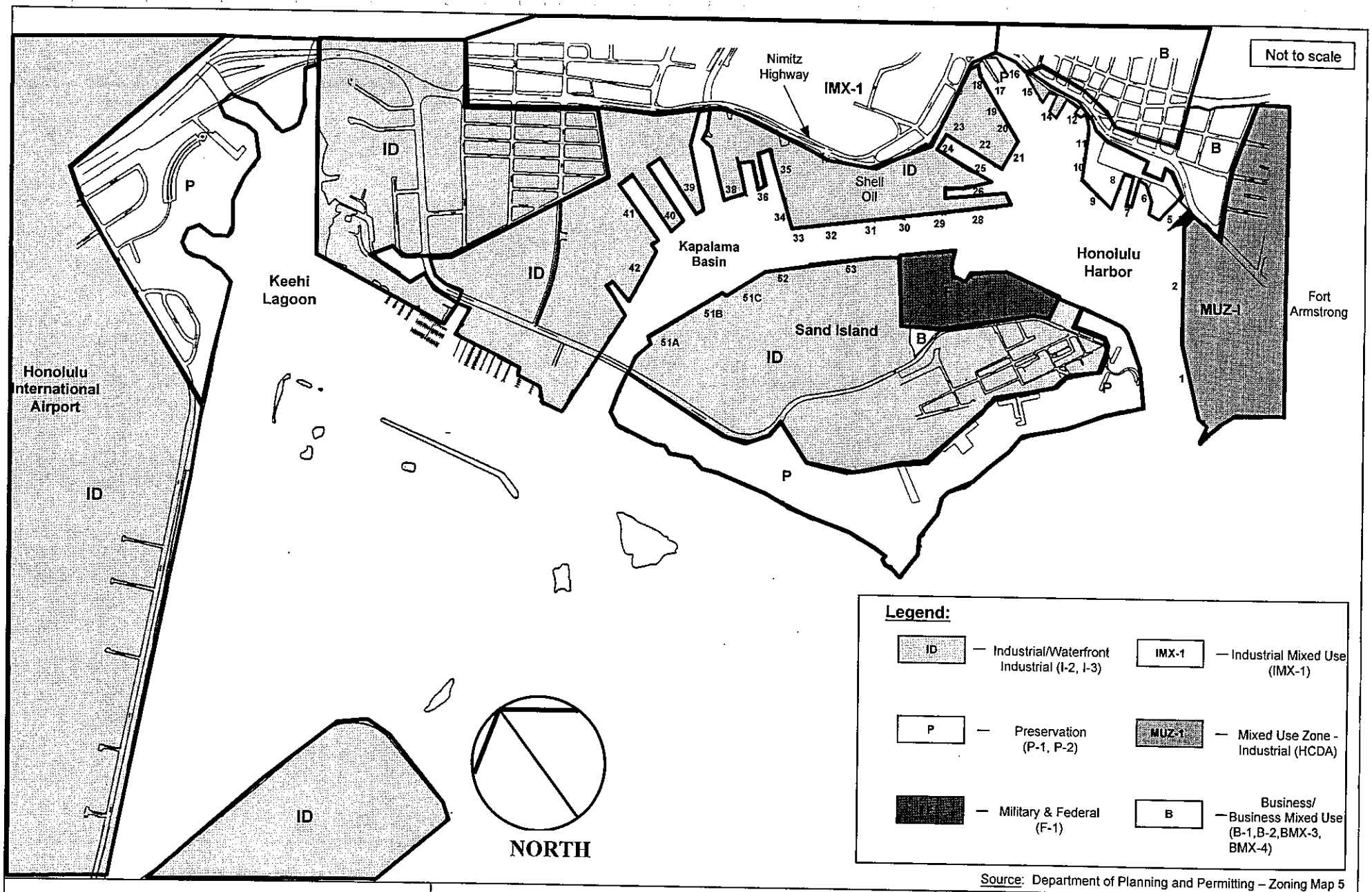
HONOLULU HARBOR

Commercial Shipping – Honolulu Harbor has served as Hawaii's main port of entry for goods from around the world since the late 18th century. Today, Honolulu Harbor still functions as Hawaii's life-line supplying the State with 98.6% of its imported goods and products (HDOT, 1997).

Honolulu Harbor is the central port facility of the State's commercial shipping industry handling over 11 million tons of cargo annually (HDOT, 1993). Commercial shipping operations at Honolulu Harbor are large-scale and diverse. Cargo is shipped either in bulk, individual units, or in containers. The major categories of cargo passing through Honolulu Harbor are described below.

- Automobiles – Some automobiles arrive and depart Honolulu Harbor in 40-foot containers and the remainder arrive on ships with RO/RO (roll-on/roll-off) capabilities. RO/RO cargo is cargo which is rolled or driven on and off ships, as opposed to cargo which is physically loaded onto a vessel. All arrival and departure modes require automobile storage at the terminal. For containerized movements, automobiles require parking before or after devanning, and for RO/RO movements, they require parking for short-term storage.

- Overseas Containers – Overseas (domestic and foreign) movements of general cargo arriving and departing Honolulu Harbor are primarily containerized. Shipping containers in the Hawaii trade range in size from 8'x8'x20' to 8'x8'x45'. Containers arriving at Honolulu Harbor are generally unloaded from the ship or barge and stacked in the container yard of the terminal. From the container yard, the container may be reloaded to a barge at the same facility for other overseas destinations or inter-island delivery, trucked to another facility for barge transshipment to inter-island destinations,



Source: Department of Planning and Permitting – Zoning Map 5

FINAL ENVIRONMENTAL IMPACT STATEMENT

FOR

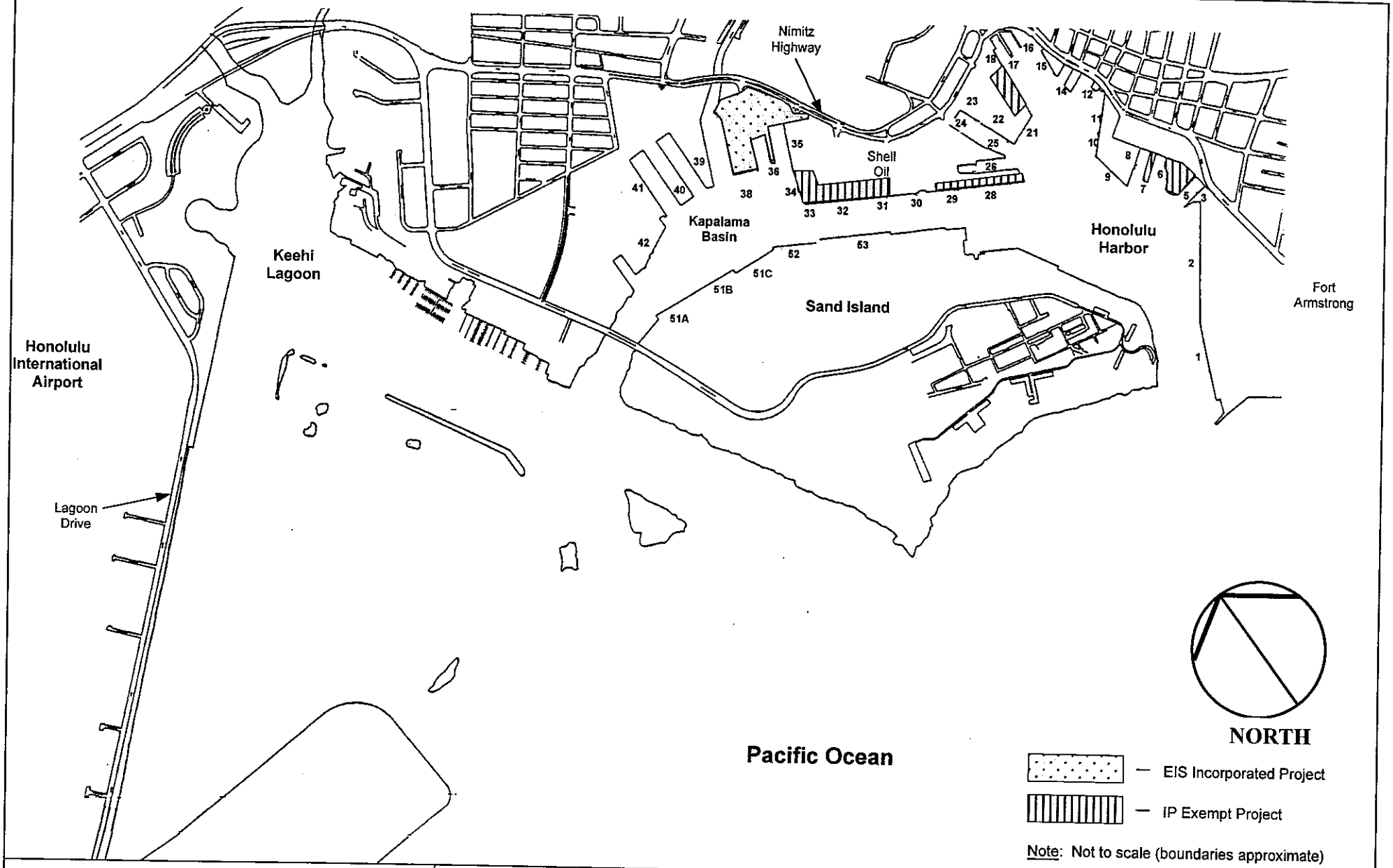
THE OAHU COMMERCIAL HARBORS 2020 MASTERPLAN
IMMEDIATE PHASE

Figure 2 – 3

Land Use Zoning Designations in Project Vicinity

Prepared for: State of Hawaii
Department of Transportation
Harbors Division

Prepared by: Wil Chee – Planning, Inc.



FINAL ENVIRONMENTAL IMPACT STATEMENT

FOR

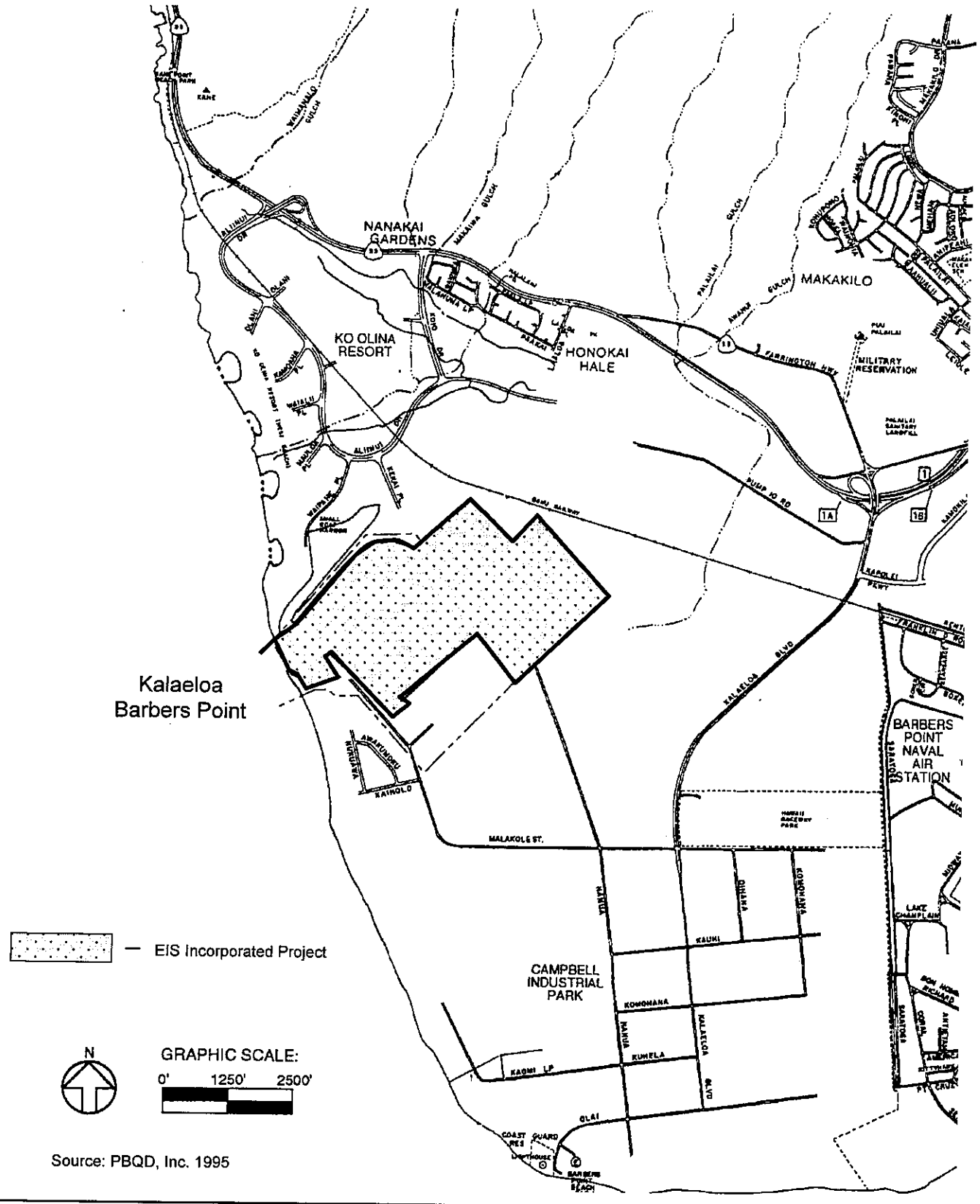
THE OAHU COMMERCIAL HARBORS 2020 MASTERPLAN
IMMEDIATE PHASE

Figure 2 – 4

Honolulu Harbor - Exempt and EIS Incorporated Projects

Prepared for: State of Hawaii
Department of Transportation
Harbors Division

Prepared by: Wil Chee – Planning, Inc.



Source: PBQD, Inc. 1995

FINAL ENVIRONMENTAL IMPACT STATEMENT FOR THE OAHU COMMERCIAL HARBORS 2020 MASTERPLAN – IMMEDIATE PHASE	**Figure 2 - 5** **Kalaeloa Barbers Point - EIS Incorporated Projects**	Prepared for: State of Hawaii Department of Transportation Harbors Division Prepared by: Wil Chee – Planning, Inc.

trucked directly to consignees on Oahu, or emptied and its contents delivered by truck on Oahu.

- Neobulk – Includes cargo moving in large, unitized loads to promote efficient handling and storage of the commodity. Neobulk cargo includes lumber, steel, construction equipment/vehicles, and newsprint.

- Break Bulk/General Cargo - Break bulk general cargo can include almost any type of "small lot" commodity which can be shipped on a pallet as an individual unit.

- Dry Bulk – Includes dry good commodities which can be shipped in bulk (non-unitized) form. Examples of dry bulk cargo are grain, sugar, cement, and coal.

- Liquid Bulk – Includes fuel oil, diesel, gasoline, jet fuel, ammonia, molasses, etc., which are transported in vessels with capacities ranging from 10,000 to 35,000 dead weight tons.

- Inter-Island Cargo – Inter-island cargo consists primarily of commodities that are shipped through the Young Brothers facilities at Piers 39 and 40. The cargo consists of containers, automobiles, and break bulk cargo originating and shipped within the State.

The above-described cargo types are accommodated at various piers throughout Honolulu Harbor. Individual piers often handle a combination of cargo types. For example, Piers 1, 2, 19, 20, 31-34, 39, 40, 51, 52, and 53 all accommodate a combination of automobiles, overseas containers, neobulk, and dry bulk cargo.

Liquid bulk cargo is usually accommodated at specific piers. In Honolulu Harbor petroleum products are handled at Piers 30 – 34, and 51A. However, some of these piers also accommodate other cargo types in addition to petroleum products.

In addition to the extensive commercial shipping industry operations, Honolulu Harbor is home to commercial fishing and passenger vessel activities. There are two general types of passenger activities which occur at Honolulu Harbor: cruise ship (foreign and interisland) operations and excursion vessel operations.

Cruise Ships - Foreign cruise ships call at Honolulu Harbor, and passengers disembark for short stays. Interisland cruise ships travel around the Hawaiian Islands and make weekly calls at Honolulu Harbor. Cruise ships including the Norwegian Dynasty, Queen Elizabeth II, SS Independence, and Island Princess currently dock at Piers 9, 10 and 11, which are located adjacent to the Aloha Tower Marketplace (ATM).

The two-story ATM structure serves as both a cruise passenger terminal facility as well as public parking for Aloha Tower Marketplace patrons. Cruise ship operations take place on the ground level, and passengers disembark onto the second level.

Cruise ship passengers disembark via a ramp connected to the second level and proceed to the ground level to tour buses waiting along Fort Street. Cruise passengers can also be found waiting on the ground level of the parking structure amidst the associated operating cruise ship vehicles.

Prior to the construction of ATM, a ramp lead directly from Piers 5-7 to the second level of the current ATM parking structure. Tour buses could easily access the second level via this ramp and cruise ship passengers could be safely and conveniently picked up and dropped off. However, with the construction of ATM, the ramp was demolished thereby relegating direct bus service for passengers to the street level.

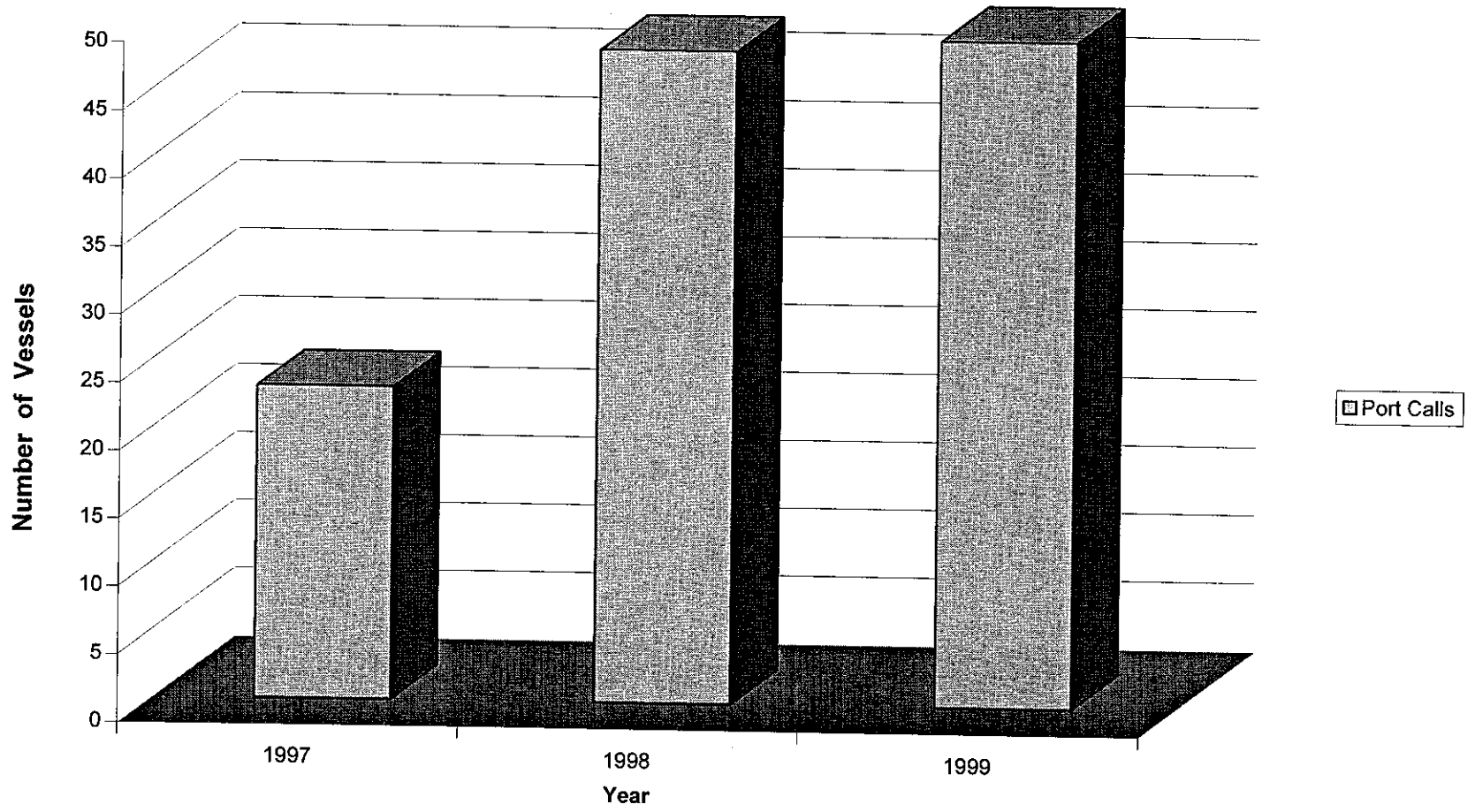
The existing cruise ship facilities at Piers 9, 10 and 11 are inadequate and they do not provide the desired amenities associated with modern day cruise terminal facilities. Due to the rapid growth of the cruise ship industry in conjunction with the lack of existing adequate cruise ship facilities, Pier 2 often serves as an overflow berth for cruise ships calling at Honolulu Harbor.

Existing facilities at Honolulu Harbor simply can not keep up with the growing demands of the cruise ship industry. Figure 2-6 shows the scheduled number of cruise ship port calls to Honolulu Harbor over the past three years. The numbers shown in the chart effectively illustrate the need for a state-of-the-art cruise ship facility at Honolulu Harbor.

Excursion Vessels - Excursion vessels are smaller in size than the foreign and interisland cruise vessels. These popular tourist cruises last only a few hours and often include meals and entertainment. For the most part, excursion vessels operate out of Kewalo Basin, but a few operate out of Honolulu Harbor as well. Piers that accommodate excursion vessel operations include Kewalo Basin and Honolulu Harbor's Piers 2, 5,6, 7, 12 and 40.

A trend towards larger excursion vessels is developing. Already, large vessels such as the Star of Honolulu, Navatek and Ali'i Kai are home-ported in Honolulu Harbor. Additionally, these large boats require extensive land support areas to accommodate the many tour buses needed to transport passengers. A fully loaded Star of Honolulu will accommodate approximately 1,500 passengers (HDOT, 1997). As Hawaii's tourists continually seek new avenues of recreation, Kewalo Basin and Honolulu Harbor receive increasing amounts of requests for excursion vessel facilities. The dramatic increase in passengers for the excursion vessels operated by Paradise Cruises, Ltd. (Star of Honolulu, Starlette, and Starlette II) is illustrated in Figure 2-7

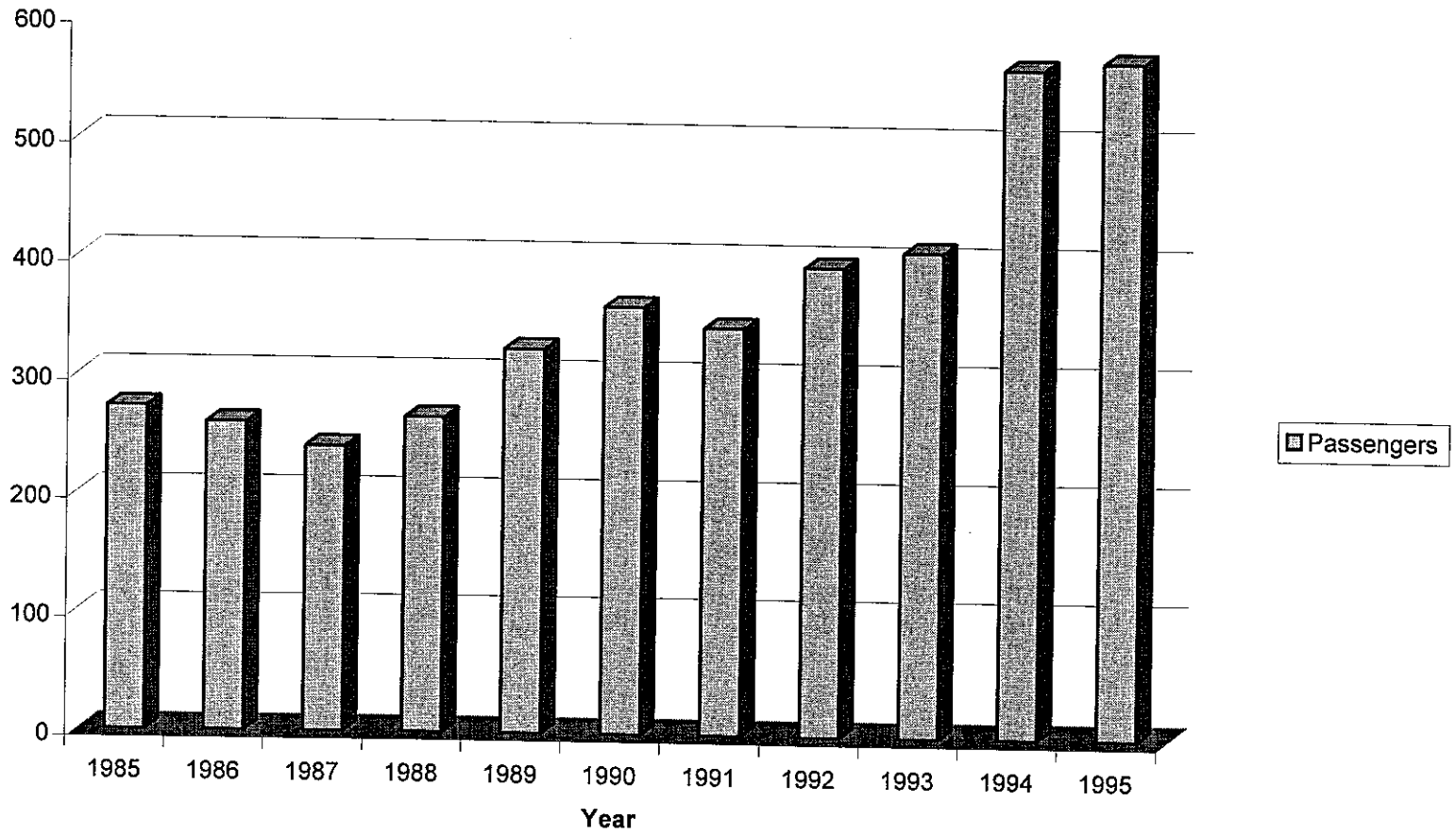
Foreign Cruise Ship Activity at Honolulu Harbor



Source: DOT-HAR

FINAL ENVIRONMENTAL IMPACT STATEMENT FOR THE OAHU COMMERCIAL HARBORS 2020 MASTERPLAN IMMEDIATE PHASE	**Figure 2 – 6** **Cruise Ship Port Calls At Honolulu Harbor**	Prepared for: State of Hawaii Department of Transportation Harbors Division Prepared by: Wil Chee – Planning, Inc.

Passengers Totals for a Typical Excursion Vessel Operator at Honolulu Harbor (in thousands)



Source: DOT-HAR/Paradise Cruises, Ltd.

FINAL ENVIRONMENTAL IMPACT STATEMENT

FOR

THE OAHU COMMERCIAL HARBORS 2020 MASTERPLAN IMMEDIATE PHASE

Figure 2 – 7

Excursion Vessel Passenger Totals

Prepared for: State of Hawaii
Department of Transportation
Harbors Division

Prepared by: Wil Chee – Planning, Inc.

Commercial Fishing - Commercial fishing operations, which include fish loading, storage, vessel repair, etc., are mainly accommodated at Kewalo Basin and Honolulu Harbor's Piers 15 through 18. Additionally, construction activities for the future "Domestic Commercial Fishing Village" at Piers 36 – 38 were recently initiated. The fishing village will consolidate Oahu's domestic fishing commercial fleet and many wholesaling operations while showcasing the fishing industry as a unique visitor attraction.

The areas adjacent to the proposed project sites in Honolulu Harbor contain a mixture of industrial, mixed commercial and industrial, and mixed commercial and residential land uses. Businesses in the area include wholesale and distribution facilities, manufacturing, auto repair shops, gasoline stations, retail stores, restaurants and bars.

