EXECUTIVE CHAMBERS

HONOLULU

JOHN WAIHEE
GOVERNOR

January 23, 1991

The Honorable Barbara Kim Stanton
Acting Director
Department of Business,
Economic Development and Tourism
State of Hawaii
Honolulu, Hawaii 96813

Dear Ms. Stanton:

I am pleased to accept the Final Environmental Impact Statement for THE WATERFRONT AT ALOHA TOWER as satisfactory fulfillment of the requirements of Chapter 343, Hawaii Revised Statutes. This environmental impact statement will be a useful tool in the process of deciding if the action described therein should be allowed to proceed. My acceptance of the statement is an affirmation of the adequacy of that statement under the applicable laws and does not constitute an endorsement of the proposed action.

When the decision is made regarding the proposed action itself, I expect the proposing agency to consider if the societal benefits justify the environmental impacts which will likely occur. These impacts are adequately described in the statement, and together with the comments made by reviewers, provide useful analysis of the proposed action.

With kindest regards,

Sincerely,

JOHN WAIHEE

cc: Bruce S. Anderson, Ph.D.

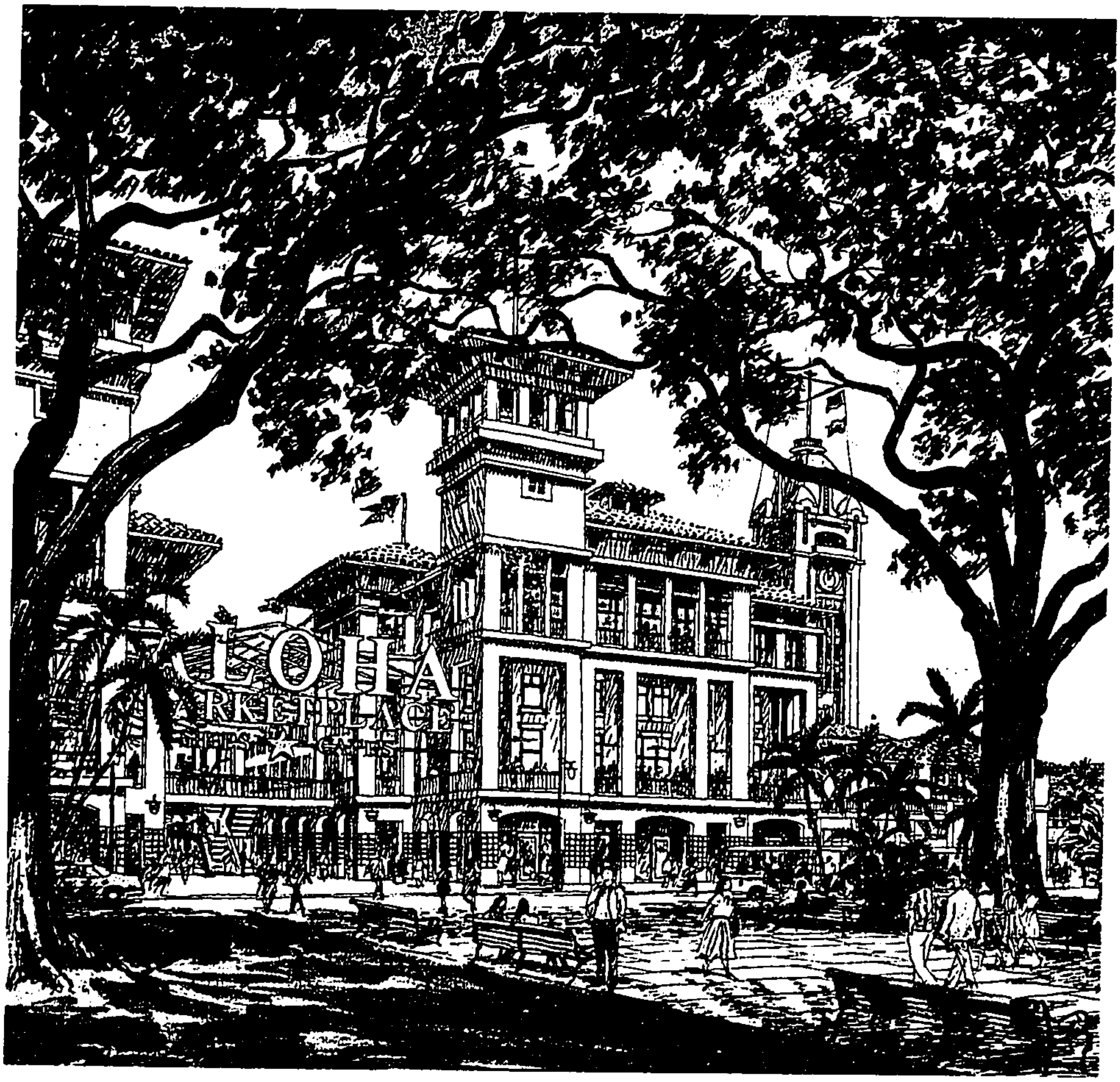
1991 - Oahu - FEIS - Aloha Tower

FILE COPY

THE WATERFRONT AT ALOHA TOWER

FINAL ENVIRONMENTAL IMPACT STATEMENT

Prepared for:
STATE OF HAWAII
ALOHA TOWER DEVELOPMENT CORPORATION
Prepared by:
Aloha Tower Associates and Wilson Okamoto & Associates, Inc.


LOHA
ARKETPLACE

THE WATERFRONT AT ALOHA TOWER

FINAL ENVIRONMENTAL IMPACT STATEMENT

This environmental document is prepared pursuant
to Chapter 343, Hawaii Revised Statutes

Proposing Agency:

Aloha Tower Development Corporation
State of Hawaii

Accepting Authority:

Governor, State of Hawaii

Responsible Official:

Daniel Orodenker
Executive Assistant
Aloha Tower Development Corporation, State of Hawaii

11/29/90
Date

Prepared by:

ALOHA TOWER ASSOCIATES
AND
WILSON OKAMOTO AND ASSOCIATES, INC.
Honolulu, Hawaii

December 1990

THE WATERFRONT
AT ALOHA TOWER

FINAL
ENVIRONMENTAL IMPACT STATEMENT

PREPARED FOR:
STATE OF HAWAII
ALOHA TOWER DEVELOPMENT CORPORATION

PREPARED BY:
ALOHA TOWER ASSOCIATES
AND
WILSON OKAMOTO AND ASSOCIATES, INC.

DECEMBER 1990

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PREFACE

This final environmental impact statement is prepared pursuant to Chapter 343, Hawaii Revised Statutes, and Title 11, Chapter 200, Administrative Rules, Department of Health, State of Hawaii. Proposed is an agency action by the Aloha Tower Development Corporation.

The Final EIS contains revisions, additions and clarifications responding to comments received on the previous Draft EIS which was distributed for public review in August, 1990. In addition to comments formally received, responded to and reproduced herein, on-going design refinements and discussions with agencies and other parties have also contributed to refinements in the Final EIS as discussed below.

Based on continuing discussions with Federal and State agencies regarding potential impacts of constructing subsurface parking garages, alternatives for reducing the depths of such garages at Piers 5 and 6 and the peninsula at Piers 8 through 11, are being considered. These alternatives will not increase building heights, "footprints" or overall building mass as proposed in the Draft EIS. Additional parking at or above grade will be absorbed through interior modifications of proposed structures. Minor adjustments in parking access, approximate stall counts and floor areas have been incorporated in the Final EIS. These adjustments will not significantly affect long-term impacts as assessed the Draft EIS. Construction-related requirements for the alternatives will be similar although significantly reduced in scale and magnitude of short-term impacts as related to site dewatering, discharge of dewatering effluent in the harbor, volume of excavated material, siltation from excavation work, and treatment of excavated material contaminated with petrochemicals.

A design refinement reflected in the Final EIS (see figure 5) is the layout for the proposed office tower complex. The proposed office tower component generally fits within the same "footprint" and is otherwise similar to the description provided in the Draft EIS with respect to height, square footage, etc. Thus, the view plane assessment, which has not been changed in the Final EIS, remains valid although the shape of the building will be rectangular instead of cylindrical. The refined layout provides more public open space and access around the base of the tower than the previously depicted layout. It incorporates a new design for the pedestrian overpass of Nimitz Highway to Walker Park and will be accessible by wheelchair.

An omission in the Draft EIS that will not affect the impact assessment is a restaurant facility in the condominium complex at Piers 13 and 14. The restaurant will primarily serve residents of the buildings.

A name change in two project components was required due to a prior claim to those names. The "Harbor Centre Office Complex" and "Harbor Centre Hotel" referred to in the Draft EIS are identified as "One Aloha Tower Office Complex" and "Aloha Tower Hotel," respectively, in the Final EIS.

Finally, based on continuing discussions with the Hawaii Maritime Center, it has been clarified in the Final EIS that the development of the proposed Duke Kahanamoku Sports Center and the extension of the Center's Pacific Canoe Museum display into the theme of the proposed marketplace are subject to mutual approval of Aloha Tower Associates and the Hawaii Maritime Center.

SUMMARY SHEET

THE WATERFRONT AT ALOHA TOWER

Proposing Agency: Aloha Tower Development Corporation
33 South King Street, Suite 403
Honolulu, HI 96817
Contact: Daniel Orodenker

Developer: Aloha Tower Associates
841 Bishop Street, Suite 2006
Honolulu, HI 96813
Contact: U. J. Rainalter, Jr. or Eric K. Smith

EIS Preparer: Wilson Okamoto & Associates, Inc.
1150 South King Street, Suite 800
Honolulu, HI 96814
Contact: Earl K. Matsukawa, Project Manager

Accepting Authority: Governor John D. Waihee
State of Hawaii

Tax Map Keys: 1-7-01, 2-1-01, 2-1-13, 2-1-15, and 2-1-27

Area: 22.4 acres

Location: Piers 5 through 14, excluding portions of Pier 7, Honolulu Harbor

Ownership: State of Hawaii

Existing Uses: Maritime facilities, vehicular parking, commercial activities, and governmental offices.

Proposed Action: The proposed project will integrate cruise ship and intraisland ferry terminal and support facilities with governmental and commercial office space, retail space, hotel, and residential condominiums.

Impacts: The beneficial impacts of the project are those which are intended by the State law creating the Aloha Tower Development Corporation (ATDC). The purpose of the

ATDC is: "*to strengthen the international economic base of the community in trade activities, to enhance the beautification of the waterfront, and in conjunction with the department of transportation to better serve modern maritime uses, and to provide the public access and use of the waterfront property.*" Properly developed, the Aloha Tower complex will further serve as a stimulant to the business community and help transform the waterfront into a "people place." (Chapter 206J, HRS)

The Waterfront at Aloha Tower fulfills this intent through a development which is both functional and attractive. The development will be a new focal point for the Downtown area, with a colorful mixture of harbor functions, retail uses, commercial and governmental offices, hotel and residential condominiums set within a classical architectural style and generous park and plaza open space.

Potential short-term construction impacts on the landward environment are less of a concern with regard to the natural environment, which is already modified, than it is to urban concerns such as those associated with traffic congestion, noise, vibration, dewatering, air quality, disposal of hazardous materials and protection of historical resources. These types of impacts will be mitigated or controlled through a variety of governmental regulations as well as the use of prudent construction methods. All significant historical resources, including Aloha Tower and Irwin Park, will be preserved and enhanced by the proposed development.

Short-term impacts on the marine environment are associated with the disposal of dewatering effluent and siltation during construction operations. Such impacts will be within the order of magnitude presently associated with storm events and shipping operations. If deemed necessary, measures to control freshwater input and siltation will be implemented.

Long-term impacts of the project with regard to traffic, parking, noise, air quality, view planes and supporting infrastructure will be marginal in relation to existing and projected future conditions. Roadway improvements along the Nimitz Highway frontage of the project site shall alleviate more peak hour traffic congestion than will be generated by the project. Important ocean vistas will be re-opened by the project, particularly down Fort and Bishop Streets. Infrastructural improvements such as for water, sewer and drainage will be required.

Long-term impacts on the marine environment include the alteration of some marine habitats where pier supported structures will extend over presently open waters at Piers 5 and 6 and from Piers 12 through 14. Some loss of fringing coral at Piers 5 and 6 will be incurred as a result. Other marine ecosystems are expected to recover following construction.

Social impacts of the proposed project are positive with regard to construction and long-term employment, generation of revenues to the State, revenues for Downtown merchants and overall image of the Downtown area. The project also includes a program to assist in providing fit and affordable housing for the very poor in Hawaii through a foundation supported by a percentage of net project revenues.

Marginal impacts on the provision of public facilities and services are anticipated as a result of the development. These will be more than offset by tax revenues generated by the project. The project will include private recreational facilities to offset new demands on active public recreational facilities which are in short supply in the Downtown area. Displacement of existing tenants at Piers 5 through 14 is an unavoidable impact. Some of the displaced businesses which occupy office space may return after development, with preference given for maritime-related activities. Most of the present tenants are on month-to-month revocable permits.

Relationship to Plans & Policies:

The proposed development will be developed in consonance with various land use plans, policies and regulatory controls, including, but not limited to, the Hawaii State Plan and Functional Plans, the City and County General Plan, the Honolulu Waterfront Master Plan, and 2010 Master Plan for

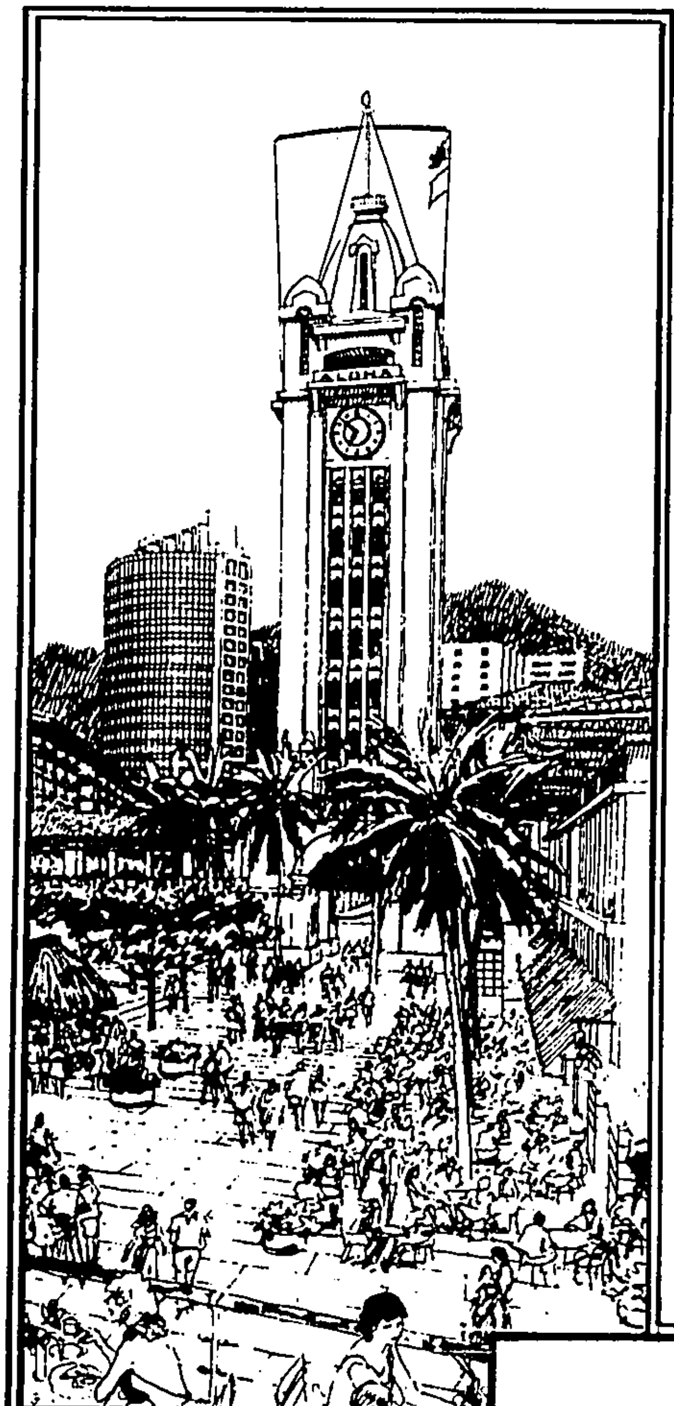
Honolulu Harbor. Specific permits and approvals that may be required for the project are listed in Section V-D herein.

Alternatives Considered:

The no-action alternative would prevent the fulfillment of the ATDC's mandate. Alternative developments to the proposed Waterfront at Aloha Tower were duly considered by the ATDC in its proceedings to select the developer. Notably, the Waterfront at Aloha Tower as depicted herein proposes the least density and the greatest economic returns to the State of the development proposals that were considered in the most recent developer selection proceedings.

Unresolved Issues:

No unresolved issues were identified.



CHAPTER I

BACKGROUND INFORMATION

I. BACKGROUND INFORMATION

A. Project Need

The State of Hawaii has recognized Aloha Tower and the surrounding piers as a valuable asset to be developed in the best interests of the citizens of the State. The area remains the State's focal point for cruise and interisland ship activity. The State has also recognized that the land area surrounding Aloha Tower can become a major center for people-oriented activities, including commercial, hotel, and retail functions which will complement the adjacent central business district, the on-going redevelopment of the Kakaako area by the Hawaii Community Development Authority, and the long-range vision set forth in the Honolulu Waterfront Master Plan.

Pursuant to this recognition, the first State effort to develop the Aloha Tower area was initiated by the State Legislature when it enacted House Bill No. 1874, House Draft 2, Senate Draft 1 in the 1981 legislative session. This legislation acknowledged the economic value of the Aloha Tower area and created the Aloha Tower Development Corporation (ATDC) to act as the State of Hawaii agency to develop the area. The bill assigned ATDC to the State of Hawaii Department of Business and Economic Development (DBED) for administrative purposes and was signed into law as Act 236, Session Laws of Hawaii 1981, by Governor George R. Ariyoshi on June 23, 1981. It was codified in the Hawaii Revised Statutes (HRS) as Chapter 206J and states in part:

> *"The legislature further finds that the Aloha Tower complex still serves a vital maritime function that must be maintained to insure adequacy and viability for existing and future maritime activities. The purpose of this chapter is to establish a new public body corporate and politic and public instrumentality of the...Aloha Tower complex to strengthen the international economic base of the community in trade activities, to enhance the beautification of the waterfront, and in conjunction with the department of transportation to better serve modern maritime uses, and to provide the public access and use of the waterfront property. Properly developed, the Aloha Tower complex will further serve as a stimulant to the business community and help transform the waterfront into a 'people place'."*

B. Aloha Tower Development Corporation (ATDC)

The ATDC is charged with defining, protecting and maximizing the public interest during the redevelopment of the Aloha Tower area. Because the proposed development project will not use government funding for any of the improvements, the ATDC is also charged with the enhancement of the commercial feasibility and financial attractiveness of the project to enlist the participation of private enterprise.

Chapter 206J established a board of seven voting directors to oversee the activities of ATDC. Of the seven directors, four are ex-officio public officers and three are appointed by the Governor from the public at large. The four ex- officio members are: the Director of DBED, who is designated by law as Chairperson; the Director of Department of Transportation; the Chairperson of the Board of Land and Natural Resources; and the Mayor of the City and County of Honolulu. Mr. Randall Y. Iwase served as Executive Officer of ATDC from November 21, 1988 to July 31, 1990.

In 1988, ATDC issued the current administrative rules for selecting a developer and administering the development of the Aloha Tower area. These rules were adopted in February, 1989, after which ATDC issued a Request for Proposals (RFP) to develop the Aloha Tower area.

On October 3, 1989, four proposals to develop the Aloha Tower area were submitted by development teams to ATDC. The development teams made presentations of their proposals to ATDC and its consultant team on November 2 and 3, 1989. The proposals were then evaluated in detail by ATDC and its consultant team.

On December 21, 1989, a public hearing and a meeting were held to select the development team. After testimony from the public, the ATDC Board of Directors selected Aloha Tower Associates (ATA) as the designated developer for the Aloha Tower area.

C. Aloha Tower Associates

ATA is a general partnership formed under the laws of the State of Hawaii. The general partners of ATA are Aloha Tower Enterprise Hawaii Limited Partnership, an affiliate of The Enterprise Development Company of Columbia, Maryland (James W. Rouse, Chairman), and Aloha Tower Hawaiian Partners, a limited partnership registered in the State of Hawaii. The General Partner of Aloha Tower Hawaiian Partners is ATA, Inc., a registered Hawaii corporation, and the Limited Partners are Robert H. Gerell, George F. Hutton, Glenn K. Okada, U. J. Rainalter, Jr., and Peter S. Smith, all legal Hawaii residents.

As a means of creating an additional benefit for the State of Hawaii through development of the Waterfront at Aloha Tower, ATA and The Enterprise Foundation of Columbia, Maryland, will establish The Aloha Tower Housing Foundation. The purpose of the Foundation will be to assist in providing fit and affordable housing for the very poor in Hawaii. It is proposed that the Foundation be sustained by the development of the Waterfront at Aloha Tower through an initial contribution of $2 million from ATA for the purpose of establishing a working capital fund during construction of improvements, and a contribution of five percent of pre-tax profits from the rental and sale of improvements during the term of ATA's ownership of improvements. It is also proposed that the project's permanent lenders for the non-residential components be required to make similar contributions equal to five percent of interest earnings during the term of ATA's ownership of improvements. During the first ten years following completion of improvements, it is estimated that $44 million in contributions will be made to the Foundation out of operating and sales revenues of The Waterfront at Aloha Tower.

D. Project Area

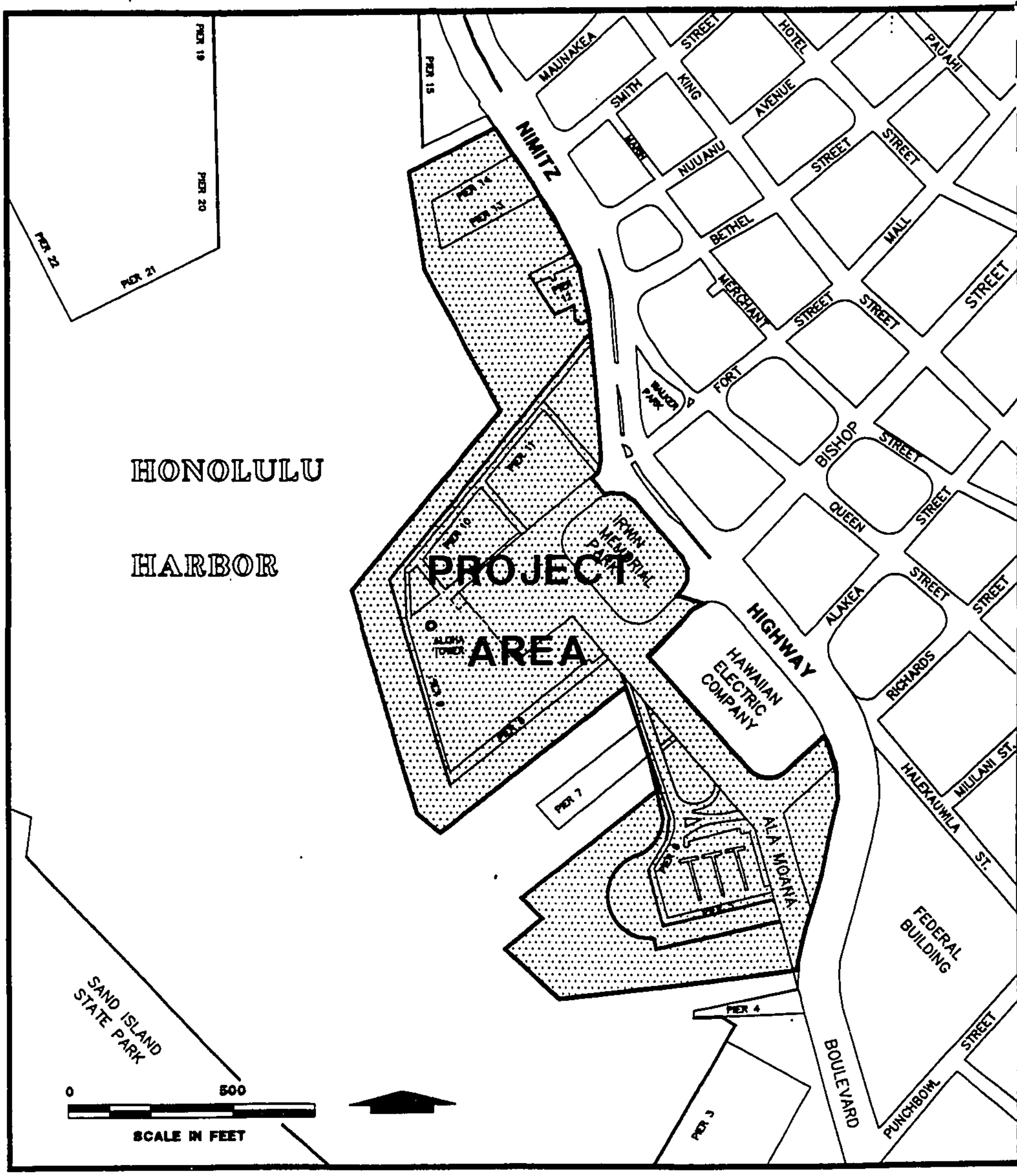
The project area for the Waterfront at Aloha Tower proposed by ATA presently encompasses Piers 5 through 14, excluding portions of Pier 7 (see figure 1). This area is located within Tax Map Key plats 1-7-01, 2-1-01, 2-1-13, 2-1-27, and 2-1-15 (see figure 2). All of the parcels within the project site are owned by the State of Hawaii. With respect to the current ATDC boundaries (see figure 3), the project area extends beyond the southeastern boundary at Piers 5 and 6 where the pier extensions are planned. Otherwise, the project area is completely within the ATDC boundary, which also includes Pier 7 and areas to the northwest as far as Pier 23 and portions of the Iwilei area.

1. Land Ownership

All land within the project site from Piers 5 to 14 is owned by the State of Hawaii, and is controlled by the Department of Transportation, Harbors Division. Ala Moana Mini Park, while also owned by the State of Hawaii, is controlled by Department of Transportation, Highways Division.

2. Harbor Functions

Piers 5 and 6 flank the filled land peninsula makai of the Federal Building (see figure 4). The peninsula is used as a public parking lot while Pier 5 is the berthing area for the Alii Kai dinner cruise vessel. Pier 6, currently unoccupied, was recently vacated by the defunct Oceania Floating Restaurant. Makai of the HECO power plant at Pier 7 is the Hawaii Maritime Museum. Coasters Restaurant is adjacent to the Hawaii Maritime Museum along the pier. The "Falls of Clyde," a four-masted schooner listed on the National Register of Historic monuments and given National Landmark status in 1989, is permanently berthed on the Ewa side of Pier 7. Neither the Hawaii Maritime Museum nor the Falls of Clyde are within the project area. Piers



THE WATERFRONT AT ALOHA TOWER	Prepared for : ALOHA TOWER DEVELOPMENT CORPORATION
Fig. 1 PROJECT AREA MAP	Prepared by : ALOHA TOWER ASSOCIATES WILSON OKAMOTO & ASSOCIATES, INC.

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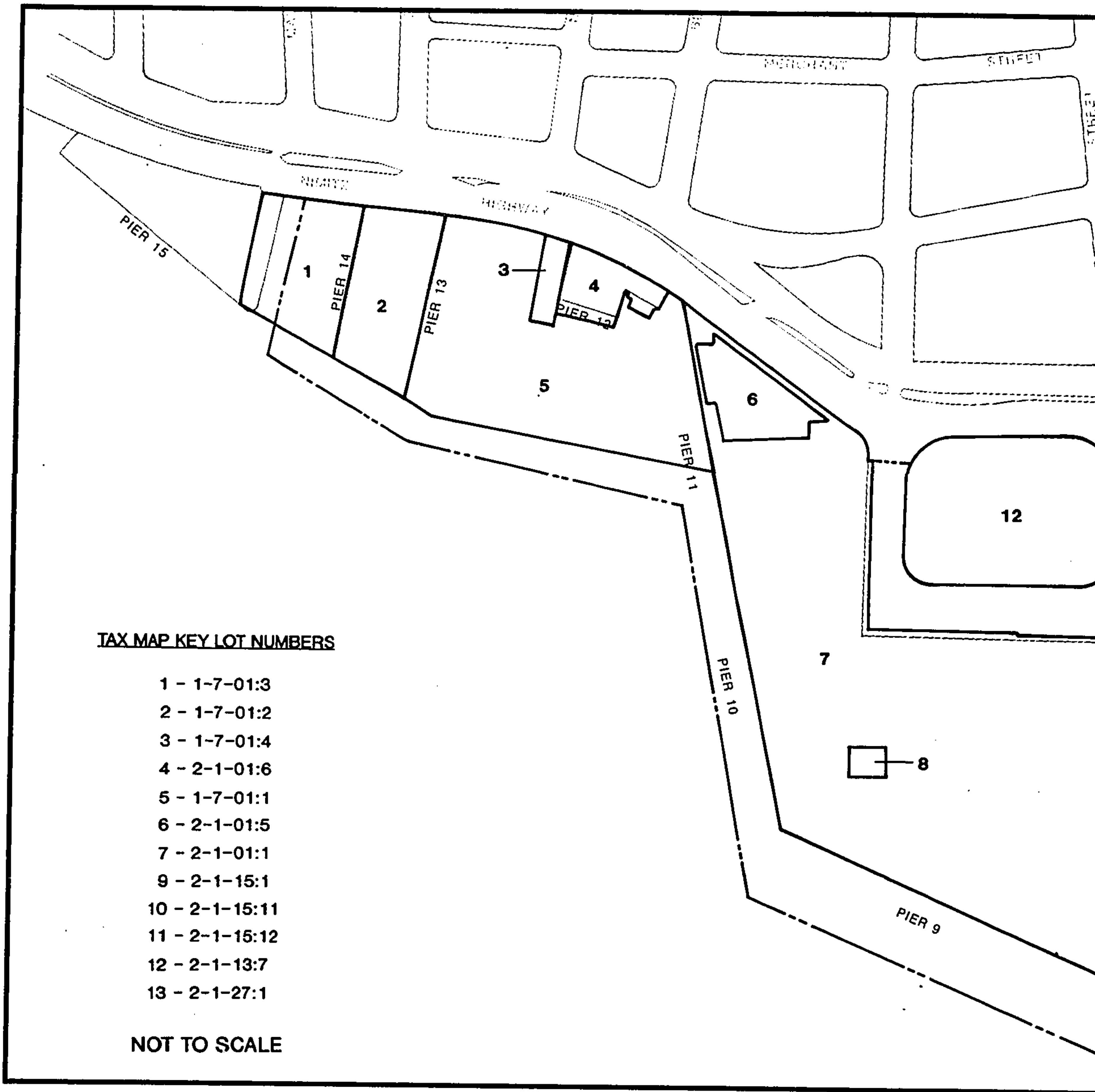

THE WATERFRONT AT ALOHA TOWER

Fig. 2

PROJECT AREA BY TMK PARCELS

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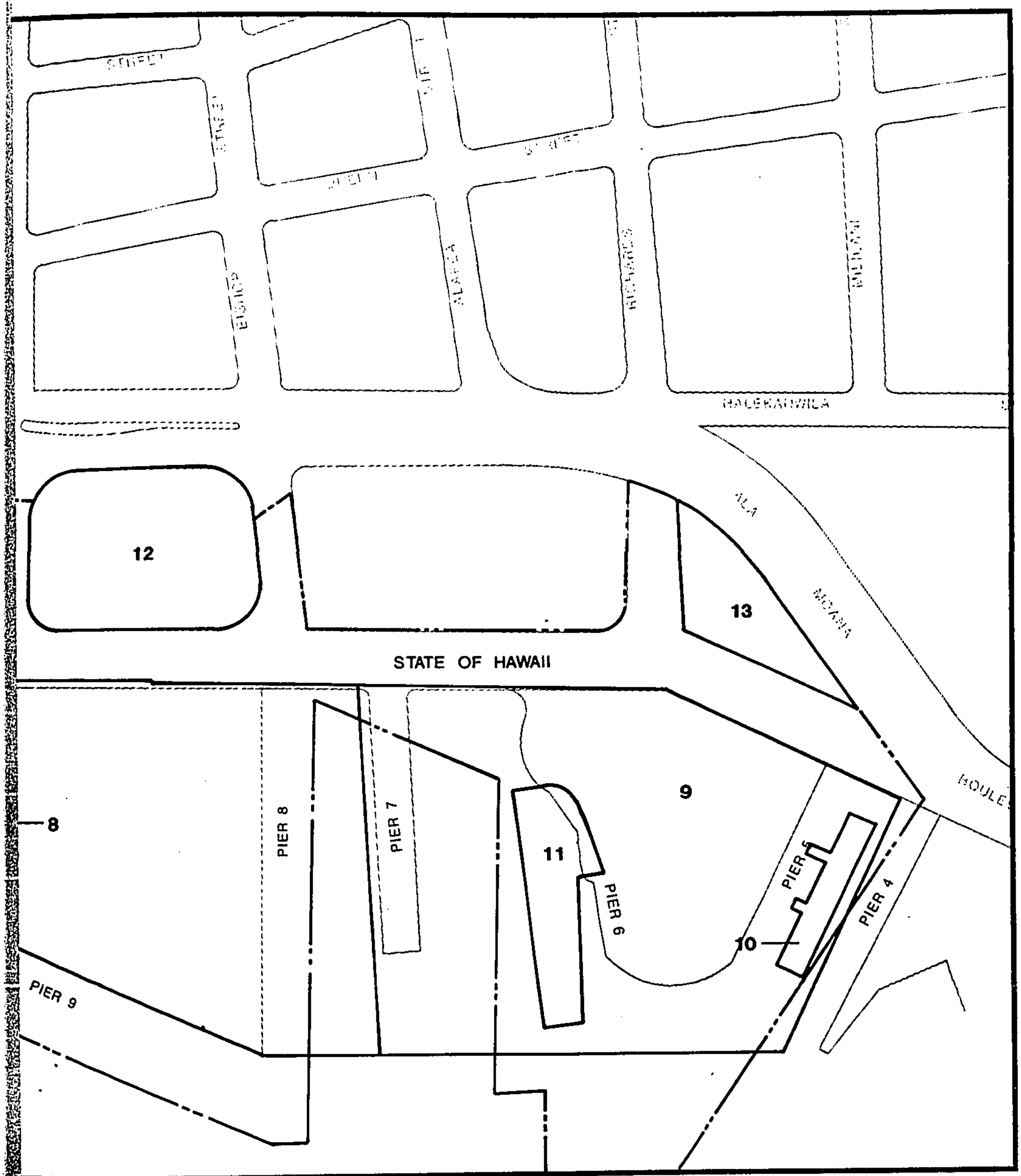
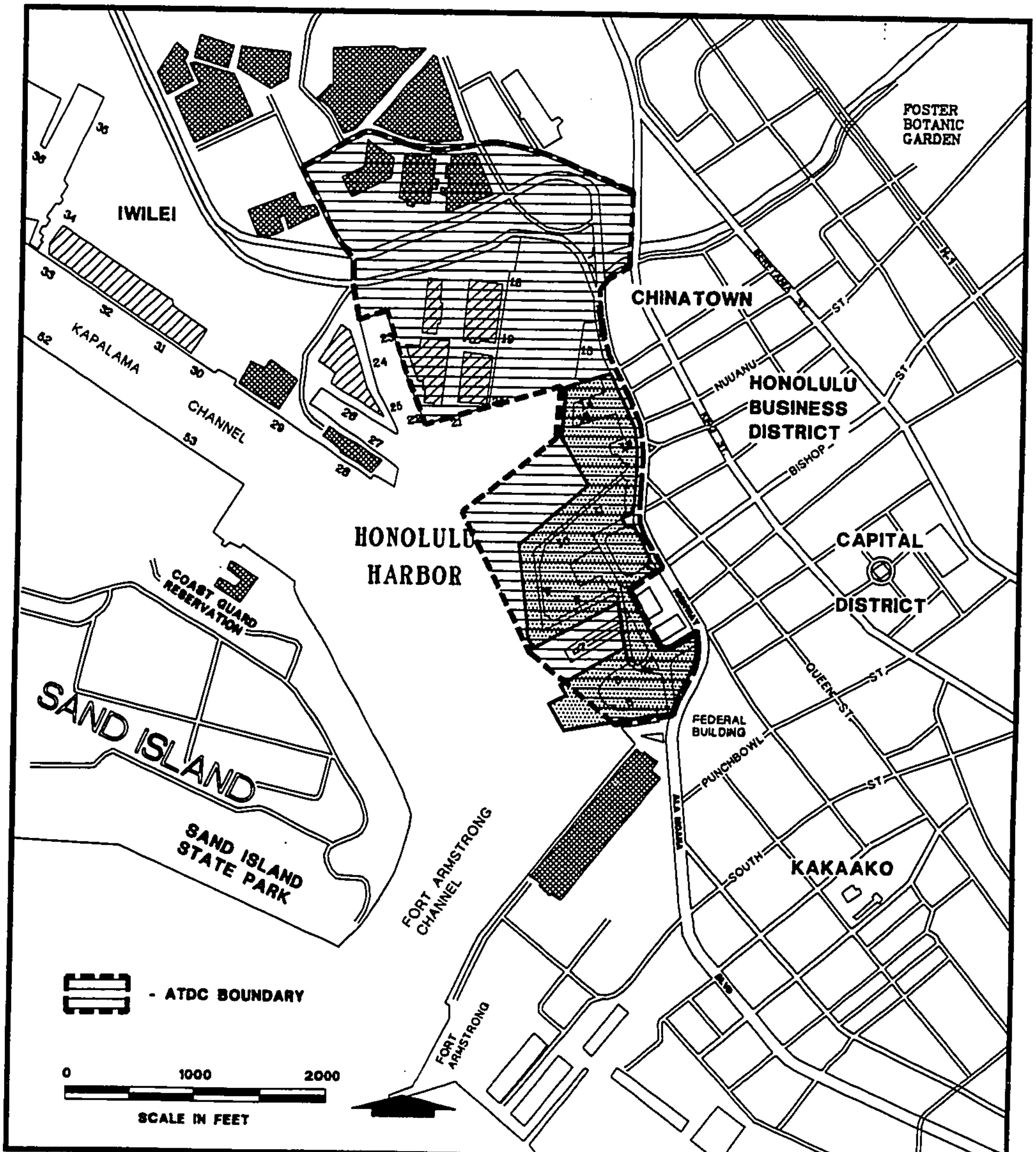


MK PARCELS

Prepared for :
ALOHA TOWER
DEVELOPMENT CORPORATION

Prepared by :
ALOHA TOWER ASSOCIATES
WILSON OKAMOTO
& ASSOCIATES, INC.



THE WATERFRONT AT ALOHA TOWER	Prepared for : ALOHA TOWER DEVELOPMENT CORPORATION Prepared by : ALOHA TOWER ASSOCIATES WILSON OKAMOTO & ASSOCIATES, INC.
Fig. 3 ATDC BOUNDARY	

8, 9, 10 and 11 front the land-filled peninsula on which Aloha Tower is located. The U-shaped building that occupies the peninsula and surrounds Aloha Tower consists of the following three levels:

Pier Level:	Shipping and receiving, parking lot, rental storage space, restaurant, office space, and the Harbor Patrol office.
Mall Level:	Passenger terminals at Piers 9 and 10, Harbors Division District Office Services, commercial offices along a 12,500 square foot gallery between Pier 8 and 11, Aloha Gift and Camera shop, and American Hawaii Cruises.
Mezzanine Level:	U.S. Immigration Service, shipping agents, and U.S. Customs.

Aloha Tower contains offices for the Department of Transportation (DOT) Administration Services, the Harbor District Manager for Oahu, the Hawaii Pilots Association, the Hawaii Maritime Museum, as well as the clock room and the observation deck.

Hale Awa Ku Moku Building (the former Matson Building) on Nimitz Highway at the mauka end of Pier 11 houses the administrative offices of the Harbors Division and the Motor Vehicle Safety Office. Parking for DOT employees and visitors is provided on ground level pavement outside the building.

Pier 12 is a land-filled pier used as a parking lot by DOT employees.

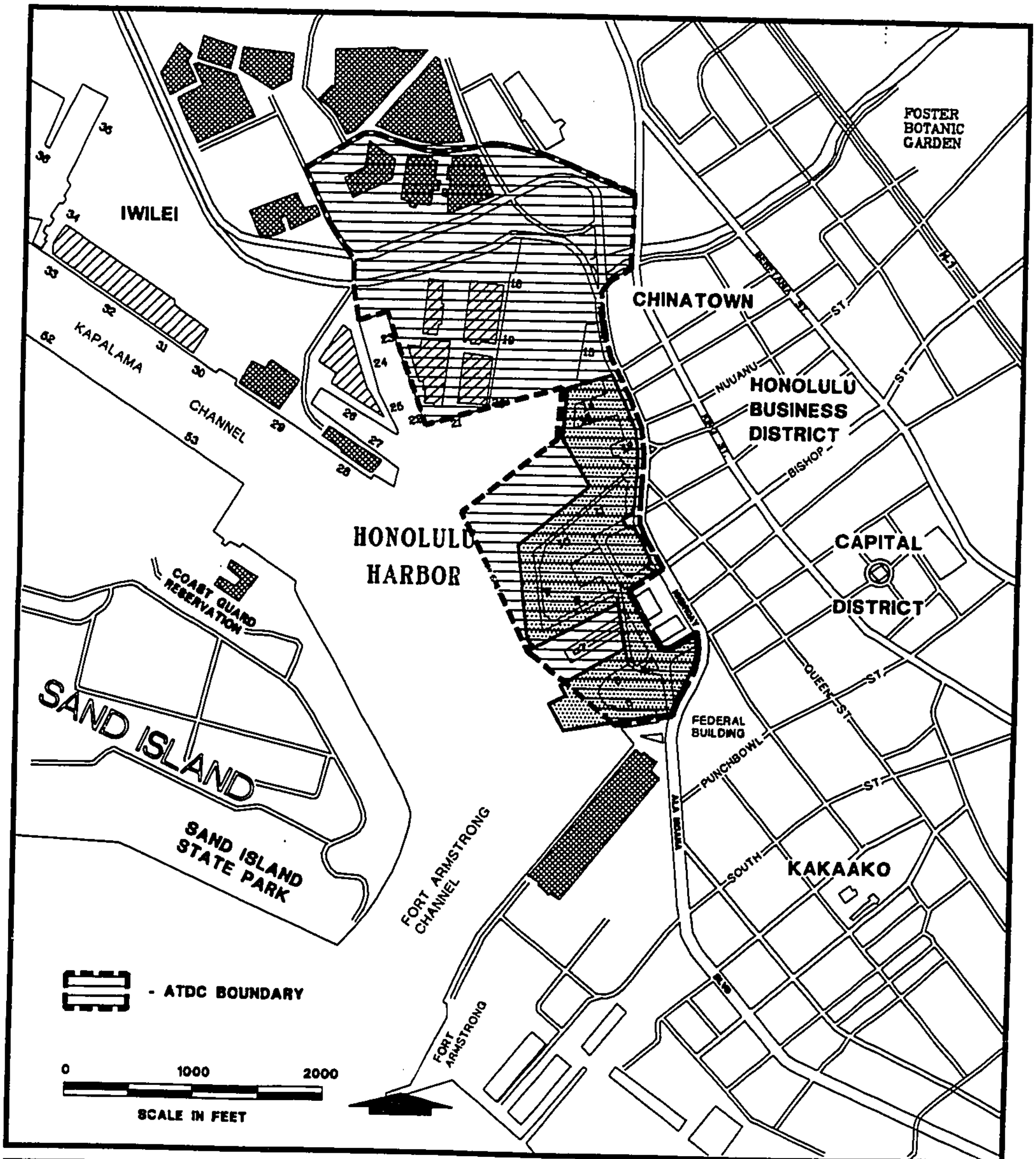
Piers 13 and 14 flank a pile supported, covered structure which is occupied by a marine salvage company, and Midpac Towing. An ice dispenser at the pier's end supplies fishing boats.

CORRECTION

THE PRECEDING DOCUMENT(S) HAS BEEN REPHOTOGRAPHED TO ASSURE LEGIBILITY

SEE FRAME(S)

IMMEDIATELY FOLLOWING



THE WATERFRONT AT ALOHA TOWER

Fig. 3
ATDC BOUNDARY

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Prepared by :
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WILSON OKAMOTO
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8, 9, 10 and 11 front the land-filled peninsula on which Aloha Tower is located. The U-shaped building that occupies the peninsula and surrounds Aloha Tower consists of the following three levels:

Pier Level:	Shipping and receiving, parking lot, rental storage space, restaurant, office space, and the Harbor Patrol office.
Mall Level:	Passenger terminals at Piers 9 and 10, Harbors Division District Office Services, commercial offices along a 12,500 square foot gallery between Pier 8 and 11, Aloha Gift and Camera shop, and American Hawaii Cruises.
Mezzanine Level:	U.S. Immigration Service, shipping agents, and U.S. Customs.

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Piers 13 and 14 flank a pile supported, covered structure which is occupied by a marine salvage company, and Midpac Towing. An ice dispenser at the pier's end supplies fishing boats.

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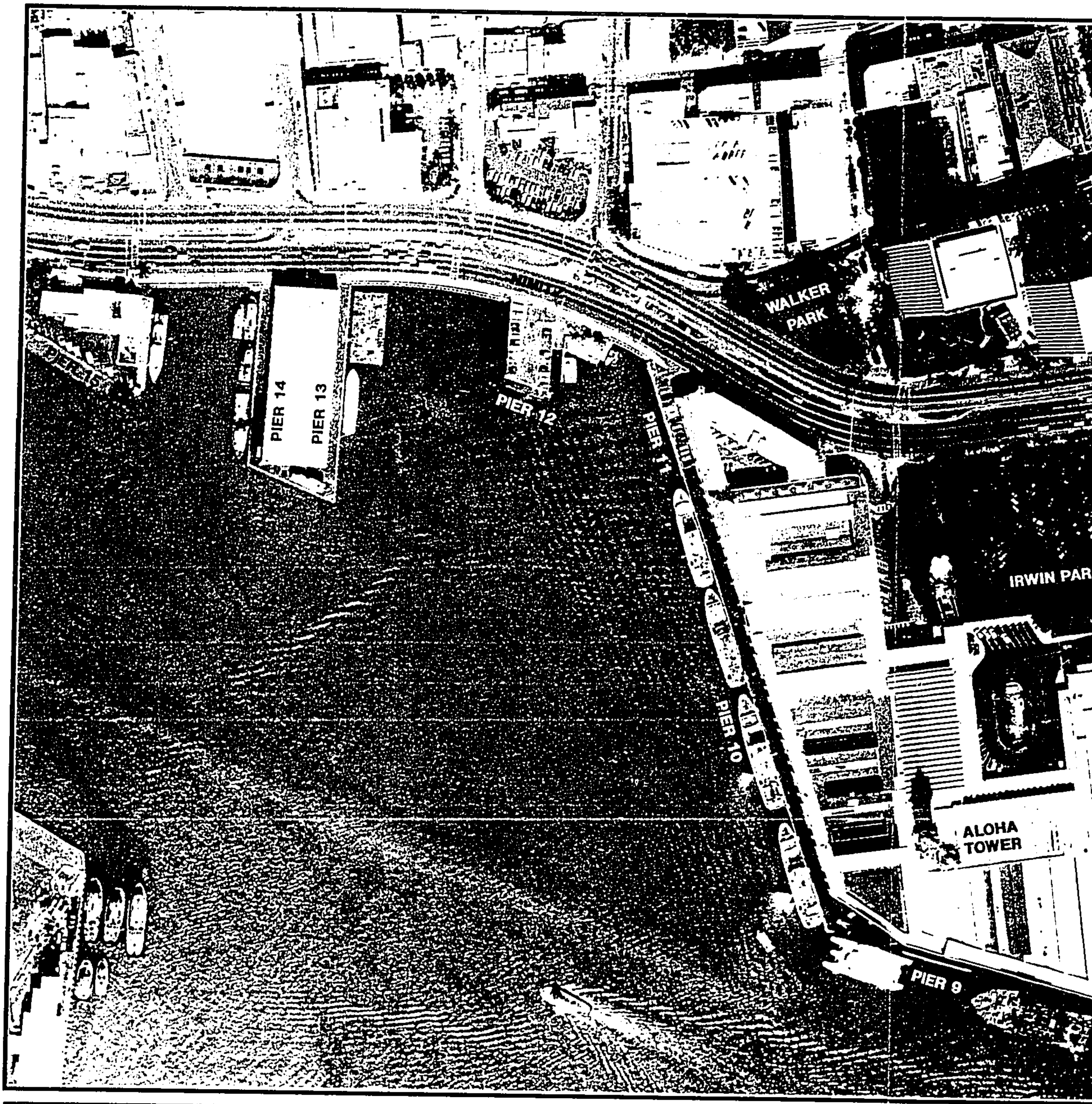

THE WATERFRONT AT ALOHA TOWER	AERIAL PHOTOGRAPH OF PROJECT ARE

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PROJECT AREA

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CHAPTER II

PROJECT DESCRIPTION

II. PROJECT DESCRIPTION

A. Location

The Waterfront at Aloha Tower project area, located makai of Nimitz Highway at Piers 5 through 14 (excluding portions of Pier 7) in Honolulu Harbor, comprises a land area of approximately 22.4 acres (see figure 1). The entire ATDC boundary area, which includes submerged lands surrounding the piers, is approximately 87 acres (see figure 3). Piers 5 through 14 constitute the waterfront edge of the Central Business District (CBD) of Honolulu. The Aloha Tower area is approximately equidistant between Honolulu International Airport and Waikiki and contains the famous landmark, Aloha Tower, as well as Irwin Memorial Park. The Hawaiian Electric Company (HECO) power plant site is not included within the project area.

B. Development Concept

The Waterfront at Aloha Tower will integrate cruise ship and intra-island vessel terminal facilities with hotel, office, retail and restaurant use. These proposed uses will create a distinctive terminus for the Fort Street Mall, which will be extended through the project as a roadway to connect Downtown with the water's edge.

Specifically, proposed development components will include: the Maritime Building and Passenger Terminal with commercial and governmental offices at Piers 5 and 6; the Pedestrian Promenade extending from Piers 5 to 14 with retail emphasis between Piers 6 and 9; Aloha Tower Marketplace retail and office space at Piers 8 and 9 with maritime improvements at the pier fronts; a refurbished and beautified Aloha Tower; the Aloha Tower Hotel at Piers 10 and 11; an international cruise ship terminal at Piers 10 and 11; the One Aloha Tower Office Complex at Pier 11; Honolulu Fort Historic Park at Pier 12; and Honolulu Harborside condominiums at Piers 13 and 14 with maritime facilities at pier level (see figures 5 & 6).

The Waterfront at Aloha Tower is characterized by its high diversity of proposed uses; almost every pier combines commercial maritime operations with public activities. The general purpose of the proposed project is to revitalize the commercial marine cruise ship industry in Honolulu in a manner which makes the waterfront more accessible to the people of Hawaii. The specific purpose of each activity is outlined by pier in table 1.

The construction of public and private improvements will be closely coordinated with the Aloha Tower Development Corporation, both in terms of design and execution. In addition, ATA has established a construction strategy that will permit continued use of Aloha Tower during construction for harbor traffic control purposes.

All improvements for public use within the project area, including roadway improvements at Fort, Bishop and Richards Streets as well as Ala Moana Boulevard, the restored Irwin Park, the new Honolulu Fort Historic Park, Ala Moana Mini Park, the Pedestrian Promenade and plaza areas will be maintained by ATA for the 65 year term of the lease agreement.

C. Architectural Theme

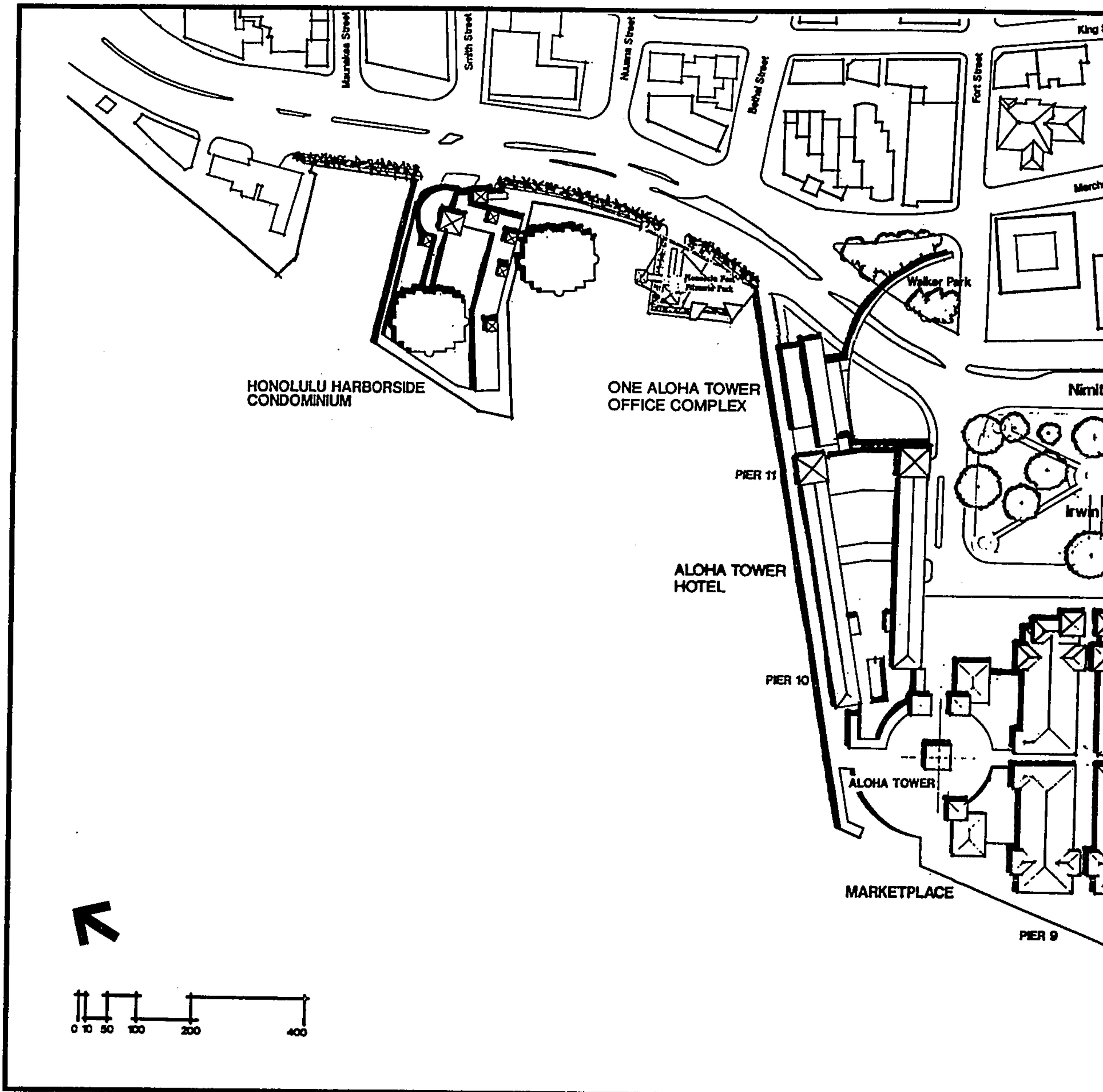
The overriding objective of the Aloha Tower development design has been the preservation of Aloha Tower as the dominant symbol of the waterfront at Honolulu Harbor. The broad circular plaza at the Tower's base, the retail buildings which border this courtyard, and the wide pedestrian promenades which lead into it, will all direct attention to this historic landmark. Aloha Tower itself will be beautified and refurbished, and may be connected by escalator from the main plaza to parking below so that it will be the focal point of activity for visitors, both coming and going. Fort Street, one of Honolulu's oldest streets, will provide street level vistas through new archways at the reconstructed base of Aloha Tower to the ocean beyond. The proposed high-rise structures at the mauka portion of the project site will be situated in order not to detract from Aloha Tower's prominence on the waterfront.

The low-rise structures adjacent to Aloha Tower have likewise been designed to emphasize the prominence of Aloha Tower as the symbol of the entire waterfront. The wide windows, gentle archways, green tile roofs and recessed lanais of these buildings are all reminiscent of what is known as the classical era in Hawaiian architecture.

D. Proposed Development

1. Design Considerations

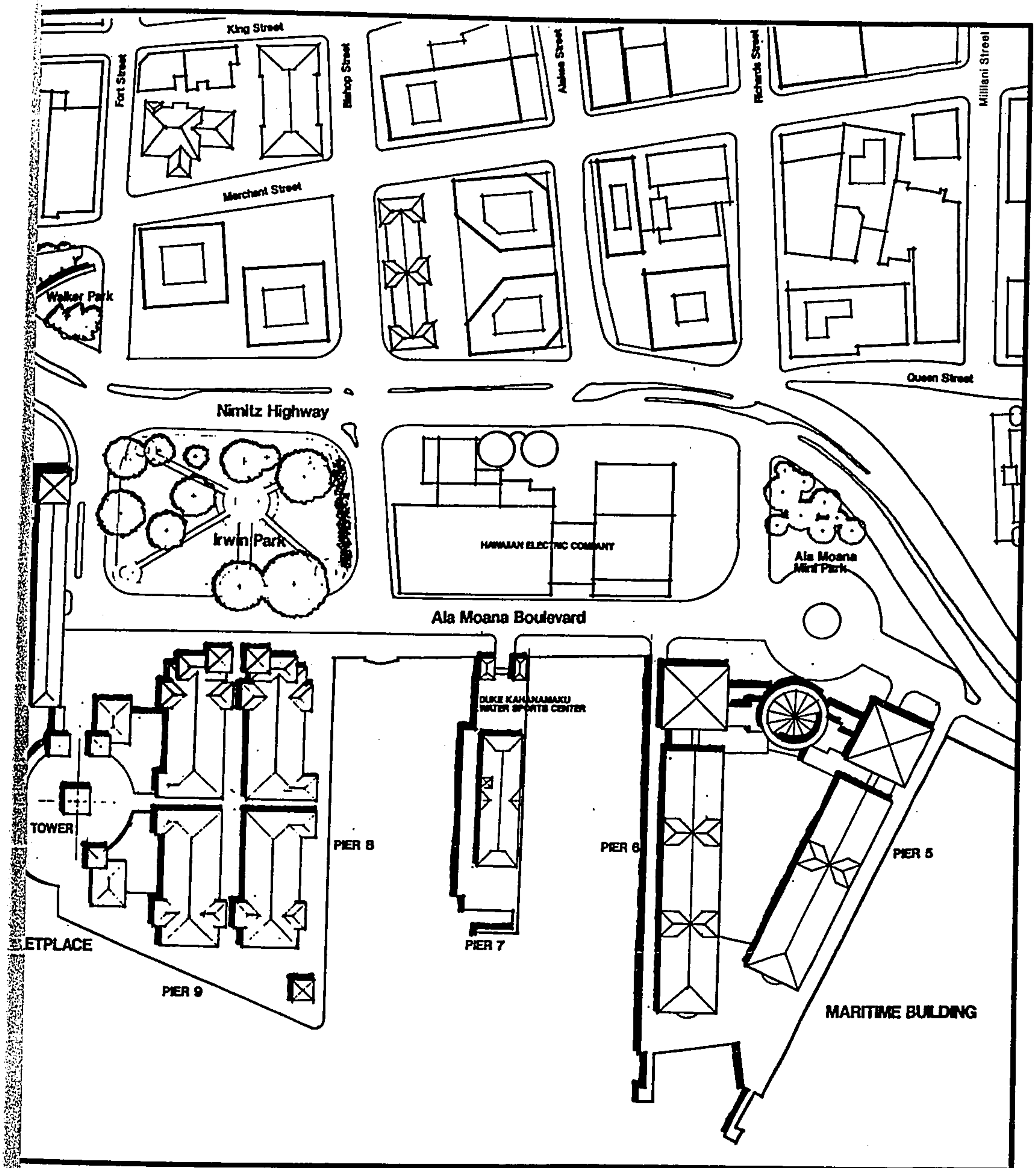
The Development Agreement was executed by ATDC and ATA on June 19, 1990. Certain design changes were requested by the State, including extension of Piers 5 and 6 (to improve the versatility of these cruise ship berth facilities), and implementation of certain servicing and support facilities for the planned ferry system (to better support that future transportation function). In addition, a number of environmental concerns were proactively addressed which resulted in the need for design changes, including a pulling back of proposed subsurface parking structures to areas behind the existing water's edge to minimize ecological disruption, and implementation of the



THE WATERFRONT AT ALOHA TOWER

Fig. 5

ROOF PLAN



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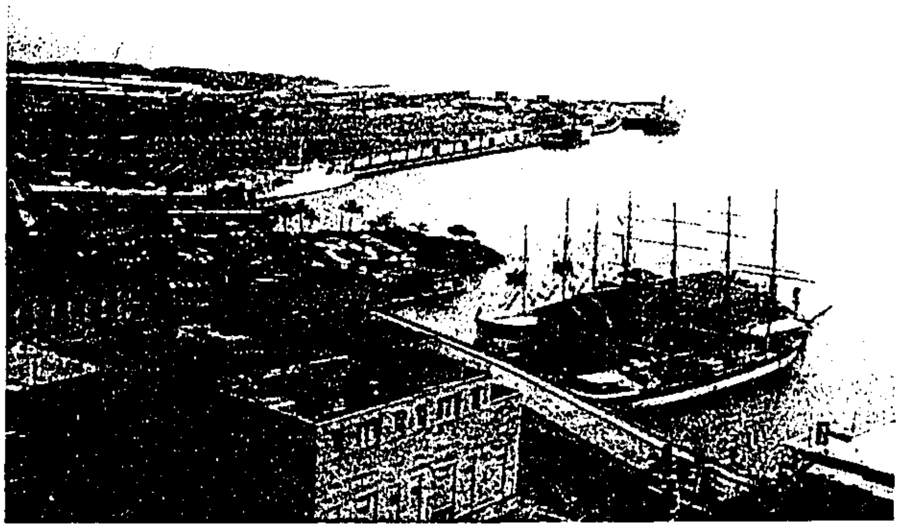
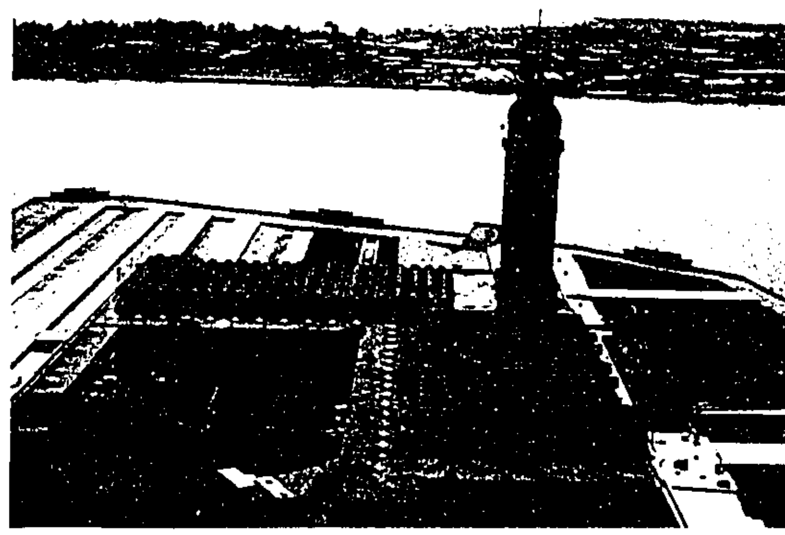
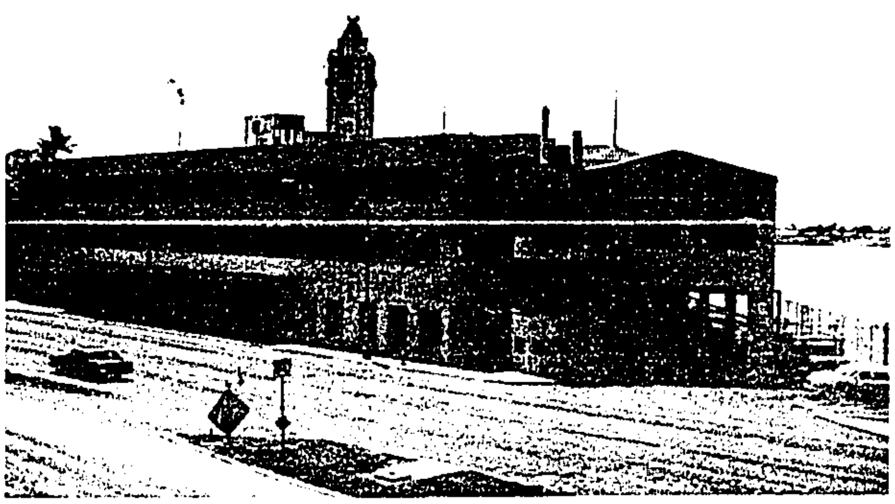


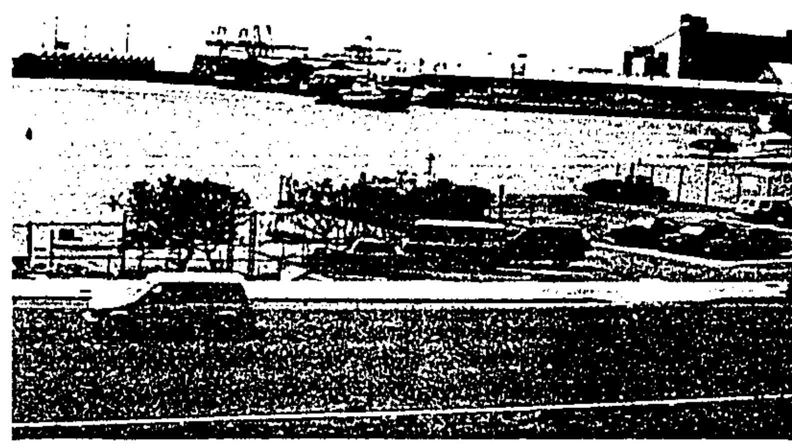
View of Piers 5, 6, and 7. Piers 5 and 6 will be extended to accommodate new Maritime Building and Passenger Terminal. Pier 7 will remain as is, with the addition of the Duke Kahanamoku Water Sports Center at the mauka end. The existing ramp will be demolished.



Over-view of Piers 8 through 10 which will be the site of
Tower Marketplace.



Pier 11, site of the proposed Office Complex/Hotel/Passenger terminal.



Pier 12 is the site of the last visible vestiges of the coral blocks from the walls of the Honolulu Fort built by King Kamehameha in 1819. Project plans are to remove the existing parking lot and create an interpretive historic p

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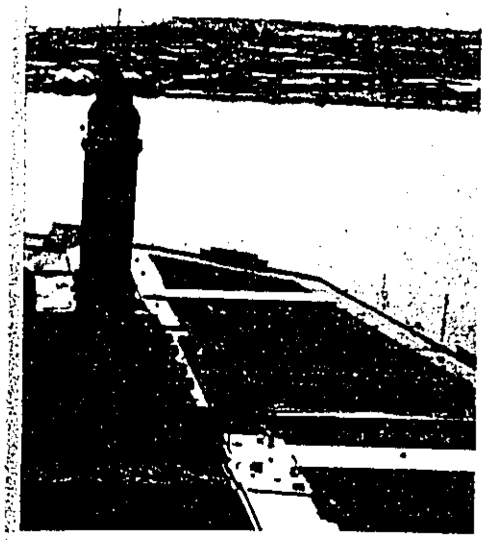
THE PROJECT AREA



10 which will be the site of Aloha

Aloha Tower's base is currently blocked from view down Fort Street. The project proposes to open this view channel through the base of Aloha Tower to the harbor beyond. The Aloha Tower Hotel will be located at right; the refurbished Irwin Park at left.

visible vestiges of the coral
Honolulu Fort built by King
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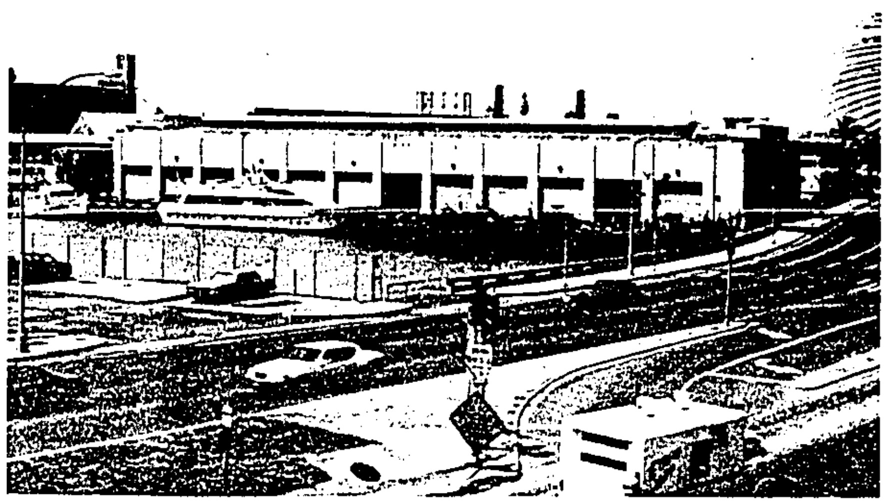
te an interpretive historic park.



Piers 13 and 14 are the site of the twin towers of the proposed Honolulu Harborside Condominium.

Figure 6

TABLE 1: SUMMARY OF PROPOSED USES BY PIERS

Piers 5/6

Commercial Maritime: Modern two-berth cruise ship terminal with associated commercial and maritime-related offices. Occasional contingency use for general maritime berthing.

Public Transportation: Potential boarding site for water taxi and surface-effect ferry service.

Public Access: Beginning of Pedestrian Promenade. Potential public use of cruise ship terminal facilities for civic activities, such as performances, meetings and sports events.

Pier 7

Public Access: Duke Kahanamoku Water Sports Center, Maritime Museum and historic vessel, "Falls of Clyde," as way point attractions on the Pedestrian Promenade.

Pier 8

Public Transportation: High-speed (surface-effect ship) ferry terminal with handicap access for intra-island and inter-island commute services.

Public Access: Continuation of Pedestrian Promenade.

Pier 9

Public Transportation: Public boarding for water taxi.

Public Access: Continuation of Pedestrian Promenade with way points for viewing and participation at amphitheater.

Commercial Recreation: Public boarding facility, including handicap access for existing dinner cruise vessels.

Commercial Maritime: Multi-purpose contingency ship terminal with limited boarding and service facilities. Interim berthing for transient vessels of various types and sizes.

TABLE 1 (CONTINUED)

Piers 10-11

Commercial Maritime: Modern cruise ship terminal for large passenger vessels. Interim berthing for transient commercial vessels.

Public Access: Continuation of Pedestrian Promenade under very limited circumstances when the berth is not occupied.

Pier 12

Public Access: Honolulu Fort historic site improvements as a feature of the Pedestrian Promenade.

Piers 13-14

Private Residential: Condominium complex.

Public Transportation: Water taxi stop, overnight berthing and light maintenance for the surface-effect ferry vessels.

concept of "no net fill" (necessitating the redesign of the parking configuration of the condominiums at Piers 13 and 14).

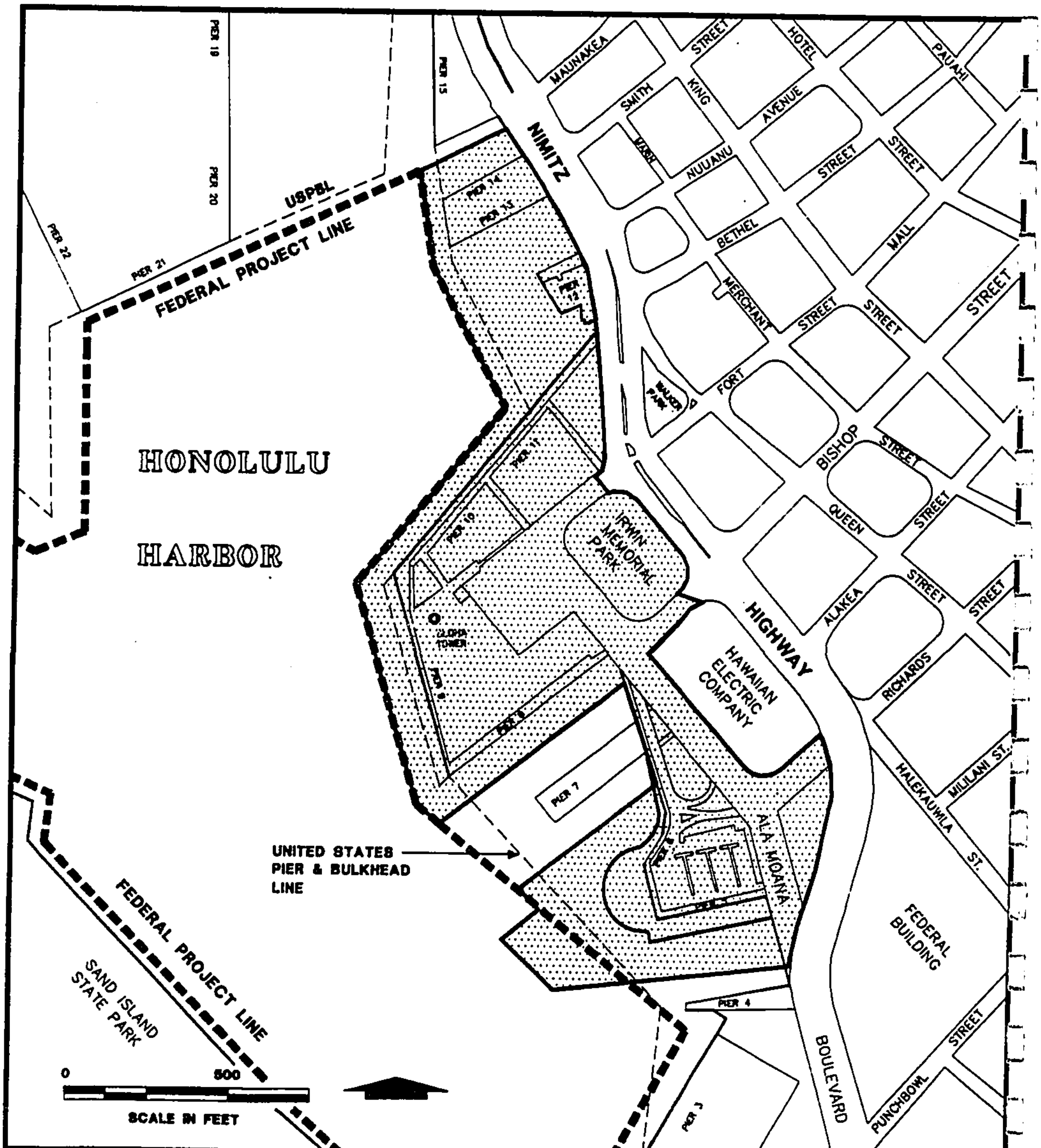
In consideration of the design changes which were necessary to address environmental concerns and requested expansion of public facilities, building heights and densities have been adjusted as depicted in the Draft EIS and reproduced without change herein. These height adjustments were confined to the tower structures only (the office tower at the mauka end of Pier 11, and the two condominium towers between Piers 12 and 14), with the heights of the remainder of the project remaining unchanged. The maximum height for any structure will be limited to 400 feet (the same height limit as established in the neighboring Kakaako area by the State's Hawaii Community Development Authority).

2. The Maritime Building and Passenger Terminal at Piers 5 and 6

The new Maritime Building and Passenger Terminal will be built on Piers 5 and 6, which will be extended to the Federal Project Line (FPL), which is the shoreward limit of federal responsibility for channel maintenance (see figure 7). There will be no increase in the present fill land. As requested by the State, ATA, in conjunction with the Department of Transportation-Harbors Division (DOT-Harbors), will seek to extend this line even further to construct catwalks and breasting dolphins to accommodate the length of larger ships from bow to stern. This will require moving both the United States Pier and Bulkhead Line (USPBL) and the FPL. Changing the USPBL and the FPL requires a Corps of Engineers permit with federal approval. The FPL change may additionally require Congressional action.

The complex at Piers 5 and 6 will include a modified H-shaped building with two long wings located parallel to Piers 5 and 6, each five to six stories tall (see figure 8). At the center of the cross piece joining the two wings will be a circular, sky-lit, central rotunda that is the main entrance to the facility. Office space serving DOT-Harbors, maritime related firms, and others wishing to relocate to the Waterfront will occupy the upper floors. The office space for DOT-Harbors replaces existing office space that will be demolished. Total office space at Piers 5 and 6 will be up to 360,000 gross square feet.