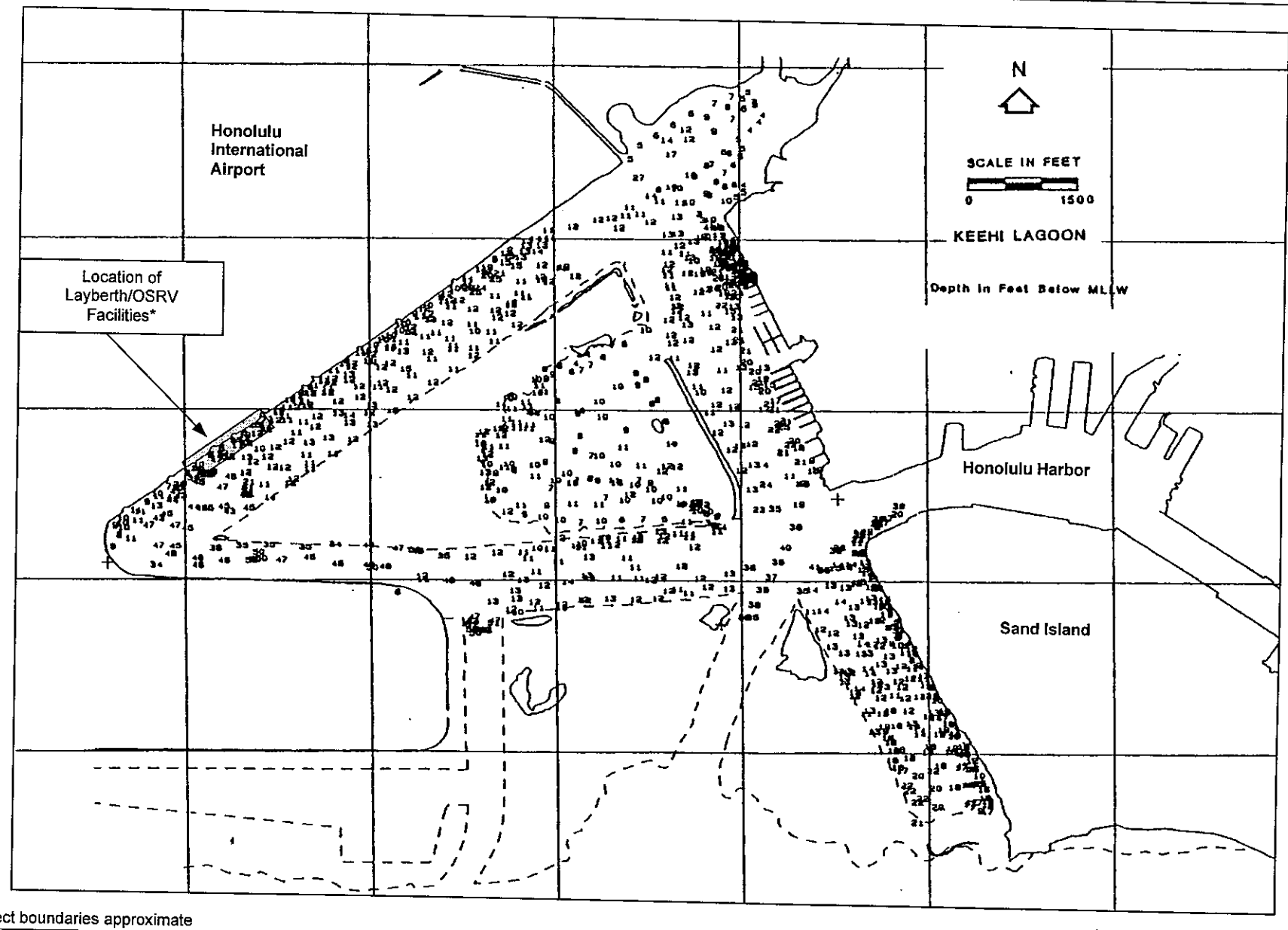
KEEHI LAGOON

Keehi Lagoon is situated on the south shore of Oahu between Honolulu Harbor and the Honolulu International Airport. The lagoon is a sheltered triangle-shaped body of water encompassing approximately 2.1 square miles. Located in the inner portion of the lagoon is an approximate 300 acre triangle reef remnant which is bordered by channels dredged for three seaplane runways. The depths of the channels bordering the remnant reef range from approximately 5 - 10 feet (northern corner) to 40 - 48 feet (south-west corner) between the mean lower low water (MLLW). Figure 2-8 illustrates the various water depths within Keehi Lagoon.

The lagoon is bordered by shallow fringe reef flats to the south, the airport to the north and west, and Kalihi Kai and Sand Island Industrial areas to the east. Keehi Lagoon and all of the perimeter shoreline areas are under the jurisdiction of the State of Hawaii.

The proposed project area along Lagoon Drive is located on land which is presently vacant and undeveloped. North and east of the proposed site are an assortment of commercial operations including various car dealerships, air freight companies, and the privately owned Island Seaplane Services, Inc. Island Seaplane Services, Inc. utilizes Seaplane Runway "B" for their operations. They have constructed a floating dock and office on Lagoon Drive opposite the United Parcel Service (UPS) facility, and is currently operating under a revocable permit issued by Airports Division. Situated to the north and west of the site is the Honolulu International Airport.

There are presently three (3) marinas in Ke'ehi Lagoon providing a total of about 500 berths. Ke'ehi Small Boat Harbor, owned and operated by the State, is the largest facility with about 300 berths. The other two marinas, Ke'ehi Marine Center and La Mariana Sailing Club, are privately owned and operated on lands



* = Project boundaries approximate

Source: Noda, E. K., 1987

FINAL ENVIRONMENTAL IMPACT STATEMENT

FOR

THE OAHU COMMERCIAL HARBORS 2020 MASTERPLAN
IMMEDIATE PHASE

Figure 2 - 8

Water Depths at Keehi Lagoon

Prepared for: State of Hawaii
Department of Transportation
Harbors Division

Prepared by: Wil Chee – Planning, Inc.

leased from the State. A federally-designated offshore anchorage area is located within Seaplane Runway "D" across from the marinas. The State has installed permanent mooring buoys within this authorized mooring area (Noda, 1999).

Commercial ocean recreation areas have been established within Seaplane Runway "B" between the end of the Reef Runway and Kalihi Channel. A commercial windsurfing, sailing, and diving zone is designated along the seaward edge of the channel near Harris Island, and a commercial thrill craft (jet ski) zone is designated near Mokuoeo Island (east of the circulation channel off the end of the Reef Runway). Hawaiian Ocean Thrills has an existing facility known as "HOT Island" that is moored offshore Mokuoeo Island in Seaplane Runway "B". This moored floating facility is utilized for the commercial operation of recreational thrill craft and water sports, with two thrill craft areas, observation deck, swimming area and loading platform (Ibid.).

2.6 2020 PLAN - Immediate Phase Projects

As previously stated in section 2.1, the 2020 PLAN was developed and approved as a long-range, conceptual, land-use planning document. It should be noted that the proposed immediate phase improvements are based upon the latest existing conceptual project plans. All final improvement designs will be determined during the project's design stage and may vary somewhat from those presented in this FEIS. If drastic changes are required supplemental environmental studies will be undertaken.

2.6.1 Cruise Passenger Terminal at Pier 2

Existing Conditions

Pier 2 is located along the east side of the main channel to Honolulu Harbor approximately 3/4 of a mile from the channel entrance. The Pier 2 site is situated on the grounds of Fort Armstrong which is bounded on the east by Ala Moana Boulevard, by Keawe Street on the southeast, and by Pier 1 on the south. Adjoined by a knuckle (wharf bend), Pier 2 is contiguous with Pier 1; together these piers border the eastern side Honolulu Harbor's main channel. Pier 2 alone provides 1,779 linear feet of total berthing space and has the capability of docking two cruise vessels.

Pier 2 consists of a large cement pier apron that is supported on cement posts approximately two feet in diameter. The pier extends out approximately 33 feet from the shoreline, and the bottom depths range from approximately 5 feet deep directly adjacent to the shore to approximately 33 feet deep at the piers edge

Located east of and parallel to the pier apron is the Pier 2 Shed, which is the State's largest cargo shed. Currently, the Pier 2 Shed operates primarily as a cargo warehouse where container shipments from cargo vessels are unloaded.

High capacity forklifts are utilized at the site to transport containers throughout the site and load them onto cargo vessels and trucks. The Pier 2 shed is currently utilized by Aloha Cargo, Sause Brothers, the Foreign Trade Zone and U.S. Customs (Figure 2-9).

As mentioned earlier, Pier 2 also serves as an overflow cruise ship terminal. When a cruise ship arrives at Pier 2, passengers are discharged onto the pier apron and directed into the Pier 2 shed. A temporary baggage claim area is staged, and planters are used to create a more aesthetically pleasing atmosphere. However, it is clearly evident that these temporary terminal operations are housed within a large warehouse facility.

Proposed Cruise Passenger Terminal (approx. 13.8 acres)

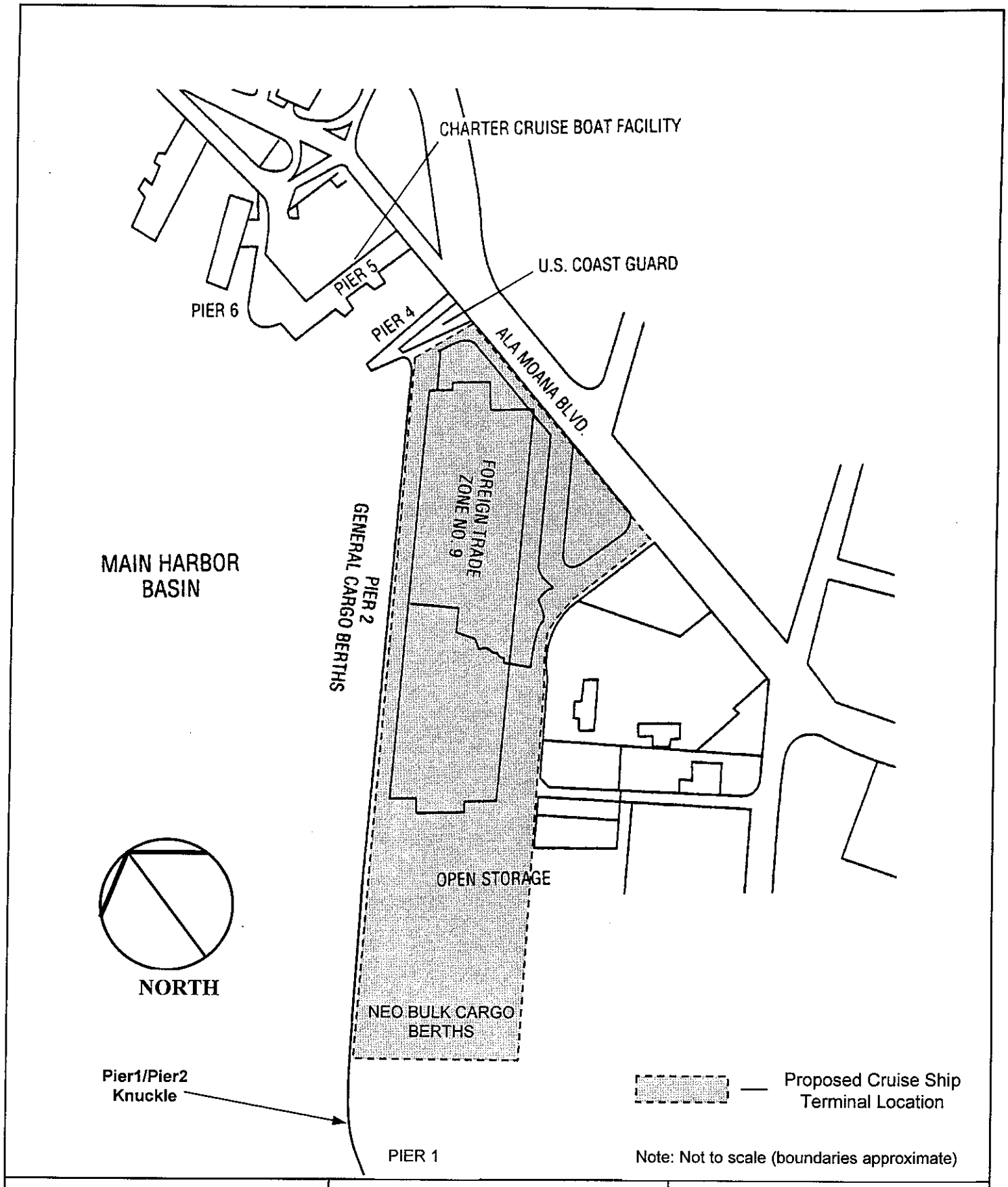
The proposed project would involve the construction of a passenger vessel terminal at Pier 2 capable of accommodating two cruise ships. The conceptual plan for the proposed facilities includes two terminal buildings, parking areas, and a new paved roadway to access the terminal buildings and parking facilities.

Additional project work includes the demolition of the existing Pier 2 shed, demolition of Channel Street, the extension of Punchbowl Street to South Street (via a proposed Ilalo Street extension), the installation and/or improvement of lighting, curbing, drainage, sewers, signage, landscaping, water supply, and signalized intersections would also be necessary.

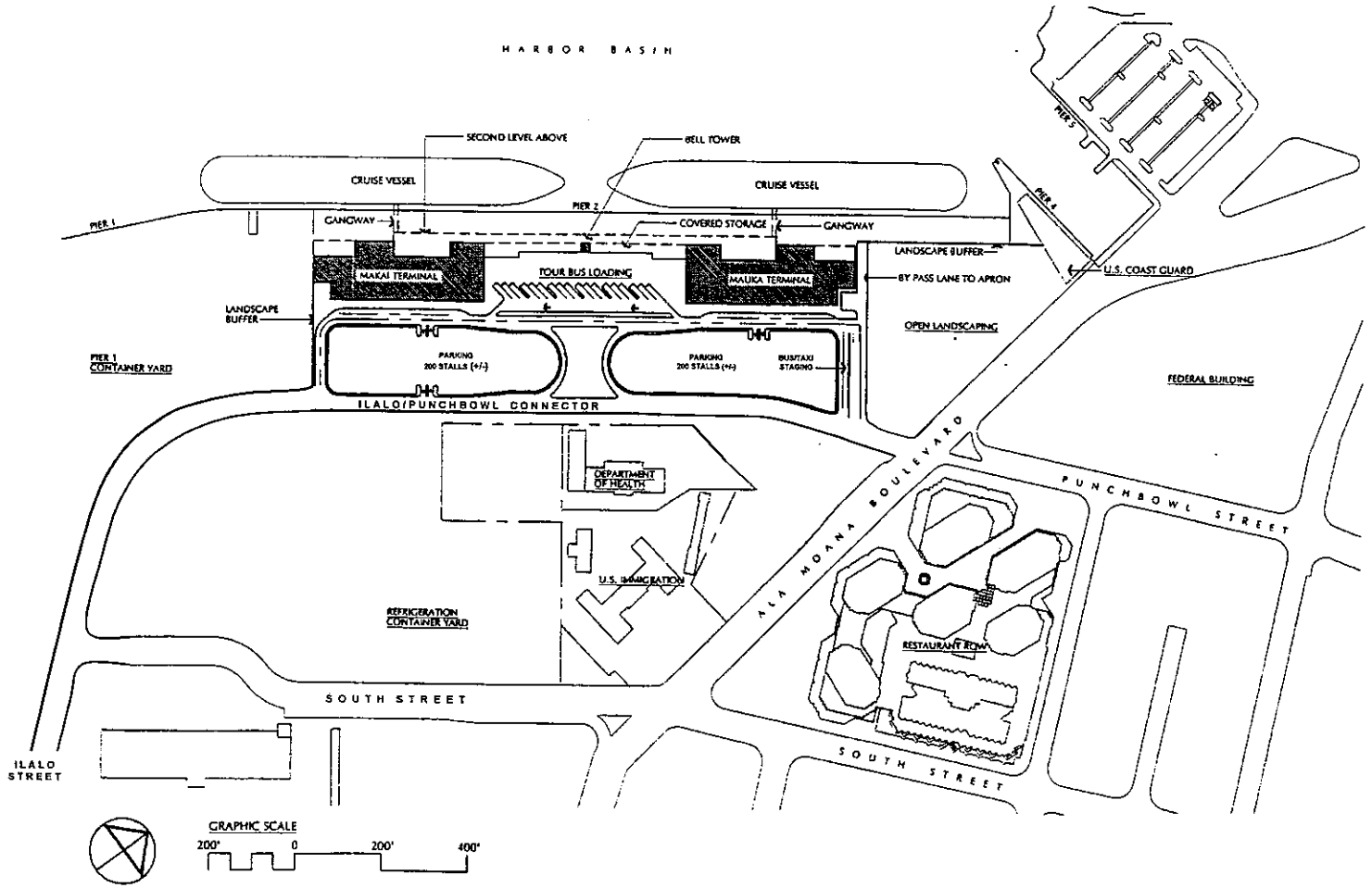
The Pier 2 Cruise Passenger Terminal will consist of two separate terminal buildings constructed along side each other. The two terminal buildings would be identified as the Mauka and Makai terminals. The northern terminal located closest to Ala Moana Boulevard will be designated the Mauka Terminal, and the southern terminal located adjacent to Pier 1 will be the Makai Terminal. The two terminal buildings will be approximately 475 feet apart separated by a common tour bus loading area and covered boarding area.

With its 1,779 linear feet of total berthing space, Pier 2 has the capability of docking two cruise vessels. At the proposed terminal, cruise ships will dock bow to bow with a 100 foot distance between each of the vessels. The proposed terminal buildings are situated and designed to accommodate two larger vessels approximately 850 feet in length, with the primary passenger entry portal being approximately 400 feet from the bow of the ship. When a large cruise ship (i.e., the Queen Elizabeth II) is docked with a medium-sized vessel, the makai vessel would extend 50 to 100 feet beyond the Pier 1-2 knuckle. The proposed cruise terminal facility is shown in Figure 2-10.

The Mauka and Makai terminals are two story buildings that are essentially identical in design. *The proposed two-story height and mauka-makai orientation of the long-axis of the planned terminal complex buildings is consistent with the City's vision for the redevelopment of the Honolulu Waterfront, as is the proposed*



FINAL ENVIRONMENTAL IMPACT STATEMENT FOR THE OAHU COMMERCIAL HARBORS 2020 MASTERPLAN – IMMEDIATE PHASE	**Figure 2 – 9** **Existing Conditions at Pier 2**	Prepared for: State of Hawaii Department of Transportation Harbors Division Prepared by: Wil Chee – Planning, Inc.



FINAL ENVIRONMENTAL IMPACT STATEMENT
FOR

THE OAHU COMMERCIAL HARBORS 2020 MASTERPLAN
IMMEDIATE PHASE

Figure 2-10

Pier 2 – Cruise Ship Terminal Conceptual Plan

Prepared for: State of Hawaii
Department of Transportation
Harbors Division

Prepared by: Wil Chee – Planning, Inc.

system of internal roadways (see section 3.10). The size of the two proposed terminals is based on a design vessel with a 2000 passenger capacity. However, the terminals will be able to accommodate two vessels with a combined passenger total of over 2000 due to the phased disembarkation process practiced by foreign registered vessels.

Each proposed terminal building will consist of a 43,400 ft^2 ground level and a 31,100 ft^2 second level. Ground level operations will include check-in, baggage claim, baggage hold, and customs. Second level operations will include a passenger lounge, V.I.P. Lounge, Retail/Concession area, and an elevated concourse (Figure 2-11).

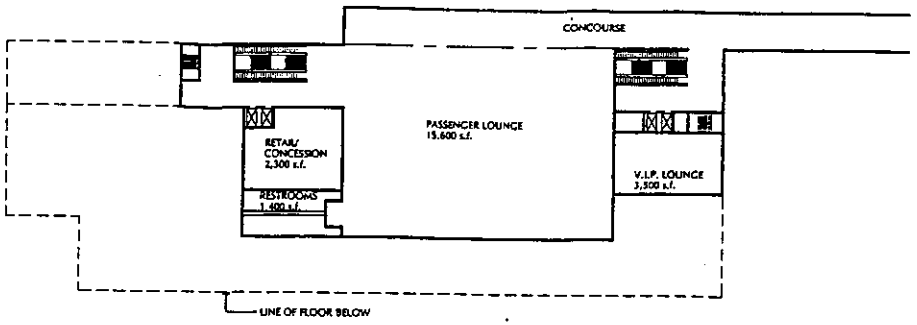
In addition to the project related improvements at Pier 2, the Hawaii Community Development Authority (HCDA) would commence with their proposed Ilalo Street improvements adjacent to the project site. These improvements involve the extension of Ilalo street at both its east and west ends. When complete, Ilalo Street will function as a connector between Ward Avenue and Punchbowl Street (HCDA, 1998). The proposed Ilalo Street improvement is discussed further in Section 3.10.

The cruise terminal facility will have an internal roadway system and parking areas that will provide sufficient space for queuing, stacking, drop-off, and turn-around functions of buses, taxis, and limousines. A vehicular circulation system which will adjoin the proposed Ilalo Street extension is proposed to link the two passenger terminals.

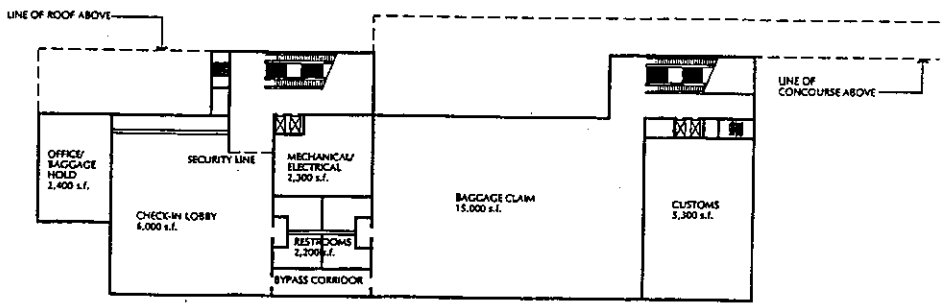
There is a provision for approximately 400 on-grade parking stalls within the vehicular circulation system inclusive of passenger rental car staging which will provide sufficient off-street parking. The common tour bus loading area will be situated between the two terminal buildings and consist of 18 bus stalls in a saw-tooth configuration to conform to the vehicular circulation system. Taxi cab and tour bus staging is located at the Mauka end of the parking area/project roadway system.

The vehicular access at the proposed Ilalo Street connector will be dedicated to circulation of passenger related traffic, which includes tour buses, taxi cabs, rental car shuttles, limousines, and public, private, and staff vehicles. Cargo/container traffic, store vehicles, baggage trucks, and other operationally related vehicles shall utilize the existing Pier 1 entrance at South Street for access to pier side activity. The segregation between operations and passenger related vehicular movement is intended to minimize congestion and cross-traffic and to optimize safety and efficiency.

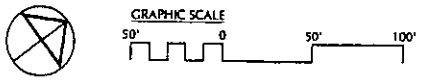
The proposed cruise terminal would serve as Honolulu Harbor's primary cruise ship berthing facility. Piers 9, 10 and 11 at ATM and Piers 19 and 20 would



SECOND FLOOR PLAN



GROUND FLOOR PLAN



FINAL ENVIRONMENTAL IMPACT STATEMENT

FOR

THE OAHU COMMERCIAL HARBORS 2020 MASTERPLAN – IMMEDIATE PHASE

Figure 2 – 11

Pier 2 - Cruise Ship Makai Terminal Conceptual Plan

Prepared for: State of Hawaii
Department of Transportation
Harbors Division

Prepared by: Wil Chee – Planning, Inc.

function as overflow berths for cruise ships when additional berthing area is required.

2.6.2 Finger Piers at Piers 12 through 16

Existing Conditions

Piers 12-16 are bounded on the east by Ala Moana Boulevard, on the south by Piers 10-11 and on the west by Piers 17-20. Nuuanu Stream outlets between Piers 15 and 16, producing a silty bottom in this area of Honolulu Harbor. Maintenance dredging is currently underway along these piers to ensure an 18-foot depth. A brief description of the existing conditions at each of the piers is provided below:

- The original Pier 12 was originally built in 1907, but is no longer present (Wilson, Okamoto, and Associates, 1968). Today, only a small area made up of cut coral blocks, extend to depths of approximately 20 feet, exist at the former site. This small coral block area (known today as Pier 12) has a berthing length of 50 linear feet and is used for small cruise boats and as an automobile parking area.

- Piers 13 and 14 have berthing lengths of 340 and 280 linear feet respectively. Pier 13 houses a 27,889 square foot shed and uses of these piers are tug boat mooring, automobile parking, and ice machine facilities.

- Pier 15 is a wooden pier with a total berthing length of 440 linear feet. The pier rests on cement piles approximately 2.5 feet in diameter. The pier is located in water depths up to 34 feet and is utilized by the waterfront Fireboat Station No. 29.

- Pier 16 is a 377-foot finger pier constructed in 1986. This finger pier has a total berthing area of 890 feet and is currently used by domestic longline fishing vessels for mooring, maintenance, and onboard repair work.

Proposed Finger Piers (approx. 0.5 acres)

The project involves the expansion of the berthing area at Piers 12 –16. This will be accomplished by the reconstruction and expansion of existing piers and the construction of new finger piers. These improvements are designed to accommodate a greater number of domestic commercial fishing vessels. In addition to domestic commercial fishing vessels, excursion/tour vessels may also utilize Piers 12 – 16. However, use of Piers 12-16 by excursion/tour vessels will not involve operational activities and will be limited to docking purposes only.

Proposed improvements will be undertaken at Piers 12, 15 and 16 and will consist of the reconstruction and extension of Pier 12, the extension of Pier 16, and construction of new finger piers at Piers 12a and 15a.

The Finger Pier 12a will be constructed in between Piers 12 and 13. Finger Pier 12a will be approximately 475 feet in length by 10 feet in width, extending directly into Honolulu Harbor.

Finger Pier 15a will be constructed as an attachment to the northern end of Pier 15 and will provide an additional 10 berths. Finger Pier 15a will consist of a segment approximately 30' wide by 140' long which will extend westward into the harbor. At the end of this 30' x 140' segment there will be an additional extension measuring approximately 20' in width by 450' in length. This additional section will extend southward in the direction of Pier 14.

The proposed improvements at Pier 16 would involve the construction of an extension approximately 300' long by 20' wide at the end of Pier 16 into Honolulu Harbor. The Pier 16 extension will provide an additional 6 berths. Figure 2 – 12 illustrates the proposed improvements at Piers 12 – 16.

2.6.3 Excursion Vessel Terminal at Piers 24 through 29

Existing Conditions

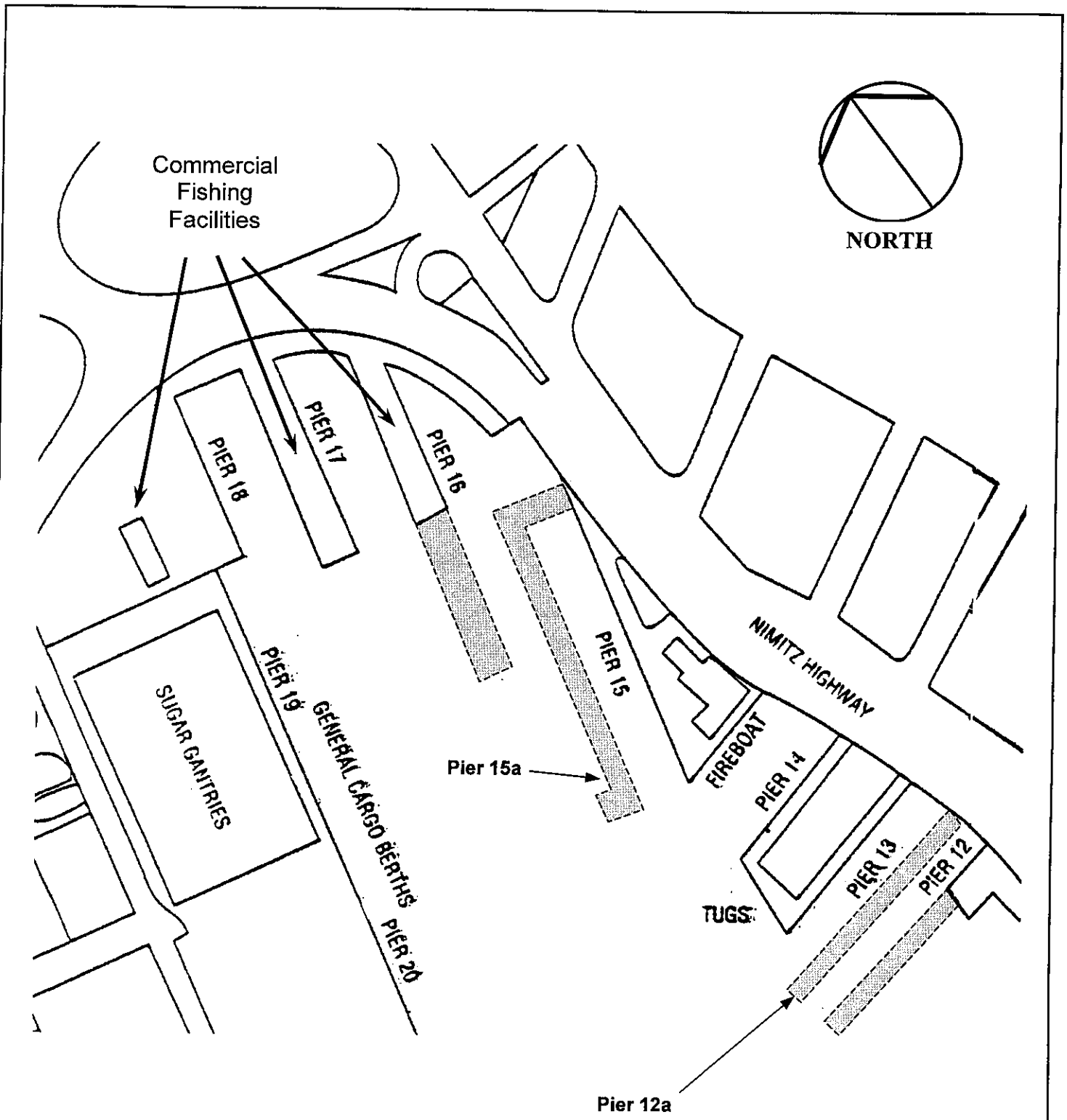
Piers 24 through 29 are bounded on the north by Nimitz Highway, on the east by the Pier 21-22 tug berths and the Pier 23 grain terminal and on the west and south by Piers 28-29 (Figure 2-13). Almost the entire area comprising Piers 24 – 29 is paved with either asphalt or concrete. The exceptions are the waterfront apron areas, which are pile-supported concrete piers.

The large Pier 24-29 interisland barge sheds occupy most of the project area and will be demolished. The sheds, which are currently vacant, have not been well maintained and are in varying degrees of disrepair. Until recently, the Pier 24-29 sheds housed the Young Brothers Break Bulk Terminal. Young Brothers Ltd. has since moved its interisland cargo operations entirely to the new Pier 39 - 40 shed.