The first two levels of the maritime facility, with a total area of approximately 155,500 gross square feet, will accommodate the loading/unloading of passenger cruise ships; immigration clearance and customs inspection; and loading/unloading of passenger buses. Small retail shops, restaurants, and snack shops (approximately 25,000 gross square feet



THE WATERFRONT AT ALOHA TOWER

Fig. 7
FEDERAL PROJECT LINE

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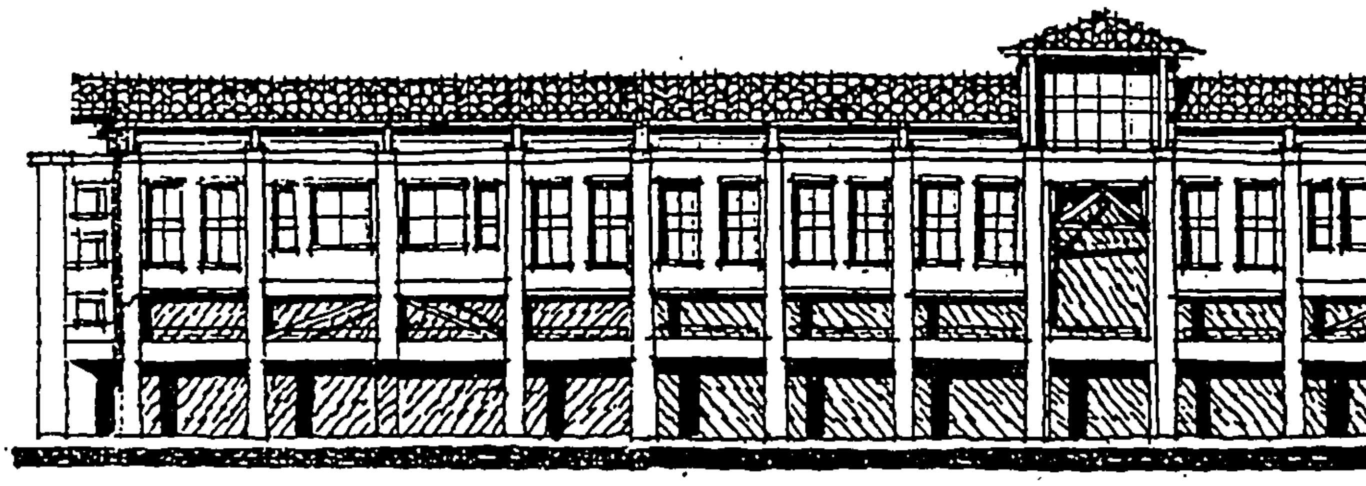

ELEVATION OF PIER 5

ELEVATION FROM ALA MOANA BOULEVARD

THE WATERFRONT AT ALOHA TOWER	Fig. 8 **MARITIME BUILDING ELEVATION**

ARD

ELEVATION

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Harborplace in Baltimore, and Darling Harbourside in Sydney. Honolulu's own Aloha Tower Marketplace will feature retail shops, a variety of small vendors with emphasis on local ownership, and food outlets with a distinctly local character in approximately 307,000 gross square feet of retail space. A multi-plex cinema and entertainment center are planned to complement these attractions. Subject to the mutual approval of ATA and the board of directors of HMC, the Marketplace will also function as an extension of the Pacific Canoe Museum at Pier 7, with appropriate displays throughout the common areas. The upper two floors of the marketplace will be reserved for approximately 130,000 gross square feet of commercial office space, adding the vitality of integrated joint-use to the marketplace concept. Pier 8 will berth the high-speed commuter ferry and any other vessels deemed appropriate. Pier 9, at the seaward face of the peninsula, will have a unique dual-use pier design, allowing water taxis and other smaller power craft to berth at a lowered dock which will also be equipped with breasting dolphins to accommodate large transient and dinner cruise vessels. The Waterfront along Pier 9 will feature outdoor cafes and restaurants, and the Pier's Ewa end will be reconfigured to create a protected inlet for water taxis. This inlet will double as an outdoor amphitheater for public events such as concerts and other stage performances. The makai end of Pier 10 will function in three distinct capacities: as a "stage" for performances at the inlet "amphitheater;" as a mooring dolphin for major vessels calling at Piers 10 and 11; and as an embarkation/debarkation point for dinner cruise vessels with bus service from the Pier 10/11 truck concourse. The current parking facilities at Irwin Park will be relocated elsewhere and the entire park will be beautified and relandscaped in a fashion similar to the Iolani Palace grounds. Major existing trees will be saved to provide a shady canopy for park users, who will enjoy colorful planter beds, stone paved walkways, and tasteful street furniture. A grassy plateau, sized to accommodate a symphony orchestra, will be used as a stage for concerts and other cultural events for the public's enjoyment.

5. Hotel/Office Tower/Passenger Terminal at Piers 10 and 11

A two-level cruise ship passenger terminal will front Piers 10 and 11, and the Aloha Tower Hotel will occupy the floors above. The adjoining One Aloha Tower Office Complex at the mauka end of Pier 11 will be integrated with the hotel and will offer scenic vistas of Honolulu Harbor and the ocean beyond.

of retail space) will only occupy the interior portion of the ground level and second floor for the convenience of office and dock workers, and cruise ship passengers.

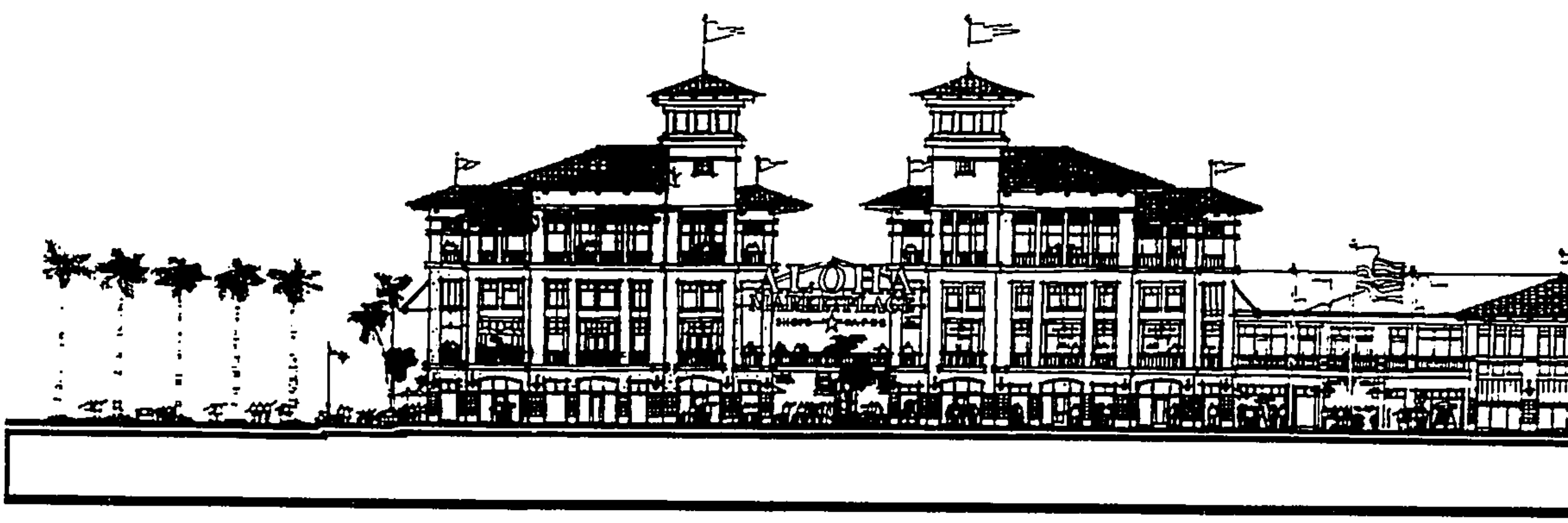
There will be a minimum of approximately 600 parking spaces, including approximately 189 reserved stalls for DOT office personnel. Elevator cores will connect the garage with the upper levels. Ala Moana Mini Park, controlled by the State DOT-Highways Division, is located mauka of Piers 5 and 6. The current parking area at the mini park may be retained, reconfigured or removed, and a portion of the park may be used as necessary to support utility services required at the waterfront. Any utility support facilities provided will be screened from view with appropriate landscaping. A half-circle driveway located on the Ala Moana Boulevard side of Ala Moana Mini Park may be implemented to tunnel under the boulevard and into the Piers 5 and 6 facilities. To the extent that parking remains or is reconfigured in this 37,011 square foot park, the adjacent perimeter of the park will be bermed and landscaped to screen the parking from view to enhance the visual appeal of the Waterfront for both visitors and downtown residents alike.

3. Duke Kahanamoku Water Sports Center at Pier 7

As a memorial to Hawaii's premier waterman, the Duke Kahanamoku Water Sports Center is a collaborative undertaking between ATA and the Hawaii Maritime Center (HMC) located at Pier &, and is subject to the mutual approval of ATA and the board of directors at HMC. The proposed center will be a facility where athletes can plan canoe regattas and other water sports events to help make Hawaii the water sports capital of the world. Adjacent to the water between Piers 7 and 8, where Duke Kahanamoku set his first swimming record in 1911, the facility will emphasize Hawaii's role in water sports history.

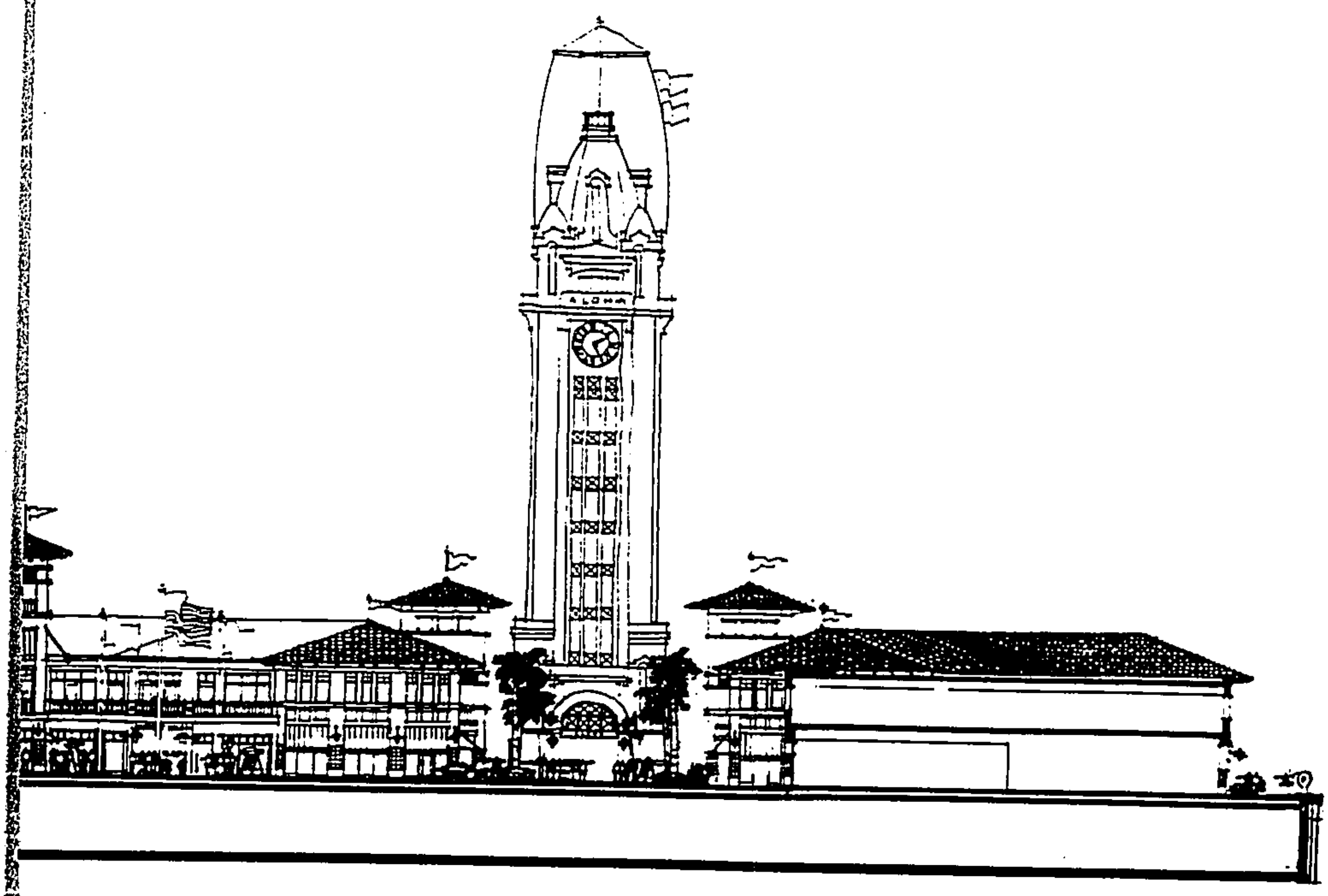
4. The Aloha Tower Marketplace at Piers 8-9

Located in the vicinity of Aloha Tower at Piers 8 and 9 (and the makai end of Pier 10), the Aloha Tower Marketplace will be the primary destination of visitors to the waterfront (see figure 9). The concept of attracting people to the waterfront with entertaining features has been enormously successful elsewhere. James W. Rouse, founder and Chief Executive Officer of The Enterprise Development Company (which, through an affiliate, is one of the two general partners in ATA), was the first to introduce the "festival marketplace" concept and has since pioneered successful downtown revitalization projects such as Faneuil Hall marketplace in Boston,



THE WATERFRONT
AT ALOHA TOWER

Fig. 9
MARKET PLACE ELEVATION



ELEVATION

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DEVELOPMENT CORPORATION

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Passenger Terminal

Physical dimensions of the new passenger terminal are based on the configurations of vessels expected to call at the new facility. Berthing facilities were determined with regard to length, tonnage, draft, and maneuvering of both the largest (Queen Elizabeth II) and the smallest (Costa Cruises' Danae) vessels. The two levels of maritime space have a total area of up to approximately 100,000 gross square feet on Piers 10 and 11, including truck chase and other shared areas, and will be designed to accommodate the loading/unloading of passenger cruise ships, immigration clearance and customs inspection. Seen from the Harbor, the facility's stucco finish, broad archways, and wood trellises will be a welcoming spectacle which will be both classical and functional. All piers in the project, including new breasting dolphins at Pier 9, will be faced with modern low-friction, non-marring, resilient fenders designed to absorb the full breasting energy of vessels during berthing operations while causing minimal abrasion to the ships' painted surfaces.

Aloha Tower Hotel

The Aloha Tower Hotel consists of two wings with the pier side wing being 100 feet high, including two levels of maritime space on the first two floors, and the park side wing being 80 feet high, including the passenger terminal at ground level. Flagpoles, ornamental roofs and other architectural features may penetrate the foregoing height limits. A minimum of 109 suite units but not more than 350 guest units will serve the needs of business travelers through integration with the adjacent One Aloha Tower Office Complex and close proximity to the adjoining CBD of Honolulu. Provided that the hotel at all times has a minimum of 109 guest rooms committed to hotel operations, other portions of the hotel may be occupied, from time to time, for any appropriate use. Facilities shared with the office complex will include the health club, swimming pool, and conference rooms. This integration of a hotel and major office complex will be the first of its kind in the State.

One Aloha Tower Office Complex

The One Aloha Tower Office Tower itself will be approximately 400 feet high (approximately 30 floors) with up to 550,000 gross square feet of space. Its location close to Nimitz Highway merges the building with the high-rises in the downtown financial district and distances it from low-rise development and open space around Aloha Tower. Nearby Irwin and Walker Parks will provide surrounding public space for the enjoyment of office tenants and visitors. The permanent open space surrounding the tower, comprised of Irwin Park, the low rise marketplace, hotel with harbor beyond, Nimitz Highway and Walker Park, will provide panoramic views in all directions. A pedestrian bridge over Nimitz Highway will provide direct access from the office complex to Walker Park and the adjacent financial district.

Parking Facility

The parking facility at Piers 8-11 will be partially located underground to augment park space and visual appeal. It will provide between 1,500 to 2,000 spaces beneath the Aloha Tower Marketplace, and within the hotel, maritime facility, and office complex. At least two entrance/exits will be provided into the parking facility. One will be located near where the Irwin Park pedestrian walkway crosses over Ala Moana Boulevard to the Aloha Tower Marketplace. The driveway ramps at this location will enter and exit on either side of the walkway to minimize interference with pedestrians. The other point of entry will be off of Fort Street between Ala Moana Boulevard and Nimitz Highway. Access from the garage to ground level facilities may be by elevator or escalator near the reconstructed base of Aloha Tower, and by elevators into the Aloha Tower Hotel, the adjoining office complex, and Aloha Tower Marketplace.

6. Honolulu Fort Historic Park at Pier 12

Pier 12 will be the site of Honolulu Fort Historic Park, a monument to the history of Honolulu Harbor. Featured at the Historic Park will be an interpretive display and broad steps leading to the waters' edge where the last remnants of the old Forts' coral blocks are still visible. The park will be pedestrian-oriented, with no berthing facilities, vehicular access or parking.

7. Honolulu Harborside Condominiums at Piers 13 and 14

The Honolulu Harborside condominium complex, with up to 350 units on Piers 13 and 14, will consist of sensitively articulated twin towers approximately 400 feet tall. Penthouses will be located on the upper levels. The condos will have views of the harbor and Aloha Tower and will be linked by a pedestrian promenade to all other areas of the waterfront. A restaurant may be included as a permitted use. The complex will provide up to 500 or more parking stalls; at least 50 percent of such stalls will be located on-site while any remainder will consist of parking rights in a nearby off-site parking structure. All above ground parking shall be architecturally screened from view.

At pier level, facilities for supporting ferry operations, including office space, berthing and light maintenance facilities, shall be provided.

8. Pedestrian Promenade

The Pedestrian Promenade will connect all components of the waterfront from Piers 5 to 14. This feature complements the State's long-range plan to make as much of the coastline as possible from Waikiki to the airport accessible to the public. There will be up to 9,600 gross square feet of retail space on the promenade, consisting of vendor-type small mobile facilities. The Promenade is linked to adjacent areas of Downtown Honolulu by means of wide new crosswalks at resignalized intersections across Nimitz Highway plus the pedestrian overpass connecting the project to the financial district at Walker Park.

9. Vehicular Access

Vehicular access to the Waterfront at Aloha Tower will be at Piers 13 and 14, Pier 11 (truck concourse), Fort Street, Bishop Street, and Richards Street.

The entry at Piers 13 and 14 serves the Honolulu Harborside Condominiums and the commuter ferry support facilities. Access for Diamond Head bound traffic is via right turn from Nimitz Highway. Access for Ewa bound traffic is via a left turn to be provided at the intersection of Smith Street. Traffic from Piers 13 and 14 will exit at Nimitz Highway and Smith Street and may turn left or right onto Nimitz Highway or proceed mauka along Smith Street.

The entry at Fort Street primarily serves the Passenger Terminal at Piers 10 and 11, the One Aloha Tower Office Complex, the Aloha Tower Hotel, and the Aloha Tower Marketplace. This entrance can be accessed from the Diamond Head bound lanes of Nimitz Highway. Left turns from the Ewa bound lanes of Nimitz Highway will be restricted to off-peak hours only. Exiting traffic may either turn right to travel in the Diamond Head direction or left to travel in the Ewa direction.

A service entrance at Pier 11 for both Diamond Head bound and Ewa bound Nimitz Highway traffic will accommodate large trucks and other service vehicles away from public view in the truck concourse adjacent to Piers 10 and 11.

The Bishop Street entrance will primarily serve the Aloha Tower Marketplace and can be accessed from the Diamond Head bound lanes of Nimitz Highway and from Bishop Street. Exiting traffic may travel in either the Diamond Head or Ewa direction.

The Richards Street entry is primarily for the Maritime Building and Terminal at Piers 5 and 6 and can be accessed from both the Ewa and Diamond Head bound lanes of Nimitz Highway.

The Ala Moana Boulevard exit to Nimitz Highway will permit access to Ala Moana Boulevard Diamond Head bound and to Nimitz Highway Ewa bound.

E. Construction Requirements

1. Piers 5 and 6:

Piers 5 and 6 flank an existing manmade peninsula of fill land covered with riprap, concrete bulkheads, and pile supported breasting dolphins along the pier fronts. The general configuration of the existing filled land area shall be preserved. The planned extension of Piers 5 and 6 to the Federal Project Line will be constructed on pilings. Upon receipt of all necessary governmental approvals, it is intended that an additional extension beyond the Federal Project Line will be constructed consisting of catwalks connecting the piers to breasting dolphins anchored by pilings.

Construction of the foundation for the cruise ship terminals, office building, and parking structure will involve removal of old fill and native material from the peninsula. Engineering studies will be conducted to determine construction requirements. For instance, some demolition, dredging and construction work may be conducted from barges in Honolulu Harbor. Blasting may be required if hard substrata are encountered during excavation. It is also anticipated that construction of any underground portion of the structure will involve dewatering the excavated peninsula site. Considerations in selecting the method of construction will include costs and potential environmental impacts, including siltation and the possibility that there are contaminants such as petrochemicals in the existing fill material.

2. Pier 7:

The pier configuration at Pier 7 will be preserved, along with the existing Hawaii Maritime Museum and Coasters Restaurant. Pier 7 is not within the project area with the exception of the proposed Duke Kahanamoku Water Sports Center which with the mutual approval of ATA and HMC, will be constructed near the mauka end of the pier using standard land-based construction methods. The existing vehicular ramp, which crosses above the mauka end of Pier 7, will be removed once access to the upper level passenger terminal is no longer required.

3. Piers 8-11:

Piers 8 through 11 border a manmade peninsula of fill land faced by concrete bulkheads. The configuration of the filled land area and wharf apron shall be preserved, except for the creation of a small boat landing inlet and amphitheater at the juncture of Piers 9 and 10. The filled land area will also be excavated for an underground parking structure and the foundation for the cruise ship terminal facility, marketplace, hotel, and office building.

Engineering studies will be conducted to determine appropriate construction requirements, including the need for dredging, blasting and dewatering. Considerations for construction at these piers include the preservation of Aloha Tower and maintaining harbor related functions throughout the construction period. A detailed plan for the interim relocation of the Harbors Division Administration shall be formulated. Land and water borne construction activities will affect other activities in the Harbor and consequently must be planned in detail with these constraints. Thus, the piers within the project have been planned for continued multiple uses according to the stated needs of the DOT-Harbors and several user maritime groups. A summary of uses, which currently includes commercial shipping, is provided in table 1. In addition, inasmuch as the intent is to bring people closer to water level, construction of the lowered boarding platforms at Pier 9 plus the small boat landing and amphitheater at the seaward end of the peninsula will require attention to wave surges. Wave dampening features will be examined to assure the safety of pedestrians and small boat traffic. Cruise ship operations currently at Piers 9-11 will be temporarily relocated during construction, most likely to Pier 2.

4. Pier 12:

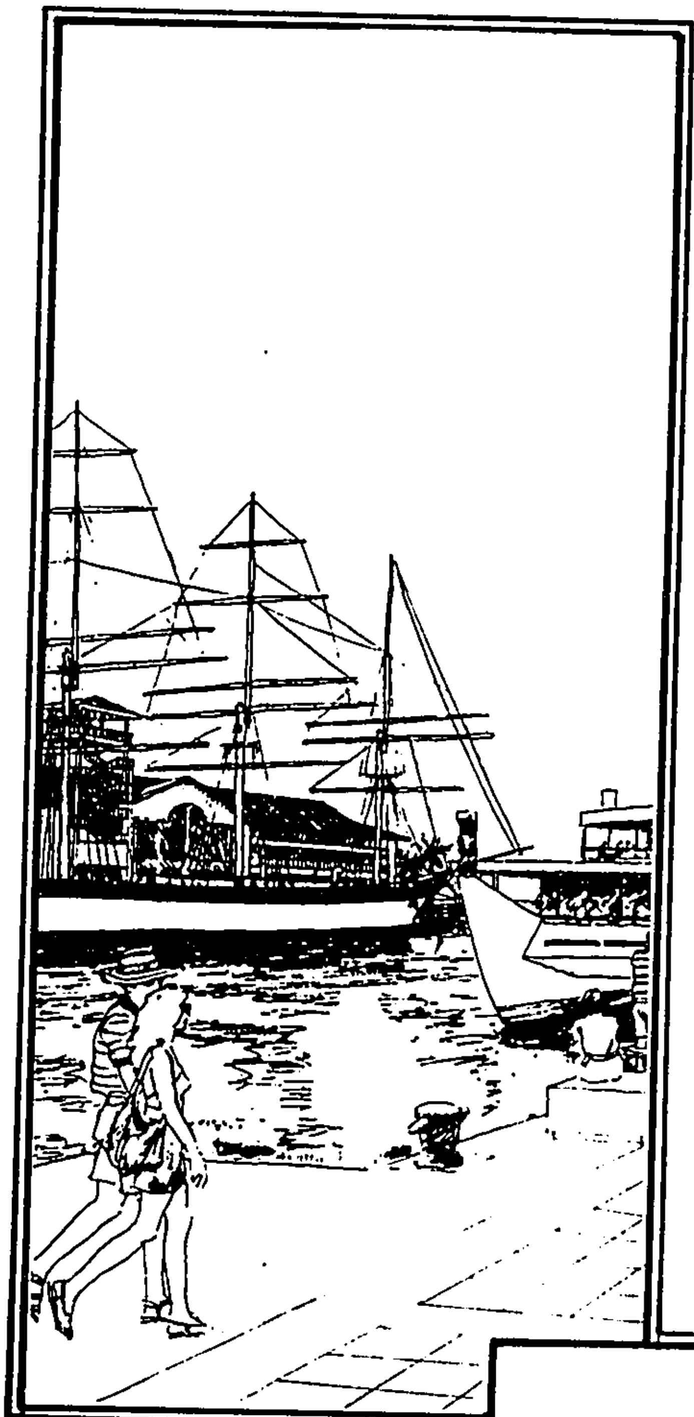
Pier 12 is a small land-filled peninsula. Construction of the Honolulu Fort Historic Park at Pier 12 will basically involve demolition of the existing paved parking area and installation of landscaping and other park features such as a historic interpretive program.

5. Piers 13 and 14:

Piers 13 and 14 are constructed on pilings with only a minor amount of existing fill materials along Nimitz Highway. The pier structure will be strengthened to bear a parking structure and other low rise elements. One condominium tower will rise through the existing pier on an independent new foundation. The other tower will be constructed on pilings to be implanted in the water between Piers 12 and 13, with an elevated connection to Pier 13. Further engineering studies shall be conducted to determine appropriate construction methodologies.

F. Estimated Project Cost/Schedule

The estimated cost of developing The Waterfront at Aloha Tower is between $750-800 million. The source of funding will be through Aloha Tower Associates (ATA). ATA is responsible for the construction of the project facilities, and the operation and maintenance of these facilities as agreed between ATA and ATDC. Construction is scheduled to begin in late 1991 - early 1992, with substantial completion anticipated approximately four and one-half years after commencement of construction.



CHAPTER III

PHYSICAL ENVIRONMENT

III. PHYSICAL ENVIRONMENT

A. The Region

The State of Hawaii is made up of eight major islands and 124 minor islands. The eight major islands are Oahu, Kauai, Molokai, Lanai, Maui, Hawaii, Niihau (privately owned), and Kahoolawe (an uninhabited island, presently used by the U.S. Navy). The State encompasses 6,450 square miles of which 6,425 are land and 25 are inland waters. Hawaii is encompassed by a coastline of some 750 miles, fourth longest among the states and territories.

Oahu is the third largest island in the State of Hawaii. Its 593 square miles of land comprise 9.4 percent of the State's total area. It is the most populous of all the islands, with about 80 percent of the population, and where the State capital of Honolulu is located.

B. Climate

The Hawaiian Islands lie in the northern fringe of the Tropic of Cancer, placing them within the belt of northeasterly trade winds which persist for the major part of the year. These "trades" are occasionally interrupted by southerly or "Kona" winds. Intermittent breakdown of typical trade wind flows occurs when deep low-pressure centers form and move slowly from west to east. This produces southerly winds and more rain in many otherwise dry places.

On Oahu, the trade winds are prevalent for 90 percent of the time between May and October. From November to April, Hawaii's winter season, the "trades" drop in frequency to about 50 percent. The "winter" season brings intense rains that account for practically all of the rain that falls on the leeward plains.

The climate in the area of the project site is typical of the leeward coastal lowlands of Oahu. This climate is characterized by long southern exposure; temperatures ranging from an average daily maximum of 79.9 degrees Fahrenheit to an average daily minimum of 70.7 degrees Fahrenheit; persistent northeasterly trade winds, ranging from 8 to 18 mph; and an average mean rainfall of 15.6 inches.

Honolulu Harbor is fairly well sheltered from northerly winds but is exposed to westerly, northwesterly, and southwesterly winds. These winds are especially strong during winter storms. Sand Island acts as a bulwark against westerly and southerly winds to protect the main harbor basin.

C. Landward Environment

1. Geology and Hydrology

The Island of Oahu is composed of the remnants of two elongated shield volcanoes, the Waianae and Koolau ranges, which are connected by the Schofield plateau. The Koolau volcano is the younger of the two and emerged east, sending lava flows westward to overlap and bank against the Waianae flank. After a long period of volcanic quiet during which deep canyons were carved out of the Koolau shield, a series of lava flows, cinder cones, and tuff cones emerged on the eastern portion of Oahu. These eruptions are known as the Honolulu Volcanic Series, and they include such landmarks as Koko Head Crater, Diamond Head Crater, and Punchbowl.

The emerged reefs on Oahu are more extensive than those of any other Hawaiian island and play an important role in its geology. Oahu's south central coast, geographically referred to as the Honolulu plain, is underlain by a broad elevated coral reef which has been partly covered by alluvium carried down from the mountains. Core samples reveal that lava flows of the Honolulu Series are interbedded with these reef deposits which were formed when sea level was higher than it is now. Prior to the dredging and filling of Honolulu Harbor, the shoreline area consisted of submerged coral reefs, mudflats, and islands of varying sizes, shapes and elevations.

Before being dredged and developed, the seaward portion of the reef at Honolulu Harbor lay submerged 2 to 6 feet below water at half-flood tide, but was dry at low tide. On the Harbor's Ewa side, a passage through the reef, now Kalihi channel, was cut naturally by freshwater from the Kalihi and Kahauiki Streams. On the Diamond Head side, the reef platform was cut by freshwater runoff from the Nuuanu Stream. This cut has since become the main entrance channel to Honolulu Harbor Basin. Today, Nuuanu Stream enters Honolulu Harbor at Piers 16 and 17.

The same interbedding of coral and alluvial deposits which play an important role in Oahu's geology also influenced the hydrological character of Oahu's leeward coastline. The interface between upper sedimentary layers and the underlying basalt constitutes a zone of low permeability known as caprock. This caprock extends along the coastline about 800 to 900 feet below sea level, forming an impervious zone which prevents the downward flow of nonpotable brackish water containing high nutrient and salt concentrations from reaching the basaltic aquifers which provide Oahu's water supply. This caprock also prevents the seaward movement of potable water from the basaltic aquifers.

The width and thickness of the caprock suggests that the basal potable water supply will be relatively unaffected by modifications along the coastline. This is supported by the fact that filling of most of Honolulu's salt marshes and lowlands over the past 40 years with dredged marine deposits of high saline content has produced no deterioration in the quality of the basal water recovered by the Board of Water Supply's wells.

2. Topography and Drainage

Generally, all of the land around the harbor is flat. The coastal plain, within which the harbor complex is located, ranges in elevation from 0 to 10 feet above sea level. Pier level on the site from Piers 6 to 9 is approximately +7 feet above mean lower low water and at Piers 13/14 is approximately +8 feet above mean lower low water.

3. Earthquake

A recent report by the Seismic Zonation Committee of the Structural Engineers Association of Hawaii (December 5, 1989) recommended upgrading the seismic zone for Oahu from Zone 1 to Zone 2A in the Honolulu Building Code. Zone 2A acknowledges a greater seismic threat to buildings on Oahu than Zone 1. Upon adoption of the new seismic zone, all structures in the project area must be designed to meet Zone 2A requirements.

4. Soils

According to U.S. Soil Conservation Service, the soil on the project site is classified as Fill land, mixed (FL). This soil type consists of material dredged from the ocean or hauled from nearby areas. Historical data indicates that the main part of the existing pier complex was produced by filling a shallow offshore area in 1857 with material from the walls of Honolulu Fort which was dismantled in that year for this purpose. It is surmised that over time, due to heavy traffic in the area, the underlying materials have been consolidated. An investigation of soils will be conducted to assess geotechnical characteristics for supporting proposed structures.

5. Flora and Fauna

Generally, the project site and the surrounding area is a highly altered urban environment, providing little habitat for any terrestrial flora and fauna. The only major vegetation on the project site is located at Irwin Memorial Park.

There are approximately 15 Monkeypod trees (Samanea Saman), 27 Coconut trees (Cocos nucifera), and two Banyan trees (Ficus var.).

Because of its highly urbanized location and exotic vegetation, it is highly unlikely that the site is a habitat for native Hawaiian or endangered avifauna. A few indigenous or migratory birds may occasionally be seen flying in the immediate project area. Those species presumed to inhabit the site are common to urban areas and may include: Common Mynah, House finch, Barred dove, House sparrow, Brazilian cardinal, Spotted dove and pigeon.

6. Air Quality

Air quality in the vicinity of the project is mostly affected by emissions from vehicular, industrial and/or natural sources (see appendix A). Nimitz Highway adjacent to the proposed project site is a major arterial roadway that carries heavy volumes of traffic. Emissions from motor vehicles tend to be carried over the project site by the prevailing winds. Also adjacent to the project site is the Hawaiian Electric Company (HECO) power plant. Emissions from the two chimneys of this facility may presently affect the air quality of the area. HECO, however, plans to close the plant sometime between 1994 and 1995. Natural sources of air pollution affecting the air quality of the site include ocean spray, plant pollens, wind-blown dust and emissions from distant volcanoes.

The State Department of Health operates a network of air quality monitoring stations located at various sites around Oahu and statewide. Based on data from these stations, it appears likely that both state and national ambient air quality standards are currently being met in the project area except for occasional exceedance of the more stringent State regulations pertaining to ambient ozone and carbon monoxide concentrations.

7. Noise

The existing noise environment at the project site is characteristic of an urban setting. Noise sources include traffic along Nimitz Highway, harbor operations, the HECO power plant, and aircraft using Honolulu International Airport and Hickam Air Force Base.

Ambient noise measurements were made at several sites at and near the proposed project site (see appendix B). Existing background noise, described in terms of sound levels exceeded for 90 percent of the time (L90), were typically 55 to 65 dBA. The main noise sources were traffic on Nimitz Highway and aircraft operations, of which military aircraft generated somewhat higher noise levels than civilian aircraft. Noise from the HECO power station was also quite noticeable at certain locations.

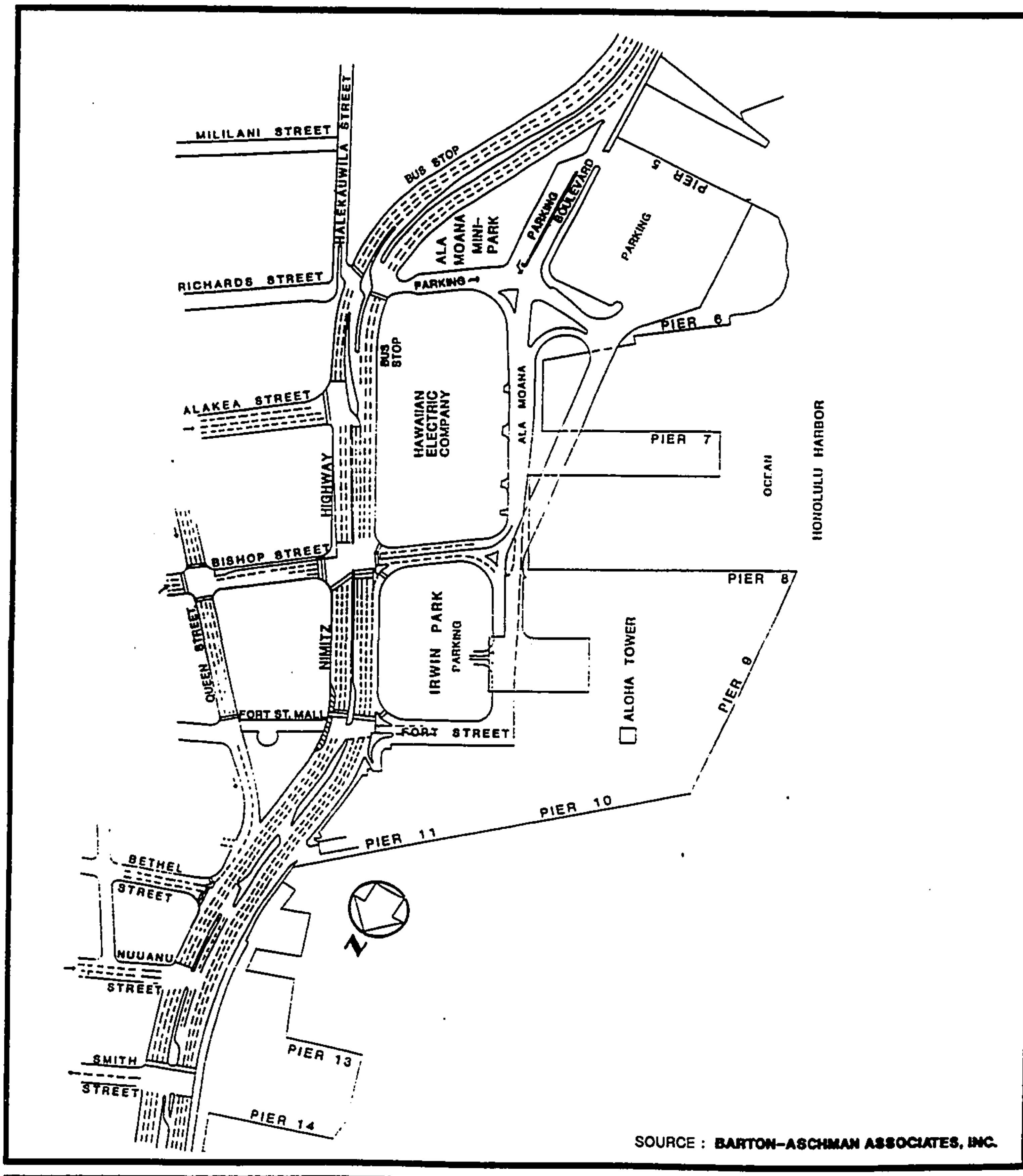
For assessing land use compatibility, the Day-Night Average Sound Level (Ldn), a measure of noise exposure over a typical 24-hour period, is commonly used. Estimated sound levels using this measure range from 63 dB Ldn in areas well screened from traffic noise to approximately 74 dB Ldn next to Nimitz Highway. At the Harbor Square condominiums, the nearest noise-sensitive buildings, noise exposure at the facade closest to Nimitz Highway is estimated to be 65 to 68 Ldn. By comparison, the U.S. Environmental Protection Agency and the Department of Housing and Urban Development specify that residential and other noise-sensitive developments can be constructed without special noise control measures in areas subjected to noise exposure levels up to 65 Ldn. In areas with higher noise exposure levels, approval is subject to the incorporation of special noise control measures. Another relevant standard is that used by the State Department of Transportation which stipulates a maximum aircraft noise exposure of 60 Ldn for residential buildings in Hawaii. Due to the high ambient noise levels at the project site, proposed noise-sensitive buildings, including the condominiums and hotel, will require noise attenuating treatment.

8. Traffic

The Waterfront at Aloha Tower site is accessible primarily by Nimitz Highway which runs Ewa-Diamond Head parallel to the waterfront. Highway lane widths range from six to eight lanes in the vicinity of the project site. Ala Moana Boulevard runs along the waterfront makai of the HECO plant to the vicinity of Pier 10. Fort Street Mall (pedestrian only mauka of Nimitz Highway) extends into the project site as Fort Street (with vehicular traffic) on the Ewa side of Irwin Park while Bishop Street extends makai between the HECO power plant and Irwin Park. Richards Street is one-way in the makai direction into the project site and is accessible from both the Ewa and Diamond Head bound lanes of Nimitz Highway.

The existing roadway network and lane configurations at the intersections adjacent to the project site are shown on figure 10. Also shown are the locations of the crosswalks along Nimitz Highway.

A traffic study assessing existing vehicular traffic in the Downtown area was conducted for the proposed project (see appendix C). The scope and method of the study was developed in consultation with the State Department of Transportation and the City and County Department of Transportation Services. Thirty-seven intersections were assessed for weekday



THE WATERFRONT AT ALOHA TOWER

Fig. 10
EXISTING ROADWAYS

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conditions and 17 for weekend conditions. Study results indicate that during the week, five of these intersections are presently operating over capacity during the AM peak hour while eight intersections operate at unacceptable levels during the PM peak hour. These intersections lie along Vineyard Boulevard, Beretania Street, Nimitz Highway and Ala Moana Boulevard. Vineyard Boulevard and Beretania Street are the primary corridors for vehicles commuting to and from the Downtown area. Nimitz Highway and Ala Moana Boulevard also serve as major distributors of traffic to the Downtown area and carry heavy volumes during both peak hours. Saturday traffic flow in Downtown is generally good.

9. Mass Transit/Rapid Transit

The City and County of Honolulu mass transit bus system serves the Aloha Tower waterfront area along Nimitz Highway. Bus Routes 55, 56, and 57 provide service in both the Koko Head and Ewa directions. Bus routes 19 and 20 only stop at Aloha Tower on their way to the Honolulu International Airport from the Ala Moana Shopping Center.

Future potential mass transit systems include the Honolulu Rapid Transit System and the Oahu Intraisland Ferry System. Out of the six full-corridor proposed alternatives for the Honolulu Rapid Transit System, four are along Nimitz Highway, fronting the Waterfront at Aloha Tower site. Two of these routes propose a Nimitz/Fort station at Irwin Park while the other two routes propose a Nimitz/Richards station in front of Piers 5 and 6. A terminal for the Oahu Intraisland Ferry System is planned at Pier 8. A support facility for ferry operation is planned at Pier 13/14.

10. Support Infrastructure

Water

Water for the project site is provided by the City and County Board of Water Supply through a network of lines serving the entire Downtown area (see figure 11). A 12-inch main runs through the project site along Nimitz Highway, down Fort Street and along Ala Moana Boulevard.

Wastewater

Piers 8 through 13, as well as areas mauka of the project site, are presently served by a 28-inch sewer line which conveys flow in the Diamond Head direction along Nimitz Highway (see figure 12). The line increases in diameter to 32 inches at the intersection of Alakea Street, proceeds makai along Richard Street, and then Diamond Head along Ala Moana Boulevard. Ultimately, sewage is conveyed to the Sand Island Sewage Treatment Plant.

Drainage

Surface runoff from Pier 5 and 6 and from portions of the streets within the project area are collected at catch basins and discharged into Honolulu Harbor at these locations: between Piers 6 and 7, via two 18-inch outlets and one 4.5 foot by 3 foot box culvert; under Piers 5 and 6 via a 30-inch outlet; Nimitz Highway near the mauka-ewa corner of Pier 11 via a 30-inch outlet; at Pier 10-11 bulkhead via a 24-inch outlet; and between Pier 7 and Pier 8 via an 18 inch outlet and a 24-inch outlet (see figure 13). Roof and floor runoff from the existing Pier 8-11 structures is carried in underground drains through the bulkhead wall into the harbor at various locations around the periphery of the piers.

11. Historic Resources

Historic resources identified within and nearby the project site are summarized below:

Aloha Tower

Aloha Tower, completed in 1926, replaced a 25-foot lighthouse which was constructed in 1869. The Tower was built on an axis formed by the harbor entrance and Fort Street, one of the city's oldest streets. At eleven stories (185 feet) in height, Aloha Tower remained the tallest building in Hawaii for nearly 40 years and became one of Hawaii's most recognizable landmarks.

During World War II the tower was controlled by the military. After the war, it was returned to civilian use to monitor commercial shipping and seaplane traffic. In 1947 the tower was refurbished; which included restoring its original Spanish white color, visible 16 miles out at sea (see appendix D). Aloha Tower was placed on the National Register of Historic Places in May 1976 and on the State Register of Historic Places in 1981.

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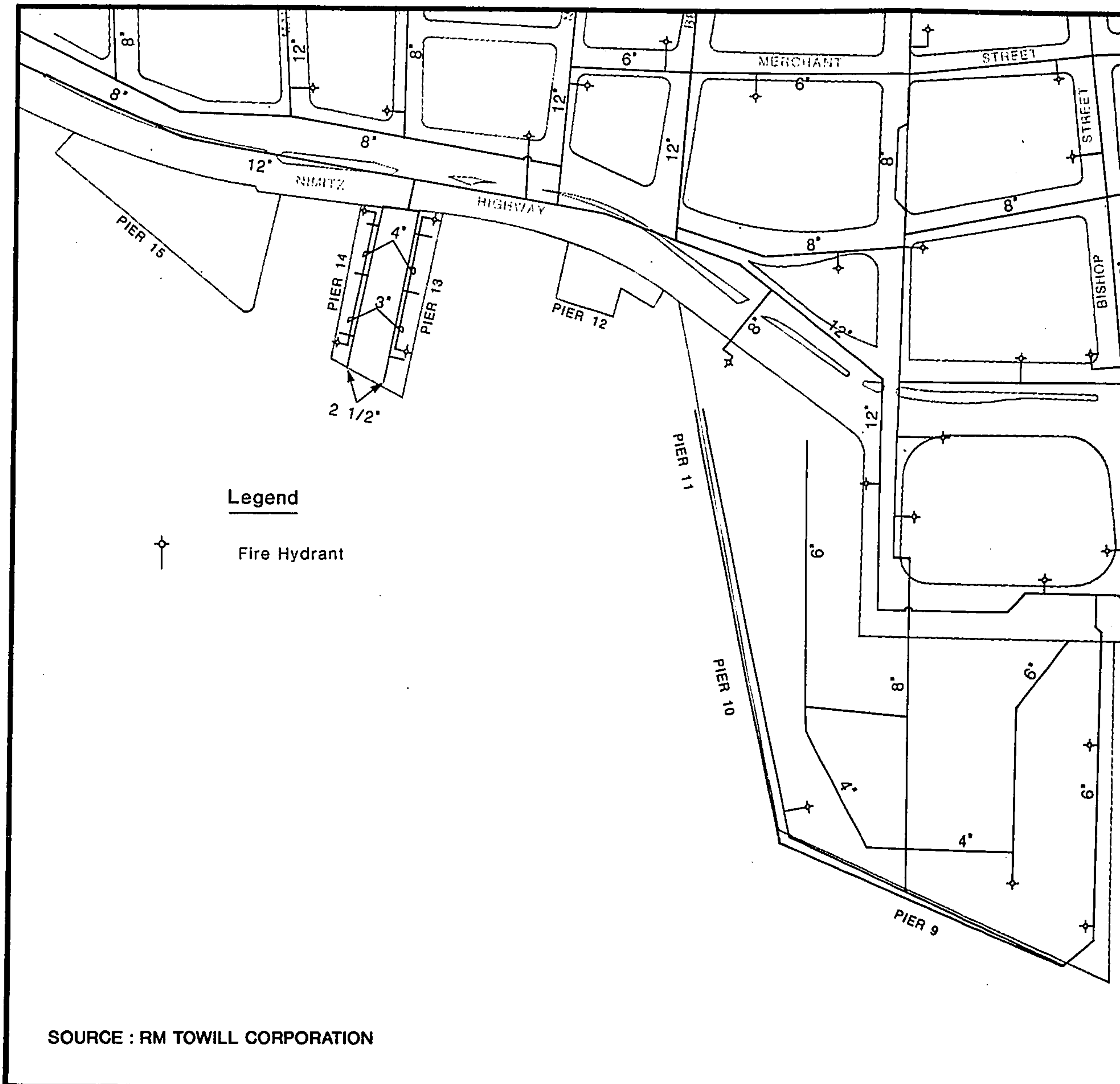

THE WATERFRONT AT ALOHA TOWER

Fig. 11
EXISTING WATER SYSTEM

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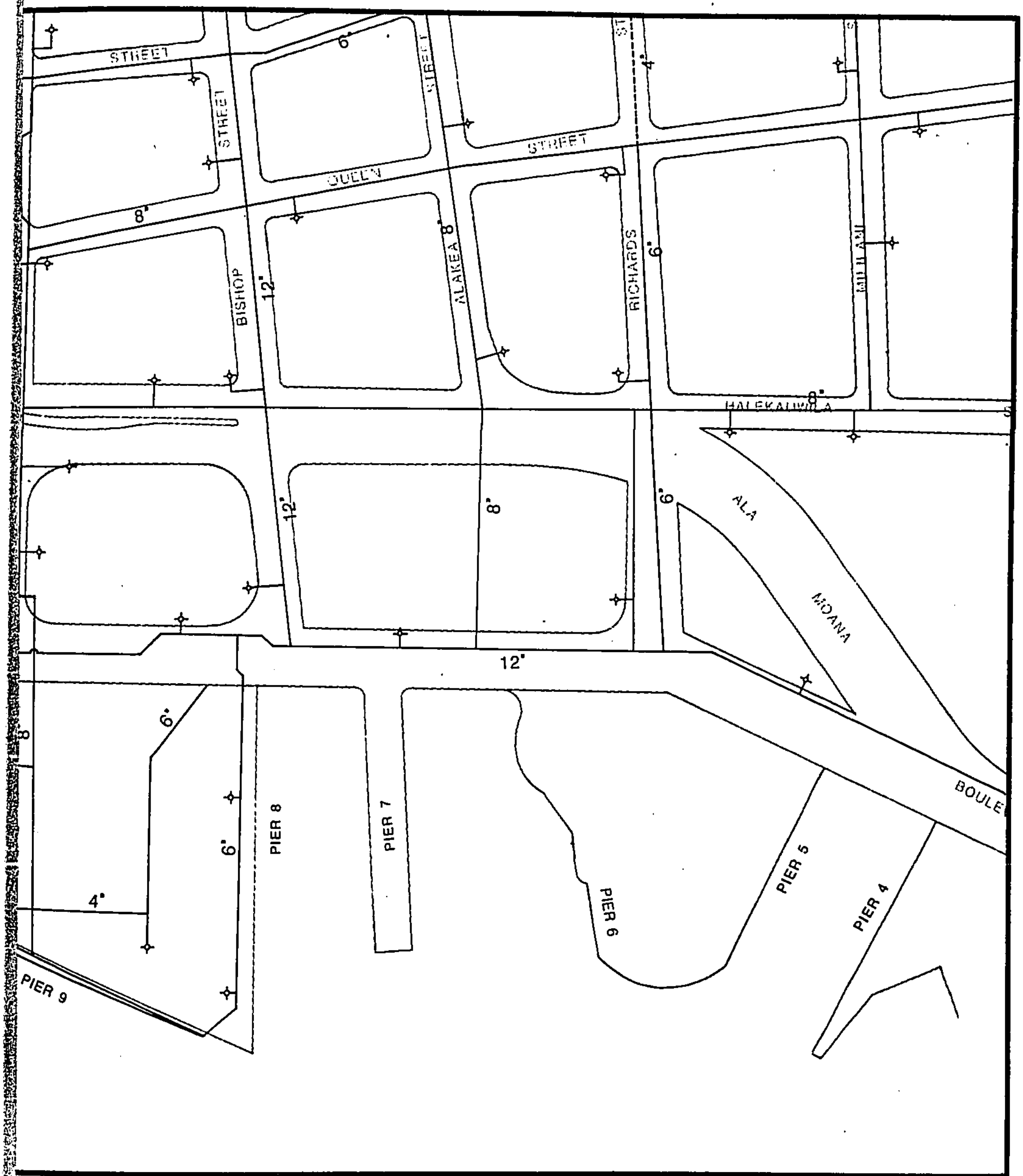

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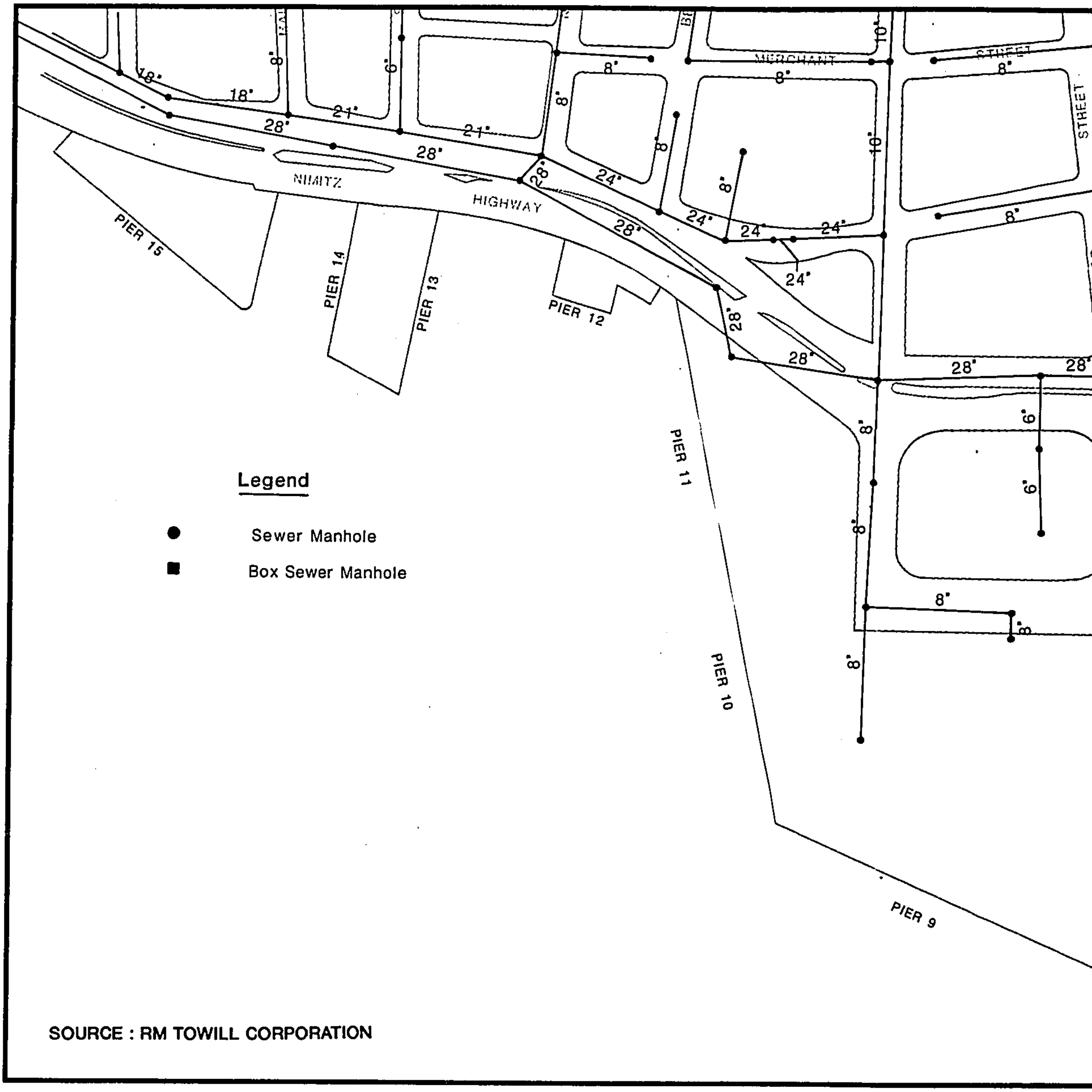

THE WATERFRONT AT ALOHA TOWER

Fig. 12

EXISTING SEWER SYSTEM

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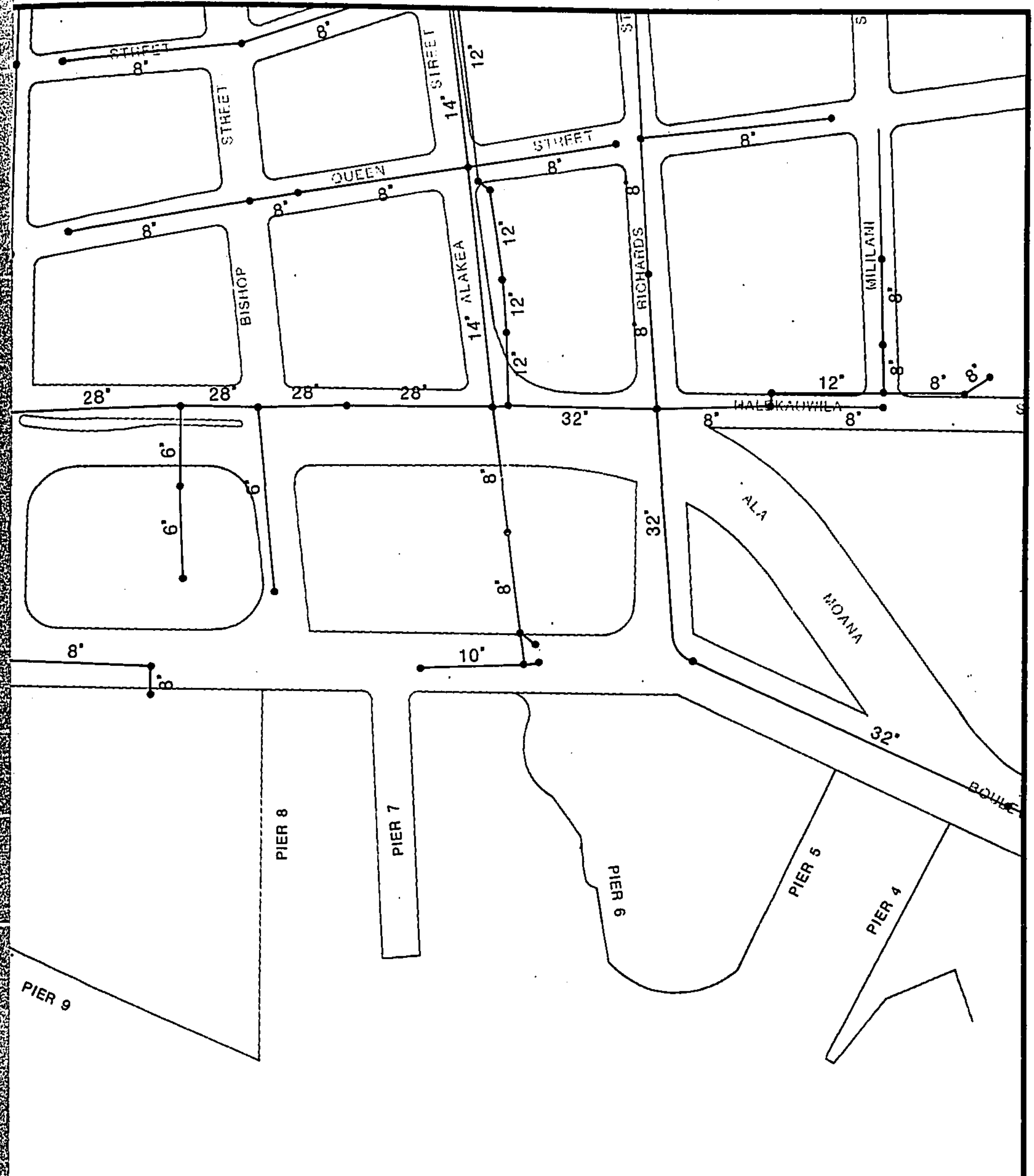

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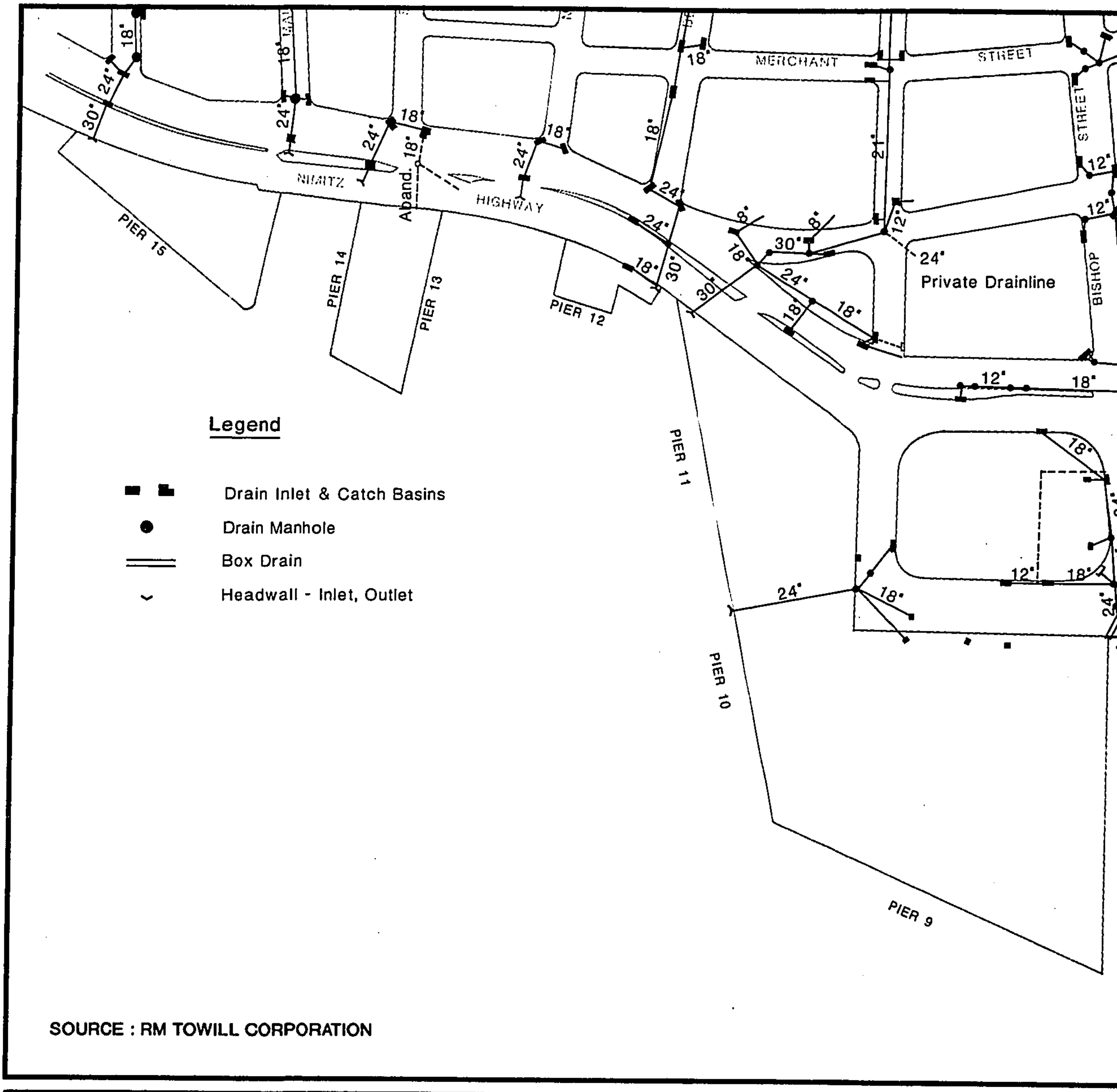

THE WATERFRONT AT ALOHA TOWER

Fig. 13

EXISTING DRAINAGE SYSTEM

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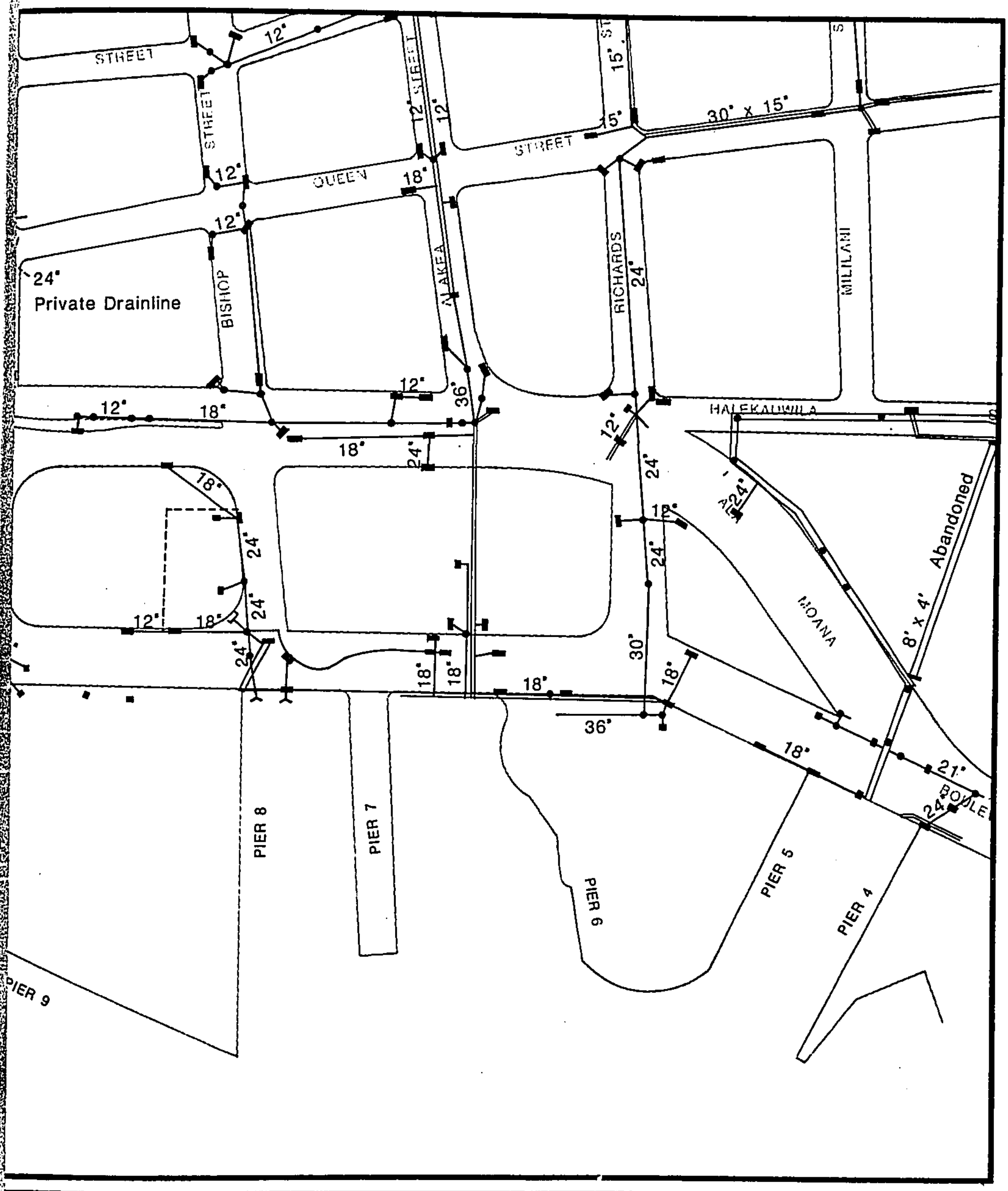

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Irwin Memorial Park

Irwin Memorial Park was built on what was originally Mahele Reef lands which were later filled and subdivided as Esplanade lots. In 1926, the U.S. Government deeded Esplanade lots to the Damon Estate in exchange for other real estate. Helene Irwin Fagan deeded the Diamond Head portion of the park site to the Territory's Board of Harbor Commissioners in 1930 to be combined with adjacent State property as a public park to be called "Irwin Memorial Park" in honor of her father, William G. Irwin.

Walker Park

Walker Park is owned by the State DOT as part of the Nimitz Highway right-of-way. Amfac has restored the area and maintains it. Present on the site are: a gate from the old H. Hackfield & Company (as AMFAC was then known); coral blocks that once supported the original retail store from which AMFAC, Inc. grew; a cannon from Honolulu Fort; a seedling planted in 1971 from a monkeypod tree that stood on the site of today's Amfac Center; a bench/sculpture feature; and a fountain.

Honolulu Fort

Honolulu Fort was built in 1816 by King Kamehameha I to protect the approaches to Honolulu Harbor. From the years 1816 to 1857, Honolulu Fort was the most prominent structure on the waterfront. The fort was located near the original shoreline at the foot of the present Fort Street Mall, in the vicinity of the Hawaii Building and Walker Park. The fort was dismantled in 1857 and its coral blocks were used to build portions of the present waterfront. The last visible remnants of the fort's coral blocks can be seen in the water at Pier 12.

Piers 8 though 11

According to the State Historic Sites Section of the Department of Land and Natural Resources, because Piers 8 through 11 are over 50 years old they may have potential historic significance. Pier 11, in particular, has both architectural and cultural significance due to its character of design and association with history. Visual elements inherent in the piers' design are important facets of the waterfront, particularly Pier 11, with its tile roofed and segmented arched gallery.

Because the other piers have been significantly restructured, they are unlikely candidates for preservation (see appendix D).

The Falls of Clyde

Presently docked at Pier 7 is the Falls of Clyde, the first four-masted, full-rigged ship to call at the Port of Honolulu. Built in 1878, she was originally designed for the wool trade with Australia. Captain Matson bought the ship in 1898, and used her primarily for hauling cane and goods to and from Hilo Harbor. In 1907, she was converted to a tanker, transporting oil to the plantations and molasses to California. Her tanks could hold 750,000 gallons of either commodity. The Falls of Clyde was retired in 1922. In 1959, she was taken to Alaska and then was returned to Honolulu in 1963. In 1971, the ship moved to Pier 5 where she was opened to the public. In 1982, Hurricane Iwa caused a surge that broke the ship's mooring lines and damaged her mooring facility. Dillingham tugs towed her to Pier 39. Since then the ship has been repaired and is on display at Pier 7.

12. Surrounding Land Uses

Like many American cities, downtown Honolulu experienced significant office/commercial growth throughout the sixties and seventies, expanding from 580,000 square feet (s.f.) in 1959 to 6,112,000 s.f. in 1982. In 1990, office space has increased to 8,600,000 s.f. The waterfront fringes the central business district (CBD) across Nimitz Highway (see figure 14). The CBD is the financial center of the islands, and is immediately adjacent to the Capital District, site of the State Legislature, Iolani Palace, and other State and City and County office buildings.

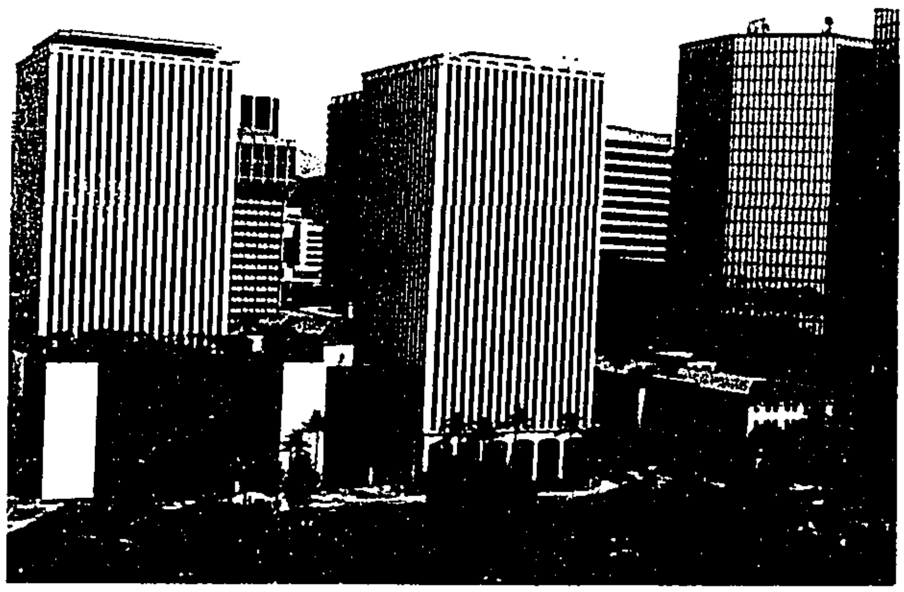
In the immediate vicinity of the project site are a variety of maritime, commercial and industrial uses. To the east are the U.S. Immigration Station and the Ala Moana Sewage Pumping Station, along with the U.S. Coast Guard occupying Pier 4. The Federal Office building is located across Nimitz Highway from Pier 4, the Harbor Square condominiums are opposite Piers 5 and 6, and the Hawaiian Electric Company (HECO) Honolulu Power Generating Station uses harbor waters for cooling purposes opposite Pier 7. The two AMFAC Towers are located across Nimitz Highway from Piers 8 and 9, and the Kaahumanu Municipal Parking Garage is across Piers 10 and 11. The City and County of Honolulu Departments of Finance and Housing are across Nimitz Highway from Pier 12 in the former Police Station and the Bank of Hawaii Annex is opposite Piers 13 and 14.

PHOTOGRAPHS OF SURROUNDING LAND USES

(viewed from Aloha Tower)

In the foreground is the Hawaiian Electric Company's power plant. Downtown buildings in the background include Harbor Square (left) and the Federal Building (far right).

Amfac Center buildings with Grosvenor Center to the right.



Under construction in the Chinatown Historic District is the Chinatown Gateway Plaza and Honolulu Park Place Condominiums. The proposed Harbor Court mixed-use project will be located at the Kaahumanu Garage.

Figure 14

See Chapter IV for a discussion of developments proposed, planned and under construction in the Downtown area.

D. Marine Environment

1. Water Quality

The waters of Honolulu Harbor are designated Class A. The objective of Class A waters are that their use for *"recreational purposes and aesthetic enjoyment be protected."* These waters shall not act as receiving waters for any discharge that has not received the best degree of treatment or control compatible with the criteria established for this class.

Honolulu Harbor is an "Artificial basin" which is defined (Section 11-54-07d) as a dredged or quarried channel harbor, or harbor-associated submerged structures. The harbor's marine bottom ecosystem is designated for the following Class II uses:

> *"The uses to be protected in this class of marine bottom ecosystems are all uses compatible with the protection and propagation of fish, shellfish, and wildlife, and with recreation. Any action which may permanently or completely modify, alter, consume, or degrade marine bottoms, such as structural flood control channelization, (dams); landfill and reclamation; navigational structures (harbors, ramps); structural shore protection (seawalls, revetments); and wastewater effluent outfall structures may be allowed upon securing approval in writing from the director of health, considering the environmental impact and the public interest pursuant to section 342-D-4, 342D-5, 342D-6, 342D-50, HRS in accordance with the applicable provisions of Chapter 91, Hawaii Revised Statutes."*

The State of Hawaii Department of Health (DOH) water quality standards were designed to account for natural variations in water quality. Thus, compliance is not determined based upon a single measurement at any particular place and time. During the winter season the harbor experiences more discharge from Nuuanu and Kapalama Streams than in the summer season. Additionally, large turbidity plumes are periodically generated by some of the large ships that use the harbor.

The harbor receives freshwater input from two primary sources, Kapalama Stream and Nuuanu Stream. These are major sources of organic matter and nutrients to the harbor. Both streams run through extensive housing and light industrial districts and are probably a source of intermittent pollutants from industrial waste and urban runoff. Both Nuuanu and Kapalama streams have been a significant source of sediments in the harbor.

Other freshwater and associated pollutant inputs to the harbor occur from direct run-off and through numerous small storm drain, roof gutter, and parking lot drainage outlets.

In general, a marine environmental assessment conducted for the proposed Waterfront at Aloha Tower project indicates that the harbor follows DOH standards for a seasonally dry embayment; those for which average fresh water inflow from the land is less than 1% of the embayment volume per day (see appendix E).

Turbidity

Turbidity is a convenient measurement of water clarity. It typically indicates the presence of suspended sediments, although it is also influenced by biological activity. Turbidity measurements in Honolulu Harbor ranged from 0.1 to 28.1 nephelometric turbidity units (NTU) with higher values measured near the bottom of the harbor at a depth of approximately 40 feet. Turbidity measurements for the harbor are within DOH water quality standards.

General observations of the harbor over several months during the course of the study indicate that the harbor experiences large turbidity plumes. Almost on a daily basis these plumes are created where tugboats guide large container ships into and out of the harbor. Within hours after the large plumes are created, the turbidity pattern disappears below the surface. Generally, these plumes do not last long enough to be transported out of the harbor by currents.