Proposed Excursion Vessel Terminal (approx. 15.4 acres)

This project involves the construction of a commercial excursion vessel passenger terminal at Piers 24 – 29. The proposed terminal will accommodate the same types of excursion and tour operations presently operating out of Kewalo Basin.

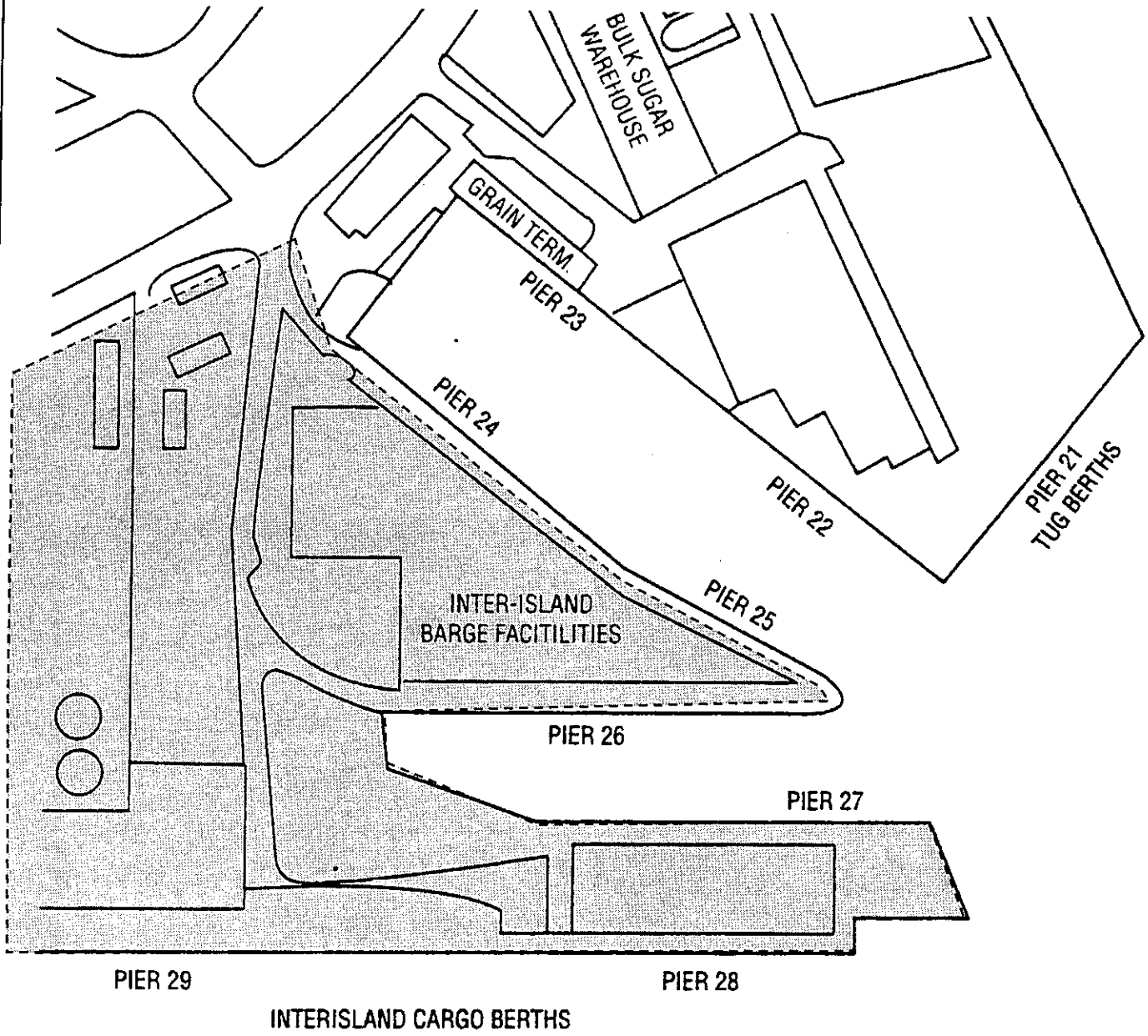
The improvements will involve the demolition of the existing Inter-Island Barge Operations Buildings and the construction of a new single-story structure which

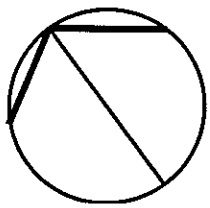


Note: Not to scale (boundaries approximate)

Proposed Improvements

FINAL ENVIRONMENTAL IMPACT STATEMENT FOR THE OAHU COMMERCIAL HARBORS 2020 MASTERPLAN – IMMEDIATE PHASE	**Figure 2 - 12** **Finger Piers at Piers 12 - 16**	Prepared for: State of Hawaii Department of Transportation Harbors Division Prepared by: Wil Chee – Planning, Inc.





Proposed Excursion Vessel Terminal Location

Note: Not to scale (boundaries approximate)

FINAL ENVIRONMENTAL IMPACT STATEMENT FOR THE OAHU COMMERCIAL HARBORS 2020 MASTERPLAN – IMMEDIATE PHASE	**Figure 2 - 13** **Existing Conditions at Piers 24-29**	Prepared for: State of Hawaii Department of Transportation Harbors Division Prepared by: Wil Chee – Planning, Inc.

will serve as the commercial excursion vessel terminal. The terminal building will include a covered passenger waiting area approximately 600 feet in length along Piers 24 and 25. The entrance to the terminal facility will be at the existing Pacific Street and Nimitz Highway intersection. This intersection will be signalized and will provide access for both Diamond Head and Ewa bound traffic.

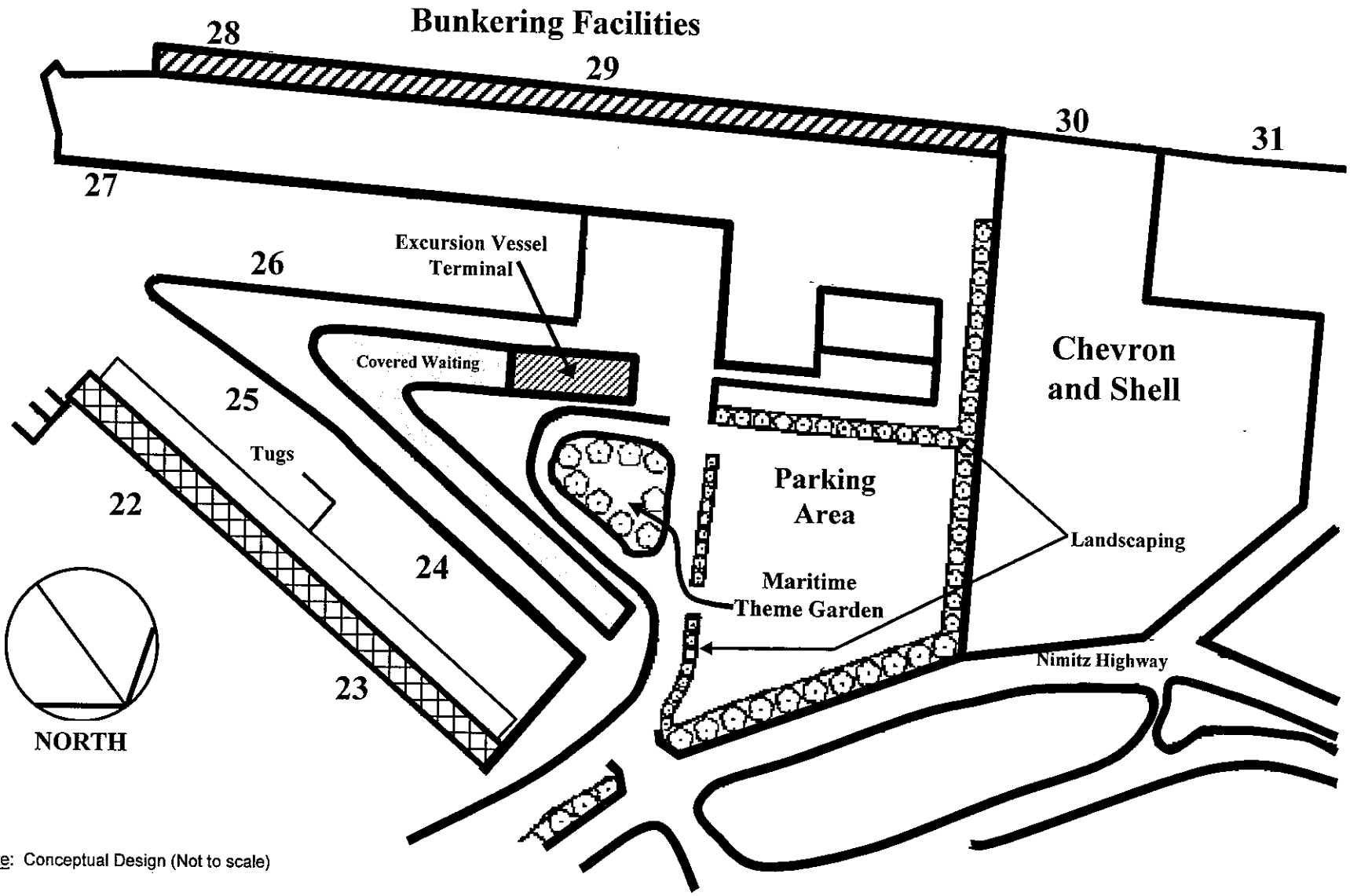
In addition to the terminal building, the proposed project will include a maritime theme garden, roadways, installation and/or improvement of lighting, curbing, drainage, sewers, signage, landscaping, and a paved parking area which would provide sufficient space for queuing, stacking, drop-off, and turn-around functions of buses, taxis, and limousines. The four-acre parking lot would be situated mauka of the proposed terminal facility and adjacent to Nimitz Highway. *The proposed single-story height, planned landscaping, and maritime theme garden are also consistent with the City's vision for the redevelopment of the Honolulu Waterfront.* (Figure 2-14).

A vehicular ferry terminal was originally being considered as part of the proposed Pier 24-29 improvements. However, the proposed terminal has since been relocated to Piers 19-20 and included as an IP exempt project. *Recently, commercial operators in Honolulu Harbor have suggested that the proposed Excursion Vessel Terminal be constructed at Piers 19-20. The site for the proposed improvements remains Piers 24-29. However, during the design phase the viability of the Pier 19-20 location will be considered. If the proposed improvements are relocated to Piers 19-20, adverse environmental impacts are not anticipated because of the similarities in land area, existing land use, and the proximity of the two sites.*

2.6.4 Lay Berths and *OSRV* Facility along Lagoon Drive at Keehi Lagoon

Existing Conditions

The approximately 1.5-mile stretch of coastline along Lagoon Drive is bounded on the north and west by the Honolulu International Airport, and on the east by Keehi Lagoon Park. The Department of Transportation - Airports Division's Fire Response Facility is located on the western most end of the proposed site. The street is lined on the makai side with paved sidewalks. The DOT-Airports Division has recently undertaken beautification efforts along this stretch, planting palm trees and naupaka shrubs along the coastline. The shoreline is lined with intermittent concrete piles and boulder-reinforced areas. A wooden dock which houses the office for the sea plane business is located about 500 yards east of the site. The reef remnant wetland area can be seen directly off shore across the channel in Keehi Lagoon.



Note: Conceptual Design (Not to scale)

FINAL ENVIRONMENTAL IMPACT STATEMENT

FOR

THE OAHU COMMERCIAL HARBORS 2020 MASTERPLAN – IMMEDIATE PHASE

Figure 2 – 14

Excursion Vessel Terminal at Piers 24-29
Conceptual Plan

Prepared for: State of Hawaii
Department of Transportation
Harbors Division

Prepared by: Wil Chee – Planning, Inc.

Construction of Layberths (Approximately 5.7 acres)

Layberths are berthing areas which function as simple "parking stalls". The berthing space is either rented (usually long-term) or used for the storage of impounded vessels. There are no operational activities associated with the proposed layberth facilities.

This project involves the construction of layberths to accommodate foreign and domestic commercial fishing vessels, barges, and other vessels. Based upon information from fishing boat agents, the current demand for fishing boat berthing space is an estimated 15 commercial foreign fishing vessels that desire to stop over in Hawaii on an annual basis, with average stays of 20 - 40 days (Noda, 1999) The proposed layberths will be constructed to the east of the existing DOT - Airports Division's Fire Response Facility along the western end of Lagoon Drive. In addition to the proposed layberth structure, paving of the adjacent road, perimeter fencing, and installation of utilities (fresh water, electricity, communications) would also be necessary.

The proposed improvements along Lagoon Drive will also include a berthing facility for Oil Spill Response Vessels (*OSRV*). *OSRV* emergency response vessels function to contain and cleanup oil spills.

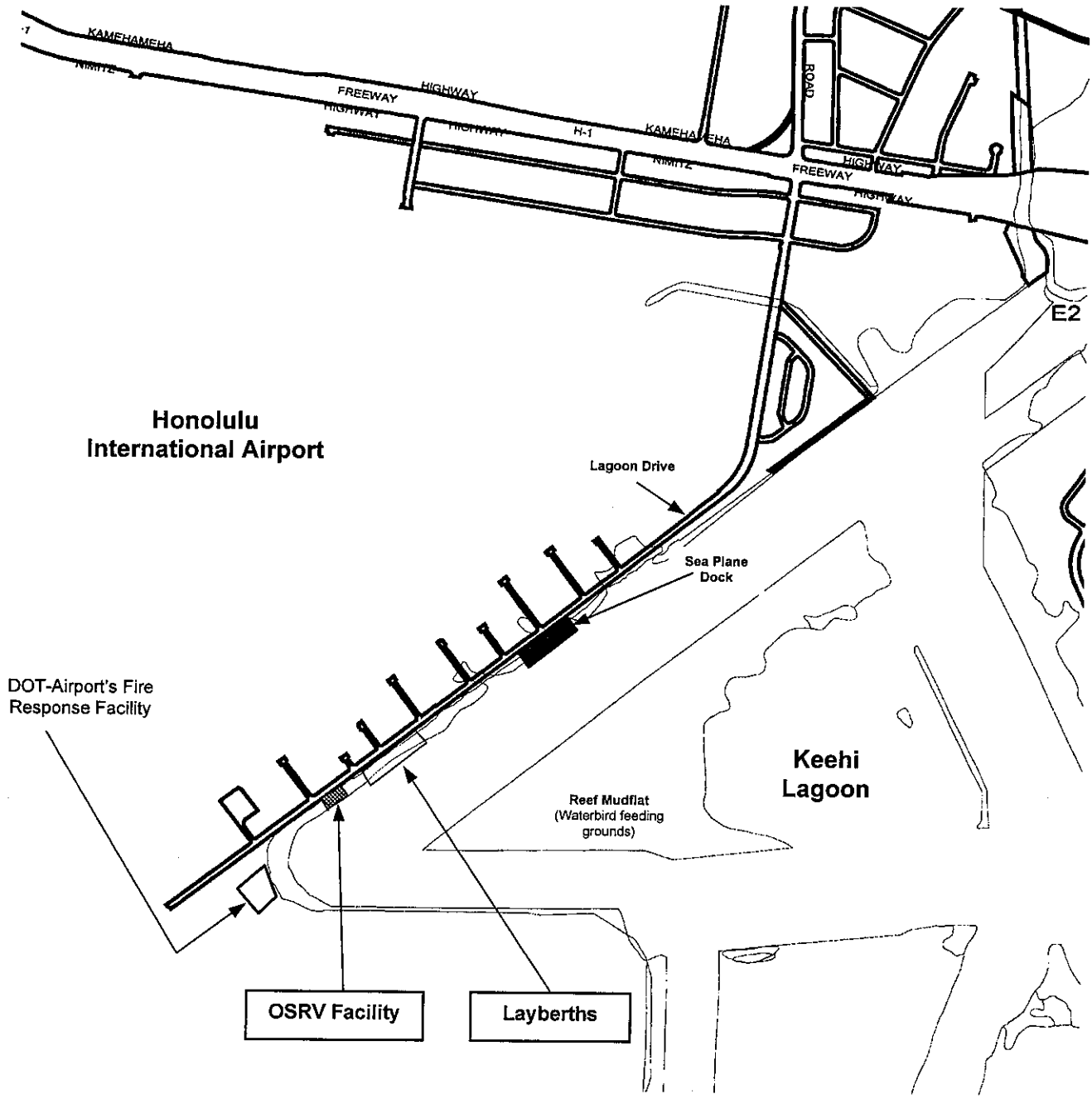
There are two primary *OSRV* emergency response vessels that operate in Honolulu Harbor: the Hawaii Responder and the Clean Island Council. Presently, both vessels berth at Pier 35 along with six small police vessels. The Clean Island Council is 130 feet in length and requires a 50' x 50' warehouse space, and the Hawaii Responder is 208 feet long and needs approximately 20,000 square feet adjacent to its berth.

The proposed *OSRV* facility will be adjacent to the western end of the layberths and will be designed to meet the needs of these two vessels. Specifically, the proposed *OSRV* facility will include warehouse space, office space, marginal wharf, water, telephone, electrical, and sewer systems.

The layberths and *OSRV* facility site is expected to extend approximately 2,100 feet along Lagoon Drive. The proposed location of the layberths and the *OSRV* facility are illustrated in Figure 2 – 15.

The proposed *OSRV* site will consist of a pier facility that would accommodate both *OSRV* vessels. The pier will be 365 feet in length and will extend approximately 100 feet seaward of the shoreline near the interface between the 12' and 45' water depths. A 20,000 square foot warehouse will be situated on the pier platform to accommodate the needs of the *OSRV* vessels.

The proposed layberth facilities will consist of a fixed 800-foot marginal pier which will accommodate vessels in a "Tahitian" style mooring arrangement. The



Note: Not to scale (Boundaries approximate)

FINAL ENVIRONMENTAL IMPACT STATEMENT FOR THE OAHU COMMERCIAL HARBORS 2020 MASTERPLAN – IMMEDIATE PHASE	**Figure 2 – 15** **Layberths and OSRV Facility and Vicinity**	Prepared for: State of Hawaii Department of Transportation Harbors Division Prepared by: Wil Chee – Planning, Inc.

marginal pier will be able to accommodate 7 - 10 vessels that average between 140 - 180 feet in length, and about 10 - 15 vessels that average 100-feet or less in length. A comfort station will be sited adjacent to the marginal pier.

The larger vessels utilizing these facilities would be located in the deeper portion of the channel while the smaller vessels would be located in the shallow areas. The advantage of the Tahitian style mooring arrangement is the flexibility in accommodating various vessel sizes with minimal capital costs. Mooring buoys can easily be rearranged as necessary. The proposed designs for these projects are shown in Figure 2 - 16.

Dredging activities will not be necessary for the proposed improvements. The foreign and domestic commercial fishing vessels which would be using the proposed layberths have an average draft depth of 15 and 10 feet respectively. These vessels will easily be able to navigate within the sea plane runway and negotiate the turn around the western-most corner of the Keehi Lagoon "triangle". The western corner of the triangle has a large turning radius (approximately 800 feet wide) through which vessels can navigate in depths of 38 – 47 feet BSL (Figure 2-8).

2.7 EIS Incorporated Projects

This section summarizes the IP projects which have either already been implemented or have already had separate environmental documents prepared for them.

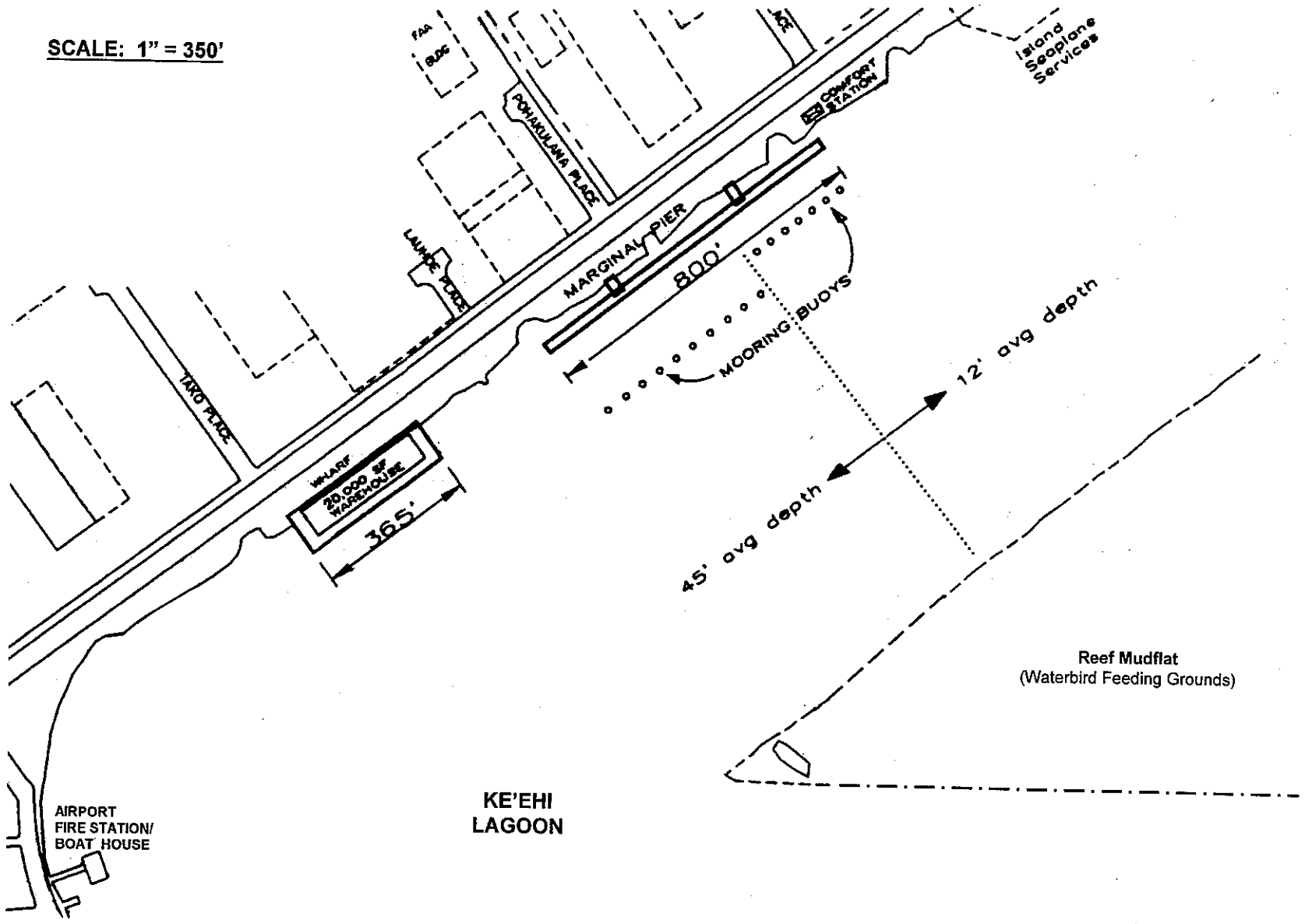
2.7.1 The Domestic Commercial Fishing Village at Piers 36-38
(Finding of No Significant Impact, 1998)

The primary objective of developing the Piers 36-38 Fishing Village is to provide a central support facility for the local commercial fishing fleet and their associated customers, primarily wholesalers and the fish auction. Concurrent to this objective is the State's desire to provide a unique visitor attraction intended to provide greater visibility for Hawaii's commercial fishing industry as a resource for tourism. In addition to wholesaling seafood and related products, tenants will be encouraged to provide limited retail sales. Purchases could be delivered to buyers' hotels or shipped overseas.

The findings and determinations of the environmental review process for this project indicated that there would be no significant adverse impacts to the environment, and a Finding of No Significant Impact was issued.

2.7.2 Interisland Cargo Yard Improvements at Piers 39-40
(Finding of No Significant Impact, 1991)

The proposed project consists of constructing a Roll-On, Roll-Off (Ro/Ro) berth at Pier 39A, Honolulu Harbor, Oahu. The project also includes reconstruction of



Source: Noda, E. K., 1999

FINAL ENVIRONMENTAL IMPACT STATEMENT
FOR

THE OAHU COMMERCIAL HARBORS 2020 MASTERPLAN
IMMEDIATE PHASE

Figure 2 - 16

Layberth and OSRV Facilities at Keehi Lagoon (Conceptual Plan)

Prepared for: State of Hawaii
Department of Transportation
Harbors Division

Prepared by: Wil Chee – Planning, Inc.

approximately one thousand sixty five (1,065) feet of existing apron within Piers 39 and 40 and complete demolition of the existing Pier 39 shed and a portion of Pier 40 shed. The proposed improvement involves driving precast prestressed piles, construction reinforced concrete pile caps, concrete deck and miscellaneous site work.

The findings and determinations of the environmental review process for this project indicated that there would be no significant adverse impacts to the environment. The action has been implemented and Young Brothers has moved their operations from Piers 24-26 to Piers 39-40.

2.7.3 The *Kalaeloa* Barbers Point Deep Draft Harbor Expansion Improvements

(Environmental Impact Statement Preparation Notice, 1998)

The proposed action consists of the following elements:

- Deepening the harbor basin;
- Deepening and flaring the entrance channel; and
- Constructing a jetty on the north side of the harbor entrance.

The existing harbor consists of a 450-foot wide and 42 feet deep, 3,100-foot long entrance channel; a 38-foot deep inshore channel (980 feet long and 450 feet wide, flaring to 650 feet over the last 200 feet); and a 92 acre inshore basin 38 feet in depth. The harbor also incorporates a 21-foot deep barge basin. Currently, the State is excavating a 600 foot by 1,100-foot deep extension along the northeast margin.

The proposed project would deepen the harbor channel to a maximum proposed depth of 48 feet and all of the 38-foot deep basin (including the area currently being extended) to 45 feet. The proposed jetty would be 450 feet long.

A Supplemental Environmental Impact Statement (SEIS) is presently being prepared. This SEIS will address in detail the potential direct, indirect, and cumulative impacts of the proposed action upon the natural and manmade environment.

2.7.4 *Kalaeloa* Barbers Point Harbor Perimeter Lighting

(Finding of No Significant Impact, 1998)

The project proposes to develop a new navigational lighting system along the northwestern margin of *Kalaeloa* Barbers Point Harbor, Oahu, Hawaii, and to upgrade the existing navigational lights at the entrance to the harbor. The project involves construction of a new navigational lighting system and extension of electrical services from the existing infrastructure on Kekai Place in West Beach Estate to the new system.

The findings and determinations of the environmental review process for this project indicated that there would be no significant adverse impacts to the environment, and a Finding of No Significant Impact was issued.

2.8 Project Schedule and Cost

The proposed IP projects consist of a development plan phase, design phase and a construction phase. Preliminary overall project costs for the construction phase are estimated to be approximately $30 million. Majority of the funding for the projects would come from the Harbors Special Fund and a portion from revenue bonds.

Project development plans are presently in their conceptual stages which will be followed by the design phase. The construction phase for the proposed action will be initiated after all required permits and approvals are obtained. The construction phase for the cruise passenger terminal at Pier 2, and the excursion vessel terminal at Piers 24 – 29 are scheduled to commence in the year 2000 with completion targeted for 2001. Construction activities for the finger piers at Piers 12 – 16, and the lay berth facilities along Lagoon Drive are anticipated to begin in the year 2001 with completion targeted for 2003.

3.0 PHYISICAL ENVIRONMENT: EXISTING CONDITIONS, IMPACTS AND MITIGATION MEASURES

3.1 Climate

3.1.1 Existing Conditions

The climate of the Honolulu area is typical of the leeward coastal lowlands of Oahu. The area is characterized by abundant sunshine, persistent tradewinds, relatively constant temperatures, moderate humidity, and the infrequency of severe storms. Northeasterly tradewinds prevail throughout the year although its frequency varies from more than 90 percent during the summer months to 50 percent in January. The average annual wind velocity is approximately 10 miles per hour.

The mean temperature measured at Honolulu International Airport ranges from 70 degrees Fahrenheit in the winter to 84 degrees Fahrenheit in the summer. The temperatures at the waterfront project area may be slightly cooler due to increased wind velocities near the open waters. The average annual precipitation in the vicinity of the site is approximately 24 inches, with most of the rainfall occurring between November and April. Relative humidity ranges between 56 and 72 percent.

As in most of Hawaii, the surface winds in the project area are influenced by northeast tradewinds. However, the "normal" northeasterly trade winds tend to

break down in the Fall giving way to more light, variable wind conditions through the winter and on into early Spring. The seasonal differences in wind conditions in vicinity of the project are illustrated in Figure 3 - 1.

3.1.2 Potential Impacts

The proposed projects will not affect the local climate of the area, and mitigation measures are not anticipated to be necessary.

3.2 Topography and Soils

3.2.1 Existing Conditions

Honolulu Harbor is at the edge of Oahu's south central coastal plain. The coastal plain and much of the southern edge of Oahu is underlain by "caprock" consisting of coral reef which is partly covered by alluvium (silt, sand, and gravel) carried down from the mountains. Beneath the caprock is basalt, the volcanic rock base, which comprises all of the major Hawaiian Islands.

Soils in the entire project area belong to the Lualualei-Fill Land-Ewa association. These soils originated from past dredging activities at Honolulu Harbor and Kapalama Basin. This association occurs on coastal plains and is characterized by deep, nearly level to moderately sloping, well-drained soils that have a fine or moderately fine textured subsoil, and areas of fill land. Fill soils are classified as useful for urban development, including airports, housing areas and industrial facilities (USDA, 1972).