During heavy winter rains the harbor may develop a milky brown color from fresh water stream discharges. Most of the fine materials will resettle below the surface within hours. Within days, most of the remaining material will settle to the bottom. This occurs because the harbor acts like a large settling pond, collecting fine materials before they can exit into the nearshore area.

In 1973, sediment was discharged into the harbor from a construction site adjacent to Piers 4 and 5. The sediment plume was clearly visible and could be seen flowing from the area bounded by the Falls of Clyde (former mooring site at Pier 5) and the U.S. Coast Guard pier, to the mouth of the harbor. Dredging operations in the harbor every five years are known to decrease visibility to less than one foot during the four to six weeks required to complete dredging.[1]

Temperature

Measured temperatures ranged from 25.06 deg-C to 26.9 deg-C. The coolest values were found at the bottom of an offshore station and other deep locations. The warmest values were measured near Pier 6 and are probably influenced by the warm water discharge from the HECO power plant.

Salinity

Salinity measurements varied from 34.51 to 34.82 parts per thousand. Results do not indicate the presence of any significant amounts of fresh water in the harbor. Discharges from sources such as Nuuanu and Kapalama Streams appear to quickly mix into harbor waters; at least during periods of minimal stream flow when the salinity measurements were made.

Dissolved Oxygen

Dissolved oxygen values ranged from 6.1 ppm to 7.1 ppm, clearly indicating well oxygenated seawater. No oxygen deprived environments were identified.

Nutrients

Nitrogen and phosphorus are the nutrients that most influence productivity in ocean waters. The availability of these nutrients generally increases shoreward due to landward inputs. Results of the marine environmental assessment indicate that the harbor and nearby area are nitrogen limited. Thus, fresh water discharges with significant nitrogen content will tend to increase phytoplankton

[1]Hawaiian Electric, Marine Biological Impact of the Honolulu Generating Station. 1974.

growth. Chlorophyll a and phaeopigment measurements indicate similar stages of phytoplankton development throughout the study area except for a few slightly stagnant pockets of water.

Fecal Coliform

The presence of fecal coliform bacteria is typically used as an indicator of sewage contamination in seawater, with attendant concern for disease transmission. Department of Health measurements in Honolulu Harbor between April 25, 1987 to March 31, 1990 found fecal coliforms ranging from 2/100 ml to 13,000/100 ml; the latter exceeding the accepted public health criteria of 200/100 ml. Potential sources of discharge are illegal shipboard discharges and runoff from streams. However, measurements conducted in May 1990 in conjunction with the marine environmental assessment (appendix D) yielded counts ranging from less than 1 (zero) to 8/100 ml; well within the acceptable criteria.

2. Waves

The south shore of Oahu is subject to local wind waves, southern swell generated by storms in the Southern Hemisphere, Kona storm waves generated by local storms, and hurricane waves.

Honolulu Harbor is well protected from most offshore waves by Sand Island. For example, a severe (once in 50 years) hurricane can generate wave heights over 26 feet outside the harbor while storm surge in the harbor would be approximately 6.4 feet. A deep water swell 10 feet high will generate a surge of 3.8 feet in the harbor. Based on the preliminary wave gauge data and analysis conducted for the marine environmental assessment, the average significant wave height inside the harbor at Piers 6 and 9 is approximately one-tenth the height of waves outside the harbor mouth.

Kona storm waves or southern swells can penetrate the harbor when the direction of travel is parallel to the main entrance channel. Harbor users report that tour boats moored at Piers 5, 7 and 8 occasionally must be moved to safer berths during such conditions. Also, the Falls of Clyde, which is moored at Pier 7, requires very heavy cables and anchors to maintain her position during Kona storm waves. Waves are known to wash up onto the roadway at the base of Pier 5 and Pier 8 during some storm conditions.

3. Tides

The mean tide in Honolulu Harbor is 0.8 feet above Mean Lower Low Water (MLLW). The mean tidal range between MLLW and Mean Higher High Water (MHHW) is 2.0 feet. The tidal range in 1990 is -0.5 to +2.7 feet MLLW. Historically, tides have ranged from a minimum of -1.3 feet to a maximum of 3.5 feet.

4. Currents

Circulation in the vicinity of Aloha Tower was studied by tracking the drift of current drogues (underwater sails suspended by floats), and by aerially monitoring the dispersion of fluorescent dye released into the water at selected sites.

The speed and paths of the drogues and the dye indicate that the circulation patterns in the harbor are complex. Calculated flow rates are greater than if they were to be generated by tidal exchange alone. At approximately 20 feet per minute in mid-channel, the findings are comparable to those of Environmental Consultants (1974), when they investigated the impact of outflow from the HECO power plant. Circulation through the plant is substantial, amounting to approximately two-thirds of the average volumetric rate of the tide. This circulation, together with that contributed by Nuuanu Stream, storm drains, and possible flows from Keehi Lagoon, can produce a relatively high rate of surface flow. The possibility of stratified flow within the basin and Main Channel is also suggested. Flushing time for the harbor based on tidal exchange only is calculated to be 12 to 15 days. Actual flushing time is probably significantly less.

5. Marine Ecology

Alterations to the harbor through dredge and fill operations have left little of the original biofauna intact. Habitats within the harbor have developed on the altered substrate to varying degrees of complexity. The degree of habitat development is dependent upon the length of time the substrate has been in place, water movement characteristics, nutrient sources, fresh water input, and water quality at the site.

Marine life is generally neither abundant nor diverse in most areas of Honolulu Harbor. Many organisms can attach to the vertical structures, but the soft, shifting sediments at the bottom of the harbor may only be colonized by a few hardy or transient species. Except for Humpback Whales which seasonally pass along Oahu's shoreline, including the area outside of

Honolulu Harbor, there have been no rare, endangered, or threatened species identified within or near the project area. The Humpback Whale is an endangered specie that migrates between feeding grounds in the North Pacific and breeding grounds near Maui.

The harbor bottom is typically thick unconsolidated sediments (mud) with occasional burrows, particularly in shallow water, and limited fish life. This substrate forms the habitat for burrowing polychaete worms, shrimp, and crabs. Most of the organisms common to the soft bottom areas are capable of rapid recolonization following disturbance. One major fish specie inhabiting the mud bottom ecosystem is the juvenile hammerhead shark which feeds on mud dwelling invertebrates.

In the Kapalama channel fronting the Matson pier and probably extending from Piers 28 - 32, the consolidated coral bottom is completely clean and devoid of mud, sand or small gravel. Some patches of unidentified pale filamentous algae were the only life form found in this area. Tooth marks from dredging equipment are visible on the coralline rock surface. Sediments may be kept clear of this area by the constant prop-wash of passing ships.

Fish and coral fauna under and around most of the piers were also limited. Piers 1 and 2, which stretch from the central harbor to the harbor mouth, display an increasing abundance of corals toward the open ocean, except for sparser pockets adjacent to normal berthing sites of cargo ships. This could be due to shortages of light under shadows cast by ships or, possibly, from exposure to toxic antifoulant ship hull paints.

An area of relatively abundant sea life is along the sea-wall extending from the base of Pier 8, at HECO's cooling water inlet, to Pier 7, where HECO's discharge outlet is located, and out and around the rock revetment surrounding Piers 5 and 6. Compared to other areas of Honolulu Harbor, coral, invertebrates, and fish life are more abundant and diverse in these areas. Of the 47 species of fish and 12 species of coral identified in the harbor, most can be found in this general area. Throughout the harbor, the abundance of both fish and invertebrates typically is limited to the top five meters of water. Benthic life below this depth is generally restricted to mud dwelling organisms. Coral and other benthic life directly exposed to HECO's warm water outflow plume are scarcer in comparison to the surrounding areas. Discussions with researchers involved in the HECO environmental studies (1970-74) indicate that these ecological conditions have persisted over the past two decades.

6. Fisheries

Both Nuuanu and Kapalama stream mouths have, in the past, been important sites for "nehu" bait fishing in support of Oahu's Aku-boat (skipjack tuna) fishery. Nehu can be found in shallow waters in many areas around the state, including Honolulu Harbor, but they are captured primarily in stream mouths where they presumably congregate to feed. Although bait-size (2-3 cm) nehu were seen in the harbor near the Sand Island Park sea wall, none were seen in the Kapalama Channel, and only a few juveniles were seen near the mouth of the Nuuanu stream. Discussions with fishermen indicate that Honolulu Harbor has not been a productive baiting site for the past several years. During 1988 and 1989, Honolulu Harbor accounted for only about 11 percent of the nehu captured.

Piers 5 and 6 is a popular recreational fishing site because of its proximity to a highly populated area, its ease of access, the micro currents generated by the HECO power plant cooling water, and the perceived abundance of game fish. The site is used daily; people commonly come down to fish for an hour or two in the morning before work or in the afternoon before going home. Weekend fishermen tend to be younger.

7. Subsurface

The Aloha Tower site is located in an area which once supported marginal coral growth. An old map drawn circa 1816 shows a margin of coral reef off the then existing shore. According to a study by Dames & Moore (1980), it is estimated that this reef is an older reef level (120,000 years old), representative of the +5 (highest growth) level upon which most of downtown Honolulu is supported. The existing pier complex extends seaward of the shoreline of 1816.

According to a study by C.W. Associates Inc., most of the proposed improvements within the vicinity of Aloha Tower, being relatively large structures, will require pile foundations.[2] Piers 12 through 15 appear to be underlain by a considerable thickness of soft sediments deposited by Nuuanu Stream. Therefore, the report estimates, any new structures larger than a single story will probably require pile foundations penetrating to depths in excess of 100 feet.

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[2]C.W. Associates, Inc. Preliminary Geological and Geotechnical Engineering Reconnaissance Report. Prepared for Helber, Hastert & Kimura Planners and R.M. Towill. February 1989. p. 15.

8. Flood Hazard

The project area is not within a specified flood hazard zone according to the Flood Insurance Rate Map. Classified as zone X, the area is "*determined to be outside the 500-year flood plain.*"

9. Tsunami

Predicted water rise from a 100-year tsunami at a point 200 feet inland on the outer side of Sand Island is 3.8 feet.[3] No flooding in the vicinity of Aloha Tower is predicted.

10. Rising Sea Level

The potential for rising sea levels has been a concern expressed in recent years. Central to this concern is the "Greenhouse Effect," which, in theory, could melt glaciers and expand near-surface ocean water in a global ocean warming. Worldwide sea level rise has been about 12 cm over the past 100 years or about 1.2 mm per year. The highest rise considered possible is approximately 10 cm over the next 25 years or about 4 mm per year. In Honolulu, this projection also accounts for the island of Oahu subsiding at a rate of about 0.4 mm per year.[4] Over the next 50 years, sea level rise is forecasted to continue, reaching between 16 cm and 38 cm, with 27 cm being the most likely rise.

Sea level rise has been considered among the design parameters of new facilities in Honolulu Harbor, especially those in proximity to main channels where wave penetration is presently a problem.

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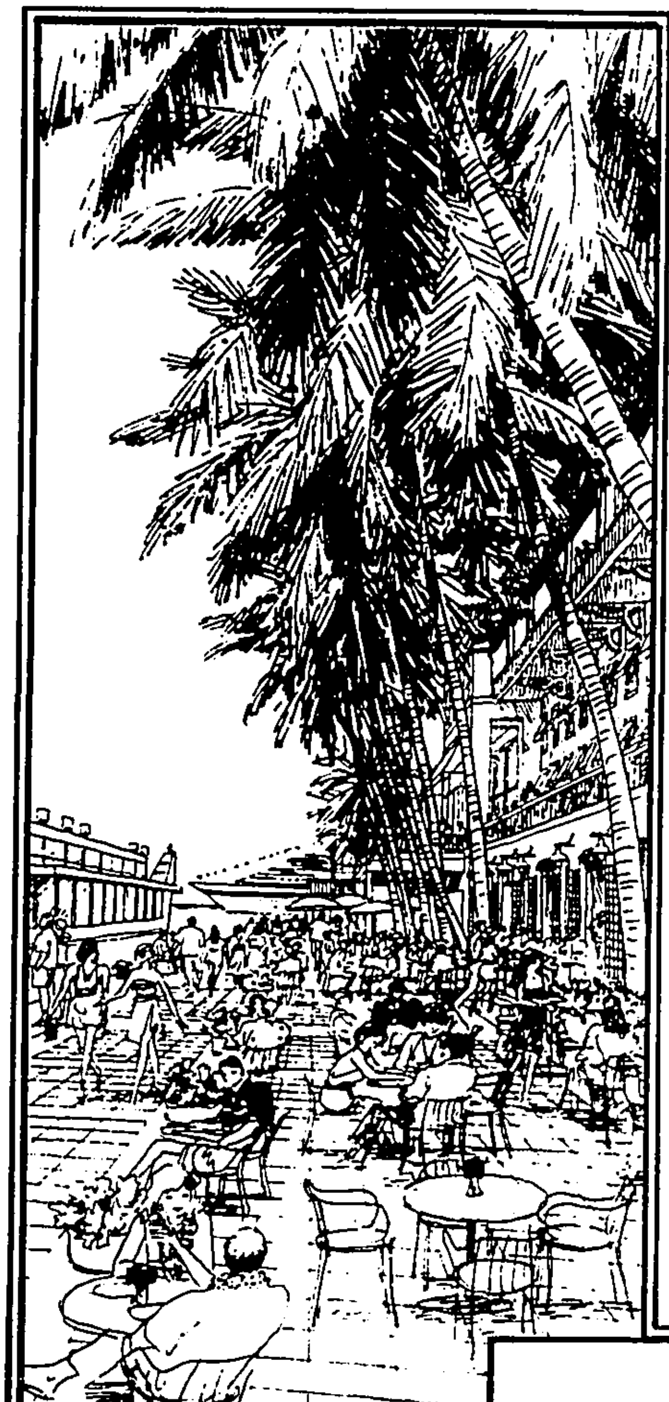
[3]Department of the Army, Pacific Ocean Division, Corps of Engineers. Manual for Determining Tsunami Runup Profiles on Coastal Areas of Hawaii. August 1978.

[4] Committee on Engineering Implications of Changes in Relative Mean Sea Level of the National Research Council, Responding to Changes in Sea Level, National Academy Press, Washington D.C. 1987.



CHAPTER IV

SOCIO-ECONOMIC ENVIRONMENT

IV. SOCIO-ECONOMIC ENVIRONMENT

This section presents an overview of the socio-economic characteristics of the area immediately surrounding the Waterfront at Aloha Tower development.

Situated mauka of the proposed Waterfront development, Downtown Honolulu represents the center of government, business, and finance on Oahu. The Downtown area is characterized by several distinct districts: the Capital District, the governmental center for the State of Hawaii and the City and County of Honolulu; the Financial District, a high density high-rise central business area and headquarters for the State's major corporations and financial institutions; the Kukui District above Beretania Street, a high-density downtown residential area; and the Chinatown District, a cultural mixed-use area of mostly older commercial and residential developments.

In the Kakaako area just east of Downtown, the State's Hawaii Community Development Authority is implementing its plan to redevelop the area into a more diverse and intensively built community of complementary commercial, industrial, and residential activities. The plan will provide approximately 25,700 commercial and industrial jobs and 6,600 housing units for about 16,500 persons in the Kakaako area by the year 2000.

A. Existing Characteristics

Honolulu's central business district (CBD) is shaped by the various heights and shapes of its numerous office towers. At ground level, plazas and wide roadways complement pedestrian malls and an exclusive public transit thoroughfare (Hotel Street). On the East side of Downtown is Honolulu's central federal, state and county offices, including the Prince Kuhio Federal Building, the State Capitol and governor's residence, City Hall, and the Municipal Building. At the Ewa side of Downtown is Chinatown, where buildings are predominantly two and three-story structures housing commercial and office uses. Residential structures are almost all high rises, except for those in Chinatown and are distributed throughout the entire Downtown area.[1]

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[1] Earthplan, Honolulu Waterfront Master Plan Technical Report Series Social Impacts. Prepared for Helber, Hastert & Kimura Planners and R.M. Towill. February 1989. p.14.

1. Profile of the Existing Community

Area Trends

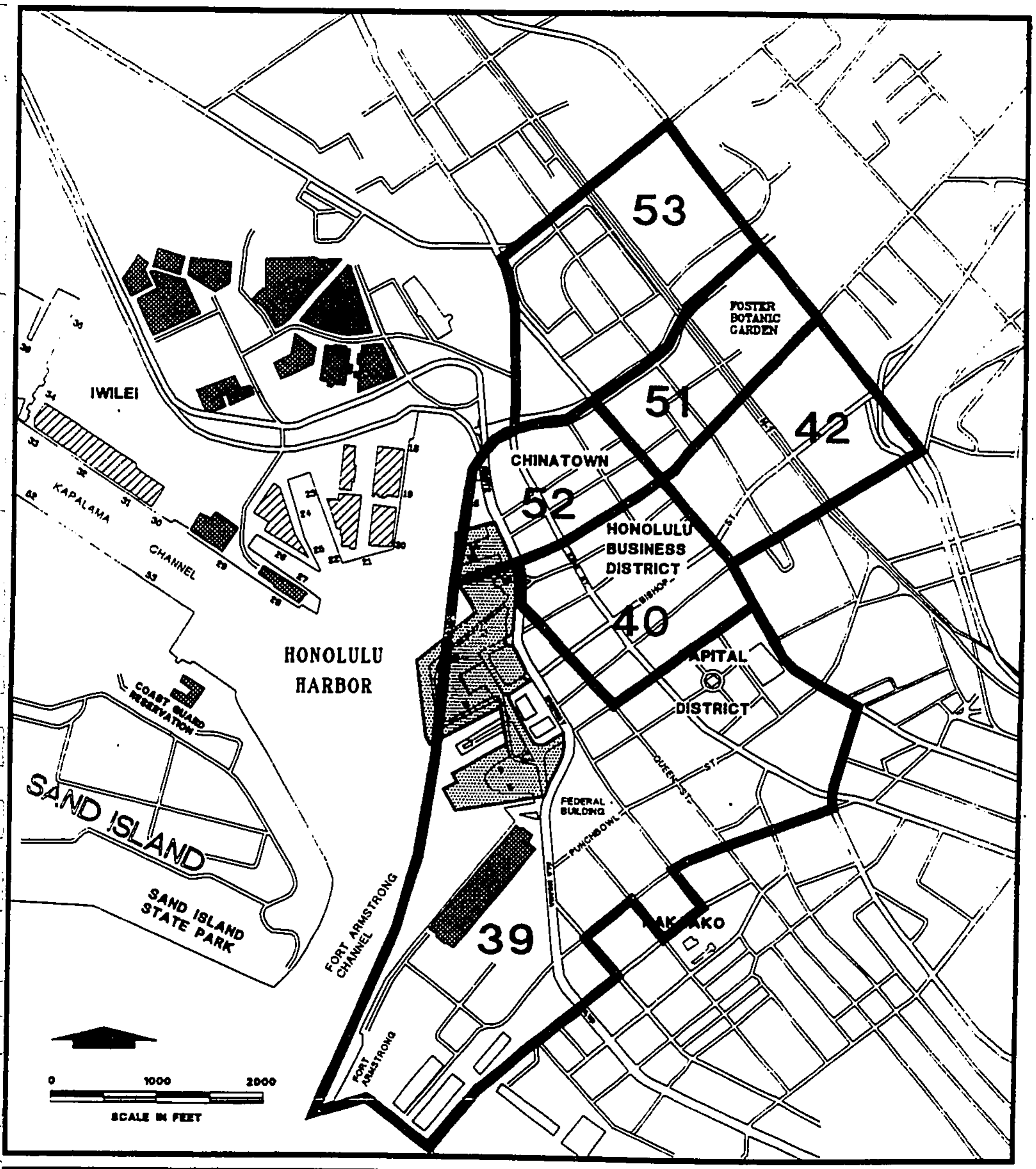
Downtown Honolulu has undergone substantial redevelopment and revitalization over the past 20 years. Particularly in the Financial district, high rise office buildings have displaced low rise structures in a trend towards high density development and modernization of the CBD. The rapid pace of development resulted in a temporary oversupply of office space in the early 1980's, most of which has since been absorbed. According to the 1980 census, the Downtown community was quite mobile, with less than a quarter of its residents living in the same house five years prior to the census.

Beginning in the 1970's, a number of high density residential and residential-commercial developments have also emerged, including Harbor Square, Kukui Plaza, Beretania North, Honolulu Tower, and Hale Pauahi. A number of new residential projects in the planning and construction stages will soon add substantially to the housing stock in the Downtown area, including One Waterfront Towers, Honolulu Park Place, Chinatown Gateway Plaza, Pacific Nations, River-Nimitz Housing, and the Kaahumanu Parking Structure redevelopment project (Harbor Court).

The Chinatown district has undergone internal change, but the physical character of the area has largely been preserved. Chinatown has served as the starting point and gathering place for many immigrants to Hawaii. This is reflected in the ethnic mix of people and small businesses in the area. The historic character of the area has been preserved through the City's designation of the Chinatown Special District, which guides development with respect to height, compatibility of land uses and architectural design.

Population

The community which the Waterfront at Aloha Tower development may have a direct effect upon is identified as the area bounded by the H-1 Freeway to the north, Liliha Street to the west, Honolulu Harbor to the south, and South Street to the east. This area encompasses Census Tracts 39, 40, 42, 51, 52 and 53, as shown in figure 15. Both the State of Hawaii Data Book and the U.S. Bureau of the Census data were used to characterize the area.



THE WATERFRONT AT ALOHA TOWER

Fig. 15
CENSUS TRACTS

Prepared for :
ALOHA TOWER DEVELOPMENT CORPORATION

Prepared by :
ALOHA TOWER ASSOCIATES
WILSON OKAMOTO & ASSOCIATES, INC.

The population within these tracts was estimated to be 13,082 residents in 1988, an increase from 10,678 in 1980.[2] This represents approximately 1.6 percent of Oahu's 838,500 resident population in 1988. While Oahu has experienced over 50 percent growth since 1960, the Downtown area has fluctuated, with a resident population of 11,500 in 1960, decreasing to 3,500 in 1970, and, following redevelopment of the area, tripling to 10,700 in 1980.

In describing the characteristics of Downtown's resident population, it is useful to distinguish among those residing in East Downtown (east of Nuuanu Avenue, in Census Tracts 40 and 42), those residing in the Chinatown vicinity (west of Nuuanu Avenue, in Census Tracts 51 and 52), and those in the Kukui area (west of Nuuanu Stream to Liliha Street, in Census Tract 53). Selected demographic characteristics are presented in table 2. Census Tract 39 encompasses a portion of the Kakaako redevelopment area to South Street, however, resident population numbered only 223 in 1980. 1980 census data preceded the recently developed residential towers (Royal Capitol Plaza and One Waterfront Plaza), thus demographic and housing characteristics for Tract 39 are not presented here. In addition, housing projects listed in tables 5, 6 and 7 also precede the 1980 census and are not reflected in tables 2, 3 and 4 (Honolulu Tower, Smith-Beretania and Hale Puahi). The latest population figures show an estimate of 3,709 in East Downtown, 4,654 in Chinatown, and 4,542 in Kukui in 1988.

<u>Personal Income and Family</u>

The Downtown area has smaller families and households than the Oahu population, with two persons per household in the East Downtown and Chinatown areas compared with an average of three per household for Oahu (see table 3). The Kukui area has a greater number of persons per household than Chinatown or East Downtown. Two-thirds of Chinatown families have children under 18, twice as many as families in East Downtown. Eighteen percent of Chinatown families with children have incomes below the poverty level, and 30 percent have a female household head.

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[2] Department of Business and Economic Development, <u>The State of Hawaii Data Book</u>. 1989. p.29.

TABLE 2: SELECTED DEMOGRAPHIC CHARACTERISTICS (1980)

	City & County of Honolulu	East Downtown (C.T. 40, 42)	Chinatown (C.T. 51,52)	Kukui (C.T. 53)
POPULATION	762,545	3,457	2,469	4,529
ETHNICITY	(percent)	(percent)	(percent)	(percent)
Caucasian	34.4%	50.4%	15.8%	9.5%
Japanese	24.9%	21.5%	10.6%	19.8%
Chinese	6.9%	9.8%	17.9%	36.8%
Filipino	12.6%	6.0%	22.0%	10.4%
Hawaiian	10.7%	5.4%	11.9%	12.0%
Korean	2.2%	2.3%	12.4%	4.2%
Other	8.2%	4.5%	9.5%	7.4%
AGE (years)				
0 - 17	28.1%	10.0%	23.0%	31.1%
18 - 34	34.6%	32.2%	27.0%	22.9%
35 - 64	30.1%	42.8%	29.7%	30.7%
65 or older	7.2%	14.3%	21.5%	15.3%
PLACE OF BIRTH				
Hawaii	55.1%	45.3%	42.4%	55.3%
Other US*	30.1%	41.2%	10.2%	9.2%
Foreign Country	14.8%	14.2%	48.6%	35.5%
RESIDENCE 5 YRS PREVIOUS (people aged 5+ yrs.)				
Same house	48.2%	25.5%	25.0%	67.6%
Elsewhere on Oahu	25.5%	52.2%	49.7%	18.8%
Neighbor Island	1.3%	2.4%	1.4%	0.0%
U.S. mainland	18.4%	16.1%	6.1%	1.1%
Foreign country	6.6%	3.8%	18.2%	12.5%
EDUCATION (people aged 25+ yrs.)				
0 - 8 years only	14.4%	8.5%	47.2%	38.3%
High school only	45.5%	37.2%	35.3%	41.7%
College	40.0%	54.4%	17.6%	20.1%

Notes: * Including persons born in U.S. territories, and abroad or at sea to American parents.

** Except for Total Population and Age, all figures based on 15% sample.

Source: U.S. Department of Commerce, Bureau of the Census. Census of Population and Housing, 1980--Summary Tape File 3A.

TABLE 3: FAMILY AND INCOME CHARACTERISTICS (1980)

	City & County of Honolulu	East Downtown (C.T. 40, 42)	Chinatown (C.T. 51,52)	Kukui (C.T. 53)
POPULATION	762,545	3,457	2,469	4,529
PERSONS IN HOUSEHOLD	230,951	1,981	1,024	1,508
1 Person	17.0%	48.7%	45.7%	25.9%
2 Persons	26.4%	34.6%	21.3%	22.7%
3 Persons	19.1%	9.7%	18.1%	14.2%
4 Persons	17.9%	5.2%	10.7%	16.1%
5 Persons	9.8%	1.4%	3.6%	10.9%
6 or more Persons	9.7%	0.4%	0.6%	10.3%
Persons per household	3.15	1.75	2.41	3.01
NUMBER OF FAMILIES	178,516	871	526	1,102
With children under 18	58.9%	35.1%	66.3%	58.5%
Below poverty w/children	6.2%	1.4%	17.9%	7.6%
W/female household head	7.5%	8.8%	29.5%	18.5%
FAMILY INCOME (Mean)	$27,318	$30,473	$11,674	$16,921
PER CAPITA INCOME	$7,912	$13,993	$4,333	$4,736
INDIVIDUALS BELOW POVERTY	9.5%	6.9%	33.1%	13.5%
Over 65 & below poverty	0.7%	0.7%	10.3%	3.5%
UNEMPLOYMENT (Persons 16 and over in labor force)	4.6%	2.5%	12.1%	4.0%

Source: U.S. Department of Commerce, Bureau of the Census. Census of Population and Housing, 1980--Summary Tape Files.

East Downtown residents are clearly more affluent, with a much higher per capita and family income than Chinatown or Kukui residents. Mean family income in 1980 was $30,500 for East Downtown compared to $11,700 for Chinatown families and $16,900 for Kukui families. One-third of Chinatown residents had incomes below the poverty level, including 10 percent of its senior citizens. Unemployment in Chinatown was 12.1 percent in 1980, compared with 2.5 percent unemployment in East Downtown and 4.0 percent unemployment in the Kukui area.

Housing

In 1980, there were 7,751 housing units in the Downtown area, about 3.0 percent of Oahu's stock of 250,866 units (see table 4). Two-thirds of the Downtown units are in high rise structures with 13 or more stories. The majority of units in the Kukui area are low-rise apartments. Two-thirds of the Downtown units have been constructed since 1970, indicating that much of this high density housing stock is relatively new.

In Chinatown, virtually all of the units are renter-occupied, and these are generally smaller units with more persons per room. In East Downtown, about one-third are owner-occupied and two-thirds are renter-occupied. The Kukui area is 55 percent owner-occupied and 45 percent renter-occupied. With older buildings in the area, about 10 percent of the East Downtown and Chinatown units lack complete kitchen or bathroom facilities.

Mean rent for renter-occupied units in Chinatown was less than half that of East Downtown, with average monthly rents of $158 in Chinatown, $348 in East Downtown, and $193 in Kukui. Figures based on the Rental Housing Development Study for the Island of Oahu show that the average monthly rental rate has risen in 1988 to $845 for a multi-family unit.

Ethnicity

Residents of the East Downtown area are predominantly Caucasian and Japanese, with 50.4 percent and 21.5 percent of the subarea's population, respectively. By contrast, the Chinatown vicinity shows great ethnic diversity, led by Filipinos with 20 percent and Chinese with 17.9 percent, followed by Caucasians, Koreans, Hawaiians, and Japanese. In the Kukui area, the Chinese with 36.8 percent are predominant, followed by Japanese with 19.8 percent, then by Hawaiians, Filipinos, and Caucasians.

As may be expected, nearly half of the Chinatown area residents are from a foreign country. In East Downtown, only 14 percent are from a foreign

TABLE 4: HOUSING CHARACTERISTICS (1980)

	City & County of Honolulu	East Downtown (C.T. 40, 42)	Chinatown (C.T. 51,52)	Kukui (C.T. 53)
HOUSING UNITS	250,866	2,198	1,024	1,514
TENURE				
Owner-occupied	49.9%	32.1%	0.4%	54.6%
Renter-occupied	50.1%	67.9%	99.6%	45.4%
MEAN NO. OF ROOMS	4.5	2.7	2.0	3.1
PERSONS PER ROOM				
1.51+ persons/room	7.4%	4.7%	17.9%	12.8%
MEAN				
CONTRACT RENT (For specified renter-occupied)	$294	$348	$158	$193
SELECTED CONDITIONS				
Lacking complete kitchen	2.4%	10.7%	9.1%	0.0%
No bathroom or half bath	1.9%	10.7%	11.1%	1.8%
HOUSING UNITS BY NUMBER OF STORIES IN STRUCTURE				
1 to 3	195,931	166	138	846
4 to 6	9,956	172	128	73
7 to 12	10,732	228	0	16
13 or more	34,245	1,599	807	579
HOUSING UNITS BY YEAR STRUCTURE BUILT				
1975 to 1980	37,861	746	678	65
1970 to 1974	50,527	460	146	798
1960 to 1969	74,750	596	96	619
1950 to 1959	45,246	105	42	18
Earlier	42,480	258	111	14

Source: U.S. Department of Commerce, Bureau of the Census. Census of Population and Housing, 1980--Summary Tape File 3A.

country, but 41 percent have migrated from the Mainland U.S. Mobility as reflected in the length of residence in these Downtown subareas is high, with only 25 percent of the population having the same residence in the previous five years. The majority in the Kukui area are Hawaii-born, although 35.5 percent are from foreign countries. There is high residential stability in the Kukui area, with nearly 70 percent having the same residence in the previous five years.

Age and Education

In the Downtown area as a whole, there are fewer children and more senior citizens relative to the remainder of Oahu's population. Well over half of the population is above 35 years of age, compared with only 37 percent in this age category for Oahu.

The Chinatown and Kukui area residents are far less educated than the Oahu average, with nearly half of the Chinatown residents having less than a high school education. In the Kukui area, 38 percent of residents have less than a high school education. East Downtown residents, by contrast, are highly educated, with only eight percent having less than a high school education and over half having college education.

2. Planned Land Uses

In 1990, a total of ten projects in the Downtown area were under construction, and nine more, including the Waterfront at Aloha Tower, are in the planning stages as of this writing. Tables 5, 6 and 7 list office, residential, retail and mixed use developments which are either under construction, planned or just completed.[3] Major improvements in close proximity to the Waterfront project include the $7 million Hotel Street renovation with 1920s style street lamps, the Kaahumanu Parking Structure redevelopment, the River-Nimitz Housing project, and the HECO Power Plant site.

Especially critical to the Downtown area is the shortage of office space which has made Honolulu's office vacancy rate the lowest in the nation. The current volume of construction is partly in response to this shortage. The Downtown Improvement Association, in their

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[3] "Development Popping Up Throughout Downtown Honolulu," Pacific Business News. March 1990.

TABLE 5: PLANNED PROJECTS

NAME	LOCATION	PROJECT	OWNER/ DEVELOPER
Unnamed Office Project	Former King Theater Site	Undetermined	A to Z, Inc.
Kaahumanu Parking Structure Redevelopment (Harbor Court)	Bethel St. and Nimitz Highway	122 apartments, Commercial/Retail 220,000 s.f., 1,055 parking stalls	City and County of Honolulu/ Beam Venture
Campbell Estate Office Tower	Bethel St. and Hotel St.	Office/retail 260,000 s.f., 400 parking stalls	Campbell Estate
Maunakea-Smith Street Housing	Maunakea St. and Nimitz Highway	238 apartments, retail 16,164 s.f., 439 parking stalls	City and County of Honolulu
Pacific Nations Center	Beretania St. and Queen Emma St.	Mixed use- 1.6 million s.f.	City and County of Honolulu
Kekaulike-Maunakea Housing	Kekaulike St.	132 apt. units, retail, 400 parking stalls	City and County of Honolulu
Unnamed Mixed-Use Project	HECO site	Undetermined	HECO
Former Toyo Theater Site	Nuuanu Stream	Undetermined	A.R. Kunimoto Trust
Foster Garden Estates	Vineyard Blvd. and Maunakea St.	1600 residential units	City and County of Honolulu

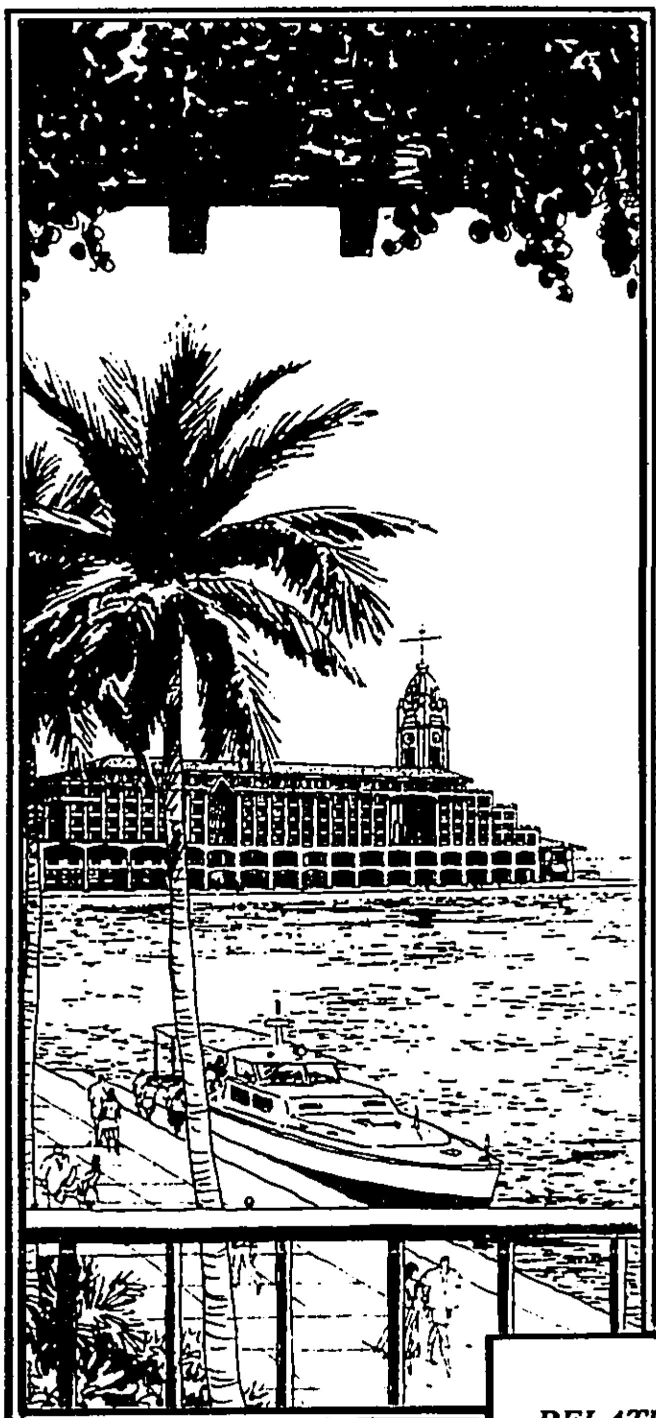
TABLE 6: PROJECTS UNDER CONSTRUCTION

NAME	LOCATION	PROJECT	DEVELOPER
State Office Tower	Beretania St.	State agency offices	Hemmeter Corp.
Chinatown Gateway Plaza	Nuuanu Ave. and Hotel St.	200 apartments, Commercial-retail 25,000 s.f. 275 parking stalls	City and County of Honolulu
Pan Pacific Plaza	Fort Street Mall	Office/retail 495,000 s.f.	Bishop Street Associates
River-Nimitz Housing	River St. and Nimitz St.	90 apartments, Commercial-retail 9,000 s.f. 134 parking stalls	City and County of Honolulu
Honolulu Park Place	Nuuanu St. and Beretania St.	437 residential units, 675 parking stalls	Charles Pankow Builders, Ltd.
Alii Place	Hotel St. and Richards St.	Commercial/retail 294,000 s.f., 1,000 parking stalls	Beta West
1100 Alakea Place Hotel St.	Alakea St. and 240 parking stalls	Office/retail 198,000 s.f.	Toa Kogyo (HI)

TABLE 7: PROJECTS RECENTLY COMPLETED

NAME	LOCATION	PROJECT	DEVELOPER
Waterfront Plaza Condominiums industrial	South St. Ventures	310 condominiums commercial/	Bruce Stark/ Kakaako
Maunakea Marketplace	Maunakea St. and Pauahi St.	Retail market restaurants 50,000 s.f.	Gerell and Associates
Hawaii National Bank	King St. and Smith St.	Bank headquarters 140,000 s.f.	Luke Family Partnership

annual review (June 1990), revealed an "extremely tight supply of new office space." Although 8.0 to 10 percent is considered a normal nationwide standard, Downtown Honolulu is less than four percent vacant.



CHAPTER V

RELATIONSHIP TO PLANS, POLICIES, AND CONTROLS

V. RELATIONSHIP TO LAND USE PLANS, POLICIES AND CONTROLS

The plans and policies relating to the proposed Waterfront at Aloha Tower project are numerous, ranging from broad program guidance offered by the Hawaii State Plan and various State Functional Plans, to land use controls governing the development of the site. The Waterfront at Aloha Tower will be developed in consonance with various land use plans, policies and regulatory controls. The following is a review of these plans and policies.

A. Plans

1. Hawaii State Plan

The Hawaii State Plan establishes a statewide planning system that provides goals, objectives, and policies which detail priority directions and concerns of the State of Hawaii (Chapter 226, Hawaii Revised Statutes). The Waterfront at Aloha Tower will revitalize the economic activity in the area by rejuvenating and expanding maritime activities; creating retail and recreational attractions for residents and visitors; and establishing business offices, related hotel accommodations, a residential complex, and various public improvements. These will be integrated within a setting that reflects the history of the area and promotes aesthetic benefits through generous park space, a pedestrian promenade at the waterfront, and respect for significant view planes. Energy efficient equipment will be utilized throughout the development. In addition, The Aloha Tower Housing Foundation, established by Aloha Tower Associates (ATA) and The Enterprise Foundation of Columbia, Maryland, will supplement the goals and objectives of the Hawaii State Plan by assisting the very poor in Hawaii in obtaining fit and affordable housing. These proposed improvements are consistent with the following State goals, objectives, policies and priority guidelines:

<u>Transportation</u>

<u>Objective:</u>

PLANNING FOR THE STATE'S FACILITY SYSTEMS WITH REGARD TO TRANSPORTATION SHALL BE DIRECTED TOWARD THE ACHIEVEMENT OF INTEGRATED MULTI-MODAL TRANSPORTATION THAT...PROMOTES THE EFFICIENT, ECONOMICAL, SAFE, AND CONVENIENT MOVEMENT OF PEOPLE AND GOODS.

Policies:

i. *Provide for improved accessibility to shipping, docking, and storage facilities.*

ii. *Promote a variety of carriers to offer increased opportunities and advantages to inter-island movement of people and goods.*

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

Housing

Objective:

PLANNING FOR THE STATE'S SOCIO-CULTURAL ADVANCEMENT WITH REGARD TO HOUSING SHALL BE DIRECTED TOWARDS ACHIEVEMENT OF GREATER OPPORTUNITIES FOR HAWAII'S PEOPLE TO SECURE REASONABLY PRICED, SAFE, SANITARY, LIVABLE HOMES...THAT SATISFACTORILY ACCOMMODATE THE NEEDS AND DESIRES OF FAMILIES AND INDIVIDUALS.

Policies:

i. *Effectively accommodate the housing needs of Hawaii's people.*

ii. *Stimulate and promote feasible approaches that increase housing choices for low-income, moderate-income, and gap-group households.*

iii. *Increase homeownership and rental opportunities and choices in terms of quality, location, cost, densities, style, and size of housing.*

Visitor Industry

Objective:

PLANNING FOR THE STATE'S ECONOMY WITH REGARD TO THE VISITOR INDUSTRY SHALL BE DIRECTED TOWARDS THE ACHIEVEMENT OF THE OBJECTIVE OF A VISITOR INDUSTRY

THAT CONSTITUTES A MAJOR COMPONENT OF STEADY GROWTH FOR HAWAII'S ECONOMY.

Policies:

i. *Improve the quality of existing visitor destination areas.*

ii. *Encourage cooperation and coordination between the government and private sectors in developing and maintaining a well-designed, adequately serviced visitor industry and related developments which are sensitive to neighboring communities and activities.*

iii. *Foster an understanding by visitors of the Aloha Spirit and of the unique and sensitive character of Hawaii's cultures and values.*

Physical Environment - scenic, natural beauty, and historic resources

Objective:

PLANNING FOR THE STATE'S PHYSICAL ENVIRONMENT SHALL BE DIRECTED TOWARDS ACHIEVEMENT OF...ENHANCEMENT OF HAWAII'S SCENIC ASSETS, NATURAL BEAUTY, AND MULTICULTURAL/HISTORIC RESOURCES.

Policies:

i. *Promote the preservation and restoration of significant natural and historic resources.*

ii. *Provide incentives to maintain and enhance historic, cultural, and scenic amenities.*

iii. *Encourage the design of developments and activities that complement the natural beauty of the islands.*

Facility Systems - energy/telecommunications

Objective:

PLANNING FOR THE STATE'S FACILITY SYSTEMS WITH REGARD TO ENERGY... SHALL BE DIRECTED TOWARDS... DEPENDABLE, EFFICIENT, AND ECONOMICAL STATEWIDE

ENERGY... SYSTEMS CAPABLE OF SUPPORTING THE NEEDS OF THE PEOPLE.

Policies:

i. *Promote prudent use of power and fuel supplies through conservation measures including education and energy-efficient practices and technologies.*

Priority guidelines for energy use and development:

(3) *Provide incentives to encourage the use of energy conserving technology in residential, industrial, and other buildings.*

(4) *Encourage the development and use of energy conserving and cost-efficient transportation systems.*

2. State Functional Plans

The Statewide planning system requires the preparation of State Functional Plans which are approved by the Governor. State Functional Plans implement the goals, objectives, policies and priority guidelines of the Hawaii State Plan. They provide the detailed linkage of State programs to State policy. Out of fourteen functional plans, five were approved by the Governor in 1989: Education, Health, Housing, Employment, and Human Services. Seven functional plans are undergoing revision for the Governor's approval: Agriculture, Conservation Lands, Energy, Historic Preservation, Recreation, Tourism, and Transportation. Two functional plans have yet to be reviewed: Higher Education and Water Resources.

The proposed Waterfront at Aloha Tower development is consistent with the following Functional Plans:

State Transportation Functional Plan

The State Transportation Functional Plan is directed "*toward the ultimate development of a multi-modal statewide transportation system that serves clearly identified social, economic, and environmental objectives.*" The plan includes projected transportation needs as well as "*a schedule of priorities for the construction, modification, and maintenance of various segments throughout the statewide plan which involve either state-operated or county-operated systems.*"

D. Objective:

DEVELOP AND UPDATE HARBOR MASTER PLANS WHICH SERVICE STATEWIDE NEEDS RELATING TO THE EFFICIENT, SAFE, AND CONVENIENT MOVEMENT OF PEOPLE AND GOODS TO ACCOMMODATE PLANNED GROWTH ACTIVITIES.

D(2). Policy:

"Maximize the utilization of Honolulu Harbor in accordance with the 1995 Honolulu Harbor Master Plan."

The development plan for the Waterfront at Aloha Tower incorporates the needs of the Department of Transportation Harbors Division for maritime operations as well as administrative office space.

State Tourism Functional Plan

The State Tourism Functional Plan guides both the public and private sector in implementing objectives, policies and Priority Guidelines for the visitor industry. The overall theme of this plan is: *"The achievement of a visitor industry that constitutes a major component of steady growth for Hawaii's economy."*

B. Objective:

DEVELOPMENT AND MAINTENANCE OF A WELL-DESIGNED AND ADEQUATELY SERVICED VISITOR INDUSTRY AND RELATED DEVELOPMENTS IN KEEPING WITH THE NEEDS AND ASPIRATIONS OF HAWAII'S PEOPLE.

B(3). Policy:

"Encourage greater cooperation between the public and private sectors in developing and maintaining well-designed and adequately serviced visitor industry and related developments."

The proposed project is a concerted effort between the public sector, represented by Aloha Tower Development Corporation (ATDC), and private enterprise, represented by ATA, to develop and maintain a major new, historically sensitive recreational and cultural resource at the waterfront.

State Housing Functional Plan

The State Housing Functional Plan is a guide for government agencies, the Legislature, the private sector, and residents of the State in response to Hawaii's housing needs.

A. Objective

HOMEOWNERSHIP FOR AT LEAST SIXTY PERCENT, OR ROUGHLY 248,500 HOUSEHOLDS BY THE YEAR 2000.

A(2). Policy:

"Encourage increased private sector participation in the development of affordable for-sale housing units."

B. Objective

SUFFICIENT AMOUNT OF AFFORDABLE RENTAL HOUSING UNITS BY THE YEAR 2000 SO AS TO INCREASE THE STATE'S RENTAL VACANCY RATE TO AT LEAST 3%.

B(2). Policy:

"Encourage increased private sector participation in the development of affordable rental housing."

C. Objective

INCREASED DEVELOPMENT OF RENTAL HOUSING UNITS FOR THE ELDERLY AND OTHER SPECIAL NEED GROUPS TO AFFORD THEM AN EQUAL ACCESS TO HOUSING.

C(4). Policy:

"Provide a continuum of housing for homeless persons and families to enable them to achieve greater independence and stability."

The Aloha Tower Housing Foundation is designed to support implementation of these State Functional Plan policies by assisting in the provision of fit and affordable housing for the poor in Hawaii. The Aloha Tower Housing Foundation will provide financial and technical resources through the contribution of five percent of all of ATA's pretax profit from the operation and sale of improvements in addition to the contribution of five percent of interest earnings from all of ATA's project lenders (excluding construction lenders and mortgagees on individual condominium apartment loans). The Aloha Tower Housing Foundation will also provide technical resources as well as work closely with the State's Housing Finance and Development Corporation (HFDC) to help implement the Comprehensive State Housing Program.

State Historic Preservation Functional Plan

The State Historic Preservation Functional Plan is designed with regard to the preservation of history and the heritage of Hawaii. Identified among the diverse activities presented in the functional plan are priorities for the preservation of historic properties and the education of the public with regard to Hawaii's past.

D. Objective:

TREATMENT OF HISTORIC PROPERTIES CONSISTENT WITH ACCEPTABLE STANDARDS OF WORKMANSHIP.

D(2). Policy:

"*Encourage the maintenance and preservation of State and County owned historic properties.*"

The proposed project includes the renovation of Aloha Tower, restoration of Irwin Park, a public interpretive program for Honolulu Fort Historic Park, and an overall historic architectural theme that harkens back to the days of Honolulu Harbor's bustling passenger ship arrivals and departures known as "Boat Days."

State Recreational Functional Plan

The State Recreational Functional Plan is directed towards "*assessing present and potential demand and supply of outdoor recreation resources and to guiding State and County agencies in acquiring or preserving lands of recreational value, providing adequate recreation facilities and programs, and ensuring public access to recreation areas.*"

D. Objective:

ASSURE THE PROVISION OF ADEQUATE PUBLIC ACCESS TO LANDS AND WATERS WITH PUBLIC RECREATION VALUE.

D(2). Policy:

"*Promote the securing of public access to resources with recreational value.*"

E. Objective:

PROVIDE ADEQUATE RECREATION OPPORTUNITIES WHICH MEET EXPRESSED NEEDS AND ARE AVAILABLE AS A RESULT OF THE CUMULATIVE EFFECTIVENESS AND COOPERATION OF RECREATION SUPPLIERS AND USERS.

E(3). Policy:

"*Coordinate visitor and resident recreation interests to achieve compatible recreation usage.*"

The recreational amenities that the Waterfront at Aloha Tower project proposes will address both resident and visitor demands.

<u>State Energy Functional Plan</u>

The State Energy Functional Plan is focused upon the "*State's energy supply and Hawaii's total reliance upon Imported oil.*" Major areas of concern include Energy Conservation and Land Use and Support Facility Systems Planning.

C. Objective:

MODERATE GROWTH IN ENERGY DEMAND THROUGH A COMPREHENSIVE PROGRAM DESIGNED TO PERMANENTLY MINIMIZE WASTE AND MAXIMIZE EFFICIENT ENERGY USE.

C(1). Policy:

"*Increase efficiency in personal energy consumption patterns, particularly in the use of ground transportation fuels, utility and bottled gas, electricity and hot water.*"

D. Objective:

PROMOTE ENERGY EFFICIENCY THROUGH LAND USE AND SUPPORT FACILITY SYSTEMS PLANNING.

D(1). Policy:

"Wherever feasible, direct future urbanization into easily serviceable, more compact, concentrated developments next to existing urban areas."

D(2). Policy:

"Facilitate the design and use of energy-efficient and energy conserving support facilities."

The Waterfront at Aloha Tower is a redevelopment project within the urban core of Honolulu. The project shall utilize energy-efficient state-of-the-art equipment to minimize energy costs.

3. General Plan of the City and County of Honolulu

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

In 1977, the City and County of Honolulu adopted the Oahu General Plan containing long-range planning objectives and policies which the City and County government hopes to achieve for the Island of Oahu through the year 2000. The General Plan was revised and expanded in subsequent years and includes the following subject areas: population, economic activity, natural environment, housing, transportation and utilities, energy, physical development and urban design, public safety, health and education, culture and recreation, and government operations and fiscal management. The Waterfront at Aloha Tower development will be consistent primarily with the following policies of the General Plan:

Population Objective C, Policy 1:

"Facilitate the full development of the primary urban center."

Economic Activity Objective A, Policy 3:

"Encourage the development in appropriate locations on Oahu of trade, communications, and other industries of a non-polluting nature."

Natural Environment Objective B, Policy 2:

"Protect Oahu's scenic views, especially those seen from highly developed and heavily travelled areas."

Transportation and Utilities Objective A, Policy 11:

"Make public, and encourage private, improvements to major walkway systems."

Physical Development and Urban Design Objective B, 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."

Physical Development and Urban Design Objective D, Policy 8:

"Preserve and maintain beneficial open space in urbanized areas."

Culture and Recreation Objective B, Policy 2:

"Identify, and to the extent possible, preserve and restore buildings, sites and areas of social, cultural, historic, architectural, and archaeological significance."

Culture and Recreation Objective D, Policy 3:

"Develop and maintain urban parks, squares, and beautification areas in high density urban places."

Housing Objective C, Policy 3:

"Encourage residential development near employment centers."

The Waterfront at Aloha Tower will facilitate implementation of the General Plan. The proposed pedestrian promenade will promote culture and recreation with the waterfront walkway system intertwining with park and plaza open space, while the entire architectural theme is based on the restoration of the historical features and reminiscences of Honolulu Harbor.

4. Honolulu Waterfront Master Plan

Due to the wide range of land and water uses and the complexity of the management framework associated with the waterfront, the Office of State Planning was directed to prepare a master plan for the entire Honolulu Waterfront for purposes of promoting a comprehensive, functionally integrated vision for the waterfront. The purpose of the master plan are three-fold:

a) *To identify and articulate 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;*

b) *To assure a logical, orderly and achievable phasing of improvements in a manner that minimizes social, environmental and economic disruption; and*

c) *To maximize public benefits associated with the improvement of the significant State-owned lands located within the waterfront planning area.*

The Waterfront at Aloha Tower development supports the above stated master plan's purpose.

The master plan also establishes a range of goals for the waterfront, many of which relate to the Waterfront at Aloha Tower development, as listed in table 8. The development supports virtually all of the stated goals. The condominiums at Piers 13 and 14, which will be luxury housing, meet the conditional use requirements of Goal C.2 by contributing *"significantly to reducing public costs for waterfront improvements,"* and by *"providing people and activities in the area 24 hours a day."* They also integrate "priority uses" (ferry piers and support facilities) into a "waterfront location." Moreover, the condominiums are not *"located adjacent to major parks or recreation areas."*

With respect to site specific recommendations in the plan, the Waterfront at Aloha Tower generally proposes uses from Piers 5 through 11 as recommended in the Kewalo/Kakaako/Downtown Subareas, although the specific locations of these activities may differ (see figure 16). One difference is the Plan's recommended use of Piers 13 and 14 for a fishing/commercial development as these piers are where the condominiums would be located. It should be noted, however, that the Waterfront Master

TABLE 8

HONOLULU WATERFRONT MASTER PLAN
LIST OF GOALS

A. PHYSICAL

1. Land Use

Maritime Uses:	*Provide sufficient space and facilities (landside and waterside) to meet the functional requirements of Oahu's harbor and maritime needs for the long range economic welfare of the State.*
Recreational Resources:	*Provide recreational resources (active, passive, social and cultural) to meet the needs of Honolulu's growing residential population, without jeopardizing the capability of meeting the State's maritime needs.*
Urban Development:	*Provide space for water-related commercial, industrial and institutional facilities which meet the demands of the State's growing population and economy.*

2. Urban Design

Public Access:	*Promote safe access to the ocean and along the water's edge.*
Views:	*Enhance views of and from the waterfront and protect significant existing view corridors.*
Historic Resources:	*Protect existing historical landmarks and incorporate historical features and themes into waterfront redevelopment programs.*

TABLE 8 (Cont.)

HONOLULU WATERFRONT MASTER PLAN
LIST OF GOALS

Design Quality:	*Encourage the highest quality of design for all public or publicly visible facilities and features.*
Hawaiian Character:	*Develop distinctly Hawaiian design themes for major waterfront redevelopment projects.*
Landmark Projects:	*Provide for one or more major landmark projects that will give the Honolulu waterfront its own world-renowned identifying symbols.*

3. Circulation

Public Transportation:	*Promote the availability and use of public transportation (land and water-borne) to and within the waterfront area.*
Service Access:	*Provide service access to all waterfront uses. Minimize conflicts and safety concerns between service vehicles and other uses.*
Nimitz Highway:	*Moderate the use of the Nimitz Highway corridor for through traffic and/or seek other ways, including grade separated facilities, to reduce this traffic barrier between the waterfront and areas immediately mauka of it.*
Pedestrian and Bikeway Linkages:	*Provide a system of pedestrian ways and bikeways linking all major activity nodes along the waterfront to those areas mauka of it.*

HONOLULU WATERFRONT MASTER PLAN
LIST OF GOALS

5. Environmental

Ecosystems:	*Minimize the adverse impacts on existing ecosystems in the harbor and the nearshore waters.*
Public Health:	*Maintain water quality, air quality, noise, vibration, and night lighting levels within acceptable health and nuisance standards.*

6. Phasing

Maritime Facilities:	*Insure that sufficient maritime facilities are available for the State's long range economic welfare before designating existing maritime lands for non-maritime uses.*
Priority Projects:	*Encourage redevelopment to take place in an orderly and incremental fashion starting with identified "priority projects" which are expected to serve as catalysts for further development of surrounding properties.*
Long Range Plan:	*Strive to implement a long range land use plan for the waterfront and avoid any actions which would foreclose implementing such a plan without fully analyzing and accepting the outcomes of such actions.*

B. **ECONOMIC**

1. Existing/Future Operations

Harbor Operations:	*Maintain the viability of Honolulu Harbor as the State's primary port, and insure that the harbor operations will be able to accommodate all necessary existing and*

TABLE 8 (Cont.)

HONOLULU WATERFRONT MASTER PLAN
LIST OF GOALS

		future inter-island and overseas statewide commerce needs.
	Compatible Uses:	*Seek to expand or enhance existing operations which are compatible and consistent with the long range plans for the waterfront and minimize dislocation impacts of non-compatible uses.*
	Ocean-Related Uses:	*Encourage the development of uses and activities which take advantage of or seek to promote Hawaii's unique ocean-related opportunities.*
2.	Financing	
	Public Benefits and Costs:	*Seek to maximize public benefits while minimizing public costs for development within the project area.*
	Private Sector Role:	*Encourage private sector redevelopment wherever possible but provide sufficient off-site infrastructure or public/private development partnerships to reduce private sector risks and insure long-term project viability.*
	Financing Tools:	*Explore innovative financing techniques to cover public expenditures such as tax increment financing, user fees, local improvement districts, etc.*

TABLE 8 (Cont.)

HONOLULU WATERFRONT MASTER PLAN
LIST OF GOALS

3. Implementation/Operational Responsibilities

Implementation Organizations:	*Identify existing or create new government agencies, authorities or development corporations which will be responsible for implementing the long range waterfront plan.*

4. Phasing

Market:	*Do not proceed with any new development until there is sufficient market to support the project or an economic benefit to the State.*
Impacts on Existing Operations:	*Seek to minimize adverse economic impacts on existing businesses and other activities during construction of off-site infrastructure and adjacent redevelopment projects.*

C. SOCIAL

1. Employment

Employment Opportunities:	*Enhance employment opportunities within the waterfront area to support the uses and activities being provided.*

2. Housing

Priority Uses:	*Housing within the waterfront should only be provided where it is not competing or conflicting with,nor impacted by, long-term maritime, commercial, industrial, recreational, cultural or institutional uses which need or benefit from waterfront locations.*
Financial and Social Justification:	*Housing should only be considered when its financial returns can contribute significantly*

TABLE 8 (Cont.)

HONOLULU WATERFRONT MASTER PLAN
LIST OF GOALS

	to reducing public costs for waterfront improvements, and its presence will enhance the sense of community by providing people and activities in the area 24 hours a day. In no case should housing (particularly luxury housing) be located adjacent to major parks or recreation areas.
3. Development Impacts	
Relocation Assistance:	*Relocation sites and assistance should be provided for existing activities which may prove to be incompatible with long-term uses in the waterfront area.*
Resident Focus:	*Uses within the waterfront area, particularly recreational and cultural, should be aimed at meeting the needs of the local residents first and visitors second.*
4. Phasing	
Community Facilities:	*Recreational, cultural and institutional facilities should be provided in the waterfront area as regional needs for these uses materialize, particularly as generated by the growing residential areas mauka of the Nimitz Highway and the Ala Moana Boulevard.*

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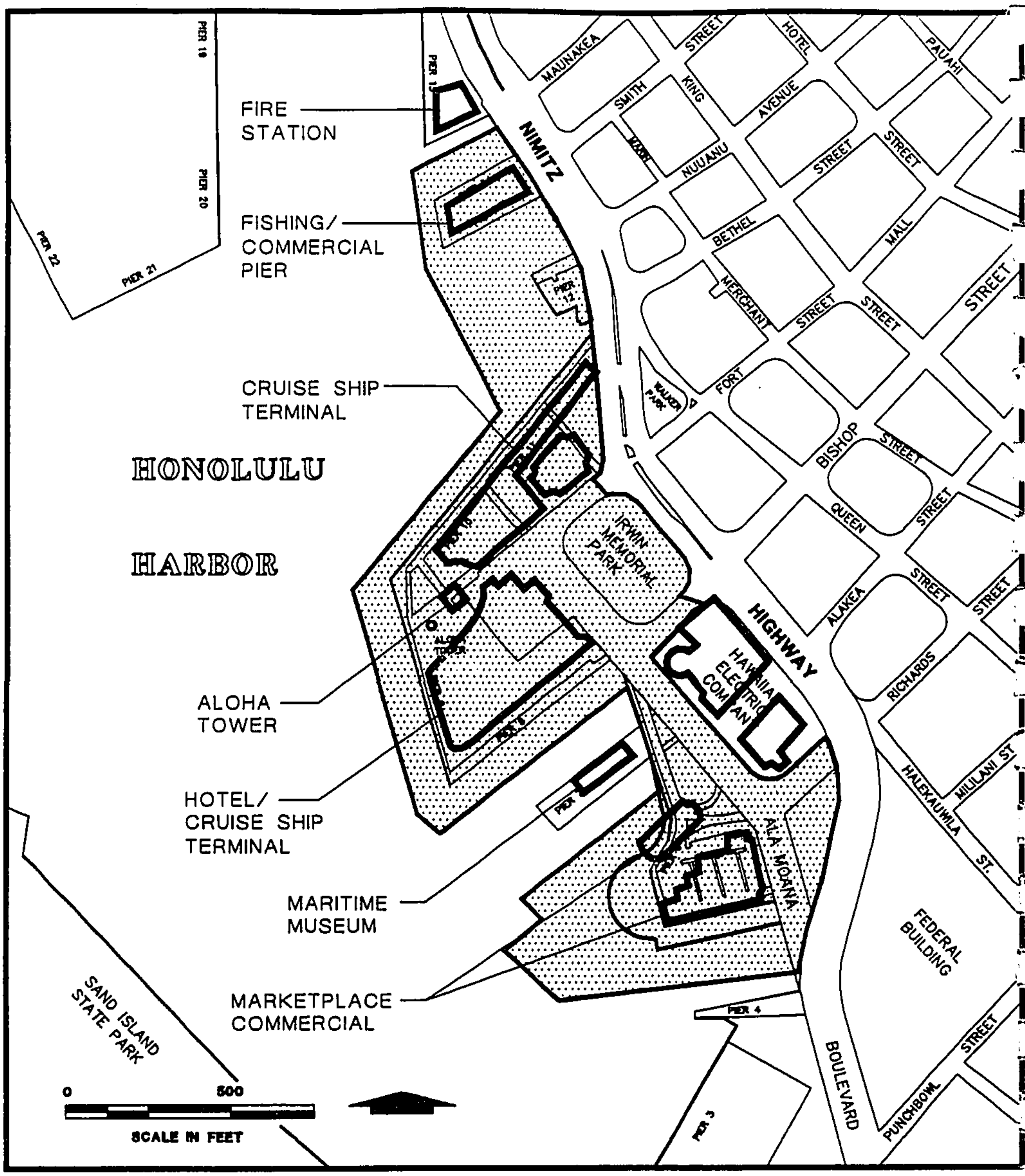
Source: State of Hawaii Office of State Planning, Honolulu Waterfront Master Plan - Final Report. Prepared by Helber, Hastert & Kimura, Planners and R.M. Towill Corporation, October 1989.



THE WATERFRONT AT ALOHA TOWER

Fig. 16
HONOLULU WATER FRONT MASTER PLAN

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Prepared by :
ALOHA TOWER ASSOCIATES

WILSON OKAMOTO & ASSOCIATES, INC.

Plan affords the ATDC leeway to "*coordinate plans for the area with ongoing efforts to develop the Aloha Tower area.*"

5. 2010 Master Plan for Honolulu Harbor

The 2010 Master Plan updates the 1995 Honolulu Harbor Master Plan completed in 1976. Prepared by the Harbors Division of the State Department of Transportation and the Chamber of Commerce of Hawaii Maritime Affairs Committee, the 2010 Master Plan updates the improvements, operations and maintenance of harbor facilities.

The following are those recommendations from the 1995 Master Plan for Honolulu Harbor that are still in effect:

3) Development of pedestrian facilities and attractions to improve the interface of the Downtown and the Civic Center area with the waterfront;

5) Provision for marine passenger shuttle service between Downtown and Sand Island;

6) Provision for expansion of inter-island hydrofoil terminal operations presently at Pier 8; and

7) Continuation of facilities for overseas passenger ships and other maritime functions at the Aloha Tower Development project.

8) Relocation of ship repair activities at Piers 13-14 when facilities at Piers 21-36 become available for such use.

The following are those recommendations from the 2010 Master Plan for Honolulu Harbor:

B) Continuation of efforts to improve the interface between Downtown and the Honolulu Harbor Waterfront.

C) Continuation of Piers 8-11 as the major passenger handling facility in Honolulu Harbor with provisions for three overseas type passenger vessels, with the possibility of using Pier 8 for a passenger ferry terminal, if other sites prove to be unfeasible.

D) Redevelopment of the Piers 12-15 area for maritime activities compatible with the Aloha Tower Development and the

Downtown/Waterfront interface efforts; with improvements to Piers 12-14 for local cruise operations and contingency commercial fishing berths or, consideration of Piers 13-14 as a possible inter-island passenger facility; relocating all or part of the existing fire station at Pier 15; removal of the Pier 15 shed; reconstruction of Pier 15 for fishing vessels; and create more open landscaped area in the Pier 15 area.

These updates were formulated as a direct result of increases in the passenger vessel industry, technological advancements in cargo handling, the declining activity of the ship repair industry, and an increase in tourist activities, such as dinner cruises. The proposed Waterfront at Aloha Tower shall implement these recommendations as proposed but will deviate somewhat with respect to the additional use of Piers 5 and 6 for passenger handling facilities. Also, Pier 12 will have no berthing facilities and Piers 13 and 14 will primarily serve the commuter ferry system.

6. Conceptual Planning Study - Honolulu Harbor Piers 2 - 18

This 1978 study, prepared by EDAW, Inc., was concerned with the comprehensive short-range and long-range action plans, together with alternatives, to guide the development of the waterfront area between Piers 2 and 18. The planning goals and objectives outlined in this study were:

* *To encourage more public enjoyment, use of, and contact with the waterfront by introducing attractive and compatible uses and creating a park-like atmosphere along the water's edge;*

* *To provide for present and future maritime uses and related activities that will encourage more public use and activity;*

* *To integrate the harbor with downtown via pedestrian overpasses at selected sites;*

* *To minimize the adverse effects of Nimitz Highway and Ala Moana Boulevard;*

* *To preserve the Aloha Tower as the symbolic, historic landmark and major focal point of the waterfront area; and*

* *To preserve and enhance the mauka - makai vistas.*

The recommendation of the studies was:

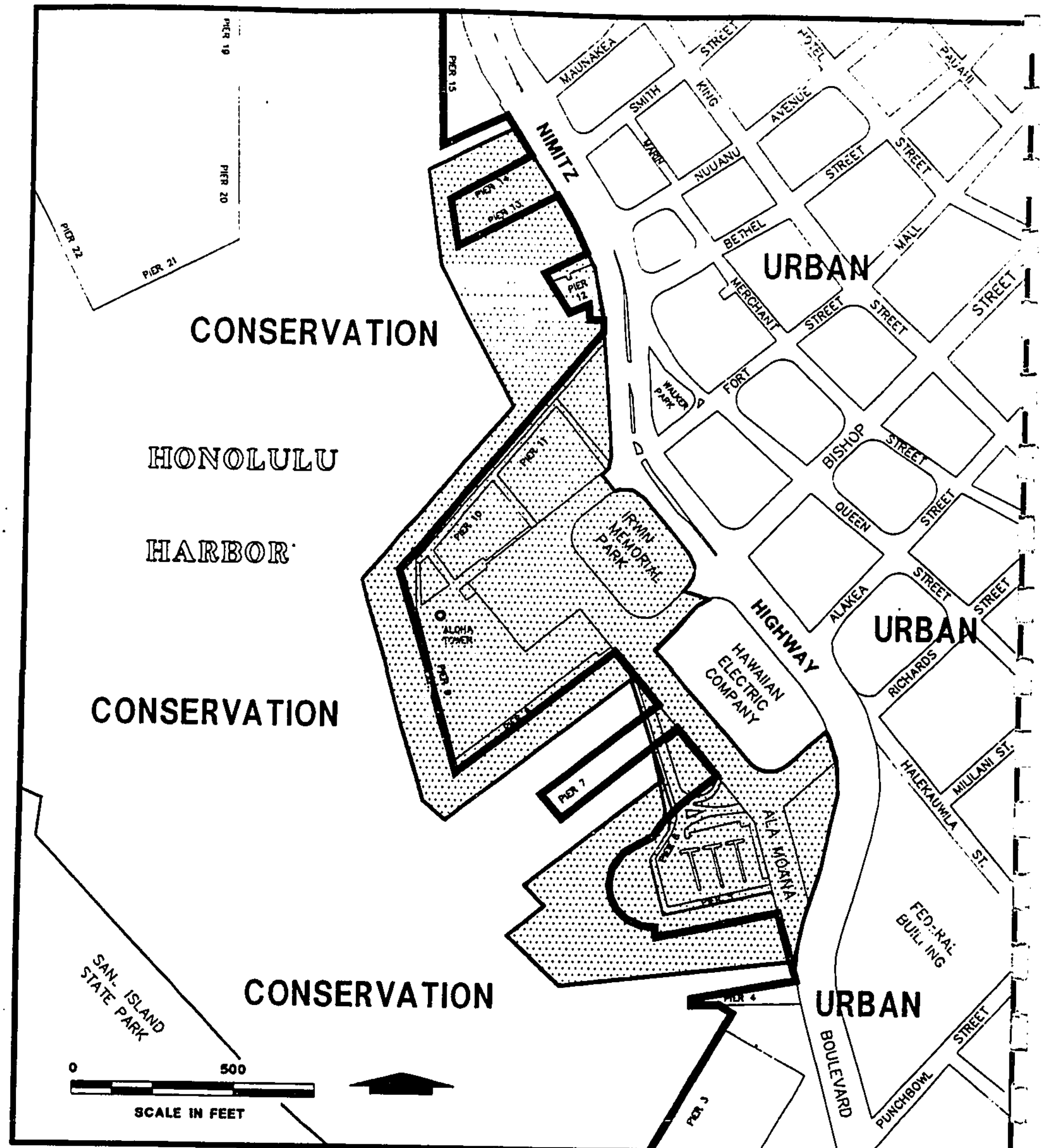
> *The Aloha Tower complex comprising piers 8 through 11 are, and should remain, the heart and focal point of the downtown waterfront - symbolically, economically and visually.*
>
> *Development of the Aloha Tower area is the key element in any long-range and short-range plans for the balance of the downtown waterfront area.*
>
> *What happens in the pier 2 through 18 area surrounding the Aloha Tower complex should be supportive, complimentary and non-competitive to the Aloha Tower development. This should be in terms of aesthetics, urban design, economic, and social considerations.*

All of the relevant recommendations contained in the Conceptual Planning Study are included in the project design goals for the proposed Waterfront at Aloha Tower development. The study proposes a large scale mixed use development similar to that proposed. However there are some differences between the two plans. For example, instead of the study's parking lot for piers 13 and 14, the Waterfront at Aloha Tower proposes the condominiums.

B. Land Use Policies And Zoning

1. State Land Use Law

According to Chapter 205 Hawaii Revised Statutes (HRS), four major land use districts are defined in the State: urban, rural, agricultural, and conservation. The landward portion of the proposed project site, including the pier aprons, and a margin of submerged lands controlled by the Department of Transportation-Harbors Division along some of these piers is in the State Urban District. The Urban District is generally defined as including "*lands characterized by 'city-like' concentrations of people, structures, streets, urban level of services and other related land uses.*" In general, submerged lands beyond pier faces are in the Conservation District (see figure 17). The proposed development of the residential condominium building situated over the water between Piers 12 and 13 and the extension at Piers 5 and 6 for the Maritime Building may require an amendment to the Urban District boundary by the State Land Use Commission. Alternatively, these improvements could be accommodated in the Conservation District through approval of a Conservation District Use application by the State Board of Land and Natural Resources.



THE WATERFRONT AT ALOHA TOWER

Fig. 17
STATE LAND USE
DISTRICT BOUNDARY

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DEVELOPMENT CORPORATION

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2. Hawaii Community Development Authority (HCDA) Makai Area Plan

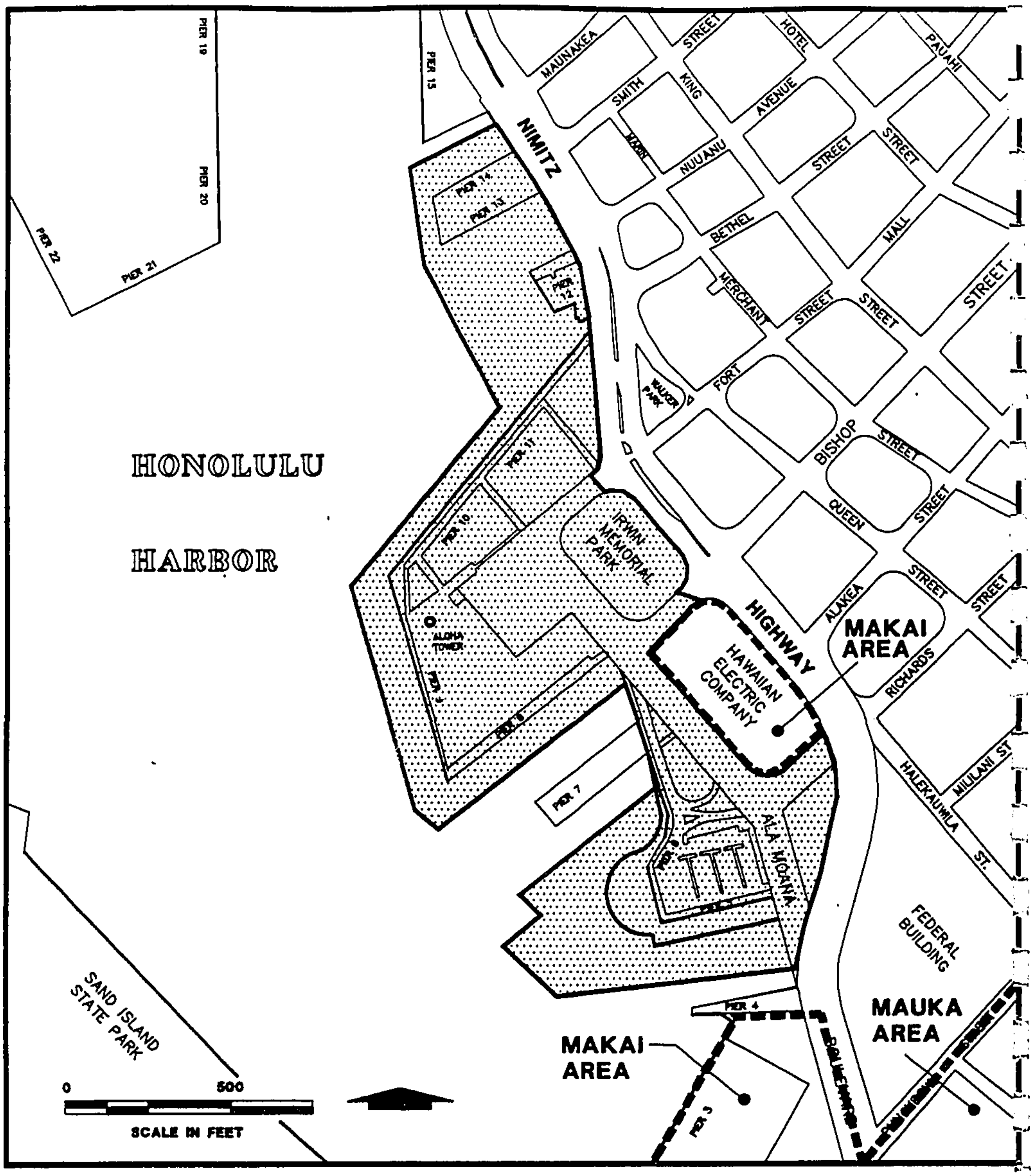
The Hawaii Community Development Authority (HCDA) was created by the 1976 Legislature (Chapter 206E, HRS) to plan and implement community development programs for areas designated as "Community Development Districts." Kakaako was designated as the Authority's first Community Development Area. The Kakaako Plan, adopted in 1982, provides a development framework for the Kakaako District to transform the predominantly older, low-rise commercial/industrial area into a modern, high-density urbanized area with a large residential population. The Authority exercises development controls which supercede the County Development Plan and zoning authorities. Although the project area for the Waterfront at Aloha Tower is not within the original Kakaako District, the 1987 Legislature expanded the boundaries of the District (Act 355, Session Laws of Hawaii, 1987) to include Piers 5 and 6 of the project area and the HECO power plant site within what is referred to as the "Kakaako Makai Area." The Authority's objective for the Kakaako Makai Area is to create a planned community that complements the mauka portion of the Kakaako District. In 1990 the Legislature enacted H.B. 2919, which excluded the project area from the Kakaako Makai Area (see figure 18). The HECO power plant site, however, still remains under the jurisdiction of the HCDA.

3. City and County of Honolulu Development Plan

Development Plans (DPs) are relatively detailed guidelines for the physical development of the island and are based on the policy guidance of the General Plan. Eight DPs have been adopted covering the entire island. Each Development Plan Ordinance (including the Primary Urban Center DP which includes the Waterfront at Aloha Tower) consists of Common Provisions applicable to all Development Plan areas, Special Provisions for each area, Land Use Map, and Public Facilities Map.

The proposed Waterfront at Aloha Tower development shall be consistent with the City and County of Honolulu Development Plans and zoning, although specific design requirements, including building heights and densities for the condominium structures, will exceed established limits. The ATDC is authorized to transcend City and County ordinances to accomplish the goals of the development corporation in an aesthetically pleasing manner.

Similar to the Hawaii Community Development Authority, the ATDC is empowered to override certain county ordinances. According HRS Title 15, Subtitle 5, Chapter 26, Subchapter 4, Development Guidelines, the ATDC is to utilize the power *"to transcend, as necessary, zoning, density, and height*



THE WATERFRONT AT ALOHA TOWER

Fig. 18
HAWAII COMMUNITY DEVELOPMENT AUTHORITY BOUNDARY

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ALOHA TOWER DEVELOPMENT CORPORATION

Prepared by :
ALOHA TOWER ASSOCIATES
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limitations in an aesthetically pleasing manner to accomplish the goals of the development corporation and to encourage private sector developers to undertake development plan solutions which will satisfy the foregoing development objectives."

4. Primary Urban Center Development Plan (PUC DP)

The Waterfront at Aloha Tower is within the Primary Urban Center Development Plan which includes the communities from Waialae-Kahala to Pearl City. It is the most populated part of the State of Hawaii and is Oahu's largest employment center. The Waterfront at Aloha Tower willprimarily conform with the following common and special provisions of the PUC DP:

<u>Common Provisions</u>

Public Views.

Public views include views along streets and highways, mauka-makai view corridors, panoramic, and significant landmark views from public places, views of natural features, heritage resources, and other landmarks, and view corridors between significant landmarks.

The design and siting of all structures shall reflect the need to maintain and enhance available views of significant landmarks. No development shall be permitted that will block important public views.

Open Space.

Open space areas consist of, but are not limited to, the ocean, beaches, parks, plazas, institutional properties with park-like grounds, streams, inland bodies of water, significant land forms...The functions of open space areas are to provide visual relief and contrast to the built environment, to serve as outdoor space for public use and enjoyment. The preservation and enhancement of areas that are well suited to perform these functions shall be given high priority.

Vehicular and Pedestrian Routes.

Landscaping shall be provided along major vehicular arterials and collector streets as a means to increase the general attractiveness of the community and the enjoyment of vehicular travel for visitors and residents. The following streetscape elements shall be considered in the *design of the landscaping: plantings, street furniture, utility fixtures, sidewalk paving treatments, small parks, signs, and building setback and facades. Different themes appropriate to the particular character of different communities may be provided.*

Pedestrian corridors shall be provided in heavy traffic areas, such as in resort, commercial, and apartment districts. Such elements as shade trees and other plantings, street furniture, attractive building frontages, and other pedestrian oriented elements shall be part of the design of pedestrian corridors. Pedestrian corridors shall be designed to be safe, minimize conflicts between people and vehicular movements, and shall be integrated with or provide access to open spaces. Provisions for bikeways shall also be made.

Major roadway intersections, particularly along arterial and collector roadways, that serve as key community orientation points shall be made easily identifiable through such means as distinctive landscaping, lighting, signing, and the siting of adjacent structures.

Landscaping controls shall be established for ground level parking areas in order to provide pleasing environments and to help minimize the visual dominance of paved surfaces.

Mixed Use Areas.

A. Purpose

Mixed use areas are intended to implement General Plan objectives and policies in the following areas of concern:

(i) Provide for mutually supportive combinations of residential and commercial and/or industrial uses that optimize the use of both land in urban centers and of already available support facilities and services.

(ii) Encourage walking and bicycling activities, especially walking to and from jobs, thus reducing automobile dependency and demands upon the transportation system.

(iii) Promote development designs and land use arrangements that save energy.

(iv) *Provide greater opportunities for variety in urban experiences for pedestrians.*

(v) *Encourage greater social interaction within communities.*

(vi) *Permit the adaptive reuse of existing structures and the preservation of older buildings.*

Special Provisions

Special provisions apply to several areas within the Primary Urban Center. The Waterfront at Aloha Tower project, being located in the Downtown area, is subject to principles and controls of these special provisions. Downtown is characterized as a Commercial Mixed-Use area "*generally bounded by Nuuanu Stream, Vineyard Boulevard, Alakea Street and Honolulu Harbor.*" Different land-use priorities are applied to the various sub-areas in Downtown: the Financial, Kukui and Chinatown districts, and the Aloha Tower-Honolulu Harbor area.

Piers 12, 13 and 14 of the project site compose a portion of the makai precinct of the Chinatown Special District. Principles and controls that apply to the Chinatown Special District mandate that the sub-area "*shall be redeveloped with emphasis on historic preservation, architectural character and adaptive re-use. The retail-commercial function shall be strengthened.*" The proposed Waterfront at Aloha Tower will preserve and enhance the historic features at Pier 12. The condominium towers at Piers 13 and 14 will be consistent with the high-rise development characterizing the adjacent Central Business District.

Principles and controls in the Aloha Tower-Honolulu Harbor sub area, which includes Piers 8 through 11, provide that: "*Aloha Tower and Honolulu Harbor area shall be redeveloped as a pedestrian oriented activity center which retains and integrates existing principal maritime activities with a mixture of hotel, commercial and recreational uses.*" The proposed development has been designed to provide for increased pedestrian-oriented activities while integrating the existing principal maritime activities with a mixture of hotel, commercial, and recreational uses.

5. Development Plan Land Use Map Designation

The Development Plan Land Use Map designates Piers 5, 6, 7, 12, 13, and 14 as Public Facilities; Piers 8, 9, 10, and 11 as Commercial; and Irwin Memorial Park as Park (see figure 19). The Waterfront at Aloha Tower development is generally consistent with the Land Use Map designation at Piers 5 and 6, 8 through 11, and at Irwin Memorial Park with the exception of the commercial office space proposed at Piers 5 and 6. Other inconsistencies in the Public Facilities Designation include the condominium use at Piers 13/14 and the Honolulu Fort Historic Park at Pier 12.

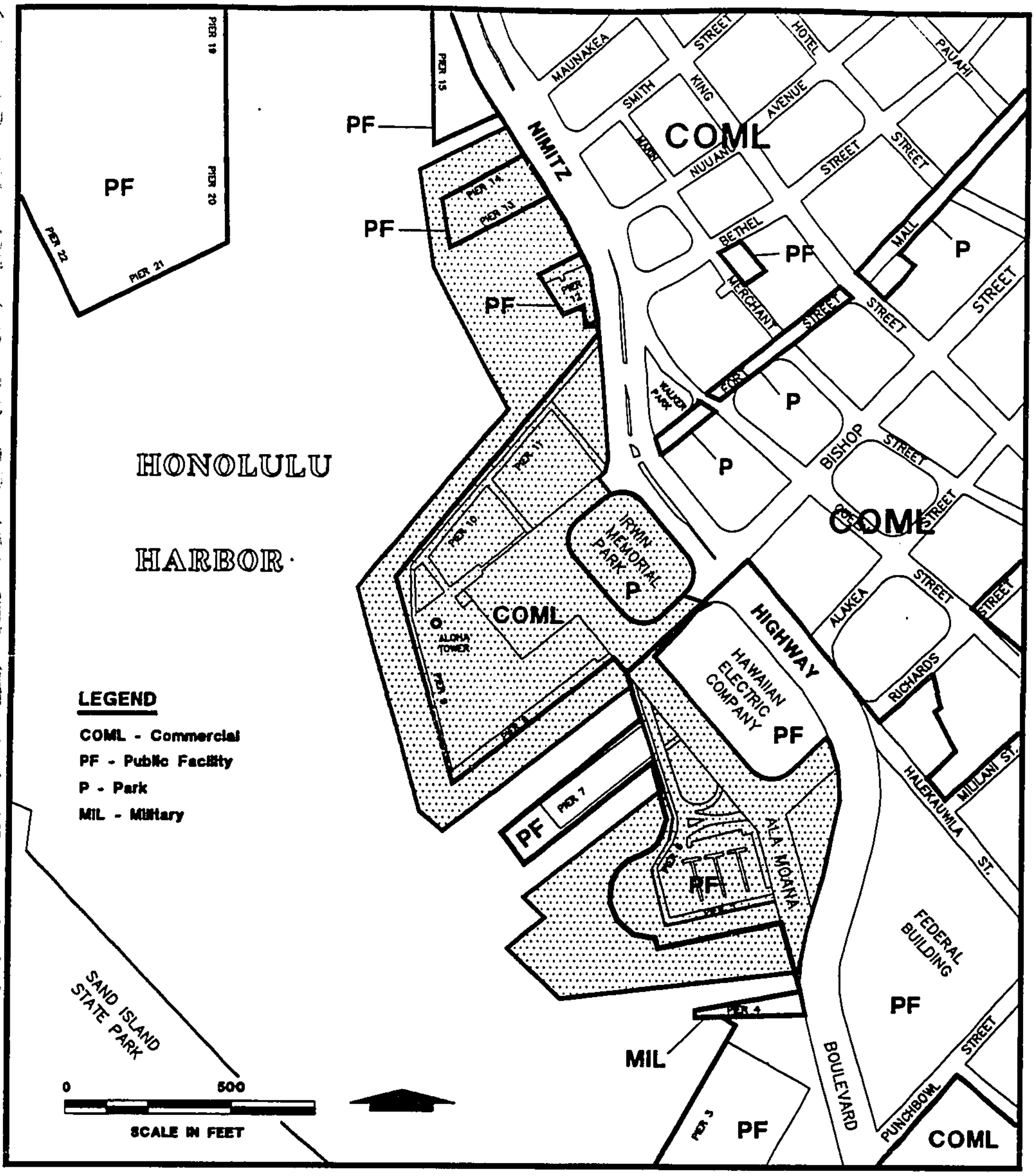
6. Development Plan Public Facilities Map Designation

The Development Plan Public Facilities maps show the general locations of proposed public and private facilities such as roads, parks, and utilities. Piers 8, 9, 10, and 11, owned by the State, are designated as a site for Government Building which also includes government initiated projects such as the Waterfront at Aloha tower. Nimitz Highway, which borders the project site, is designated for improvements on the existing right-of-way beyond six years (see figure 20). The Waterfront at Aloha Tower Project is not anticipated to conflict with these improvements.

7. County Zoning and Special Districts

The City and County of Honolulu Land Use Ordinance (LUO) regulates land use in accordance with adopted land use policies, including the Oahu General Plan and the Development Plans. Under the City and County of Honolulu's Land Use Ordinance, Piers 5 through 11 are predominantly zoned BMX-4 Business Mixed Use, which permits a wide range of uses, including office, hotel, retail and residential (see figure 21). This zoning is appropriate for the proposed uses. Piers 12 through 15 are zoned I-3, Waterfront Industrial District. The condominium use is not consistent with this zoning. It would, however, be consistent with adjacent BMX-4 zoning at Piers 5 through 11 and on the mauka side of Nimitz Highway. The proposed historic park at Pier 12 would be an allowable use as a public facility in the I-3 district.

Special Districts are designated by the Land Use Ordinance to guide development for certain areas of the community. These are areas which are in need of restoration, preservation, redevelopment, and/or rejuvenation to protect and/or to enhance the physical and visual aspects of the area for the benefit of the community as a whole. The project site lies in part of both the Chinatown Special District and the Hawaii Capital Special District (see

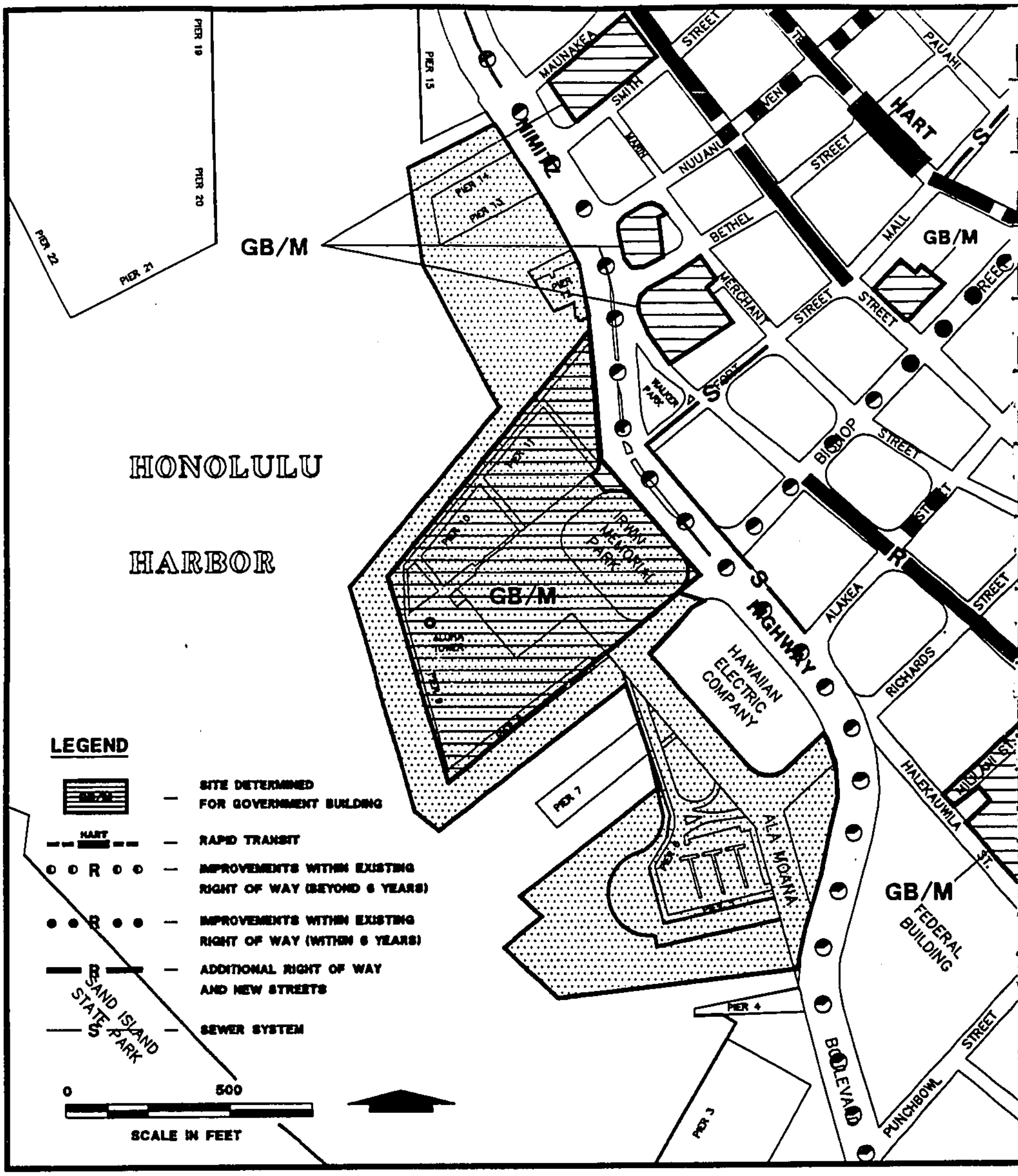


THE WATERFRONT AT ALOHA TOWER

Fig. 19
DEVELOPMENT PLAN
LAND USE

Prepared for :
ALOHA TOWER DEVELOPMENT CORPORATION

Prepared by :
ALOHA TOWER ASSOCIATES
WILSON OKAMOTO & ASSOCIATES, INC.



THE WATERFRONT AT ALOHA TOWER

Fig. 20
DEVELOPMENT PLAN
PUBLIC FACILITIES MAP

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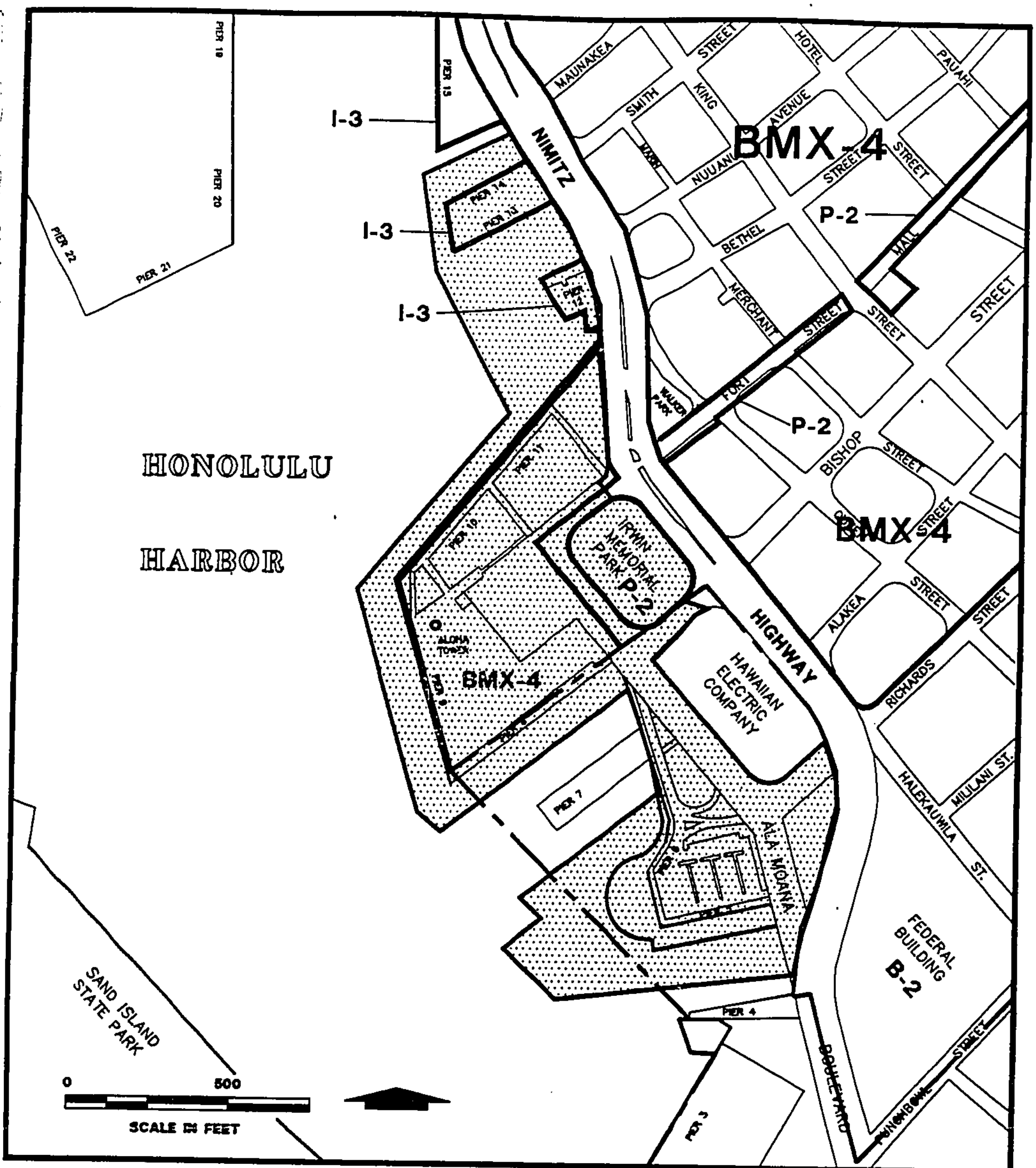
ALOHA TOWER DEVELOPMENT CORPORATION

Prepared by :
ALOHA TOWER ASSOCIATES
WILSON OKAMOTO & ASSOCIATES, INC.



THE WATERFRONT AT ALOHA TOWER	Prepared for : ALOHA TOWER DEVELOPMENT CORPORATION
Fig. 21 CITY & COUNTY OF HONOLULU ZONING	Prepared by : ALOHA TOWER ASSOCIATES WILSON OKAMOTO & ASSOCIATES, INC.

figure 22). Special Districts have more specific and restrictive design guidelines than those provided by zoning. Piers 5 through 11 are located in the Hawaii Capital Special District, while Piers 12, 13, and 14 are located within the Chinatown Special District. The Chinatown Special District imposes height limitations in the historic core area of chinatown and adjacent areas. The proposed residential condominiums will exceed the 40 foot height limit in the Makai Precinct in which they are located. Nevertheless, the condominiums are within the area designated for "moderate redevelopment" in the District. The historic core of the Chinatown Special District is not encroached upon by the project.

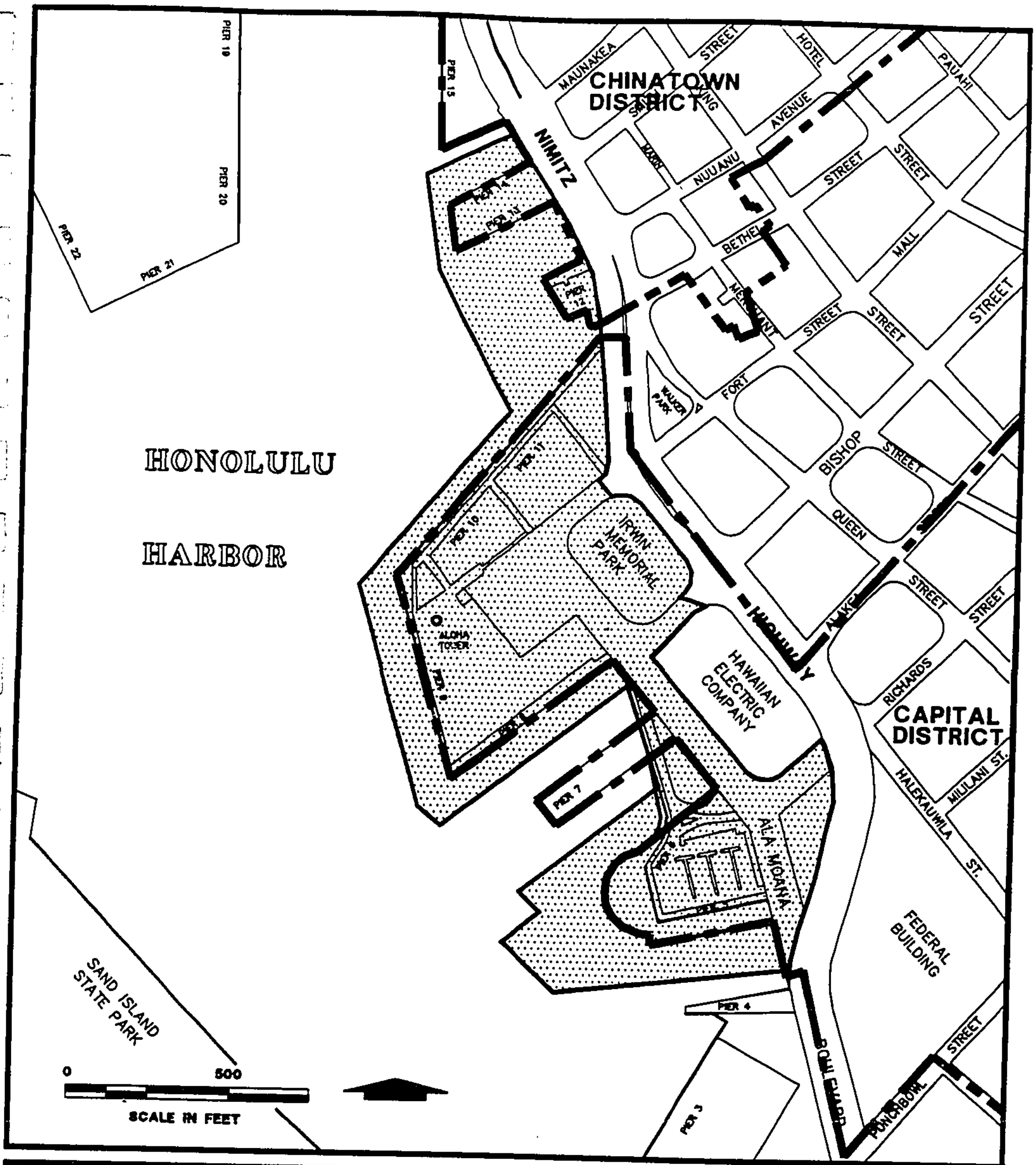
A 50-foot setback is imposed along Piers 5, 6, 8, 9, 10, and 11 as well as a height limitation of 40 feet for Piers 5 through 11. Although the Waterfront at Aloha Tower may exceed some of these setbacks and heights, the development will be consistent with Hawaii Capital Special District design objectives to preserve and enhance buildings and landmarks within the District and to enhance the park-like setting. The refurbishment and beautification of Aloha Tower as well as the proposed view planes and open space attenuating the Tower's prominence along the waterfront amid the old-Honolulu architectural theme are consistent with these objectives. Moreover, the proposed Aloha Tower Plaza, Irwin Park restoration, Pedestrian Promenade, and Honolulu Fort Historic Park will significantly contribute to the park-like setting of the area.

C. Environmental Permits

1. Department of the Army Permits

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

Issuance of the permit is based on an evaluation of the probable impact of the proposed activity on the public interest, reflecting national concern for both protection and utilization of important resources. Factors considered include those relating to: conservation, economics, aesthetics, flood damage



THE WATERFRONT AT ALOHA TOWER

Fig. 22
CITY & COUNTY OF HONOLULU
DESIGN CONTROLS

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DEVELOPMENT CORPORATION
Prepared by :
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WILSON OKAMOTO
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prevention, land use, navigation, recreation, water supply, water quality, energy needs, safety, food production and, in general, the needs and welfare of the people.

Portions of the Waterfront at Aloha Tower potentially subject to review under the Department of the Army permit would include any dredging with offshore disposal, and improvements extending into navigable waters under the jurisdiction of the Corps of Engineers.

2. Hawaii Coastal Zone Management Program Federal Consistency Review

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

Among Federal actions subject to review is the issuance of Federal permits, including the Department of Army Permit, which will be required for improvements extending into the water. Before the Federal permit can be issued, the OSP must determine its consistency with the enforceable policies of the Hawaii CZM Program. These policies encompass broad concerns such as impact on recreational resources, historic and archaeological resources, coastal hazards, and the management of development.

3. Section 401 Water Quality Certification

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

4. Conservation District Use Application (CDUA)

Any use of lands, including submerged lands within the State's Conservation District, as established by the State Land Use Commission, are subject to review pursuant to Chapter 183, HRS and Title 13, Chapter 2, Administrative Rules of the Department of Land and Natural Resources. Approval by the State Board of Land and Natural Resources will be required for all dredging and construction offshore in the Conservation District. A temporary variance may also be required for test borings in the offshore submerged lands. However, portions of the project site are presently under Executive Order #1793 to the State Department of Transportation (DOT) Harbors Division which may supercede this permitting process.

5. Permit for Work in Shores and Shorewaters

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

This permit is required for any construction, dredging, or filling within the shorewaters of the State, as defined by Chapter 266, HRS. Jurisdiction extends to shores, shorewaters, navigable streams and harbors, belonging to or controlled by the State.

DOT review of this permit is normally conducted via interagency coordination with the Department of Land and Natural Resources through the Conservation District Use Application. The DOT, however, could request an independent review.

Portions of the Waterfront at Aloha Tower project subject to review include improvements extending into the water.

D. Summary of Possible Permits and Approvals

The following is a list of permits and approvals that may be required prior to project construction:

<u>FEDERAL</u>

<u>Department of the Army</u>

* Department of the Army Permit

<u>Federal Aviation Administration (FAA)</u>

* Notice of construction of structures or work in areas of air navigation

STATE

Department of Health (DOH)

* Noise Variance Permit
* Variance for 24-hour Construction
* Permit for Air Emissions
* Notification for Work on Sewer Lines
* National Pollutant Discharge Elimination System (NPDES) Permit
* Section 401 Water Quality Certification

Department of Land and Natural Resources (DLNR)

* Historic Sites Review
* Right-of-Entry approval for State-owned lands
* Conservation District Use Application (CDUA) for work in Conservation Districts
* Conservation District Use Application (CDUA) Temporary Variance for geotechnical coring studies in Conservation Districts

Department of Transportation (DOT)

* Permit to Perform Work upon State Highways
* Written permit for any project involving permit or temporary construction
* Approval for utilities and traffic rerouting
* Street Usage Permit
* Permit for Work in Shores and Shorewaters (Combined with CDUA review)

Land Use Commission (LUC)

* State Land Use District Boundary Amendment

Office of State Planning

* Hawaii Coastal Zone Management Program Federal Consistency Certification

CITY AND COUNTY OF HONOLULU

Board of Water Supply (BWS)

* Water and Water System Requirements for Developments

Department of Land Utilization (DLU)

* Subdivision Permit for consolidation and subdivision of parcels

Department of Public Works (DPW)

* Grubbing Permit
* Grading Permit
* Demolition Permit
* Construction Dewatering Permit
* Excavation Permit
* Permit to Excavate Public Right-of-Way
* Sewer Connection Permits
* Sewer Extension, Oversizing and Relief Sewer Requirements

Building Department

* Building Permit
* Electrical Permit
* Plumbing Permit
* Sidewalk/Driveway Work Permit
* Demolition Permit
* Sign Permit (to be reviewed by DLU)
* Certificate of Occupancy

OTHER

Hawaiian Telephone Company

* Permit regarding work on utility lines

Hawaiian Electric Company

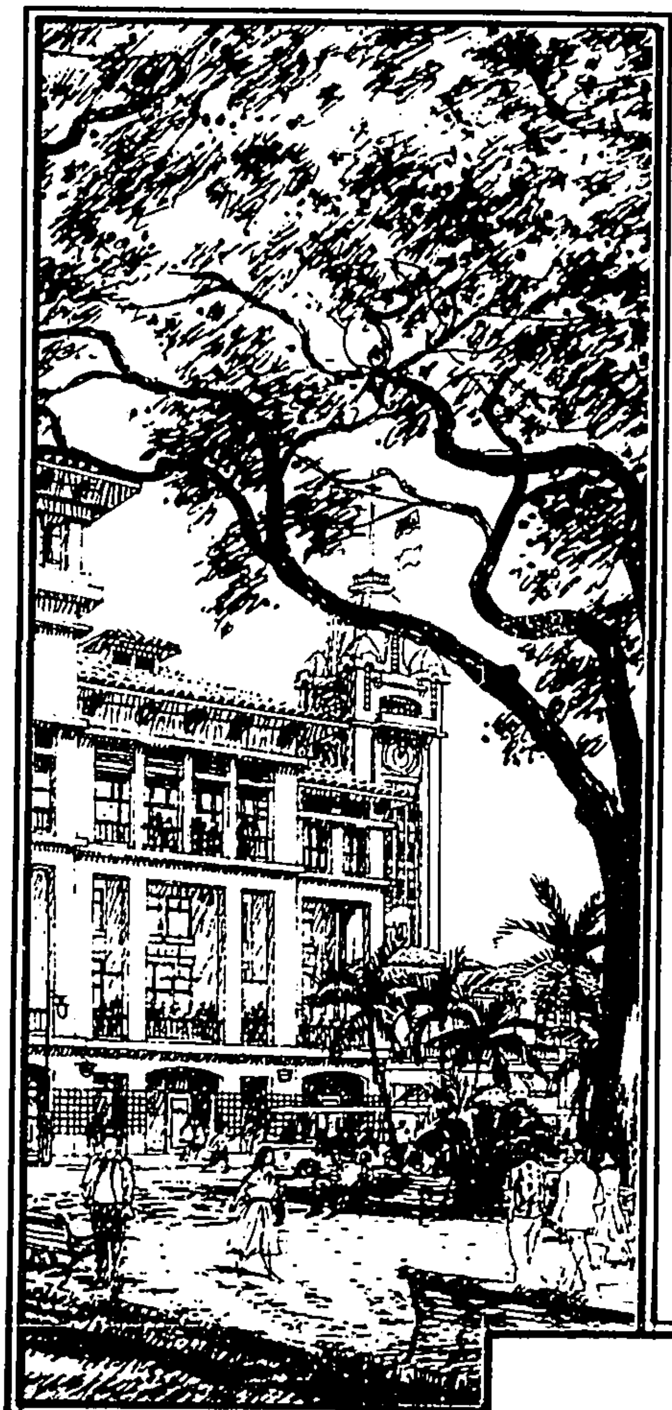
* Permit regarding work on utility lines

Gas Company

* Permit regarding work on utility lines

Cable TV

* Permit regarding work on utility lines



CHAPTER VI

PROJECT IMPACTS

VI. PROJECT IMPACTS

A. Overview

Potential impacts of developing the Waterfront at Aloha Tower have been divided into several categories to facilitate assessment. Short-term construction related impacts are transitory and are expected to occur only during the construction phase of the project. Within the short-term impacts category, both landward impacts and marine impacts are assessed since construction spans the land/water interface, each with unique concerns. Long-term impacts relate to the permanent alteration of the landward and marine environments as a result of developing the project. Social impacts relate to the long-term changes the proposed project may have on the population in the vicinity.

B. Short-Term Impacts - Landward

The highly urbanized landward environment at the waterfront and in the adjoining Central Business District (CBD) establishes the context for assessing potential construction impacts. There is relatively less concern regarding natural terrestrial habitats, which are limited to trees found at Irwin Memorial Park, and greater emphasis on urban concerns such as traffic, noise, air quality, and historic preservation.

1. Traffic

During construction of the Waterfront at Aloha Tower project various types of construction vehicles, such as earthmovers and heavy trucks transporting equipment, building materials, and excavated materials will use Nimitz Highway and other roadways to access the project site. Construction vehicles could impede traffic flow since they are relatively slow and difficult to maneuver. Moreover, it may occasionally be necessary to close a portion of the makai curb lane of Nimitz Highway during certain operations, such as delivering large pieces of equipment. To avoid potential traffic congestion, movement of such vehicles to and from the project site will be minimized between the hours of 7:00 AM and 7:00 PM and restricted during the morning and afternoon peak traffic hours. Lane closure will also be restricted between 7:00 AM and 7:00 PM.

2. Noise

Development of the project site will involve demolition, excavation grading and the construction of infrastructure and buildings. The various construction phases will generate significant noise, the actual amount depending upon the methods employed during particular phases (see appendix B). Typical construction equipment noise ranges in dBA are shown in figure 23.

Pile drivers will probably be the loudest equipment used during construction and could be annoying to residents of the Harbor Square condominiums. It is estimated that the peak exterior noise levels at the condominiums could be up to 80 dBA. Pile driving may also be audible inside some of the closest existing commercial buildings, including Grosvenor Center and the Amfac Building.

Blasting, if required, could also have noise impacts. However, current methods for controlling noise from blasting are very effective. Also, because of its intermittence and extremely brief duration, blasting noise tends to be less annoying than noise from other, more continuous construction activities.

In cases where construction noise is expected to exceed the Department of Health's property line limits, a permit to allow such noise is required. Permit conditions will include restrictions on permissible operating hours.

3. Vibration/Dewatering

Ground vibration and dewatering could be a concern with regard to structures surrounding the project site; however, appropriate construction techniques can mitigate most concerns. During pile driving, ground vibration can be minimized by:

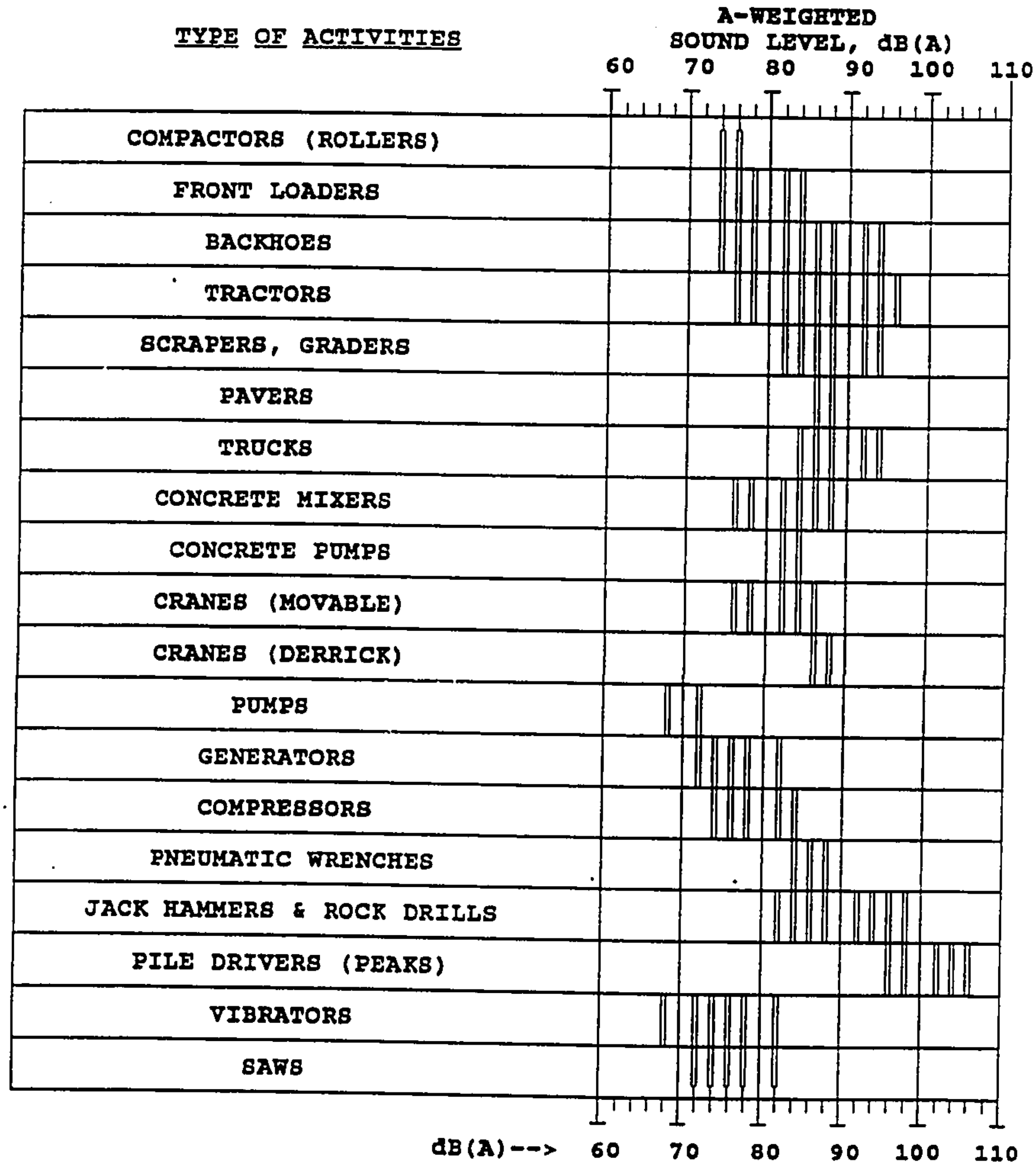
a) Pre-drilling holes through hard substrates to avoid hammering piles through them;

b) Appropriate matching of pile hammers to anticipated subsurface conditions so as to achieve required penetration with relatively low energy;

c) Directly monitoring vibration levels at potentially sensitive sites; and

d) Conducting pre-condition surveys and monitoring of adjacent properties to facilitate early detection of potential impacts.

It is anticipated that blasting will be unnecessary for the planned excavation work. Should blasting be deemed appropriate to remove unanticipated resistant materials, resulting ground vibration can be minimized by careful placement of small charges targeting localized areas of such materials.



CONSTRUCTION EQUIPMENT NOISE RANGES @ 50 FEET
NOTE: BASED ON LIMITED AVAILABLE DATA SAMPLES

SOURCE : DARBY & ASSOCIATES

THE WATERFRONT AT ALOHA TOWER

Fig. 23
EQUIPMENT NOISE RANGES

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ALOHA TOWER DEVELOPMENT CORPORATION

Prepared by :
ALOHA TOWER ASSOCIATES

WILSON OKAMOTO & ASSOCIATES, INC.

Dewatering may be required during excavation and construction of the parking facilities at Piers 5 and 6, and at Piers 8 through 11. Geotechnical specialists have been retained to assure that appropriate measures are taken to protect surrounding buildings from damage due to ground settlement. Depending on subsurface conditions, a variety of techniques are available to mitigate potential ground settlement concerns. These include:

a) Appropriately siting dewatering wells in relation to the excavated area;

b) Installing monitoring wells outside of the excavated area to detect any significant lowering of the water table;

c) Recharging the surrounding ground water table to maintain safe levels;

d) Impeding the flow of ground water into the excavation site by installing appropriate coffer dams and shoring; and

e) Conducting pre-condition surveys and monitoring of adjacent properties to facilitate early detection of potential ground settling impacts.

4. Air Quality

Short-term impacts from fugitive dust will likely occur during the project construction phase. To a lesser extent, exhaust emissions from stationary and mobile construction equipment and workers' vehicles may also affect air quality during the construction phase. State air pollution control regulations require that there be no visible fugitive dust emissions at the property line. Hence, an effective dust control plan must be implemented to ensure compliance with state regulations. Fugitive dust emissions can be controlled by watering active work areas and by covering open-bodied trucks. Paving and landscaping early in the construction schedule will also reduce dust emissions.

5. Cumulative Impacts

Due to the current boom in construction activity in the Downtown area, it is likely that one or more large projects could be under construction concurrently with the Waterfront at Aloha Tower. Cumulative impacts of these construction activities such as on traffic, ambient noise, and air quality will depend on the phase of construction each project may be in and their location relative to the waterfront.

Cumulative traffic impacts of construction vehicles should be minimized since those associated with the Waterfront at Aloha Tower project would be limited to specific non-peak traffic hours as described previously. Cumulative traffic impacts of commuting construction workers to the job site could be mitigated, if necessary, by staggering work hours.

Cumulative noise impacts could be significant, particularly if pile driving activities were to coincide. Nevertheless, the nearest noise sensitive use in the area, which is the Harbor Towers condominiums, will be impacted most by the Waterfront at Aloha Tower project, as assessed previously. Currently planned projects are further away and shielded by intervening structures which should significantly reduce noise impacts. Since the condominiums have air-conditioning, much of the noise impacts can be attenuated.

Cumulative short term air quality impacts relate primarily to traffic congestion and dust generated on site. As discussed above, traffic congestion, which can impact air quality, will be mitigated by regulating the schedule and movements of construction vehicles. If necessary, schedules of commuting construction workers could also be adjusted. Dust generation must, by law, be controlled to eliminate any visible dust at the property line of each project. Thus, no cumulative impacts should result.

6. Hazardous Waste

To determine appropriate demolition and construction methods for the proposed Waterfront at Aloha Tower development, a survey of the project site was conducted to identify potential problems associated with asbestos, PCB electrical equipment, and other hazardous materials. In addition, subsurface soil testing is being conducted to determine the presence of hazardous contaminants.

The project site survey identified asbestos containing building materials including ceiling insulation, floor tiles, pipe insulation, adhesives and sealants. Where these construction materials are damaged and could release asbestos fibers, immediate removal is recommended. Since most asbestos containing materials in the building are intact, their removal is not required until prior to demolition or renovation.

Of nine electrical transformers on the site, only one has been positively determined to be non-PCB and all are intact, showing no signs of leakage. By regulation, PCB transformers can remain in service unless they pose a threat of contamination to food or feed. Positive determination of PCB content is required for proper handling and disposal.

Hazardous materials such as paints, anti-fouling agents, solvents and various petroleum products are used and generated as wastes at Piers 13 and 14. No evidence of gross surface contamination was evident on-site. All hazardous materials and wastes must be removed and properly disposed of when existing uses are terminated.

Subsurface testing of soils is proceeding. If hazardous materials such as petroleum products are found, appropriate remediation will be required before the soils can be disposed of. Remediation can be accomplished either at the site or at another location, depending on the nature and extent of contamination. Remediation could, for example, involve aeration of volatile components or bio-remediation using bacteria capable of breaking down petroleum products into safe components. If toxic materials are encountered, such as PCB, more drastic disposal requirements may be imposed, including containment and transshipment to toxic waste disposal sites on the Mainland.

7. Historical Resources

In view of Honolulu Harbor's importance in the historical development of Honolulu, a historical documentary review and an archaeological survey was conducted to aid in identifying potentially significant features and to determine potential mitigation measures that may be necessary to protect such features during construction of the proposed development (see appendix D). Most of the project site lies over a submerged coral reef which was makai of the shoreline until 1857, when the present land area was, for the most part, created with fill. Thus, no impacts on archaeological resources are anticipated. With respect to historic resources, development plans call for the preservation and refurbishment of Aloha Tower; restoration of Irwin Park; preservation and establishment of a historic park consisting of the remnants of Honolulu Fort at Pier 12; and, replication of the facades of Piers 10 and 11 for incorporation in the project design.

C. Short-Term Impacts - Marine

Short-term marine impacts are anticipated to result from construction activities including: dewatering during construction of parking facilities; excavation and dredging which may generate airborne dust and sediments that settle on the water; and creation of sediment plumes during dredging operations.

1. Dewatering

Inasmuch as fresh water already enters the harbor on a daily basis and large storm flows enter the harbor during winter rain seasons, the impacts of dewatering discharges will depend on the relative quantity, constituency and duration of the dewatering activity. Potential concerns include impacts on nearby corals and marine life. If discharge flows and constituents are similar to those of 10 and 50 year storm events, then the impact is expected to be negligible. If discharge flows are greater than a 100 year stream discharge event, then construction methods, materials and schedules need to be reviewed so that impacts can be controlled. In any case, a monitoring program before, during and after construction is planned.

2. Airborne Dust

Airborne dust and fine sediments generated during construction activity will increase the turbidity of harbor waters. The magnitude of impact from this dust will depend on the methods and duration of construction. Within the context of existing harbor activities, however, a measurable difference in water clarity is not anticipated.

3. Silt Plumes

Silt plumes generated during construction will generally settle out before reaching the open ocean; however, during strong trade winds or periods when large amounts of storm runoff is being discharged into the harbor, silt plumes may travel the length of the main channel, exiting the harbor. If it is anticipated that large volumes of silt will be generated during construction, a silt curtain may be necessary to contain the material inside the harbor, allowing it to settle. In general, construction activities are not expected to contain effluent that would have greater impact on the harbor than normal runoff or silt churned up by ships using the harbor. Thus, no significant short-term effects are anticipated on marine flora and fauna, including reefs and recreational and commercial fishery resources.

4. Ciguatera

Shoreline construction is occasionally associated with outbreaks of a fish poison known as ciguatera. Results of a ciguatera sampling study show that there is currently a minimal threat of ciguatera poisoning from harbor fish (see appendix E). Because ciguatera outbreaks are associated with underwater disturbances such as construction, it would be prudent to monitor for ciguatoxin at regular intervals during construction.

D. Long-Term Impacts - Landward

The proposed Waterfront at Aloha Tower will permanently change the land uses at Piers 5 and 6, and 8 through 14. New and renovated maritime passenger terminals will share space with proposed retail, commercial, office, hotel, residential, and expanded recreational uses. The greatly intensified use of the site is anticipated to have the following long-term impacts in the area:

1. Traffic

Long-term traffic impacts of the Waterfront at Aloha Tower will result from the development of traffic generating uses at the project site. A traffic impact study was conducted to determine the magnitude of this impact and to identify any necessary mitigation measures (see appendix C). The State Department of Transportation and the City and County Department of Transportation Services were consulted regarding the scope and methodology for the study.

Intersection operation was studied for Friday weekday and Saturday weekend under present and future (1995) conditions, with and without the project. Saturday traffic was examined since that is when cruise ship berthing is expected to generate traffic from arriving and departing passengers.

Of two methods used to conduct the evaluation, the Critical Movement Analysis (CMA) provided results more closely representing actual field conditions than those determined by the Highway Capacity Manual (HCM) method. The findings based on the CMA method are presented in tables 9 and 10 for the weekday morning and afternoon peak traffic hours, respectively. The analysis for each of the intersections is represented by a numerical and letter rating scale. The volume-to-capacity (V/C) ratio measures the ratio of the calculated critical volume to the total capacity of an intersection. As the ratio approaches the value of 1, the maximum capacity of the intersection is realized. Level-of-Service (LOS) is an A through F rating scale based on the V/C ratios, where A represents the best operating conditions and F represents the worst. Changes in the V/C ratio are provided to show the magnitude of change in future scenarios.

The analysis indicates a significant worsening of traffic conditions at almost all intersections in the future, regardless of whether traffic generated by the Waterfront at Aloha Tower project is considered or not, if measures to improve traffic flow throughout the Downtown area are not implemented. The future "without project" condition takes into account historical growth in traffic as well as a number of new development projects presently under

TABLE 9
WEEKDAY AM LEVEL OF SERVICE ANALYSIS
EXISTING AND 1995

Intersection E-W STREET	N-S STREET	Existing AM Peak V/C (CMA)	Existing AM Peak LOS	Without Project Future AM Peak (1995) V/C (CMA)	Without Project LOS	Change in V/C*	With Project Future AM Peak V/C (CMA)	With Project LOS	Change Due to Project V/C**
Vineyard Blvd.	Nuuanu Ave.	0.740	C	1.080	F	0.340	1.140	F	0.060
Vineyard Blvd.	Pali Hwy.	0.940	E	1.430	F	0.490	1.480	F	0.050
Vineyard Blvd.	Q. Emma St.	0.950	E	1.420	F	0.470	1.420	F	0.000
Vineyard Blvd.	Punchbowl St.	0.970	E	1.370	F	0.400	1.390	F	0.020
Kukui St	Nuuanu Ave.	0.450	A	0.870	D	0.420	0.930	E	0.060
Kukui St.	Pali Hwy.	0.650	B	0.700	C	0.050	0.740	C	0.040
Kukui St.	Q. Emma St.	0.250	A	0.420	A	0.170	0.450	A	0.030
Beretania St.	Nuuanu Ave.	0.590	A	0.840	D	0.250	0.890	D	0.050
Beretania St.	Pali Hwy.	0.730	C	0.900	E	0.170	0.970	E	0.070
Beretania St.	Q. Emma St.	0.450	A	0.660	B	0.210	0.680	B	0.020
Beretania St.	Richards St.	0.530	A	0.740	C	0.210	0.830	D	0.090
Beretania St.	Punchbowl St.	0.850	D	1.150	F	0.300	1.200	F	0.050
Beretania St.	Alapai St.	0.650	B	0.850	D	0.200	0.890	D	0.040
Hotel St.	Nuuanu Ave.	0.450	A	0.850	D	0.400	0.970	E	0.120
Hotel St.	Bishop St.	0.380	A	0.490	A	0.400	0.530	A	0.040
Hotel St.	Alakea St.	0.190	A	0.320	A	0.130	0.330	A	0.010
Hotel St.	Richards St.	0.550	A	0.660	B	0.110	0.750	C	0.090
King St.	Nuuanu Ave.	0.710	C	1.300	F	0.590	1.320	F	0.020
King St.	Bethel St.	0.540	A	0.730	C	0.190	0.780	C	0.050
King St.	Bishop St.	0.790	C	1.330	F	0.540	1.330	F	0.000
King St.	Alakea St.	0.680	B	0.800	D	0.120	0.820	D	0.020
King St.	Richards St.	0.470	A	0.540	A	0.070	0.500	A	–
King St.	Punchbowl St.	0.610	B	0.780	C	0.170	0.780	C	0.000
King St.	Alapai St.	0.490	A	0.660	B	0.170	0.610	B	–
Kapiolani Bl.	South St.	0.310	A	0.360	A	0.050	0.370	A	0.010
Queen St.	Bishop St.	0.530	A	0.570	A	0.040	0.620	B	0.050
Queen St.	Alakea St.	0.580	A	0.660	B	0.080	0.710	C	0.050
Nimitz Hwy.	River St.	0.600	A	0.690	B	0.090	0.710	C	0.020
Nimitz Hwy.	Smith St.	0.520	A	0.680	B	0.160	0.700	C	0.020
Nimitz Hwy.	Nuuanu Ave.	0.630	B	0.640	B	0.010	0.840	D	0.200
Nimitz Hwy.	Bethel St.	0.550	A	0.600	B	0.050	0.700	C	0.100
Nimitz Hwy.	Fort St.	0.540	A	0.600	B	0.060	0.630	B	0.030
Nimitz Hwy.	Bishop St.	0.780	C	0.860	D	0.080	0.940	E	0.080
Nimitz Hwy.	Alakea St.	0.720	C	0.830	D	0.110	0.850	D	0.020
Nimitz Hwy.	Richards St.	0.600	A	0.650	B	0.050	0.970	E	0.320
Ala Moana Bl.	Punchbowl St.	0.830	D	0.940	E	0.110	0.892	D	–
Ala Moana Bl.	Trade Zone Entr.	0.600	A	0.690	B	0.090	0.720	C	0.030
Ala Moana Bl.	South St.	0.780	C	0.900	E	0.120	0.960	E	0.060
Halekauwila St.	Punchbowl St.	0.480	A	0.530	A	0.050	0.620	B	0.090

Notes: V/C = Volume-to-Capacity Ratio
LOS = Level-of-Service
CMA = Planning Method

* = Difference in Existing Peak V/C from Future Peak V/C Without Project
** = Difference in Future Peak V/C With Project from Future Peak V/C Without Project

TABLE 10
WEEKDAY PM LEVEL OF SERVICE ANALYSIS
EXISTING AND 1995

Intersection E-W STREET	N-S STREET	Existing PM Peak V/C (CMA)	Existing PM Peak LOS	Without Project Future PM Peak (1995) V/C (CMA)	Without Project LOS	Change in V/C*	With Project Future PM Peak V/C (CMA)	With Project LOS	Change Due to Project V/C**
Vineyard Blvd.	Nuuanu Ave.	0.940	E	1.390	F	0.450	1.450	F	0.060
Vineyard Blvd.	Pali Hwy.	0.950	E	1.330	F	0.380	1.400	F	0.070
Vineyard Blvd.	Q. Emma St.	0.940	E	1.600	F	0.660	1.660	F	0.060
Vineyard Blvd.	Punchbowl St.	0.970	E	1.410	F	0.440	1.470	F	0.060
Kukui St	Nuuanu Ave.	0.760	C	1.050	F	0.290	1.160	F	0.110
Kukui St.	Pali Hwy.	0.260	A	0.290	A	0.030	0.320	A	0.030
Kukui St.	Q. Emma St.	0.700	B	1.300	F	0.600	1.400	F	0.100
Beretania St.	Nuuanu Ave.	0.570	A	0.860	D	0.290	0.930	E	0.070
Beretania St.	Pali Hwy.	0.580	A	0.690	B	0.110	0.710	C	0.020
Beretania St.	Q. Emma St.	0.960	E	1.430	F	0.470	1.470	F	0.040
Beretania St.	Richards St.	0.510	A	0.590	A	0.080	0.600	B	0.010
Beretania St.	Punchbowl St.	0.870	D	1.040	F	0.170	1.080	F	0.040
Beretania St.	Alapai St.	0.690	B	0.860	D	0.170	0.900	E	0.040
Hotel St.	Nuuanu Ave.	0.310	A	0.510	A	0.200	0.600	B	0.090
Hotel St.	Bishop St.	0.240	A	0.460	A	0.220	0.480	A	0.020
Hotel St.	Alakea St.	0.330	A	0.600	B	0.270	0.620	B	0.020
Hotel St.	Richards St.	0.380	A	0.450	A	0.070	0.510	A	0.060
King St.	Nuuanu Ave.	0.570	A	0.870	D	0.300	0.880	D	0.010
King St.	Bethel St.	0.680	B	0.930	E	0.250	1.110	F	0.180
King St.	Bishop St.	0.710	C	1.790	F	1.080	1.790	F	0.000
King St.	Alakea St.	0.750	C	1.030	F	0.280	1.070	F	0.040
King St.	Richards St.	0.560	A	0.920	E	0.360	0.820	D	–
King St.	Punchbowl St.	0.720	C	0.900	E	0.180	0.900	E	0.000
King St.	Alapai St.	0.670	B	0.930	E	0.260	1.220	F	0.290
Kapiolani Bl.	South St.	0.540	A	0.670	A	0.130	0.720	C	0.050
Queen St.	Bishop St.	0.470	A	0.550	B	0.080	0.580	A	0.030
Queen St.	Alakea St.	0.700	B	0.780	A	0.080	0.850	D	0.070
Nimitz Hwy.	River St.	0.680	B	0.780	C	0.100	0.820	D	0.040
Nimitz Hwy.	Smith St.	0.720	C	0.830	D	0.110	0.860	D	0.030
Nimitz Hwy.	Nuuanu Ave.	0.640	B	0.840	D	0.200	0.950	E	0.110
Nimitz Hwy.	Bethel St.	0.780	C	0.830	D	0.050	0.970	E	0.140
Nimitz Hwy.	Fort St.	0.660	B	0.670	B	0.010	0.900	E	0.230
Nimitz Hwy.	Bishop St.	0.850	D	0.930	E	0.080	0.930	E	0.000
Nimitz Hwy.	Alakea St.	0.900	D	0.980	E	0.080	1.090	F	0.110
Nimitz Hwy.	Richards St.	0.580	A	0.670	B	0.090	0.840	D	0.170
Ala Moana Bl.	Punchbowl St.	0.940	E	1.030	F	0.090	0.980	E	–
Ala Moana Bl.	Trade Zone Entr.	0.750	C	1.820	D	1.070	0.880	D	0.060
Ala Moana Bl.	South St.	0.960	E	1.000	F	0.040	1.200	F	0.200
Halekauwila St.	Punchbowl St.	0.470	A	0.550	A	0.080	0.690	B	0.140

Notes: V/C = Volume-to-Capacity Ratio
LOS = Level-of-Service
CMA = Planning Method

* = Difference in Existing Peak V/C from Future Peak V/C Without Project
** = Difference in Future Peak V/C With Project from Future Peak V/C Without Project

construction and/or planned for completion in the downtown area by 1995. The change in V/C ratio in the "without project" column represents the magnitude of change from present conditions. The "with project" scenario presents traffic conditions resulting from the additional traffic generated by the project and considers improvements at project entrances and exits along Nimitz Highway. The change in V/C ratio in the "with project" column indicates the increase that would result in relation to the "without project" scenario. Clearly, future traffic conditions in Downtown Honolulu will be dictated by present growth trends as well as currently planned projects, while the portion of impact resulting from the proposed project is much less significant.

Results of the weekend traffic analysis indicate that far fewer intersections will be congested, due to the overall lighter traffic flow. As in the case for weekday traffic, most of the anticipated traffic congestion can be attributed to future conditions from causes other than traffic generated by the Waterfront at Aloha Tower project.

A variety of mitigation measures are identified in the traffic study, which would address anticipated traffic congestion. The developers are proposing to implement traffic improvements associated with the project entrances and exits along Nimitz Highway, including those portions of Fort, Bishop and Richards Streets and Ala Moana Boulevard that are adjacent to the project. Traffic improvements along the Nimitz Highway frontage of the project will alleviate more traffic congestion than would be generated by the project in this area. All proposed mitigation measures for the project shall be coordinated with the State Department of Transportation and the City and County Department of Transportation Services. All public streets, sidewalks and associated landscaping within the project area, including Fort Street, Bishop Street, Richards Street, and Ala Moana Boulevard, shall be maintained by the developers for the 65 year term of the lease agreement. Additionally, the developers will also maintain all public parks, including the restored Irwin Park, Ala Moana Mini Park, and the new Honolulu Fort Historic Park.

2. Rapid Transit

The traffic study prepared for the Waterfront at Aloha Tower assumes a "worst case" future condition which includes no consideration of the City and County's proposed Honolulu Rapid Transit System. Should this system be implemented, future traffic conditions are likely to be improved. Design considerations for accommodating a terminal, should one be designated at the proposed project, shall be pursued with the City and County Department of Transportation Services.

The Oahu Intraisland Ferry System was likewise not considered in the traffic study. Its implementation could also improve traffic conditions since a terminal is planned at Pier 8.

3. Parking

Development of the Waterfront at Aloha will result in the demolition of approximately 530 metered, unmetered, reserved, and bus parking stalls in the project area. The State is requiring that the developer replace a total of 227 stalls for use by the DOT-Harbors.

In determining the parking requirements for the project, the developers selected a method that would best meet their requirements as well as those imposed by the State. Based on the "shared parking" method which accounts for efficiencies inherent in mixed-use developments, a total of approximately 3,000 parking stalls will be provided. By comparison, based on the City and County's parking requirements for BMX-4 mixed-use zoning, an estimated 2,200 to 2,700 stalls would be needed.

4. Noise

Most existing development on the mauka side of Nimitz Highway, in the immediate vicinity of the proposed project site, is commercial. The only existing noise-sensitive buildings are the Harbor Square condominiums, between Richards and Alakea Streets. The buildings have air conditioning which allows occupants to keep windows closed, providing substantial noise attenuation. In the future, proposed noise-sensitive buildings nearby will include the project's condominium and hotel developments as well as condominiums to be constructed as part of the Kaahumanu Municipal Parking Structure redevelopment (Harbor Court) at the corner of Nimitz Highway and Nuuanu Avenue.

The potential increase in traffic noise as a result of traffic generated by the proposed project was forecasted using the Federal Highway Administration Highway Traffic Noise Prediction Model (see appendix B). The model was calibrated by on-site noise measurements and loaded with projected traffic data produced by a separate traffic study (see appendix C). The results demonstrate that the traffic generated by the proposed project will increase noise levels by 2 dB or less. This is not considered a significant increase in terms of the public's perception of loudness. Thus, the additional traffic on

Nimitz Highway and other city streets generated by the proposed Waterfront at Aloha Tower development will not cause any significant environmental noise impact.

The noise from mechanical and electrical equipment associated with the proposed development, including air conditioning equipment, garage exhaust fans, transformers, and emergency generators, will be reduced to acceptable levels at the property lines in compliance with appropriate State Department of Health, and City and County Land Use Ordinance limits. A variety of noise attenuating measures are available to reduce mechanical noises. Noise from service areas, such as loading docks and trash pickup points, can be reduced to acceptable levels at the closest noise-sensitive buildings by providing suitable locations for such activities and by using appropriate acoustical treatments.

Proposed uses within the Waterfront at Aloha Tower development will be subject to potential noise impacts, almost all of which are unrelated to the proposed project. Noise-sensitive uses include the condominiums and hotel which will require acoustical treatment, such as air conditioning and special glass windows, to attenuate traffic and aircraft noise. The proposed multi-plex cinema may also require special acoustical treatment. The proposed amphitheater at the juncture of Piers 9 and 10 will be subjected to aircraft noise, which could at times affect performances held there. Other outdoor uses, such as restaurants and shopping along the pedestrian mall, should not be unduly affected by existing noises.

5. Air Quality

The primary long-term impacts on air quality in the vicinity of the project site will indirectly result from vehicular traffic associated with the proposed development. These vehicles will use Nimitz Highway/Ala Moana Boulevard and adjacent roadways running mauka-makai from the waterfront area. An air quality monitoring study of vehicular generated emissions was conducted to estimate current ambient concentrations of carbon monoxide along Nimitz Highway and Ala Moana Boulevard and to also forecast future levels both with and without the project (see appendix A). Present carbon monoxide concentrations were estimated to be well within the national 1-hour ambient air quality standard but may occasionally exceed the 8-hour national limit as well as the more stringent 1-hour and 8-hour state standards during adverse traffic and meteorological conditions.

In the year 1995, without the project, carbon monoxide concentrations are predicted to decrease even though traffic is expected to increase. This is due to a growing proportion of newer motor vehicles equipped with more efficient emission control devices. Occasionally, however, worst-case traffic and meteorological conditions will continue to cause exceedances of the State carbon monoxide standards in small "hot-spot" areas near congested intersections; but the national standards will be met. In the 1995 "with project" scenario, maximum carbon monoxide concentrations will likely be about 20 percent higher compared to the "without project" case and about the same or lower compared to existing conditions. This assumes that traffic improvements along Nimitz Highway proposed in conjunction with project development are implemented. Further mitigative measures beyond the control of the project developers include promoting mass transit and carpooling, adjusting local school and business hours to begin and end during off peak periods, and reducing motor vehicle emissions from individual vehicles.

Long-term indirect impacts are also possible due to the project's electrical power demands and solid waste disposal requirements. Both power generation and incineration of refuse at the H-Power Garbage to Energy Plant may contribute air pollutants to the atmosphere. Quantitative estimates of these potential impacts were not made; however, based upon estimated emission rates involved, attendant impacts are insignificant in relation to present and future power demands and solid waste disposal requirements islandwide.

6. View Planes

The proposed Waterfront at Aloha Tower features an architectural theme that is reminiscent of a classic style characterizing the historic Aloha Tower area of the waterfront. Medium and low-rise structures done in this style throughout the development provide an appealing visual transition from the neighboring high rises in the central business district to the plazas and other open spaces around Aloha Tower, whose historic prominence on the waterfront is enhanced. The proposed high-rise office building and condominium towers are located at the mauka end of the development, distancing them from Aloha Tower, thereby accentuating Aloha Tower as the dominant visual symbol for the entire waterfront.

Views of the downtown area from elevated mauka vantage points such as Punchbowl, Tantalus and Pali Highway will not be affected since existing high rise buildings in Downtown will obscure most the project. Although the proposed high rise structures will be 50 feet taller than the tallest surrounding buildings, the 14 percent difference in height will have minimal visual impact.

Views along the waterfront will be changed by the proposed development, with new structures blending historic architecture in a setting of generous open space and landscaping. Important view channels long hidden will be restored and enhanced for the public to enjoy.

The proposed Maritime Building and Passenger Terminal at Piers 5 and 6 will reduce a portion of the open space currently used as a parking lot in this area. On the other hand, the classic styling of the proposed building, together with the generous fronting open space, which will extend through the restored Ala Moana Mini Park, will enhance the overall visual appeal of the area (see figure 24). Removal of the ramp over Pier 7 will open ocean vistas down Bishop Street, with views of the Maritime Museum, Falls of Clyde and the plaza fronting Pier 8 (see figure 25). At Irwin Park, removal of vehicular parking and implementation of landscaping improvements will provide scenic open space at the entrance to the Aloha Tower Marketplace (see figure 26). Down Fort Street, the refurbished Aloha Tower will continue to be the prominent landmark but greatly enhanced with the restoration of long hidden arches and a broad surrounding plaza providing an ocean backdrop (see figures 28 and 29).

From the Downtown area, the proposed high-rise structures will generally be the only portions of the project visible from street level over some of the low and medium-rise buildings. Depending on the vantage point, the prominence of these structures will vary. In the eastern part of Downtown, existing high-rise buildings will remain the dominant features among which the proposed office and condominium towers may be partially visible at a distance. Thus, their visual impact will be minimal. In the low-rise Chinatown area, the proposed high rise towers will be more prominent, particularly the condominium towers at nearby Piers 13 and 14. Nevertheless, as new high rise buildings such as the Chinatown Gateway and the Kaahumanu Municipal Parking Structure redevelopment (Harbor Court) are constructed, the prominence of the project buildings will be reduced (see figure 29). Throughout this area, high rise buildings are or will be prominent in the makai direction (Chinatown Gateway and the proposed Harbor Court at Bethel Street and Nimitz Highway), the Koko Head direction (East Downtown high-rises), and the Mauka Direction (Kukui high-rises).

Along Nimitz Highway, west of the project, the proposed office and condominium buildings will add to the Downtown/Waterfront skyline (see figure 30). On-going and proposed developments in Downtown, including the Harbor Court condominiums at Nimitz and Nuuanu, will continue to fill in this skyline. At street level, the base of the proposed Honolulu Harborside Condominiums at Piers 13 and 14 will offer an articulated, landscaped frontage rising away from Nimitz Highway in place of the aging utilitarian structure on the pier (see figure 31).

Views from the harbor as well as Sand Island Park will continue to feature Aloha Tower against a backdrop of the Downtown buildings and the Koolau Range beyond (see figures 32 and 33). The waterfront view will be particularly enhanced because the full height of Aloha Tower will be revealed and flanked by the classic architecture that greeted ship arrivals in the heyday of ocean travel. Pier 13, which also faces ships arriving at Piers 10 and 11, will offer a new look at the base of the Honolulu Harborside Condominiums (see figure 34).

7. Support Infrastructure

<u>Water</u>

Water for the Waterfront at Aloha Tower development will be provided through City and County Board of Water Supply facilities. Inasmuch as the project is sponsored by the State, the Board has indicated that an allocation of water supply from the State to the Board will be required based on anticipated project demands. A water master plan will be prepared for the Waterfront at Aloha Tower development which will determine the water requirements for the project. An allocation shall be sought from the State Department of Land and Natural Resources which is responsible for developing water resources for the State.

<u>Wastewater</u>

The proposed Waterfront at Aloha Tower development will increase sewage discharge in the project area. Although the City and County Department of Public Works is planning to install sewer lines in Nimitz Highway to upgrade sewer service in the area, the Department has indicated that, even with these improvements, there may be insufficient capacity for the proposed development. If future sewage capacity is inadequate, a relief sewer line may be necessary to accommodate project flows. Further discussion with the Department of Public Works will be pursued during the designing of the project to determine sewage disposal requirements.

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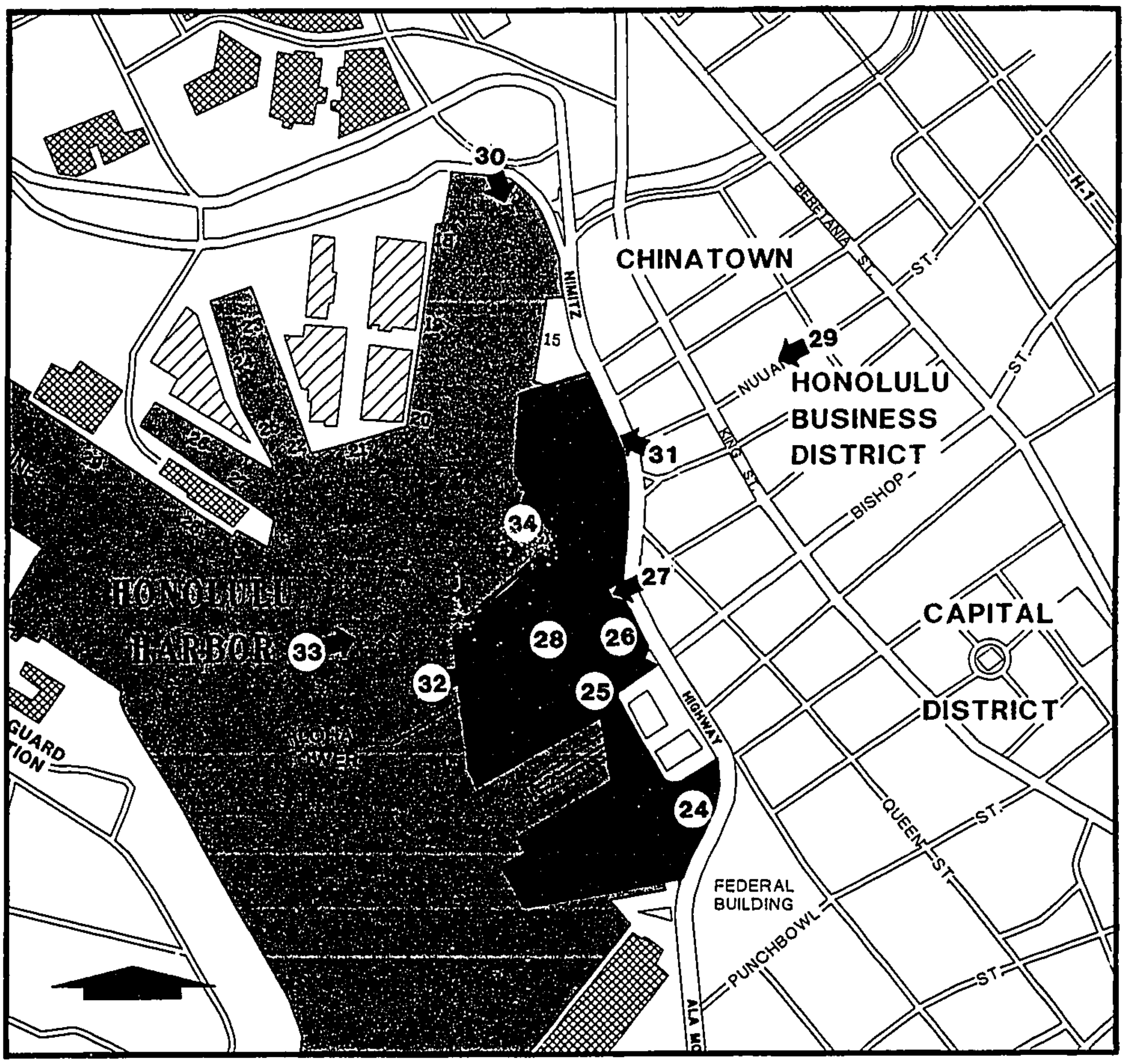

FIGURES 24 THROUGH 34

WATERFRONT AT ALOHA TOWER VIEW PLANES

Figure 24

The Maritime Building site from Ala Moana Mini-Park.

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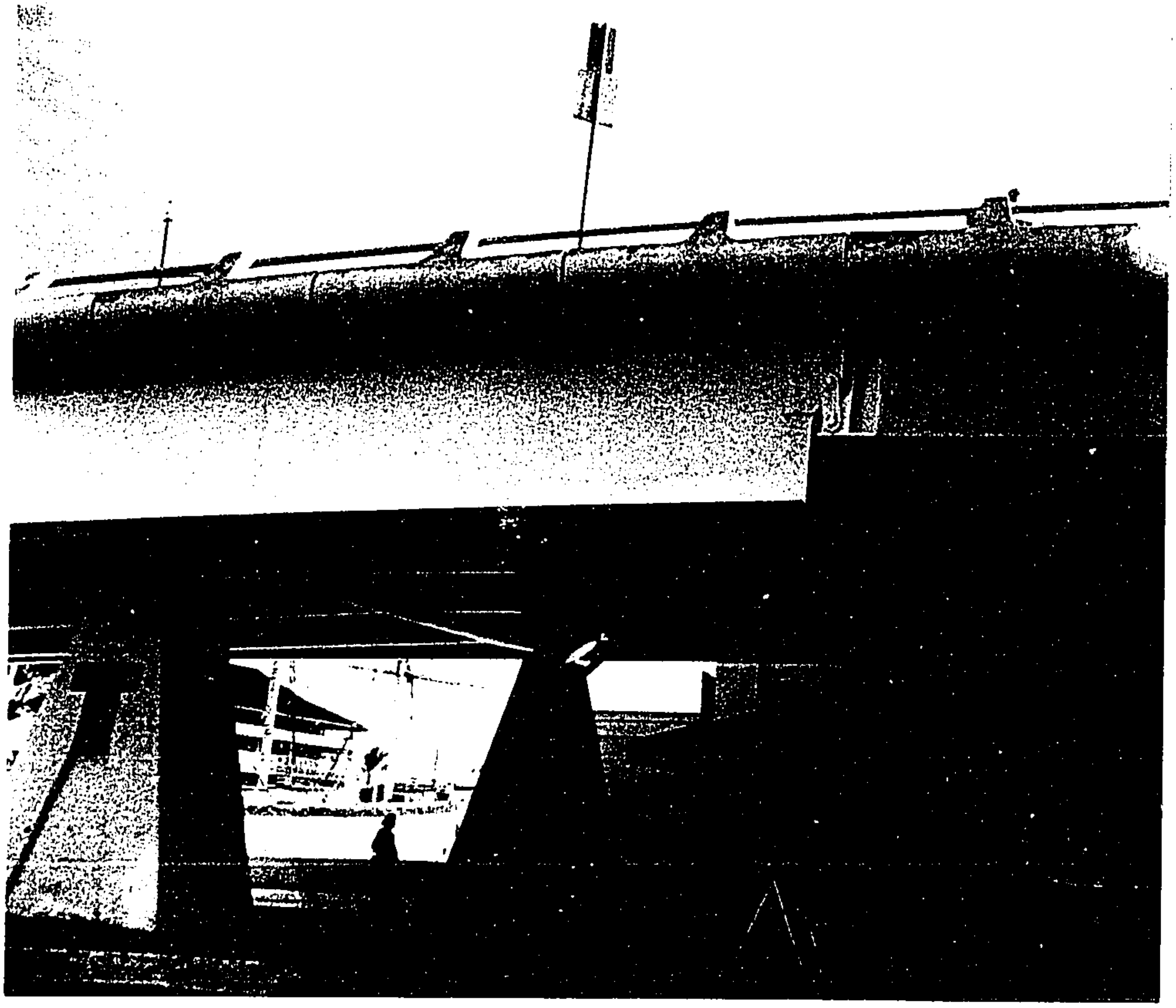

Figure 25

Pier 8 and Maritime Museum at the end of Bishop Street.