The island of Oahu is not subject to volcanic eruptions or significant earthquakes. It is in Seismic Zone 2A which is characterized by earthquakes that may cause minor damage to structures (ICBO, 1994).

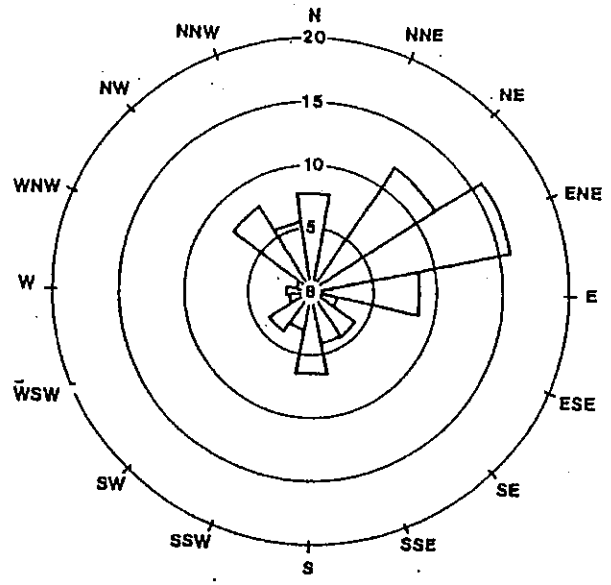
3.2.2 Potential Impacts

The Fill soils within the project area would experience disruption as a result of construction activities such as pile driving, drilling and excavations for utility and drainage improvements. Potential short-term construction related impacts from soil erosion and sedimentation are discussed in section 3.9. Additionally, the proposed projects require no dredging of these fill lands. Thus, there will be no stockpiling of dredge spoils at upland sites to alter the area's topography.

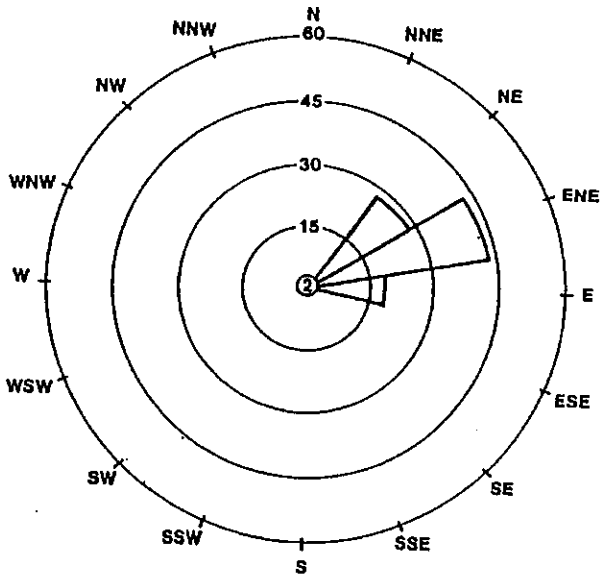
3.2.3 Proposed Mitigation Measures

The proposed project will not adversely affect the topography and soils of the area, and mitigation measures are not anticipated to be necessary.

January Wind Rose
Honolulu International Airport



August Wind Rose
Honolulu International Airport



Source: National Weather Service
Historic Records, 1940-57

Center Values = % Calm Winds

FINAL ENVIRONMENTAL IMPACT STATEMENT FOR THE OAHU COMMERCIAL HARBORS 2020 MASTERPLAN IMMEDIATE PHASE	**Figure 3-1** **Seasonal Wind Conditions in Project Vicinity**	Prepared for: State of Hawaii Department of Transportation Harbors Division Prepared by: Wil Chee – Planning, Inc.

3.3 Geology and Hydrology

3.3.1 Existing Conditions

Oahu's south central coast is geographically referred to as the Honolulu Plain. The geological composition of the Honolulu Plain plays an important role in the hydrological character of Oahu's leeward coastline.

The caprock layer is formed at the interface between upper sedimentary layers and the underlying basalt of the plain. The caprock forms a zone of low permeability which extends along the coastline, and in the project area, is believed to be between 800 to 900 feet thick. This impervious zone prevents the seaward movement of potable water from the basaltic aquifers.

Honolulu Harbor area was created by the continual flow of fresh water from Nu'uanu Valley into the ocean. The freshwater restricted the growth of coral which resulted in the forming of a basin and the beginnings of the harbor. The freshwater flows also cut channels through the existing coral reef in which sand eventually began to accumulate. These sand accumulations grew over time, forming what would later become Sand Island (HDOT, 1997). Over the years spoils from harbor dredging activities were used to expand the size of Sand Island to what it is today.

Surface waters in the immediate vicinity of the project area consist of four streams: the Nuuanu Stream which discharges into Honolulu Harbor at Piers 15 and 16, Kapalama Stream which discharges into Honolulu Harbor (Kapalama Basin) at Piers 38-39, and Kalihi and Moanalua Streams which discharge into Keehi Lagoon. Water quality of these streams is strongly influenced by surface runoff from surrounding industrial, commercial, and residential areas.

3.3.2 Potential Impacts

Almost all lands within the project areas have already been paved. During construction activities various areas will be unearthed and subsequently repaved. These construction related changes in site drainage patterns will be temporary and are not anticipated to have any long term adverse impacts on site hydrology.

Existing unpaved areas at the proposed layberth/*OSRV* facility site along lagoon drive will need to be paved. The area to be paved is relatively small (approximately *58,000* ft^2), and would only minimally increase the volume of surface runoff.

3.3.3 Proposed Mitigation Measures

The proposed projects are subject to regulation under the National Pollution Discharge System (NPDES) Permit System. The NPDES Permitting process will

also require the submission of a Best Management Practices Plan (BMPP) which will address methods of runoff, erosion, and sediment control at the project sites. The NPDES permit system and BMPP are discussed in further detail in section 3.9.

The increased runoff resulting from newly paved areas at the proposed Keehi Lagoon project sites is not expected to have significant adverse impacts. However, if necessary, a Drainage Plan will be prepared during the design phase of the proposed projects to ensure that the future storm drainage systems are properly sized.

3.4 Tsunami and Flood Hazard

3.4.1 Existing Conditions

According to the Flood Insurance Rate Map prepared by the Federal Emergency Management Agency (FEMA, 1990), the entire project site, with the exception of Keehi Lagoon, is designated as being outside the 500 year flood plain. The project site located at Keehi is designated as being in an undetermined flood hazard area.

Tsunami occur as a series of waves that strike a coastline, and the waves decrease in height over time. Tsunami can cause serious damage to coastal areas. The degree of tsunami damage is dependent upon several factors including an area's topography, wave origin, and wave intensity.

In the event of a tsunami flooding of on-shore port facilities, strong currents in the area close to harbor entrances could put ships at risk, and large water movements may produce surging forces on both moored ships and ships underway.

3.4.2 Potential Impacts

Tsunami are natural occurrences over which humans have little control. The threat of a tsunami always exists as their frequency and intensity are unpredictable. The destructive potential of a tsunami depends mainly on the wave runup height and the levels of the shores they inundate.

The proposed projects will not entail any reduction or increase in shoreline levels at Honolulu Harbor or Keehi Lagoon. Therefore, the extent of overland flooding as a result of tsunami would not be affected by the proposed projects.

3.4.3 Proposed Mitigation Measures

Damage from tsunami will be minimized by following Oahu Civil Defense evacuation procedures. Measures would include the evacuation of ships, personnel, vehicles, containers, and other cargo from flood prone areas. The

proposed harbor facilities will be designed, constructed, and operated in accordance with potential for tsunami flood inundation.

3.5 Terrestrial Biology

3.5.1 Existing Conditions

Honolulu Harbor

The project sites within Honolulu Harbor are located in an urban area, and existing land uses are predominantly industrial and commercial in nature. All of the proposed project sites have been highly disturbed and are dominated by manmade structures and areas paved over with asphalt or cement. The presence of terrestrial flora and fauna is both scattered and sparse.

Flora present on-site include common introduced species such as haole koa (*Leucaena leucocephala*), kiawe (*Prosopis pallida*), wedelia ground cover (*Wedelia trilocata*), and several weedy species of grasses.

Given the urban character of the Harbor, terrestrial fauna which might exist here include feral animals such as cats (*Felix domesticus*), rats (*Rattus spp.*), dogs (*Canis familiaris*), and Small Indian Mongoose (*Herpestes auropunctatus*). Some species of migratory shorebirds may occasionally pass through but not settle at the proposed project sites.

Keehi Lagoon

The proposed project site at Keehi Lagoon is situated in the vicinity of industrial and commercial land use operations but is less developed than the Honolulu Harbor sites. The flora present on the Keehi Lagoon triangle reef islets and surrounding shoreline is limited in diversity and is dominated by introduced species. The most abundant introduced plant species present is the American mangrove (*Rhizophora mangle*). Other exotic varieties of plants include coconut trees (*Cocos nucifera*), akulikuli-kai (*Batis maritima*), small kiawe (*Prosopis pallida*), ironwood (*Casuarina equestifolia*), kolu (*Acacia farnesiana*), sea mulberry (*Conocarpus erecta*), wedelia ground cover (*Wedelia trilocata*), and various weedy species of grasses.

There are no endemic species present, and only three indigenous species are known to exist in the project area. These species are the milo (*Thespisia populnea*), akulikuli (*Sesuvium portlacastrum*), and the seaside heliotrope (*Heliotropium curassavicum*). None of these species is considered threatened or endangered (Noda, 1989).

Keehi Lagoon serves as a resting and feeding site for a variety of bird life. The largest group of birds recorded in the Keehi Lagoon area are introduced species. Previous surveys have recorded 17 species of introduced birds none of which

are threatened or endangered, and a number have proven to be serious pests in Hawaii. Native bird species including the black-crowned night *heron (Nycticorax n. hoactli*), brown booby (*Sula leucogatser*), white tern (*Gygis alba*), common noddy (*Anous stolidus*), and great frigatebird (*Fregata minor palmerstoni*) have been recorded flying over but not nesting in the Keehi Lagoon area (Noda, 1989).

One of the most important habitat features of the Keehi Lagoon area are the offshore inter-tidal mudflats. These mudflats are exposed during low-tide conditions and provide a resting and foraging area for various shorebirds such as the wandering tattler or ulili (*Heteroscelus incanus*), sanderling or hunakai (*Calidris alba*), the ruddy turnstone or akekeke (*Arenaria interpres*), the Pacific golden-plover or Kolea (Pluvialis fulva), and the endemic the Hawaiian stilt or 'ae'o (*Himantopus mexicanus knudseni*). Additionally, the mudflats provide a staging area where each shorebird species congregates with their own kind prior to flying off as a flock during migrations to northern breeding sites (USFWS, 1999).

The ulili (Heteroscelus incanus), sanderling or hunakai (Calidris alba), the ruddy turnstone or akekeke (Arenaria interpres), and the Pacific golden-plover or Kolea (Pluvialis fulva) are all migratory bird species afforded protection under the Migratory Bird Treaty Act (16 USCS section 703). The Hawaiian stilt is the only species found at Keehi Lagoon that is listed as endangered by the Federal government (USFWS, 1996). The Hawaiian stilt and its Keehi Lagoon habitat are discussed further in section 3.7.

3.5.2 Potential Impacts

The proposed actions are not expected to have a significant adverse impact on plant resources in the project area. A majority of the construction activities will occur on previously disturbed areas. It is likely that abundant plant species such as kiawe and mangrove trees, Haole koa shrubs, and weedy grasses will need to be removed from undeveloped portions of the proposed sites. These introduced species are all regionally abundant floral resources.

The proposed improvements are also not expected to have a significant impact on the terrestrial fauna communities in the project area. In Honolulu Harbor construction will take place in previously disturbed areas, and the faunal species which may be affected are common and abundant in the region.

3.5.3 Proposed Mitigation Measures

In order to secure habitat protection for shorebird species which utilize the Keehi Lagoon mudflats, the final project design will avoid the mudflat areas during the construction and long-term operation of the berthing facilities. Because of the lack of significant impacts, no additional mitigation measures are proposed.

3.6 Marine Biology

Biological surveys of the marine environment in the project areas were conducted in September of 1998 by S. L. Coles and R.E. De Felice of the Bishop Museum's Department of Natural Sciences. These surveys were incorporated into the *Aquatic Habitat and Water Quality Impact Assessment Report* which was prepared by AECOS, Inc. in conjunction with this EIS (Appendix D). The information presented in this section is based on these surveys and the assessment report.

3.6.1 Existing Conditions

In contrast to the distribution of the terrestrial biota in the project area, Honolulu Harbor contains a much more diverse marine biological community than Keehi Lagoon.

Overall, there were a total of 82 different species observed in the marine waters at the proposed project sites within Honolulu Harbor. These species were comprised of a wide variety of marine life including corals, sponges, alga, nematodes, crustaceans, and fish species. The macroalga (*Mesophyllum mesomorphum*); eight invertebrate taxa (sponges *Mycale cecilia, Hyatella intestinalis*; barnacle *Chthamalus proteus*; ectoprocts *Amahtia distans* and *Diaperoecia* sp.; ascidans *Phallusia nigra* and *Bottryllus spp.*) occurred at every site. All of these except the macroalga and the ectoproct Diaperoecia sp. are known or suspected nonindigenous species introduced from areas outside of Hawaii (Coles, et. al., 1999).

A total of 45 different species were recorded at the Pier 2 site. Twelve species of fish were noted under and around the pier and five species were unique to the site, including *Parapeneus multifasciatus*, *Chaetodin miliaris*, *Forciper flavissimus*, *Thalosomma duperry*, and *Canthigaster jactator* (Ibid.) It is of interest to note that a previous study of marine organisms in the same vicinity (conducted at Pier 1) recorded 29 species of fish and only 8 invertebrates and one macroalga (AECOS, 1988). These differences from the present results are for the most part due to the fact that Pier 1 is closer to the channel entrance where more reef fishes are likely to be present.

The marine community at Pier 15 was the most diverse of the sites surveyed. A total of 47 taxa were found consisting of 4 macroalga, 35 invertebrates and 8 fish species. Sponges, represented by 14 different species, are most abundant at this site (Coles, et. al., 1999). No coral occurred at the site, and decreasing numbers of invertebrate coverage on the pier pilings going toward the Nuuanu Stream mouth suggest the limiting effect of stream outflow on the marine community.

Pier 12 which is located farther from the Nuuanu Stream Mouth (approximately 500 yards) supports a high coverage of reef corals. Only 7 coral species were recorded at this site *(Porites compressa, Porites lobata, Montipora patula, Montipora verucosa, Pocillopora damicornis, Carijoa riisei, Zoanthus pacificus)* but they encrusted the walls of the dock and other hard surfaces down to 5 meter depths resulting in up to 50% coverage of available surfaces (Coles, et. al., 1999).

Pier 16 is located approximately 100 yards from the mouth of Nuuanu Stream. A total of only 21 invertebrates and 3 fish species were found at the site, the fewest number of taxa of all the sites surveyed (Ibid). These results are not surprising considering the proximity to the Nuuanu Stream Mouth. Surfaces at the site showed signs of heavy sedimentation, with silt adhering even to the horizontal surfaces of the pier pilings.

An in-water survey was not conducted at Piers 24-29 because of its interior location within the harbor and the fact that the proposed improvements will not involve any work specifically in the water. The marine biota in this area is generally similar to that described for Pier 15, consisting of fouling biota on vertical piles and a generally sparse community of assorted fishes. Pier locations this far into the harbor show a lesser diversity of organisms compared with piling-associated biota closer to the harbor entrance (Guinther, et. al., 1999).

The marine community in Keehi Lagoon is substantially less diverse than those found at the Honolulu Harbor sites. There were only 27 total species observed in the area of the proposed layberth site. There were 21 macroinvertebrates species found, 11 of which were sponges including, *Suberites zeteki* and *Tedania sp.* which occurred only at this site. The only coral present was *Leptastrea purpurea.* Six species of fish were observed among the rocks along the shoreline and included the stripey (*Microanthus strigatus*) and the surgeon fish (*Acanthrus nigorus*).

3.6.2 Potential Impacts

In contrast to the terrestrial biota, marine life at the project sites is both diverse and abundant. The waters within Honolulu Harbor and Keehi Lagoon contain complex benthic communities which may experience some project-related impacts. It is unlikely that the proposed projects would result in any significant, long-term impacts on the resident marine biota. The potential impacts to the marine biological communities would be the short-term increase in turbidity and sedimentation rates resulting from construction activities.

Construction activities at Pier 2 and Piers 24-29 require no dredging and no work specifically within the water. Consequently, these proposed projects should cause little or no disturbance of sediments. Any sediments that might be resuspended into the water column by construction activities would be fine to

medium sands. These sands would settle out rapidly with minimal effect on the marine organisms growing primarily on the vertical surfaces of pier pilings. Additionally, the Pier 2 site is situated relatively close to the channel opening. This area has increased circulation which would rapidly dissipate any construction related turbidity.

Though pile driving activities will be required, it is unlikely that lay berth construction in Keehi Lagoon will cause substantial impact on the marine communities in the area. As mentioned earlier, this area had the fewest number of species of any of the sites, and the organisms found were primarily intertidal organisms which can withstand high levels of sedimentation. Furthermore, any construction related, re-suspended sediments and turbidity are likely to be rapidly dissipated as a result of the high level of water circulation generated by wind-driven turbulence.

Construction of the proposed finger piers at Piers 12 - 16 will also require the installation of piles which may result in some suspension of silt, sedimentation, and elevated turbidity levels. The area most likely to show an impact from these activities is the coral community and associated organisms that are in the vicinity of Pier 12. However, these corals appear to be adapted to relatively high levels of turbidity and sedimentation. They have withstood previous construction activities, a high volume of vessel activity, and other stresses that have occurred in this area of the Harbor over the past decade (including the construction of Piers 16 and 17), maintaining a high level of coral coverage by a variety of species (Guinther, et. al., 1999).

The sessile marine biota in the vicinity of Piers 12 - 16 are already limited and are composed primarily of organisms adapted to a sedimentary or turbid environment. Any benthic organisms disturbed or displaced are likely to be replaced by rapid resettlement on existing and new surfaces provided by the construction. Fish communities disrupted by construction activities may leave the area temporarily and return when conditions are more favorable (Ibid).

3.6.3 Proposed Mitigation Measures

Significant impacts to the marine biota are not anticipated. However, the minor impacts expected to occur as a result of construction activities can be mitigated by employing measures to reduce the suspension of silt and sedimentation. These mitigation measures are discussed further in section 3.9.3.

3.7 Threatened and Endangered Species

3.7.1 Existing Conditions

The project areas within Honolulu Harbor are not utilized or inhabited by any rare, threatened, or endangered species as listed by the U.S. Fish and Wildlife Service (1996). Previous disturbance of harbor lands and ongoing industrial and

commercial activities at the harbor do not provide a conducive habitat for threatened or endangered species.

The endangered Hawaiian stilt or 'ae'o (*Himantopus mexicanus knudseni)* is a North American subspecies. They are found on all major islands except Lanai or Kahoolawe and often feed in shallow freshwater, brackish, or saltwater areas other than those in which they nest. As previously discussed, the tidal mudflats in Keehi Lagoon are such an area utilized by the Hawaiian stilt and other migratory shorebird species. The approximate island-wide stilt population has been estimated to be between 1,200 - 1,500 birds and have varied widely in the past (Scott et al., 1989).

In recent years, there has been a significant decline in the numbers of Hawaiian stilts in Keehi Lagoon. This decline in numbers can be attributed mostly to the construction of the Hawaii International Airport Reef Runway which has resulted in increased air traffic and flight paths over these important sand and mudflat areas used by these birds for feeding (Guinther, et.al., 1999).

The Green Sea Turtle (*Chelonia mydas*) which is listed as a threatened species is rarely observed in Keehi Lagoon. A 1989 survey of sea turtles at Keehi Lagoon found that sea turtles rarely enter the lagoon waters because of the silty, mud-type bottom and the turbid water column (Noda, E.K., 1989). Furthermore, turtles that do frequent the area are most often found away from the proposed project area swimming in the vicinity of the triangular reef flat remnant in the lagoon's center.

The U.S. Fish and Wildlife Service was consulted to determine the location and extent of environmentally sensitive areas. The mudflats are located within the triangular reef flat remnant located approximately 1,100 feet off the lagoon's southern and eastern shores (Figures 2-14 and 2-15). It has also been established that there are no critical breeding habitats within the proposed project areas.

3.7.2 Potential Impacts

The existing mud flats in Keehi Lagoon will not be affected by the proposed project. They are located a considerable distance (approx. 1,100 feet) from the proposed project site and will not be adversely impacted by construction activities. No significant long-term adverse impacts on the Hawaiian stilts or the Green Sea Turtle is anticipated because the proposed project would not affect the existing mudflat areas.

3.7.3 Proposed Mitigation Measures

Mitigative measures are not necessary as there are no impacts anticipated which would adversely affect the Hawaiian stilts found in Keehi Lagoon.*OSRV* Mudflat

areas will be totally avoided during both the construction stages and long-term operation of these facilities.

3.8 Alien Species

3.8.1 Existing Conditions

Hawaii's geographic isolation and island setting have resulted in the uniqueness and diversity of its native flora and fauna. This isolated evolution has also resulted in a very fragile ecosystem and has produced native Hawaiian species highly vulnerable to human disturbances and invasions of introduced species. In contrast, most alien flora and fauna evolved in continental ecosystems where competition has produced aggressive species with highly successful survival strategies. However, most of Hawaii's native flora and fauna are unable to compete with these survival strategies resulting in their demise.

Alien species are a continual threat to Hawaii's fragile ecosystems, and the remainder of this section attempts to address potential project-related impacts on the marine environment as a result of alien species introductions.

3.8.2 Potential Impacts

Harbors, like other port facilities, have the potential to introduce alien pest species into Hawaii. In harbor areas, the threat of alien species introduced into Hawaii's coastal waters is always present. Non-indigenous marine organisms can enter harbor waters by being attached to the bottom of ships' hulls (hull-growth) or by being released during a ships' ballast water discharge operations.

A ships' ballast water functions to increase the vessel's manageability and safety and to control its draft, trim (for maximum sailing efficiency), and stability. Ballast water is taken in and discharged by vessels at varying rates and volumes depending on external (weather and sea conditions) and internal (cargo type, vessel design, and load quantity) conditions under which a vessel is sailing.

Ballast water is carried by many types of vessels and is held in a variety of tanks or holds. Ballast capacity can range from several cubic meters in small fishing boats to hundreds of thousands of cubic meters in large cargo carriers. Large tankers can carry an excess of 200,000 m^3 of ballast water and have ballasting discharge rates as high as 15,000 to 20,000 m^3/hour (NRC, 1996). Discharged ballast water often contains marine organisms and sediment which has accumulated in ballast tanks.

The potential diversity of marine biota which can be transported in ballast water is vast. The maximum size range of organisms capable of being taken into a ship depends upon the method of ballasting and the size of the intake screens. Virtually all organisms less than 1cm in size that are adjacent to the vessel –

either swimming naturally, stirred up from bottom sediments, or rubbed off harbor pilings – could be ballasted into the vessel. Such organisms include viruses, bacteria, protozoa, fungi, algae, plants, zooplankton, and fish.

Studies have shown that a wide variety of alien species populations in United States coastal waters are the result of shipborne introductions via ballast water discharge. San Francisco Bay is now home to several species of cepopods indigenous to China and Japan, and areas of New England now have jellyfish species from the Black Sea and mollusks from Eurasia in their waters. Locally, the goby species *Mugiligobius parvus* which is indigenous to the Philippines has established itself in Hawaii's coastal waters (NRC, 1996)

Among the plants transported, phytoplankton, especially diatoms and dinoflagellates, have been found to be particularly common in ballast water (Carlton, et al., 1993). Ciguatera toxin is a poison caused by the nonindigenous marine dinoflagellate, *Gambierdiscus toxicus*, which is found in association with certain red and brown algae. *G. toxicus* poisons fish (through ingestion of algae or herbivorous fish) and can cause poisoning in humans when contaminated fish are consumed.

Ciguatera fish poisoning has been reported more frequently in recent years because there is an increase in knowledge and awareness of fish poisoning, and there is an increase in *G. toxicus* that come from the discharge of contaminated ballast water (Parsons, Brinkerhoff, 1995). In some coastal areas, construction activities have been linked, albeit tenuously, to the increase in the presence of ciguatera toxin in marine organisms (HOMRC, 1991).

The project areas in Honolulu Harbor and Keehi Lagoon are characterized by several physical limitations which are not conducive to the proliferation of *G. toxicus.* These limitations include: high turbidity levels, water temperatures below 25° C, and the influx of groundwater (Parsons, Brinkerhoff, 1995). As a result of these limitations, it is unlikely that ciguatera poses a serious threat as either an invasive species or a human health risk.

To a lesser degree, nonindigenous organisms can also be transported and released into Hawaiian coastal waters attached to the hulls of ships. Organisms found in hull-growth include microscopic invertebrates, barnacles, algae, mollusks, and crustaceans. The loosening and release of hull-growth into receiving waters can occur from natural ocean currents, draft of the vessel, or from rubbing against harbor pilings.

Hull-growth is not anticipated to be a major contributor to alien species introduction because relative to ballast water discharge, the amount of organisms contained in hull-growth is minimal, and most vessels adhere to regularly scheduled hull cleaning activities as a part of their preventive maintenance program.

3.8.3 Proposed Mitigation Measures

The release of nonindigenous marine species, whether from ballast water discharge or hull-growth, into a new coastal environment does not necessarily constitute their successful introduction. An alien species must have the ability to form established populations to complete a successful introduction. Limiting the number of a given species in ballast water would reduce the chances of the successful establishment of reproducing populations in receiving waters.

Regulatory Measures

At the present time, there are no enforceable laws which regulate ballast water discharge. Concerted efforts are being undertaken by both international organizations and individual governments to establish regulatory mechanisms to monitor ballast water discharge. The main purpose of these efforts is to establish universal regulations which are enforceable in both international and national waters.

An Executive Order was recently signed to coordinate a federal strategy addressing the environmental and economic threats of foreign marine organisms being discharged into U.S. waters. The order creates an Invasive Species Council that is mandated to develop a comprehensive plan to minimize the economic, ecological, and human health impacts of invasive species and to determine further steps to prevent future introductions (HOISN, 1999).

The United Nations - International Maritime Organization (IMO) is a specialized international body devoted exclusively to maritime matters. As part of the continuing efforts to regulate ballast water, the IMO recently developed a draft annex to the International Convention on the Prevention of Pollution from Ships titled, "Regulations for the Control and Management of Ships' Ballast Water and Sediments to Minimize the Transfer of Harmful Aquatic Organisms and Pathogens" (HOISN, 1998).

Until such time that enforceable ballast water regulations are established and promulgated, ships entering Honolulu Harbor should, when practicable, comply with the existing "voluntary ballast water guidelines" established by the IMO. These guidelines are intended to assist governments and appropriate authorities, ship masters, operators, owners, and port authorities in minimizing the risk of introducing harmful aquatic organisms, pathogens, and associated sediments from ships' ballast water while protecting ships' safety (IMO, 1996).

Particular attention should be given to the "Ships' Operational Procedures" contained in the IMO guidelines. This section outlines specific precautionary practices and ballast water management options. Specific procedures which would reduce the release of alien species include:

- Minimizing the uptake of harmful aquatic organisms, pathogens, and sediments - Avoidance of loading ballast in very shallow waters where propellers stir up sediments and in the darkness when bottom-dwelling organisms may rise up in the water column.

- Removing ballast sediment on a timely basis - Routine cleaning of ballast tanks should, when practicable, be carried out in mid-ocean and in accordance with the provisions of the ships' ballast water management plan.

- Avoidance of unnecessary ballast water discharge - Care should be taken to avoid unnecessary discharge of ballast water that has been taken up in another port.

- Practicing of sound ballast water management options - This includes, when practicable, deep water/open ocean ballast water exchange, non-release or minimal release of ballast water, discharge to reception facilities, use of emergent and new technologies and treatments.

Technological Measures

Once ballast water has been loaded on board, the ideal mechanism for preventing subsequent introductions of nonindigenous aquatic species is to kill or remove the organisms prior to discharging ballast water overboard. This could be achieved by utilizing onboard chemical, physical, biological, or mechanical treatment technologies. There are numerous promising treatment technologies emerging, a few of which are listed below (IMO, 1996):

- Filtration Systems
- Oxidizing and nonoxidizing biocides
- Thermal techniques
- Electric pulse and pulse plasma techniques
- Ultra violet treatment
- Acoustic systems
- Magnetic Fields
- Deoxygenation
- Biological techniques

Each of the above technologies, whether utilized individually or in combination, would achieve the goal of neutralizing potentially harmful alien species in an environmentally safe manner before they are discharged into receiving waters.

As discussed in sections 2.3 and 2.5, Hawaii is primarily an import state receiving almost all of its goods through Honolulu Harbor. Cargo ships entering the harbor are usually carrying a full cargo load with only minimal amounts of ballast water (as opposed to an empty ship which would need to fill its ballast tanks to capacity

to stabilize the vessel). Consequently, cargo ships in Honolulu Harbor do not discharge but rather take in ballast water prior to port departure. This practice further reduces the risk of alien species introduction via ballast water discharge.

In summary, the proposed projects will increase the number of vessels arriving in the Honolulu Harbor. However, the potential for alien species introductions resulting from ballast water discharge is considered to be low.