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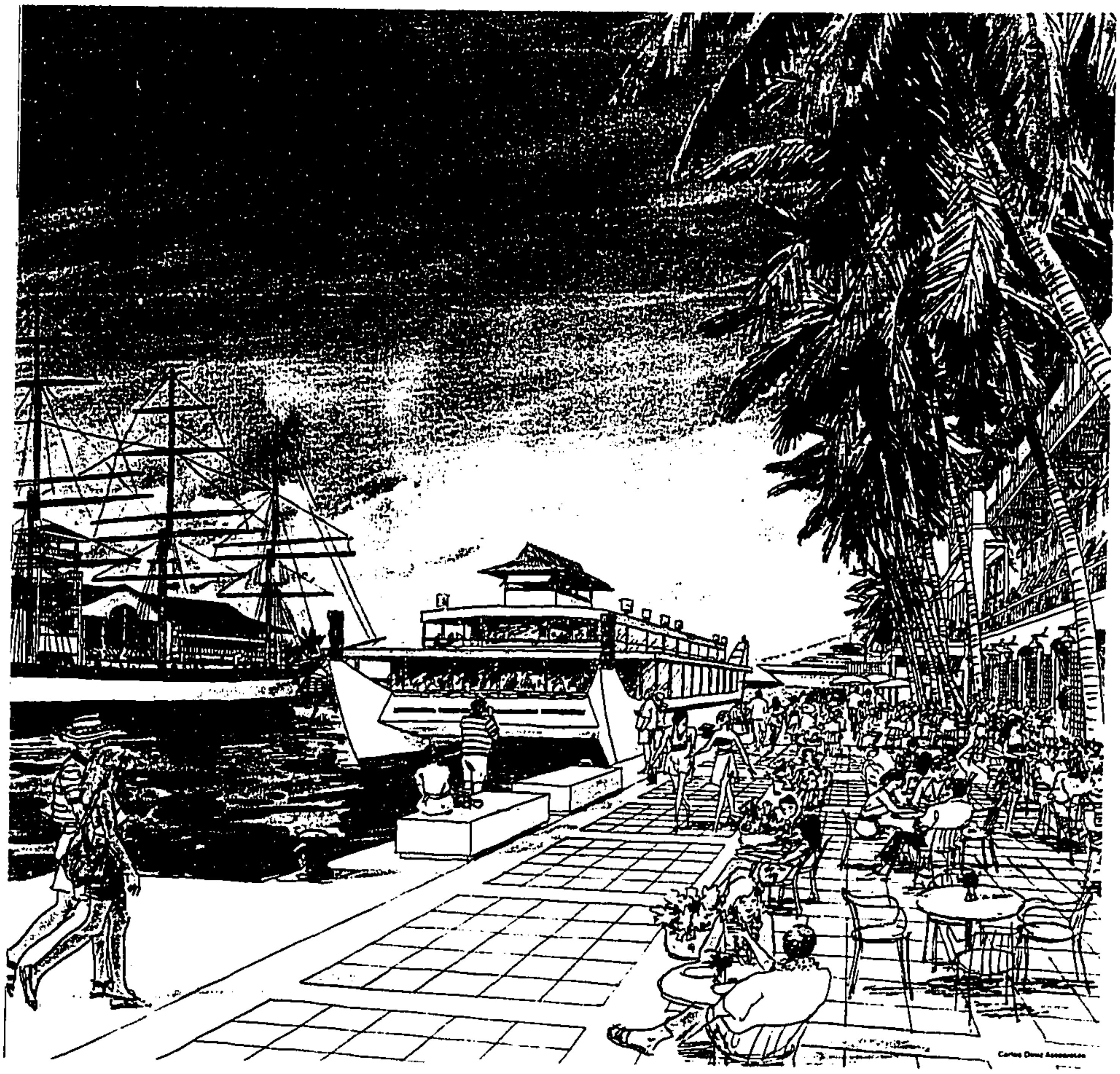

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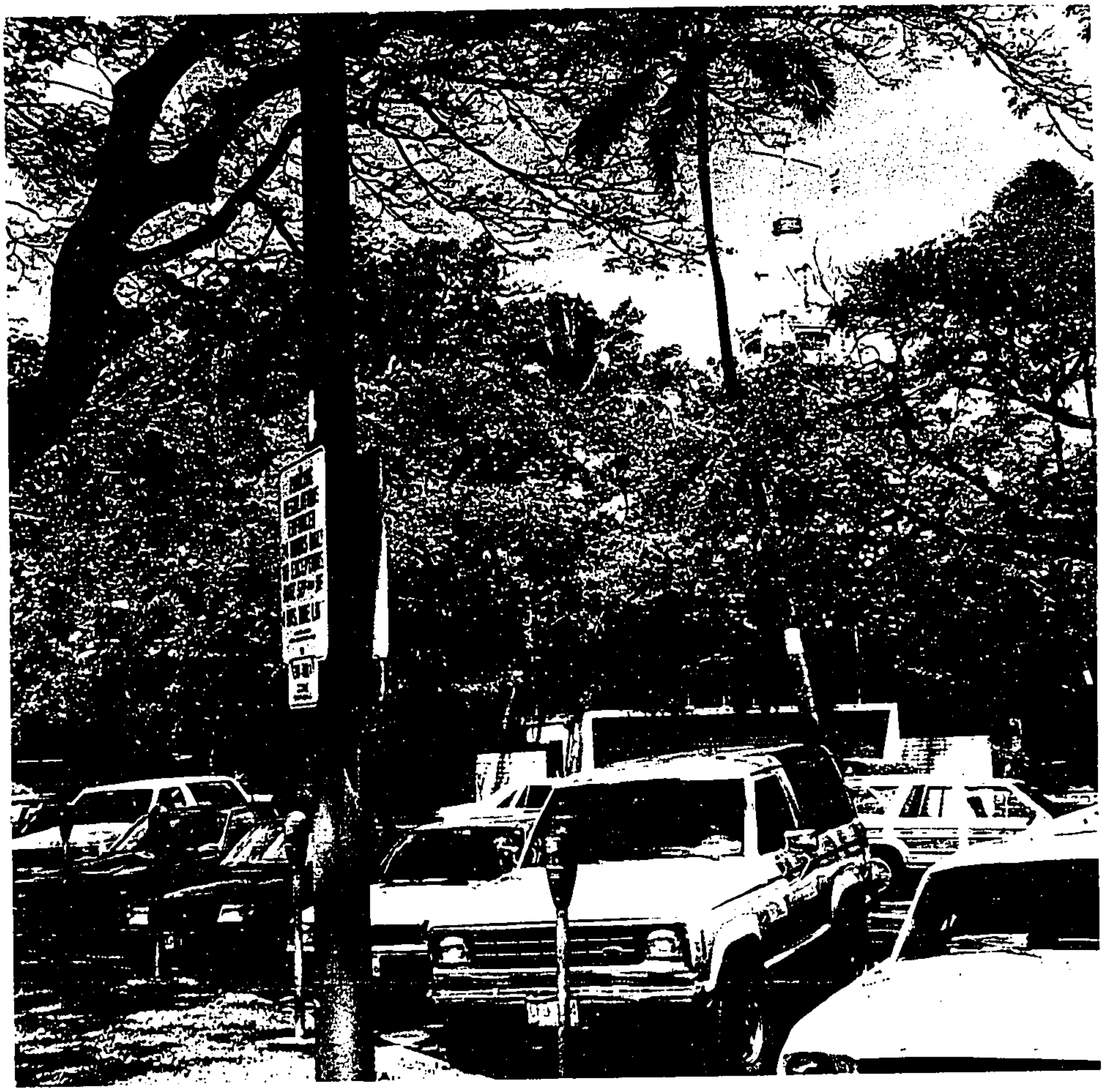

Figure 26

Aloha Tower Marketplace site from Irwin Park.

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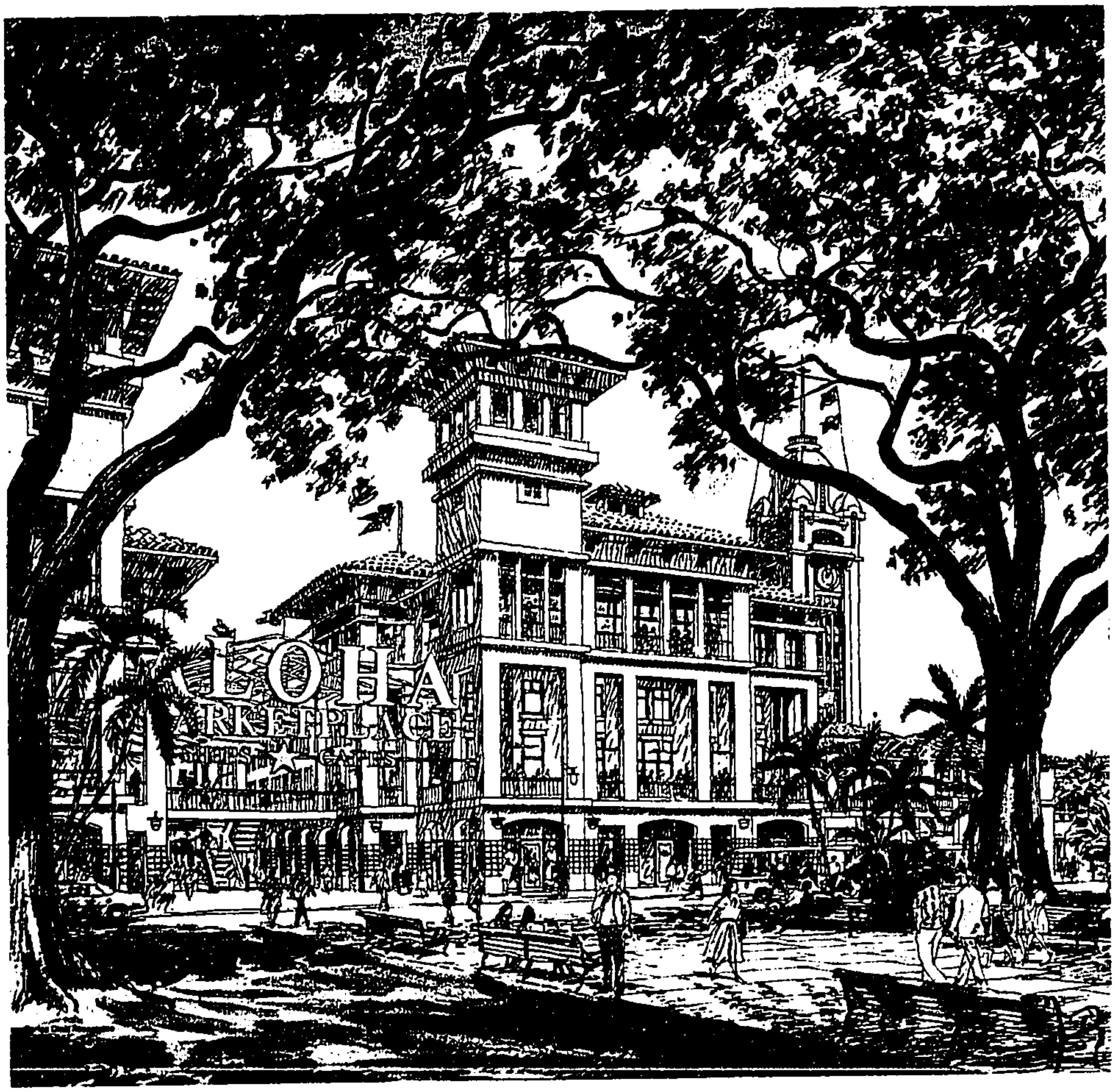

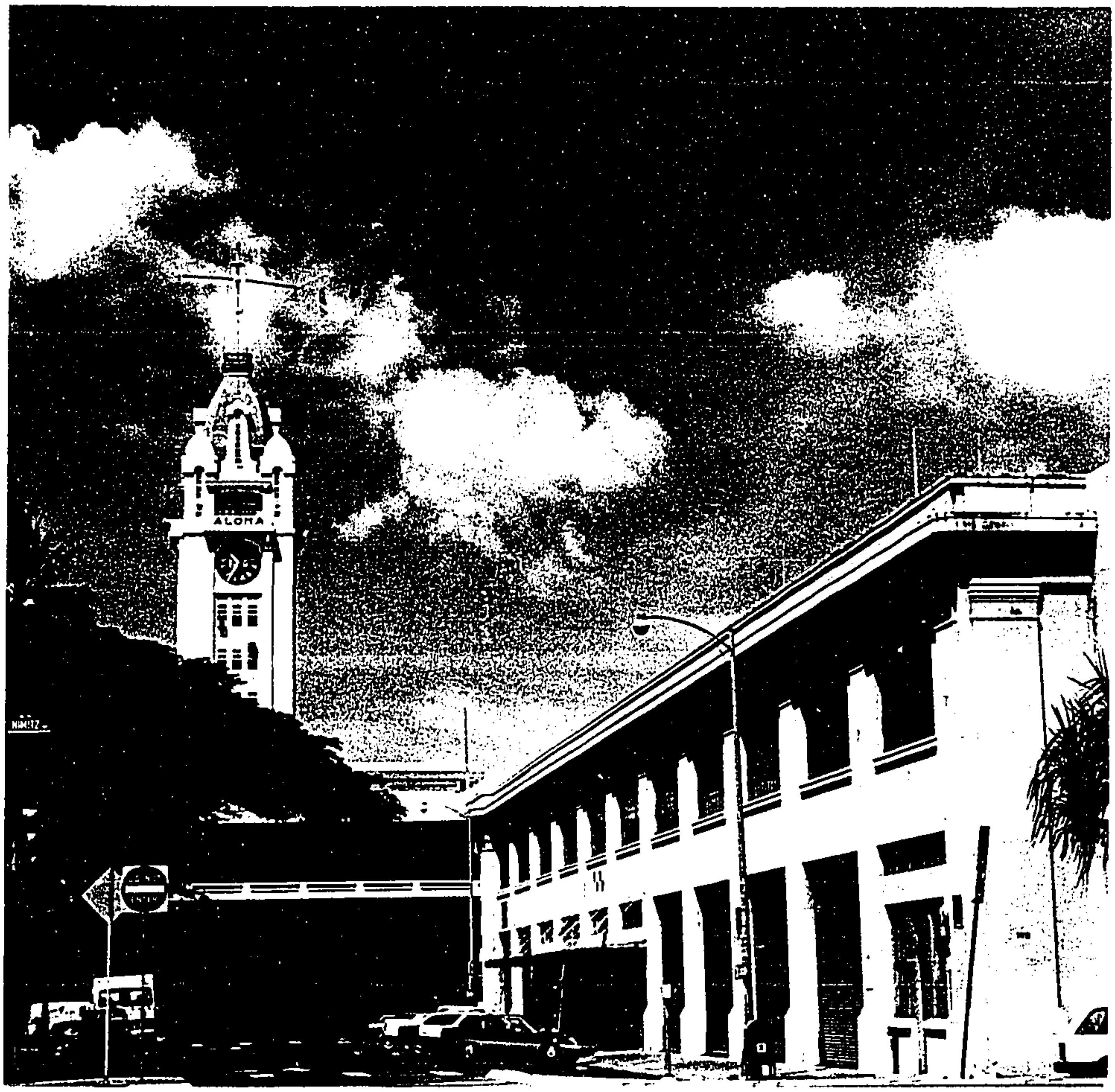

Figure 27

Aloha Tower from Fort Street and Nimitz Highway.

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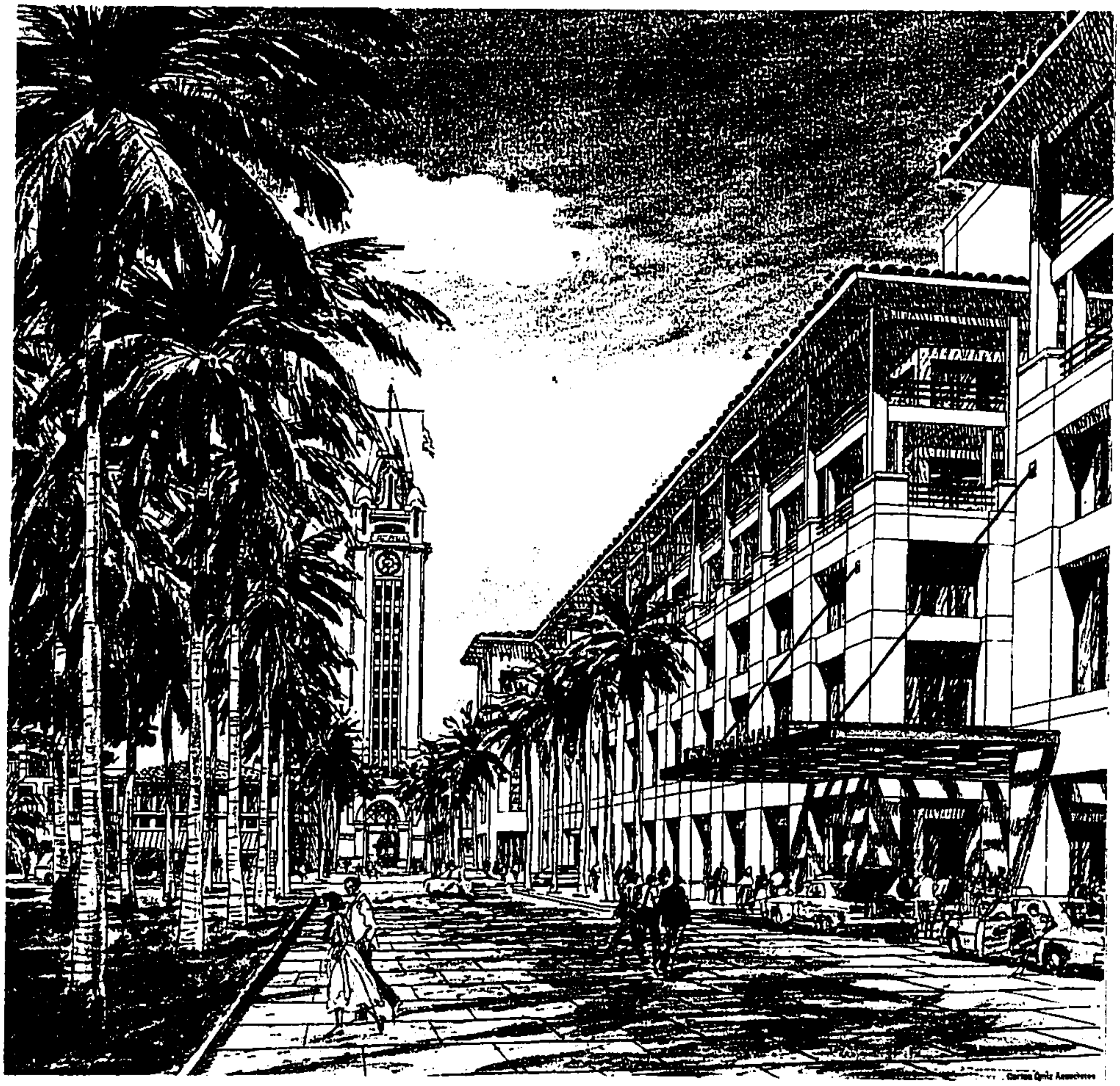

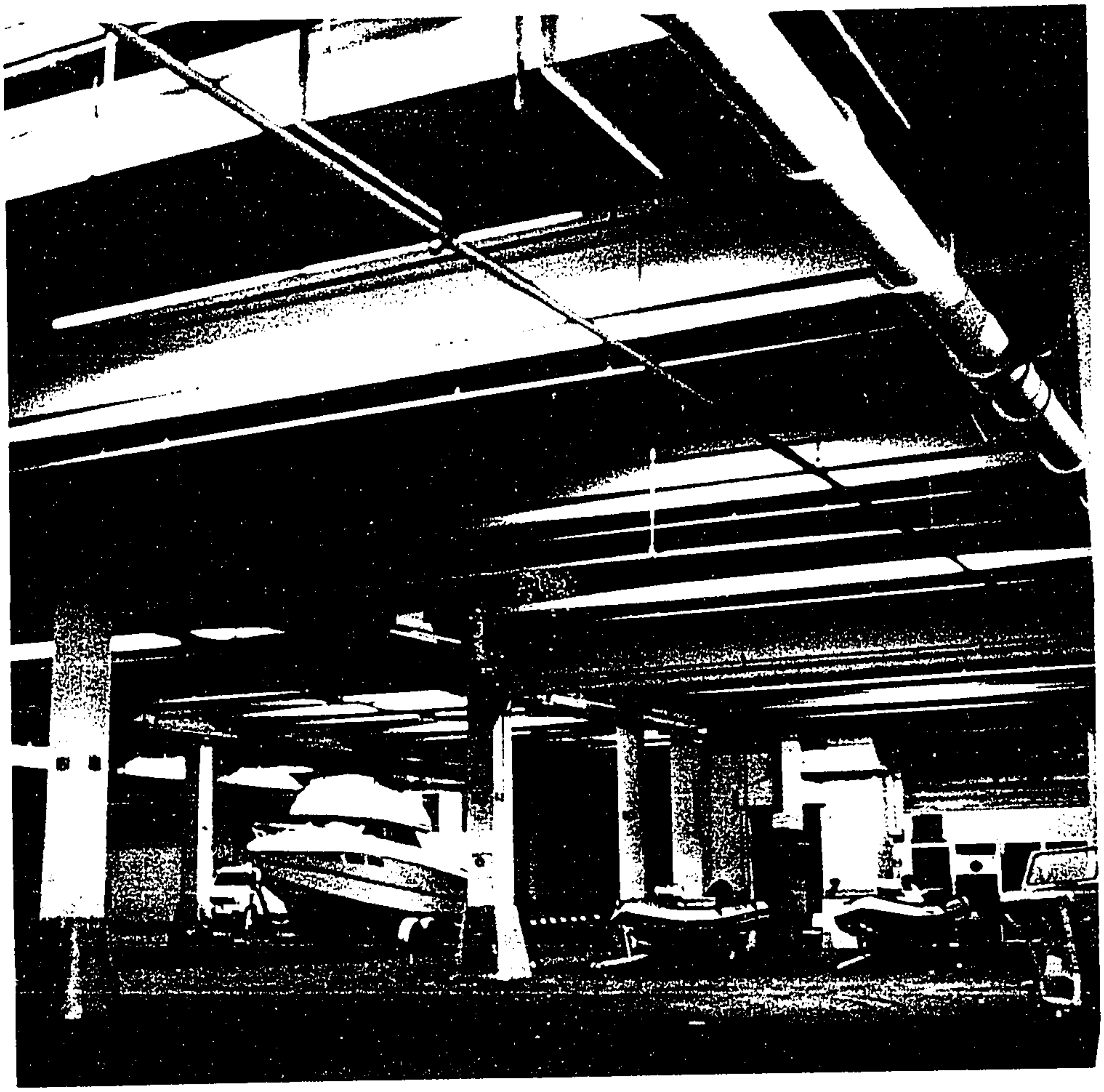

Figure 28

Base of Aloha Tower at the end of Fort Street.

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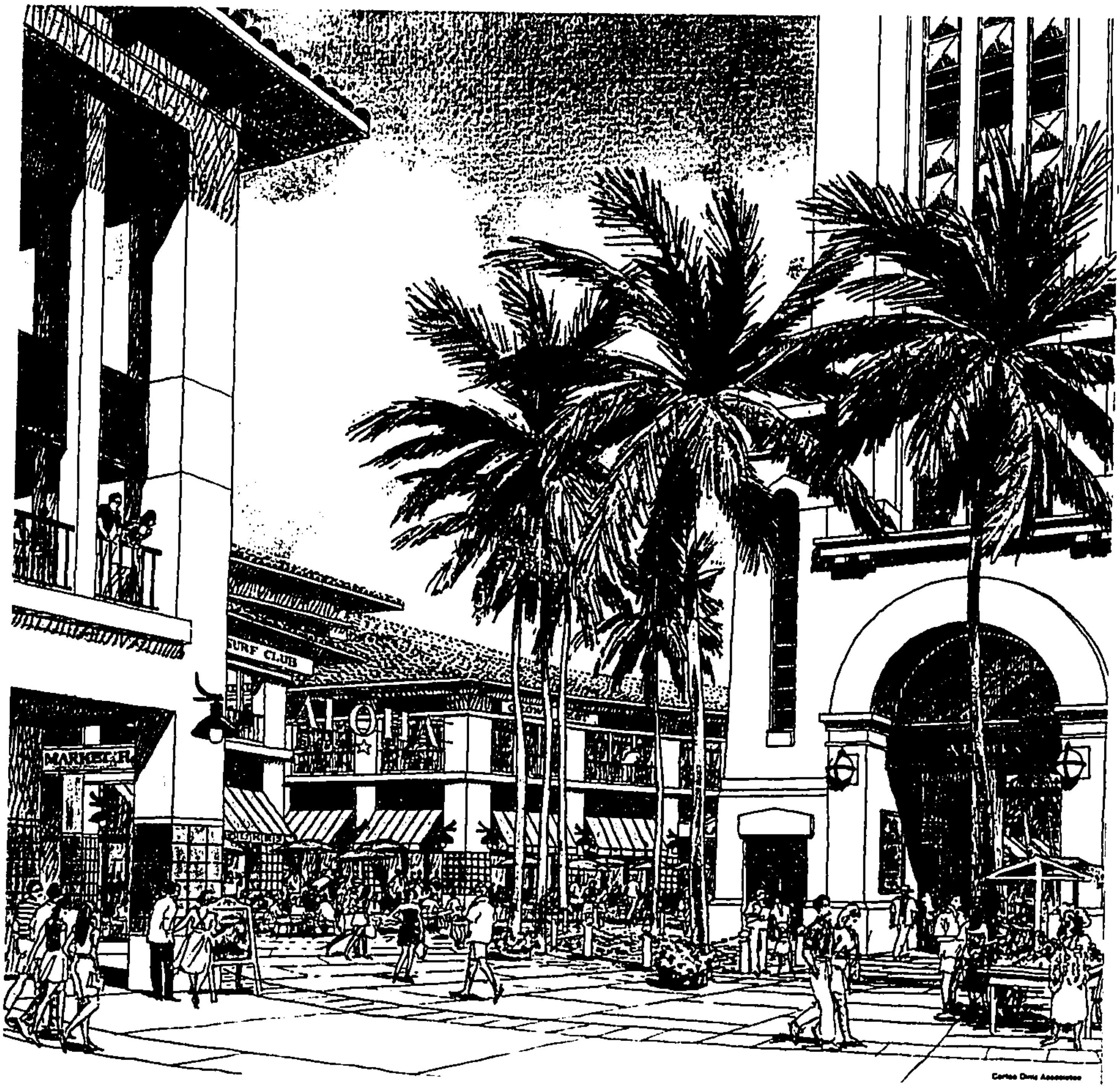

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Figure 29

Makai view at Nuuanu Avenue and Pauahi Street.

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Figure 30

Downtown Skyline from Nimitz Highway at Fishing Boat Wharf, Pier 16.

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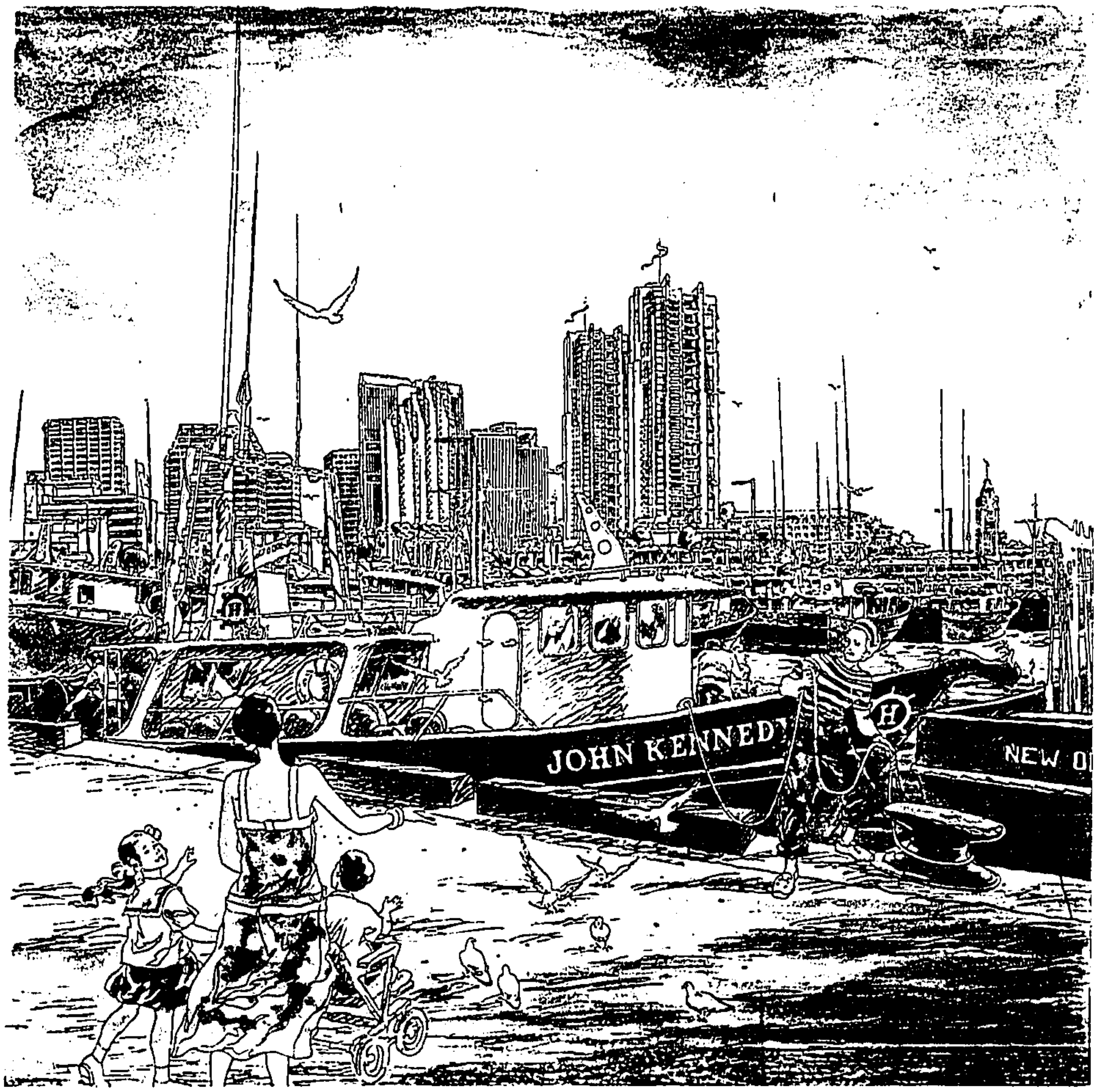

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Figure 31

Honolulu Harborside Condominiums site at Piers 13 and 14 from Nimitz Highway and Nuuanu Avenue.

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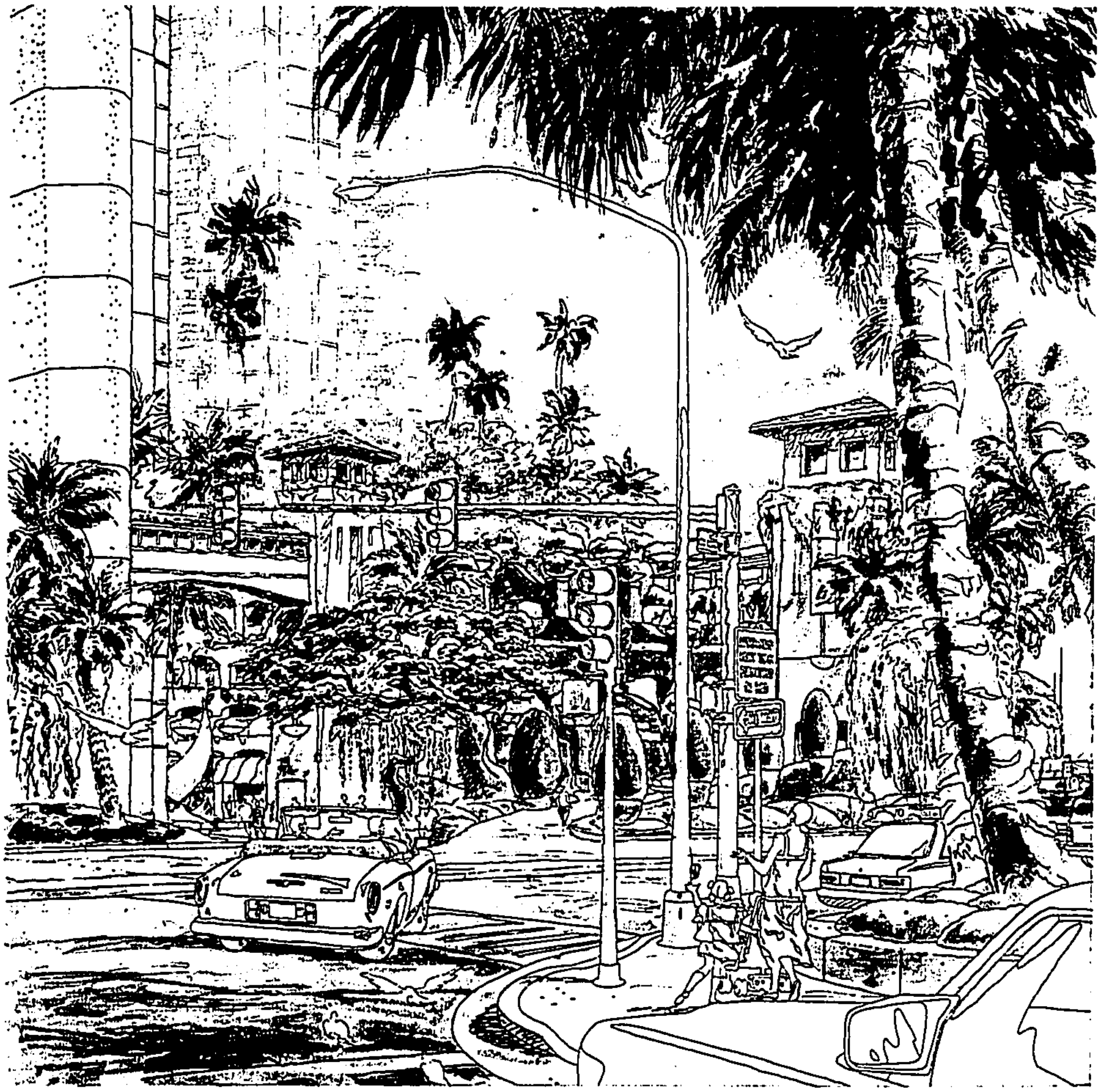

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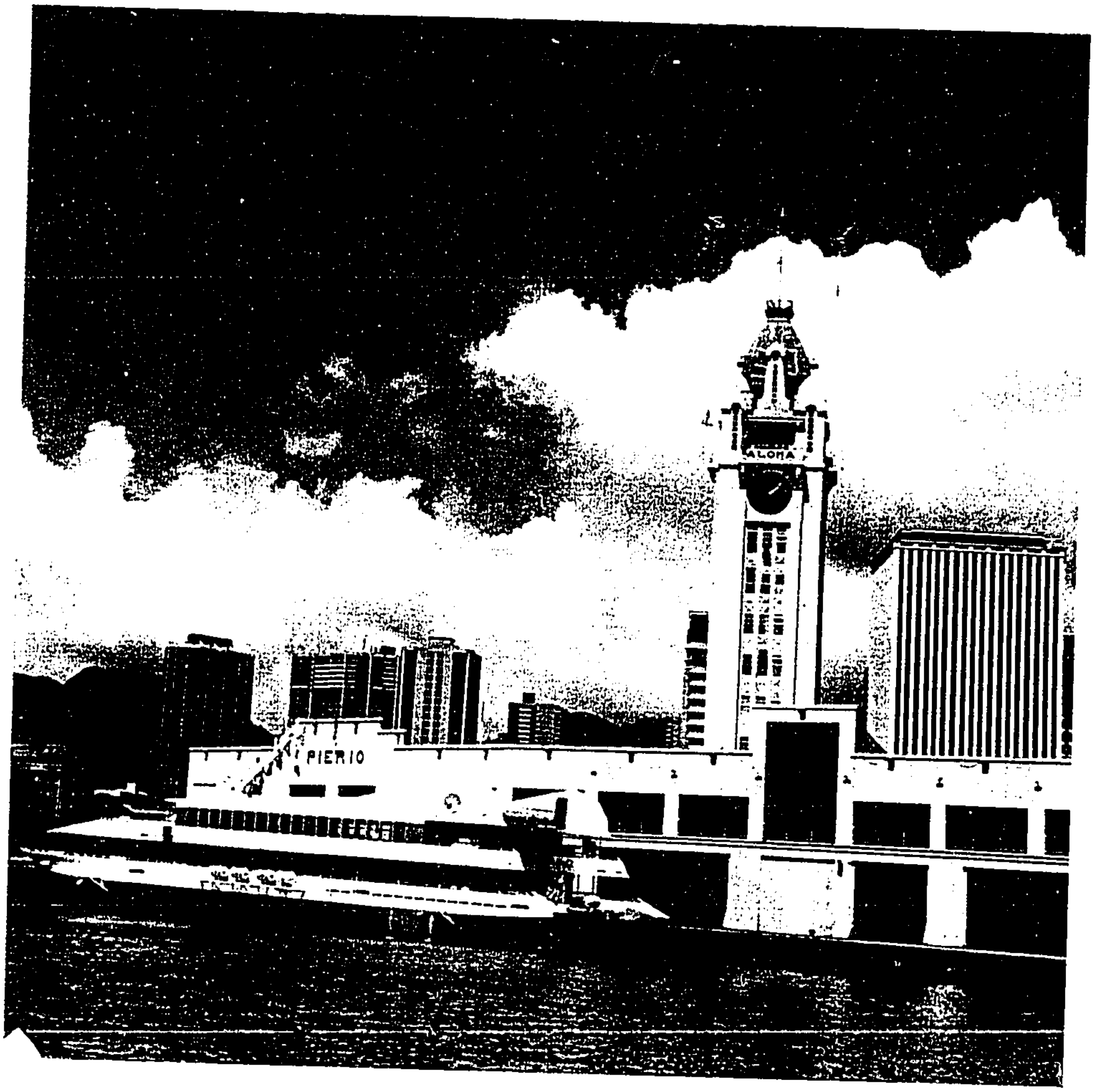

Figure 32

Aloha Tower and Plaza Site at Piers 9 and 10 from Honolulu Harbor.

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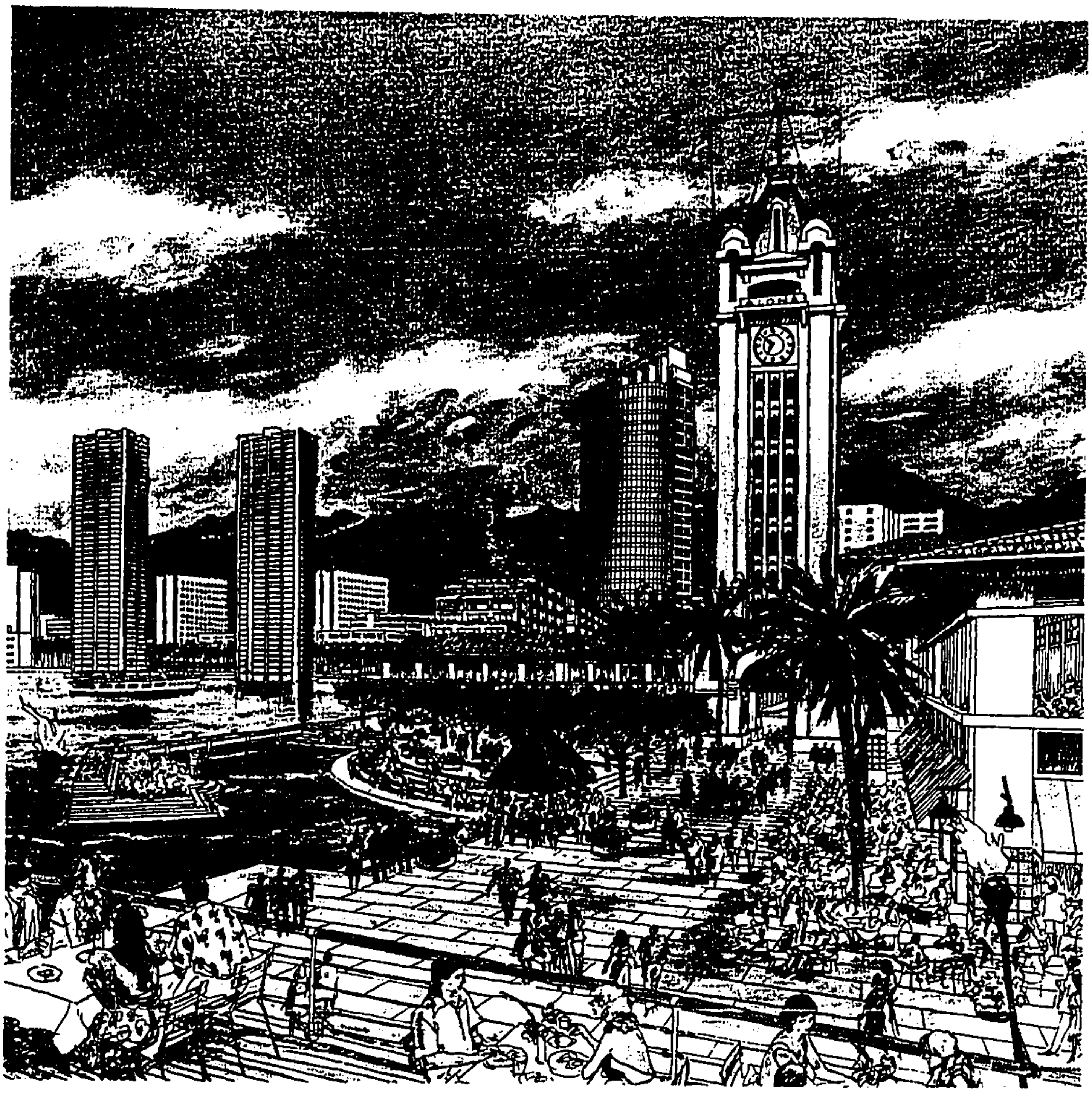

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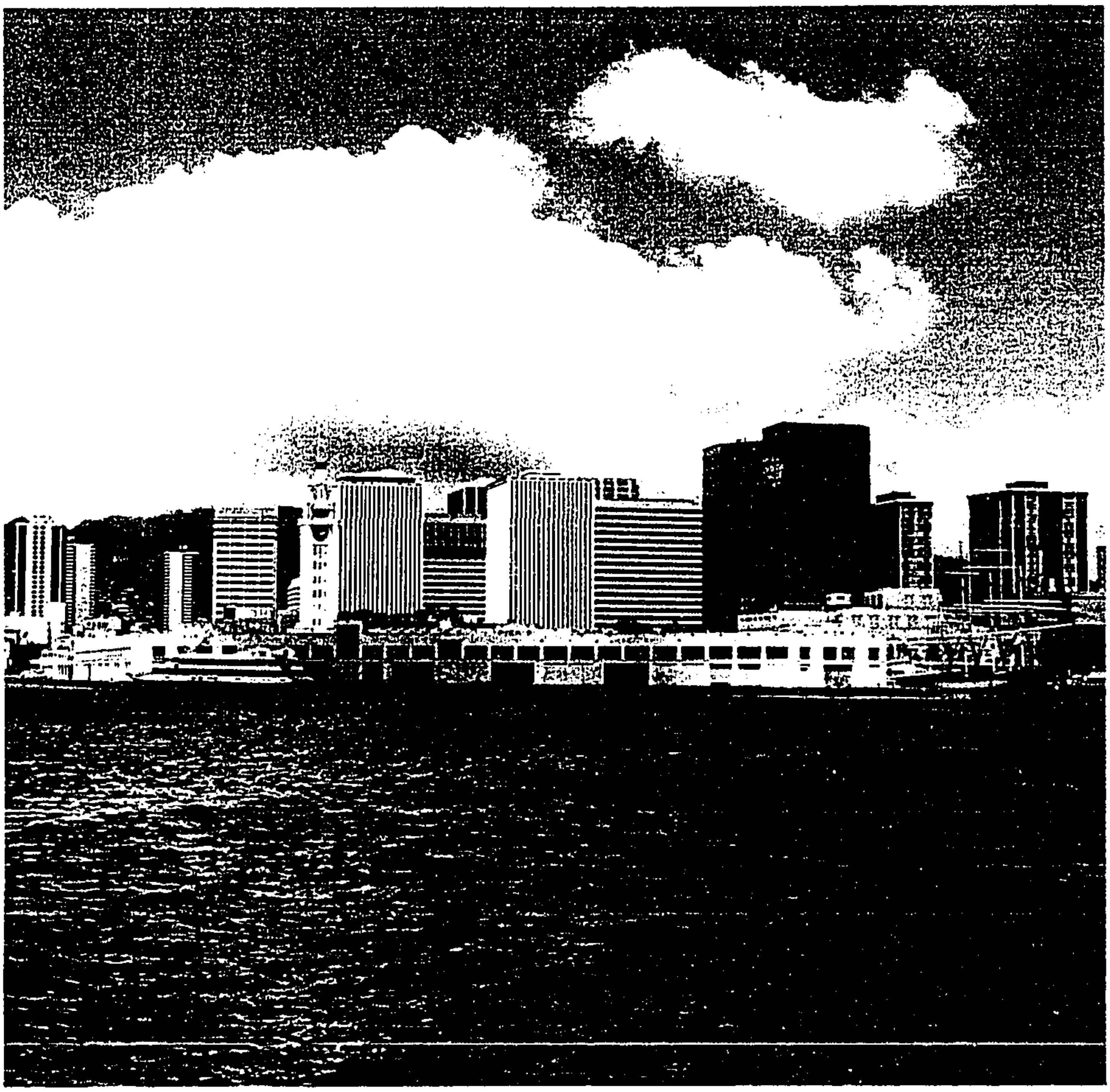

Figure 33

Waterfront at Aloha Tower site from Honolulu Harbor.

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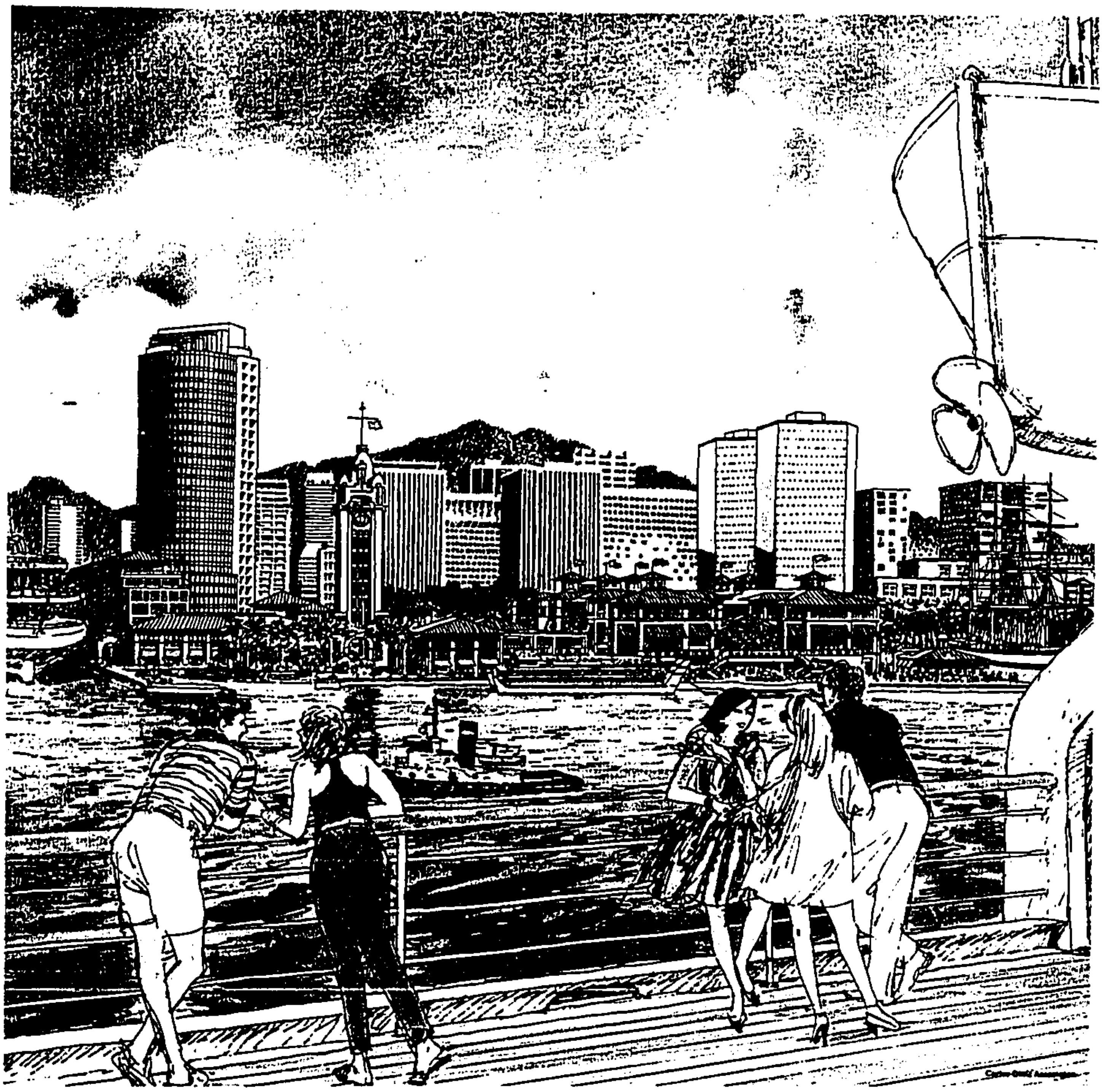

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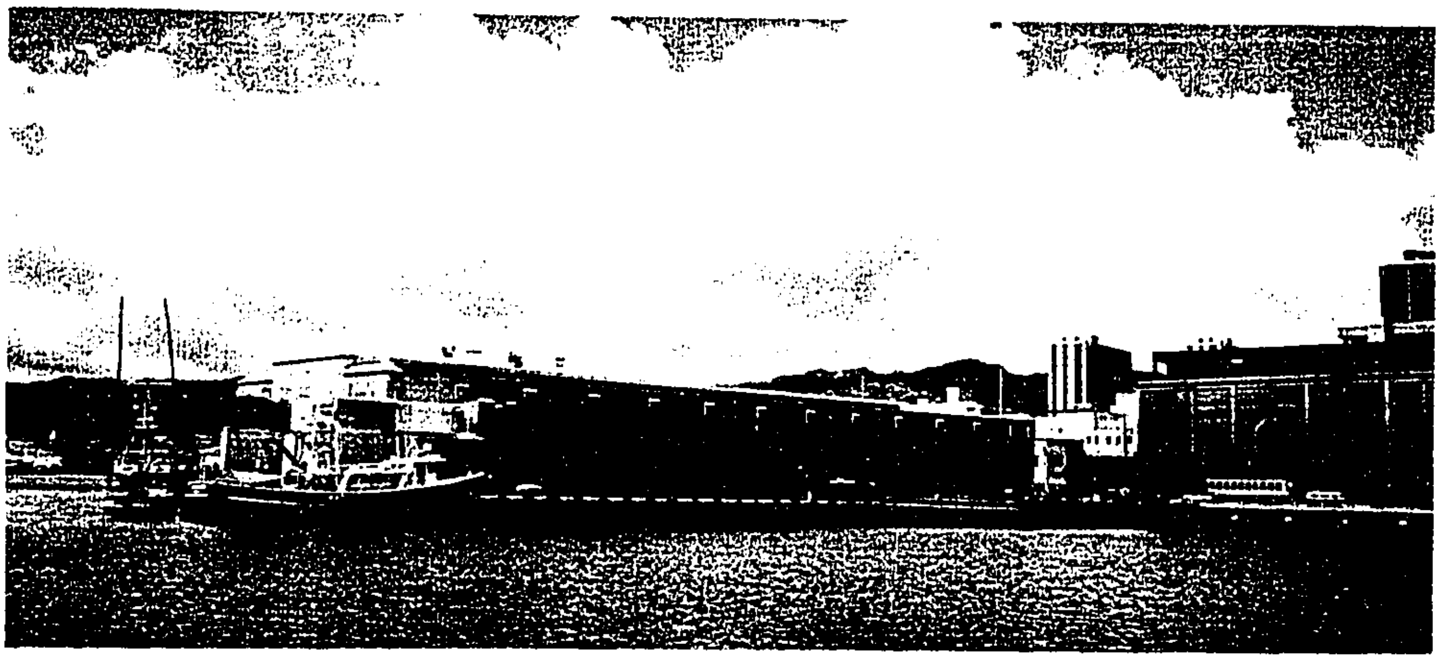

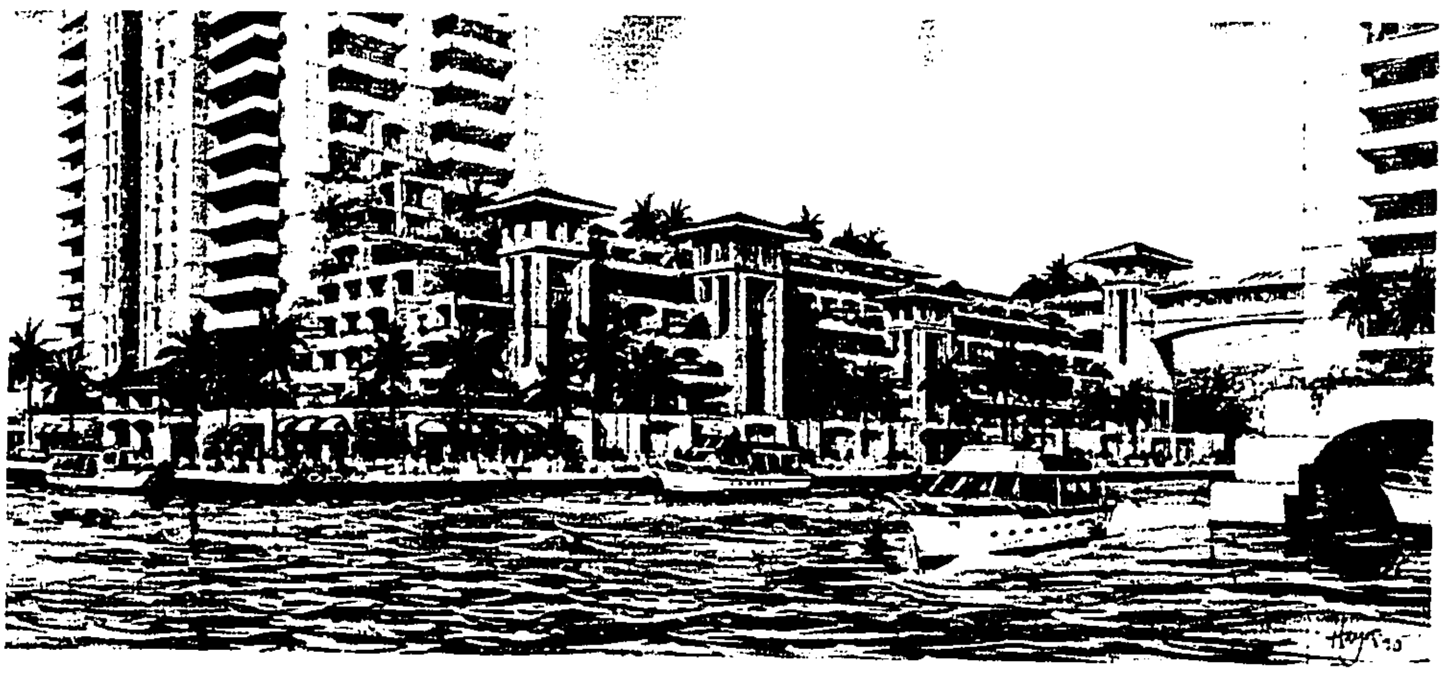

Figure 34

Honolulu Harborside Condominiums site at Piers 13 and 14 from Honolulu Harbor near Pier 11.

Drainage

Due to the complex network of drainage facilities in the vicinity of the project site, it is anticipated that extensive coordination with the City and County Department of Public Works will be required to assure that adequate facilities are provided for the project as well as to accommodate existing runoff from mauka areas. Some rerouting of existing drainage lines may be necessary. A drainage study will be prepared for the project to determine the drainage improvements required.

E. Long-Term Impacts - Marine

1. Waves

Wave penetration into the harbor during south swell or Kona storm conditions is of some concern to harbor users. Additionally, long waves that result from group effects also may contribute to motions of large vessels. No other wave phenomena, such as harbor resonance, appear to be major factors that need to be considered for proposed harbor modifications. Wave penetration presently affects smaller vessels in the harbor such as dinner cruise ships, requiring some vessels to be moved to secure berths several times per year. These conditions will not be changed by the proposed Waterfront at Aloha Tower development. Wave penetration will be considered in designs of pier structures for large cruise ship operations at Piers 5 and 6. During severe storm conditions, wave splash and run-up may reach onto the roadway along the harbor between Piers 5 and 8. Under storm conditions, access by pedestrians to proposed facilities on Piers 9 and 10 may be restricted.

2. Marine Habitats

Pile driving for the Honolulu Harborside Condominiums between Piers 12 and 14 is not expected to have long term effects on marine life. Piles will be placed in an area with a low-productivity mud bottom.

The proposed extension of Piers 5 and 6 will alter the marine habitat beneath it. Algae and coral, which depend on significant sunlight, will be lost in areas shaded or covered by the new structure. However, since the pier extension is pile-supported and exposed to harbor waters, other marine species will grow in this environment. Other coral reefs along the adjoining seawalls and revetments in the area should recover from construction activities and will not be affected in the long-term as a result of the development.

The biological impact brought about by long-term alterations in water circulation patterns is difficult to predict. The greatest abundance of fish and coral found in the harbor is around the HECO power plant where circulation is driven by the intake and discharge of cooling water. Although this flow is not likely to change as a result of the project, the HECO power plant is scheduled to shut down by 1995. The presence of healthy coral reef on limited hard substrate around Pier 12 indicates that constant currents may not be necessary for coral growth in the harbor.

F. Social Impacts

This section will discuss how the Waterfront at Aloha Tower will impact the immediate area surrounding the project, namely Chinatown, East Downtown, and tenants of the project area. Also discussed are the project's impacts on population, employment, and public services and facilities. Current City policy is to revitalize Downtown through improved traffic and transportation capabilities, preservation of historic buildings, and improvements to the pedestrian environment by providing open space, pedestrian malls, and residential-condominium projects. Meanwhile, a surge in redevelopment and construction has been accompanied by higher costs for housing, commercial, and office space in Downtown.

Over the long term, the proposed Waterfront at Aloha Tower development is anticipated to have positive impacts with regard to economic development and employment through:

a) Increased revenues for Downtown merchants and retailers;

b) More and varied evening activities along the Waterfront and Downtown;

c) Increased job opportunities along the Waterfront and Downtown; and

d) Improvement of the overall image of Downtown.

On the other hand, potential social concerns may arise regarding:

a) Competition for public facilities;

b) Increased crime from more intensified use of the area; and

c) Displacement of pier tenants.

RECEIVED AS FOLLOWS

1. Residential Population

Based on the estimates of future population and household size, the number of households on Oahu is projected to increase from 304,000 in 1989 to 325,100 by 1995. Similarly, urban Honolulu households are projected to increase from about 155,400 in 1989 to 166,300 by 1995. The average household size on Oahu has declined over the past 10 to 15 years as the rate of household formation slows and the number of children per family declines. This trend, which has been experienced nationwide, is expected to continue. Over the projection period, household sizes are projected to average 2.6 persons in urban Honolulu and 2.8 persons on Oahu.[1]

Based on the difference between the number of projected households and the number of existing housing units, housing requirements on Oahu are projected to increase from about 3,200 units in 1989 to a cumulative total of about 14,100 by 1995.

An important consideration in the ATA proposed Waterfront at Aloha Tower development is the establishment of The Aloha Tower Housing Foundation, the purpose of which is to assist in providing fit and affordable housing for the poor in Hawaii. Five percent of interest earnings from all of ATA's project lenders (excluding construction lenders and mortgagees on individual condominium apartment loans) will be donated to the Foundation, as will five percent of all of ATA's pretax profit from the operation and sale of improvements.

The proposed condominiums of the Waterfront at Aloha Tower are expected to add up to 350 units to the housing stock or up to 950 new residents to the Downtown area. The condominiums are expected to be up-scale units.

2. Employment

Short-term construction jobs will be generated during the several years it will take to complete the waterfront development. The number of construction jobs created is a function of the development's phasing, duration and design.

Long-term employment would be provided by commercial, retail, restaurant, office, and hotel developments. The number of jobs directly created would

[1]Coldwell Banker McCormack Real Estate. Makai Corridor Condominium Market Assessment Honolulu, Hawaii. Prepared for Aloha Tower Associates. September 1989. p.7

be a function of the type and mix of commercial establishments which have yet to be determined. It is anticipated, however, that several thousand direct and indirect jobs may be created by the waterfront development.

3. Public Services and Facilities

Police

The project area is located within the Honolulu Metropolitan Police District I which extends from Hawaii Kai to Pearl City. District I headquarters are currently located in Pawaa, but will be relocated to a facility on Alapai Street between Beretania and King Streets where the bus depot was located. Relocation will place the station closer to the project site after its completion in 1991. A Downtown substation has recently been established at Nuuanu Avenue and Hotel Street, about three blocks mauka from Piers 13/14.

Based on discussions with police officers at the Downtown substation, there is very little crime occurring along the waterfront pier areas, except for an occasional fight. In the vicinity of Downtown, the Chinatown area experiences the highest crime rate. Once lined with seedy bars and night clubs, "cruising" and prostitution on Hotel Street were nightly activities. Since Hotel Street was renovated in 1986-87, crime has decreased. Restricting Hotel Street to bus and pedestrian traffic has eliminated "cruising" while most prostitutes have vacated the area. Nevertheless, drug dealing and drug use, most recently in the form of "ice," have not diminished from the bar scene and are still considered a problem in the Downtown area. According to the Police Department, the Liquor Commission may eventually revoke the liquor licenses of the remaining bars in Chinatown.

While there is very little gang activity in Downtown, homelessness is acutely visible. More assaults involving the homeless have occurred in Aala Park since "tent city" was erected by the City.

As a result of ongoing Downtown redevelopment, such as the Chinatown Gateway Plaza, the Police Department anticipates a "cleaning up" of crime with more residents living in Downtown. More residents mean more "watchful eyes." With the eventual elimination of the nightlife element, the present conditions on Hotel Street should slowly improve over the decade.

With the advent of the Waterfront at Aloha Tower project, it is anticipated that the increased mixed-use activities in the area may require more security and nighttime surveillance. Within the development, this function will be provided through a private security service.

Fire

Fire protection services are available at the Central Fire Station, located at the intersection of Beretania and Fort Streets. Pier 15 houses the Honolulu Harbor Fireboat Station.

Medical and Emergency Services

Major medical facilities located near the project site are the Queen's Medical Center at the corner of Beretania and Punchbowl Streets, and Straub Clinic and Hospital, Inc. at King Street and Ward Avenue. Both facilities are located within one-half mile east of the project site. Emergency services are available at both medical facilities.

Schools

Primary and Secondary schools to service the project area are located in or near the Downtown area. Royal Elementary is located on Queen Emma Street, just makai of the H-1 freeway. Central Intermediate School is located on the block bounded by Pali Highway, Kukui Street, Queen Emma Street, and Vineyard Boulevard. McKinley High School is on the corner of King and Pensacola Streets, adjacent to the Neal Blaisdell Center.

Recreation

Within the boundaries of the Downtown Neighborhood Board, there is one neighborhood park (Kamamalu, on the corner of Vineyard Boulevard and Beretania Street), and one botanic garden (Foster Gardens, on the corner of Nuuanu Avenue and Vineyard Boulevard). Urban parks and squares include Emma Square (just makai of St. Andrew Priory School), Kamalii Park (where Nuuanu Avenue meets Beretania Street), Union Street Mall, and Fort Street Mall. Within the boundaries of the Kalihi-Palama Neighborhood Board, just Ewa of River Street is Aala Triangle Park. Tamarind Square, occupying the corner of Bishop and King Streets, is privately maintained.

Amenities for active public recreational pursuits are available at Kamamalu Park. The Richards Street Y.W.C.A., and the Nuuanu Y.M.C.A. offer various recreational amentities to its members. Fishing off the waterfront piers is a common recreational pastime although subject to DOT-Harbors control to assure public safety and prevent interference with harbor operations. In recognition of the shortage of active recreational facilities, the developers intend to provide private recreational amenities, including a swimming pool and health club for hotel guests and office tenants at Piers 10 and 11, and similar amenities at Piers 13 and 14 for the condominium towers. Project related demand for active recreational opportunities which are not satisfied within the project site, however, may increase demand on public parks. Present access to fishing sites at Piers 5 and 6 may be restricted by the DOT-Harbors due to the construction of the proposed maritime facilities.

The Kewalo and Kakaako areas just east of Downtown offer numerous opportunities for fishing and surfing; Point Panic is very popular with body surfers. East of Kakaako and Kewalo Basin is Ala Moana Beach Park, a very popular recreational resource. Frequented daily by residents and visitors alike, the park offers surfing, swimming, picnicking, beach-going, volleyball and running activities.

Except for the Sand Island Recreation Area, the area west of Downtown offers minimal recreational opportunities due to its industrial nature.

With the conversion of Pier 12 and the parking lot at Irwin Park into parks, the Waterfront at Aloha Tower will add 109,097 square feet of park space within the project boundaries.

5. Displacement

Displacement of existing tenants at Piers 5 through 14 is an unavoidable impact, given the scope and magnitude of the proposed project. Some of the existing businesses currently located in the project area will be displaced as a result of uses proposed for the Waterfront at Aloha Tower.

Displacement may be either temporary or permanent. Some displaced businesses may move to a temporary site and return to the original site after improvements are completed. Permanent displacement will occur when the proposed use of a site precludes the current on-site use. A new tenant will be given preference for location on-site if the activity or operation involved is maritime-related.

The following tenants will be affected:

- Pier 5 - small cruise ships, parking

  The Webe Corporation Ltd.

- Pier 8 - cruise ships, diner, storage space, office space, public parking, marine operations, mobile fueling operations

  APCOA, Inc., Aloha Petroleum, Ltd., American Hawaii Cruises, Hung Yat Chan, Clean Islands Council, Ed Yamashiro, Inc., Garlow Petroleum Inc., GTE Hawaiian Telephone, Inc., Holiday Promotions, Inc., Marine Electrical Design, Mike Doyle, Ltd., National Cargo Bureau, Inc., Pacific TMR, Pacific Petroleum Services, U.S. Coast Guard, The Webe Corporation.

- Pier 9 - cruise ships, storage space, warehouse space, office space, harbor pilot operations, mobile fueling operations

  Aloha Petroleum, Ltd., American Hawaii Cruises, Caleb Brett (USA) Inc., Ed Yamashiro, Inc., Garlow Petroleum Inc., GTE Hawaiian Telephone, Inc., HPBS, Inc., Hawaii Maritime Center, Hawaii Stevedores, Inc., Jenkins, Leroy dba MWM Production Agency, Pacific TMR, Pacific Petroleum Services, Sea Engineering, Inc., TheoDavies Marine Agencies, Waldron Steamship Co., Ltd., Pacific Resources Terminals, Inc.

- Pier 10 - custom brokerage, office space, customs office, gift & sundry concession, storage space,mobile fueling operations

  Aloha Camera & Gift Shops, Inc., Aloha Petroleum, Inc., Ed Yamashiro,Inc., Garlow Petroleum Inc., GTE Hawaiian Telephone, Inc., Hawaii Stevedores, Inc., S. G. Lam, Pacific TMR, Pacific Petroleum Services, U.S. Bureau of Customs, Pacific Resources Terminals, Inc.

- Pier 11 - office space, ship agency, storage space, marine surveying operations, customhouse brokers, DOT offices, marine & industrial photography, parking, mobile fueling operations

Aloha Petroleum, Ltd., American Global Line, Inc., Ed Yamashiro, Inc., Garlow Petroleum Inc., Internal Office Department c/o Hawaii Pacific Maritime, Mike Doyle, Ltd., Pacific TMR, Pacific Petroleum Services, S. De Freest & Co., Inc., State Department of Transportation, TheoDavies Marine Agencies, Matt Williams dba Williams Photography, Pacific Resources Terminals Inc.

- Pier 12 - parking, Hokulea emergency tie-up space and mobile fueling operations

  Aloha Petroleum, Ltd., Ed Yamashiro, Inc., Garlow Petroleum Inc., Pacific-TMR, Pacific Petroleum Services, John G. Savio dba Nahoku Catamaran, Pacific Resources Terminals, Inc.

- Piers 13/14 - tugs, parking, barges, bunker fuel, mobile fueling operations, ice dispensing

  Aloha Petroleum, Ltd., American Divers, Inc., American Workboats, Inc., Ed Yamashiro, Inc., Garlow Petroleum Inc., Ocean Ice, Inc., Pacific Petroleum Services, Uaukewai Diving Salvage & Fishing, Inc., Pacific TMR, Pacific Resources Terminals, Inc.

All pier tenants listed, except the Webe Corporation, have Revocable Permits, which are month-to-month rental agreements and require only 30-day notice for termination. No revocation assistance or compensation is required for tenants on Revocable Permit status. DOT-Harbors will be scheduling periodic meetings with pier tenants once more definitive information on development plans and timetable are available. Tenants will be informed by DOT-Harbors of any impending plans at the earliest possible time and will be kept advised of the proposed project.

6. Community Impacts

Interviews with members of the community elicited issues of concern with regard to the project and to their neighborhood in general. Three neighborhood enclaves within the study area have different types of views and concerns with regard to the proposed development:

East Downtown

Redevelopment of the CBD is continuing at a rapid pace, with a number of major office and residential developments proposed or presently under construction. Despite the cumulative impacts resulting from the effects of multiple developments in the Downtown area, most residents located within the vicinity of the waterfront are in favor of the proposed project. Overall, the Waterfront at Aloha Tower is foreseen as helping to improve the overall character of Downtown.

Residents, through the Downtown Neighborhood Board, have expressed the need for greater, improved and active recreational facilities, particularly in the face of pending City housing projects in the CBD area. Parking also continues to be a significant concern. Issues have likewise been raised for developing the area with family, group, and community uses in mind, recognizing the growing commercial activity and need for waterfront improvements. Other issues include the growing residential population in a commercial environment, noise, resident safety and security, street people and the homeless, beautification, sanitation, traffic and parking.

Chinatown

Residents in older neighborhoods such as Chinatown are concerned with rehabilitation and redevelopment which may radically change their lives, particularly through higher rents and potential evictions. While the development around Downtown is likely to push the costs of housing upward, much of Chinatown's housing is subsidized by the City and County of Honolulu (Federally-funded Section 8 Housing Voucher Program and City Rental Assistance Program). Redevelopment in Chinatown, now and in the future, may displace low income tenants who have been living in dilapidated structures for many years. Nevertheless, Chinatown residents desire ongoing improvements, although not at the risk of massive social change. Chinatown property values, in general, are still lower than the cost for prime Downtown land. East Downtown has always been more expensive and Chinatown merchants claim that climbing rents are now a problem for those who previously sought space in Chinatown because it was reasonably priced.

Nevertheless, both Chinatown and Downtown community leaders foresee the Waterfront project providing opportunities for their area. Currently, Chinatown is not a popular tourist destination; most tour buses stop at the merchants' shops for only a very short time. With the retail emphasis associated with the Waterfront at Aloha Tower, more tourists are likely to visit, stay longer and shop in Chinatown as well as the rest of Downtown.

There is a need to improve traffic circulation patterns and parking capacities. Chinatown leaders favor the Honolulu Rapid Transit System as a means to ease the flow of people and parking problems. There also exists a shortage of uses designed to attract people to the area in the evenings and on weekends. As more residents move into the Downtown area, however, evening activities are likely to increase. Economic productivity in Chinatown, with the addition of the Waterfront at Aloha Tower, may depend on the ease of pedestrian flow between the waterfront and Chinatown. As Nimitz Highway poses as a barrier between the two areas, residents from the Waterfront at Aloha Tower may be impeded from venturing into Chinatown.

Kukui

Kukui is a relatively stable neighborhood lying mostly within the boundaries of the Kalihi-Palama Neighborhood Board. More concern has been expressed about potential evictions of the Keehi Lagoon boat people than with the proposed Waterfront at Aloha Tower project. Some Neighborhood Board members see the Waterfront at Aloha Tower project luring more Kalihi-Palama residents into the Downtown area for shopping and entertainment.

G. Short-Term Use Versus Long-Term Productivity

1. Short-Term Uses

In the short-term, the project will confer some positive benefits in the local area. Direct economic benefits will result from construction expenditures both through the purchase of material from local suppliers and through the employment of local labor. Indirect economic impacts may include benefits to local downtown retail businesses resulting from construction activities.

2. Long-Term Productivity

The development will result in a long-term commitment of land for the uses described in the plan. Once in a higher density use, it is unlikely that the land will be reverted to a lower usage in the foreseeable future.

Also in the long-term, the project will result in the increased availability of hotel rooms in the CBD; greater public access to the harbor; additional open space for the CBD; and additional office and commercial space for private businesses. The revenues generated by the property will increase and result in higher tax revenue for the State. The ground lease rents to the State will represent a substantial increase over current income from these sources. One identifiable trade-off of the Waterfront at Aloha Tower development involves the displacement of a few existing businesses in return for higher density commercial development in a more pleasing setting. The proposed action is expected to enhance the long-term vitality of this presently under-utilized urban site by upgrading the infrastructure necessary for redevelopment and by providing additional public improvements and amenities.

H. Irreversible and Irretrievable Commitment of Resources

Construction and operation of the proposed project would involve the irretrievable commitment of certain natural and fiscal resources. Major resource commitments include land, money, construction materials, manpower, and energy. The impacts of using these resources should, however, be weighed against the economic benefits to the residents of the State, and the consequences resulting from taking no action.

Land committed to this project is already urbanized; therefore, the proposed action represents an intensified use of existing land resources rather than a commitment of any new resources. Extensions at Piers 5 and 6, however, represent a marginal encroachment on marine habitats, although the proposed construction on piles will minimize habitat loss. The capital committed to the construction of the project will be irrevocably committed by private sources. Although this commitment is large, implementation of the proposed project will result in substantial economic benefits.

The commitment of resources required to accomplish the project includes labor and materials, which are mostly unrenewable and irretrievable. Benefits will accrue to the State's construction industry. Operation of the project will also include the irretrievable consumption of potable water and petroleum-generated electricity.

I. Alternatives to the Proposed Project

The no-action alternative would preserve the status quo, and the economic and social benefits of the proposed Waterfront at Aloha Tower development would not be realized. As a consequence, the ATDC would not be able to fulfill its mandate for which it was formed.

Alternative developments to the proposed Waterfront at Aloha Tower were duly considered by the ATDC in its proceedings to select the developer. Notably, the Waterfront at Aloha Tower proposes the least density and the greatest economic returns to the State of the development proposals that were considered in the most recent developer selection proceedings.

CHAPTER VII
CONSULTATION

VII. AGENCIES, ORGANIZATIONS AND INDIVIDUALS CONSULTED DURING EIS PREPARATION NOTICE PHASE

The following agencies, organizations and individuals were consulted in the preparation of the Draft Environmental Impact Statement.

FEDERAL

Army-DAFE (Facilities Eng.-USASCH)
Environmental Protection Agency
U.S. Army Corp of Engineers
U.S. Coast Guard
U.S. Fish and Wildlife Service
U.S. Geological Survey
National Park Service
National Marine Fisheries Service
Federal Aviation Administration
U.S. Immigration & Naturalization Service
U.S. Bureau of Customs

STATE AGENCIES

Department of Agriculture
Department of Accounting & General Services
Department of Defense
Department of Education
Department of Hawaiian Home Lands
Department of Health
Department of Land & Natural Resources
DLNR Aquatics Resources Division
DLNR Office of Environmental & Conservation Affairs
DLNR State Historic Preservation Officer
Department of Business and Economic Development
DBED Library
Housing Finance & Development Corporation
Department of Transportation
DOT, Harbors Division
DOT, Highways Division
DOT, Airports Division
State Archives
State Energy Office
Office of State Planning
OSP, Coastal Zone Management

Hawaii Community Development Authority
Office of Hawaiian Affairs

CITY AND COUNTY OF HONOLULU

Board of Water Supply
Building Department
Department of Housing and Community Development
Department of General Planning
Department of Land Utilization
Department of Parks and Recreation
Department of Public Works
Department of Transportation Services
Fire Department
Police Department

UNIVERSITY OF HAWAII

Environmental Center - 4 copies
Marine Programs (Sea Grant)
Water Resources Research Center

MEDIA

Honolulu Star-Bulletin
Honolulu Advertiser
Pacific Business News
Downtown Planet

ELECTED OFFICIALS

Council Chair Arnold Morgado Jr.
Councilman Gary Gill
State Representative Mike Liu (District 34)
State Representative Kenneth Hiraki (District 35)
Senator Milton Holt (18th District)

LIBRARIES

University of Hawaii Hamilton Library, Hawaiian Collection
Legislative Reference Bureau
State Main Library

OTHERS

Downtown Neighborhood Board, No. 13
Chinese Chamber of Commerce of Hawaii
Eight Bells (Sea Grant)
Hawaii (Harbor) Pilots Association
Hawaii Maritime Center
American Hawaii Cruises
Davies Marine Agencies, Ltd.
Hawaii Pacific Maritime, Inc.
American Workboats, Inc.
Downtown Improvement Association
Outdoor Circle
Historic Hawaii Foundation/Main Street
International Longshoremen Workers Union
Robert Crone, Architect
American Institute of Architects
American Planning Association
American Lung Association
Hawaiian Electric Company
Hawaiian Telephone Company

The following is a list of agencies, organizations and individuals who responded (*) and provided substantive comments (**) on the EIS Preparation Notice.

FEDERAL

- ** U.S. Army Corp of Engineers
- * U.S. Fish and Wildlife Service
- * U.S. Geological Survey
- ** Federal Aviation Administration

STATE AGENCIES

- * Department of Accounting & General Services
- * Department of Defense
- * Department of Education
- ** Department of Health
- ** DLNR Historic Preservation Officer
- ** Department of Land & Natural Resources
- ** Department of Business & Economic Development
- * Housing Finance & Development Corporation
- ** Department of Transportation
- ** DOT, Airports Division
- ** Office of State Planning
- ** Hawaii Community Development Authority

CITY AND COUNTY OF HONOLULU

- ** Board of Water Supply
- * Building Department
- ** Department of Housing and Community Development
- ** Department of General Planning
- * Department of Land Utilization
- ** Department of Parks and Recreation
- ** Department of Public Works
- ** Department of Transportation Services
- * Fire Department
- ** Police Department

OTHERS

*	Downtown Neighborhood Board, No. 13
**	Hawaii (Harbor) Pilots Association
**	Outdoor Circle
**	Historic Hawaii Foundation/Main Street
*	Robert Crone, Architect
**	American Institute of Architects
**	Hawaiian Electric Company

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

REPLY TO ATTENTION OF

July 5, 1990

Planning Division

ALOHA TOWER DEVELOPMENT CORP.
JUL 6 1 05 PM '90

Mr. Randall Y. Iwase, Executive Officer
Aloha Tower Development Corporation
33 South King Street, Suite 403
Honolulu, Hawaii 96813

Dear Mr. Iwase:

Thank you for the opportunity to review the Environmental Impact Statement Preparation Notice (EISPN) for the Waterfront at Aloha Tower project. The following comments are offered:

a. A Department of the Army permit is required for all alterations and improvements within the waters of Honolulu Harbor. Alteration of the federal project line (FPL), if determined by the U.S. Army Corps of Engineers (with industry input) to be feasible, will require authorization from the Chief of Engineers, or Congressional approval.

b. Better maps are needed to more precisely show the project structures in relation to the FPL. For example, Figure 4 shows the project features only in general outline. The detail of Figure 3 is much better, but there the FPL is not included.

c. In the map scale of Figure 4, it appears that "1000" should be corrected to "500"; also, the FPL segment between Piers 4 and 8 is not as close to the Sand Island portion of the FPL as shown. Scales of other figures should also be checked for accuracy.

d. The project sites are in Zone X, "Other Areas" determined to be outside of the 500-year flood plain as

determined by the Federal Emergency Management Agency (preliminary flood insurance rate map dated September 22, 1989).

Sincerely,

Kisuk Cheung
Director of Engineering

ALOHA TOWER DEVELOPMENT CORPORATION

John Waihee
Governor

Roger A. Ulveling
Chairman

Randall Y. Iwase
Executive Officer

33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

July 27, 1990

Mr. Kisuk Cheung, Director of Engineering
U.S. Army Engineer District, Planning Division
Building 230
Fort Shafter, Hawaii 96858-5440

SUBJECT: The Waterfront at Aloha Tower
Environmental Impact Statement Preparation Notice
(EISPN)

Dear Mr. Cheung:

Thank you for your comments on the subject EISPN. We offer the following responses, in respective order, to your comments:

a. We look forward to working with your competent staff who have provided the project developer with much assistance in the scoping phase of applying for the Department of the Army Permit. We also appreciate your clarification regarding alteration of the Federal Project Line and will include it in our Draft Environmental Impact Statement (EIS).

b. Survey maps of the proposed project site in relation to the Federal Project Line and other boundaries have recently been prepared to precisely establish geographical relationships. These will be made available for your review. The figures in the EIS are provided only for illustrative purposes.

c. The approximate scales of the maps have been corrected in the Draft EIS.

d. A discussion of the flood zone shall be included in the Draft EIS.

We hope that we have satisfactorily responded to your comments. If you have any further questions, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

for Randall Iwase
Executive Officer

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

United States Department of the Interior
FISH AND WILDLIFE SERVICE
PACIFIC ISLANDS OFFICE
P.O. BOX 50187
HONOLULU, HAWAII 96850

JUN 1 1990

ALOHA TOWER
DEVELOPMENT CORP.
JUN 15 9 29 AM '90

Mr. Randall Y. Iwase
Executive Officer
Aloha Tower Development Corporation
33 South King Street
Suite 403
Honolulu, Hawaii 96813

Re: Environmental Impact Statement Preparation Notice
The Waterfront at Aloha Tower

Dear Mr. Iwase:

Due to current staff limitations, the Pacific Islands Office, Fish and Wildlife Enhancement cannot devote the time to adequately evaluate potential impacts to important fish and wildlife resources from the proposed project. Please understand that this notification does not represent the Fish and Wildlife Service's approval of the proposed activity. We may review future actions related to this project should workload constraints be alleviated, or if significant adverse impacts to trustee fish and wildlife resources are identified.

Sincerely yours,

Ernest Kosaka

Ernest Kosaka
Field Supervisor
Fish and Wildlife Enhancement

John Waihee
Governor

Roger A. Ulveling
Chairman

Randall Y. Iwase
Executive Officer

ALOHA TOWER DEVELOPMENT CORPORATION

33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

July 27, 1990

Mr. Ernest Kosaka, Field Supervisor
Fish and Wildlife Enhancement
Fish and Wildlife Service
Pacific Islands Office
U.S. Department of the Interior
P.O. Box 50187
Honolulu, Hawaii 96850

SUBJECT: The Waterfront at Aloha Tower
Environmental Impact Statement Preparation Notice
(EISPN)

Dear Mr. Kosaka:

We are sorry to learn of your current staff limitations. Agency comments on environmental disclosure documents help to establish the informational basis for subsequent permit and approval procedures. Thus, early identification of relevant concerns is important to us in order to avoid costly delays as the project proceeds through the regulatory process.

We hope that your agency will be able to review the Draft EIS for this project. If you have any further questions, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

for Randall Iwase
Executive Officer

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

United States Department of the Interior

GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
677 Ala Moana Boulevard, Suite 415
Honolulu, Hawaii 96813

ALOHA TOWER DEVELOPMENT CORP.
Jun 22 9 09 AM '90

June 19, 1990

Randall Y. Iwase
Executive Officer
Aloha Tower Development Corporation
33 South King Street, Suite 403
Honolulu, Hawaii 96813

Dear Mr. Iwase:

Subject: Environmental Impact Statement Preparation Notice
The Waterfront at Aloha Tower

We have reviewed the subject preparation notice and have no comments to make at this time.

We appreciate the opportunity to review the document.

Sincerely,

William Meyer
District Chief

ALOHA TOWER DEVELOPMENT CORPORATION

John Waihee, Governor
Roger A. Ulveling, Chairman
Randall Y. Iwase, Executive Officer

33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

July 27, 1990

Mr. William Meyer, District Chief
Water Resources Division
Geological Survey
U.S. Department of the Interior
677 Ala Moana Boulevard, Suite 415
Honolulu, Hawaii 96813

SUBJECT: The Waterfront at Aloha Tower
Environmental Impact Statement Preparation Notice
(EISPN)

Dear Mr. Meyer:

Thank you for responding to the subject EISPN. We shall continue to seek your review and comments as a consulted party during the public review procedures for the Draft EIS.

If you have any questions regarding the EIS, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

Randall Iwase
Executive Officer

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

US Department of Transportation
Federal Aviation Administration

AIRPORTS DISTRICT OFFICE
BOX 50244
HONOLULU, HI 96850-0001
Telephone: (808) 541-1243

July 6, 1990

ALOHA TOWER DEVELOPMENT CORP.
JUL 9 7 52 AM '90

Mr. Randall Y. Iwase
Executive Officer
Aloha Tower Development Corporation
33 South King Street, Suite 403
Honolulu, Hawaii 96813

We have reviewed the Environmental Impact Statement Preparation Notice for the Waterfront at Aloha Tower.

Our only comment concerns the heights of the condominium towers and office tower noted on page II-4. These buildings would penetrate the 50:1 approach surface to Runway 26L at Honolulu International Airport. These buildings, plus the other proposed development, will require the submittal of a Notice of Proposed Construction or Alteration, FAA Form 7460-1. We also note that the heights noted on page II-4 do not agree with those given on pages II-9 and II-10.

We appreciate the opportunity to review this EIS Preparation Notice. If you have any questions regarding our comment, please call us.

Sincerely,

David J. Welhouse

David J. Welhouse
Airport Engineer/Planner

Henry A. Sumida
Airports District Office Manager

cc:
Wilson Okamoto & Associates

ALOHA TOWER DEVELOPMENT CORPORATION

John Waihee
Governor

Roger A. Ulveling
Chairman

Randall Y. Iwase
Executive Officer

33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

July 27, 1990

Mr. David Welhouse, Airport Engineer/Planner
Airports District Office
Federal Aviation Administration
P.O. Box 50244
Honolulu, Hawaii 96850-0001

SUBJECT: The Waterfront at Aloha Tower
Environmental Impact Statement Preparation Notice
(EISPN)

Dear Mr. Welhouse:

Thank you for your comments on the subject EISPN. We have submitted the Notice of Proposed Construction (FAA Form 7460-1) for the office and condominium towers to the FAA Airspace and Procedures Branch.

The discrepancy in building heights you noted was an oversight that has been corrected in the Draft EIS. We appreciate your calling our attention to it.

We hope that we have satisfactorily responded to your comments. If you have any further questions, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

for Randall Iwase
Executive Officer

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
DIVISION OF PUBLIC WORKS

(P)1468.0

ALOHA TOWER DEVELOPMENT CORP.
JUN 20 9 33 AM '90

JUN 18 1990

Mr. Randall Y. Iwase
Executive Officer
Aloha Tower Development Corporation
33 South King Street, Suite 403
Honolulu, Hawaii 96813

Dear Mr. Iwase:

Subject: The Waterfront at Aloha Tower
EIS Preparation Notice

Thank you for the opportunity to review the subject document. We have no plans to be a consulted party.

Should there be any questions, please contact Mr. Cedric Takamoto of the Planning Branch at 548-7192.

Very truly yours,

TEUANE TOMINAGA
State Public Works Engineer

CT:jnt

ALOHA TOWER DEVELOPMENT CORPORATION
33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

John Waihee
Governor
Roger A. Ulveling
Chairman
Randall Y. Iwase
Executive Officer

July 27, 1990

Mr. Teuane Tominaga,
State Public Works Engineer
Division of Public Works
Department of Accounting and General Services
State of Hawaii
P.O. Box 119
Honolulu, Hawaii 96810

SUBJECT: The Waterfront at Aloha Tower
Environmental Impact Statement Preparation Notice
(EISPN) [(P)1468.0]

Dear Mr. Tominaga:

Thank you for responding to the subject EISPN. In deference to your plan not to be a consulted party, we shall seek no further review or comments on the Draft EIS.

If you have any questions regarding the EIS, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

for Randall Iwase
Executive Officer

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

STATE OF HAWAII
DEPARTMENT OF DEFENSE
OFFICE OF THE ADJUTANT GENERAL

JUN 15 1990

Engineering Office

ALOHA TOWER DEVELOPMENT CORP.
JUN 20 9 33 AM '90

Mr. Randall Y. Iwase
Executive Officer
Aloha Tower Development Corporation
33 South King Street, Suite 403
Honolulu, Hawaii 96813

Dear Mr. Iwase:

Environmental Impact Statement Preparation Notice
The Waterfront at Aloha Tower

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

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

Sincerely,

Alexis T. Lum
Major General, Hawaii
Army National Guard
Adjutant General

cc: Wilson Okamoto and Associates
Aloha Tower Associates

NATIONAL GUARD
Americans At Their Best.

ALOHA TOWER DEVELOPMENT CORPORATION
33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

John Waihee
Governor

Roger A. Ulveling
Chairman

Randall Y. Iwase
Executive Officer

July 27, 1990

Major General Alexis T. Lum, Adjutant General
Hawaii Army National Guard
Department of Defense
3949 Diamond Head Road
Honolulu, Hawaii 96816-4495

SUBJECT: The Waterfront at Aloha Tower
Environmental Impact Statement Preparation Notice
(EISPN)

Dear Major General Lum:

Thank you for responding to the subject EISPN. We shall continue to seek your review and comments as a consulted party during the public review procedures for the Draft EIS.

If you have any questions regarding the EIS, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

Randall Iwase
Executive Officer

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

STATE OF HAWAII
DEPARTMENT OF EDUCATION
P. O. BOX 2360
HONOLULU, HAWAII 96804

OFFICE OF THE SUPERINTENDENT

June 18, 1990

ALOHA TOWER
DEVELOPMENT CORP.
Jun 28 9 09 AM '90

Mr. Randall Y. Iwase
Executive Director
Aloha Tower Development Corporation
33 South King Street, Suite 403
Honolulu, Hawaii 96813

Dear Mr. Iwase:

Subject: Environmental Impact Statement Preparation Notice
The Waterfront at Aloha Tower
Honolulu, Hawaii

Our review of the subject preparation notice indicates the project will have negligible impact on the schools in the area.

Thank you for the opportunity to comment.

Sincerely,

Charles T. Toguchi

Charles T. Toguchi
Superintendent

CTT:sy

cc: E. Imai
H. Oda

AN AFFIRMATIVE ACTION AND EQUAL OPPORTUNITY EMPLOYER

ALOHA TOWER DEVELOPMENT CORPORATION

John Waihee
Governor
Roger A. Ulveling
Chairman
Randall Y. Iwase
Executive Officer

33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

July 27, 1990

The Honorable Charles T. Toguchi, Superintendent
Department of Education
P.O. Box 2360
Honolulu, Hawaii 96804

SUBJECT: The Waterfront at Aloha Tower
Environmental Impact Statement Preparation Notice
(EISPN)

Dear Mr. Toguchi:

Thank you for responding to the subject EISPN. We shall continue to seek your review and comments as a consulted party during the public review procedures for the Draft EIS.

If you have any questions regarding the EIS, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

for Randall Iwase
Executive Officer

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

JOHN WAIHEE
GOVERNOR OF HAWAII

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

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

In reply, please refer to:
EPHSD

086

July 9, 1990

ALOHA TOWER
DEVELOPM'NT CORP.
JUL 12 9 29 AM '90

Mr. Randall Y. Iwase, Executive Officer
Aloha Tower Development Corporation
33 South King Street, Suite 403
Honolulu, Hawaii 96813

Dear Mr. Iwase:

Subject: Environmental Impact Statement Preparation Notice
The Waterfront at Aloha Tower
Pier 5 through 14 Excluding Portions of Pier 7
TMK: 1-7-01, 2-1-01, 2-1-13, 2-1-15, 2-1-27

The State Department of Health has reviewed the subject project preparation notice. At this time, the details of wastewater treatment and disposal from the site is incomplete. After consultation with the City and County Wastewater Management Division, it has been determined that Pier 5, 6, 7, and 8 are connected to the Ala Moana Boulevard sewer line, Pier 9 has a manhole connection, Pier 10 is connected to the Fort Street sewer line, Pier 11 has an onsite system and connection to the Fort Street sewer line, Pier 12 is sewered to the Harbor Division, and Pier 13 and 14 are connected to the Nimitz sewer line at Smith Street and Nuuanu Street.

All wastewater generated by the proposed subject project must be conveyed to the City and County sewer system. No other means of sewage disposal will be allowed. The Department of Health reserves the right to review the detailed wastewater plans for conformance to applicable rules.

If you have any questions, please contact the Wastewater Branch at 543-8294.

Sincerely,

BRUCE S. ANDERSON, PH.D.
Deputy Director for
Environmental Health0

cc: Chief, Wastewater Branch

ALOHA TOWER DEVELOPMENT CORPORATION

33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

John Waihee
Governor

Roger A. Ulveling
Chairman

Randall Y. Iwase
Executive Officer

July 27, 1990

Dr. Bruce Anderson, Deputy Director
for Environmental Health
Department of Health
State of Hawaii
P.O. Box 3378
Honolulu, Hawaii 96801

SUBJECT: The Waterfront at Aloha Tower
Environmental Impact Statement Preparation Notice
(EISPN) [086]

Dear Dr. Anderson:

Thank you for your comments on the subject EISPN.

The design considerations for disposal of wastewater from the Waterfront at Aloha Tower development are being discussed with the City and County Wastewater Management Division. Some of the major considerations in this regard shall be presented in the Draft EIS. Please be assured that all sewage from the project will be disposed of through the City and County sewer system.

We hope that we have satisfactorily responded to your comments. If you have any further questions, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

Randall Iwase
Executive Officer

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

JOHN WAIHEE
GOVERNOR OF HAWAII

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

WILLIAM W. PATY, CHAIRPERSON

REF:HP-AL

JUN 11 1990

Mr. Randall Y. Iwase, Executive Officer
Aloha Tower Development Corporation
33 South King Street, Suite 403
Honolulu, Hawaii 96813

ALOHA TOWER DEVELOPMENT CORP
JUL 13 10 35 AM '90

Dear Mr. Iwase: Paty

SUBJECT: **ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE WATERFRONT AT ALOHA TOWER**

Thank you for providing our office with a copy of the Environmental Impact Statement Preparation Notice for the Waterfront at Aloha Tower. Our office offers the following comments:

1. Figure 5 would be more enlightening if the Harbor Centre Hotel and Office Complex was included in the elevation. This would allow people to better comprehend the relationship between this highrise tower and Aloha Tower.
2. The pedestrian overpass crossing Nimitz Highway mentioned on Page II-9 is not included in Figure 3.
3. Under the discussion of historic sites, no mention was made of the piers within the project area and their historic significance. The histories of each of the piers effected by the project should be included. The following limited information is from our files: the wharves of Piers 8-9 and 10 were completed in 1918, and were the first to be constructed of precast concrete pillars. Pier 11, the makai extension of Pier 10, was completed in 1927, in time for the arrival of the Malolo's maiden voyage. For several decades it served as a festive location on "boat days", and its tile roofed, segmental arched gallery is a distinctive design element on the Honolulu waterfront.

We look forward to reviewing the historical assessment and its mitigating actions, and we request that your consultant coordinate with our Historic Preservation Office early in the development of this assessment. We are especially concerned with the design of this project and its potential for long term impacts on the historic sites within and adjacent to the project area.

Very truly yours,

Bill

WILLIAM W. PATY
Chairperson and State
Historic Preservation Officer

ALOHA TOWER DEVELOPMENT CORPORATION
33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

John Waihee
Governor
Roger A. Ulveling
Chairman
Randall Y. Iwase
Executive Officer

July 27, 1990

The Honorable William W. Paty,
Chairperson and State
Historic Preservation Officer
Director of Land and Natural Resources
P.O. Box 621
Honolulu, Hawaii 96809

SUBJECT: The Waterfront at Aloha Tower
Environmental Impact Statement Preparation Notice
(EISPN) (REF:HP-AL)

Dear Mr. Paty:

Thank you for your comments on the subject EISPN. We offer the following responses, in respective order, to your comments:

1. A view plane analysis of the high-rise towers in relation to the Downtown structures will be included in the Draft EIS.

2. The pedestrian overpass was inadvertently omitted from figure 3. This figure has been revised for the Draft EIS.

3. We appreciate the additional information regarding Piers 8 through 11. It shall be incorporated in the Draft EIS.

The developer's historical consultant has assured us that your office will be consulted in the preparation of the historical assessment. We share your concern regarding impacts of the development on historical resources. In this regard, we recognize and appreciate the developer's effort to integrate and highlight the historical features of the site in the proposed development.

If you have any further questions regarding the EIS, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Sincerely,

Randall Iwase
Executive Officer

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

JOHN WAIHEE
GOVERNOR OF HAWAII

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

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

DEPUTIES
KEITH W. AHUE
MANABU TAGOMORI
RUSSELL N. FUKUMOTO

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

REF:OCEA-CT

AUG 2 1990

File: 90-784
Doc.: 8697E

ALOHA TOWER DEVELOPMENT CORP.
AUG 6 8 48 AM '90

Mr. Randall Y. Iwase, Executive Officer
Aloha Tower Development Corporation
33 South King Street, Suite 403
Honolulu, Hawaii 96813

Dear Mr. Iwase:

Subject: Environmental Impact Statement Preparation Notice the Waterfront at Aloha Tower

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

In order to adequately evaluate the project from an aquatic resources standpoint, the forthcoming EIS should address the impacts of construction activities on the water quality, marine life and fisheries of Honolulu Harbor and adjacent nearshore waters. Since Honolulu Harbor is one of several primary sources of baitfish for the Hawaiian skipjack tuna industry, particular attention should be given to potential impacts on the nehu fishery in the harbor. Project impacts on the recreational fisheries should also be assessed.

Additionally, as noted on page V-22 of the EISPN, portions of the proposed project may involve the use of submerged lands within the Conservation District. Approval by this Department will be required prior to any work conducted within the Conservation District to ensure compliance with Executive Order No. 1793.

If you have any questions, please call me or Cathy Tilton at our Office of Conservation and Environmental Affairs at 548-7837.

Very truly yours,

Keith W. Ahue
for WILLIAM W. PATY

cc: HPP, LM

ALOHA TOWER DEVELOPMENT CORPORATION

John Waihee
Governor

Roger A. Ulveling
Chairman

Randall Y. Iwase
Executive Officer

33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

November 30, 1990

The Honorable William W. Paty
Department of Land and Natural Resources
P. O. Box 621
Honolulu, Hawaii 96809

SUBJECT: The Waterfront at Aloha Tower
Environmental Impact Statement Preparation Notice (EISPN)

Dear Mr. Paty:

Thank you for your comments on the Draft EIS. Although your letter was not received in time for inclusion in the Draft EIS, we hope that your comments have been addressed within that document, as discussed below:

1. A marine environmental assessment has been prepared for the Draft EIS and is reproduced as an appendix in that document. The assessment addresses potential construction impacts as well as long-term impacts of the development on water quality and marine life, including commercial and recreational fisheries, in Honolulu Harbor. The Draft EIS has been sent to you for review and comment.

2. The requirements for approval by your Department of uses in the State Conservation District is discussed in the Draft EIS.

Your comments as well as this response will be included in the Final EIS. If you have any questions regarding the EIS contents or process, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

Daniel Orodenker
Executive Assistant

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

DEPARTMENT OF BUSINESS
AND ECONOMIC DEVELOPMENT

ENERGY DIVISION 335 MERCHANT ST. RM. 110 HONOLULU, HAWAII 96813 FAX (808) 531-5243

90:822e

June 22, 1990

ALOHA TOWER
DEVELOPMENT CORP.

JUN 27 8 14 AM '90

Mr. Randall Y. Iwase
Executive Officer
Aloha Tower Development Corp.
33 South King Street, Suite 403
Honolulu, Hawaii 96813

Dear Mr. Iwase:

Subject: Environmental Impact Statement Preparation Notice
(EISPN) for the Waterfront at Aloha Tower

The Energy Division has received the above EISPN and has the following comments:

We note that in Section V, neither the State's energy goals, objectives, policies, and priority guidelines as set out in the Hawaii State Plan, nor the State Energy Functional Plan are mentioned. Also, in Section VI, energy impacts that will result from this project are not mentioned.

We recommend that the Draft Environmental Impact Statement (DEIS) examine the Waterfront at Aloha Tower for consistency with the energy provisions of the Hawaii State Plan and with the State Energy Functional Plan. The DEIS should explain in some detail the energy impacts of the Waterfront at Aloha Tower, as well as the energy conservation design/technologies and renewable energy sources that will be used to help meet the project's energy requirements. The requirement for an evaluation of the project's energy impacts in the DEIS is spelled out in the enclosed excerpt from the OEQC Bulletin.

Also enclosed is a copy of a letter we received from DHM Inc., regarding our comments on a DEIS for the Waikiki Landmark. We recommend that specific language similar to that in the DHM letter be included in the DEIS for the Waterfront at Aloha Tower. In addition, we recommend separate metering where appropriate for the commercial units, since separate metering provides an incentive for energy conservation to the unit occupants.

Finally, we would like to recommend that the Aloha Tower Development Corporation consider the adoption of "energy efficiency design guidelines" for the Waterfront at Aloha Tower. Enclosed for your consideration are the Energy

Efficiency Design Guidelines that the Energy Division prepared for the Housing Finance and Development Corporation (HFDC). HFDC included the Guidelines as an Addendum in its Request for Proposals for Increments two and three of the Villages of Kapolei.

Thank you for the opportunity to provide comments.

Sincerely,

Maurice H. Kaya
Energy Program Administrator

MHK/PE:do
Enclosures

465 SOUTH KING STREET · KEKUANAOA BUILDING, #104 · HONOLULU, HAWAII 96813 · TELEPHONE (808) 548-6915

OEQC BULLETIN

OFFICE OF ENVIRONMENTAL QUALITY CONTROL

JOHN WAIHEE
GOVERNOR

MARVIN T. MIURA, Ph.D.
DIRECTOR

Volume 5 | September 23, 1988 | Number 18

REGISTER OF CHAPTER 343, HRS DOCUMENTS

All Chapter 343, HRS documents submitted for publication in the OEQC Bulletin must be addressed to the Office of Environmental Quality Control, 465 South King Street, Room 104, Honolulu, Hawaii 96813. Documents addressed otherwise will not be considered for publication.

NEGATIVE DECLARATIONS

The following are Negative Declarations or determinations made by proposing or approving agencies that certain proposed actions will not have significant effects on the environment and therefore do not require EISs (EIS Rules 11-200-11). Publication in the Bulletin of a Negative Declaration initiates a 60-day period during which litigation measures may be instituted. Copies are available at 25 cents per page upon request to the Office. Parties wishing to comment may submit written comments to the agency responsible for the determination (indicated in project title). The Office would appreciate a copy of your comments.

KAUAI

GOLF COURSE AT HYATT REGENCY, POIPU, Ainako Resort Associates-Grove Farm Properties, Inc./County of Kauai Planning Commission

The applicant proposes to develop an 18-hole championship-calibre golf course and operate it in association with the planned 605-room Hyatt Regency Kauai at Keoneloa Bay. The proposed development will be maintained as a resort-oriented facility but will be opened to the public. It will be developed also to accommodate an increasing demand for golf play in Poipu and to make South Kauai more competitive with other visitor destination areas on the island.

The golf course will consist of 18 holes, a driving range, putting green, and clubhouse. The clubhouse will be located near the planned Hyatt Regency Kauai and will include parking and access from Poipu Road extension. The clubhouse will include a golf pro shop, restaurant, golf club storage room and golf cart maintenance area. Also proposed are a golf course maintenance building and temporary field nursery that will be located within the golf fairways away from the golf clubhouse.

NOTEWORTHY

NEWS FROM THE EPA

Rule Finalized for Premanufacture Notification Fees

The EPA Administrator signed a final rule requiring fees from manufacturers, importers, and processors who are seeking Agency review of premanufacture notices (PMNs) for new chemicals, exemption applications and significant new-use notices submitted under Section 5 of the Toxic Substances Control Act (TSCA). The rule will be published in the Federal Register within two weeks. Contact: TSCA Assistance Information Service (202) 554-1404.

Chemical Fact Sheets

EPA has distributed about 180 fact sheets prepared by the State of New Jersey on chemicals which must be reported under Section 313 of Title III (annual toxic chemcial release reports). EPA and New Jersey have committed to developing fact sheets on the remaining Section 313 chemicals by December 31, 1988. Each fact sheet contains a 2- to 5-page summary of relevant information on each chemical and was developed primarily for individuals working with chemicals, and also offers relevant and important information for general use. To obtain copies of the fact sheets, call the TSCA Information Assistance Service (202)554-1404.

Lead in Drinking Water

Safe Drinking Water Hotline's correct number: 1-800-426-4791 or (202)382-5533 in the Washington metropolitan area.

ENERGY IMPACTS

Draft Environmental Impact Statements should comply with the requirements found in State laws for evaluating any energy impacts that the project will have. The mandate for such an evaluation is found in Chapter 344, HRS ("State Environmental Policy") and Chapter 226, HRS ("Hawaii State Planning Act"). In particular, Chapter 226-18(a)(2) and (c)(3); 226-52(a)(2) and (b)(2)(D); and 226-103(f)(1) and (2) should be noted.

ENVIRONMENTAL COUCNIL MEETINGS

The Environmental Council is currently updating its list of individuals, organizations, and agencies that receive notices of its meetings. All those wishing to be kept on or added to the list are asked to submit their names and addresses to: Environmental Council, 465 S. King Street, Room 104, Honolulu, HI 96813.

JAN 1 ...

DHM inc.

Suite 2405
Honolulu, HI 96813
Ph. (808) 521-3555
Fax 808-433-3665

January 11, 1990

Mr. Maurice H. Kaya
Energy Program Administrator
Department of Business
and Economic Development
Energy Division
State of Hawaii
335 Merchant Street, Room 310
Honolulu, Hawaii 96813

Dear Mr. Kaya:

Subject: **Revised Draft Environmental Impact Statement for Waikiki Landmark**

Thank you for your letter commenting on the Revised Draft Environmental Impact Statement (Revised dEIS) for the Waikiki Landmark.

The proposed Waikiki Landmark Development has an estimated electrical energy consumption of 500,000 kwh/month or 1,428.6 kwh/day. The Waikiki Landmark development will incorporate the most recent energy saving technology so as to minimize the cost of energy to occupants of the commercial space and the residential units. The following features will be provided:

1) Each fan coil air conditioning unit in each unit will be separately controlled so that the occupant has the choice of cooling different areas in his/her unit at alternative times of the day.

2) A heat pump will be used to heat the building's hot water system. Studies have shown that this is the most efficient method of heating the hot water.

3) The condenser heat from the central chilled water system will be recovered by the heat pump to heat the building's hot water.

4) High efficiency motors will be used on most of the motor driven equipment.

5) High efficiency chillers will be used for the residential towers.

6) A variable speed secondary chilled water pumping system will be used for the residential fan coil units.

Electrical energy conservation measures which will be provided as part of the proposed development include:

1) Light sources to be used primarily are fluorescent and H.I.D. (High Pressure Sodium and Metal Halide). Compact fluorescent lamps will be used in place of incandescent lamps, with the exception of low-voltage accent lighting at water features, etc. A 13-watt compact fluorescent replaces a 60 watt incandescent with the same light output at a savings of 47 watts/lamp. This reduction in watts also lowers the air conditioning load.

2) Ballasts for all fluorescent lamps will be energy-saving type, or premium high power factor type for applications where energy-saving type are not manufactured. Energy-saving ballasts (ESB's) use 37 percent less energy than standard ballasts for the same light output. ESB's also run approximately 10 degrees cooler than standard ballasts, reducing the air conditioning load.

3) Reflectors for light fixtures are highly specular and contribute to overall fixture efficiency, enabling use of lower wattages and fewer fixtures to achieve desired lighting levels.

4) Secondary power factor correction is provided to bring the building power factor to 90 percent or greater.

Applicable sections of the State Plan's objectives, policies and guidelines for energy use and the State Energy Functional Plan will be examined and included in the Final EIS for the Waikiki Landmark.

Your comment letter is appreciated and will be included in the Final Environmental Impact Statement. If you should have any additional comments regarding these measures please feel free to contact me or Eric Parker of my staff.

Sincerely,

DHM inc.

Duk Hee Murabayashi (Mrs.)
President

cc: Dr. Marvin Miura, OEQC
Mr. Bennett Mark, DLU
Mr. Tony Tjan, Bel-Landmark, Inc.

DESIGN GUIDELINES - ADDENDUM NO. 1

ENERGY EFFICIENCY DESIGN GUIDELINES

To minimize the life cycle energy use and life cycle cost of the project while maintaining the project development objectives of cost effectiveness, health, safety, security and aesthetics, the following guidelines should be considered and, where applicable, incorporated into the project plans.

1.0 Site Planning and Landscaping

1.1 Orient streets to provide an east/west orientation for the long dimension of the houses to minimize heat gains in the morning and afternoon.

1.2 Incorporate pedestrian walkways and bikeways to encourage walking and bicycling between home, school, parks and commercial areas.

1.3 Select and place landscape materials on the site to provide shading to minimize heat gains in the morning and afternoon.

1.4 Minimize exterior paved surfaces that are not shaded by trees, awnings, trellises, roofing or house.

1.5 Provide for enclosed yard areas where clotheslines could be utilized.

1.6 Incorporate drip irrigation where appropriate, and automate irrigation system to conserve water.

1.7 Select drought-tolerant landscape materials, where appropriate to reduce the need for water and energy consumption associated with landscape maintenance.

2.0 Building Design

2.1 Use operable windows to allow cross ventilation in every room, and orient openings toward prevailing winds.

2.2 Utilize eaves (minimum 30"), louvers, trellises, or shade screen to shade windows, especially on west, south and east sides.

2.3 Ventilate attic with devices such as louvers at or near the roof ridge to reduce attic heat buildup and resultant heat transfer to living areas.

2.4 Install a radiant barrier (reflective foil-faced kraft paper material or similar product) in the attic to reduce heat gain into the house attic. Typically installed at the underside of the roof rafters or the top side of the ceiling joists per manufacturer's recommendations.

2.5 Use light colored finishes on roof and wall to reflect sunlight.

3.0 Mechanical Equipment and Systems

3.1 Consider use of heat pump waterheaters.

3.2 Consider use of solar waterheater or provide for future installation by pre-plumbing and running power and control wiring.

3.3 Utilize the most efficient refrigerators, clothes dryers, and dishwashers.

3.4 Install ceiling fans or provide for future installation.

3.5 Use time switches to cut off electricity when not needed to high-usage applications or equipment such as electric waterheater.

3.6 Install fluorescent lights with high efficiency ballasts.

3.7 Use low water consumption waterclosets.

3.8 Install flow restrictors on showers and other water uses which can have high flow rates.

ALOHA TOWER DEVELOPMENT CORPORATION

33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

John Waihee
Governor

Roger A. Ulveling
Chairman

Randall Y. Iwase
Executive Officer

July 27, 1990

Mr. Maurice Kaya,
Energy Program Administrator
Department of Business and Economic Development
State of Hawaii
335 Merchant Street, Room 110
Honolulu, Hawaii 96813

SUBJECT: The Waterfront at Aloha Tower
Environmental Impact Statement Preparation Notice
(EISPN) [90: 882e]

Dear Mr. Kaya:

Thank you for your comments on the subject EISPN. We offer the following responses, in respective order, to your comments:

1. We have included a discussion regarding the relationship of the project to the Hawaii State Plan and the Energy Functional Plan. In addition, we mention the impacts of additional electrical consumption as a result of the project on marginal increases in air pollution produced by petroleum fueled generators. Electrical consumption requirements for the project have yet to be determined.

2. The developer has an economic interest in efficient energy usage. While the project designers feel that the types of measures listed for the Waikiki Landmark will be appropriate for the Waterfront at Aloha Tower development, the specific requirements for the project have yet to be determined. The "Energy Efficiency Design Guidelines," have been forwarded to the project designers for their consideration.

We hope that we have satisfactorily responded to your comments. If you have any further questions, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

for Randall Iwase
Executive Officer

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

STATE OF HAWAII

DEPARTMENT OF BUDGET AND FINANCE
HOUSING FINANCE AND DEVELOPMENT CORPORATION
SEVEN WATERFRONT PLAZA, SUITE 300
500 ALA MOANA BOULEVARD
HONOLULU, HAWAII 96813

90:PLNG/2998 jt

July 2, 1990

ALOHA TOWER DEVELOPMENT CORP.
JUL 3 9 32 AM '90

Mr. Randall Y. Iwase
Executive Director
Aloha Tower Development Corporation
33 South King Street, Suite 403
Honolulu, Hawaii 96813

Dear Mr. Iwase:

Re: Environmental Impact Statement Preparation Notice (EISPN) for the Waterfront at Aloha Tower

Thank you for the opportunity to review the subject EISPN.

We are very interested in the proposed creation of The Aloha Tower Housing Foundation, the purpose of which is to assist in providing affordable housing. We would appreciate obtaining more information, including the basis for establishing funding at five percent of pre-tax profits.

Sincerely,

JOSEPH K. CONANT
Executive Director

JT:eks

ALOHA TOWER DEVELOPMENT CORPORATION

John Waihee, Governor
Roger A. Ulveling, Chairman
Randall Y. Iwase, Executive Officer

33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

July 27, 1990

The Honorable Joseph Conant, Executive Director
Housing Finance and Development Corporation
Department of Budget and Finance
Seven Waterfront Plaza, Suite 300
500 Ala Moana Boulevard
Honolulu, Hawaii 96813

SUBJECT: The Waterfront at Aloha Tower
Environmental Impact Statement Preparation Notice (EISPN) [90:PLNG/2998 jt]

Dear Mr. Conant:

Thank you for your comments on the subject EISPN.

We will be glad to provide you with the information requested. Please contact Ms. Alex Wade of Aloha Tower Associates at 532-1500.

If you have any further questions regarding the EIS for the project, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

Randall Y. Iwase
Executive Officer

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

JOHN WAIHEE
GOVERNOR

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

EDWARD Y. HIRATA
DIRECTOR

DEPUTY DIRECTORS
DAN T. KOCHI (PRIMARY)
RONALD N. HIRANO
JEANNE K. SCHULTZ
CALVIN M. TSUDA

IN REPLY REFER TO:

July 11, 1990

HAR-EP 5227.91

ALOHA TOWER
DEVELOPMENT CORP.
JUL 13 10 35 AM '90

Mr. Randall Y. Iwase, Executive Officer
Aloha Tower Development Corporation
33 South King Street, Suite 403
Honolulu, Hawaii 96813

Dear Mr. Iwase:

Subject: Environmental Impact Statement Preparation Notice The Waterfront at Aloha Tower

We have reviewed the EIS Preparation Notice for The Waterfront at Aloha Tower and offer the following comments:

1. Page I-3, Item D. The 1990 Legislature amended the ATDC boundary to include Piers 5 and 6.

2. Page II-1, Item B. The proposed development should also include maritime facilities at Piers 8, 9, 13, and 14.

3. Page II-3, Item D and Page II-10, Honolulu Harborside Condominiums at Piers 13 and 14. Due to air space considerations, the height limits for the tower structures must be coordinated closely with the Federal Aviation Administration and our Airports Division.

4. Page II-10, Honolulu Harborside Condominiums at Piers 13 and 14. The proposed development should include the ferry operation office space and vessel berthing, service, and maintenance facilities that were planned for the Piers 13 and 14 area.

5. Page II-10, Pedestrian Promenade. A pedestrian overpass crossing Nimitz Highway should also be included in the proposed development.

6. Page II-10, Vehicular Access. The access to Piers 13 and 14 should also include providing entry for the ferry facilities mentioned in Comment No. 4.

7. Page II-12, Item E, 2. The east side of Pier 7 will continue to be used for berthing.

8. Page II-13, Item E, 5. The proposed development should also include the ferry facilities mentioned in Comment No. 4.

9. Page VI-6, Item E, Maritime Impacts. The office space for the State Department of Transportation harbor functions should be considered replacement facilities.

10. General Traffic. We have met with the developer's traffic consultant to discuss our requirements for the Traffic Impact Analyses Report (TIAR). This report should reflect not only traffic generated from the proposed Waterfront at Aloha Tower project, but all other major developments within and surrounding the area, which would impact the affected corridor. This would include, but not limited to, the Kakaako Development, the Honolulu International Airport expansion, the Keehi Lagoon Recreational Complex, and various other projects in the Downtown area. The TIAR should evaluate/identify transportation needs for the area and recommend required improvements and/or mitigation measures to correct undesirable traffic conditions resulting from The Waterfront at Aloha Tower proposed development.

We appreciate this opportunity to provide comments.

Very truly yours,

Edward Y. Hirata

Edward Y. Hirata
Director of Transportation

John Waihee
Governor

Roger A. Ulveling
Chairman

Randall Y. Iwase
Executive Officer

ALOHA TOWER DEVELOPMENT CORPORATION

33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

July 27, 1990

The Honorable Edward Y. Hirata,
Director of Transportation
Department of Transportation
State of Hawaii
869 Punchbowl Street
Honolulu, Hawaii 96813-5087

SUBJECT: The Waterfront at Aloha Tower
Environmental Impact Statement Preparation Notice
(EISPN) [HAR-EP 5227.91]

Dear Mr. Hirata:

Thank you for your comments on the subject EISPN. We offer the following responses, in respective order, to your comments:

1. Subsequent to the publication of the EISPN, Governor Waihee signed H.B. 2919 into law which amended the ATDC boundary to include Piers 5 and 6. The amended boundary is addressed in the Draft EIS.

2. The maritime facilities have been included in the description of proposed improvements.

3. We have submitted the Notice of Proposed Construction (FAA Form 7460-1) for the office and condominium towers to the FAA Airspace and Procedures Branch.

4. Accommodations for the ferry operation have been included in the description of proposed improvements.

5. The pedestrian overpass is mentioned in the description of the Harbor Centre Office Complex as a link to the financial district. We shall revise the description of the Pedestrian Promenade to include the role of the overpass in the overall pedestrian circulation system.

6. Access for the ferry operation at Piers 13 and 14 has been included in the description of proposed improvements.

7. We understand that the maritime facilities at Pier 7 are not within the project area for the proposed Waterfront at Aloha Tower development.

8. Accommodation of the ferry landing at Pier 8 shall be included in the description of proposed improvements.

9. We shall clarify that the DOT office space replaces the office space to be demolished for the project.

10. We appreciate your assistance in the formulation of study scope and methodology for the Traffic Impact Analyses Report (TIAR). The traffic consultants assure us that your recommendations have been addressed. Traffic generated by developments far from the site, including the Honolulu International Airport and the Keehi Recreation Complex, are accounted for by a factor representing increases in background traffic. Traffic generated by major developments in the Downtown and Kakaako Development area are considered in addition to these background increases.

We hope that we have satisfactorily responded to your comments. If you have any further questions, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

for Randall Iwase
Executive Officer

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

JOHN WAIHEE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
AIRPORTS DIVISION

IN REPLY REFER TO
AIR-EP
90.3

ALOHA TOWER DEVELOPMENT CORP.
JUL 11 9 19 AM '90

July 10, 1990

Mr. Randall Y. Iwase, Executive Officer
Aloha Tower Development Corporation
33 South King Street, Suite 403
Honolulu, Hawaii 96813

Dear Mr. Iwase:

Subject: ENVIRONMENTAL IMPACT STATEMENT (EIS) PREPARATION NOTICE THE WATERFRONT AT ALOHA TOWER

Thank you for the opportunity to review the subject EIS Preparation Notice.

Our interests on The Waterfront at Aloha Tower centers on the effects of aircraft noise and airspace requirements on the proposed project relative to Honolulu International Airport operations. We understand that aircraft noise will be addressed in the Draft EIS but are not certain whether airspace considerations were included. If not, we would recommend that an assessment be done to ensure that buildings in the proposed project do not affect existing or future aeronautical procedures into Honolulu International Airport. The Federal Aviation Administration should be contacted in this regard. Again, thank you for the opportunity to provide comments on this notice.

Very truly yours,

Owen Miyamoto

OWEN MIYAMOTO
Airports Administrator

c: Wilson, Okamato & Associates - Earl Matsukawa
FAA, ADO - Dave Welhouse

ALOHA TOWER DEVELOPMENT CORPORATION

33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

John Waihee
Governor

Roger A. Ulveling
Chairman

Randall Y. Iwase
Executive Officer

July 27, 1990

Mr. Owen Miyamoto, Airports Administrator
Department of Transportation
Airports Division
Honolulu International Airport
Honolulu, Hawaii 96819

SUBJECT: The Waterfront at Aloha Tower
Environmental Impact Statement Preparation Notice (EISPN) [AIR-EP 90.3]

Dear Mr. Miyamoto:

Thank you for your comments on the subject EISPN.

We have submitted a Notice of Proposed Construction (FAA Form 7460-1) for the office and condominium towers to the FAA Airspace and Procedures Branch.

We hope that we have satisfactorily responded to your comments. If you have any further questions, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

for Randall Iwase
Executive Officer

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

OFFICE OF STATE PLANNING
Office of the Governor

Ref. No. P-966

July 6, 1990

ALOHA TOWER
DEVELOPMENT CORP.
JUL 17 12 28 PM '90

MEMORANDUM

TO: Mr. Randall Y. Iwase, Executive Officer
Aloha Tower Development Corporation

SUBJECT: The Waterfront at Aloha Tower
Environmental Impact Statement Preparation Notice

Thank you for the opportunity to review the subject document.

The major areas that need to be addressed in the forthcoming EIS appear to be adequately identified. At the same time, we wish to emphasize the need for a more detailed description and assessment of the project's relationship to the Honolulu Waterfront Master Plan as well as HCDA's Makai Area Plan to ensure that the proposed development is effectively integrated with long-range plans for surrounding areas (e.g., Piers 15-23, Fort Armstrong, and the HECO Property).

We also recommend that the State Coastal Zone Management Program be consulted to assure that the project's consistency with program objectives and policies are adequately addressed.

We appreciate this opportunity to comment.

Harold S. Masumoto
Director

ALOHA TOWER DEVELOPMENT CORPORATION

John Waihee
Governor

Roger A. Ulveling
Chairman

Randall Y. Iwase
Executive Officer

33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

July 27, 1990

The Honorable Harold S. Masumoto, Director
Office of State Planning
Office of the Governor
State Capitol
Honolulu, Hawaii 96813

SUBJECT: The Waterfront at Aloha Tower
Environmental Impact Statement Preparation Notice
(EISPN) [Ref. No. P-966]

Dear Mr. Masumoto:

Thank you for your comments on the subject EISPN. We have revised our discussion of the relationship of the proposed Waterfront at Aloha Tower to the Honolulu Waterfront Master Plan and Makai Area Plan in the Draft EIS.

We have also initiated preparation of the Federal Consistency Certification in conjunction with the application for the Department of Army Permit for the project. We will continue to coordinate with the State Coastal Zone Management Program to assure that the program's objectives and policies are adequately addressed.

If you have any further questions regarding the EIS, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

for Randall Iwase
Executive Officer

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

Hawaii Community Development Authority

677 Ala Moana Boulevard, Suite 1001 Honolulu, Hawaii 96813
(808) 548-7180 FAX: (808) 599-2613

John Waihee
Governor

Kenneth K. Takenaka
Chairman

Rex D. Johnson
Executive Director

Ref. No.: PL EIS 6.17

June 25, 1990

ALOHA TOWER DEVELOPMENT CORP.
JUN 28 9 09 AM '90

Mr. Randall Y. Iwase
Executive Director
Aloha Tower Development
Corporation
Suite 403
33 South King Street
Honolulu, Hawaii 96813

Dear Mr. Iwase:

Re: Review and Comments on the EIS Preparation Notice for the Aloha Tower Project

Thank you for the opportunity to review the Preparation Notice for the Aloha Tower Project. Based upon our review, we would like to offer the following comments:

H.B. 2919 of the 1990 State Legislature revised the boundaries of the Hawaii Community Development District. The Ewa end of the District is demarcated by the property line between Piers 2 and 4. Still included is the parcel presently occupied by Hawaiian Electric Company, Inc.

Please identify any detrimental effects that the proposed Piers 5 and 6 passenger terminal will have on the proposed additional berthing facilities for dinner cruise boats at Pier 4, and the passenger cruise ship terminal at Piers 1 and 2 as identified in the Makai Area Plan dated February 1990.

The Makai Area Plan has established a significant visual axis from Aloha Tower through the inland waterways to the Waterfront Park. Will this view

corridor be impacted by structures within the Aloha Tower Project?

If you have any questions regarding our comments, please call us at 548-7180.

Very truly yours,

Rex D. Johnson

RDJ/AI:gst

ALOHA TOWER DEVELOPMENT CORPORATION
33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

John Waihee
Governor
Roger A. Ulveling
Chairman
Randall Y. Iwase
Executive Officer

July 27, 1990

The Honorable Rex Johnson, Executive Director
Hawaii Community Development Authority
677 Ala Moana Boulevard, Suite 1001
Honolulu, Hawaii 96813

SUBJECT: The Waterfront at Aloha Tower
Environmental Impact Statement Preparation Notice
(EISPN) [Ref. No.: PL EIS 6.17]

Dear Mr. Johnson:

Thank you for your comments on the subject EISPN. We offer the following responses, in respective order, to your comments:

1. Following distribution of the EISPN, the Governor signed into law H.B. 2919 which amended the boundaries of both the Aloha Tower Development Corporation and the Hawaii Community Development Authority. The revised boundaries shall be illustrated in the Draft Environmental Impact Statement (EIS).

2. The plans for this project still permit the long-term redevelopment of the Pier 4 area for dinner cruise boats and the use of Piers 1 and 2 for cruise ship terminals as adopted in the Makai Area Plan to meet the anticipated future demands for these uses.

3. The visual axis to Aloha Tower will not be affected by the proposed development since structures on the Koko Head flank of Aloha Tower will be low-rise and similar in scale to the existing structures. Furthermore, since the proposed structures will reflect the architecture of historic structures of Honolulu Harbor, we believe the view shall be significantly improved.

We hope that we have satisfactorily responded to your comments. If you have any further questions, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

Randall Iwase
Executive Officer

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

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

June 27, 1990

Mr. Randall Y. Iwase
Executive Officer
Aloha Tower Development
Corporation
33 South King Street, Suite 403
Honolulu, Hawaii 96813

ALOHA TOWER DEVELOPMENT CORP.
Jun 29 9 15 AM '90

Dear Mr. Iwase:

Subject: Your Letter of June 1, 1990 Regarding the Environmental Impact Statement Preparation Notice for the Waterfront at Aloha Tower

We have no objections to the proposed project. The developer shall be required to submit the estimated water demands and an overall water master plan for the Waterfront development.

The water requirement for the proposed project should be taken care of through allocation from the State Department of Land and Natural Resources (DLNR). The allocation may be for water from a source the DLNR has constructed or a source the developer plans to install that has been approved by the State Commission on Water Resource Management.

If you have any questions, please contact Lawrence Whang at 527-6138.

Very truly yours,

KAZU HAYASHIDA
Manager and Chief Engineer

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

ALOHA TOWER DEVELOPMENT CORPORATION

John Waihee
Governor
Roger A. Ulveling
Chairman
Randall Y. Iwase
Executive Officer

33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

July 27, 1990

The Honorable Kazu Hayashida,
Manager and Chief Engineer
Board of Water Supply
City and County of Honolulu
630 South Beretania Street
Honolulu, Hawaii 96843

SUBJECT: The Waterfront at Aloha Tower
Environmental Impact Statement Preparation Notice
(EISPN)

Dear Mr. Hayashida:

Thank you for your comments on the subject EISPN. We shall be coordinating the water source requirements for the project through the Department of Land and Natural Resources. An estimated water demand and an overall water master plan for the development will be submitted to your office.

We hope that we have satisfactorily responded to your comments. If you have any further questions, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

Randall Iwase
Executive Officer

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET 5TH FLOOR
HONOLULU, HAWAII 96813
PHONE 523-4427 • FAX 527-5498

July 2, 1990

Mr. Randall Y. Iwase, Executive Officer
Aloha Tower Development Corporation
33 South King Street, Suite 403
Honolulu, Hawaii 96813

ALOHA TOWER
DEVELOPMENT CORP.
JUL 9 1 22 PM '90

Dear Mr. Iwase:

Subject: Environmental Impact Statement Preparation Notice
The Waterfront at Aloha Tower

We appreciate the opportunity to review the Environmental Impact Statement (EIS) Preparation Notice for The Waterfront at Aloha Tower.

For your information, there are two City-sponsored mixed-use projects which are in proximity to and will be developed during the approximate time frame as the Aloha Tower project:

1. Harbor Court, to be developed by BEAM Harbor Venture on the site of the Kaahumanu Municipal Parking facility and Old District Court parking lot, generally bounded by Nuuanu Avenue, Merchant and Queen Streets and Nimitz Highway. The Kaahumanu parking facility will be replaced with a 20-story office tower containing approximately 220,000 square feet of commercial space, a 30-story condominium hotel tower containing 122 units, 37,000 square feet of retail space and 1,035 parking stalls. A mid-rise building containing 24,900 square feet of office condominiums and 15,900 square feet of retail space will be developed on the Old District Court parking lot. Construction is estimated to commence in September 1991.

2. Smith-Maunakea Housing project, to be developed on the site of the municipal parking lot bounded by Maunakea and Smith Streets, Nimitz Highway, Liberty Bank and small shops on King Street. Preliminary plans call for the development of 262 housing units, 16,000 square feet of retail commercial space and 442 parking stalls. Construction is estimated to begin in March 1991.

Although the preparation notice did not contain an estimated development schedule for the Aloha Tower project, we are of the impression that the

City projects may be under construction at the time that development of the Aloha Tower project gets underway. Because of their proximity to each other, potential short term environmental impacts, such as traffic congestion, noise and air pollution, could be intensified as a result of construction activities occurring simultaneously at all three project sites. Your agency may wish to address this issue in the draft EIS.

Thank you for the opportunity to comment. Please contact Eileen Mark at 527-5095 if you have any questions.

Sincerely,

M Scarfone

MICHAEL N. SCARFONE
Director

ALOHA TOWER DEVELOPMENT CORPORATION

33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

John Waihee
Governor

Roger A. Ulveling
Chairman

Randall Y. Iwase
Executive Officer

July 27, 1990

The Honorable Michael N. Scarfone, Director
Department of Housing and Community Development
City and County of Honolulu
650 South King Street, 5th Floor
Honolulu, Hawaii 96813

SUBJECT: The Waterfront at Aloha Tower
Environmental Impact Statement Preparation Notice
(EISPN)

Dear Mr. Scarfone:

Thank you for your comments on the subject EISPN. The projected start date of construction for the Waterfront at Aloha Tower development is late 1991 or early 1992. We concur that there is a potential for cumulative impacts if the three construction projects were on-going concurrently. The Draft EIS shall acknowledge this potential short-term impact and identify potential mitigation measures. Such measures would need to be coordinated among the various projects once construction schedules are determined.

If you have any further questions, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

Randall Iwase
Executive Officer

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

DEPARTMENT OF GENERAL PLANNING

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

RK 6/90-1681A

July 10, 1990

ALOHA TOWER
DEVELOPMENT CORP.
JUL 12 9 29 AM '90

Mr. Randall Y. Iwase, Executive Officer
Aloha Tower Development Corporation
33 South King Street, Suite 403
Honolulu, Hawaii 96813

Dear Mr. Iwase: Randy

Environmental Impact Statement Preparation Notice
the Waterfront at Aloha Tower

We have reviewed the Environmental Impact Statement (EIS) Preparation Notice for the Waterfront at Aloha Tower project and offer the following comments:

1. The Waterfront area of the Aloha Tower project may impede future development of facilities (land and shoreline) required to service Oahu's projected harbor and maritime needs. Potential expansion areas will be reduced by this development, the Kakaako Makai Area Plan, and the Keehi Lagoon Recreation Plan.

   Barbers Point Harbor may provide some relief from pressures to expand Honolulu Harbor, but Barbers Point has constraints which limit its utility as a secondary relief harbor. These constraints, as outlined in the Honolulu Waterfront Master Plan final report (October 1989), include design problems which reduce its navigability, limited wharf space, and its remoteness from existing markets and east Oahu population centers.

   The Aloha Tower Development Corporation (ATDC) has jurisdiction over Piers 8-23. While the Aloha Tower Project only encompasses Piers 5-14, the draft EIS should indicate if a second phase ATDC project involving Piers 15-23 will be forthcoming or if this area will be retained in harbor related use.

   The Draft EIS should fully discuss the issue of harbor expansion needs.

2. There is an apparent discrepancy between the Aloha Tower Development's Plan for two 340' residential towers between Piers 12 and 14, and the Honolulu Waterfront Master Plan, which calls for "Redevelopment of Piers 12-15 in the Chinatown area with an emphasis on Historic Development and Chinatown themes." (Summary Report, January 1990.) This despite the developer's contention (EIS Preparation Notice, page 8) that the proposal is fully consistent with the Waterfront Master Plan. This should be clarified in the Draft EIS.

   An attendant concern with the planned residential/office towers is the potential for the breaching of the State's current 400' Airport zoning height limit for these sites. A 400' tower would be subject to review and approval by the FAA. This should be discussed in the Draft EIS.

3. Air quality, noise and traffic studies in the Draft EIS should consider not only the individual impact of this project, but also the potential collective impact of the Waterfront project along with other projects planned for this area, including Rapid Transit along the City's preferred alignment.

4. Pedestrian access to the Waterfront Development at grade from the central business district will require traversing Nimitz Highway. Present pedestrian crossing accommodations are button-actuated signals, which could impose significant slow-downs in traffic should heavy pedestrian traffic extend the walk cycles on Nimitz Highway. The Draft EIS should consider this potential problem and mitigating measures.

5. We request a disclosure of the number and/or percentages of affordable units to be offered on site.

   Also requiring discussion in the Draft EIS are the economic feasibility of the project and consequences of lower than anticipated revenues on the proposed Aloha Tower Housing Fund, since fund contributions are to be derived from the pre-tax profits from sales and the rental of improvements in the development.

6. The Draft EIS should provide a more definitive discussion on the elements of the Aloha Tower Project which will not be in conformance with the Development Plans. We understand that ATDC is empowered to override certain county ordinances according to HRS Title 15, Subtitle 5, Chapter 26, Subchapter 4, Development Guidelines.

Thank you for the opportunity to review this document.

Should there be any questions, please contact Keith Kurahashi at 527-6051.

Sincerely,

Ben

BENJAMIN B. LEE
Chief Planning Officer

BBL:js

cc: Galen Fox, Office of the Mayor

ALOHA TOWER DEVELOPMENT CORPORATION
33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

John Waihee
Governor

Roger A. Ulveling
Chairman

Randall Y. Iwase
Executive Officer

July 27, 1990

The Honorable Benjamin B. Lee,
Chief Planning Officer
Department of General Planning
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

SUBJECT: The Waterfront at Aloha Tower
Environmental Impact Statement Preparation Notice
(EISPN) [RK 6/90-1681A]

Dear Mr. Lee:

Thank you for your comments on the subject EISPN. We offer the following responses, in respective order, to your comments:

1. The proposed Waterfront at Aloha Tower Development implements a portion of the Honolulu Waterfront Master Plan which addresses the broader scope of the State's waterfront development effort. Proposed maritime facilities, which will occupy most of the development's pier frontages, respond to needs expressed by the State Department of Transportation Harbors Division which is represented on the Aloha Tower Development Corporation (ATDC) Board.

   Although the Legislature has also included Piers 15 to 23 within the ATDC boundaries, ATDC has no plans to remove these piers from their current maritime uses.

2. The Waterfront Master Plan (Final Report, October 1990) recommends that Pier 13/14 be developed with support facilities for commercial fishing boats as well as fresh seafood sales. The proposed plan will not implement this recommendation. Nevertheless,

Section 5.4, <u>Recommended Management Framework</u>, recognizes the ATDC's lead in the redevelopment of this area and offers as the Implementation Guideline: "Coordinate plans for the area with ongoing efforts to develop the Aloha Tower area." The Draft EIS shall clarify this distinction.

With regard to proposed building heights, A Notice of Proposed Construction (FAA Form 7460-1) for the office and condominium towers has been filed with the Federal Aviation Administration, Airspace and Procedures Branch.

3. The traffic study for the Draft EIS is based on anticipated increases in background traffic as well as 16 anticipated development projects in the Downtown area. The air quality and noise impacts resulting from this increase in traffic are assessed in separate studies. Implementation of the proposed Rapid Transit system is not considered in the future traffic scenario. Thus, the study assumes a "worst case" scenario which could be improved if the Rapid Transit system were implemented.

4. The traffic study for the Draft EIS accounts for the adjustments in pedestrian crossing signals on Nimitz Highway.

5. There will be no affordable units offered on site.

Since the proposed Aloha Tower Housing Fund is derived from sales profits and rents, lower than anticipated returns will reduce contributions to the Fund.

6. We shall expand upon the discussion of the projects relationship with the City and County Development Plans.

We hope that we have satisfactorily responded to your comments. If you have any further questions, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

for Randall Iwase
Executive Officer

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

DEPARTMENT OF LAND UTILIZATION

CITY AND COUNTY OF HONOLULU

LU6/90-3850(RF)

June 20, 1990

Mr. Randall Y. Iwase
Executive Officer
Aloha Tower Development Corporation
33 South King Street
Suite 403
Honolulu, Hawaii 96813

Dear Mr. Iwase:

Environmental Impact Statement Preparation Notice for the Waterfront at Aloha Tower

Thank you for forwarding the Environmental Impact Statement Preparation Notice on the Aloha Tower Waterfront Project for our review. We have no comment to offer at this time. We will review and comment on the Draft EIS, when it becomes available.

Very truly yours,

Donald Clegg

DONALD A. CLEGG
Director of Land Utilization

DAC:sl
0338N/39

ALOHA TOWER DEVELOPMENT CORP.
JUN 21 9 14 AM '90

ALOHA TOWER DEVELOPMENT CORPORATION

33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

John Waihee, Governor
Roger A. Ulveling, Chairman
Randall Y. Iwase, Executive Officer

July 27, 1990

The Honorable Donald A. Clegg, Director
Department of Land Utilization
650 South King Street
Honolulu, Hawaii 96813

SUBJECT: The Waterfront at Aloha Tower
Environmental Impact Statement Preparation Notice (EISPN) [LU6/90-3850(RF)]

Dear Mr. Clegg:

Thank you for responding to the subject EISPN. We shall continue to seek your review and comments as a consulted party during the public review procedures for the Draft EIS.

If you have any questions regarding the EIS, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

Randall Iwase
Executive Officer

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

DEPARTMENT OF PARKS AND RECREATION

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

June 20, 1990

ALOHA TOWER
DEVELOPMENT CORP.
Jun 22 9 09 AM '90

Mr. Randall Y. Iwase, Executive Officer
Aloha Tower Development Corporation
33 South King Street, Suite 403
Honolulu, Hawaii 96813

Dear Mr. Iwase:

Subject: Environmental Impact Statement Preparation (EISPN)
Notice for the Waterfront at Aloha Tower Project.
TMK: 1-7-01, 2-1-01, 2-1-13, 2-1-15, and 2-1-27

The Waterfront at Aloha Tower project will have a significant impact on our public parks and facilities in the downtown area. Other than mini-parks and malls, there are no large parks in the downtown area to serve the proposed project. Mini-parks are passive-type parks and do not effectively serve the active needs of the project and the proposed residents who will utilize existing City facilities.

The design considerations for the Waterfront at Aloha Tower project provide open space areas primarily for pedestrian promenades and visual relief for the project. Considerations should include recreation areas and facilities to serve the hotel and particularly the condominium complexes as well.

We would be pleased to assist you in providing information of our limited existing parks and facilities in the downtown area to include in your Draft Environmental Impact Statement. Please contact Jason Yuen of our Executive Policy Planning Unit at 527-6315.

Thank you for the opportunity to comment on the EISPN.

Sincerely,

WALTER M. OZAWA, Director

WMO:ja

Attach.

cc: Wilson Okamoto and Associates, Inc.
Aloha Tower Associates
Downtown Neighborhood Board No. 13

John Waihee
Governor

Roger A. Ulveling
Chairman

Randall Y. Iwase
Executive Officer

ALOHA TOWER DEVELOPMENT CORPORATION

33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

July 27, 1990

The Honorable Walter M. Ozawa, Director
Department of Parks and Recreation
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

SUBJECT: The Waterfront at Aloha Tower
Environmental Impact Statement Preparation Notice
(EISPN)

Dear Mr. Ozawa:

Thank you for your comments on the subject EISPN. In recognition of the shortage of active public recreational facilities in the Downtown area, the developers intend to provide private recreational amenities, including a swimming pool, accommodations for a health club for hotel guests and office tenants at Piers 10 and 11, and similar amenities at Piers 13 and 14 for the condominium towers. While we concur that the residential component of the project could increase demand for recreational opportunities that can only be met by facilities administered by your agency, we do not feel that the limited number of units would create an extraordinary demand.

We hope that we have satisfactorily responded to your comments. If you have any further questions, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

Randall Iwase
Executive Officer

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

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

In reply refer to:
ENV 90-140(448)

June 29, 1990

Mr. Randall Y. Iwase
Executive Officer
Aloha Tower Development Corporation
33 South King Street, Suite 403
Honolulu, Hawaii 96813

Dear Randy

Subject: Environmental Impact Statement Preparation Notice (EISPN)
The Waterfront at Aloha Tower
Tax Map Key: 1-7-01; 2-1-01, 13, 15 and 27

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

1. The Draft EIS should address the disposal of wastewater from the proposed development.

2. Although we plan to install sewer lines in Nimitz Highway in FY 1993, we did not design to accommodate the entire flow demand of the waterfront project. Consequently, a relief sewer may be required to meet the flow demand and the costs associated with the design and construction of the relief sewer will be borne entirely by the developer.

3. A drainage report is required to be submitted to the Drainage Section, Division of Engineering, for review and comment.

Very truly yours,

SAM CALLEJO
Director and Chief Engineer

ALOHA TOWER
DEVELOPMENT CORP.
Jul 3 9 32 AM '90

ALOHA TOWER DEVELOPMENT CORPORATION
33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

John Waihee
Governor
Roger A. Ulveling
Chairman
Randall Y. Iwase
Executive Officer

July 27, 1990

The Honorable Sam Callejo, Director and
Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

SUBJECT: The Waterfront at Aloha Tower
Environmental Impact Statement Preparation Notice
(EISPN) [ENV 90-140(448)]

Dear Mr. Callejo:

Thank you for your comments on the subject EISPN. We offer the following responses, in respective order, to your comments:

1. Inasmuch as wastewater disposal requirements have yet to be determined, the Draft EIS shall provide an overview of potential concerns regarding overall system capacities as well as the off-site considerations you noted.

2. Your comment regarding potential off-site requirements to accommodate wastewater disposal has been forwarded to the appropriate design consultants. They will be coordinating their work with your department as the project proceeds.

3. We acknowledge the requirement for preparing and filing a drainage report for review and approval by your office.

We hope that we have satisfactorily responded to your comments. If you have any further questions, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

for Randall Iwase
Executive Officer

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

DEPARTMENT OF TRANSPORTATION SERVICES

CITY AND COUNTY OF HONOLULU

HONOLULU MUNICIPAL BUILDING
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR

ALFRED J. THIEDE
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

RT-2780

July 3, 1990

ALOHA TOWER
DEVELOPMENT CORP.
Jul 9 7 52 AM '90

Honorable Randall Y. Iwase, Executive Officer
Aloha Tower Development Corporation
State of Hawaii
33 South King Street, Suite 403
Honolulu, Hawaii 96813

Dear Mr. ~~Iwase~~: Randy

Subject: Honolulu Rapid Transit Development Project

Thank you for your letter of May 18, 1990, regarding the Alternatives Analysis/Draft Environmental Impact Statement for the subject project.

Your comments are being used to assist in the selection of the locally preferred alternative (LPA) and will be used to prepare the Final Environmental Impact Statement.

Should the LPA include either the Nimitz or Beretania/Alakea alignments, we will closely coordinate with the Aloha Tower redevelopment project to minimize any impact to the project. The location and design of the stations will be further refined during subsequent engineering phases. The impact on Nimitz Highway traffic during construction will be closely reviewed and coordinated, particularly if construction occurs at or about the time the Aloha Tower redevelopment is underway.

We share your concern regarding the visual impact of the elements of the fixed guideway system. The visual impact, especially of the Nimitz Highway alignment, will be an important consideration in the technology selection.

If you have any additional comments, please call Amar Sappal, Project Manager, at 527-6975.

Sincerely,

JOSEPH M. MAGALDI, JR.

DEPARTMENT OF TRANSPORTATION SERVICES

CITY AND COUNTY OF HONOLULU

HONOLULU MUNICIPAL BUILDING
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR

ALFRED J. THIEDE
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

TE-3271
PL90.1.182

July 5, 1990

ALOHA TOWER
DEVELOPMENT CORP.
Jul 9 7 52 AM '90

Mr. Randall Y. Iwase
Executive Officer
Aloha Tower Development Corporation
33 South King Street, Suite 403
Honolulu, Hawaii 96813

Dear Mr. Iwase:

Subject: Waterfront at Aloha Tower
EIS Preparation Notice
TMK: 1-7-01; 2-1-01, 13, 15, and 27

This is in response to your letter of June 1, 1990 requesting our comments on the EIS preparation notice for the subject project.

The impacts resulting from the anticipated increase in traffic affecting streets and intersections under the jurisdiction of the City should be addressed in the traffic study. Due to the magnitude of this development, an area wide analysis should be conducted. We are of the understanding that the ultimate jurisdiction of roadways within the project site will remain with the State Department of Transportation.

Nimitz Highway in the vicinity of this project is an alternative alignment for the proposed rapid transit system. Our Rapid Transit Development Division should be contacted with regard to this proposed alignment during the preparation of the EIS for this project.

Should you have any questions, please contact Mel Hirayama of my staff at 523-4119.

Very truly yours,

for ALFRED J. THIEDE
Director

ALOHA TOWER DEVELOPMENT CORPORATION

John Waihee, Governor
Roger A. Ulveling, Chairman
Randall Y. Iwase, Executive Officer

33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

July 27, 1990

The Honorable Alfred Thiede, Director
Department of Transportation Services
City and County of Honolulu
Honolulu Municipal Building
650 South King Street
Honolulu, Hawaii 96813

SUBJECT: The Waterfront at Aloha Tower
Environmental Impact Statement Preparation Notice
(EISPN) [TE-3271 PL90.1.182]

Dear Mr. Thiede:

Thank you for your comments on the subject EISPN. We offer the following responses, in respective order, to your comments:

1. A traffic study of the proposed project has been prepared for inclusion in the Draft EIS. We appreciate the assistance provided by your staff to the project developer and their consultants in determining the area wide scope of the study and its methodology. All roadways within the project area shall be owned by the State.

2. Through the EIS review for the Honolulu Rapid Transit project, we established initial contact with your Department's Rapid Transit Development Division regarding the relationship of the proposed Honolulu Rapid Transit alignment to the Waterfront at Aloha Tower development. In response to our comments, we received the attached letter regarding future coordination. We look forward to continued coordination with your Rapid Transit Development Division as our projects proceed.

We hope that we have satisfactorily responded to your comments. If you have any further questions, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

for Randall Iwase
Executive Officer

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

Enclosure

FIRE DEPARTMENT

CITY AND COUNTY OF HONOLULU

1455 SOUTH BERETANIA STREET ROOM 305
HONOLULU HAWAII 96814

ALOHA TOWER
DEVELOPMENT CORP.
JUN 18 7 53 AM '90

June 14, 1990

ALOHA TOWER
DEVELOPMENT CORP.
JUN 18 7 53 AM '90

Mr. Randall Y. Iwase, Executive Officer
Aloha Tower Development Corporation
33 South King Street, Suite 403
Honolulu, Hawaii 96813

Dear Mr. Iwase:

SUBJECT: Environmental Impact Statement Preparation Notice
The Waterfront at Aloha Tower

We have reviewed the subject material provided and foresee no adverse impact in Fire Department facilities or services, planned or now provided, existing fire protection is considered adequate.

Access for fire apparatus, water supply and building construction shall be in conformance to existing codes and standards.

Should you have any questions, please contact Battalion Chief Michael Zablan of our Administrative Services Bureau at 943-3838.

Sincerely,

DONALD S. M. CHANG
Acting Fire Chief

MZ:ny

ALOHA TOWER DEVELOPMENT CORPORATION

John Waihee, Governor
Roger A. Ulveling, Chairman
Randall Y. Iwase, Executive Officer

33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

July 27, 1990

Mr. Donald F. Chang, Acting Fire Chief
Fire Department
City and County of Honolulu
1455 South Beretania Street, Room 305
Honolulu, Hawaii 96814

SUBJECT: The Waterfront at Aloha Tower
Environmental Impact Statement Preparation Notice
(EISPN)

Dear Chief Chang:

Thank you for your comments on the subject EISPN. The developers have retained a fire protection specialist to assure conformance with all applicable codes and standards.

If you have any questions regarding the EIS, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

Randall Iwase
Executive Officer

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

POLICE DEPARTMENT
CITY AND COUNTY OF HONOLULU

ES-LK

July 3, 1990

ALOHA TOWER DEVELOPMENT CORP.
JUL 10 9 21 AM '90

Mr. Randall Y. Iwase, Executive Officer
Aloha Tower Development Corporation
33 South King Street, Suite 403
Honolulu, Hawaii 96813

Dear Mr. Iwase:

This is in response to your request for comments concerning the Environmental Impact Statement Preparation Notice for the Waterfront at Aloha Tower.

The scope and location of the project will mean a substantial increase in vehicular and pedestrian traffic in the area, which will create additional problems in both traffic flow and public safety.

We urge that the traffic studies for the project give careful attention to ways of easing congestion and promoting smooth traffic flow. Appropriate measures should be planned to prevent accidents and harm to the public, both during and after the construction of the project facilities. Some attention should also be given to providing security for the facilities.

Thank you for the opportunity to comment.

Sincerely,

HAROLD KAWASAKI
Chief of Police

BY
JOSEPH AVEIRO
Assistant Chief of Police
Support Services Bureau

ALOHA TOWER DEVELOPMENT CORPORATION
33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

July 27, 1990

Chief Harold Kawasaki, Chief of Police
Police Department
City and County of Honolulu
1466 South Beretania Street
Honolulu, Hawaii 96814

ATTENTION: Joseph Aveiro, Assistant Chief of Police
Support Services Bureau

SUBJECT: The Waterfront at Aloha Tower
Environmental Impact Statement Preparation Notice
(EISPN) [ES-LK]

Dear Chief Kawasaki:

Thank you for your comments on the subject EISPN. We offer the following responses, in respective order, to your comments:

1. We concur with your concern regarding increased vehicular and pedestrian traffic in the area resulting from the proposed project. An extensive and detailed traffic study which considers pedestrian as well as vehicular traffic has been prepared in conjunction with the Draft EIS. The study scope and methodology were developed in consultation with the State Department of Transportation and the City and County Department of Transportation Services. Recommendations for mitigation measures to reduce congestion and enhance public safety are provided.