3.9 Coastal and Ground Waters

An assessment of the extant aquatic habitat and water quality in Honolulu Harbor and Keehi Lagoon was conducted in conjunction with this EIS (Appendix D). This section is based mainly on that assessment.

3.9.1 Existing Conditions

The project area is located over two aquifers. The overlying caprock aquifer is nonpotable and is not considered ecologically important. The general direction of groundwater flow is assumed to be seaward towards the harbor. The water table is approximately at sea level this close to the shore and fluctuates with the tide.

The underlying aquifer is currently used for drinking water, pumped from deep wells inland of the project site. This aquifer is basal, meaning its underside is in contact with seawater. The direction of groundwater flow under the site is not known but is presumed to be in a seaward direction. This aquifer is protected from surface contamination at the project area up to 900 feet of the overlying caprock layer (Mink and Lau, 1990).

In the State of Hawaii marine waters are divided into Class AA and Class A waters. In accordance with Chapter 11-54-06 HAR, the objective of Class AA waters is to preserve them "in their natural Pristine state as nearly as possible with an absolute minimum of pollution or alteration of water quality of any human-caused source or actions." The objective of Class A waters is to ensure that their use for recreational and aesthetic enjoyment is protected. The waters of the Honolulu-Kapalama—Keehi Complex are designated Class A waters. Water quality standards for Class A waters are summarized in Table 3 - 1 below.

Table 3 -1
State of Hawaii Water Quality Standards
For Class A Waters

Parameter	Geometric Mean Concentration (Not to exceed)	Value not to be exceeded >10% of the time	Value not to be exceeded >2% of the time
Total Nitrogen (TN)	150.0	250.0	350.0
Ammonia			

(NH_3)	3.5	8.5	15.0
Nitrate + Nitrite ($NO_3 + NO_2$)	5.0	14.0	25.0
Total Phosphorus (TP)	20.0	40.0	60.0
Chlorophyll α (Chl. α)	0.50	1.50	3.00
Turbidity	0.4	1.0	1.5
Dissolved Oxygen (DO)	Levels may not decrease below 75% saturation.		

Note: All parameter values are expressed in micrograms/liter (μg /l) except for Turbidity which is measured in Nephlometric Turbidity Units (NTU), and Dissolved Oxygen which is expressed as % saturation.

The project area extends between the marine waters of the Honolulu Harbor, Kapalama Basin, and Keehi Lagoon. This area is referred to as the Honolulu-Kapalama-Keehi Complex. The marine waters of the Honolulu-Kapalama-Keehi Complex serve as receiving waters for runoff, drainage, and seepage from major residential, commercial, and industrial land use areas of the city. Four major streams drain into the Honolulu-Kapalama-Keehi Complex. Honolulu Harbor and Kapalama Basin receive drainage from the Nu'uanu Stream which discharges into the harbor at 15 and 16 and the Kapalama Stream which discharges near Pier 38. Keehi Lagoon receives stream flow from the Kalihi and Moanalua Streams.

Water quality in the Honolulu-Kapalama-Keehi Complex is in a constant state of flux, being influenced by numerous factors which include: storm runoff, wind conditions, tidal state, and even the movements of large ships which can cause resuspension of sediments into the water column as they pass by. A major contributor to the dynamic state of the Honolulu-Kapalama-Keehi Complex can be attributed to storm runoff. During an average storm event, the Kapalama Basin – Honolulu Harbor area receives approximately 66 million gallons per day (mgd) and Keehi Lagoon receives approximately 110 mgd (Guinther, et. al., 1999).

A summary of existing water quality data for the Honolulu-Kapalama-Keehi Complex is presented in Table 3 - 2. The data presented was compiled from various scientific studies and Department of Health monitoring station data (Gunither, et.al., 1999).

Table 3 - 2
Existing Water Quality Data for the
Honolulu-Kapalama-Keehi Complex

Location	TN (μg /l)	NH_3 (μg /l)	NO_3+NO_2 (μg /l)	TP (μg /l)	Chl. α (μg /l)	Turbidity (NTU)	DO (% saturation)

Honolulu Harbor	124	**6.8**	4.3	20	0.36	**0.7**	85
Kapalama Basin	137	**5.1**	2.2	**31**	0.26	**1.9**	95
Keehi Lagoon	**167**	**3.7**	1.8	**22**	0.32	**2.7**	95

Note: Bolded figures indicate that the mean (or geometric mean) values of the State water quality criteria were exceeded.

In comparison with State water quality standards, Keehi Lagoon exceeded the four criteria (turbidity, NH_3, TN, and TP), and Honolulu Harbor exceeded two (turbidity and NH_3). These data are not surprising considering the Honolulu-Kapalama-Keehi Complex serves as a settling area for terrestrial runoff. It is unlikely that any management practice, short of the diversion of runoff, will help these waters meet the State's criteria for turbidity and certain nutrients. However, it should be noted that both DO saturation levels and Chlorophyll α concentrations are well within the State's criteria. These two parameters represent the culmination of a number of factors influencing water quality and are more appropriate indicators of the health of a specific aquatic environment than either nutrients or turbidity. (Gunither, et.al., 1999).

3.9.2 Potential Impacts

The proposed project is not anticipated to impact the ground water underlying the area. The width and thickness of the caprock layer (800 to 900 feet) suggests that the basal potable water supply will be relatively unaffected by the proposed modifications along the coastline.

Coastal water quality may be impacted by construction activities associated with the proposed projects. Some suspension of silt, sedimentation, and elevated turbidity during construction activities could occur. However, as previously discussed in section 3.6.2, it is unlikely that construction activities will have significant adverse impacts on the marine communities within the Honolulu-Kapalama-Keehi Complex.

3.9.3 Proposed Mitigation Measures

In accordance with HAR 11-55, the proposed harbor improvements will require NPDES permit approvals from DOH. The NPDES permit application will require development of a Best Management Practices Plan (BMPP). The BMPP, which will be developed prior to construction activities, will identify the most effective erosion, sedimentation, and turbidity control measures to reduce the amount of soil and sediment accumulation in the coastal waters as a result of construction activities.

Unknown factors such as pile driver size and type, construction equipment to be used, construction site staging areas, etc. would determine the most effective BMP's in mitigating construction related impacts on coastal waters. Mitigation measures may include, but not be limited to, the on-site utilization of the following BMP technologies:

- Silt Curtains – To limit and contain the suspension of fine sediments from activities associated with piling installation.
- Drainage Swales - To convey on-site runoff while limiting erosion.
- Storm Drain Inlet Protection – Filtering measures placed around inlets and drains to trap sediment, preventing it from entering inlets and receiving waters.
- Sediment Traps – To retain site runoff and allow suspended sediments to settle out.
- Soil Stabilization– Practices designed to prevent the loss of disturbed or exposed soil areas through the use of vegetation and/or geotextiles.

Specific BMP's for the proposed actions will be determined during the design and construction phases and incorporated into the BMPP.

3.10 Traffic and Circulation

The proposed improvements associated with the 2020 Master Plan are located within a large area between Keehi Lagoon in the west and Pier 2 and Kewalo Basin in the east. Coordination with the State Department of Transportation was initiated to define the study area and establish key roadway intersections for analysis. A traffic impact analysis was subsequently conducted to evaluate potential traffic impacts associated with implementation of the proposed harbor projects (Rowell, 1999). The information in this section is based upon the findings of this study.

3.10.1 Existing Conditions

There are three major roads that provide access to the proposed project areas: Nimitz Highway, Ala Moana Boulevard, and Lagoon Drive. Nimitz Highway provides access to the proposed project sites within Honolulu Harbor, and Lagoon Drive provides access to proposed project site within Keehi Lagoon. Nimitz Highway is an east-west arterial bordering the entire Honolulu Harbor area along its northern perimeter and provides access to all piers in the harbor. From downtown Honolulu, Nimitz Highway extends westward to Hickam Air Force Base. At the downtown terminus of the highway, Nimitz Highway converts to Ala Moana Boulevard, which extends eastward into Waikiki. At the Hickam terminus, Nimitz Highway ends and feeds two off-ramps. One ramp enters the H-1 Freeway and the other connects with Kamehameha Highway.

Lagoon Drive intersects Nimitz Highway underneath the eastern portion of the H1 viaduct. North of Nimitz Highway, Lagoon Drive converts to Puuloa Road which eventually merges with Salt Lake Boulevard. South of Nimitz Highway, Lagoon Drive extends along the western shore of Keehi Lagoon and at its southern-most terminus ends at Honolulu International Airport.

There are several smaller roads adjacent to the project area which intersect these major roadways and provide vehicular access to the project sites. Key intersecting roads analyzed were South Street, Punchbowl Street, Pacific Street, and Channel Street. Table 3 - 3 summarizes the existing characteristic of the study roadways.

Table 3 -3
Traffic Characteristics
At Study Roadways[a]

Roadway	Direction	Speed Limit	Average Daily Traffic (ADT)[b]
Ala Moana Boulevard	Eastbound	35 mph	40,100
	Westbound	35 mph	38,000
South Street	Northbound	25 mph	4,340
	Southbound	25 mph	3,790
Channel Street	Eastbound	10 mph	1,350
	Westbound	10 mph	1,350
Punchbowl Street	Southbound	25 mph	9,780
Nimitz Highway	Eastbound	35 mph	40,100
	Westbound	35 mph	38,000
Pacific Street	Northbound	25 mph	3,200
	Southbound	25 mph	1,400

a All figures obtained from Hawaii Dept. of Transportation Surveys (12/11/95, 7/31/97) except for Channel Street (Estimated from traffic counts)
b Average Daily Traffic volumes are expressed in terms of Vehicles Per Day (VPD)

As mentioned in section 2.6.1 HCDA is proposing the extension of Ilalo Street to function as a connecting roadway between Ward Avenue and Punchbowl Street. The development schedule for Ilalo Street improvements will be staggered, occurring in four phases. Phase 1 (extension of Ward Avenue to Ilalo Street), Phase 2 (widening of Ilalo Street), Phase 3 (extension of South Street to Ilalo Street) and Phase 4 (extension of Punchbowl Street to Ilalo Street) (HCDA, 1999a).

Phase 1 was recently initiated in March of this year and is scheduled to take about 15 months to complete (HCDA, 1999c). The schedule for the remaining phases have not yet been finalized. Design work for Phase 4 is on hold pending the final design plans for the proposed Pier 2 cruise ship terminal (HCDA, 1999b). During the design stages of the Pier 2 cruise terminal, DOT-HAR will closely coordinate their efforts with those of HCDA.

The section of Ilalo Street adjacent to Pier 2 (Phase 4) was assumed to be constructed concurrently with the Pier 2 cruise ship terminal. Part of Ilalo Street roadway improvements involve the demolition of Channel Street and the traffic signal at the intersection of Channel Street and Ala Moana Blvd. For the purposes of this EIS, all analyses for the year 2003 traffic forecasts assumed that the Ilalo Street connector would be in place.

3.10.2 Potential Impacts

Project Related Impacts

Traffic related impacts of a proposed project generally involve the determination of project-generated traffic during the A.M. and P.M. weekday commuter peak period and the determination of the levels-of-service (LOS) at affected roadway intersections subsequent to implementation of the project. Traffic surveys were performed in July and August 1998 to establish baseline conditions to estimate future traffic volumes. None of the four proposed projects have established trip generation rates or equations in the standard references. Therefore, the methodology used in conducting each of the proposed project's trip generation analysis is described separately. The methodology and calculations for these analyses are presented in Appendix F.

Pier 2 Cruise Terminal

Trip generation analysis was performed for both interisland and foreign cruise ship operations. Interisland cruise ship calculations were based on 850 passengers and 335 crew members. Foreign cruise ship calculations were performed for average-sized (1,000 passenger/460 crew) and maximum-sized (2,000 passenger/800 crew) vessels. These figures were provided by cruise ship industry operators and assume 100% capacity.

Traffic surveys indicate that interisland cruise ship arrivals have much greater traffic impacts than their departures. This is because passenger disembarkation is concentrated within a short period after arrival of the cruise ship. During passenger embarkation, passengers arrive and board the cruise ship over an extended period of time throughout the afternoon.

All interisland cruises are currently scheduled to arrive on Saturday mornings and depart Saturday evenings. Therefore, interisland cruise ship operations have no impacts on the weekday A.M. or P.M. commuter peak periods. Future interisland cruises are anticipated to continue operating on the same weekend schedule. In contrast, foreign cruise ships schedules do occur during the weekdays and their arrival may be concurrent with the A.M. or P.M. commuter peak periods.

The typical interisland cruise ship arrival would generate129 vehicular trips during the heaviest disembarkation period following the ship's arrival. A maximum-sized, foreign cruise ship will generate 415 vehicular trips during the heaviest disembarkation period following the ship's arrival (Rowell, 1999). Summaries of trip generation calculations for interisland and foreign cruise ships are presented in Tables 3 - 4 and 3 - 5 respectively.

Table 3 - 4
Summary of Vehicular Trip Generation Rates for Interisland Cruise Ships

Direction	Trips Generated	Trips per 100 Passengers
Inbound	78	9.18
Outbound	51	6.00
TOTAL	129	15.18

Table 3 - 5
Summary of Vehicular Trip Generation Rates for Foreign Cruise Ships

Cruise Ship Arrival	Trips Generated (Average-sized Ship)	Trips Generated (Maximum-sized Ship)	Trips per 100 Passengers
Inbound	95	190	9.50
Outbound	113	225	11.25
TOTAL	208	415	20.75
Cruise Ship Departure	**Trips Generated (Average-sized Ship)**	**Trips Generated (Maximum-sized Ship)**	**Trips per 100 Passengers**
Inbound	34	68	3.38
Outbound	33	65	3.25
TOTAL	67	133	6.63

Based upon the trip generation analyses and the maximum berthing capacity of the proposed Pier 2 Terminal (one maximum-sized and one medium-size vessel), it was possible to establish a worst-case condition for traffic generated by cruise ship operations. Three scenarios depicting the arrival of cruise ships were evaluated to determine a worst-case traffic generation scenario (Table 3 - 6) . As shown, the worst-case scenario would occur when a maximum-size cruise ship and an interisland cruise ship arrive at the proposed terminal concurrently.

Table 3 - 6
Trip Generation for Cruise Ship Arrival Scenarios

No.	Scenario	Trips Generated Inbound	Trips Generated Outbound	Total
1	1 Maximum-Sized Cruise Ship	190	225	415
2	2 Interisland Cruise Ships	156	102	258
	1 Maximum-Sized Cruise Ship			

3	Plus 1 Interisland Cruise Ship	268	276	544

Piers 12 – 16 Finger Piers

The proposed finger pier construction will serve to accommodate additional commercial fishing vessels and provide additional berthing space. Fishing boat activities at the existing facilities and at Kewalo Basin indicate that fishing boat operators depart well before the AM peak commuter period and return during the mid-afternoon. Therefore, these operations will not impact the peak commuter periods in the project area.

Pier 24 – 29 Excursion Vessel Terminal

In order to establish trip generation rates for this proposed project, a traffic survey was conducted at Kewalo Basin because commercial excursion vessel operations presently operate out of this port. The survey concluded that there are 1.11 inbound vehicle trips and 0.90 outbound vehicle trips generated per daily boat operation which translates into 160 inbound and 130 outbound total vehicle trips generated.

Keehi Lagoon Lay Berths

This proposed project is intended to provide approximately 13 lay berths to accommodate fishing boats waiting for repairs or scheduled departures. Based upon several factors including average crew size, berth occupancy, and vehicle types accessing the berths, it was estimated that the proposed project would generate approximately 35 inbound and 35 outbound vehicle trips. All vehicles would use Lagoon Drive to access the lay berths.

Table 3 - 7 presents the overall summary of total trips generated by each of the proposed projects both individually and combined.

Table 3 - 7
Trip Generation Summary

Location and Project	Trips Generated Inbound	Trips Generated Outbound	Total
Pier 2 Cruise Ship Terminal	268	276	544
Piers 12 – 24 Finger Piers	Minimal generation of traffic		
Piers 24 – 29 Excursion Vessel Terminal	160	130	290
Keehi Lagoon Lay Berth Facilities	35	35	70
TOTAL	463	441	904

Using the traffic generation data, a Level-of Service (LOS) analysis was performed. LOS is a qualitative measure to describe the flow or operational characteristics of traffic as perceived by the level of congestion or delays experienced by motorists. There are six grades of LOS measured from "A" to "F". In general, LOS A is considered best, representing free-flow conditions with no congestion. LOS F is considered worst, representing severe congestion with stop-and-go conditions. LOS grades A through F and associated time delays are summarized in Table 3 - 8 below.

Table 3 - 8
Level-of Service Descriptions and Time Delays

Level-of-Service	Description	Time Delay (in seconds)
A,B	Uncongested operations; free-flow of traffic. Motorists have free movement within traffic stream.	< 15.0
C	Light congestion; occurrence of occasional backups on critical approaches	15.1 – 25.0
D	Congestion on critical approaches but intersection functional. Vehicles must wait more than one cycle during short periods. No long standing lines form.	25.1 – 40.0
E	Severe congestion with some standing lines on critical approaches. Blockage of intersection may occur.	40.1 – 60.0
F	Total breakdown with stop-and-go traffic conditions	> 60.0

The LOS analysis was based upon the "worst-case" traffic conditions both without and with the proposed project. Worst-case conditions were estimated by super-imposing the maximum hourly traffic volume generated by the proposed projects on traffic volumes generated during the peak commuter periods. The results of the traffic impact analysis are summarized in Table 3 - 9.

Table 3 - 9
Traffic Impact Analysis Summary
(Measured in Level-of-Service)

Intersection	Existing (1998) Weekday PM	2003 w/o Project Weekday PM	2003 w/Project Weekday PM	Existing (1998) Saturday Peak	2003 w/o Project Saturday Peak	2003 w/Project Saturday Peak
Ala Moana Bl. at South Street	C	C	C	B	B	B
Ala Moana Bl. at Channel St.	B	B	N/A[c]	A	A	N/A[c]
Ala Moana Bl. at	B	D	D	B	B	C

Punchbowl St.						
Nimitz Hwy. at Pacific St.[a]	B	B	B	N/A[d]	N/A[d]	N/A[d]
Nimitz Hwy. at Pacific St.[b]	B	B	B	N/A[d]	N/A[d]	N/A[d]

[a] Measurements taken for the eastbound lanes of Nimitz Highway
[b] Measurements taken for the westbound lanes of Nimitz Highway
[c] LOS measurements are not applicable because this intersection will be demolished during the construction of the final section of the Ilalo Street extension.
[d] LOS measurements are not applicable for these intersections because they would not be affected by the weekend operations at the proposed Pier 2 Cruise Terminal.

The results of the LOS analysis indicate that only two intersections are predicted to operate at a LOS C and a LOS D (South St. at Ala Moana Blvd. and Punchbowl St. at Ala Moana Blvd. respectively). It should be noted that the LOS C and LOS D grades at these intersections are predicted with or without implementation of the proposed projects.

Construction Related Impacts

Construction related traffic impacts are not expected to be significant as construction activities will take place in areas removed from adjacent roadways. However, activities requiring the use of motor vehicles such as tractors, dump trucks, backhoes, cement mixers, front loaders, and graders may result in temporary short-term traffic congestion in the adjacent street network when entering and exiting the site.

3.10.3 Proposed Mitigation Measures

The results of the LOS analysis of future conditions with and without the proposed projects indicate that they will have minimal impacts on traffic operations during the weekday PM commuter peak period and will have no significant impacts of Saturday traffic conditions. In summary, traffic generated by the proposed projects is localized and will not be a significant contributor to regional traffic nor will they have significant long-term cumulative impacts on the environment.

Although they are not necessary, the following measures can be employed to further mitigate the minimal traffic impacts which may occur as a result of the proposed projects.

- Limiting the operation of construction vehicles to off peak hours would reduce traffic congestion in the adjacent street network

- Interisland cruise ship operations should continue to operate on the current schedule with arrivals and departures scheduled during Saturday mornings and evenings, respectively.

- A shuttle bus operation between Pier 2 and adjacent shopping areas might be considered for a period of several hours before the departure of a large cruise ship to reduce the pedestrian activity and associated impacts on traffic flow at the adjacent intersections. A schedule of one shuttle bus every 10 to 15 minutes would have a minimal impact on traffic operations but would enhance pedestrian movement and safety. This operation would best be provided by the cruise operator.

- *During the design phase of the proposed projects, potential site tenants and users will be consulted to determine specific off-street parking and loading area requirements.*

3.11 Utilities

3.11.1 Existing conditions

The Honolulu Harbor area and its immediate vicinity is heavily industrialized and is served by a variety of public services and utilities including fire and police protection services, water supply, wastewater collection, telephone, electricity, gas, and drainage. The City and County of Honolulu provides fire, sewer, and water services. Hawaiian Electric Company (HECO) provides electrical services through overhead lines and underground conduits. Telephone services are provided by GTE Hawaiian Tel.

Water Supply

The projects sites are currently served by a network of Board of Water Supply (BWS) mains ranging in size from 4" to 16" diameters. The project areas have several existing domestic water meters which will service the proposed projects. A summary of the existing water supply systems to the project areas is discussed below.

Pier 2 is serviced by a 6" line which runs underneath and parallel to the Pier 2 shoreside apron. This 6" line is connected to a larger 8" water line at the northern end of the Pier 2 site, which in turn is connected to the 12' water main running along Ala Moana Boulevard. Water service to ships berthed at Pier 2 is provided by a series of 2 1/2" water laterals located in utility hatches in the pier. The Pier 2 site is serviced by two 6" compound water meters and two 8" detector check water meters.

The Pier 12 - 16 area is serviced by a series of 6" and 8" lateral lines which also connect to the 12" water main running along Ala Moana Boulevard. Piers 12 - 16

are serviced by a series of smaller meters including two 3" compound meters, one 2" meter, and a 1 1/4" meter.

Piers 24 - 29 are serviced by three main water lines: a 6" water line along Pier 26, a 4" water line along Pier 27, and another 6" line which runs along Piers 28 and 29. These three lines connect to a single 6" main which eventually connects to the 16" water main underneath Nimitz Highway. The project area is serviced by one 4" compound meter and two smaller 3/4" meters.

The project site for the proposed layberths at Keehi Lagoon is presently vacant, undeveloped land and does not have any existing utilities on site. There is a fully developed network of water lines in the Keehi Lagoon/Lagoon Drive vicinity which currently provides water to the commercial and industrial operations adjacent to the proposed project site. The project area would require the installation of a lateral water line which would connect to the existing 12" water main along Lagoon Drive. The Board of Water Supply has indicated that there is an existing 8" turbine water meter which would service the project area.

Sewers and Drainage

Existing sewer systems at Pier 2 and Piers 12 - 16 areas are fully developed, consisting of various service laterals connected to the major 34" relief sewerline which runs along Ala Moana Boulevard. The 34" sewer main collects and delivers sewage flows from downtown Honolulu to the Ala Moana Wastewater Pump Station at Keawe Street. From there the sewage is conveyed via a 78" force main to the City and County Sand Island Wastewater Treatment Plant where it undergoes treatment and disposal.

Onsite lateral structures include lateral manholes, chimneys, stubouts, and connectors. The Pier 2 and Piers 12 - 16 areas also have on-site sewer analysis nodes which may include but are not limited to modeling, lateral, test site, and map tile nodes.

There are only limited sewer system facilities at the Pier 24 -29 area and, as mentioned in section 2.6.3, upgrades may be required. There are no existing sewer facilities at the proposed layberth and *OSRV* project sites.

Drainage on the project sites and existing roadways is collected in drain inlets which outlet directly into the Honolulu Harbor and Kapalama Basin. Sheet flow within the project areas runs off-site toward these two receiving waters as well. The Keehi Lagoon project site is undeveloped and does not have an existing drainage system.

Energy and Communications

All of the proposed project sites except the lay berth site at Keehi Lagoon are provided with electrical and telephone services by HECO and GTE Hawaiian Tel respectively. Most of the existing structures on the project sites are old and in poor condition and at their time of construction were not designed with energy efficiency standards in mind.

3.11.2 Potential Impacts

Water Supply

The potable water demand for the proposed project areas will increase as a result of the proposed Harbor improvements. The increase in water demand will result mainly from the proposed Pier 2 cruise terminal and the excursion vessel terminal at Piers 24 -29. The proposed projects at Piers 12 -16 and at Keehi Lagoon are small, non-service oriented operations requiring only minimal usage of water for day-to-day activities. The existing water supply system along Lagoon Drive would have to be extended to the proposed shoreside *OSRV* and layberth facilities.

Sewers and Drainage

Sewer upgrades will be required at the Pier 2 and Piers 24 - 29 project sites. These upgrades would be minor in scope consisting primarily of lateral main connections to existing sewer systems, main diameter upgrades, and required appurtenant lateral structures. Onsite drainage systems will need to be upgraded accordingly to accommodate the new project designs and site layouts. *Additionally, proposed sewer improvements at Pier 2 will be made in conjunction with the Kakaako Community Development District Area Sewerage Master Plan.*

The proposed improvements and operations at Piers 12 –16 will be small in scale requiring minimal services. Nonetheless, any proposed sewer improvements at the site will be contingent upon the upcoming Nimitz Highway Reconstructed Sewer Project (Auahi Street to Hotel Street), tentatively scheduled for completion in September 2000 (Appendix A DPP letter dated 8/24/99)

The limited paving of areas at the lay berth project site in Keehi Lagoon would result in increased sheet flow and surface run off. However, as discussed in section 3.3.2, the area to be paved over is relatively small (approximately *58,000* ft^2) and would only minimally increase the volume of surface runoff.

Energy and Communication

All of the proposed project sites will be equipped with telephone communication systems. These systems will not affect the existing communication systems in the project areas. The operation of the proposed projects will result in the increased consumption of electricity. The increase in electrical consumption is

expected to be minimal and not significantly higher than present electrical usage at the existing project site facilities.

Fire Protection

The proposed projects will allow Honolulu Harbor to accommodate more cargo, fishing, and cruise vessels. The increase in vessels and overall operations could possibly increase the potential for fires. The proximity of the project sites to the downtown Honolulu area and Honolulu International Airport make them very accessible to the numerous existing fire stations in the surrounding area. This accessibility will result in shortened response times, and no adverse impacts to the Fire Department are anticipated.

3.11.3 Proposed Mitigation Measures

Water Supply

The BWS has indicated that the existing water supply system is currently adequate to accommodate the proposed Honolulu Harbor and Keehi Lagoon improvement projects. Additionally, after water demands have been established during the design phase, DOT-HAR will be required to obtain a water allocation from the State Department of Land and Natural Resources. The availability of water will be confirmed when the building permit application is submitted to the BWS for review and approval.

Proposed buildings and landscapes at the project sites will be designed with water saving considerations in mind. The water conservation methods which could be considered during the design phase of the proposed projects may include but are not limited to:

- Installation of water efficient fixtures
- Low-volume flush toilets and urinals
- Automatic Faucets for sinks and lavatories
- Appropriate landscape plant selection to limit water uptake
- Irrigation with non-potable or reclaimed water

Sewer and Drainage

The increased runoff resulting from newly paved areas at the proposed Keehi Lagoon project sites is not expected to have significant adverse impacts. However, a Drainage Master Plan will be prepared during the design phase of the proposed projects to ensure that the future storm drainage systems are properly sized.

Energy and Communications

Proposed project buildings, activities, and site grounds will be designed with energy saving considerations in mind. Energy usage at the proposed project sites will be designed in accordance with Chapter 33 (State Environmental Policy) and chapter 226 (State Planning Act) of the Hawaii Revised Statutes. Section 226-18(4) which establishes the promotion of cost-effective energy conservation through the adoption of energy efficient practices and technologies will be given particular attention. At the county level, the energy conservation regulations in chapter 16 article 5 of the City and County Building Code shall also be complied with. *Additionally, during the design phase, a "Hawaiian sense of place" will be incorporated into the facilities through architectural design and natural ventilation.*

The energy conservation methods which could be considered during the design phase of the proposed projects may include, but are not limited to:

- Maximum cooling load through the use of site shading, orientation, and use of naturally ventilated areas
- Use of high efficiency indoor and outdoor lamps and lighting
- Maximum integration of day lighting in building design
- Design mechanical systems to comply with the Honolulu Energy Code and to exceed its energy conserving requirements
- Conformance with HECO's New Construction Demand-Side Management Program to potentially qualify for energy conservation rebates and incentives.

Fire Protection

All future harbor structures and cargo handling activities must conform to existing fire codes. Additional fire hydrants and sprinkler systems will be installed when warranted at the appropriate project sites. All on-site fire protection requirements and procedures will be closely coordinated with the Fire Prevention Bureau of the City and County of Honolulu Fire Department.

In summary, all of the existing utilities and public services are expected to be sufficient. No significant adverse impacts to existing utilities and public services are expected, and no additional mitigation measures are anticipated to be necessary.

3.12 Solid and Hazardous Waste

3.12.1 Existing Conditions

Solid Waste

Solid residential waste in the area surrounding the project site is collected by the City and County of Honolulu Refuse Collection and Disposal Division (RCDD) and is transported to the Keehi Transfer Station. The waste is then transported

to the Honolulu Program of Waste Energy Recovery (H-POWER) facility at Campbell Industrial Park where it is converted to electricity.

Solid commercial and industrial wastes generated at Honolulu Harbor are collected by private waste collection companies. Solid waste is usually transported directly to the Waimanalo Gulch Landfill (if it contains no combustible materials) or to Oahu's H-POWER facility (if combustible materials are present).