2. Security considerations for the project shall be discussed in the Social Impacts section of the Draft EIS.

We hope that we have satisfactorily responded to your comments. If you have any further questions, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

Randall Iwase
Executive Officer

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

DOWNTOWN NEIGHBORHOOD BOARD NO. 13
c/o NEIGHBORHOOD COMMISSION • CITY HALL, ROOM 400 • HONOLULU, HAWAII 96813

June 26, 1990

ALOHA TOWER
DEVELOPMENT CORP.
JUN 27 10 16 AM '90

Mr. Randall Iwase
Executive Director
Aloha Tower Development Corp.
33 South King Street, Suite 403
Honolulu, HI 96813

Re: EIS Preparation Notice
The Waterfront at Aloha Tower

Dear Randy:

Downtown Neighborhood Board #13 has reviewed the Environmental Impact Statement Preparation Notice for the Waterfront at Aloha Tower. We have the following comments:

The State has requested that piers 5 and 6 be extended. Also, with the implementation of a concept of "no net fill,' the parking configuration of the condominiums at piers 13 and 14 may need to be redesigned. with the condos rising to 400 feet.

The Board believes that any costs resulting from State and Federal requests should be borne by the State or, alternatively, the lease rents should be reduced.

The Board believes that everything possible should be done to keep the maximum height limit to 350 feet, the current maximum height limit in the City and County except for the Aloha Motors Convention Complex.

The data in Section IV generally is outdated. Due to significant changes in the neighborhood since 1980, we would expect the DEIS to use the most current data available, not the 1980 census. The population figures for the study area are grossly underestimated. Our count for the high rises only is in the neighborhood of 8,500. Also, the written description says the study area goes to the H-1, it appears you omitted the census tract which encompasses Queen Emma Garden, a 587 unit apartment complex.

Also, the impact area appears to have been drawn very narrowly. A project of this magnitude will affect a broader area. The writer of the DEIS should explain and defend the choice impact area boundaries.

No analysis was done of the changes underway in the downtown/Chinatown area and how they, coupled with the impact of the first major tourist facility downtown, would be on the financial, residential and Chinatown districts.

Pages V-7 and V-8 state that the project will be consistent with culture and recreation objective D, policy 3 of the General Plan, "Develop and maintain urban parks, squares, and beautification areas in high density urban places." We are sorely in need of active recreation space, not more pretty parks or

concrete plazas like Chinatown-Gateway and Wilcox. The City has a park dedication ordinance. Unfortunately, the ATDC rules make no provision for providing recreation space. As this project will be adding residents to the downtown area, we hope the developer will provide active recreation on site for its residential towers and, inasmuch as there is no provision for active recreation in its public areas, that it will be a good neighbor and donate funds as a facilities fee to provide for active recreation for the community at large.

Page VI-7 says, "Residents, through the Downtown Neighborhood Board, have expressed the need for greater and improved recreational facilities." The Board has stressed the need for active, not passive park space, a distinction not made in the Preparation Notice.

Page V-13 states the Waterfront at Aloha Tower will be in conformace primarily with certain provisions of the Primary Urban Center Development Plan, including encouraging "walking to and from jobs, thus reducing automobile dependency and demands upon the transportation system." The Downtown Neighborhood Board is encouraging developers of office buildings to provide showers so those walking and bicycling to work can refresh themselves before the work day starts. We also believe these facilities downtown will promote walking and bicycling to work.

Contract to what is said on page V-9, there are no inter-island hydrofoil operations at pier 8.

Page VI-8, G says, "construction activities associated with the Waterfront at Aloha Tower will create minor disruptions of traffic..." We believe there will be major disruptions on this heavily travelled artery and this needs to be addressed in the DEIS.

We also question whether the escalators by the parking structure can handle the pedestrian traffic from the underground parking lot.

Sincerely,

Lynne

Lynne Matusow
Chairman

cc: Marvin Miura, OEQC
Earl Matsuwaka, Wilson Okamoto and Associates

ALOHA TOWER DEVELOPMENT CORPORATION

33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

July 27, 1990

Ms. Lynne Matusow, Chairperson
Downtown Neighborhood Board No. 13
c/o Neighborhood Commission
City Hall Room 400
Honolulu, Hawaii 96813

SUBJECT: The Waterfront at Aloha Tower
Environmental Impact Statement Preparation Notice
(EISPN)

Dear Ms. Matusow:

Thank you for your comments on the subject EISPN. We offer the following responses, in respective order, to your comments:

1. Negotiations on the lease agreement for the Waterfront at Aloha Tower development is presently ongoing. Our goal is to achieve an equitable agreement with the developer that will maximize benefits to the people of Hawaii.

2. Although the maximum building height allowed by zoning in the Central Business District of Honolulu is 350 feet, the Hawaii Community Development Authority has established a 400 foot maximum in the adjoining Kakaako District. Thus, we do not feel that a 400 foot limit would be out of character for the area.

3. Inasmuch as we are at the tail end of the ten-year U.S. Census data cycle, we concur that much of the information available through this source is out-of-date. Thus, for the Draft EIS we have relied on other sources to update our data base, including the City and County of Honolulu Department of General Planning and recent EISs prepared for projects in the downtown area.

4. While we are confident that the selected study area is appropriate for identifying potentially significant social impacts of the proposed development, we concur that the Queen Emma Garden apartment complex should also be included. The Draft EIS will contain a social impact assessment based on the adjusted study area.

5. As stated in the EISPN, a social impact assessment will be included in the Draft EIS. The study will discuss potential changes in the Downtown/Chinatown area.

6. The developer's plan for restoring and creating new park space within the project will far exceed requirements that would be applicable under the Park Dedication Ordinance. Further, in recognition of the shortage of active public recreational facilities in the Downtown area, the developers intend to provide private recreational amenities, including a swimming pool, health club accommodations for hotel guests and office tenants at Piers 10 and 11, and similar amenities at Piers 13 and 14 for the condominium towers.

7. The social impact assessment in the Draft EIS shall differentiate between active and passive recreational demands.

8. Your suggestion for showers in the office building has been forwarded to the project designers.

9. While the inter-island hydrofoil is no longer in operation, the State Department of Transportation is examining the possibility of accommodating an intra-island ferry system that may also provide inter-island service.

10. Short-term traffic impacts resulting from construction activities shall be addressed in the Draft EIS.

11. Please be assured that the project designers are examining the pedestrian traffic requirements for the underground parking structure to assure safe and efficient pedestrian movement.

We hope that we have satisfactorily responded to your comments. If you have any further questions, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

for Randall Iwase
Executive Officer

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

HAWAII PILOTS ASSOCIATION
P.O. Box 721 • Honolulu, Hawaii 96808
Telephone: (808) 531-4478

To: Mr. Randall Y. Iwase, Executive Officer
Aloha Tower Development Corporation
33 South King Street, Suite 403
Honolulu, Hawaii 96813

8 July, 1990

From: Capt. Dave Lyman
Vice President
Hawaii Pilots Association

Subject: THE WATERFRONT AT ALOHA TOWER
Environmental Impact Statement
Preparation Notice

ALOHA TOWER DEVELOPMENT CORP.
JUL 9 10 48 AM '90

Randy —

Dear ~~Mr. Iwase,~~

As per your request, my comments are enclosed pertaining to the above referenced "Preparation Notice". To avoid burdening you and your staff down with reams of paperwork I am restricting my comments only to those areas that are directly relevant to the Hawaii Pilots Association's (HPA) operational concerns and/or special areas of expertise.

The following comments follow the numerical page order of the "Notice". Each comment is preceded by the page number and paragraph citation of the applicable area of comment. Additional comments that may be useful to ATDC that do not directly relate to the "Notice" are enclosed as a separate attachment.

Page I - 3 D. Project Area

Once again, ATDC is to be commended in its selection of the ATA development proposal as the defined boundaries are ample for current and future commercial vessel movement in Honolulu Harbor.

Page II - 4 The Maritime Building and Passenger Terminal at Piers 5 and 6

Please refer to comments regarding "Maritime Impacts", Pages VI - 6, 7

Page III - 7 First paragraph (continuation from Page III - 6)

Many individuals and agencies, including the United States Coast Guard, may very well take exception to the statement: "Oil contamination from ship traffic, causing sheens on harbor water, is the most visible pollutant." This may very well have been true in 1970 but, today's vessels are under very severe regulations that require extensive measures to prevent such pollution and, furthermore, are subject to substantial penalties should such pollution occur. If oil pollution occurs in the harbor today it is:
1) Immediately reported to the United States Coast Guard,
2) Immediately contained with floating booms, and
3) Immediately cleaned up with special oil absorbing materials.

Recent data suggests that the majority of visible oil sheens in the harbor occur after heavy rainfalls wash road oil and illegally dumped oil into the harbor through the storm drain system.

Page V -2 Transportation Policies

i. The addition of a phrase that recognizes a potential increase in overseas shipping would indicate that future growth is predicted.

Example: "Provide for improved accessibility to shipping, docking, and storage facilities to accommodate present and future needs."

ii. In addition to inter-island shipping, intra-island needs could be recognized here.

Example: "Promote a variety of carriers to offer increased opportunities and advantages to inter-island and intra island movement of people and goods."

Page V-9 2010 Master Plan for Honolulu Harbor
Conceptual Planning Study - Honolulu Harbor Piers 2 - 18

Having been personally involved with the 2010 Master Plan as Chairman of the Chamber of Commerce Maritime Affairs Committee during the Plan's preparation it is personally gratifying to see that: "The proposed Waterfront at Aloha Tower shall implement these recommendations as proposed."

The planning objective: "c) To provide for present and future maritime uses......" as listed in the 1978 EDAW, Inc. study certainly gives both the ATDC and ATA quite a mandate. This may be a good section in the final EIS to include a section on how the recent Kapalama land purchases by the State may favorably impact the ATA development.

Page VI - 3, 4 Maritime Activities

A correction: "Harbor Pilots Association" should read "Hawaii Pilots Association".
Page VI - 6, 7 Maritime Impacts

"harbor pilots" should read, "Hawaii Pilots Association". Yes, discussions with Hugh Foster and John Vickerman of Vickerman and Associates have pointed out a glaring need to expand the distance between Piers 7 and 6 from 169 feet to an ideal of 250 feet. The State requested Pier and Bulkhead Line extension that will allow construction of catwalks and breasting dolphins may require new techniques to be developed by the pilots when utilizing the area between Piers 5 and 6 and Sand Island to turn large vessels. At present, the proposed plan appears to be workable.

As you know, meaningful dialogue currently exists between the harbor users, including the Hawaii Pilots Association, and Aloha Tower Associates. On behalf of the HPA and the majority of the Honolulu Harbor users who actively support this project I would like to extend a big mahalo to you and your staff for this opportunity to comment on your EIS Preparation Notice. I can be reached at the above address and/or phone number if you would like to further discuss any of these comments.

Very Truly Yours,

Dave

Capt. Dave Lyman

ALOHA TOWER DEVELOPMENT CORPORATION

John Waihee
Governor

Roger A. Ulveling
Chairman

Randall Y. Iwase
Executive Officer

33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

July 27, 1990

Captain David Lyman, Vice President
Hawaii Pilots Association
P.O. Box 721
Honolulu, Hawaii 96808

SUBJECT: The Waterfront at Aloha Tower
Environmental Impact Statement Preparation Notice
(EISPN)

Dear Captain Lyman:

Thank you for your comments on the subject EISPN. We offer the following responses, in respective order, to your comments:

1. A marine environmental assessment has been prepared for inclusion in the Draft EIS. A summary of findings based on this assessment shall replace the text used in the EISPN.

2. The policies quoted on page V-2 of the EISPN are excerpted from the Hawaii State Plan. We believe that the proposed development will fulfill multiple goals, including those of the invaluable maritime industry.

3. We concur on the importance of the State's recent acquisitions in Kapalama and their potential beneficial impact on the proposed Waterfront at Aloha Tower development. Our perspective is that the Kapalama acquisitions as well as the Waterfront at Aloha Tower collectively support the 2010 Master Plan for Honolulu Harbor.

4. The Draft EIS will correctly cite the Hawaii Pilots Association.

5. We appreciate the invaluable service and skills of the harbor pilots and shall continue to work with the Department of Transportation Harbors Division and the Hawaii Pilots Association to seek acceptable design solutions.

We are pleased that a meaningful dialogue has been established with the Hawaii Pilots Association through the initial planning phase of this project. We look forward to continuing this dialogue to assure that maritime interests are addressed throughout the development of this important project.

If you have any further questions regarding the EIS, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261. Other maritime questions may be directed to Vickerman, Zachary and Miller, represented in Hawaii by Mr. Hugh Foster whom you may reach at 599-1805.

Very truly yours,

Randall Iwase
Executive Officer

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

THE OUTDOOR CIRCLE
Established 1912
A Non-profit Organization
1110 University Avenue, Suite 206
Honolulu, Hawaii 96826
(808) 941-0655

ALOHA TOWER
DEVELOPMENT CORP.
Jul 5 12 46 PM '90

July 3, 1990

Aloha Tower Development Corporation
State of Hawai'i
33 So. King St., Suite 403
Honolulu, Hawai'i 96813

SUBJECT: EIS Preparation Notice - The Waterfront At Aloha Tower

Gentlemen:

Thank your for forwarding us a copy of the Waterfront at Aloha Tower, Environmental Impact Statement Preparation Notice. This is indeed a major development. We will continue to circulate the document for review, but submit the following comments pending the final EIS.

1. The Outdoor Circle has been interested in the planning of the waterfront and Aloha Tower complex for many years. We have supported the purpose to "enhance the beautification of the waterfront" to "serve maritime uses" and to provide "public access" and to "transform the waterfront into a people place."

   When you consider the development of the Kakaako waterfront area together with the Aloha Tower area, one cannot help but ask if we can survive or support such massive development?

   We seriously question the availability of water and attach for your information, our statement to the Honolulu City Council regarding the adoption of the Oahu Water Management Plan.

2. It has always been the position of The Outdoor Circle that activities along the shoreline should be water oriented. We, therefore, oppose the two Honolulu Harborside Condominiums at piers 13 and 14. We are aware that the apartments are, no doubt, included to make the project financially feasible for the developer. This is a pretty high price to pay!

BRANCHES
KANEOHE KAUAI KONA LANIKAILUA NORTH SHORE MAUI
GARDEN CIRCLES
HAWAII KAI KOHALA (HAWAII) LANIKAI WAIALAE KAHALA

3. We support the preservation of Aloha Tower as the dominant symbol of the waterfront development. We also commend you for the preservation of Irwin Park and its revitalization. We would be very interested in the plans for the park as they develop. Our organizations has worked for the restoration of Irwin Park since it was turned into a parking lot during World War II.

4. We simply cannot help but comment on the sign "Aloha Marketplace" that is used on the front cover and again on Figure 5, Marketplace Elevation. We question the size of the sign with regard to the local sign regulations. All signs should conform to the local sign ordinance and State billboard law.

We would appreciate your keeping us on your mailing list.

Sincerely,

Susan Fristoe

Susan Fristoe, Chair
Landscape & Planting

Betty Crocker

Betty Crocker
President

enclosure: Statement on Oahu Water Mgt.

THE OUTDOOR CIRCLE
Established 1912
A Non-profit Organization
1110 University Avenue, Suite 205
Honolulu, Hawaii 96826
(808) 943-9658

June 1, 1990

The Honorable John Felix, Chair
and Members
Committee On Public Works
Honolulu Hale
Honolulu, Hawai'i 96813

BILL NO. 47 - ORDINANCE ESTABLISHING THE OAHU WATER MANAGEMENT PLAN

Dear Chair Felix and Members:

The Outdoor Circle strongly supports the establishment of an Oahu Water Management Plan that will protect this important resource from depletion and pollution. Bill 47, as written, fails to do this.

Under section 34-2.1., Intent, Bill 47 should state that further development on Oahu will be limited, by law, to that amount that our aquifers can supply, with the inevitable periods of drought taken into account.

Teaching water conservation is a noble cause, but it should not be used to prepare the public for water rationing. Those of us who have lived with water rationing in such areas as Santa Barbara, California and Corpus Christi, Texas, wonder at the reckless pace of development on this island without scientific proof that sufficient water is available.

Watching one's lawn turn to blowing dirt and sand, no water allowed for shrubs, flowers, fruit trees, or washing cars and the stench of urine from unflushed toilets add up to the reality of not enough water.

We believe further development on Oahu must be made contingent upon demonstration that sufficient water is available to supply Oahu's population in perpetuity, rather than just for the next thirty years.

We welcome this opportunity to express our concern.

Sincerely,

Sally Youngblood
Sally Youngblood
Public Affairs

Betty Crocker
Betty Crocker
President

BRANCHES
KANEOHE KAUAI KONA LANI-KAILUA NORTH SHORE MAUI
GARDEN CIRCLES
HAWAII KAI KOHALA (HAWAII) WAIALAE KAHALA

ALOHA TOWER DEVELOPMENT CORPORATION
33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

John Waihee
Governor
Roger A. Ulveling
Chairman
Randall Y. Iwase
Executive Officer

July 27, 1990

Ms. Betty Crocker, President
The Outdoor Circle
1110 University Avenue, Suite 205
Honolulu, Hawaii 96826

SUBJECT: The Waterfront at Aloha Tower
Environmental Impact Statement Preparation Notice
(EISPN)

Dear Ms. Crocker:

Thank you for your comments on the subject EISPN. We offer the following responses, in respective order, to your comments:

1. The City Council has recently adopted by ordinance the Oahu Water Management Plan which "consists of policies and strategies which guide the activities of the City and County of Honolulu and advises the State Commission on Water Resource Management in the areas of planning, management, water development and use and allocation of Oahu's limited water resources." (Bill No. 47, CD-1, 1990) The water source for the project will be coordinated both with the City and County Board of Water Supply and the State Commission on Water Resource Management.

2. We acknowledge your opposition to the condominiums. As you noted, they are essential to the financial feasibility of the project.

3. We appreciate your support for the restoration of Irwin Park and will be glad to solicit your input on our plans for the park as they are formulated.

4. Thank you for your observation regarding the marketplace sign. We concur that the conceptual sketches depict a sign that may be in violation of the local sign ordinance. Please be assured that all project signage shall comply with all applicable laws and ordinances.

We hope that we have satisfactorily responded to your comments. If you have any further questions, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

for Randall Iwase
Executive Officer

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

HISTORIC HAWAII
FOUNDATION

ALOHA TOWER
DEVELOPMENT CORP.
JUL 10 9 21 AM '90

July 9, 1990

Mr. Randall Y. Iwase
Executive Officer
Aloha Tower Development Corporation
33 South King Street, Suite 403
Honolulu, HI 96813

RE: Environmental Impact Statement Preparation Notice The Waterfront at Aloha Tower

Dear Randy:

Thank you for the opportunity to review and comment on the EIS Preparation Notice for the Waterfront at Aloha Tower.

As the statewide, historic preservation organization, we are concerned with the identification, documentation, protection and preservation of historic buildings, objects, sites and structures.

Those located within the proposed development are valuable and will require special consideration in the planning and implementation processes.

We are very pleased that the EIS Preparation Notice indicates concern and care for the historically valuable Aloha Tower, remnants of Fort Honolulu, Irwin Memorial Park and the artifacts in Walker Park.

We would appreciate consideration of saving and incorporating as much as possible of the existing facades of Piers 10 & 11 into the overall development.

We commend the developers for designing and using an overall architectural approach which reflects the theme of neighboring historic buildings.

Box 1658 Honolulu, HI 96806 • Telephone (808) 537-9564 • Fax (808) 526-3989 • The Ward Warehouse, Bldg. D, 2nd Floor • Honolulu, HI 96814

We support the proposed development of a historical documentary review and an archaeological survey as part of the EIS process to identify potentially significant features and determine potential positive and negative impacts along with appropriate safeguards and mitigation measures which may be necessary to protect historic features during construction.

We are especially concerned that the Aloha Tower is fully protected during the excavation of the below ground parking area.

We appreciate the incorporation of plans for interpretation into the EIS and ongoing operation of the historic sites and would be happy to provide resources in this endeavor.

Sincerely yours,

Sanford Murata
Sanford Murata
Chairman
Preservation Review Committee

cc: Wilson Okamoto & Associates, Inc. (E. Matsukawa)
Aloha Tower Associates (E. K. Smith)
Charles J. Pietsch III
Preservation Review Committee Members
Phyllis G. Fox

ALOHA TOWER DEVELOPMENT CORPORATION

John Waihee, Governor
Roger A. Ulveling, Chairman
Randall Y. Iwase, Executive Officer

33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

July 27, 1990

Mr. Sanford Murata, Chairman
Preservation Review Committee
Historic Hawaii Foundation
1050 Ala Moana Boulevard Building D
Honolulu, Hawaii 96814

SUBJECT: The Waterfront at Aloha Tower
Environmental Impact Statement Preparation Notice
(EISPN)

Dear Mr. Murata:

Thank you for your comments on the subject EISPN.

The developer has placed a high priority on protecting and enhancing the historical value of the Aloha Tower area. The Draft Environmental Impact Statement (EIS) shall include a thorough assessment of both archaeological and historical resources associated with this area. Please be assured that protection of Aloha Tower during the construction phase is a primary concern as it will serve as the centerpiece for the entire development.

Special attention has also been devoted to preserving the appearance of the original facades at Piers 10 and 11. Due to structural safety considerations, these facades cannot be preserved. Instead, they will be replicated and incorporated in the design of the proposed project.

We hope that we have satisfactorily responded to your comments. If you have any further questions, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

for Randall Iwase
Executive Officer

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

ROBERT M CRONE ARCHITECT 4130 PALOMA PLACE HONOLULU HI 96816

July 6, 1990

Marvin T Miura, PhD
Director
Office of Environmental Quality Control
465 South King Street, Room 104
Honolulu HI 96813

RE: THE WATERFRONT AT ALOHA TOWER EIS PREPARATION NOTICE

Dear Dr Miura,

I wish to thank you for the opportunity to comment on the EIS Preparation Notice for The Waterfront at Aloha Tower project.

I strongly support this project and believe that the positive impact it will have on the Honolulu waterfront, on Downtown Honolulu, on the city and on the state will far outweigh any short term or long term adverse impact it may generate.

I share the comments and concerns made by the Honolulu Chapter American Institute of Architects under separate cover and offer no additional comments of my own at this time.

I wish to be kept on your distribution list and may offer my own comment at a later stage. I look forward to the Draft EIS and to the ultimate realization of this project which will prove so beneficial to our community.

Mahalo.

Sincerely,

ROBERT M CRONE, AIA

cc: Aloha Tower Development Corp
c/o Wilson Okamoto & Associates

ALOHA TOWER DEVELOPMENT CORPORATION

John Waihee
Governor

Roger A. Ulveling
Chairman

Randall Y. Iwase
Executive Officer

33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

July 27, 1990

Mr. Robert M. Crone, AIA
4130 Paloma Place
Honolulu, Hawaii 96816

SUBJECT: The Waterfront at Aloha Tower
Environmental Impact Statement Preparation Notice
(EISPN)

Dear Mr. Crone:

Thank you for your supportive comments on the proposed Waterfront at Aloha Tower project. We have attached our response to the comments offered by the Honolulu Chapter of the American Institute of Architects for your review. You will be included on our list of consulted parties for the Draft EIS.

If you have any further questions regarding the EIS process, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

Randall Iwase
Executive Officer

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

Enclosure

Honolulu Chapter
THE AMERICAN
INSTITUTE
OF ARCHITECTS

July 6, 1990

Marvin T Miura, PhD
Director
Office of Environmental Quality Control
465 South King Street, Room 104
Honolulu HI 96813

RE: THE WATERFRONT AT ALOHA TOWER EIS PREPARATION NOTICE

Dear Dr Miura,

We of the Honolulu Chapter of the American Institute of Architects appreciate the opportunity to comment on the EIS Preparation Notice for The Waterfront at Aloha Tower project.

We strongly support this project and believe that the positive impact it will have on the Honolulu waterfront, on Downtown Honolulu, on the city and on the state will far outweigh any short term or long term adverse impact it may generate.

We are, however, concerned about two developments which have occurred since the project selection was initially announced in December 1989.

The first, due to extra pier length desired at Piers 5 and 6 and extra excavation requirements at Piers 8 through 11, is the possible increase of the maximum permitted building height for the office tower and the condominium towers from 350 feet to 400 feet. Although we fully realize that the additional revenue space generated will serve to offset the additional costs at Piers 5 and 6 and Piers 8 through 11 and that the effort is to locate the additional space away from the Aloha Tower itself, we urge maximum effort be made to limit the tower height as much as practical and possible. We do greatly appreciate and support the effort to maintain a lower scale in the immediate vicinity of the Aloha Tower itself. The Draft EIS might look into the impact of tower height and orientation, specifically this added height.

The second development is the relocation of the condominium parking at Piers 13 and 14 above grade. We believe this is of much greater impact than the additional building height. One very positive aspect of the project has been the location of parking below grade and out of view. It is most unfortunate that this parking, makai of Nimitz Highway, must now be planned above grade. An early recommendation of ours was to develop the condominium towers so as to allow makai views from street level through the towers to the harbor, such as mauka views through the municipal office building or harbor views under the World Trade Center at the Baltimore harbor. Above grade parking will preclude this. Understanding the requirement for no new net

bulkhead area, the current construction of Piers 13 and 14 on piles and the need for bulkhead space to provide below grade parking, we recommend one apparent avenue to explore is transforming bulkhead to piles elsewhere in the project in exchange for bulkhead space at Piers 13 and 14. We urge the designers to explore all avenues to eliminate the need for above grade parking on Piers 13 and 14. The Draft EIS might look at the impact of the loss of these street level harbor views.

We look forward to the Draft EIS and to the ultimate realization of this project which will prove so beneficial to our community.

Sincerely,

Ted Garduque

Theodore A. Garduque, AIA
President
Honolulu Chapter

cc: Aloha Tower Development Corp
c/o Wilson Okamoto & Associates

ALOHA TOWER DEVELOPMENT CORPORATION

John Waihee
Governor

Roger A. Ulveling
Chairman

Randall Y. Iwase
Executive Officer

33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

July 27, 1990

Mr. Theodore A. Garduque AIA, President
Honolulu Chapter
The American Institute of Architects
1128 Nuuanu Avenue
Honolulu, Hawaii 96817

SUBJECT: The Waterfront at Aloha Tower
Environmental Impact Statement Preparation Notice
(EISPN)

Dear Mr. Garduque:

Thank you for your comments on the subject EISPN. We offer the following responses, in respective order, to your comments:

1. A view plane assessment of the proposed development, including the condominium tower, shall be included in the Draft EIS.

2. We are equally concerned about the visual impacts of the above grade parking for the condominium towers; however, there appear to be no other feasible alternatives available at this time. The concept of exchanging pile supported deck space for bulkhead space is only applicable to "water dependent" uses. The Federal Environmental Protection Agency has indicated that it will not approve of newly created bulkhead space (fill) to be used for a parking structure. The condominium architects are currently exploring conceptual designs to minimize these visual impacts and hope to have those available for the Draft EIS.

We hope that we have satisfactorily responded to your comments. If you have any further questions, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

for Randall Iwase
Executive Officer

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

Hawaiian Electric Company, Inc.

ENV 2-1
JA/G

William A. Bonnet
Manager

July 6, 1990

ALOHA TOWER
DEVELOPMENT CORP.
Jul 9 7 52 AM '90

Mr. Randall Y. Iwase
Executive Officer
Aloha Tower Development Corporation
33 South King Street, Suite 403
Honolulu, HI 96813

Dear Mr. Iwase:

Subject: Environmental Impact Statement (EIS) Preparation Notice
The Waterfront at Aloha Tower

We have reviewed the subject EIS and have several comments.

1. HECO has several vaults servicing the existing complex and major ductlines along Ala Moana Boulevard and Bishop Street within the project site. Our major concern is how the project will impact on the major ductlines. These ductlines contain network system feeders and would be extremely costly to relocate. Also, should this portion of Ala Moana Boulevard and Bishop Street become closed to traffic, HECO will require an easement and vehicular access to its facilities.

2. On Page I-3: The first statement of land ownership paragraph says that all land in the project site is owned by the State except for 3.4 acres owned by HECO. Since the project site does not include any of HECO's property, the statement should be revised to delete any reference to HECO's property.

3. Reference is made to figures 1, 3 and 4. The expansion of Pier 6 development will infringe on Honolulu Units 8 & 9 circulating water tunnel discharge into the harbor. This development is the new Maritime Building and Passenger Terminal at Piers 5 and 6.

Sincerely,

William A. Bonnet

An HEI Company

ALOHA TOWER DEVELOPMENT CORPORATION

33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

July 27, 1990

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

SUBJECT: The Waterfront at Aloha Tower
Environmental Impact Statement Preparation Notice
(EISPN) [ENV 2-1 JA/G]

Dear Mr. Bonnet:

Thank you for your comments on the subject EISPN. We offer the following responses, in respective order, to your comments:

1. Your concerns regarding HECO ductlines along Ala Moana Boulevard and Bishop Street have been forwarded to the project designers. We look forward to establishing a cooperative relationship with HECO to resolve any potential concerns regarding your vital facilities.

2. The statement on land ownership shall be corrected in the Draft EIS.

3. The project designers have assured us that current plans using pile supported structures will avoid infringing on the discharge tunnel and the discharge itself. Again, we wish to coordinate our evolving designs to address potential HECO concerns.

We hope that we have satisfactorily responded to your comments. If you have any further questions, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

Randall Iwase
Executive Officer

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

AGENCIES, ORGANIZATIONS AND INDIVIDUALS CONSULTED DURING DRAFT EIS PHASE

The following agencies, organizations and individuals were consulted during the Draft Environmental Impact Statement Phase.

FEDERAL

Army-DAFE (Facilities Eng.-USASCH)
Environmental Protection Agency
U.S. Army Corp of Engineers
U.S. Coast Guard
U.S. Navy
U.S. Fish and Wildlife Service
U.S. Geological Survey
National Park Service
National Marine Fisheries Service
Federal Aviation Administration
U.S. Immigration & Naturalization Service
U.S. Bureau of Customs

STATE AGENCIES

Department of Agriculture
Department of Accounting & General Services
Department of Defense
Department of Education
Department of Hawaiian Home Lands
Department of Health
Department of Land & Natural Resources
DLNR Aquatics Resources Division
DLNR Office of Environmental & Conservation Affairs
DLNR State Historic Preservation Officer
Department of Business and Economic Development
DBED Library
Land Use Commission
Housing Finance & Development Corporation
Department of Transportation
DOT, Harbors Division
DOT, Highways Division
DOT, Airports Division
State Archives
State Energy Office

Office of State Planning
OSP, Coastal Zone Management
Hawaii Community Development Authority
Office of Hawaiian Affairs

CITY AND COUNTY OF HONOLULU

Board of Water Supply
Building Department
Department of Housing and Community Development
Department of General Planning
Department of Land Utilization
Department of Parks and Recreation
Department of Public Works
Department of Transportation Services
Fire Department
Police Department

UNIVERSITY OF HAWAII

Environmental Center - 4 copies
Marine Programs (Sea Grant)
Water Resources Research Center

MEDIA

Honolulu Star-Bulletin
Honolulu Advertiser
Pacific Business News
Downtown Planet

ELECTED OFFICIALS

Council Chair Arnold Morgado Jr.
Councilman Gary Gill
State Representative Mike Liu (District 34)
State Representative Kenneth Hiraki (District 35)
Senator Milton Holt (18th District)

LIBRARIES

University of Hawaii Hamilton Library, Hawaiian Collection
Legislative Reference Bureau
State Main Library

OTHERS

Downtown Neighborhood Board, No. 13
Chinese Chamber of Commerce of Hawaii
Eight Bells (Sea Grant)
Hawaii (Harbor) Pilots Association
Hawaii Maritime Center
American Hawaii Cruises
Davies Marine Agencies, Ltd.
Hawaii Pacific Maritime, Inc.
American Workboats, Inc.
Downtown Improvement Association
Outdoor Circle
Historic Hawaii Foundation/Main Street
International Longshoremen Workers Union
Robert Crone, Architect
American Institute of Architects
American Planning Association
American Lung Association
Hawaiian Electric Company
Hawaiian Telephone Company
Lunsford Dole Phillips
Chamber of Commerce of Hawaii

CORRECTION

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

We hope that we have satisfactorily responded to your comments. If you have any further questions, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

Randall Iwase
Executive Officer

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

AGENCIES, ORGANIZATIONS AND INDIVIDUALS CONSULTED DURING DRAFT EIS PHASE

The following agencies, organizations and individuals were consulted during the Draft Environmental Impact Statement Phase.

FEDERAL

Army-DAFE (Facilities Eng.-USASCH)
Environmental Protection Agency
U.S. Army Corp of Engineers
U.S. Coast Guard
U.S. Navy
U.S. Fish and Wildlife Service
U.S. Geological Survey
National Park Service
National Marine Fisheries Service
Federal Aviation Administration
U.S. Immigration & Naturalization Service
U.S. Bureau of Customs

STATE AGENCIES

Department of Agriculture
Department of Accounting & General Services
Department of Defense
Department of Education
Department of Hawaiian Home Lands
Department of Health
Department of Land & Natural Resources
DLNR Aquatics Resources Division
DLNR Office of Environmental & Conservation Affairs
DLNR State Historic Preservation Officer
Department of Business and Economic Development
DBED Library
Land Use Commission
Housing Finance & Development Corporation
Department of Transportation
DOT, Harbors Division
DOT, Highways Division
DOT, Airports Division
State Archives
State Energy Office

Office of State Planning
OSP, Coastal Zone Management
Hawaii Community Development Authority
Office of Hawaiian Affairs

CITY AND COUNTY OF HONOLULU

Board of Water Supply
Building Department
Department of Housing and Community Development
Department of General Planning
Department of Land Utilization
Department of Parks and Recreation
Department of Public Works
Department of Transportation Services
Fire Department
Police Department

UNIVERSITY OF HAWAII

Environmental Center - 4 copies
Marine Programs (Sea Grant)
Water Resources Research Center

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Honolulu Star-Bulletin
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Pacific Business News
Downtown Planet

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Councilman Gary Gill
State Representative Mike Liu (District 34)
State Representative Kenneth Hiraki (District 35)
Senator Milton Holt (18th District)

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State Main Library

OTHERS

Downtown Neighborhood Board, No. 13
Chinese Chamber of Commerce of Hawaii
Eight Bells (Sea Grant)
Hawaii (Harbor) Pilots Association
Hawaii Maritime Center
American Hawaii Cruises
Davies Marine Agencies, Ltd.
Hawaii Pacific Maritime, Inc.
American Workboats, Inc.
Downtown Improvement Association
Outdoor Circle
Historic Hawaii Foundation/Main Street
International Longshoremen Workers Union
Robert Crone, Architect
American Institute of Architects
American Planning Association
American Lung Association
Hawaiian Electric Company
Hawaiian Telephone Company
Lunsford Dole Phillips
Chamber of Commerce of Hawaii

The following is a list of agencies, organizations and individuals who responded (*) and provided substantive comments (**) on the Draft EIS.

FEDERAL

** U.S. Army Corp of Engineers
** U.S. Coast Guard
* U.S. Navy
** Federal Aviation Administration

STATE AGENCIES

* Department of Accounting & General Services
* Department of Defense
** Department of Land & Natural Resources
* Department of Business & Economic Development
** Land Use Commission
** Housing Finance & Development Corporation
** Department of Transportation
* Hawaii Community Development Authority
** Office of Hawaiian Affairs

CITY AND COUNTY OF HONOLULU

** Board of Water Supply
* Building Department
** Department of Housing and Community Development
** Department of General Planning
** Department of Land Utilization
** Department of Parks and Recreation
** Department of Public Works
** Department of Transportation Services
** Fire Department
* Police Department

UNIVERSITY OF HAWAII

** Environmental Center

OTHERS

- ** Downtown Neighborhood Board, No. 13
- ** Hawaii (Harbor) Pilots Association
- ** American Institute of Architects
- ** Hawaiian Electric Company
- ** Lunsford Dole Phillips
- ** Chamber of Commerce of Hawaii
- ** People Against Chinatown Eviction

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

REPLY TO ATTENTION OF

September 28, 1990

Planning Division

Dr. Bruce Anderson
Acting Interim Director
Office of Environmental
Quality Control
465 South King Street, Room 104
Honolulu, Hawaii 96813

Dear Dr. Anderson:

We have reviewed the Draft Environmental Impact Statement (DEIS) for the Waterfront at Aloha Tower, Honolulu, Hawaii. The following comments are offered:

a. Our previous comments in response to the Preparation Notice (letter dated July 5, 1990) have been addressed in the DEIS.

b. As noted in our previous comments and in the DEIS, a Department of the Army permit is required. Operations Division has been meeting with Aloha Tower Associates to discuss application requirements.

Sincerely,

Kisuk Cheung
Director of Engineering

Copies Furnished:

Aloha Tower Development Corporation
P.O. Box 2359
Honolulu, Hawaii 96804

Mr. Earl Matsukawa
c/o Wilson Okamoto & Associates
1150 South King Street, Suite 800
Honolulu, Hawaii 96814

ALOHA TOWER DEVELOPMENT CORPORATION

John Waihee
Governor

Roger A. Ulveling
Chairman

Randall Y. Iwase
Executive Officer

33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

November 30, 1990

Mr. Kisuk Cheung, Director of Engineering
U.S. Army Engineer District, Planning Division
Building 230
Fort Shafter, Hawaii 96858-5440

SUBJECT: The Waterfront at Aloha Tower
Draft Environmental Impact Statement (EIS)

Dear Mr. Cheung:

Thank you for responding to the request for comments on the Draft EIS. Your participation in the review process helps assure that a range of interests and expertise are considered in regard to the proposed action.

We appreciate the continuing efforts of your Operations Division in facilitating communication with Aloha Tower Associates regarding permit application requirements.

If you have any further questions, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

Daniel Orodenker
Executive Assistant

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

U.S. Department of Transportation
United States Coast Guard

Commander (oan)
Fourteenth Coast Guard District

Prince Kalanianaole Federal Building
300 Ala Moana Blvd.
Honolulu, Hawaii 96850-4982
Phone: (808) 541-2315

16500
Serial 32529
30 OCT 1990

ALOHA TOWER DEVELOPMENT CORP.
Nov 7 11 22 AM '90

Aloha Tower Development Corporation
P. O. Box 2359
Honolulu, Hawaii 96804

Dear Sir:

I have received and reviewed a draft copy of your Environmental Impact Statement concerning the proposed Aloha Tower Waterfront Project.

The Coast Guard currently maintains the Honolulu Harbor Rear Range Light which is located atop the southeast corner of the pier 8 building. The site is leased from the State of Hawaii.

As this office became aware of plans to raze the existing pier 8 building, we discussed with members of the Aloha Tower Authority the need to continue to provide mariners using Honolulu Harbor (especially large commercial vessels) with range lights in the interest of safe navigation. Mr. Donald Gately, Oahu District Manager of the State of Hawaii, Department of Transportation, assured us that a temporary rear range light would be provided and that provisions would be made in the waterfront development plans for a replacement light structure mounted either on top of the new pier 8 building, or on a suitable site along the range line. I saw nothing in your draft EIS addressing the range light issue.

As discussed on several occasions, it is critical that the range light issue be addressed early in the planning stages of the waterfront development. Engineering allowances must be made if the light is to be placed atop the new pier 8 building since the height of eye, wind load on the structure and rangeboard, etc., have to be considered.

30 OCT 1990

I look forward to hearing from you soon. Our District point of contact is Commander Kyle Jones at 541-2126.

Sincerely,

M S Swegles

M. S. SWEGLES
Lieutenant, U. S. Coast Guard
Chief, Aids to Navigation Branch (Acting)
Fourteenth Coast Guard District
By direction of the District Commander

Copy: CCGD14(dpl)
Mr. Donald Gately

ALOHA TOWER DEVELOPMENT CORPORATION

John Waihee
Governor

Roger A. Ulveling
Chairman

Randall Y. Iwase
Executive Officer

33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

November 30, 1990

Lieutenant M. S. Swegles
United States Coast Guard
9th Floor dpl
300 Ala Moana Boulevard
Honolulu, Hawaii 96850-4982

SUBJECT: The Waterfront at Aloha Tower
Draft Environmental Impact Statement (EIS)

Dear Lieutenant Swegles:

Thank you for your comments on the subject Draft EIS. Your observation regarding the range light at Pier 8 has been noted. The range light will be maintained and improved, if required in coordination with the Coast Guard, during construction of the proposed project. We understand that could include adjustment to accommodate a clearer viewing angle. During construction, a temporary range light will be installed in a similar location and incorporated into the design of the project. Final placement will be a permanent range light as coordinated with the U. S. Coast Guard.

We hope we have satisfactorily responded to your comments. If you have any further questions regarding the Draft EIS for the project, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

Daniel Orodenker
Executive Assistant

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

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

IN REPLY REFER TO
11010
Ser 00F(202)/3032
05 SEP 1990

Dr. Bruce S. Anderson
Acting Director
Office of Environmental Quality Control
State of Hawaii
465 South King Street, Room 104
Honolulu, HI 96813

Dear Dr. Anderson:

THE WATERFRONT AT ALOHA TOWER
DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)

As requested by your letter which was received on August 23, 1990, we have reviewed the DEIS and have no comments to offer at this time.

Thank you for the opportunity to review the DEIS. Since we have no further use for the document, we are returning it for your files.

The Navy's point of contact is Mr. Bill Liu, telephone 471-3324.

Sincerely,

W. K. Liu

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

Copy to:
Aloha Tower Development Corp.
Wilson Okamoto & Associates
OEQC (w/DEIS)

ALOHA TOWER DEVELOPMENT CORPORATION
33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

John Waihee
Governor

Roger A. Ulveling
Chairman

Randall Y. Iwase
Executive Officer

November 30, 1990

Mr. W. K. Liu
Assistant Base Civil Engineer
Department of the Navy
Naval Base Pearl Harbor
Box 110
Pearl Harbor, Hawaii 96860-5020

SUBJECT: The Waterfront at Aloha Tower
Draft Environmental Impact Statement (EIS)

Dear Mr. Liu:

Thank you for responding to the request for comments on the subject Draft EIS. Your participation in this review process helps assure that a range of interests and expertise are considered in regard to the proposed action.

If you have any questions regarding the EIS or the EIS process, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

Daniel E. Orodenker

Daniel Orodenker
Executive Assistant

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

US Department of Transportation
Federal Aviation Administration

AIRPORTS DISTRICT OFFICE
BOX 50244
HONOLULU, HI 96850-0001
Telephone: (808) 541-1243

September 12, 1990

Mr. Mark H. Hastert
Helber Hastert & Kimura, Planners
Aloha Tower Development Corporation
33 South King Street, Suite 403
Honolulu, Hawaii 96813

Dear Mr. Hastert:

We have reviewed the Draft EIS for the Waterfront at Aloha Tower.

Our only comment remains the same as on the Preparation Notice. The condominium towers and office tower at approximately 400' (pages II-7 and II-15) would penetrate the 50:1 approach surface to Runway 26L at Honolulu International Airport. The enclosed portion of the Approach and Clear Zone Drawing for Honolulu has been highlighted in red to show an approach surface elevation of 335' MSL at the tower sites.

Also, we note that all buildings will require the submittal of a Notice of Proposed Construction, FAA Form 7460-1.

We appreciate the opportunity to review this Draft EIS. If you have any questions regarding our comment, please call us.

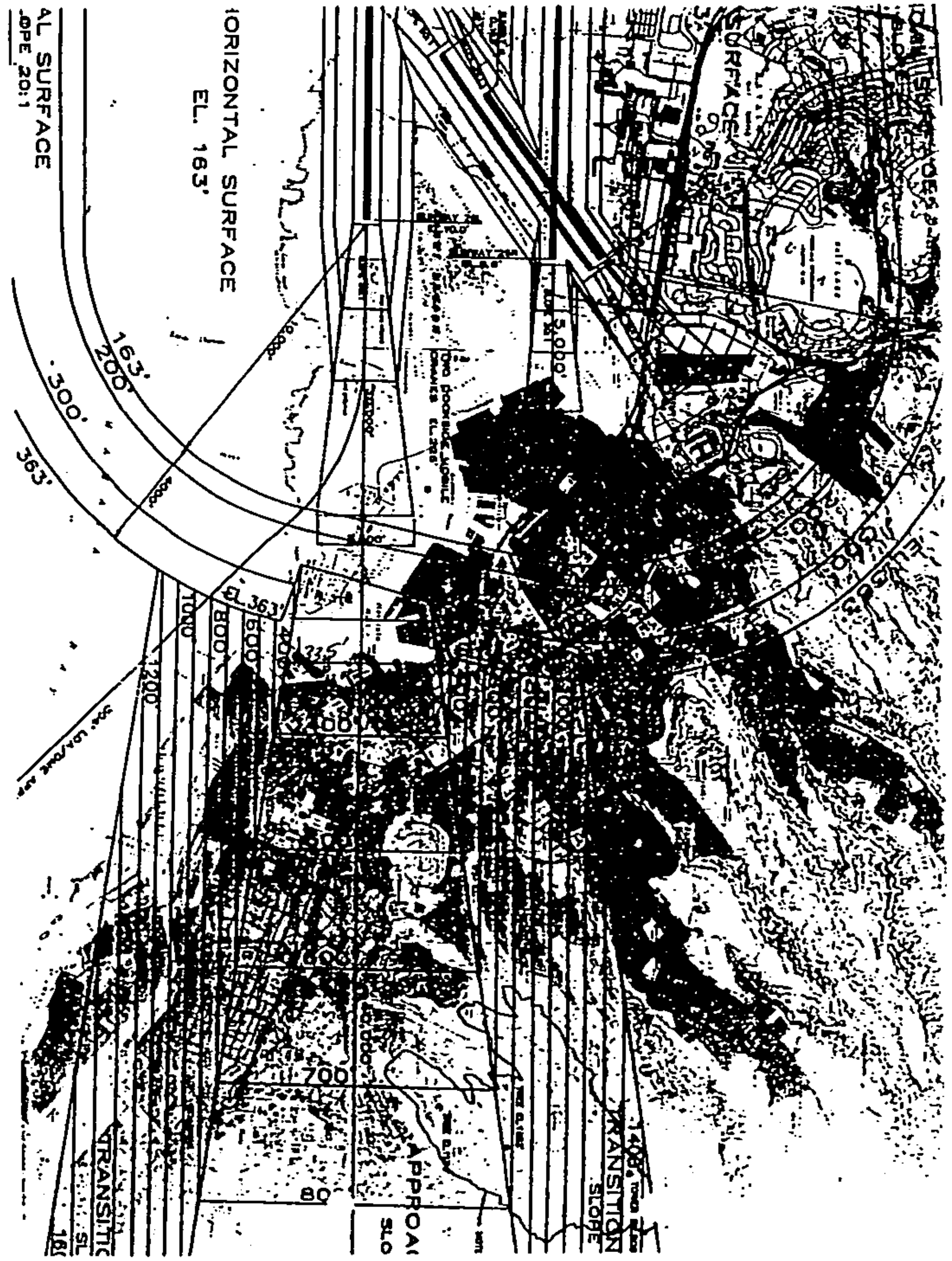
Sincerely,

David J. Welhouse
Airport Engineer/Planner

Henry A. Sumida
Airports District Office Manager

Enclosure

cc:
Wilson Okamoto (Earl Matsukawa) w/encl.



ALOHA TOWER DEVELOPMENT CORPORATION

33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

John Waihee
Governor

Roger A. Ulveling
Chairman

Randall Y. Iwase
Executive Officer

November 30, 1990

Mr. David J. Welhouse, Airport Engineer/Planner
Federal Aviation Administration
Airports District Office
P. O. Box 50244
Honolulu, Hawaii 96850-0001

SUBJECT: The Waterfront at Aloha Tower
Draft Environmental Impact Statement (EIS)

Dear Mr. Welhouse:

Thank you for your comments on the subject Draft EIS. The project developers recognize that the proposed condominium towers and office tower will penetrate a 50:1 approach surface to Runway 26L at Honolulu International Airport. Therefore, on June 18, 1990, they filed the required 7460-1 forms with the FAA office in Los Angeles to initiate the process for a full FAA aeronautical study under Part 77. Our consultant advises us that the FAA will probably use the operational standard of 34:1 contained in TERPS instead of 50:1. The proposed structures do not exceed the 34:1 slope. We are awaiting the FAA decision at this time.

If you have any further questions regarding the Draft EIS for the project, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

Daniel Orodenker
Executive Assistant

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

JOHN WAIHEE
GOVERNOR

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

RUSSEL S. NAGATA
COMPTROLLER
JAMES H. YASUDA
DEPUTY COMPTROLLER

LETTER NO. (P)1711.0

RECD
90 AUG 31 A9:34
OFC. OF ENVIRONMENTAL QUALITY CONTROL

AUG 30 1990

Governor
State of Hawaii
c/o Office of Environmental
  Quality Control
465 South King Street, Room 104
Honolulu, Hawaii 96813

Gentlemen:

Subject: The Waterfront at Aloha Tower
Draft EIS

Thank you for the opportunity to review the subject document. We have no comments to offer.

Should there be any questions, please have your staff contact Mr. Ralph Yukumoto of the Planning Branch at 548-7192.

Respectfully,

RUSSEL S. NAGATA
State Comptroller

ALOHA TOWER DEVELOPMENT CORPORATION
33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

John Waihee
Governor
Roger A. Ulveling
Chairman
Randall Y. Iwase
Executive Officer

November 30, 1990

The Honorable Russel S. Nagata, State Comptroller
State of Hawaii
Department of Accounting and General Services
P. O. Box 119
Honolulu, Hawaii 96810

SUBJECT: The Waterfront at Aloha Tower
Draft Environmental Impact Statement (EIS)

Dear Mr. Nagata:

Thank you for responding to the request for comments on the subject Draft EIS. Your participation in this review process helps assure that a range of interests and expertise are considered in regard to the proposed action.

If you have any questions on the EIS or the review process, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours

Daniel Orodenker
Executive Assistant

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

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

August 23, 1990

Engineering Office

Governor, State of Hawaii
c/o Officer of Environmental
Quality Control
465 South King Street, #104
Honolulu, Hawaii 96813

Dear Governor:

The Waterfront at Aloha Tower
Draft Environmental Impact Statement

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

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

Sincerely,

Jerry M. Matsuda

Jerry M. Matsuda
Lieutenant Colonel
Hawaii Air National Guard
Contracting & Engineering Officer

cc: Aloha Tower Development Corporation
Wilson Okamoto & Associates

NATIONAL GUARD
Americans At Their Best

ALOHA TOWER DEVELOPMENT CORPORATION

John Waihee, Governor
Roger A. Ulveling, Chairman
Randall Y. Iwase, Executive Officer

33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

November 30, 1990

Lt. Colonel Jerry Masuda,
Contracting & Engineering Officer
Hawaii National Guard
Department of Defense
State of Hawaii
Office of the Adjutant General
3949 Diamond Head Road
Honolulu, Hawaii 96816-4495

SUBJECT: The Waterfront at Aloha Tower
Draft Environmental Impact Statement (EIS)

Dear Lt. Colonel Masuda:

Thank you for responding to the request for comments on the subject Draft EIS. Your participation in this review process helps assure that a range of interests and expertise are considered in regard to the proposed action.

If you have any questions on the EIS or the review process, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

Daniel Orodenker
Executive Assistant

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

JOHN WAIHEE
GOVERNOR OF HAWAII

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

REF:OCEA:JN

File No.: 91-98
Doc. No.: 0048E

OCT 15 1990

MEMORANDUM

TO: Office of Environmental Quality Control

FROM: William W. Paty, Chairperson
Board of Land and Natural Resources WP

SUBJECT: The Waterfront at Aloha Tower - Draft EIS

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

In order to adequately evaluate the project from an aquatic resources standpoint, the Final EIS should address the impacts of construction activities on the water quality, marine life and fisheries values of Honolulu Harbor and adjacent nearshore waters. The applicant also should describe the precautions that will be taken to minimize erosion and siltation.

Since Honolulu Harbor is one of several primary sources of baitfish for the Hawaiian skipjack tuna industry, particular attention should be given to potential impacts on the nehu fishery in the harbor. Impacts on recreational fisheries also should be addressed.

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

cc: Aloha Tower Development Corp.
Earl Matsukawa, Wilson Okamoto Associates

ALOHA TOWER DEVELOPMENT CORPORATION
33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

John Waihee
Governor
Roger A. Ulveling
Chairman
Randall Y. Iwase
Executive Officer

November 30, 1990

The Honorable William W. Paty
Department of Land and Natural Resources
P.O. Box 621
Honolulu, Hawaii 96809

SUBJECT: The Waterfront at Aloha Tower
Draft Environmental Impact Statement (EIS)

Dear Mr. Paty:

Thank you for your comments on the Draft EIS. We offer the following responses, in respective order, to your comments:

1. The impacts on water quality, marine life and fisheries are discussed on pages VI-6 to VI-7 and VI-39 to VI-40 of the Draft EIS. The marine environmental assessment by Oceanit Laboratories in appendix E provides a more in-depth discussion of these topics on pages IV-1 to IV-5. Potential mitigation measures are discussed on page VI-7 of the Draft EIS and include a water quality monitoring program for dewatering activities and the possible use of silt curtains to control silt plumes.

2. Baitfish resources of Honolulu Harbor are discussed on page III-25 of the Draft EIS and also elaborated on in appendix E on page III-38. Construction impacts on baitfish, as well as those upon other marine resources, is not anticipated to be significant as such activities are not expected to contain effluent that would have greater impact on the harbor than normal runoff or silt churned up by ships using the harbor. Impacts upon recreational fisheries are similarly anticipated to be minimal. However, some coral growth will be lost in the vicinity of Piers 5 and 6, which is a popular fishing area discussed on page VI-39 of

the Draft EIS. Potential restriction on public access to maritime facilities is also discussed on page VI-44 of the Draft EIS.

If you have any further questions regarding the Draft EIS, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

Daniel Orodenker
Executive Assistant

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

DEPARTMENT OF BUSINESS AND ECONOMIC DEVELOPMENT

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

ENERGY DIVISION, 335 MERCHANT ST., RM 110, HONOLULU, HAWAII 96813 FAX (808) 531-5243 ENERGY HOTLINE (808) 548-4080

90:0015M-059

September 19, 1990

RECEIVED SEP 2 ? 1990

MEMORANDUM

TO: The Honorable John Waihee
Governor, State of Hawaii

FROM: for Roger A. Ulveling

SUBJECT: The Waterfront at Aloha Tower - Draft Environmental Impact Statement

We wish to inform you that we have no comments to offer on the subject environmental impact statement.

Thank you for the opportunity to review the document.

RAU/MLT:dt

cc: Aloha Tower Development Corporation
Mr. Earl Matsukawa
Office of Environmental Quality Control

Effective July 1, 1990, the department name has been changed to Department of Business, Economic Development & Tourism

ALOHA TOWER DEVELOPMENT CORPORATION

33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

John Waihee, Governor
Roger A. Ulveling, Chairman
Randall Y. Iwase, Executive Officer

November 30, 1990

The Honorable Roger A. Ulveling, Director
Department of Business, Economic Development and Tourism
Energy Division
335 Merchant Street, Room 110
Honolulu, Hawaii 96813

SUBJECT: The Waterfront at Aloha Tower
Draft Environmental Impact Statement (EIS)

Dear Mr. Ulveling:

Thank you for responding to the request for comments on the subject Draft EIS. Your participation in this review process helps assure that a range of interests and expertise are considered in regard to the proposed action.

If you have any questions in the EIS or the review process, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

Daniel Orodenker
Executive Assistant

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

JOHN WAIHEE
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT, AND TOURISM
LAND USE COMMISSION
Room 104, Old Federal Building
335 Merchant Street
Honolulu, Hawaii 96813
Telephone: 548-4611

ESTHER UEDA
EXECUTIVE OFFICER

ALOHA TOWER
DEVELOPMENT CORP.
SEP 10 7 59 AM '90

September 7, 1990

Mr. Mark H. Hastert
Helber Hastert & Kimura,
Planners for Aloha Tower
Development Corporation
33 South King Street, Suite 403
Honolulu, Hawaii 96813

Dear Mr. Hastert:

Subject: Draft EIS for The Waterfront At Aloha Tower

We have reviewed the Draft EIS and would like to clarify paragraph one on page V-13 to indicate that the Project Area is designated within the State Land Use Urban and Conservation Districts. Proposed improvements which are designated in the Conservation District may require a land use district boundary amendment or a Conservation District Use Permit.

For your information, the Commission Staff is processing a boundary interpretation to clarify the location of the Urban/Conservation District Boundary for this area.

Thank you for the opportunity to comment.

Sincerely,

Esther Ueda

ESTHER UEDA
Executive Officer

EU:to

ALOHA TOWER DEVELOPMENT CORPORATION
33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

John Waihee
Governor
Roger A. Ulveling
Chairman
Randall Y. Iwase
Executive Officer

November 30, 1990

The Honorable Esther Ueda, Executive Officer
Land Use Commission
Room 104, Old Federal Building
335 Merchant Street
Honolulu, Hawaii 96813

SUBJECT: The Waterfront at Aloha Tower
Draft Environmental Impact Statement (EIS)

Dear Ms. Ueda:

Thank you for your comments on the Draft EIS. Your clarification of the requirement for either a land use district boundary amendment or Conservation District Use permit for improvements in the Conservation District shall be included in the Final EIS. Also, we have received the boundary interpretation between the Urban and Conservation Districts within the project area and have depicted the boundary in the Final EIS. Your assistance in securing this interpretation is greatly appreciated.

We hope we have satisfactorily responded to your comments. If you have any questions, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

Daniel Orodenker
Executive Assistant

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

JOHN WAIHEE
GOVERNOR

JOSEPH K. CONANT
EXECUTIVE DIRECTOR

STATE OF HAWAII
DEPARTMENT OF BUDGET AND FINANCE
HOUSING FINANCE AND DEVELOPMENT CORPORATION
SEVEN WATERFRONT PLAZA, SUITE 300
500 ALA MOANA BOULEVARD
HONOLULU, HAWAII 96813
FAX (808) 543-2941

IN REPLY REFER TO

90:PLNG/4792dl

October 8, 1990

TO: The Honorable John Waihee
Governor, State of Hawaii

FROM: Joseph K. Conant
Executive Director

SUBJECT: DRAFT EIS FOR THE WATERFRONT AT ALOHA TOWER

We have reviewed the Draft EIS for the Waterfront at Aloha Tower project and have the following comments to offer:

1) The DEIS mentions that The Aloha Tower Housing Foundation will be established for the purpose of "assisting in providing fit and affordable housing for the very poor in Hawaii." $2 million will be initially contributed for the purpose of establishing a working capital fund during construction of improvements. A contribution of five percent of pre-tax profits from the rental and sale of improvements during the term of ATA's ownership of improvements is estimated to yield $44 million during the first ten years. The DEIS does not, however, expand on how these moneys will be used to assist the poor, nor does it expand on how the formula of 5% of pre-tax profits was derived.

   In our letter dated July 2, 1990 regarding the EISPN for this project, we expressed an interest in obtaining more information on the fund, including the basis for establishing funding at five percent of pre-tax profits. These have still not been addressed in the DEIS.

2) The Honolulu Harborside condominium complex will contain approximately 350 units in twin towers rising to about 400 feet. We understand from your response to Benjamin Lee, Chief Planning Officer of the City and County of Honolulu, that none of these units will be affordable.

   The DEIS fails to discuss the types of housing units to be developed, as well as estimated sale prices.

3) Page V-1 - Although the discussion on the Hawaii State Plan states that The Enterprise Foundation will supplement the goals and objectives of the Hawaii State Plan by assisting the very poor in Hawaii in obtaining fit and affordable housing, there are no housing objectives listed on the pages following.

4) Page V-3 - The State Functional Plans are no longer adopted by the State Legislature, and the number of functional plans have been reduced. This discussion needs to be updated.

5) Page V-5 - The State Housing Functional Plan was updated in 1989. The objectives and policies cited in the DEIS are from a previous version of the Plan.

If you have any questions regarding our comments, please call Janice Takahashi at 543-2999.

DL:eks

c: Aloha Tower Development Corporation
   Mr. Earl Matsukawa, Wilson Okamoto & Associates

ALOHA TOWER DEVELOPMENT CORPORATION

John Waihee
Governor

Roger A. Ulveling
Chairman

Randall Y. Iwase
Executive Officer

33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

November 30, 1990

The Honorable Joseph K. Conant, Executive Director
Housing Finance and Development Corporation
Seven Waterfront Plaza, Suite 300
500 Ala Moana Boulevard
Honolulu, Hawaii 96813

SUBJECT: The Waterfront at Aloha Tower
Draft Environmental Impact Statement (EIS)

Dear Mr. Conant:

Thank you for your comments on the Draft EIS. We offer the following responses, in respective order, to your comments:

1. The Aloha Tower Housing Foundation has targeted its assistance to provide fit and affordable housing for those persons throughout the State whose income is less than 80 percent of the median income. It is not expected, however, that the Foundation will receive significant funds for a period of at least five years. When funds become available, the Foundation will work with the State Housing Finance and Development Corporation and/or other State or local agencies to address low income housing shortages through development of housing units or provision of necessary services supporting their development. The actual manner in which these funds will be applied, however, is uncertain at this time.

   It should be clarified that the Foundation is not proposed as a mitigation measure for any identified project impact nor is it required as a condition of development approvals. Thus, details such as the derivation of the pre-tax profit formula is beyond the scope of discussion for the EIS.

2. Thank you for pointing out our inadvertent errors and omissions. We will update our discussions relating the Hawaii State Plan and the State Functional Plans.

We hope that we have satisfactorily responded to your comments. If you have any further questions, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

Daniel Orodenker
Executive Assistant

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

JOHN WAIHEE

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

EDWARD Y. HIRATA
DIRECTOR

DEPUTY DIRECTORS
DAN T KOCHI (PRIMARY)
RONALD N HIRANO
JEANNE K SCHULTZ
CALVIN M TSUDA

IN REPLY REFER TO

October 18, 1990

HAR-EP 8254.91

To: Bruce Anderson, Acting Director
The Office of Environmental Quality Control

From: Edward Y. Hirata, Director
Department of Transportation

Subject: DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)
THE WATERFRONT AT ALOHA TOWER

We have reviewed the DEIS for the Waterfront at Aloha Tower and offer the following comments:

1. Page II-7, 2. The Maritime Building and Passenger Terminal at Piers 5 and 6. The last sentence of the third paragraph should read, "Small retail shops, restaurants, and snack shops will only occupy the interior portions of the ground level and second floor for the convenience of office and dock workers, and cruise ship passengers."

2. Page II-16, 6. Honolulu Port Historic Park at Pier 12. The paragraph should be clarified to note that there will be no berthing facilities at this pier.

3. Page II-17, 8. Pedestrian Promenade. The pedestrian promenade will be closed to pedestrians during maritime operations. The promenade as shown in the report will also present accessibility problems. Our concern is primarily one of maintenance to Nimitz Highway. We must have direct access to inspect and maintain the infrastructure under the viaduct.

4. Page II-19, 3. Piers 8-11. Disposition of the existing Harbors Division Administration Building at 79 South Nimitz Highway should be discussed.

The second sentence of the second paragraph on maintaining harbor related functions throughout the construction, should be more fully discussed and explained.

5. We do not foresee any problem with encroachment into the Ala Moana Minipark area for the proposed access to the parking structure. The park itself must be reserved for open space. Construction plans for this area should be submitted for our approval; we will coordinate the required concurrence with the responsible federal agency.

6. We oppose at grade crossings where there are pedestrian overpasses. At grade crossings will adversely affect the operations of the roadway and reduce its capacity.

Adequacy of one pedestrian overpass is questionable and a study should be made to evaluate the need for additional pedestrian overpasses.

7. The TIAR should be revised to reflect the conditions and assumptions of the OMPO Long-Range Transportation Plan. Additionally, major planned developments which would have a regional impact on the traffic in the area, and which were not included in the OMPO Plan update, should be reflected in the TIAR (e.g. HIA expansion and Keehi Lagoon Complex).

An evaluation of the traffic impacts and effectiveness of the proposed mitigation measures should be included as part of the TIAR. This should include projected traffic volumes (for the roadway segments and turning movements) and LOS analyses.

The feasibility of the mitigation measures proposed, including ROW constraints, spacing of the median openings, etc., will have to be examined. Also, an arterial progression analysis should be conducted.

The revised TIAR should be submitted for our review.

8. Construction trucks should not be permitted to enter or leave the project site during the peak traffic hours. Also, lane closures will not be allowed during the peak hours.

HAR-EP 8254.91

9. Access plans and other construction work within the highway ROW must be submitted for our review and approval.

c: ATDC - Daniel Orondenker
Wilson Okamoto & Associates - Earl Matsukawa

ALOHA TOWER DEVELOPMENT CORPORATION

John Waihee, Governor
Roger A. Ulveling, Chairman
Randall Y. Iwase, Executive Officer

33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

November 30, 1990

The Honorable Edward Y. Hirata, Director
Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813-5097

SUBJECT: The Waterfront at Aloha Tower
Draft Environmental Impact Statement (EIS)

Dear Mr. Hirata:

Thank you for responding to the request for comments on the subject Draft EIS. We offer the following responses, in respective order, to your comments:

1. Your wording shall be incorporated in the Final EIS.

2. The description of the Honolulu Fort Historic park shall be revised in the Final EIS to clarify that no berthing facilities will be provided there.

3. Your concern regarding infrastructure accessibility under the viaduct at Nimitz Highway has been noted. The pedestrian promenade will be raised along Nimitz Highway to allow access.

4. A detailed plan for the interim relocation of the Harbors Division Administration shall be formulated. Land and water borne construction activities will affect other activities in the Harbor and consequently must be planned in detail with these constraints in mind. This planning responsibility is acknowledged and will be met at an appropriate time. The piers within the project have been planned for continued multiple uses according to the stated needs of the DOT-Harbors and several user maritime groups. A summary of uses, which currently includes commercial shipping, will be included in the Final EIS.

5. Your observation regarding open space encroachment into Ala Moana Mini Park has been noted.

6. A pedestrian analysis has been completed and will be included as an appendix in the Final EIS.

7. We have been in contact with Oahu Metropolitan Planning Organization (OMPO) and been advised that OMPO does not have long-range forecasts for 2005 for Nimitz Highway. At this time, the only data available is in the form of screenline volumes projections across the major corridors serving Downtown Honolulu. Thus, analysis of future conditions for 2005 and beyond can only be completed when OMPO has examined the Nimitz Highway-Ala Moana Boulevard corridor in more detail. When volumes for Nimitz Highway and Ala Moana Boulevard are available, the requested analysis can be conducted. We shall pursue further discussion with DOT-Highways to agree on an approach to address this concern.

   The feasibility of mitigation measures proposed outside of the immediate project area are indicated in Chapter 6 of the TIAR. In some instances, the indicated mitigation measure is not feasible due to right-of-way restrictions and is so noted in the text of the report. Other mitigation measures require a high level of coordination between State and City transportation agencies. Most recommended mitigations are feasible from an engineering and right-of-way standpoint.

   The arterial progression analysis is being conducted and will be included in the Final EIS.

   The mitigation measures in the immediate vicinity of the project area, as discussed in the TIAR analysis, have been designed into the proposed project. The developer intends to implement these mitigations as part of the project plans. Some proposals, such as the pedestrian crosswalk on the Diamond Head side of Bishop Street, are being reworked via dialog with DOT-Highways. We shall pursue further discussion with DOT-Highways regarding mitigation proposals.

8. A detailed traffic flow plan for the project site cannot be developed until the schedule for construction has been fully determined. Traffic flows on-site and access to the construction site would be the responsibility of the contractor in coordination with DTS and DOT. Your comments are also discussed on page 6-12 (Construction Traffic) in the TIAR (appendix C).

9. All access plans and other construction work within the highway ROW shall be submitted to DOT-Highways for review and approval.

We hope we have satisfactorily responded to your comments. If you have any questions, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

Daniel Orodenker
Executive Assistant

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

Hawaii Community Development Authority
677 Ala Moana Boulevard, Suite 1001 Honolulu, Hawaii 96813
(808) 548-7180 FAX: (808) 599-2613

RECEIVED SEP 10 1990

Ref. No.: PL EIS 6.17

September 4, 1990

Mr. Mark H. Hastert
Helber Hastert & Kimura
Planners
Suite 2590
Grosvenor Center
733 Bishop Street
Honolulu, Hawaii 96813

Dear Mr. Hastert:

Re: Draft Environmental Impact Statement (DSEIS) for the Waterfront at Aloha Tower

Thank you for the opportunity to comment on the DSEIS for the Waterfront at Aloha Tower. We have no comments to offer at this time. Should there be any substantial changes to the existing proposal, we recommend that we be consulted to assure that the project will not impact the Kakaako Makai Area.

If we can be of further assistance to you, please contact Milton Arakawa at 548-2200. Once again, thank you for the opportunity to review the DSEIS and we look forward to working with you during the implementation of the project.

Very truly yours,

Rex D. Johnson

RDJ/SJT:gst

ALOHA TOWER DEVELOPMENT CORPORATION
33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

November 30, 1990

The Honorable Rex D. Johnson,
Executive Director
Hawaii Community Development Authority
677 Ala Moana Boulevard, Suite 1001
Honolulu, Hawaii 96813

SUBJECT: The Waterfront at Aloha Tower
Draft Environmental Impact Statement (EIS)

Dear Mr. Johnson:

Thank you for responding to the request for comments on the Draft EIS. Your participation in this review process helps assure that a range of interests and expertise are considered in regard to the proposed action.

If you have any questions regarding the EIS, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

Daniel Orodenker
Executive Assistant

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

STATE OF HAWAII
OFFICE OF HAWAIIAN AFFAIRS
1600 KAPIOLANI BLVD., SUITE 1500
HONOLULU, HAWAII 96814
(808) 548-8960
(808) 946-2642

September 24, 1990

The Honorable John Waihee
Governor, State of Hawaii
c/o Office of Environmental Quality Control
465 South King Street, Room 104
Honolulu, Hawaii 96813

Dear Governor Waihee:

Re: The Waterfront At Aloha Tower

Thank you for the opportunity to review the above-referenced draft environmental impact statement. We found the project to be well conceived. We do however, have the following concerns and comments.

1. A major feature in the project is the market place at Aloha Tower. The marketplace is currently being called the "Aloha" Marketplace". We feel strongly that the word "Aloha" as a promotional tool for the marketplace is inappropriate. We suggest instead the "Aloha Tower Market".

2. Interpretive work on the proposed new Honolulu Fort Historic Park is an opportunity to bring together knowledgable people in the field of history, Native Hawaiian culture and park planning. We encourage the developer to put together a highly qualified group to address this unique opportunity.

We have no other comments or concerns at this time.

Sincerely,

Richard K. Paglinawan

Richard K. Paglinawan
Administrator

cc: Aloha Tower Development Corporation
c/o Earl Matsukawa
Wilson Okamoto & Associates

ALOHA TOWER DEVELOPMENT CORPORATION

33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

November 30, 1990

Mr. Richard Paglinawan, Administrator
Office of Hawaiian Affairs
1600 Kapiolani Boulevard, Suite 1500
Honolulu, Hawaii 96814

SUBJECT: The Waterfront at Aloha Tower
Draft Environmental Impact Statement (EIS)

Dear Mr. Paglinawan:

Thank you for responding to the request for comments on the subject Draft EIS. Your participation in this review process helps assure that a range of interests and expertise are considered in regard to the proposed project. We offer the following responses, in respective order, to your comments:

1. With regard to the marketplace name, please note that the Draft EIS refers to the "Aloha Tower Marketplace." We regret that the rendering depicting the gate at the marketplace has not been modified to reflect the new name.

2. The project developers are sincere in their efforts to develop the interpretive program for the proposed Honolulu Fort Historic Park in a manner sensitive to native Hawaiian culture. Please be assured that they will assemble an expert team to implement this intent.

We hope that we have satisfactorily responded to your comments. If you have any further questions, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

Daniel Orodenker
Executive Assistant

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

COPY

September 27, 1990

The Honorable John Waihee
Governor
State of Hawaii
c/o Office of Environmental Quality Control
465 South King Street, Room 104
Honolulu, Hawaii 96813

Dear Governor Waihee:

Subject: Draft Environmental Impact Statement (DEIS) for the Waterfront at Aloha Tower

In addition to our previous comments on the project which is included in Section VII, "Consultation," of the DEIS, we have the following comments on the proposed project:

1. Plans for water system infrastructure improvements for the development should be addressed in greater detail. The State's Honolulu Waterfront Master Plan indicates a proposed 42-inch transmission main on Nimitz Highway/Ala Moana Boulevard and the Board of Water Supply's Downtown Improvement Plan proposes mains on Richards Street between King and Halekauwila Streets. These plans should be integrated into the overall project's water system plans.

2. The water master plan should indicate the status of all existing water services and record all water services discontinued within the last five years so credits can be applied toward any applicable water system facilities. To qualify for credits, discontinued services must be reactivated prior to expiration of the five-year limit.

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

COPY

3. New water meters shall be sized according to the water demands for each building. Construction plans shall be submitted for our review and approval for the installation of meters three inches or larger. All existing water laterals, meter boxes and meter numbers shall be indicated on the construction plans.

4. Artesian well No. 1851-22 located in Ala Moana Mini Park (see attached Fig. 16) should be protected or sealed properly during construction.

If you have any questions, please contact Bert Kuioka at 527-5235.

Very truly yours,

Kazu Hayashida

KAZU HAYASHIDA
Manager and Chief Engineer

Attachment

cc: Aloha Tower Development Corporation
Earl Matsukawa (Wilson Okamoto and Associates)

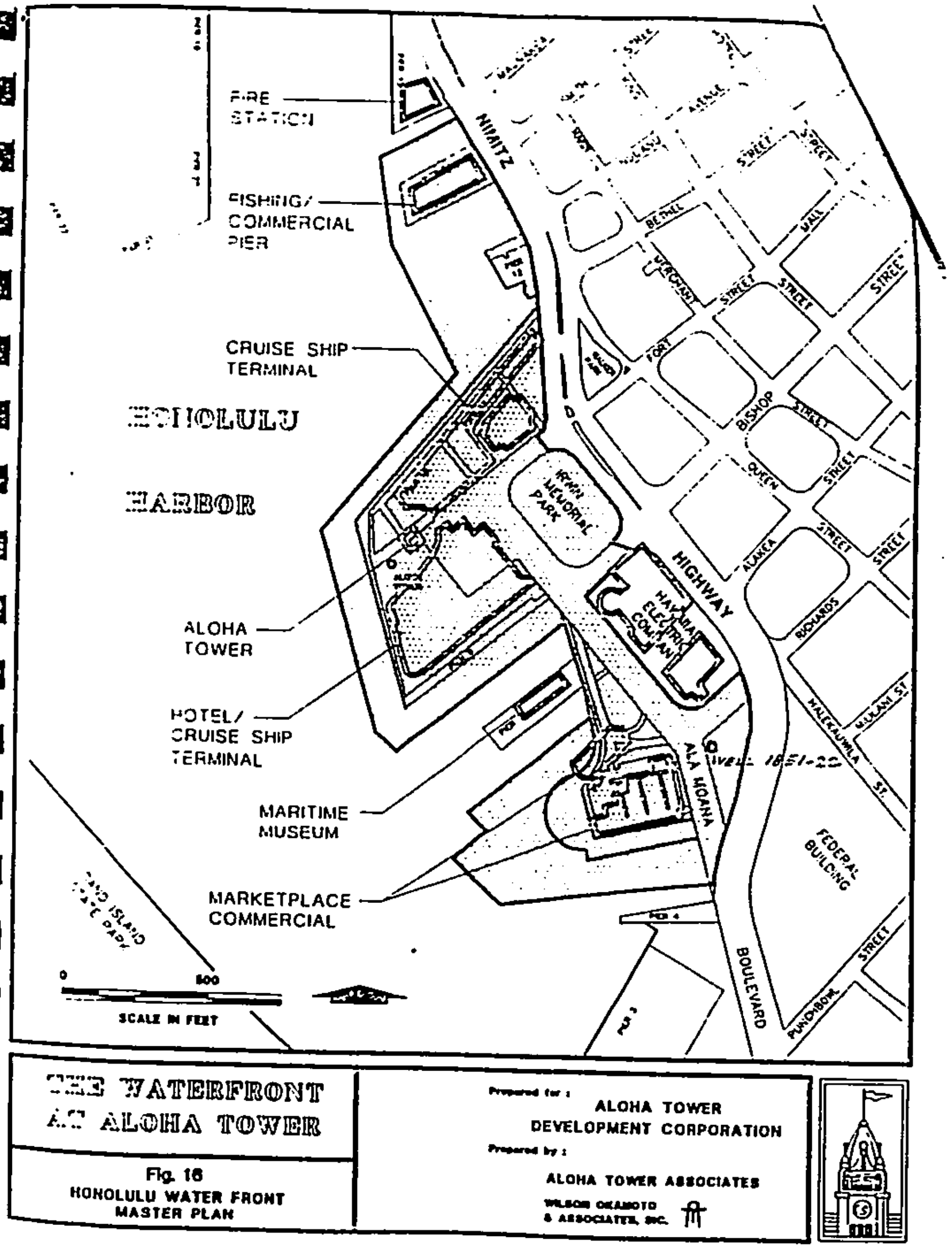


Fig. 16
HONOLULU WATER FRONT MASTER PLAN

John Waihee
Governor

Roger A. Ulveling
Chairman

Randall Y. Iwase
Executive Officer

ALOHA TOWER DEVELOPMENT CORPORATION

33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

November 30, 1990

The Honorable Kazu Hayashida
Manager and Chief Engineer
Board of Water Supply
630 South Beretania Street
Honolulu, Hawaii 96813

SUBJECT: The Waterfront at Aloha Tower
Draft Environmental Impact Statement (EIS)

Dear Mr. Hayashida:

Thank you for responding to the request for comments on the subject Draft EIS. Your participation in this review process helps assure that a range of interests and expertise are considered in regard to the proposed project. We offer the following responses, in respective order, to your comments:

1. Infrastructure requirements to meet the proposed project's water demands have yet to be determined. They will be included in the project's water system master plan which will integrate the planned improvements for the area.