The disposal of solid waste generated by U.S. registered cruise ships is not regulated by the United States Department of Agriculture (USDA). Foreign cruise ship solid waste is inspected by the USDA prior to its disposal at a U.S. port. At Honolulu Harbor the solid waste generated by both U.S. and foreign cruise vessels is transported to the H-POWER facility for incineration. For economic reasons, most foreign cruise ships dispose of their trash during their call to Oahu.

Hazardous Waste

The entire project area is located within the confines of a heavily industrialized harbor of a major U.S. city. The diversity of industrial operations involving the use of hazardous materials, and the extended period of time over which these operations have been performed, have resulted in the contamination of soil and groundwater in portions of Honolulu Harbor.

A comprehensive Phase I Environmental Assessment (PIEA) was recently conducted for the Honolulu Harbor, Iwilei Unit to assess potential environmental contamination of DOT-HAR properties by hazardous wastes. The study identified petroleum contamination of soils, heavy metal contamination, and free product (i.e., petroleum product that floats on top of groundwater). Additionally, soil and groundwater contamination exceeding DOH cleanup guidelines for metals (arsenic, chromium, lead, and zinc), BTEX (benzene1 toluene, ethylbenzene, and xylenes), and PAHs (polycyclic aromatic hydrocarbons) also exist within the project area (Earth Tech, 1997).

Leaks from underground, petroleum fuel pipelines appear to be the most widespread source of contamination identified in Honolulu Harbor by the PIEA. Many of these leaks occurred beneath what is now Nimitz Highway and are likely to have resulted in contamination of DOT-HAR properties in the project areas and other adjoining properties. Other sources of contamination have included petroleum storage and transfer operations and maintenance activities on boats and land-use equipment.

The PIEA identified information confirming past releases of hazardous substances that have resulted in the contamination of soil and/or groundwater at Piers 19 - 21, 32, 34, 22 - 29, and 35 - 38. The contamination at Piers 22 - 29, and 35 - 38 have been confirmed to exist in concentrations exceeding DOH action levels (Earth Tech, 1997).

Several of the buildings in the project area were constructed prior to the establishment of existing environmental regulations prohibiting the use of hazardous materials such as asbestos and lead-based paints. Existing structures known to contain lead-based paints and/or asbestos containing materials are located at Piers 2, 18, 19, 21 - 29, and 32 (Earth Tech, 1996)

3.12.2 Potential Impacts

Solid Waste

With the proposed increase in commercial maritime operations, additional solid waste will be generated. Of the projects being proposed, activities associated the Pier 2 Cruise terminal operations would generate the largest quantity of municipal solid waste. This waste would be disposed and incinerated at the H-POWER facility.

Construction activities would require land clearing, demolition of existing structures, excavation, drilling, and pile driving operations. These activities would generate construction and demolition (C & D) waste consisting of wooden beams, asphalt, concrete, glass, brick, metal, soil, vegetation, and other miscellaneous building and landscaping materials. The only landfill on Oahu which accepts C & D solid waste is the PVT Nanakuli C & D Land Fill.

Hazardous Waste

As a result of the hazardous substances (asbestos and lead-based paints) present in buildings to be demolished, demolition could result in the release and spreading of such contaminants into the environment. Excavation equipment could damage or rupture remnant underground storage tanks or fuel lines and, in removing sheet piling, could allow existing contaminated groundwater to migrate to new areas of the project area.

Excavation and demolition may also uncover floating product or release flammable vapors. Any exposure to a nearby ignition source, such as a cigarette, sparking steel tool, or combustion engine, could potentially result in a fire or explosion.

Potential adverse impacts to construction personnel include possible exposure to both known and unknown hazardous materials and wastes present in existing structures or the surrounding environment. Additionally, physical hazards associated with construction activities such as heat stress, personal injury, noise, and heavy machinery also exist.

3.12.3 Proposed Mitigation Measures

Solid Waste

Overall, the proposed project will increase the amount of solid waste generated at Honolulu Harbor. However, it is not expected to adversely impact solid waste disposal capacities. The Keehi Transfer Station and the H-POWER facility have capacities of 500 tons/day and 2000 tons/day respectively. According to RCDD, these facilities would be able to accommodate the additional solid waste generated by the proposed projects. Additionally, RCDD indicated that they are presently proposing to expand the capacity of the Waimanalo Gulch Landfill thereby allowing it to continue accepting solid waste for an additional 15 years (CCH, 1998).

Furthermore, many foreign cruise operators have already equipped or are planning to equip their vessels with on-board incinerators. Interisland cruise ship operators have not yet begun such upgrades but are planning to do the same. On-board incinerators would reduce the amount of solid waste generated by cruise ships and would allow them to hold larger quantities of solid waste aboard the vessel for longer periods of time.

Potential impacts to the PVT Nanakuli C&D Land Fill can be minimized through recycling efforts and the resultant diversion of C&D generated waste. C&D recovery operations have been very successful and produce diversion rates as high as 24%. Between July 1997 and June 1998 State and county construction operations generated 23,232 tons of C&D solid waste. Through recycling efforts 5,573 tons were recovered and kept from disposal at the PVT Nanakuli C & D Land Fill (Island Demo, 1999).

During the design and construction phases of the proposed improvements, consideration will be given to the development and implementation of a C&D recycling plan. A recycling program would effectively recover building materials which could contain potentially hazardous substances (such as batteries, mercury containing thermostats, asbestos, liquid wastes, oils, paints, solvents, refrigerant fluids, tires and liquid filled transformers) and prevent them from being disposed of in an unlined landfill. *The C&D recycling plan would also consider the designation of Harbors property and infrastructure development for industries such as reuse, recycling, and remanufacturing that depend heavily on interisland, interstate, and international shipping.*

Hazardous Waste

All known utilities and underground pipelines will be identified by the demolition and construction contractor and subsequently disconnected or removed prior to site work. All fuel storage tanks, hazardous materials (including asbestos building material and lead-based paint), and transformers (potential sources for polychlorinated biphenyls [PCBs) present in structures planned for demolition, will be managed in accordance with measures agreed upon by DOH. These

measures may include the removal, on-site stabilization, and if feasible recycling of hazardous materials to avoid the potential for release into the environment.

Site construction and demolition will be performed in accordance with a site-specific Health and Safety Plan. The plan will identify safe working conditions for construction in areas of known flammable products and/or vapor contamination. Safety measures will include proper techniques for monitoring the presence of flammable vapors in the air, response protocol, personal protective equipment, use of allowable tools, and mechanical measures, as appropriate.

Areas where explosive levels of soil gas have been observed (i.e. Piers 24 – 29) are presently equipped with vapor collection systems. These systems monitor soil gas concentration and effectively reduce safety hazards posed by subsurface explosive gas generation.

The existing regional petroleum contamination will be addressed during the project design and construction phases and incorporated into contract and bid documents. The design and construction phases will be completed in compliance with Department of Health (DOH) *Guidance on Construction Activities Encountering Area-Wide Petroleum Contaminated Soils* (DOH Guidance) and other applicable Federal and State laws and regulations.

The contractor shall be responsible for taking the safety, contamination management, and documentation actions required by the DOH Guidance on Construction Activities. Compliance with the DOH Guidance involves the protection of workers and public health and safety; immediate notification of the DOH, documentation of the locations of contaminated areas, and proper management of contaminated excavated materials.

It is expected that most of the excavated materials will be returned to trenches and safely covered on-site. However, if some contaminated materials cannot remain on-site, they will be sampled, analyzed, and appropriately disposed of at DOH-approved facilities. Transport of the materials will also comply with State and Federal regulations regarding the transport of hazardous or petroleum contaminated materials. It is expected that a minimal amount of material will be removed from the property. Disposal of the materials will also comply with all State requirements and site-specific permits at the disposal site.

Normal operations at the proposed project sites would not expose the public or site workers to hazardous substances. Tenants on the site will be required to inform workers, through regular training sessions and use of operational manuals, about standard procedures for use of all equipment, especially equipment which may contain or use hazardous materials. Training will identify procedures to follow in the event of equipment malfunction or other emergency. Thus, no significant long-term impacts associated with exposure to hazardous materials are anticipated.

A site-specific Health and Safety Plan will be prepared prior to construction. The contractor is required to comply with all conditions of the Health and Safety Plan, which will ensure that workers will not be exposed to unacceptable safety risks. Compliance with the site-specific Health and Safety Plan, DOH Regulations, and other permit requirements, as described above, will assure that no significant impacts from hazardous materials or site contamination will occur during construction activities or facility operations.

3.13 Noise Quality

The impacts of sound on the environment are determined by several factors including, sound level (loudness), the duration of exposure to the noise, the frequencies involved, and the variation or fluctuations in noise levels during exposure. Loudness is measured in units called decibels (dB). Since the human ear is unable to perceive all sound frequencies equally, noise levels are adjusted to correspond to human hearing. This adjusted unit is known as the A-weighted decibel, or dBA.

The noise descriptor currently used by federal agencies to assess environmental noise is the Day-Night Average Sound Level (DNL or Ldn). This descriptor incorporates a 24 hour average of instantaneous dBA levels as read on a standard Sound Level Meter. By definition, the minimum averaging period for the DNL descriptor is 24 hours. Sound levels which occur during the nighttime hours of 10:00 PM and 7:00 AM are increased by 10 dB prior to computing the 24-hour average by the DNL descriptor.

A value of 65 DNL or lower is considered to be an acceptable exterior noise level for residential receptors. This standard is applied nationally including the state of Hawaii. Table 3 - 10 presents current federal noise standards and acceptability criteria for residential land uses that are present within the general environs of the Oahu harbor areas and which may be affected by noise from harbor activities.

Table 3 - 10
Exterior Noise Exposure Classification
(Residential Land Use)

Noise Exposure Class	Day-Night Sound Level	Equivalent Sound Level	Federal (1) Standard
Minimal Exposure	Not Exceeding 55DNL	Not Exceeding 55Leq	Unconditionally Acceptable
Moderate Exposure	Above 55 Ldn But not above 65DNL	Above 55 Ldn But not above 65Leq	Acceptable (2)
Significant	Above 65 DNL But not above	Above 55 Leq But not above	Normally

Exposure	75DNL	65Ldn	Unacceptable
Severe Exposure	Above 75 DNL	Above 75 Leq	Unacceptable

Notes: (1) Federal Housing Administration, Veterans Administration, Department of Defense, and Department of Transportation.

(2) Federal Highways Administration (FHWA) uses the Leq instead of the Ldn descriptor. For planning purposes, both are equivalent if: a) heavy trucks do not exceed 10 percent of total traffic flow in vehicles per 24 hours, and b) traffic between 10:00 PM and 7:00 AM does not exceed 15 percent of average daily traffic flow in vehicles per 24 hours. The noise mitigation threshold used by FHWA for residences is 67 Leq.

A noise study was conducted by Y. Ebisu and Associates to evaluate potential noise impacts associated with implementation of the proposed projects (Ebisu, 1999). This study evaluated the potential noise impacts resulting from future roadway traffic, proposed land-use operations, and construction activities. Information in this section is based upon the findings of this study.

3.13.1 Existing Conditions

The overall existing DNL levels in the vicinity of the project sites generally range from 60 to 70 DNL and are influenced by surf noise, motor vehicle traffic, aircraft, and harbor vessels and equipment. These estimates of existing background ambient noise levels are based on noise measurements taken at Piers 2, 11, 12, and 25 during the month of December 1998 (Ebisu, 1999).

Noise related to harbor operations include on-site motor vehicles, fixed mechanical equipment, and ocean vessels activities. The noise generated from harbor operations are for the most part not radiated beyond the harbor property boundaries. The exception to this is the noise radiated by boat whistles and horns. Whistles and horns of the excursion vessels operating out of Kewalo Basin and Pier 5 were measured at approximately 90 dB at 250 feet distance, and the horns of large cruise ships were measured at 85 dB at 1,000 feet distance (Ebisu, 1999).

Traffic noise levels in the project vicinity are considered to be in the "Significant Exposure, Normally Unacceptable" category for noise sensitive land-uses at the lots which front Nimitz Highway and Ala Moana Boulevard. For commercial and industrial uses, existing traffic noise levels fall under the "Compatible and Marginally Compatible" categories. Residual traffic noise levels typically remain steady (ranging between 55 to 60 dB) during the daylight hours of 7:00 AM – 6:00 PM and decline to their lowest levels (between 45 to 50 dB) at 4:00 AM the next morning (Ebisu, 1999).

Traffic noise calculations for the existing conditions as well as noise predictions for the year 2003 following completion of the proposed developments were performed using the Federal Highway Administration Noise Prediction Model (FHWA, 1998).

3.13.2 Potential Impacts

Traffic Related Noise

As discussed in section 3.10, the proposed projects will have minimal or no significant traffic impacts and in some cases will improve traffic conditions. The traffic volume in the project vicinity is expected to increase with or without the proposed projects. Similarly, traffic noise levels in the project area are expected to increase as well.

Future traffic noise level increases resulting from the proposed projects were calculated for key roadway locations in the project vicinity. The hourly Equivalent Sound Level (Leq) is expected to increase an average of 2.1 dB and at certain locations will decrease an average of .35 dB. A comparison of existing noise levels and projected noise levels after project implementation is shown in Table 3-11.

Table 3 - 11
Existing and Future Traffic Noise Levels Along Roadways in the Project Area

	Hourly Equivalent Sound Level in dB[1]	
Location	**Existing (1998)**	**Future (2003 w/Projects)**
Ala Moana Blvd. West of Punchbowl	66.7	67.7
Ala Moana Blvd. East of Punchbowl	66.5	67.0
Ala Moana Blvd. West of South St.	66.4	67.0
Ala Moana Blvd. East of South St.	66.1	66.7
Punchbowl Street	58.4	58.7
Channel Street	42.4	56.7
South Street (Mauka of Ala Moana	57.6	58.1
South Street (Makai of Ala Moana	52.5	55.2
Nimitz Highway (North) at Pacific St.	66.9	67.7
Nimitz Highway (South) at Pacific St.	69.2	68.9
Pacific Street (Mauka)	53.9	53.5
Pacific Street (Middle)	56.2	56.6
Pacific Street (Makai)	42.4	44.6

[1] – During the PM peak hour and at 100 ft. setback distance from roadway centerline.

Traffic noise level increases for most of the project area will result mainly from non-project traffic. Project-related traffic noise levels will minimally contribute to future traffic noise levels at only three roadway locations in the project area (Nimitz Highway (South) at Pacific St., Pacific Street, and Channel/Ilalo Streets). Table 3 - 12 shows the increases in traffic noise levels resulting from both non-project and project-related traffic.

Table 3 - 12
Calculations of Project-Related and Non-Project Traffic Noise Contributions

	Noise Level Increase in DNL	
Location	**Non-Project Traffic**	**Project-Related Traffic**
Ala Moana Blvd. West of Punchbowl	0.6	0.3
Ala Moana Blvd. East of Punchbowl	0.5	0.5
Ala Moana Blvd. West of South St.	0.5	0.4
Ala Moana Blvd. East of South St.	0.5	0.3
Punchbowl Street	0.3	0.0
Channel/Ilalo Streets	0.1	4.8
South Street (Mauka of Ala Moana	0.5	0.1
South Street (Makai of Ala Moana	2.9	3.4
Nimitz Highway (North) at Pacific St.	0.5	0.3
Nimitz Highway (South) at Pacific St.	0.3	0.4
Pacific Street (Mauka)	0.2	0.1
Pacific Street (Middle)	0.2	1.0
Pacific Street (Makai)	0.2	2.6

Construction Related Noise

Unavoidable but temporary noise impacts may occur during the construction of the proposed harbor improvement projects. The quality of the acoustic environment may be degraded to unacceptable levels during periods of construction because noise from construction activities are predicted to be audible at adjoining properties.

Construction related noise will be generated by both on-site equipment i.e. pumps, generators, compressors, jack hammers, rock drills, demolition

equipment, and power tools) and vehicles (i.e. trucks, front loaders, backhoes, tractors, graders, pavers, concrete mixers, etc.).

Construction-related noise impacts are not anticipated at the Lagoon Drive Lay Berths or the Excursion Vessel Passenger terminal at Piers 24 – 29 project sites because these two sites are in excess of 2,000 feet from the noise sensitive receptors. The noise sensitive properties anticipated to experience the highest noise levels during construction activities are the residential condominiums across from Piers 12 – 16 (Harbor Village, Marin Tower, and Harbor Court) and those in the vicinity of Pier 2 (Waterfront Towers Condominiums).

The Harbor Court, Marin Tower, and Harbor Village Condominium Units are expected to experience construction-related noise levels ranging from 60 to 75 decibels. The Waterfront Towers Condominiums may experience some increase in noise due to construction activities at Pier 2. However, construction activities will typically be at least 1,000 feet from the condominiums, and construction noise levels will be barely audible or inaudible.

Pile driving will be necessary to implant concrete piles during the construction of the finger piers at Piers 12 – 16 and the layberths at Keehi Lagoon. Pile driving activities are not anticipated to be necessary for the proposed projects at Pier 2 and Piers 24-29.

Pile driving operations at project sites are anticipated to generate noise levels ranging from 80 dB at 1,000 ft distance to 90 dB at 250 ft distance without mitigation measures. Indoors, typical pile driving noise levels range from approximately 70 to 80 dB for naturally ventilated structures and 58 to 68 dB for air conditioned structures (Ebisu, 1999)

In addition to noise generated by pile driving activities, pile driving induces ground vibrations which have the potential to cause structural and architectural damage to existing structures. Pile driving ground vibrations are measured in peak particle (or ground) velocity (PPV) in units of inches/second. The criteria most commonly used in measuring structural damage induced by pile driving activities is a 2.0 inches/second limit derived from work from the U.S. Bureau of Mines (Ebisu, 1999). A more conservative limit of 0.2 inches/second is also used and was suggested for planning purposes on the proposed harbor projects because of the repetitive nature of pile driving activities which can increase the risks of damage to adjacent structures.

The intensity of vibration of pile driving activities can be expressed in units known as scaled energy distance factor (SEDF). The SEDF can be converted to measurable distances between the pile driver tip and a receptor to determine PPV levels. SEDF and PPV levels for pile driving activities vary depending upon substrate type and the size of the pile driver used. When pile driving operations must penetrate through coral layers, vibration levels at a receptor (adjacent

structure) may exceed the 0.2 inches/second vibration damage criteria, particularly if the receptor is supported by the common coral layer. Actual PPV levels at the receptor are dependent upon both the distance from the pile driver and the size of the pile driver.

Future Harbor Operations

Harbor vehicles such as heavy trucks, forklifts, sweepers, buses, and ships which will conduct maintenance activities and transport materials and personnel to and from harbor projects are potential sources of noise. Mechanical equipment such as emergency electrical generators, air conditioning cooling towers, air-conditioning compressors, exhaust fans, and other ventilation systems will be the primary fixed on-site noise sources expected to be located at the harbor project sites.

3.13.3 Proposed Mitigation Measures

Traffic Related Noise

Traffic noise levels in the immediate vicinity of the proposed projects are predicted to increase by less than 1.0 dB on the high volume roadways (i.e. Nimitz Highway and Ala Moana Boulevard) (Table 3.13-2). These predicted traffic noise level increases are considered to be very small and not significant. Predicted noise levels along the low volume roadways (Channel Street and South Street makai of Ala Moana Blvd. and along Pacific Street makai of Nimitz Highway) are relatively large at 2.6 to 4.8 dB (Table 3.13-3). However, these noise level increases along the low volume roadways are attributable to the low Base Year traffic noise levels, and future traffic noise levels are predicted to remain at less than 60 DNL at 100 ft. setback distance (Ebisu, 1999).

Overall, the risk of adverse traffic noise impacts resulting from the proposed improvements are considered to be very low. Future increases in traffic noise levels will be very small and insignificant and will not require traffic noise mitigation measures.

Construction Related Noise

Mitigation of construction noise to inaudible levels may not be practical in all cases due to the intensity of construction noise sources (80 to 90+ dB at 50 ft distance), and the exterior nature of the work (earth moving, pile driving, trenching, concrete pouring, hammering, etc.). However, the following mitigation measures should be implemented if determined to be feasible.

- The use of properly muffled construction equipment should be required
- If possible, heavy equipment and portable diesel engines and generators should be located at least 400 – 500 feet from residences.

- If feasible, the use of pre-drilling techniques, vibratory pile driving equipment, and bored and cast-in-situ piles to reduce the number of blows and impact noise from pile driving operations.
- The adherence to State Department of Health regulations controlling construction noise limits and construction curfew times. Under DOH permit procedures, construction activities are permitted weekdays between the hours of 7:00 AM – 6:00 PM, and on Saturdays between 9:00 AM – 6:00 PM.

Future Harbor Operations

Exterior noise levels as high as 75 DNL are generally considered acceptable for commercial, industrial, and other non-noise sensitive land uses. The Oahu harbor project areas include proposed land uses and activities which fall within the commercial and industrial categories. These proposed land uses and activities are not considered to be noise sensitive, and risks of adverse noise impacts within the proposed project areas is considered to be small.

Noise generated by harbor vehicles and fixed on-site mechanical equipment must comply with existing State DOH vehicular noise limits and property line noise limits (Hawaii Administrative Rules Title 11 – Chapters 42 and 46 respectively). Noise from these sources will be difficult to hear at the closest noise sensitive receptors if the noise radiated beyond the harbor property boundaries are at or below the residual background ambient noise levels (approximately 50to 55 dB) which are controlled by roadway traffic along Nimitz Highway and Ala Moana Boulevard (Ebisu, 1999).

Boat whistles and horns from excursion vessels at Piers 24 – 29 and cruise vessels at Pier 2 should not cause excessive noise due to the relatively large distances to the nearest residential condominiums (2,000 ft. and 1,500 ft. respectively). Predicted levels should be less than 75 dB which are similar to levels associated with street traffic noise. The relocation of large cruise ships from Pier 11 to Pier 2 should significantly reduce noise levels at the Harbor Court Condominiums. Additionally, horns are intermittent in nature and are usually sounded prior to sailing or during safety drills. Because of their low frequency characteristics, the horns of large ships are not considered to interfere with speech communication.

3.14 Air Quality

Ambient air pollution concentrations are regulated by both federal (Section 40, Part 50 CFR) and State (Hawaii Revised Statutes Chapter 11-59) Ambient Air Quality Standards (AAQS). Some of the State AAQS (CO, NO_2, and O_3) are more stringent than the federal standards but are allowed to be exceeded once per year. Another difference between State and federal AAQS is that the former

is given in terms of a single standard while the latter is divided into primary and secondary standards.

The State AAQS are intended to "protect public health and welfare and to prevent the significant deterioration of air quality" (State of Hawaii, 1993). The primary federal AAQS are intended to protect public health with an adequate margin of safety while secondary standards are intended to protect public welfare through the prevention of damage to soils, water, vegetation, animals, wildlife, man-made materials, visibility climate and economic values (40 CFR, Part 50).

Table 3 - 13 summarizes both the federal and State AAQS. Each regulated air pollutant has the potential to adversely impact human health or to produce environmental degradation when present in sufficiently high concentrations for prolonged periods of time. Additionally, the State Air-Pollution Control Regulations also prohibit visible emissions at the property line of fugitive dust from concentration activities (State of Hawaii, 1993a).

Table 3 - 13
Summary of State of Hawaii and Federal Ambient Air Quality Standards[a]

Pollutant	Sampling Period	National AAQS Primary	National AAQS Secondary	State of Hawaii AAQS
Particulate Matter[b]	Annual	50	50	50
	24 hours	150	150	150
Sulfur Dioxide	Annual	80	--	80
	24 hours	365	--	365
	3 hours	--	1,300	1,300
Nitrogen Dioxide	Annual	100	--	70
Carbon Monoxide	8 hour	10	--	5
	1 hour	40	--	10
Ozone	1 hour	235	--	100
Hydrogen Sulfide	1 hour	--	--	35
Lead	Quarterly	1.5	--	1.5

[a] All standards represent the maximum allowable concentrations and are expressed in micrograms per cubic meter ($\mu g/m^3$) except CO in milligrams per cubic meter (mg/m^3)
[b] Particles are less than or equal to 10 microns aerodynamic diameter.

A detailed air quality study was conducted to assess the potential adverse impacts of the proposed harbor improvements on the air quality in the project area (Morrow, 1999). The information presented in this section is based primarily on that study.

3.14.1 Existing Conditions

The State Department of Health (DOH) maintains a limited network of air monitoring stations around the state to gather data on the pollutants listed in

Table 3-13. The DOH air monitoring stations nearest to the project area are located at the DOH building on the corner of Punchbowl and Beretania Streets and on Sand Island. The most recent published air quality data from these station is presented in Table 3 - 14 below.

Table 3 - 14

State Department of Health Air Quality Data at Project Area Monitoring Stations 1996

Pollutant	Concentration ($\mu g/m^3$)
Particulate Matter (PM_{10}) 24-hour (max) Annual	 28 14
Sulfur dioxide (SO_2) 3-hour (max) 24-hour (max) Annual	 73 18 3
Carbon monoxide (CO) 1-hour (max) 8=hour (max) Annual	 4.6 2.1 0.9
Ozone (O_3) 1-hour (max) Annual	 92 27
Lead (Pb) Quarterly (max) Annual	 0.0 0.0

Notes: 1. CO, PM_{10}, SO_2, and Pb are from the DOH building monitoring station
2. O_3 data are from the Sand Island monitoring station
3. CO concentrations are in milligrams per cubic meter (mg/m^3)

Air quality in the vicinity of the project site is primarily affected by vehicular emissions and industrial and commercial harbor operations. Among the various air pollutants for which State and National standards have been established, carbon monoxide levels are the primary concern in areas near heavy traffic flow and where fossil fuels are burned for industrial purposes.

Carbon Monoxide sampling was conducted in December 1998 during the A.M and P.M peak traffic hours at key intersections serving the project area. The results of this sampling episode are summarized in Table 3 - 15. The data presented clearly demonstrate that CO concentrations are highly variable depending mainly upon factors such wind speed, wind direction, and traffic volumes.

Table 3 - 15
Onsite Carbon Monoxide Concentrations at Key Intersections in the Project Area

Intersection Analyzed	Date	Time	Wind Speed	Wind Direction	CO Concentration ((mg/m^3)
Ala Moana Blvd. at South Street	12/11/98 12/10/98	A.M P.M.	2.6 mph 4.3 mph	Northeast Northeast	2.1 1.9
Ala Moana Blvd. at Channel Street	12/9/98 12/8/98	A.M P.M	1.1mph 1.9 mph	North Southeast	1.6 1.6
Nimitz Highway at Pacific Street	12/8/98 12/7/98	A.M P.M	2.2 mph 2.6 mph	Northeast North	3.7 1.3

3.14.2 Potential Impacts

In the short-term, air quality will be impacted primarily by construction activities at the project sites. Construction vehicular activity will increase automotive pollutant concentrations at the project sites and adjacent streets. Construction activities will generate fugitive dust emissions resulting in an increase of particulate matter (PM_{10}) levels in the project area.

Particulate matter emissions resulting from construction activities were estimated for the proposed Pier 24 – 29 Excursion Vessel Terminal. Calculations of PM_{10} generation at this project site represents a worst-case 24-hour period concentration because it encompasses the greatest land area (15.4 acres). The resultant calculations indicate that construction activities at the Pier 24-29 project site generate PM_{10} concentration levels of 43 ug/m3, a level which is well below the 150 ug/m3 standard (Morrow, 1999).

In addition to the onsite impacts from construction activities, there will also be off site impacts due to the operation of concrete and asphalt batching plants necessary for construction. These plants will also contribute to PM_{10} emissions as well as other gaseous pollutants.

Automotive emission factors for carbon monoxide (CO) were generated for the calendar year 1999 and 2003 with and without the proposed projects. CO generation was calculated for both 1-hour and 8-hour concentration levels during peak traffic hours using the EPA's MOBILE-5B - Mobile Sources Emissions Model (U.S. EPA, 1996a).

The results of the modeling effort are presented in Table 3 - 16 which shows the maximum CO concentrations in mg/m^3 for each scenario evaluated. The results

suggest that at all locations and under all conditions of meteorology and traffic throughout the year, both 1-hour and 8-hour federal AAQS would be met. At the Ala Moana/Punchbowl intersection there appears to be a possible exceedance of the more stringent State 1-hour and 8-hour AAQS. However, it should be noted that the predicted exceedances at this heavily congested intersection are already occurring under existing conditions and the number of exceedances does not change in the future even *with* the proposed projects.

Table 3 - 16
Predicted Maximum 1-Hour and 8-Hour Carbon Monoxide Concentrations (mg/m^3)

Intersection	Period	1999	2003 w/o Project	2003 w/Project
Ala Moana Blvd. at South Street	1-Hr. (A..M.)	5.7	5.7	5.7
	1-Hr. (P.M.)	5.3	5.2	5.3
	8-Hour	3.3	3.4	3.5
Ala Moana Blvd. at Channel Street	1-Hr. (A..M.)	7.4	8.3	4.4
	1-Hr. (P.M.)	4.7	4.1	4.1
	8-Hour	3.4	3.6	2.6
Ala Moana Blvd. at Punchbowl Street	1-Hr. (A..M.)	10.4	10.1	10.4
	1-Hr. (P.M.)	8.9	8.8	8.9
	8-Hour	5.3	5.3	5.7
Nimitz Highway at Pacific Street	1-Hr. (A..M.)	4.8	5.1	5.3
	1-Hr. (P.M.)	4.3	4.5	4.7
	8-Hour	2.6	2.8	3.0

The 400 stall parking lot area associated with the proposed Pier 2 Cruise Ship Passenger Terminal is not expected to contribute significantly to the overall CO concentration levels in the area due to the relatively small number and intermittent cruise ship arrivals and departures throughout the year in contrast to a municipal parking facility which would be actively used on a daily basis.

It should also be noted that peak traffic activity associated with cruise ship arrivals and departures does not normally coincide with peak traffic hours on the adjoining street network. This further reduces potential CO impacts on air quality since such impact is largely a function of traffic congestion.

3.14.3 Proposed Mitigation Measures

The proposed project will have short-term construction-related impacts on air quality, including the generation of dust and emissions from construction vehicles, equipment, and commuting construction workers. In the long-term,

increased traffic volumes in the vicinity of the project site will contribute minimally to ambient CO concentration levels.

During the construction period fugitive dust control measures should be implemented to reduce the amount of particulate matter emissions. On-site dust control can be accomplished through frequent watering of unpaved roadways and areas of exposed soil. The EPA estimates that twice daily watering can reduce fugitive dust emissions by as much as 50% (U.S. EPA, 1996b). To further minimize fugitive dust emissions, the paving and/or landscaping of bare earth areas should be implemented as soon as practicable.

The off-site concrete and asphalt batching plants must be permitted by the DOH Clean Air Branch pursuant to state regulations (State of Hawaii, 1993b). Issuance of the necessary permits is contingent upon the ability of the batching plants to continuously comply with both emissions and ambient air quality standards.

The proposed project's impact on air quality in the vicinity of major intersections serving the project area will be minimal and will not threaten or contribute to violations of the national AAQS. The State AAQS may be exceeded two or three times per year at the Punchbowl/Ala Moana intersection. If these exceedences were to actually occur, they would amount to a mere 0.023 – 0.034% of the hours in a year (Morrow , 1999). The project will contribute minimally to the overall CO levels which are already approaching and possibly exceeding the State's AAQS at the Punchbowl Street – Ala Moana intersection.

Mitigation measures for future CO emissions will not be necessary as emission levels associated with the proposed action will be minimal. However, a mitigation measure to reduce vehicle generated CO emissions could be implemented by limiting construction vehicle activity to off-peak hours. This restriction would lower traffic congestion, which in turn, would reduce vehicle emissions and CO concentration levels.

4.0 SOCIAL ENVIRONMENT: EXISTING CONDITIONS, IMPACTS AND MITIGATION MEASURES

4.1 Archaeological, Historic, and Cultural Resources

This section addresses the archaeological, historic, and cultural characteristics of the areas within Honolulu Harbor and Keehi Lagoon that could potentially be affected by the proposed improvements. An archaeological study was performed in conjunction with this EIS and the contents of this section is based primarily on the findings of that study (Appendix E).

History

The Honolulu Harbor and its vicinity are rich in culture and history. Honolulu Harbor is a located in a naturally protected bay and the literal translation of its name is "sheltered harbor". The harbor entrance was called Mamala after "the shark woman that lived near the entrance of the harbor" (Pukui, et al. 1973; 1976).

The growth of Honolulu Harbor can be attributed to three distinct periods in Hawaiian history. The sandalwood trade during the late 1700's, whaling operations during the early 1800's, and the sugar trade which began in the mi-1800's and continued on into the 1900's.

The sandalwood or 'iliahi (Santalum elipticum) trade which dominated trade in the islands during the 1790's started the shipping industry and the birth of Honolulu Harbor as a major port. Prior to the discovery of sandalwood in Hawaii, ships would layover to replenish supplies for their journey between the Pacific Northwest and China. After its discovery, ships came from as far away as Boston to take part in the trade.

Since much of the sandalwood trees were situated on royal lands, King Kamehameha I administered great control over sandalwood harvesting and trading. However, after his death in 1819 his heirs found it difficult to maintain control and the over harvesting of sandalwood began. The over harvesting resulted not only in environmental impacts (deforestation), but it took its toll on the Hawaiian people who began to neglect their lo'i (taro fields), resulting in a minor famine (Cleghorn, et al. 1999). Eventually, the over harvesting resulted in depletion of sandalwood trees and the demise of the trade.

During the decline of the sandalwood trade in the 1820's, more whaling vessels utilized Honolulu Harbor as a rest stop for the ships to refit and replenish supplies for their long journeys. At the peak of whaling operations, Honolulu Harbor was inundated with vessels. Some historical accounts have claimed that there were as many as 100 whaling ships anchored in the harbor at one time (Cleghorn, et al. 1999).

The sugar trade replaced whaling as the primary activity at Honolulu Harbor during the Civil War when northern states could no longer obtain their sugar from the South. It was the boom in the sugar industry and resultant exports which led to major improvements and rapid expansion of Honolulu Harbor. Improvements have continued over the years as wharfage was expanded and the harbor was dredged, resulting in the overall increase of waterfront acreage to its present state.

Cultural Resources

Today, recreational fishing is not permitted in the Honolulu Harbor. However, during consultation with the State Office of Hawaiian Affairs concerns were

expressed over effects of the proposed project on Native Hawaiian gathering rights, specifically *konohiki* fishing rights. This section attempts to address these concerns.

It can be safely assumed that prior to western contact the coastal waters of the harbor and its vicinity were used by Native Hawaiian fisherman. The Native Hawaiian fisherman would have been practicing *konohiki* fishing rights under the ancient land tenure system of old Hawaii. Ancient land practices divided the islands into large districts called moku which were governed by a high chief. *Moku* were divided into smaller divisions called *ahupua'a* which were administered by chiefs of lesser rank known as *alii ahupua'a*.

The *ahupua'a* was a "self-sustaining" strip of land running from the mountains to the sea which yielded the varied food products of the mountains, the cultivated land, and the sea. The *konohiki* were the land agents who managed these lands for the *ali'i ahupua'a*. It is largely with the *ahupua'a* that *konohiki* fishing rights became associated. *Konohiki* fisheries were nearshore fisheries (between the shoreline and reef) which at one time comprised much of Oahu's coastal waters (Kosaki, 1954). Figure 4 - 1 depicts the former locations and names of Oahu's *konohiki* fisheries.

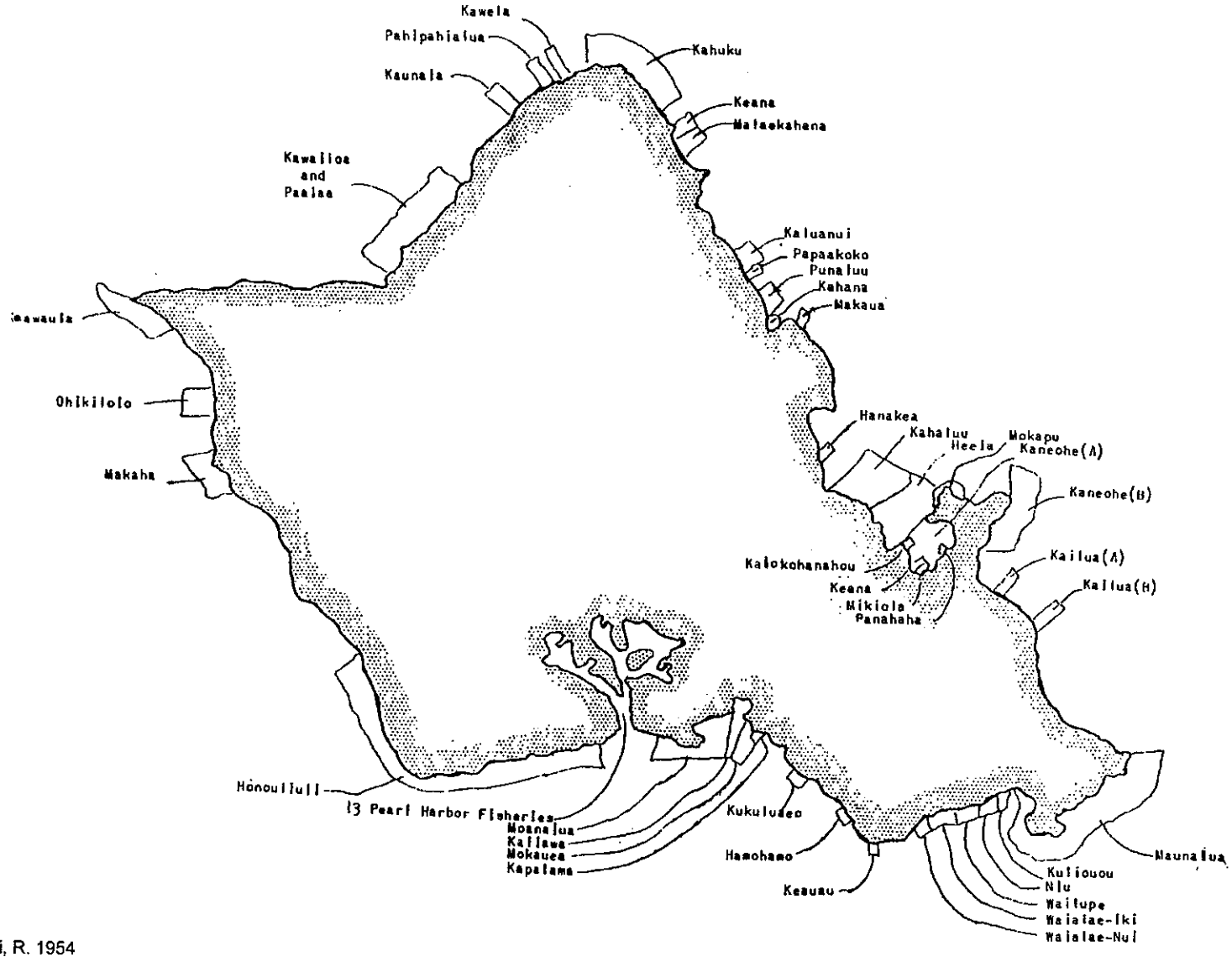
Today, *konohiki* fishing rights are no longer practiced in Hawaii's coastal waters. The Hawai'i Organic Act of 1900 severely restricted *konohiki* fishing rights by eliminating "private" fishery rights in the islands. However, there is ongoing debate over the interpretation of the Organic Act and the viability and effect of *konohiki* fishing rights on modern activities involving nearshore fisheries (MacKenzie, 1991).

4.1.1 Existing Conditions

Archaeological and Historic Sites

The project area is situated on recently created land formed by numerous dredging and filling operations. The lands are extensively urbanized making the presence of archaeological sites unlikely. Historical records indicate that there are no archaeological sites within the project areas. The State Department of Land and Natural Resources Historic Preservation Office has confirmed that there are no known archaeological sites at the proposed project areas.

It should be noted that in 1997 human remains were inadvertently discovered at Pier 40 during the excavation of a utility trench. The remains were located in a small crevice between ridges of coral bedrock. Such a location is not typical of a traditional burial site and State Historic Preservation archaeologists believe that those remains were of a person who died at the spot (possibly fishing) and was not necessarily buried there (Cleghorn, et al. 1999).



Source: Kosaki, R. 1954

FINAL ENVIRONMENTAL IMPACT STATEMENT FOR THE OAHU COMMERCIAL HARBORS 2020 MASTERPLAN IMMEDIATE PHASE	**Figure 4 – 1** **Former Konohiki Fisheries on Oahu**	Prepared for: State of Hawaii Department of Transportation Harbors Division Prepared by: Wil Chee – Planning, Inc.

Only one traditional site, the Pakaka Heiau, is known to have previously existed within the immediate area of the project sites. The Pakaka Heiau was known to exist at the base of what is now Fort Street, but it has long been destroyed. Two significant Historic sites are recorded in immediate area of the project sites. These are the Aloha Tower Complex and the Falls of Clyde.

The Aloha Tower Complex was constructed between 1921 and 1926. The land that the tower sits on was filled with timber and coral blocks from the old Honolulu Fort. Construction of the tower itself was begun in 1924 by C.W. Winstedt and the National Construction Co. Closed to the public during WWII, Aloha Tower was reopened in 1947. It is designated as State Site 50-80-14-9929, and is listed on the National Register of Historic Places (NRHP).

The Falls of Clyde, presently located at Pier 7, is the only four-masted, fully-rigged iron hulled ship left in the world. The vessel was constructed in great Britain in 1878 by Russell and Company. It was built for general trade between Great Britain and India. The ship was first sold to American owners in 1893. Restored and re-opened to the public in 1968, The Falls of Clyde is listed on the NRHP (Ibid.).

4.1.2 Potential Impacts

Archaeological and Historic Sites

Adverse impacts are not anticipated as no archaeological or cultural remains should be present within the proposed project areas. In the unlikely event that any are identified, they would most probably have been brought in with the fill and are not in-situ. The original coastline around the turn of the century was located farther inland along the airport and harbor areas. Thus, any cultural remains that were once present along the coast will be situated inland of Nimitz Highway rather than along the current harbor edge (Cleghorn, et al. 1999).

The two identified significant Historic sites, Aloha Tower Complex and the Falls of Clyde, are located outside of the proposed project areas and will not be adversely impacted by construction activities or future operations at the project sites.

Several existing structures on the project sites are scheduled for demolition for the implementation of the proposed projects. Some of these buildings are over 50 years old, making them potentially eligible for listing on NRHP. A property may be listed in the NRHP if it meets a specific set of criteria as defined in 36 CFR Section 60.4. The significance criteria are summarized below:

The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and

(a) That are associated with events that have made a significant contribution to the broad patterns of our history; or
(b) That are associated with the lives of persons significant in our past; or
(c) That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
(d) That have yielded, or may be likely to yield, information important in prehistory or history.

A detailed examination of all existing structures at the project sites was conducted, and it was found that most of the buildings were in either in extremely poor condition or had been extensively altered thereby compromising their original integrity. Based on the above criteria the Archaeological Study determined that none of the structures at the project sites qualify as historically significant. *Close consultation was maintained with the State Historic Preservation Office (SHPO) during the course of the Archaeological Study and SHPO has concurred with the determination that the demolition of the identified structures, and the project will have no impact on cultural resources (See Appendix E).*

Cultural Resources

As mentioned earlier in this section, there is ongoing debate over the interpretation of the Organic Act and the viability and effect of *konohiki* fishing rights on modern activities involving nearshore fisheries.

Many legal experts and scholars have attempted to address the issue of Native Hawaiian rights in a regulated fishery. Various solutions involving preferential rights to Native Hawaiians have been explored including: rationing permits to achieve quotas, establishing special use areas, auctioning of parcels or permits, and assigning points for Native Hawaiian fishermen (Anders, 1987). However, the status of Native Hawaiian fishing rights remains an unresolved issue.

Since private fishing activities are not permitted within Honolulu Harbor, the proposed projects will have no impacts on native Hawaiian fishing rights. It is not known at this time whether or not the proposed projects will have adverse or beneficial impacts on Native or *konohiki* fishing rights in the future. It is beyond the scope and not the intent of this EIS to provide a solution to the status of *konohiki* fishing rights in Hawaii's coastal waters. The resolution of this controversial issue would be best accomplished within legal and political arenas.

4.1.3 Proposed Mitigation Measures

Based upon the findings of the Archaeological Study, archaeological monitoring will not be necessary during construction activities. However, in the unlikely event cultural artifacts or human remains are inadvertently encountered during construction activities, all operations in vicinity of the discovery will immediately cease. The discovery and surrounding area will be secured and protected from further damage. The State Historic Preservation Division shall be notified of the discovery, and immediate consultation with the Oahu Island Burial Council shall be sought before commencement of construction activities.

4.2 Aesthetic and Recreational Considerations

4.2.1 Existing Conditions

Honolulu Harbor has an industrial appearance. Visual resources within the proposed project area are typical of commercial port settings (i.e. piers, paved areas, heavy equipment, warehouses, passenger and cargo terminals, etc.). Many of the existing structures on the project sites are quite old, in poor condition, and in varying states of disrepair.

The proposed project sites within the Honolulu Harbor are not open to public or recreational boating access and is limited to commercial and industrial harbor uses. The Keehi Lagoon Canoe Complex is located approximately 1.5 miles to the north of the proposed layberth and *OSRV* sites. In addition to the canoe complex, there are several other recreational areas in Keehi Lagoon (section 2.5) all of which are located outside of the proposed project area. Recreational areas located within five miles of the project site include Ala Moana Beach Park, Sand Island State Recreation Area, and the Kakaako Waterfront State Recreation Area.

4.2.2 Potential Impacts

The construction and operation of the proposed improvements are not expected to have an adverse impact on existing view sheds because the existing harbor already has an industrial appearance. The proposed projects call for the demolition or refurbishing of existing pier structures and the construction of new buildings. These buildings will become a visible part of the harbor landscape, but they will, for the most part, be replacing existing structures of similar size.

Recreational activities will not be impacted by the proposed projects because the existing recreational facilities are considerable distances away from the project sites. Furthermore. The areas directly adjacent to the proposed project sites are areas where public recreational activities are not permitted.

4.2.3 Proposed Mitigation Measures

Impacts on visual resources by the proposed project are not anticipated to be significant. The proposed projects and their associated operations would be consistent with the existing maritime industrial setting in the harbor area. Many of the existing structures, such as the Pier 2 Shed and the Pier 24 shed, will be replaced by new and more aesthetically pleasing structures.

Since Honolulu Harbor can be considered the "Gateway to Hawaii," it is important to recognize the unique physical and cultural setting of the islands during project design. Hawaii's unique architecture has contributed to the islands' sense of place and image as a tropical paradise. For this reason, the "Hawaiian Sense of Place" should be considered during the architectural design phases of proposed project buildings. Use of Hawaiian architectural designs which stress features like natural ventilation, open spaces, landscaped gardens, columns, and lanais would further serve to create an aesthetically pleasing Harbor landscape.

4.3 Socio-Economic Conditions

4.3.1 Existing Conditions

Population

The Island of Oahu is the commercial, cultural, and social center of Hawaii. Consequently, Oahu Island and the urban Honolulu area have the highest resident population in the state. As of July 1, 1997, Oahu's resident population was 869,857, 45 percent of whom lived in the urban Honolulu area. The resident population for the island of Oahu is projected to reach 1,050,000 by the year 2020 (DBEDT, 1997).

The residential areas nearest the project site are the Kakaako, Downtown, Kalihi-Palama, and Airport neighborhoods. In 1990 these neighborhoods had resident populations of 10,934, 11,752, 40,147, and 26,734 respectively. The median annual household income in the Kalihi-Palama and neighboring downtown area averaged just over $25,000 in 1990 compared to Oahu's median annual income of $40,581.14 (Ibid.)

Tourism accounts for approximately one-quarter of the gross state product and one third of total employment. In 1997 visitor expenditures exceeded $10 Billion, and the number of visitors to Hawaii reached 6,876,140 (Ibid.). In the past three years the number of visitors to Hawaii has leveled off but is still expected to grow in the future.

Currently, the only developed tourist facilities within Honolulu Harbor are

at Piers 8 and 9 where the Aloha Tower retail development attracts residents and visitors. Piers 10 and 11 serve as Oahu's cruise ship terminal with over 14,500 overseas passenger arrivals in 1994. Other important tourist, recreational, and retail facilities in the project vicinity include Restaurant Row, Dole Cannery Mall, Historic Chinatown, Iolani Palace, Ala Moana Shopping Center, and Ala Moana Beach Park.

Ceded Lands

When Hawaii became a State in 1959, the disposition of former Crown and Government lands (ceded lands) were established in section 5 of the Admission Act. Section 5(f) of the Admission Act provides that these lands and the income and proceeds derived from them are to be *held in trust* by the State of Hawaii. Submerged lands in the State of Hawaii are a part of the ceded lands trust.

Therefore, any parcels within the project area identified as ceded lands, although administered by the State Department of Transportation - Harbors Division, are not "owned" by the State but rather "held in trust" by the State.

Consultation with the Office of Hawaiian affairs was initiated to determine whether any ceded lands were located within the project areas at either Keehi Lagoon or Honolulu Harbor. Only five parcels (located at Piers 18-23 and 24-29) within the projects areas were listed in the ceded lands inventory. However, it should be noted that an accurate and complete ceded lands inventory does not yet exist. Efforts are currently ongoing to create such an inventory.

Section 5 (f) of the Admissions Act states that ceded lands are to be utilized for the following five purposes:

- The support of the public schools and other public educational institutions
- The betterment of the conditions of Native Hawaiians
- The development of farm and home ownership
- The making of public improvements
- The provision of lands for public use

Differing legal interpretations of section 5 of the Admissions Act have clouded the issue of what actions meet the above criteria. As a result, what would be considered an "appropriate use" of ceded lands has become a highly subjective, politicized, controversial, and as yet, unresolved issue.

The Office of Hawaiian Affairs along with various Native Hawaiian organizations are involved in ongoing negotiations with the State in an attempt to reach a settlement on the ceded lands controversy. It is beyond the scope and not the intent of this EIS to provide a solution to the ceded lands debate. The resolution of this controversial issue would be best accomplished within legal and political arenas.

4.3.2 Potential Impacts

The economic importance of harbor development and improvement is best illustrated when looking at potential adverse impacts associated with imposing restraints upon such activities.

Preliminary findings from an input/output model developed for DOT-HAR suggest that the negative impacts of curtailed harbor industry growth are substantial. The study found that by limiting harbor development and improvements by just 1% per year less than the estimated 2% annual increase in the real value of the Gross State Product through the year 2020 would result in the following adverse impacts:

- Sales and employment of the major harbor industries would realize only 76.6 percent of their potential;
- Hawaii's Gross State Product would be 2.1 percent lower; and
- Estimated statewide employment would be reduced by 0.5 percent.

Overall, constraints on harbor development that limit annual harbor industry growth to 1 percent would impact the State's economy by a combined loss of $11.7 billion through 2020 (HDOT, 1997).

For the reasons stated above, the economic impacts associated with the implementation of the proposed Honolulu Harbor and Keehi Lagoon improvements are, for the most part, beneficial.

In the short-term, construction expenditures will have an overall beneficial impact on the local construction industry, and construction activities will benefit the community indirectly through the creation of jobs.

In the long-term, harbor operations are expected to have positive economic impacts as well. The expanded harbor operations will stimulate direct maritime expenditures, create port-related jobs, and develop new businesses in the Honolulu Harbor area. Harbor operations will require support businesses to supply ships, handle cargo, and provide other services.

The commercial fishing industry and tourism industry should also experience beneficial economic impacts as a result of the proposed projects. Both of these industries will experience increased activity and growth as a result of the new and expanded facilities.

Overall, implementation of the proposed projects and resultant harbor expansion will stimulate harbor-related business enterprises and increase local employment. The combined increased business activities in the commercial

shipping, fishing and tourism industries will result in increased state tax revenues, in the form of excise, individual, and corporate taxes.

4.3.3 Proposed Mitigation Measures

There are no adverse socio-economic impacts anticipated. Therefore, mitigation measures have not been proposed.

5.0 RELATIONSHIP TO PLANS, POLICIES, AND CONTROLS

5.1 Federal Land Use Plans and Policies

Land use policies, plans, and controls administered by the Federal government which affect the proposed action are described in the following sections.

5.1.1 Clean Water Act

The Clean Water Act (CWA), Section 404, defines requirements for discharges of dredged or fill materials in waters of the United States" and sets limits on such discharges. Permit approval is through the U.S. Army Corps of Engineers (USACE). The "Excavation Rule" was established jointly by USACE and the U.S. Environmental Protection Agency (EPA) (33 CFR 323.2 of 25 August 1993) to also regulate removal of material from waters of the United States. Up until recently, the "incidental fallback" accompanying dredging activities was considered to be "discharge" under Section 404. However, Section 404 no longer regulates excavation activities and now regulates discharge and fill only.

Although dredging activities will not be required for the proposed projects, it should be noted that according to 33 CFR 232.2 (d)(3)(ii), a Section 404 permit would not required for any incidental movement of dredged material occurring during normal dredging operations, defined as dredging for navigation in navigable waters of the United States.

The USACE will be consulted to provide a jurisdictional determination regarding the applicability of Section 404 to the proposed project. It was determined that a section 404 Permit will be required for the proposed actions at Piers 12- 16 and at Keehi Lagoon, because "in filling" during piling operations would be considered a discharge of fill material in the water.

5.1.2 Section 401 CWA Water Quality Certification

Under the Federal CWA and Hawaii Revised Statutes (HRS) Chapter 342D, and associated Hawaii Administrative Rules (HAR) 11-54, a WQC is required for activities when proposed construction or operation may result in discharges to State waters. In Hawaii, the Department of Health (DOH) is the agency with authority for project review and issuance of the WQC.

Since it has been determined that the proposed action will result in the discharge fill materials requiring a CWA Section 404 permit, a CWA Section 401 Water Quality Certification (WQC) will also be required.

5.1.3 Section 402 CWA NPDES Permit

Discharges of point sources of pollutants into surface waters of the U.S. are regulated under the National Pollutant Discharge Elimination System (NPDES) program, pursuant to CWA, Section 402. In Hawaii, the DOH administers the NPDES program under HAR 11-55.

NPDES permits are available under General or Individual categories. General permits are available for activities that meet specific criteria, such as construction-related storm water discharges, hydrotesting, and construction dewatering. The Individual Permit has greater flexibility, but involves a longer process, which includes Public Notice of permit application.

Separate Notices of Intent (NOIs) are required for NPDES General Permit coverage for hydrotesting, dewatering, or discharges to surface waters of construction-related storm water from sites equal to or greater than 5 acres in size. Discharge of dewatering effluent associated with dredged sediment would require NPDFS permit coverage as well. The NOI submitted with the NPDES permit application requires development of a Best Management Practices plan, in accordance with HAR 11-55. Discharges for storm water associated with construction activity, hydrotesting, and dewatering under the proposed project will require NPDES permit approvals from DOH.

A NPDES permit will be required for the proposed Harbor improvements.

5.1.4 Rivers and Harbors Act

The Rivers and Harbors Act (RHA), Section 10, requires the issuance of a USACE permit for any activity that obstructs or alters navigable waters of the U.S., or modifies the course, location, condition, or capacity of any port, harbor or refuge, or enclosure within the limits of any breakwater or of the channel of any navigable water. The USACE was consulted and has confirmed that a permit under Section 10, Rivers and Harbors Act, will be required for the proposed action.

5.1.5 Marine Protection, Research, and Sanctuaries Act

Section 103 of the Marine Protection, Research and Sanctuaries Act (MPRSA) (33 U.S.C. 1413) authorizes the USACE to issue permits for the transportation of dredged material for the purpose of dumping in ocean waters. Section 103 prohibits disposal activities that would unreasonably degrade or endanger human health or the marine environment.

The EPA and USACE have joint authority for regulating ocean disposal of dredged material and for managing ocean dredged material disposal sites (ODMDS) in the Hawaiian Islands. Under the MPRSA, Section 103, the USACE in coordination with the EPA has the authority to issue permits for ocean dumping. A USACE permit under Section 103 will not be required for the proposed action.

5.1.6 Endangered Species Act and Marine Mammal Protection Act

The Endangered Species Act of 1973 and the Marine Mammal Protection Act of 1972 require that actions not jeopardize the continued existence of endangered or threatened marine and terrestrial plant and animal species. *The U.S. Fish and Wildlife Service (USFWS) has jurisdiction over certain federally listed endangered and threatened species that occur in terrestrial and marine environments. The National Marine Fisheries Service (NMFS) has jurisdiction over marine mammals and fishes. The two agencies share responsibility for listed (threatened or endangered) sea turtles.*

As discussed in section 3.6, it is not anticipated that there will be any significant impacts to T&E marine and non-marine species as a result of the proposed project. However, protected marine species and waterbirds are known to frequent areas of Keehi Lagoon in the vicinity of the layberth project site. Therefore, close coordination and consultation with the US Fish and Wildlife Service and the National Marine Fisheries Service will be maintained during project planning and construction.

5.1.7 National Historic Preservation Act

Section 106 of the National Historic Preservation Act, as amended, and its implementing regulations (36 CFR 800), are intended to provide for the protection and use of historic properties for the benefit of the public. The State Department of Land and Natural Resources - Historic Preservation Division (SH PD), oversees the historic preservation compliance process. The SHPD determines whether any historic sites exist and their historical significance.

There are several historic structures (over 50 years old) within the project site. Some of these structures are scheduled to be demolished for the proposed improvements. As mentioned in section 4.1, the archaeological investigation report determined that there were no significant historic structures on the project sites. Should the State Historic Preservation Division determine otherwise, then appropriate mitigation and preservation measures will be developed.

5.1.8 Native American Graves Protection and Repatriation Act

The proposed project will be conducted in accordance with the Native American Graves Protection and Repatriation Act (NAGPRA). NAGPRA, which was passed into law in 1990, is intended to protect Native American (including native Hawaiian) burial sites. NAGPRA sets guidelines for the removal and subsequent repatriation of human remains and associated burial objects on Federal, Indian, and native Hawaiian lands.

NAGPRA requires consultation with native Hawaiian organizations, including the Office of Hawaiian Affairs, Hui Malama I Na Kupuna '0 Hawaii Nei, and the Oahu Burial Council (and the State Historic Preservation Division, DLNR) if Hawaiian burials are encountered. As explained in section 4.1, it is unlikely that any human burials exist within the project site area. However, should human remains be encountered, the above NAGPRA requirements will be met.

5.2 State Land Use Plans and Policies

5.2.1 Hawaii State Plan (HRS 226)

The Hawaii State Plan, Chapter 226, HRS (1995) was developed to serve as a guide for the future growth of the State of Hawaii. The State Plan identifies goals, objectives, policies, and priorities for the development and growth of the State. It provides a basis for prioritizing and allocating the states limited resources, including public funds, services, human resources, land, energy, water. The State Plan establishes a system for the formulation and program coordination of State and County plans, policies, programs, projects, and regulatory activities and facilitates the integration of all major State and county activities.

The proposed action is consistent with the objectives and policies of the Hawaii State Plan. Specifically, the proposed action will increase and diversify the State's economic base through upgrading facilities for the tourist, commercial fishing, shipping industries. Described below are sections of the State Plan's overall theme, goals, objectives, and policies, that relate to the proposed action.

Part I - Goals, Objectives, and Policies

SEC. 226-8 Objectives and policies for the economy - visitor industry.

b)(1) Support and assist in the promotion of Hawaii's visitor attractions.

SEC. 226-10 Objective and policies for the economy - potential growth activities.

(a) Planning for the State's economy with regard to potential growth activities shall be directed towards achievement of the objective of development and expansion of potential growth activities that serve to

increase and diversify Hawaii's economic base.

(b) To achieve the potential growth activity objective, it shall be the policy of this State to:

Facilitate investment and employment in economic activities that have the potential for growth such as diversified agriculture, aquaculture, apparel and textile manufacturing, film and television production, and energy and marine-related industries.

(5) Promote Hawaii's geographic, environmental, social, and technological advantages to attract new economic activities into the State.

(7) Increase research and the development of ocean-related economic activities such as mining, food production, and scientific research.

SEC. 226-11 Objectives and policies for the physical environment land-based, shoreline, and marine resources.

(a) Planning for the State's physical environment with regard to land-based, shoreline, and marine resources shall be directed towards achievement of the following objectives:

(1) Prudent use of Hawaii's land-based, shoreline, and marine resources.

(2) Effective protection of Hawaii's unique and fragile environmental resources.

(b) To achieve the land-based, shoreline, and marine resources objectives, it shall be the policy of this State to:

(1) Exercise an overall conservation ethic in the use of Hawaii's natural resources.

(2) Ensure compatibility between land-based and water-based activities and natural resources and ecological systems.

(3) Take into account the physical attributes of areas when planning and designing activities and facilities.

(4) Manage natural resources and environs to encourage their beneficial and multiple use without generating costly or irreparable environmental damage.

(8) Pursue compatible relationships among activities, facilities, and natural resources.

(9) Promote increased accessibility and prudent use of inland and shoreline areas for public recreational, educational, and scientific purposes.

SEC. 226-17 Objectives and Policies for Facility Systems - Transportation

4) Provide for improved accessibility to shipping, docking, and storage facilities.

6) Encourage transportation systems that serve to accommodate present and future development needs of communities.

8) Increase the capacities of airport and harbor systems and support facilities to effectively accommodate transshipment of storage needs.

9) Encourage the development of transportation systems and programs which would assist statewide economic growth and diversification.

SEC. 226-1O3 Economic priority guidelines.

(a) Priority guidelines to stimulate economic growth and encourage business expansion and development to provide needed jobs for Hawaii's people and achieve a stable and diversified economy:

(1) Seek a variety of means to increase the availability of investment capital for new and expanding enterprises.

(A)(iv) Reinvest in the local economy.

(6) Encourage the formation of cooperatives and other favorable marketing or distribution arrangements at the regional or local level to assist Hawaii's small-scale producers, manufacturers, and distributors.

10 (b)(4) Encourage visitor industry practices of activities which respect, preserve, and enhance Hawaii's significant natural, scenic, historic, and cultural resources.

5.2.2 Honolulu Waterfront Master Plan

The Honolulu Waterfront Master Plan (HWMP) represents a comprehensive, long range vision for the Honolulu waterfront area. The HWMP directly addresses major planning issues concerning public access and use of the waterfront, long-term integrity of commercial maritime operations, plan implementation, relocation needs, and financial feasibility.

The 2020 Plan and the proposed IP projects support the overall objectives of the HWMP by:

- Identifying and articulating a long-range vision for the Honolulu Waterfront that is fiscally responsible but also innovative, challenging, and responsive to the current and future needs of Hawaii's residents.

- Assuring a logical, orderly and achievable phasing of improvements in a manner that minimizes social, environmental, and economic disruption.

- Maximizes public benefits associated with the improvement of the significant State-owned lands located within the waterfront planning area.

5.2.3 Keehi Lagoon Recreation Plan

The Keehi Lagoon Recreation Plan outlines a number of objectives which emphasize the growth of ocean recreation and business development with in the Keehi Lagoon. The objectives set forth in the Keehi Lagoon Recreation Plan are designed to meet the following needs:

- Construction of additional berths
- Maritime Industry Support Lands
- Active Ocean Recreation Areas
- Shoreline Fishing Areas, Waterfront Greenbelts, Picnic Areas and Walkways

The Keehi Lagoon Recreation Plan specifically identifies additional berths required for small recreational vessels and larger boats used for ocean racing and commercial purposes (incl. commercial fishing craft).

5.2.4 State Functional Plans

State Functional Plans are the primary guidelines for implementing the Hawaii State Plan. In contrast to the Hawaii State Plan which establishes long-term objectives, the State Functional Plans serve to establish objectives for shorter-term actions. Described below are specific sections of State Functional Plans which contain overall themes, goals, objectives, and policies, that relate to the proposed action.

State Transportation Functional Plan

Objective 1A: Expansion of the transportation system.

1) Increase transportation capacity and modernize transportation infrastructure in accordance with existing master plans and laws requiring accessibility for people with disabilities.

As public facilities, with public accommodations, the final designs for the proposed excursion and cruise vessel terminals (at Piers 24 - 29 and Pier 2 respectively), will be

required to comply with Titles II and III of the Americans with Disabilities Act of 1990 (ADA). Sections with particular significance to the proposed projects are following sections which address specific areas. Section 226 (New Facilities), section 227 (Alterations of existing Facilities), and section 303 (New Construction and Alterations in Public Accommodations and Commercial Facilities).

Objective 1D: Identify reserve and acquire land for future transportation improvements.

State Conservation Lands Functional Plan

The objective of the State Conservation Lands Functional Plan is to provide for a management program allowing for judicious use of the State's natural resources balanced with the need to protect these resources to varying degrees. Objectives and policies that would be met by the completion of the proposed projects are presented below.

Objective IIE: Promotion and marketing of appropriate natural resources designated for commercial development.

Policy IIE(4): Assist the fishing industry to develop new markets and improve production and processing of fishery products.

5.2.5 State Land Use Law (HRS 205)

The State of Hawaii classifies all land into four districts: Urban, Conservation, Agricultural, and Rural. Changes to the boundaries of any conservation district and other districts greater than 15 acres must be approved by the State Land Use Commission. Changes to boundaries of districts other than conservation districts of less than 15 acres can be approved by the county land use authority.

The proposed action would involve activity on two land classes - Urban and Conservation. Land uses within the Urban District are regulated by the City and County of Honolulu through the Land Use Ordinance. The State Department of Land and Natural Resources regulates land uses in the Conservation Districts.

The proposed projects are located within the Urban District, and the proposed facilities are permissible within this State land use district. The waters of Honolulu Harbor and Keehi Lagoon are located within the State Conservation District which is administered by the State Board of Land and Natural Resources. The Harbors Division has an existing Conservation District Use Permit from the BLNR for any maritime construction activities in the harbor which would allow construction of the proposed projects to proceed.

5.2.6 Coastal Zone Management Program (Special Management Areas)

The Coastal Zone Management Act of 1972 (P.L. 92-583) is administered in Hawaii by the State Office of Planning of the Department of Business, Economic Development, and Tourism and affects projects that require Federal permits, including USACE permits (State of Hawaii, 1985). The objectives and policies of the Hawaii Coastal Zone Management (CZM) as set forth in Chapter 205A Hawaii Revised Statutes are to provide recreational resources; protect historic, scenic, and coastal ecosystem resources; provide economic uses; reduce coastal hazards; and manage development in the coastal zone.

Chapter 205A outlines controls and policies for development within an area along the shoreline referred to as the Special Management Area (SMA). SMA policies are administered at the county level. Only the proposed cruise ship terminal at Pier 2 and the layberth facilities at Keehi Lagoon fall within the SMA boundary.

Although the proposed Keehi Lagoon project site is located within the SMA, DOT-HAR is exempt from the County SMA requirements. DOT-HAR's authority over the planning, construction, operation, and maintenance of harbor facilities does not require county approval for such projects.

The proposed Pier 2 Cruise Terminal Facility is situated within the Kakaako Community Development District. Community Development Districts are administered at the State level and are not subject to City and County rules and regulations. As such, SMA permits and shoreline setback variances will be required for the development of proposed structures at the Pier 2 site. These permit applications will be administered at the State level through the Office of Planning pursuant to Section 206E-8.5 of the Hawaii Revise Statutes.

Environmental concerns are also addressed through the CZM consistency review process. The entire Island of Oahu is within the coastal zone area affected by the CZM Act. A CZM consistency determination of 'no effects' is required under the CZM program and is being sought from the State Office of Planning.

5.3 County Land Use Plans and Policies

5.3.1 General Plan for the City and County of Honolulu

The General Plan establishes the City and County of Honolulu's long-term objectives and policies. These objectives tend to be broad in scope; land use policies in subsequent Development Plans provide more specific policies to achieve the General Plan objectives. General Plan objectives and policies that relate to the proposed actions at Honolulu Harbor and *Kalaeloa* Barbers Point Harbor are summarized below.

Transportation and Utilities

Objective A: 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, the elderly, and the physically handicapped; and offer a variety of attractive and convenient modes of travel.

Policy 13: Facilitate the development of a second deep-water harbor to relieve congestion in Honolulu Harbor.

Economic Activity:

Objective A: To promote employment opportunities that will enable all the people of Oahu to attain a decent standard of living.

Policy 2: Encourage the development of small businesses and larger industries which will contribute to the economic and social well-being of Oahu residents.

Objective D: To make full use of the economic resources of the sea.

Policy 1: Assist the fishing industry to maintain its viability.

Policy 2: Encourage the development of aquaculture, ocean research, and other Ocean-related industries.

Physical Development and Urban Design:

Objective A: To coordinate changes in the physical environment of Oahu to ensure that all new developments are timely, well-designed, and appropriate for the areas in which they will be located.

Objective B: To develop Honolulu, Aiea, and Pearl City as the island's primary urban center.

Policy 8: Foster the development of Honolulu's waterfront as the State's major port and maritime center, as a people-oriented mixed use area, and as a major recreation area.

Policy 10: Establish a review process to evaluate the design of major development projects.

Objective C: To develop a secondary urban center in Ewa with its nucleus in the Kapolei area.

Policy 3: Encourage the continuing development of Barbers Point as a major industrial center.

Policy 5: Cooperate with the State and federal governments in the development of a deep water harbor at Barbers Point.

5.3.2 Development Plan for the City and County of Honolulu

Pursuant to Chapter 226, HRS, each County within the State of Hawaii is mandated to carry out the Hawaii State Plan through the adoption and use of a County General Plan. Development Plans (DPs) have been established to provide land use controls designed to implement the objectives and policies of these General Plans and to provide guidance for more specific zoning and density regulations.

The *Oahu DP's* consist of two main sections: the Common Provisions that are common to all of Oahu's DPs, and the Special Provisionsvary depending upon the location of the area of concern. The DPs are relatively detailed guidelines for physical development on Oahu. The site of the proposed action is on land designated as Public Facilities. The proposed action is consistent with this land-use designation.

The development plans for both Ewa and the Primary Urban Center (PUC) have recently been updated or are in the process of being updated. The proposed Honolulu and *Kalaeloa* Barbers Point Harbor improvements are *consistent with* and support the updated development plans, objectives, and policies. *In particular, the proposed cruise ship and excursion vessel terminals are consistent with the City's development plans supporting the long-range vision of developing a "City on the Water".*

The existing PUC DP policies address uses near airports and harbors (policy D.2.1). Development Plan Special Provisions provide some policy guidance for uses in the vicinity of the airport and for the design treatment of the Nimitz Highway corridor. However, the DP provides no policies concerning long-term plans for airport and harbor facilities.

The proposed DP policy changes (policy D.2.3) would:

> "Allow a broader mix of industrial and commercial uses near Honolulu Harbor and Honolulu International Airport, adding retail and office uses that are compatible with harbor and airport operations and existing light industrial uses." (CCH, 1999)

The proposed *Kalaeloa* Barbers Point Harbor improvements support the general policies, planning principles, and guidelines for development of industrial centers and industrial uses in Ewa. Additionally, the proposed *Kalaeloa* Barbers Point Harbor improvements follow the coastal environment guidelines in section 3.7.3.3 of the Ewa DP.

The Ewa Development Plan update states:

> "Barbers Point Industrial Area includes Campbell Industrial Park, Barbers Point Deep Draft harbor, Kenai Industrial Park, and Kapolei Business Park. It should continue to grow as one of Oahu and the State's most important industrial areas. It is the site of the State's largest heavy industrial area (Campbell Industrial Park) and an important industrial harbor and fuel transfer point." (CCH, 1997)

5.3.3 County Land Use Ordinances and Zoning

The proposed project area is located *within I-2 Intensive Industrial, I-3 Waterfront Industrial, P-I Restricted Preservation, and IMX-1 Industrial Commercial Mixed Use* designations. All improvements within these districts are subject to review by City and County Department of Planning and Permitting (formerly the Department of Land Utilization).

It should be noted that pursuant to Chapter 266-2, Hawaii Revised Statutes, all harbor improvements, including any maritime facilities constructed by the State Department of Transportation, are exempted from City and County zoning regulations. Nonetheless, the proposed actions are a permitted use within these zones and are in accordance with the Land Use Ordinance of the City and County of Honolulu.

6.0 ALTERNATIVES TO THE PROPOSED ACTION

6.1 No Action

The no action alternative would mean the existing operations at Honolulu Harbor would remain unchanged. Traffic congestion within Honolulu Harbor would not be alleviated. Existing vacant land areas and poorly maintained harbor facilities would remain underutilized and undeveloped. With this alternative, there would not be additional piers, storage yards, or passenger facilities to accommodate the anticipated growth of the State's tourism, commercial fishing, and shipping industries.

The no action alternative has been rejected from further consideration because; i) the goals of the 2020 PLAN would not be achieved, and ii) State and county development policies would not be implemented.

6.2 Alternative Locations

Alternative locations for the proposed action were not considered. No other sites on Oahu would provide an economical feasible alternative for the proposed actions. The 2020 PLAN outlines a systematic approach for the improvement and development of Oahu's commercial harbors. The only other commercial harbor on Oahu in addition to the proposed project sites is Kewalo Basin. Kewalo Basin is not a feasible alternative as it would be unable to meet the needs of the proposed IP projects in terms of location, existing facilities, infrastructure, and economical considerations.

7.0 PERMITS AND APPROVALS REQUIRED

A list of applicable permits and approvals which may be required for the proposed action are outlined below.

Permit/Approval	Administering Agency
Rivers Harbors Act Section 10 Permit	U.S. Army Corps of Engineers
Department of the Army Section 404 Permit	U.S. Army Corps of Engineers
Section 401 Water Quality Certification	State Department of Health
Coastal Zone Management Consistency Certification	Office of State Planning
Special Management Area Permit	Office of State Planning
Shoreline Setback Variance	Office of State Planning
HCDA Development Permit (for Pier 2)	Hawaii Community Development Authority
National Pollution Discharge Elimination System (NPDES)	State Department of Health
Noise Variance	State Department of Health
Permit for Air Emissions	State Department of Health
Water Use Permit	State Department of Land and Natural Resources
Environmental Review (Chapter 343, HRS)	Office of Environmental Quality Control

In accordance with Chapter 266-2(b) HRS, DOT-HAR is exempt from county approvals for commercial harbor construction activities. Therefore, the following regulatory requirements are not applicable.

- Special Management Area Permit (For Pier 2 see section 5.2.6)
- Grading, Grubbing, and Stockpiling Permit
- Compliance with City and County Zoning

8.0 ANY IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES WHICH WOULD BE INVOLVED IN THE PROPOSED PROJECTS

During the construction phase of the proposed improvements, resources such as fossil fuels and construction materials such as concrete, steel, asphalt, wood, and rock would be irrevocably committed. In addition to the fuels and construction materials involved, approximately $30 million will be committed to the proposed improvement projects. Labor would be required for construction, planning, engineering design, landscaping, purchasing, and services. Once used the labor is irretrievable. However, labor effort is also monetarily compensated, thereby supporting the State's economy.

9.0 SUMMARY OF UNRESOLVED ISSUES

The DOT-HAR consultation program yielded substantial input from government agencies, commercial businesses, private interest groups, and individuals. Comments were received on the EISPN and the Draft EIS (see Appendix A) which provided input on issues and concerns relative to the proposed action. The issues raised during the consultation program have been addressed in this Final EIS, and at this stage in the EIS process there are no outstanding issues or concerns that remain unresolved.

The DOT-HAR is aware that additional concerns regarding the proposed project may arise in the future. Therefore, DOT-HAR will continue to work with area residents and businesses, interest groups, and government agencies so that the final project plans meet project objectives and are responsive to public and agency concerns.

10.0 PARTIES CONSULTED DURING PREPARATION OF THE EISPN AND DRAFT EIS

The State Department of Transportation - Harbors Division determined that the proposed project may have a significant impact on the environment and that the preparation of an EIS was required. Notice of this determination was published in the February 23, 1999 edition of The Environmental Notice, commencing a 30-day public review period which ended March 25, 1999. The Draft Environmental Impact Statement (DEIS) was published in the July 8, 1999 edition of The Environmental Notice, commencing a 45-day public review period which ended on August 23, 1999.

A copy of the Environmental Impact Statement Preparation Notice (EISPN) and/or DEIS was mailed to agencies and organizations believed to have an interest in the project. The list of recipients is provided below.

A total of 28 agencies, organizations, or individuals provided written comments on the EISPN and/or DEIS. The parties who responded to the EISPN are identified by an asterisk (*), and parties who responded to the DEIS are identified by a pound symbol (#). Both comments on the EISPN and DEIS have been reproduced in Appendix A, along with response letters to the comments.

Federal Agencies:

US Fish and Wildlife Service * #
US National Marine Fisheries Service
US Army Corps of Engineers, Pacific Ocean Division *US Coast Guard
US Geological Survey – Water Resources Division

State Agencies:

Office of Environmental Quality Control
Department of Accounting and General Services #
Department of Business Economic Development and Tourism (Planning Office) *
Department of Business Economic Development and Tourism (Energy, Resources, & Technology Division) #
Department of Health (Environmental Management Branch) #
Department of Health (Clean Water Branch)
Department of Health (Clean Air Branch)
Department of Land and Natural Resources (Office of Conservation & Environmental Affairs) *
Department of Land and Natural Resources (Commission on Water Resources Management)
Department of Land and Natural Resources (Aquatic Resources Division) #

Department of Land and Natural Resources (State Historic Preservation) *
Department of Transportation – Statewide Planning Office *
Office of Hawaiian Affairs *#
UH Environmental Center
UH Water Resources Research Center

City and County of Honolulu Agencies

Board of Water Supply *#
Department of Design and Construction (formerly Building Dept.)
Department of Planning and Permitting (formerly DLU)
Dept. of Planning & Permitting (Coastal Lands Branch) *#
Dept. of Parks and Recreation
Planning Department
Department of Facility Maintenance *#
Dept of Transportation Services *#
Department of Environmental Services *#
Downtown Neighborhood Board No. 13
Kakaako/Ala Moana Neighborhood Board No. 11
Kalihi/Palama Neighborhood Board No. 15

Other Agencies, Organizations and Individuals:

Sierra Club, Hawaii Chapter
Aala Ship Service
Oceanic Global Trading
Norko Marine Agency
Sealand Shipping
Young Brothers
Sause Brothers, Inc. #
Matson Cargo
Honolulu Agency
Gasco
Native Hawaiian Legal Corporation *
Architects Hawaii
Environment Hawaii
Keehi Boat Club (Various members) *

Councilman John Yoshimura
Eugene Dashiell
Chris Welch
Nancy E. Murphy #

Page Intentionally Left Blank

11.0 REFERENCES

AECOS, Inc. 1988 Biological Reconnaissance Survey and Environmental Assessment for Pier 1 Modifications, Honolulu Harbor, Hawaii. Rep. No. AECOS 550, Honolulu.

Anders, G.C. 1987. Native Hawaiian Rights in Regulated Fishery: An Exploratory Analysis. East West Center, Honolulu

Belt Collins Hawaii, Inc., 1998. Final Environmental Assessment for the Proposed Domestic Commercial Fishing Village at Piers 36-38, Honolulu Harbor, Oahu. Prepared for DOT-HAR.

Carlton, J.T. and J.B. Geller. 1993. Ecological Roulette: Biological Invasions and the Global Transport of Nonindigenous Marine Organisms. Science 261:78-82.

Cleghorn, P. and J. McIntosh. 1999. Archaeological Report for the Oahu Commercial Harbors 2020 Master Plan - Immediate Phase Environmental Impact Statement. Kailua, HI.

City and County of Honolulu (CCH). 1999. Policy Evaluation Report - Primary Urban Center Development Plan Update. Department of Planning and Permitting. January, 1999.

City and County of Honolulu (CCH). 1998. Telephone conservation with John Lee, Deputy Administrator of the City and County Refuse Collection and Disposal Division. November, 1998.

City and County of Honolulu (CCH). 1997. Ewa Development Plan. Planning Department. August 1997.

Code of Federal Regulations, Title 40, Protection of Environment, Part 50, "National Primary and Secondary Ambient Air Quality Standards".

Coles, S.L. and R.E. De Felice. 1999. Biological Surveys in the Honolulu Harbor Relating to Oahu Commercial Harbors 2020 Master Plan Immediate Phase EIS. Bishop Museum – Department of Natural Sciences (Prepared for AECOS, Inc.)

Department of Business, Economic Development and Tourism. 1997. The State of Hawaii Data Book 1997: A Statistical Abstract. DBEDT

Department of Business, Economic Development and Tourism. 1985. Hawaii Coastal Zone management Program, Federal Consistency Guide

Department of Transportation (HDOT), 1997. Oahu Commercial Harbors 2020 Master Plan. DOT Harbors Division

Department of Transportation (HDOT), 1993. Port Hawaii Commercial Harbors System Handbook, Dept. of Transportation. August, 1991.

Department of Transportation (HDOT), 1991. Negative Declaration for Pier 39 and 40 Modifications, Honolulu Harbor, Oahu, Dept. of Transportation

Earth Tech, Inc. 1997. Honolulu Harbor, Iwilei Unit – Phase I Environmental Assessment. (Prepared for State of Hawaii Department of Transportation - Harbors Division)

Earth Tech, Inc. 1996. Asbestos and Lead Paint Survey of Harbor Facilities. (Prepared for State of Hawaii Department of Transportation - Harbors Division)

Ebisu, Y. & Associates, 1999. Acoustic Study for the Oahu Commercial Harbors 2020 Master Plan, Immediate Phase.

Federal Emergency Agency (FEMA), 1990. Flood Insurance Rate Map

Federal Highway Administration, 1998. FHWA Highway Traffic Noise Model User's Guide FHWA-PD-96-009. Washington D.C.

Guinther, Eric and S. Allen Cattell, 1999. Aquatic Habitat and Water Quality Impact Assessment for the Oahu Commercial Harbors 2020 Master Plan EIS. Report No. AECOS 904, Honolulu.

Hawaii Community Development Authority. Kakaako Community Development District - Makai Area Plan. August, 1998

Hawaii Community Development Authority - 1999a Personal Communication with HCDA (M. Akamu) on February 10, 1999.

Hawaii Community Development Authority – 1999b. Report of the Executive Director. February 3, 1999.

Hawaii Community Development Authority – 1999c. The Kakaako Connection, Volume 20, No. 5. April, 1999.

Hawaii Ocean Industry and Shipping News (HOISN), 1999. Regulatory News - "Feds to Study Foreign Ballast Water". April/May Issue. Honolulu, HI

Hawaii Ocean Industry and Shipping News (HOISN), 1998. Regulatory News – "IMO to meet on Ballast Water Regulations". October/November Issue. Honolulu, HI

Hawaii Ocean and Marine Resources Council, 1991. Hawaii Resources Management Plan – Technical Report.

Helbert, Hastert, and Kimura, & R.M. Towill, 1989. Honolulu Waterfront Master Plan. (Prepared for the Office of State Planning).

Island Demo, Inc. 1999. C&D Recycling Background Info & Land Fill Diversion Plan Specifications. Honolulu. May 5, 1999

International Conference of Building Officials (ICBO), 1994. Uniform Building Code.

International Maritime Organization (IMO), 1995. Guidelines for the Control and Management of Ships' Ballast Water to Minimize the Transfer of Harmful Aquatic Organisms and Pathogens.

Juvik, S. and J. Juvik (ed.). 1998. Atlas of Hawaii, Third Edition. University of Hawaii Press.

Kosaki, R. 1954. Konohiki Fishing Rights. Legislative Reference Bureau, University of Hawaii, Honolulu.

MacKenzie, M.K.(ed.) 1991. Native Hawaiian Rights Handbook, Office of Hawaiian Affairs

Mink and Lau, 1990. Aquifer Identification and Classification of Oahu: Groundwater Protection Strategy for Hawaii. Water Resources Research Center, University of Hawaii at Manoa.

Morrow, J.W., 1999. Air Quality Impact Report (AQIR) for Oahu Commercial Harbors 2020 Master Plan EIS Immediate Phase Projects

National Research Council (NRC). 1996. Stemming the Tide - Introductions of Nonindigenous Species by Ships' Ballast Water. Committee on Ships' Ballast Operations - Marine Board Commission on Engineering and Technical Systems. National Academy Press, Washington D.C.

Noda, Edward K. and Assoc. Inc., 1999. Updated Conceptual Plans for Boating Facilities Along Lagoon Drive in Ke'ehi Lagoon, Honolulu Hawaii. (Prepared for State Department of Transportation - Airports Division)

Noda, Edward K. and Assoc. Inc., 1989. Final Environmental Impact Statement for the Keehi Lagoon Recreation Plan

Noda, Edward K. and Assoc. & E. Dashiell, 1987. Ke'ehi lagoon Recreation Plan Update – Final Draft (Prepared for State Department of Transportation)

Parsons, Brinkerhoff, Quade, 1998. Environmental Impact Statement Preparaton Notice for Modifications to Barbers Point Harbor. Prepared for DOT-HAR and USACE. November 25, 1998.

Parsons, Brinkerhoff, Quade, 1995. Final Supplemental Environmental Impact Statement for the Basin Expansion and Tug Pier at Barbers Point Harbor. Prepared for DOT-HAR

Pukui, Mary Kawena, Samual Elbert, and Esther Mokini. 1976. Place Names of Hawaii. University of Hawaii Press, Honolulu.

Pukui, Mary Kawena, Samual Elbert. 1973. Hawaiian Dictionary. University of Hawaii Press, Honolulu.

R. M. Towill Corporation, 1998. Draft Environmental Assessment for the Navigational Lighting Along Northwestern Margin of Barbers Point Harbor, Oahu. (Prepared for DOT-HAR) March 1998.

Rowell, Philip & Associates, 1999. Traffic Impact Analysis Report – Oahu Commercial Harbors 2020 Master Plan Immediate Phase

Scott, JM, C.B. Kepler, C. van Riper III, and S.I. Fefer. 1998. "Conservation of Hawaii's Vanishing Avifauna". Bioscience 38(4): 238 - 253.

State of Hawaii. Title 11, Hawaii Administrative Rules, Chapter 46, "Community Noise Control", Hawaii State Department of Health; September, 1996.

State of Hawaii. Title 11, Hawaii Administrative Rules, Chapter 59, "Ambient Air Quality Standards", Hawaii State Department of Health; November, 1993(a).

State of Hawaii. Title 11, Hawaii Administrative Rules, Chapter 60, "Air Pollution Control", Hawaii State Department of Health; November, 1993(b).State of Hawaii.

State of Hawaii. Title 11, Hawaii Administrative Rules, Chapter 42, "Vehicular Noise Control for Oahu", Hawaii State Department of Health; October, 1981.

U. S. Department of Agriculture, Soil Conservation Service. 1972. Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii.

U.S. Environmental Protection Agency. MOBILE-5B (Mobile Sources Emissions Factor Model). September 14, 1996(a).

U.S. Environmental Protection Agency. Compilation of Air Pollutant Emission Factors, Fifth Edition, as updated on the EPA Technology transfer Network (TNN). October,1996(b).

U.S. Environmental Protection Agency. Storm Water Management for Construction Activities – Developing Pollution Prevention Plans and Best Management Practices, Office of Water, 1993

U.S. Fish and Wildlife Service (USFWS) 1996. Response letter to Oahu Commercial Harbors 2020 Master Plan – Immediate Phase EISPN. April 2, 1999.

U.S. Fish and Wildlife Service (USFWS) 1996. Hawaiian Islands Animals: Updated march 1996. Listed and candidate species, as designated under the U.S. Endangered Act. 16pp.

12.0 APPENDICES

Appendix A – EISPN and DEIS Comment Letters
Appendix B – Acoustic Study
Appendix C – Air Quality Study
Appendix D – Aquatic Habitat and Water Quality Impact Assessment
Appendix E – Archaeological Report and SHPO Letter (dated July 23, 1999)
Appendix F – Traffic Impacts Analysis Report