2. We appreciate your apprising us of this potential opportunity for reducing development fees. The developers are examining their options in this regard.

3. The developers intend to comply with this requirement.

4. Currently, the project designers are recommending that the well be sealed. We understand that such work requires supervision by the Board of Water Supply.

We hope we have satisfactorily responded to your comments. If you have any further questions, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

Daniel Orodenker
Executive Assistant

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

BUILDING DEPARTMENT

CITY AND COUNTY OF HONOLULU

HONOLULU MUNICIPAL BUILDING
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

HERBERT K. MURAOKA
DIRECTOR AND BUILDING SUPERINTENDENT

PB 90-730

August 29, 1990

Governor, State of Hawaii
c/o The Office of Environmental Quality Control
465 South King Street, Room 104
Honolulu, Hawaii 96813

Dear Sir:

Subject: Draft Environmental Impact Statement (DEIS) for Waterfront at Aloha Tower

This is in response to your letter which we received on August 23, 1990 concerning the subject project.

We have reviewed the subject DEIS and have no comments to offer.

Thank you for the opportunity to review the DEIS.

Very truly yours,

HERBERT K. MURAOKA
Director and Building Superintendent

'90 AUG 31 AM

attach.
cc: J. Harada
Aloha Tower Development Corp.
Wilson Okamoto & Assoc., Inc.
Earl Matsukawa

John Waihee
Governor

Roger A. Ulveling
Chairman

Randall Y. Iwase
Executive Officer

ALOHA TOWER DEVELOPMENT CORPORATION

33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

November 30, 1990

The Honorable Herbert K. Muraoka
Director and Building Superintendent
Building Department
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

SUBJECT: The Waterfront at Aloha Tower
Draft Environmental Impact Statement (EIS)

Dear Mr. Muraoka:

Thank you for responding to the request for comments on the subject Draft EIS. Your participation in this review process helps assure that a range of interests and expertise are considered in regard to the proposed action.

If you have any questions on the EIS or the review process, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

Daniel Orodenker
Executive Assistant

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET 5TH FLOOR
HONOLULU HAWAII 96813
PHONE 523 4427 • FAX 527 5498

FRANK F. FASI
MAYOR

MICHAEL N. SCARFONE
DIRECTOR

Gail M. Kaito
DEPUTY DIRECTOR

RECEIVED

October 8, 1990

Honorable John Waihee, Governor
State of Hawaii
c/o The Office of Environmental
Quality Control
465 South King Street, Room 104
Honolulu, Hawaii 96813

Dear Governor Waihee:

Subject: Draft Environmental Impact Statement
The Waterfront at Aloha Tower
Honolulu, Oahu

We appreciate the opportunity to review the Draft Environmental Impact Statement (DEIS) for The Waterfront at Aloha Tower.

For your information, the following corrections to the list of planned projects and projects under construction (Tables 4 and 5 on pages IV-10 and IV-11 should be noted:

Table 4: Planned Projects

1. Kaahumanu Parking Structure Redevelopment: 122 apartments, 220,000 square feet commercial-retail space, 1,055 parking stalls.

2. Maunakea-Smith Housing: 238 apartments, 16,164 square feet commercial-retail space, 439 parking stalls.

3. Pacific Nations Center: mixed use--1.2 million square feet, 2,000 parking stalls.

Table 5: Projects Under Construction

1. Chinatown Gateway Plaza: 200 apartments, 25,000 square feet commercial-retail space, 275 parking stalls.

2. River-Nimitz Housing: 90 apartments, 9,000 square feet commercial-retail space, 134 parking stalls.

3. Alii Place: 294,000 square feet commercial-retail space, 1,000 parking stalls.

The discussion of the project's Social Impacts (Section F, page VI-41), identifies the proposed establishment of the Aloha Tower Housing Foundation as "an important consideration." According to the DEIS, the Foundation will "assist in providing fit and affordable housing for the poor in Hawaii" using donated funds comprised of five percent of the interest earnings from project lenders, exclusive of construction loans and individual condominium mortgages, and five percent of the pretax profits from the operation and sale of improvements. However, assessments of the public benefits to be derived from the creation of the proposed entity as well as the adequacy of its funding cannot be made unless information regarding the means by which the Foundation will assist in the provision of affordable housing and estimates of the funding expected to be received by the Foundation from the project are included in the EIS.

Thank you for the opportunity to comment.

Sincerely,

Gail Kaito

for MICHAEL N. SCARFONE
Director

cc: Aloha Tower Development Corporation
P. O. Box 2359
Honolulu, Hawaii 96804

Mr. Earl Matsukawa
c/o Wilson Okamoto & Associates
1150 South King Street, Suite 800
Honolulu, Hawaii 96814

John Waihee
Governor

Roger A. Ulveling
Chairman

Randall Y. Iwase
Executive Officer

ALOHA TOWER DEVELOPMENT CORPORATION

33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

November 30, 1990

The Honorable Michael Scarfone, Director
Department of Housing and Community Development
650 South King Street, Fifth Floor
Honolulu, Hawaii 96813

SUBJECT: The Waterfront at Aloha Tower
Draft Environmental Impact Statement (EIS)

Dear Mr. Scarfone:

Thank you for your comments on the subject Draft EIS. We offer the following responses, in respective order, to your comments:

1. Thank you for providing updated information regarding the list of planned projects and projects under construction (tables 4 and 5). We will incorporate this information into the Final EIS.

2. The Foundation has targeted its assistance to provide fit and affordable housing for those persons throughout the State whose income is less than 80 percent of the median income. It is not expected, however, that the Foundation will receive significant funds for a period of at least five years. When funds become available, the Foundation will work with the State Housing Finance and Development Corporation and/or other State or local agencies to address low income housing shortages through development of housing units or provision of necessary services supporting their development. The actual manner in which these funds will be applied, however, is uncertain at this time.

It should be clarified that the Foundation is not proposed as a mitigation measure for any identified project impact nor is it required as a condition of development approvals. Thus, a detailed analysis of its implementation is beyond the scope of this EIS.

We hope that we have satisfactorily responded to your comments. If you have any further questions, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531- 5261.

Very truly yours,

Daniel Orodenker
Executive Assistant

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

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

BENJAMIN B. LEE
CHIEF PLANNING OFFICER
ROLANDO D. LIBBY JR.
DEPUTY CHIEF PLANNING OFFICER

RK 8/90-2360

September 7, 1990

RECEIVED
SEP 1 1 1990

Honorable Bruce Anderson, Acting Director
Office of Environmental Quality Control
State of Hawaii
465 South King Street, Room 104
Honolulu, Hawaii 96813

Attn: Mr. Brian J. J. Choy

Dear Dr. Anderson:

Draft Environmental Impact Statement
for the Waterfront at Aloha Tower Project

We appreciate your response to our comments on the Environmental Impact Statement Preparation Notice (EISPN) for the Waterfront at Aloha Tower project. Most of our concerns have been adequately addressed. However, two issues remain for which we would appreciate further elaboration.

1. In your reply to our EISPN comments (June 27, 1990), item 1, you state that the project's proposed maritime facilities respond to needs expressed by the State Department of Transportation's (DOT) Harbor Division. Among current needs are the Piers 5 and 6 renovations, and office space in the maritime building.

   Has consideration been given to the relationship of the Waterfront project to the future expansion needs of the DOT Harbors Division? Potential harbor expansion areas will be reduced by this project, the Kakaako Makai Area Plan and the Keehi Lagoon Recreation Plan. Piers 15-23 are also under Aloha Tower Development Corporation jurisdiction. Although we understand there are no immediate plans for this site, future development of this area would displace additional maritime functions. The Final EIS should include a discussion of the impact of the Waterfront at Aloha Tower project on future harbor expansion.

2. The proposed Aloha Tower Housing Fund (ATHF) will derive its funding from a fixed percentage of profits from rentals and sales. A discussion of anticipated contributions to the ATHF within a representative time period should be included in the Final EIS.

The following issues should be discussed in the body of the Final EIS since they are items important in the evaluation of project impacts.

1. The Draft EIS recognizes Nimitz Highway as a potential barrier to pedestrian traffic between the waterfront and Chinatown. Possible mitigation is discussed in the Traffic Study (6-12), and alternatives should be elaborated upon in the Community Impacts text.

2. The Final EIS should provide a brief description of the Honolulu Harborside condominium units, including size, amenities and price range. It should also be stated that no affordable units will be offered.

Thank you for the opportunity to review this document. Should there be any questions, please contact Verne Winquist at 527-6044.

Sincerely,

Benjamin

BENJAMIN B. LEE
Chief Planning Officer

BBL:js

cc: Aloha Tower Development Corporation
√Wilson Okamoto and Associates

ALOHA TOWER DEVELOPMENT CORPORATION

33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

John Waihee
Governor

Roger A. Ulveling
Chairman

Randall Y. Iwase
Executive Officer

November 30, 1990

The Honorable Benjamin B. Lee
Chief Planning Officer
Department of General Planning
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

SUBJECT: The Waterfront at Aloha Tower
Draft Environmental Impact Statement (EIS)

Dear Mr. Lee:

Thank you for responding to the request for comments on the subject Draft EIS. We offer the following responses, in respective order, to your comments:

1. The proposed maritime facilities comprising the Waterfront at Aloha Tower development are not limited to current needs such as "renovations" of Piers 5 and 6 and "office space" in the Maritime Building as you suggest. As described in the EIS Preparation Notice, the project represents a major expansion of harbor facilities for the long-term future:

   a. Piers 5 and 6 will be redeveloped and extended to accommodate larger cruise ships;

   b. The first two floors of the new Maritime Building will be dedicated to loading/unloading of passenger cruise ships, immigration clearance, customs inspections, loading and unloading of passenger buses, and small supporting retail facilities;

   c. The Maritime Building complex will provide replacement for office space and parking for the DOT-Harbors Division;

   d. Piers 8 will continue to accommodate vessel berthing, including the proposed high-speed commuter ferry;

   e. Pier 9 will be reconfigured to accommodate dinner cruise vessels as well as water taxis but will continue to accommodate passenger cruise ships and other larger vessels;

   f. Piers 10 and 11, and the new passenger terminal will completely modernize passenger cruise ship berthing operations with two levels of maritime space housing the range of passenger loading and unloading facilities, including immigration clearance and customs inspection; and

   g. Piers 13 and 14 will be redeveloped for the Honolulu Harborside Condominiums but will also include new facilities supporting the proposed commuter ferry operations with office space, berthing and light maintenance facilities.

The proposed Waterfront at Aloha Tower development, with its mixture of commercial maritime activities and its orientation to the Downtown area, is consistent with the DOT-Harbors Division 2010 Master Plan for Honolulu Harbor. Continuing discussion with the DOT-Harbors Division assures that the Hawaii's maritime facilities requirements will be addressed in the short and long term. Thus, we disagree with your statement that "(p)otential harbor expansion areas will be reduced by this project..." To the contrary, we believe that the project is the realization of Hawaii's long-term harbor expansion needs in the Aloha Tower area.

2. A discussion of anticipated contributions to The Aloha Tower Housing Foundation is included in the Draft EIS.

3. The reference to Nimitz Highway being a barrier to pedestrian traffic between Chinatown and the waterfront is an opinion expressed during interviews eliciting issues and concerns of nearby residents. Investigations in conjuction with the traffic study, including consultation with City and State transportation agencies, did not reveal an actual "barrier" in terms of the capacity of existing crosswalks and signals along the Chinatown section of the highway. Future pedestrian crossing demands arising from the proposed development were specifically addressed between Fort and Bishop Streets where office worker demands are projected to increase during peak hour traffic. Future increases in pedestrian traffic near Chinatown are not projected to be significant in this category and, therefore, are not anticipated to be a problem.

4. The number of units, size, amenities and price range for the Honolulu Harborside Condominium units will be based on market analyses which have yet to be completed. As stated in the EIS Preparation Notice and Draft EIS, however, there will be no more than 350 units. The Draft EIS also clarifies that the proposed condominiums are expected to be up-scale units (page VI-41).

We hope that we have satisfactorily responded to your comments. If you have any further questions, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

Daniel Orodenker
Executive Assistant

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

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

FRANK F. FASI
MAYOR

DONALD A. CLEGG
DIRECTOR

LORETTA K.C. CHEE
DEPUTY DIRECTOR

LU8/90-5760(DEB)

October 11, 1990

Governor John Waihee
State of Hawaii
c/o The Office of Environmental Quality Control
465 South King Street, Room 104
Honolulu, Hawaii 96813

Dear Governor Waihee:

Draft Environmental Impact Statement (EIS)
The Waterfront at Aloha Tower

Thank you for forwarding the Draft EIS on the Aloha Tower Waterfront Project for our review. We offer the following comments:

1. A guiding concept for the proposed project is one of "no net fill" in Honolulu Harbor. However, extensive use of pilings with foundations to depths of greater than 100 feet to support the proposed 400-foot condominium buildings appears to contradict this guiding concept. Page II-19 of the Draft EIS explains that Piers 13 and 14 are especially affected. The existing pier structure is proposed to be strengthened, an independent new foundation added, and a new series of pilings implanted in the water between Piers 12 and 13 with an elevated connection to Pier 13. This will require, in our opinion, a substantial displacement in Honolulu Harbor with a potentially negative impact on the Harbor.

2. Since portions of the proposed project are within both the Chinatown and Capital Special Districts, the Final EIS should list City and County of Honolulu Special District review under Chapter V, Section V.D. Summary of Possible Permits and Approvals.

A more complete study of the amount of displacement which will occur as a result of these added pilings and a discussion of the potential long-term impacts on Honolulu Harbor with mitigation measures should be included in the Final EIS.

If you have any questions, please contact Diane E. Borchardt of our staff at 527-5349.

Very truly yours,

Donald Clegg

DONALD A. CLEGG
Director of Land Utilization

DAC:deb

cc: Aloha Tower Development Corporation
Mr. Earl Matsukawa, Wilson Okamoto & Associates
0251N

ALOHA TOWER DEVELOPMENT CORPORATION

John Waihee, Governor
Roger A. Ulveling, Chairman
Randall Y. Iwase, Executive Officer

33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

November 30, 1990

The Honorable Donald Clegg, Director
Department of Land Utilization
650 South King Street
Honolulu, Hawaii 96813

SUBJECT: The Waterfront at Aloha Tower
Draft Environmental Impact Statement (EIS)

Dear Mr. Clegg:

Thank you for your comments on the subject Draft EIS. We offer the following responses, in respective order, to your comments:

1. The concept of "no net fill" is based on the governing regulations according to the U.S. Army Corps of Engineers Regulatory Guidance Letter. Within that context, pile supported structures do not constitute "fill."

   According to the the Marine Environmental Assessment, the area's marine life and benthic habitat are neither abundant nor diverse. The addition of hard vertical substrates such as piles will somewhat increase both the abundance and diversity of marine life in the area. Thus, we consider the discussion in the Draft EIS regarding mitigation measures and displacement as adequate.

2. The Summary of Possible Permits and Approvals does not list the City and County of Honolulu Special District Review inasmuch as the ATDC is empowered to override certain county ordinances. According to HRS Title 15, Subtitle 5, Chapter 26, Subchapter 4, Development Guidelines, the ATDC may "transcend, as necessary, zoning, density, and height limitations in an aesthetically pleasing manner to accomplish the goals of the development corporation and to encourage private sector developers to undertake development plan solutions which will satisfy the foregoing development objectives."

We hope that we have satisfactorily responded to your comments. If you have any questions, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

Daniel Orodenker
Executive Assistant

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

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

FRANK F. FASI
MAYOR

WALTER M. OZAWA
DIRECTOR

ALVIN K.C. AU
DEPUTY DIRECTOR

September 10, 1990

Office of Environmental
Quality Control
State of Hawaii
465 South King Street
Kekuanaoa Building, Room 104
Honolulu, Hawaii 96813

Gentlemen:

Subject: Draft Environmental Impact Statement (Draft EIS)
The Waterfront at Aloha Tower
Tax Map Keys: 1-7-01, 2-1-01, 2-1-13, 2-1-15, 2-1-27

We have reviewed the Draft EIS for the Waterfront at Aloha Tower project and make the following comments and recommendations.

The design considerations for the Waterfront at Aloha Tower project provides primarily for the passive recreational needs of the project with pedestrian promenades and the conversion of Pier 12 and the parking lot at Irwin Park to open space.

With the recognized shortfall of active public recreation facilities in the downtown area, the project will generate increased demands on our public parks. Although the Waterfront at Aloha Tower project proposes to provide a health club and swimming pool for hotel guests and similar facilities for condominium residents, consideration should be given to expanding the recreational amenities to include tennis courts and other multi-purpose recreational areas.

Thank you for the opportunity to comment on this Draft EIS. Should you have any questions, please contact Wayne Lee of our Advance Planning Branch at extension 4246.

Sincerely,

WALTER M. OZAWA, Director

WMO:sl

cc: Aloha Tower Development Corp.
Earl Matsukawa, Wilson Okamoto & Associates

ALOHA TOWER DEVELOPMENT CORPORATION
33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

John Waihee
Governor

Roger A. Ulveling
Chairman

Randall Y. Iwase
Executive Officer

November 30, 1990

The Honorable Walter M. Ozawa, Director
Department of Parks and Recreation
650 South King Street
Honolulu, Hawaii 96813

SUBJECT: The Waterfront at Aloha Tower
Draft Environmental Impact Statement (EIS)

Dear Mr. Ozawa:

Thank you for responding to the request for comments on the Draft EIS. While we recognize that current demand on municipal park facilities in the Downtown area exceeds supply, current development plans will not accommodate additional active recreational facilities within the Waterfront at Aloha Tower project. The Final EIS will clarify that proposed project demand for active recreational opportunities which are not satisfied within the project site may increase demand on public parks.

We hope we have satisfactorily responded to your comments. If you have any further questions, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

Daniel Orodenker
Executive Assistant

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

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

FRANK F. FASI
MAYOR

SAM CALLEJO
DIRECTOR AND CHIEF ENGINEER

C. MICHAEL STREET
DEPUTY DIRECTOR

In reply refer to:
ENV 90-203(449)

September 4, 1990

The Honorable John Waihee, Governor
State of Hawaii
c/o The Office of Environmental
Quality Control
465 South King Street, Room 104
Honolulu, Hawaii 96813

Dear Governor Waihee:

Subject: Draft Environmental Impact Statement (DEIS)
The Waterfront at Aloha Tower
TMK: 1-7-01: 1 to 4; 2-1-01: 1, 5 and 6;
2-1-15: 1, 11 and 12; 2-1-13: 7; 2-1-27: 1

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

1. Presently, the City is planning to reconstruct a 36-inch sewer in Nimitz Highway between Richards Street and Maunakea Street of which the construction is tentatively scheduled for Fiscal Year 1993. However, because of the oil contaminated soil in the area, the project may be delayed until the State Department of Health requirements for mitigation can be met.

2. If the developer wants to proceed with the project, he can install such sewer line at his cost and dedicate it to the City upon its completion.

Very truly yours,

SAM CALLEJO
Director and Chief Engineer

cc: Aloha Tower Development Corporation
Earl Matsukawa (Wilson Okamoto & Associates)
Office of Environmental Quality Control

ALOHA TOWER DEVELOPMENT CORPORATION
33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

John Waihee
Governor

Roger A. Ulveling
Chairman

Randall Y. Iwase
Executive Officer

November 30, 1990

The Honorable Sam Callejo,
Director and Chief Engineer
Department of Public Works
650 South King Street
Honolulu, Hawaii 96813

SUBJECT: The Waterfront at Aloha Tower
Draft Environmental Impact Statement (EIS)

Dear Mr. Callejo:

Thank you for your comments on the Draft EIS. We offer the following responses, in respective order, to your comments:

1. We recognize the dilemma concerning the provision of sewer service for proposed development in Downtown Honolulu. We shall pursue further discussion with the developers and seek your assistance in resolving this matter.

2. The developer is considering several options concerning the sewer line you mentioned in your letter, including building and dedicating such a sewer line to the City. The developer will pursue discussion and negotiation with your Department.

If you have any further questions regarding the EIS for the project, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

Daniel Orodenker
Executive Assistant

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

WILSON OKAMOTO & ASSOCIATES

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

FRANK F. FASI
MAYOR

ALFRED J. THIEDE
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR

TE-4837
PL90.1.285

October 15, 1990

The Honorable John Waihee
c/o The Office of Environmental
Quality Control
465 South King Street, Room 104
Honolulu, Hawaii 96813

Dear Governor Waihee:

Subject: The Waterfront at Aloha Tower
Draft Environmental Impact Statement
TMK: 1-7-01: 2-1-01, 13, 15 & 27

This is in response to a letter which was received by our office on August 23, 1990 requesting our comments on the subject project.

We have met with the developers and their traffic consultant to discuss various aspects of this project.

Based on our review and discussions, we have the following comments:

1. The methodology used to discount trips should be clearly documented and established specifically for the purposes of this project.

2. The impacts of traffic diverted to King Street resulting from the proposed contraflow lane on Dillingham Boulevard should be addressed.

3. Mitigation measures which may require removal of on-street parking outside the project limits should be discussed with the owners/property managers of the affected buildings, Downtown Improvement Association and the Downtown Neighborhood Board.

4. This project should be closely coordinated with the State Department of Transportation since Nimitz Highway is under their jurisdiction.

We understand that all roadways within the project site will remain under the jurisdiction of the State.

If you have any questions, please contact Mel Hirayama of my staff at 523-4199.

Very truly yours,

JOSEPH M. MAGALDI, JR.
Acting Director

cc: Aloha Tower Development Corporation
Wilson Okamoto & Associates

ALOHA TOWER DEVELOPMENT CORPORATION

John Waihee
Governor

Roger A. Ulveling
Chairman

Randall Y. Iwase
Executive Officer

33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

November 30, 1990

The Honorable Joseph M. Magaldi, Jr., Acting Director
Department of Transportation Services
650 South King Street
Honolulu, Hawaii 96813

SUBJECT: The Waterfront at Aloha Tower
Draft Environmental Impact Statement (EIS)

Dear Mr. Magaldi:

Thank you for responding to the request for comments on the subject Draft EIS. We offer the following responses, in respective order, to your comments:

1. The methodology used to discount trips shall be included in the revised traffic study and appended to the Final EIS. Essentially, trip discounts were applied to; a) each land use based on location in a multi-use development, b) observation of existing transportation trends in the downtown area, and c) data provided by the Oahu Metropolitan Planning Organization (OMPO). Census data for 1980 obtained by OMPO showed approximately 11 percent of commuters using bus transit and roughly 22 percent carpooling to work.

2. The impact of diverted traffic on King Street is being analyzed by the traffic consultant and shall be included in the revised traffic study and appended to the Final EIS.

3. The project developers are not planning to implement mitigation measures outside the project limits.

4. The project's transporation planners have closely coordinated the traffic study and proposed vehicular and pedestrian improvements for the project with the State Department of Transportation.

We hope we have satisfactorily responded to your comments. If you have any further questions, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

Daniel Orodenker
Executive Assistant

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

FIRE DEPARTMENT
CITY AND COUNTY OF HONOLULU
1455 SOUTH BERETANIA STREET, ROOM 305
HONOLULU, HAWAII 96814

FRANK F. FASI
MAYOR

LIONEL E. CAMARA
FIRE CHIEF

DONALD S. M. CHANG
DEPUTY FIRE CHIEF

September 17, 1990

Dr. Bruce Anderson
Acting Director
The Office of Environmental Quality Control
465 South King Street, Room 104
Honolulu, Hawaii 96813

Attn: Brian J. J. Choy

Gentlemen:

Subject: The Waterfront at Aloha Tower
Draft Environmental Impact Statement

We have reviewed the application of the above subject request, made an on-site assessment and have no objections to the proposal providing the following conditions are complied with prior to subdivision approval. Compliance with Article 10 of the Uniform Fire Code should also be made, but not limited to the following:

1. Provide a private water system where all appurtenances, hydrant spacing and fire flow requirements meet Board of Water Supply standards.

2. Provide a fire access road to within 150 feet of the first floor of the most remote structure. Such access shall have a minimum vertical clearance of 13 feet 6 inches, be constructed of an all-weather driving surface of not less than 20 feet in unobstructed width shoulder to shoulder capable of supporting the minumum 60,000 pound weight of our fire apparatus and with a gradient not to exceed 20%. All dead-end fire apparatus access roads in excess of 150 feet in length shall be provided with an approved turnaround having a radius of not less than 35 feet.

3. Submit construction plans to the building and fire departments for permit review and approval prior to commencement of the project.

Should additional information or assistance be required, you may contact Captain August K. F. Range or Fire Inspector Michael Aki of our Fire Prevention Bureau at 523-4186.

DONALD S. M. CHANG
Fire Deputy Chief

MC:mc

cc: Aloha Tower Development Corporation
Mr. Earl Matsukawa, Wilson Okamoto & Assoc.

ALOHA TOWER DEVELOPMENT CORPORATION

John Waihee
Governor

Roger A. Ulveling
Chairman

Randall Y. Iwase
Executive Officer

33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

November 30, 1990

Mr. Donald S. H. Chang, Fire Deputy Chief
City and County Fire Department
1455 South Beretania Street, Room 305
Honolulu, Hawaii 96814

SUBJECT: The Waterfront at Aloha Tower
Draft Environmental Impact Statement (EIS)

Dear Mr. Chang:

Thank you for responding to the request for comments on the subject Draft EIS. Your participation in this review process helps assure that a range of interests and expertise are considered in regard to the proposed project. We offer the following responses, in respective order, to your comments:

1. On September 27, 1990, our fire protection engineering consultant met with Captain August K. F. Range to discuss your letter. It is our understanding that the requirement for the private water system shall be met by the combined sprinkler standpipe system prescribed for each of the facilities. This combined standpipe/sprinkler system has a capability to deliver 2,000 gpm to wall hydrants located on the exterior walls around the perimeter of the structures.

2. Based on prior discussions with your department, all structures will have access roads and shall meet the requirements of the Fire Code you describe.

3. All construction plans shall be submitted to the Building and Fire Departments for review and approval.

We hope that we have satisfactorily responded to your comments. If you have any further questions, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

Daniel Orodenker
Executive Assistant

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

POLICE DEPARTMENT
CITY AND COUNTY OF HONOLULU
1455 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96814 - AREA CODE (808) 943-3111

FRANK F. FASI
MAYOR

MICHAEL S. NAKAMURA
CHIEF

HAROLD M. KAWASAKI
DEPUTY CHIEF

2A

OUR REFERENCE ES-LK

October 1, 1990

Dr. Bruce Anderson
Acting Director
Office of Environmental Quality Control
465 South King Street, Room 104
Honolulu, Hawaii 96813

Dear Dr. Anderson:

This is in response to your request for comments on the draft environmental impact statement for the Waterfront at Aloha Tower. The draft statement addressed all the concerns that we had expressed previously, and we have nothing more to add at this time.

Thank you for the opportunity to comment.

Sincerely,

MICHAEL S. NAKAMURA
Chief of Police

By [signature]
JOSEPH AVEIRO
Assistant Chief of Police
Support Services Bureau

cc: Aloha Tower Development Corp.
Mr. Earl Matsukawa

ALOHA TOWER DEVELOPMENT CORPORATION

John Waihee
Governor

Roger A. Ulveling
Chairman

Randall Y. Iwase
Executive Officer

33 South King Street, Suite 403 • Honolulu, Hawaii 96813
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November 30, 1990

Mr. Joseph Aviero, Assistant Chief of Police
Police Department
1455 South Beretania Street
Honolulu, Hawaii 96814

SUBJECT: The Waterfront at Aloha Tower
Draft Environmental Impact Statement (EIS)

Dear Mr. Aviero:

Thank you for commenting on the subject Draft EIS. Your participation in this review process helps assure that a range of interests and expertise are considered in regard to the proposed action.

If you have any questions on the EIS or the raview process, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

[signature]
Daniel Orodenker
Executive Assistant

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

University of Hawaii at Manoa

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

October 8, 1990
RE:0562

Governor, State of Hawaii
c/o Office of Environmental Quality Control
465 South King Street, Room 104
Honolulu, Hawaii 96819

Dear Sir:

Draft Environmental Impact Statement (EIS)
The Waterfront at Aloha Towers
Honolulu, Oahu

The above referenced document addresses the proposed redevelopment of Piers 5 through 14 at the waterfront in Honolulu. Proposed improvements include: the Maritime Building and Passenger Terminal with commercial and governmental offices at Piers 5 and 6; a Pedestrian Promenade extending from Piers 5 through 14 with retail emphasis between Piers 6 and 9; a Marketplace retail and office complex at Piers 8 and 9 with maritime improvements at the pier fronts; a refurbished Aloha Tower; a 350 room hotel at Piers 10 and 11; an international cruise ship terminal also at Piers 10 and 11; a 30 story, 550,000 square foot office tower at Pier 11; refurbishment of Honolulu Fort Historic Park at Pier 12; a 350 unit, twin 30 story tower condominium at Piers 13 and 14 with maritime facilities at pier level; and a 2,000 vehicle underground parking structure on Piers 8 to 11.

The Environmental Center has reviewed this EIS with the assistance of Chuck Gee, Travel Industry Management; Peter Flachsbart, Urban and Regional Planning; Y.S. Fok and Henry Gee, Water Resources Research Center; George Taoka, Civil Engineering; and Lee Lyttle, Environmental Center.

General Comments

Although most reviewers found the Draft EIS to be well constructed, many felt that it leaned towards promoting the project and was not as unbiased as it should have been. The numerous graphics and photographs did help reviewers to envision the various elements of the proposed action. A few colored drawings, however, were misleading, in that scale and proportion of the sizable office and residential towers were de-emphasized through the use of lighter lines and weaker, washed out colors.

Contruction Requirements (Section II-E, pages II-18 and 19)

These pages indicate that further engineering studies will be required in connection with demolition, dredging, blasting, and dewatering during construction. These are fairly disruptive activities. If studies indicate the use of construction techniques which result in impacts which are significantly different than those discussed in this EIS, then further environmental review should be undertaken prior to the issuance of construction permits.

Rising Sea Level (Section III-D-10, page III-26)

Our reviewers questioned the use of a 25 year time frame as an adequate delimiter. The use of a 50 to 100 year period is more appropriate since the project will exceed 30 years in duration, and scientists are predicting a 30 to 200 cm rise in sea levels over the next century in coastal areas. It is also not clear from the Draft EIS whether sea level rise has been factored into wash-up onto Piers 5 through 8 during a Kona storm.

Socio-Economic Environment (Section IV-A-1, page IV-1 to 7)

The use of 1980 census data as the basis for this section's tables and discussion paints a very inaccurate picture of the existing socio-economic conditions. The rental rates quoted are indicative of how out of date these figures are. The Final EIS should either update these figures through interpolation, or expand the discussion on changes which have occurred since 1980.

Honolulu Waterfront Master Plan (Section V-A & B, page V-1 to 21)

While it is, of course, necessary to edit lengthy planning documents for the purposes of an EIS, it appears that many of the stated planning goals which do not support various parts of the proposed action were omitted. The Honolulu Waterfront Master Plan and the 2010 Master Plan for Honolulu Harbor both discuss restrictions for luxury housing. They also discuss issues of waterfront view blockage, and mauka-makai relationships in term of pedestrian and visual access. In these, and other documents, it is stated that maritime uses should receive priority for waterfront areas, yet residential uses are proposed. This section of the Draft EIS should contain a more balanced presentation of adopted public policies and indicate how this project addresses, fails to address, or violates them. It should not merely select those policies which support the proposed action.

Project Impacts

Noise (Section VI-B-2, page VI-1 to 2): The possibility of a request for a 'variance for 24-hour construction' permit is stated on page V-26. The impacts associated with a 24-hour construction period should be clearly stated in this section on noise impacts.

Traffic (Section VI-D-1, pages VI-8 to 11): Our reviewers concurred with the general conclusions of the traffic consultant, that is, the road network in the downtown area is already reaching its capacity limits and will continue to do so even without the added burden of this project. It was unclear, however, as to whether the resultant 'level of service with the project' data shown in Table 8 include the proposed mitigative measures stipulated in Appendix C. Those measures should be brought from the appendix and discussed in this section. Given the numerous other development projects rapidly being completed in the area, traffic projections for the years 2005 to 2050 also should be shown.

Air Quality (Section VI-D-5, page VI-13): Tables 5 and 7, which describe forecasted carbon monoxide (CO) concentrations, are alluded to in the air quality appendix but are missing from the Draft EIS. These should be included in the final.

The consultant compared the forecasted CO levels to threshold limit values for industrial work places. These values are based on the air pollutant exposure of a healthy adult male. Stricter standards should be applied since the project will attract a cross section of the population, including young and old people, and pregnant females. Noted is the recommendation to vent the underground parking areas as far away from pedestrian areas as possible which will help mitigate this impact.

View Planes (Section VI-D-6, page VI-14): This section repeatedly states that the three proposed 400 foot office and residential towers ("50 feet taller than the tallest surrounding buildings") will have minimal visual impact. Our reviewers felt that these statements were unsubstantiated, given the fact that these structures would block views of the water from countless mauka locations. The discussion tends to justify rather than analyze visual impact.

Draft EIS

Support Infrastructure - Water (Section VI-D-7, page VI-16): This section should indicate, at least, a preliminary estimate of the water utilization requirements of the proposal and the resultant effects on the capacity of the existing system.

Residential Population (Section VI-F-1, page VI-41): This section presents a scant analysis of the project's impact on the housing demands on Oahu. The document does not indicate which of the stated 14,100 demanded units by 1995 are low, middle, or high income units. The 350 luxury housing units proposed will undoubtedly be in the one million dollar per unit range. Given the discussion on pages IV-1 to 7, an estimate should be presented of how many more affordable units could be built under the Aloha Tower Housing Foundation structure.

Employment (Section VI-F-2, page VI-41): Recent economic analyses of Hawaii have indicated that the labor shortage is an obstacle to the State's development. A more extended analysis, therefore, is warranted here. Some projection of the prevailing labor situation at the time of the project's completion as well as estimates of the various types and the total number of jobs provided would yield a better assessment of impact.

Thank you for the opportunity to comment on this document.

Yours truly,

John T. Harrison, Ph. D.
Environmental Coordinator

cc: Aloha Towers Development Corporation
Wilson Okamoto & Associates
Roger Fujioka
Chuck Gee
George Taoka
Peter Flaschbart
Henry Gee
Y.S. Fok
Lne Lyttle

ALOHA TOWER DEVELOPMENT CORPORATION

John Waihee
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November 30, 1990

Dr. John T. Harrison, Environmental Coordinator
Environmental Center
University of Hawaii at Manoa
2550 Campus Road
Honolulu, Hawaii 96822

SUBJECT: The Waterfront at Aloha Tower
Draft Environmental Impact Statement (EIS)

Dear Dr. Harrison:

Thank you for your comments on the Draft EIS. We offer the following responses, in respective order, to your comments:

1. In reference to your general comments, please be assured that we have attempted to provide an objective assessment of the proposed project. We admit, however, that we are enthusiastic about some of the features of the project which have a positive impact and may have emphasized them in the text. While we agree that renderings alone do not necessarily provide the most realistic impression of the project, we believe that in side-by-side comparisons with photographs of existing conditions, they provide a good indication of the project's visual impact.

2. Please be assured that should modification of construction methods implicate a significantly greater impact than discussed in the Draft EIS, additional review shall be sought through supplemental environmental documentation.

3. Our researchers indicate that sea level rise over the next 50 years is estimated to be between 16 and 38 cm with 27 cm being the most likely rise. We will include this estimate in the Final EIS. Sea level rise is not factored in calculations of surge from a Kona storm. Surge levels are based on the sea level existing at the time of the storm.

   We have also discovered an error in the information on page III-26 of the Draft EIS which will be corrected in the Final EIS. The Draft EIS states that, "In Honolulu, the rise may be even less because the island is estimated to uplift at about 0.4 mm per year." Actually, the island is subsiding at about 0.4 mm per year. This subsidence, however, is accounted for in the estimate of sea level rise. Thus, the projected 10 cm rise over the next 25 years is correct, but without any counteracting factors such as island uplifting.

4. Inasmuch as we are at the tail end of the ten-year U.S. Census data cycle, we concur that much of the information available through this source is out-of-date. Thus, we have relied on other sources to update our data base, including the City and County of Honolulu Department of General Planning and recent EISs prepared for projects in the downtown area. With respect to rental rates, we plan to update figures in the Final EIS based on the Rental Housing Development Study for the Island of Oahu by the City and County of Honolulu Department of Housing and Community Development (July, 1989).

5. Potential omissions of planning goals that may conflict with the project were not intentional. We shall review those documents you cited to identify any relevant policies and include an expanded discussion in the Final EIS.

6. The developers do not anticipate doing construction on a 24-hour basis. Therefore, a "variance for 24-hour construction" permit is not necessary.

7. The Level of Service for the "with project" data (table 8) includes only the proposed traffic improvements for project entrances and exits along Nimitz Highway. Although these improvements were discussed in the Draft EIS on page VI-11, we will revise the discussion in the Final EIS to clarify that they were included in the "with project" data on table 8. None of the other mitigation measures discussed in the traffic study (Appendix C) were included in table 8.

The purpose of the traffic study is to determine the impacts of the project-generation traffic on the surrounding roadway network. Traffic projections beyond the 1995 horizon would not be valid based on the methods used in the traffic study. Year 2005 projections and beyond would require a planning study of the entire downtown area. Increases in traffic after the Waterfront at Aloha Tower is completed would be due to developments other than that which is proposed.

8. Tables 1 through 8 were inadvertently omitted from the Air Quality Study (Appendix A). These tables will be included in the Final EIS.

With respect to the Threshold Limit Value (TLV) for the parking garages, it should be noted that both the State Department of Health and the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) suggest in their design guidelines that the TLV for carbon monoxide are appropriate for designing enclosed parking garages. Carbon monoxide uptake by individuals is directly related to the level of exertion. The higher the level of exertion, the lower the level of carbon monoxide that can be tolerated, and vice versa. Within the industrial work place, at least a moderate level of exertion is assumed. Within a parking garage, individuals will by and large be walking or sitting and thus be functioning at relatively low exertion levels. Hence, carbon monoxide levels within a parking garage could likely exceed the TLV to some extent without adverse effects on healthy adults.

It is also recognized, however, that the proposed project will attract subpopulations, such as young and old people as well as pregnant females who may be more sensitive to air pollution. To account for body weight and respiratory differences between children and adults, the TLV is often divided by a factor of 1.75. Hence, the short-term TLV for carbon monoxide specifically for children would be 440/1.75 or 251 mg/m3. The estimated maximum concentration within the parking garages was 190 mg/m3, assuming the recommended ventilation rate of 1.5 cfm per square foot of floor space. Neglecting the level of exertion, the worst-case concentrations will still meet this criteria. Nevertheless, enclosed parking garages are areas where persons sensitive to air pollution should not be allowed to linger for extended periods, and the proposed facilities shall be operated accordingly.

9. The view plane analysis considers the overall context of Downtown high-rise development as the basis for stating that the additional 50-foot height would not have a substantial impact on public views from the mauka areas. Notably, the proposed high-rise buildings lie behind existing high-rise developments in the Downtown area when viewed from the mauka direction. At lower elevations such as in the Kukui area, views of the water from public streets and parks are largely obscured by existing buildings. From higher elevations which are more distant, such as the Punchbowl lookout, the project buildings would be visible among the Downtown high-rises and may obscure additional patches of the ocean, which stretch across the background of the Downtown skyline. We do not agree that the marginal addition to the Downtown skyline would be accurately described as "block(ing) views of water from countless mauka locations."

10. Infrastructure requirements to meet the proposed project's water demands have yet to be determined and will be included in the preparation of the project's water system master plan. Water system improvements in the vicinity of the project site have been proposed by the State in its Waterfront Master Plan as well as by the Board of Water

Supply in its Downtown Improvement Plan. How the project's water system will relate to these planned system improvements has yet to be determined although they will provide ample capacity for the project.

11. The discussion pertaining to housing demand states that the 14,100 units is an Oahu total. Based on how this total was derived, it cannot be broken down by income categories. The maximum of 350 units proposed in the project are identified as "upscale" and, therefore, will not fulfill housing demand in categories where housing shortages have been identified as a social problem.

    The Aloha Tower Housing Foundation as targeted its assistance to provide fit and affordable housing for those persons throughout the State whose income is less than 80 percent of the median income. It is not expected, however, that the Foundation will receive significant funds for a period of at least five years. When funds become available, the Foundation will work with the State Housing Finance and Development Corporation and/or other State or local agencies to address low income housing shortages through development of housing units or provision of necessary services supporting their development. The actual manner in which these funds will be applied, however, is uncertain at this time. It should be clarified that the Foundation is not proposed as a mitigation measure for any identified project impact nor is it required as a condition of development approvals. Thus, a detailed analysis of its implementation is beyond the scope of this EIS.

12. An estimate of the number of long-term jobs created is presented in the Draft EIS on page VI-42. Short-term construction or long-term jobs may be impacted by economic factors such as the number of jobs created and the condition of the labor market at that time. If the labor market remains as it is, the degree of labor demand will likely dictate the price of labor recruitment and retainage; which is a consideration for the project developers.

We hope that we have satisfactorily responded to your comments. If you have any further questions, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

Daniel Orodenker
Executive Assistant

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

DOWNTOWN NEIGHBORHOOD BOARD NO. 13
c/o NEIGHBORHOOD COMMISSION OFFICE
CITY HALL, 4TH FLOOR
HONOLULU, HAWAII 96813-3014

RECEIVED

October 5, 1990

Aloha:

The Downtown Neighborhood Board has reviewed the waterfront at Aloha Tower Draft EIS. We have the following comments:

1. We object to any building height which is greater than that permitted by the City and County of Honolulu in the downtown area. That height limit is 350 feet. We object to the State overriding City zoning and again ask you to look at other ways to keep the maximum height at 350 feet. Perhaps you should again consult with the American Institute of Architects for ideas, and go underground at Irwin Park.

2. We want assurances that dewatering will not create problems similar to those which occured in Waikiki during the Duty Free Shoppers construction.

3. We want assurances that all toxics found will be removed safely, without contaminating the community.

4. City buses do not stop at Aloha Tower. Whatever route they take, passengers must still walk to the Tower.

5. Board members have seen humpback whales at the entrance to the harbor. The Chairman saw two whales cavorting as the Navatek departed from Pier No. 9 for a whalewatching excursion last spring. The statement on page III-24 that there have been no rare, endangered, or threatened species identified within or near the project area is incorrect.

6. The population counts are still wrong. Census tracts 51 and 52 include Beretania - North, 756 apartments; Honolulu Tower, 395 apartments; Smith-Beretania, 163 apartments; and Hale Pauahi, 396 Apartments - for a total of 1,710 units. Assuming 1.85 residents per unit, that equals 3,163. And we did not include any low rises.

7. Maunakea-Smith will have 238 units, not the 191 you mention.

8. Page VI-44 mentions residents can use the Richards Street YWCA and Nuuanu YMCA for active recreation? Will the developer pay for our membership and usage fees? These are not free. If not, don't site them as available recreation sites.

9. Maunakea Street should have been included in the traffic study. Also, the midget maps and printing were impossible to read; they should have been full page to enable us to check your assumptions. However, since we found the traffic studies you cited, Alii Place and Pacific Nations Center, woefully inadequate, we will assume yours is lacking.

Traffic in the area is abysmal in the afternoon, and we can only assume that the increased volume of tour buses generated by the project will make the situation a lot worse, especially if they are forced to make a left turn on Nimitz to enter the project.

10. Because of the one-way traffic situation downtown, any traffic study should take that into consideration. The concentration of traffic into specific lanes for turns rather than averaging traffic over all lanes.

Sincerely,

Lynne Matusow

Lynne Matusow
Chair

cc: Aloha Tower Development
Mayor Frank F. Fasi

ALOHA TOWER DEVELOPMENT CORPORATION

John Waihee
Governor

Roger A. Ulveling
Chairman

Randall Y. Iwase
Executive Officer

33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

November 30, 1990

Ms. Lynne Matusow, Chairperson
Downtown Neighborhood Board No. 13
c/o Neighborhood Commission
City Hall Room 400
Honolulu, Hawaii 96813

SUBJECT: The Waterfront at Aloha Tower
Draft Environmental Impact Statement (EIS)

Dear Ms. Matusow:

Thank you for your comments on the subject Draft EIS. We offer the following responses, in respective order, to your comments:

1. We acknowledge your objection to exceeding the 350 foot height limit. The American Institute of Architects was consulted both for the EIS Preparation Notice and Draft EIS. Their comments on the EIS Preparation Notice and the Draft EIS, as well as our responses to those comments are included in the Final EIS. Although the alternative of going underground of Irwin Park was considered, it was determined that such excavation could not be accomplished without destroying the large monkey pod trees which are integral to the historic and aesthetic value of the park.

2. As a disclosure document, the EIS identifies and discusses the potential for impact and possible mitigation measures. The construction contractor is responsible for implementing necessary mitigation measures and is liable for construction related damages.

3. Surveys to date have found no toxic wastes although the presence of hazardous wastes and materials, including asbestos and petroleum products, have been confirmed. All State and Federal requirements must be met in dealing with these materials.

4. The Draft EIS states that the bus system serves the waterfront along Nimitz Highway. Although city buses do not presently stop at Aloha Tower, The Waterfront at Aloha Tower will be serviced upon redevelopment. Based on preliminary discussions with the City Department of Transportation Services, bus routes and stops will be provided at appropriate locations along Nimitz Highway-Ala Moana Boulevard.

5. Humpback whales are protected by Federal and International law. They seasonally migrate between feeding grounds in the North Pacific and breeding areas near Maui. During these migrations they pass along the shorelines of Oahu and are frequently seen in many nearshore locations. Proposed construction activities are not likely to have any impact on the transit of whales fronting the mouth of Honolulu Harbor. The Final EIS shall acknowledge the potential transit of whales outside of Honolulu Harbor.

6. The demographic characteristics are based on 1980 Census data. Most housing projects mentioned were built after this census and are thus not reflected in the demographic tables (Honolulu Tower, Smith-Beretania and Hale Pauahi). The only later figures available covering these census tracks are unpublished estimates from the City and County of Honolulu, Department of General Planning. These show an estimate of 4,654 in 1988 for census tracts 51 and 52. The Final EIS will be revised to reflect these more recently updated population estimates.

7. The Final EIS will be revised to reflect the correct number of units.

8. We shall clarify in the Final EIS that the Y.M.C.A. and Y.W.C.A. are private non-profit organizations offering recreational amenities to their members.

9. During the consultation phase, the list of streets used in the traffic analysis was discussed with the City and County of Honolulu Department of Transportation Services and the State of Hawaii Department of Transportation. Maunakea Street was not considered to be within the scope of the project area.

The comments regarding the map size have been noted. Their readability and visual clarity shall be improved for the Final EIS.

Tour buses turning left off Nimitz Highway at Fort Street onto the site will make this maneuver during off-peak hours only. However, tour buses turning left off Nimitz Highway at Richards Street may do so at any time, due to the existing long stacking lane in that location.

10. All one-way configurations of streets in the downtown study area were taken into consideration in the analysis. Existing, cumulative, and project volumes were assigned to each turning movement at an intersection. The program used to analyze the level-of-service at an intersection distributes each turning movement volume over the number of lanes designated for that movement.

We hope that we have satisfactorily responded to your comments. If you have any questions, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

Daniel Orodenker
Executive Assistant

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

HAWAII PILOTS ASSOCIATION
P.O. Box 721 • Honolulu, Hawaii 96808
Telephone: (808) 531-4478

FAX: 521-2780

Servicing: Hilo, Honolulu, Kahului, Kawaihae, Nawiliwili, Port Allen

8 October, 1990

Mr. Mark H. Hastert
Aloha Tower Development Corporation
33 South King Street, Suite 403
Honolulu, Hawaii, 96813

SUBJECT: Comments On Draft Environmental Impact Statement For The Waterfront At Aloha Tower

Dear Mr. Hastert,

Thankyou for the opportunity to comment on the above cited document. I have reviewed the Draft EIS from two points of objectivity: 1. As a representative of the Hawaii Pilots Association, the pilot group that handles the majority of large ship traffic in Honolulu Harbor and, 2. As a member of the Hawaii Chamber of Commerce Maritime Affairs Subcommittee appointed to comment on the EIS. My overall comments are reflected in the Chamber Subcommittee report submitted to you as a separate document.

The operational concerns of the Hawaii Pilots Association are divided into the following two basic categories:

1. FUTURE AND INTERIM VESSEL BERTHING FACILITIES

Fortunately, the Association has developed an excellent working raport with the developer's maritime facility designers, Vickerman, Zachary, Miller. As designs are being developed the Association is one of the primary groups that is consulted. Our recommendations are being taken into account and we are confident that the final, and interim, maritime facilities will reflect our professional input.

2. FUTURE AND INTERIM FACILITIES FOR DISPLACED TENANTS CURRENTLY IN THE DEVELOPMENT AREA

The Hawaii Pilots Association wholeheartedly endorses the Subcommittee's recommendation that refers to tenants at piers 5 through 14: "Their operational and financial interests should be protected during the interim and be given priority status in obtaining alternative locations on State harbor lands." To meet this end we recommend that a meeting(s) be convened to specifically discuss interim and future locations for affected businesses. Unique needs particular to each affected business need to be adressed so a smooth transition from the present, to the interim construction period, and finally to the future can be effected.

In conclusion I, once again, commend the Aloha Tower Development Corporation on the selection of Aloha Tower Associates as the developer for this project. As an active member of Honolulu's operational waterfront, and a representative of the Hawaii Pilots Association, I am pleased to report to you that the present working relationship with the developer is an excellent one that will result in new maritime facilities in conjuction with the "festival market place" that will enhance not only the maritime community but the entire city of Honolulu.

If you have any questions or would like to discuss any aspects of the project and/or the Draft Environmental Impact Statement I can be contacted at the above phone number and/or address.

Very Truly Yours,

Dave Lyman

Captain Dave Lyman

ALOHA TOWER DEVELOPMENT CORPORATION

John Waihee
Governor

Roger A. Ulveling
Chairman

Randall Y. Iwase
Executive Officer

33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

November 30, 1990

Captain Dave Lyman
Hawaii Pilots Association
P.O. Box 721
Honolulu, Hawaii 96808

SUBJECT: The Waterfront at Aloha Tower
Draft Environmental Impact Statement (EIS)

Dear Captain Lyman:

Thank you for responding to the request for comments on the subject Draft EIS. Your participation in this review process helps assure that a range of interests and expertise are considered in regard to the proposed project. We offer the following responses, in respective order, to your comments:

1. Thank you for your feedback concerning the rapport with the developer's maritime facility designers. The developers look forward to continuing work with the Hawaii Pilots Association in this regard.

2. We appreciate your interest in the position of the Harbor tenants in the project area. The Department of Transportation-Harbors will be coordinating efforts for the relocation of affected tenants.

We hope we have satisfactorily responded to your comments. If you have any further questions, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

Daniel Orodenker
Executive Assistant

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

HONOLULU CHAPTER
THE AMERICAN INSTITUTE OF ARCHITECTS

October 8, 1990

Executive Director
Aloha Tower Development Corporation
33 South King Street, Suite 403
Honolulu HI 96813

REF: THE WATERFRONT AT ALOHA TOWER DRAFT EIS

Dear Sir,

Following review of the Draft Environmental Impact Statement, we of the Honolulu Chapter /American Institute of Architects still have the following concerns -

1. An independent view plane analysis needs to be done as part of the Final EIS (similar to the independent studies in the appendices of the Draft EIS) in order to be more thorough, more objective and less self-serving. The view plane analysis of this EIS is substantially weaker than independent analyses we have reviewed in other EIS reports. Specifically, we note the following -

a. The Harbor Court tower is diamond head of Bethel Street in the Financial District and not at Nimitz and Nuuanu in Chinatown as stated.

b. The 400 foot towers at the water's edge are by no means of "minimal impact". The 400 foot towers may be 14% taller than the 350 foot height limit of the Financial District but they are 60% taller than the more relevant 250 foot height limit in the immediate area.

c. The Kukui highrises are far away from the site and the waterfront and thus not a valid comparison. They are also substantially less than 400 feet and in the mauka area of downtown.

2. Comments on the renderings in the view plane analysis -

a. The renderings in the view plane analysis have only served to reinforce our concerns about condo tower height, bulk and orientation. Orienting towers with the long axis in the mauka-makai direction as is required in Chinatown rather than the indicated ewa-diamond head direction would less interfere with mauka-makai views.

1128 Nuuanu Avenue
Honolulu, Hawaii 96817
Tel (808) 545-4242

b. Regarding wording in the Draft EIS, the project seems to have gone from towers "of 350 to 400 feet" or "of 400 feet maximum" in the EIS Preparation Notice to towers of "a definite 400 feet" in the Draft EIS.

c. There are discrepancies between the renderings and the plans in the Draft EIS. These drawings need to be revised in the Final EIS to resolved any discrepancies.

(1) The plans show the diamond head condo tower adjacent to and touching Pier 13. The rendering shows water separating the two. Of concern is that the towers not interrupt makai views along Nuuanu and Smith Streets.

(2) The bridge indicated in the renderings of Figures 30 and 33 is a new addition of most serious concern. The plan does not indicate what the bridge is connecting or its extent. In no way should makai views along Smith and Nuuanu be traversed. Is the bridge crossing these views? What is the bridging connecting?

3. We note that in Figures 8 and 9 the Draft EIS clearly shows elevations of the Maritime Building and the Marketplace but the document declines to show elevations of the Office Building or the Condo Towers leading to speculation as to why. We trust that elevations of the towers will be shown in the Final EIS. These buildings are obviously of greatest impact. Certainly elevations would clear up questions about the bridges in the renderings.

4. Of greatest concern is the degree to which the base structures of the condo towers will block makai views at ground level (Figure 30). The original intent was to allow makai views under and through the lobbies of the condo towers. This has been totally lost due to parking location problems. This is a great tragedy and of utmost concern. Parking problems need to be resolved in a different manner. The project needs to improve on existing makai views ewa of Pier 11, not worsen existing conditions.

5. Assuming sensitive development of the HECO power plant site, makai views can be gained along the axis of Alakea Street. The maritime building as positioned in the current scheme interferes with such views. Minimal adjustment can rectify this situation.

6. On Figure 5, "William Street" should read "Mililani Street". Also on Figure 5, the plan at Piers 13 and 14 needs to be revised to coordinate with the renderings (Figures 30 and 33). See the above comments.

Thank you for the opportunity to comment on the Draft EIS for the Waterfront at Aloha Tower. We look forward to seeing the Final EIS revised to incorporate the above comments.

Sincerely,

Theodore E. Garduque

Theodore E. Garduque, AIA
President, Honolulu Chapter/AIA

ALOHA TOWER DEVELOPMENT CORPORATION
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John Waihee
Governor

Roger A. Ulveling
Chairman

Randall Y. Iwase
Executive Officer

November 30, 1990

Mr. Theodore E. Garduque, President
Honolulu Chapter
American Institute of Architects
1128 Nuuanu Avenue
Honolulu, Hawaii 96817

SUBJECT: The Waterfront at Aloha Tower
Draft Environmental Impact Statement

Dear Mr. Garduque:

Thank you for responding to the request for comments on the subject Draft EIS. We offer the following responses, in respective order, to your comments:

1. The view plane analysis was conducted independently as were the other studies in the Draft EIS. However, the study was incorporated into the text because its methodology and findings are less technical and the graphic presentation can be readily interpreted.

   a. The street reference will be corrected in the Final EIS.

   b. The magnitude of the project's visual impact depends on the vantage point. The "minimal visual impact" from the 14 percent greater height of project high-rises refers specifically to public views from elevated mauka vantage points such as Punchbowl, Tantalus and Pali Highway. From such locations, the tallest buildings in the Downtown area will establish the visual context for the project buildings.

c. The Kukui highrises were mentioned in the context of views from the low-rise Chinatown area where high-rise development is or will be prominent in mauka, makai and Diamond Head directions. The Kukui high-rises are prominent in the mauka direction while the project high-rises will join the Chinatown Gateway Plaza, presently under construction, and the planned Harbor Court tower in the makai direction. The high-rise financial district is prominent in the Diamond Head direction.

2. a. Since the EIS is a disclosure document, the renderings provided in the view plane analysis are intended to provide an impression of tower height, bulk and orientation. We recognize the intent of aligning the shorter axes of buildings in the mauka-makai direction to preserve views toward the ocean. The axes of the proposed buildings, however, are relatively close in scale such that the potential increase in the view plane by shifting the axes would not be significant.

b. The Draft EIS is intended to provide as accurate a project description as is available when it is published. To retain the earlier wording would not have served this intent.

c. The intent of the view plane analysis is to provide as accurate an impression of the proposed development as is presently available, including the siting of buildings and their overall character. Due to on-going refinements in design, the rendering may not depict building placement exactly as shown on the site plan which reflects the latest layout. The discrepancies, however, are minor and further design refinements will not deviate significantly from that depicted in the renderings and site plan.

(1) In the rendering, which was prepared earlier, the pier level service connection to the Diamond Head tower was via a bridge which is not visible in the rendering. In later plans, the pier apron is extended and touches the Diamond Head tower. In either scheme, harbor views from Nuuanu Avenue and Smith Street would be generally similar.

(2) The bridge shown in the Draft EIS is an eighth floor pedestrian link between the two condominium towers to provide sheltered access between the parking area and the Diamond Head tower. The bridge has since been lowered to the third floor to improve views from mauka buildings. In either case, the span of the bridge lies approximately midway between Nuuanu Avenue and Smith Street and, therefore, will not be in the makai view corridors of these streets. The bridge will be visible from these streets near their intersection with Nimitz Highway.

3. The elevation drawings in the Draft EIS are intended to provide a visual impression of the proposed development, including the intended character of the buildings. Since they are not drawn within the context of existing buildings in the area, they are not well suited for view assessment. The view plane analysis is intended to serve that purpose. Available elevation drawings of the condominium towers were not accurate because of the parking structure modifications. New elevations have yet to be prepared and will not be available for the Final EIS.

4. Your concern regarding the view impacts of the present design in the Smith Street area is acknowledged, however, the project design theme of improving view corridors down Fort, Bethel and Bishop Streets should be considered as well.

5. An imaginary view down Alakea Street and through the HECO power plant site will run into Honolulu Harbor along the Ewa face of the Maritime complex and include any ships which are berthed there at the time. The layout of the Maritime complex took this viewline into consideration. We concur, however, that the alignment of Alakea Street, as depicted in the Roof Plan (figure 5) of the Draft EIS does not reflect this. This diagram has been corrected.

6. The street labeling shall be corrected.

We hope that we have satisfactorily responded to your comments. If you have any further questions, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

Daniel Orodenker
Executive Assistant

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

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

ENV 2-1
JA/G

William A. Bonnet
Manager
Environmental Department

October 5, 1990

RECEIVED

Mr. Mark H. Hastert
Helber Hastert & Kimura, Planners
Aloha Tower Development Corporation
33 South King Street, Suite 403
Honolulu, Hawaii 96813

Dear Mr. ~~Hastert~~ Mark:

Subject: Draft Environmental Impact Statement for the Waterfront at Aloha Tower

We have reviewed the subject EIS, and have the following comments:

(1) Page II-19, paragraph 3, Piers 8-11: Reference is made to, "Engineering studies will be conducted to determine appropriate construction requirements, including the need for dredging, blasting, and construction." Since HECO will still have the Honolulu Power Plant in operation, these engineering studies need to address any adverse impact for HECO's circulating water systems.

(2) Electric Utility and Electric Power requirements were not addressed in this draft. A project of this magnitude would require a substation and underground line extensions.

HECO shall reserve further comment pertaining to the protection of existing power lines within the project area until construction plans are finalized.

Sincerely,

William A. Bonnet

cc: Wilson Okamoto & Associates, Inc. (E. Matsukawa)
Aloha Tower Associates (E. K. Smith)

ALOHA TOWER DEVELOPMENT CORPORATION

John Waihee
Governor

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Chairman

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Executive Officer

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November 30, 1990

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

SUBJECT: The Waterfront at Aloha Tower
Draft Environmental Impact Statement (EIS)

Dear Mr. Bonnet:

Thank you for responding to the request for comments on the subject Draft EIS. Your participation in this review process helps assure that a range of interests and expertise are considered in regard to the proposed project. We offer the following responses, in respective order, to your comments:

1. All engineering studies for construction in the vicinity of the HECO's power plant facilities shall address potential adverse impacts on those facilities. We understand that the project designers shall be coordinating pertinent aspects of these engineering studies with HECO.

2. We understand that project designers have been in contact with HECO representatives regarding the possible need for a power substation(s). Currently, several options are being evaluated which will meet the projected power requirements of the proposed project.

We hope we have satisfactorily responded to your comments. If you have any further questions, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

Daniel Orodenker
Executive Assistant

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

LUNSFORD DOLE PHILLIPS
ATTORNEY

Suite 1620 Pioneer Plaza
900 Fort Street Mall
Honolulu, Hawaii 96813
Tel 808 533-1734

Of Counsel To The
Law Offices of
Burt L. Snyder
Fax 808-531-4491

August 28, 1990

Mark H. Hastert
Helber Hastert & Kimura
Planners for Aloha Towers Dev. Corp.
State of Hawaii
33 South King Street, Suite 403
Honolulu, Hawaii 96813

Re: EIS comments

Dear Sir:

Thank you for sharing the Draft EIS with me. While I am unable to address many of the technical issues, please allow me to urge you to plan in accessibility for persons with disabilities at the earliest stages.

The Draft notes that the downtown residents median age is much older than for the island as a whole. Likewise you will find that the median age of our island's tourists is also far older. Inevitably advanced age occasions physical limitations and disabilities. So the statistical percentage nationally of ten percent persons with disabilities would probably be low for the populations most affected by your project. Therefore, aside from legal requirements, good planning dictates you recognize accessibility as an essential component.

If I can be of any assistance, feel free to contact me.

Sincerely,

LUNSFORD DOLE PHILLIPS

LDP/cb

cc: Wilson Okamoto and Assoc.: E. Matsukawa
Aloha Tower Associates: E.R. Smith

ALOHA TOWER DEVELOPMENT CORPORATION

John Waihee, Governor
Roger A. Ulveling, Chairman
Randall Y. Iwase, Executive Officer

33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

November 30, 1990

Mr. Lunsford Dole Phillips, Esquire
900 Fort Street Mall, Suite 1620
Honolulu, Hawaii 96813

SUBJECT: The Waterfront at Aloha Tower
Draft Environmental Impact Statement (EIS)

Dear Mr. Phillips:

Thank you for your comments on the subject Draft EIS. The Waterfront at Aloha Tower will be designed to be accessible in accordance with the Americans with Disabilities Act of 1990. Article 9, as included in the 1990 Chapter 16 (Building Code) Amendments to the Revised Ordinances of Honolulu, or the Uniform Federal Accessibility Standards will be used as a guide until the design requirements of the Disabilities Act are published in April, 1991.

We hope that we have satisfactorily responded to your comments. If you have any further questions, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

Daniel Orodenker
Executive Assistant

cc: Mr. Buck Roger, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

The Chamber of Commerce of Hawaii
Established 1850

October 8, 1990

Mr. R. P. Rogers
Permits and Approvals Manager
Aloha Tower Associates
841 Bishop Street
Suite 2006
Honolulu, Hawaii 96813

Dear Mr. Rogers:

We are in receipt of your letter dated August 28, 1990 requesting comments of the submitted Environmental Impact Statement Draft of the Waterfront at Aloha Tower. A subcommittee of the Chamber of Commerce Maritime Affairs Committee convened on September 29th to discuss and herein present comments for consideration in the preparation of the final EIS. The attending subcommittee members were: Captain D. Lyman, Hawaii Pilots Association, P. Hallewas, Vice Chairman of Chamber of Commerce Maritime Affairs, R. Jonsson, Vice President, Hawaiian Tug & Barge, D. Panagopulos, President, TheoDavies Marine Agencies.

The subcommittee recognizes and compliments the firm of Wilson Okamoto and Associates, Inc., for preparing a comprehensive and objective analysis.

Comments:

The subcommittee draws attention to the draft's summary proposed action plan describing the integration of cruise-ferry terminal and support facilities with office retail space, hotel and condominiums. While these types of maritime operations are consistent with the pier's utilization, the proposed action plan's working should specifically include "commercial shipping" to reflect the piers continued us e by all types of vessels (container, barges, tugs, fishing, etc.).

The final EIS study should fully addressed long and short term impact on commercial shipping and related services. This should include interim conditions during the project's waterside construction phase on port congestion, pier availability, and navigation.

The proposed extentions of Piers 5 and 6 beyond the Federal Project Line described in Section II Page 18 Paragraph E-1 of the study remain subject

to governmental approval. It is suggested that in lieu of receiving approval the extention's impact be evaluated with regard to vessel turning area and navigation. Provision should be made that will allow these piers to remain operational in the likelihood that approval is granted after they are placed into service.

A detailed description of security features to be incorporated in project should be presented in the study. This should include an on-site Harbors police station simiIiar to the existing station located at Pier 10, flood lighting, remote camera surveillance, motion detection, gates, etc. In the normal case of maritime operation, sections or entire piers will be required to be removed from public access to service a vessel. In general, the greatest demand on security will be from cruise vessels, consequently a thorough analysis of national and international guidelines covering cruise vessel port security should be undertaken.

The traffic flow in and around the waterfront development area as described in the study will be reconfigured periodically until completion. A traffic flow plan should be included, illustrating vehicular access through the area during the interim and on completion. Such plans should include access for firms providing shore side services, loading-unloading zones, passenger-crew transport areas and parking. Sufficient access for emergency services should be provided to all pier areas.

Recoginizing the waterfront project at Aloha Tower as the first project of it's kind to interface an active maritime facility with a "people place". It is imperative that both can be effectively segregated as necessary for the public's safety. Provisions should be made to limit public access to specific piers when mooring and unmooring vessels, fueling, transfer operations or during periods when heavy surge is evident in the harbor.

The effects of wave penetration on pier structure, type and size of vessel as described in Section VI Page 39 Paragraph E-1 of the study should include all types of vessels anticipated to berth at Piers 5 through 9. Minimum mooring requirements for these vessels may be necessary in order to avoid potential hazards from mooring lines parting and recoiling or vessel break out from pier.

Limited mention was found with respect to current tenents displaced by the project. Most of these tenents provide vital maritime services as the Port of Honolulu and State of Hawaii. Their operational and financial interests should be addressed during the interim and given priority status in obtaining locations on State Harbor lands.

On behalf of the Chamber of Commerce Maritime Affairs Commettee we appreciate the opportunity to review and comment on this study.

Should any question or additional information be required to kindly contact The Maritime Affairs Committee of the Chamber of Commerce at your earliest convenience.

Very truly yours,

D. Panagopulos
Subcommittee Chairman

DP:hn

cc: Wilson Okamoto and Associates Inc. (E. Matsukawa)
Aloha Tower Development Corporation (M.H. Hastert)

ALOHA TOWER DEVELOPMENT CORPORATION

John Waihee, Governor
Roger A. Ulveling, Chairman
Randall Y. Iwase, Executive Officer

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(808) 548-6585 • FAX: (808) 548-7214

November 30, 1990

Mr. D. Panagopulos, Subcommittee Chairman
The Chamber of Commerce of Hawaii
735 Bishop Street
Honolulu, Hawaii 96813

SUBJECT: The Waterfront at Aloha Tower
Draft Environmental Impact Statement (EIS)

Dear Mr. Panagopulos:

Thank you for responding to the request for comments on the subject Draft EIS. Your participation in this review process helps assure that a range of interests and expertise are considered in regard to the proposed project. We offer the following responses, in respective order, to your comments:

1. The piers within the project have been planned for continued multiple uses according to the stated needs of the Department of Transportation (DOT)-Harbors and several maritime user groups. A summary of uses, which currently includes commercial shipping, will be included in the Final EIS. The piers and their hardware (fenders, cleats, utility systems, etc.) are being developed with considerable flexibility consistent with all known potential uses.

2. There exists a detailed plan for the interim relocation of cruise ship operations. This plan has been developed in conjunction with the affected users and conforms to their requirements. DOT-Harbors will be coordinating efforts for the relocation of other affected tenants. Land and water borne construction activities will affect other activities in the Harbor and consequently must be planned in detail with these constraints in mind. This planning

responsibility is acknowledged and will be met at an appropriate time.

3. Several vessel maneuvering studies have been completed which examine the slip widths planned between Piers 4 and 5, 6 and 7, and 14 and 15, as well as the turning basin makai of Piers 5 and 6, with planned extension. These geometry studies have been discussed with DOT-Harbors and the Hawaii Pilots Association. The consensus conclusion is that will be no adverse impacts on vessel maneuverability due to the project. These studies and discussions are intent on maintaining maximum functional usage of the harbor for maritime activities.

4, 6 & 7. We are aware that security, lighting, public safety and vessel mooring requirements are all sensitive issues at Honolulu Harbor and they are all being considered as part of a good port design. They are appropriately addressed during detailed design and design review.

5. A detailed traffic flow plan for the project site cannot be developed until the schedule for construction has been fully determined. These plans will be coordinated with the State and City transportation agencies.

It is our understanding that no businesses will be operating on the piers during construction. Traffic flows on-site and access to the construction site would be the responsibility of the contractor in coordination with DTS and DOT-Harbors.

8. We appreciate your consideration given to tenants in the project area. DOT-Harbors will be coordinating efforts for the relocation of affected Harbor tenants.

We hope that we have satisfactorily responded to your comments. If you have any further questions, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

Daniel Orodenker
Executive Assistant

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

ALOHA WFR
DEVELOP. CORP.
Oct 36 10 17 AM '90

"Pace"
c/o Christine Brown
1170 Nuuanu Av
Apt 603
Hon. Hi 96817

October 27, 1990

Mr. Mark H. Hastert
Helber Hastert & Kimura
33 South King Street, Suite 403
Honolulu, Hawaii 96813

Dear Mr. Hastert:

Our apologies for not responding before the October 8, 1990 deadline. However, we would like still to share our reaction to your Draft EIS-The Waterfront At Aloha Tower.

Attached is our response at PACE (People Against Chinatown Eviction) to the Draft EIS.

Sincerely Yours,

Christine R. Brown

Christine Brown

Given the housing crisis afflicting Hawaii today, our concern at PACE (People Against Chinatown Eviction) regarding new construction projects is their impact on low-income (and affordable) housing. In this response to your Draft EIS, we note the following:

On page I-2 you indicate that "ATA and the Enterprise Foundation of Columbia, Maryland, will establish the Aloha Tower Housing Foundation. The purpose of the Foundation will be to assist in providing fit and affordable housing for the poor in Hawaii."

It is clear from the project presentation that it does not include any low-income housing units. Indeed, the entire project is upscale (including two condo towers). The project is intended for visitors and residents who have enough discretionary income to spend in business establishments housed in the project.

In our judgement, the Waterfront at Aloha Tower will adversely affect the situation of low-income housing in the downtown and adjacent areas. Ostensibly, the Aloha Tower Housing Foundation (ATHF) will be established "to assist in providing fit and affordable housing for the poor in Hawaii." However, nowhere in the Draft EIS is there a serious discussion of the impact of the project on the poor especially in the area of housing. We think that this must be one of the top issues discussed in the EIS. In this regard, we would note the following:

1) the statistics included in the report are from the 1980 Census. Consequently, they do not reflect the socio-economic and demographic changes that have taken place in the downtown and adjacent areas during the last decade. We strongly recommend that you bring relevant up-to-date statistics to bear upon the EIS for the project; and

2) your mention of the State Housing Functional Plan as part of your enumeration of the State Functional Plans, does not address in any meaningful way what you intend to do "to fulfill the State Functional Plan." All you seem to say in this connection is that the ATHF will deal with this (pv-5). You also reiterate the same in your mention of the General Plan of the City and County of Honolulu-- Housing Objective C, Policy 3 (pv-9).

We would like to see the following questions addressed in a meaningful way in the EIS:

a) Where would the ATHF be building housing for the poor who would be adversely affected by the project?
b) Will there be "displacement" of poor to make way for development in "sub areas" as a result of the impact of

the project on these "sub areas"?
c) How would all of this affect the poor in Chinatown? As a derivative question, how would the development of upscale housing units in Chinatown impact the poor and in general, yet substantive, terms, how would the project builders propose to deal with this eventuality through ATHF?

These questions are relevant and need to be addressed seriously. In your discussion of Community Impact (pp. vi-46-48) some of these questions were addressed. However, in the section on Chinatown especially, the discussion remained ambigious and ambivalent.

After reading the report we still do not know how many people will be affected or how adversely.

To help in meeting the needs of low-income people who will be affected by this development, PACE requests representation on the ATHF.

ALOHA TOWER DEVELOPMENT CORPORATION
33 South King Street, Suite 403 • Honolulu, Hawaii 96813
(808) 548-6585 • FAX: (808) 548-7214

November 30, 1990

Ms. Christina R. Brown
People Against Chinatown Eviction
1170 Nuuanu Avenue, Apartment 603
Honolulu, Hawaii 96817

SUBJECT: The Waterfront at Aloha Tower
Draft Environmental Impact Statement (EIS)

Dear Ms. Brown:

Thank you for your comments on the subject Draft EIS. We offer the following responses, in respective order, to your comments:

1. The EIS for the Waterfront at Aloha Tower addresses potential social impacts of the proposed project, however, there is no evidence suggesting that it would have a direct or secondary impact on housing for the poor on the site or in the neighboring Chinatown area. The project will not displace such housing or plans for such housing on the project site. In the Downtown area, increasing land values have been cited as contributing to the housing problem; however, most of the housing in Chinatown is government subsidized, as discussed in the Draft EIS. Land values in the Downtown area are likely to continue to rise whether or not the Waterfront at Aloha Tower project is implemented.

2. Inasmuch as we are at the tail end of the ten-year U.S. Census data cycle, we concur that much of information available through this source is out-of-date. Thus, we have relied on other sources to update our data base, including the City and County of Honolulu Department of General Planning and recent EISs prepared for projects in the Downtown area. The Final EIS will be revised to reflect these more recently updated population estimates.

3. The Aloha Tower Housing Foundation has targeted its assistance to provide fit and affordable housing for those persons throughout the State whose income is less than 80 percent of the median income. It is not expected, however, that the Foundation will receive significant funds for a period of at least five years. When funds become available, the Foundation will work with the State Housing Finance and Development Corporation and/or other State or local agencies to address low income housing shortages through development of housing units or provision of necessary services supporting their development. The actual manner in which these funds will be applied, however, is uncertain at this time. It should be clarified that the Foundation is not proposed as a mitigation measure for any identified project impact nor is it required as a condition of development approvals. Thus, a detailed analysis of its implementation is beyond the scope of this EIS.

We hope that we have satisfactorily responded to your comments. If you have any questions, please contact Mr. Earl Matsukawa of Wilson Okamoto & Associates, our EIS consultant, at 531-5261.

Very truly yours,

Daniel Orodenker
Executive Assistant

cc: Mr. Buck Rogers, Aloha Tower Associates
Mr. Earl Matsukawa, Wilson Okamoto & Associates

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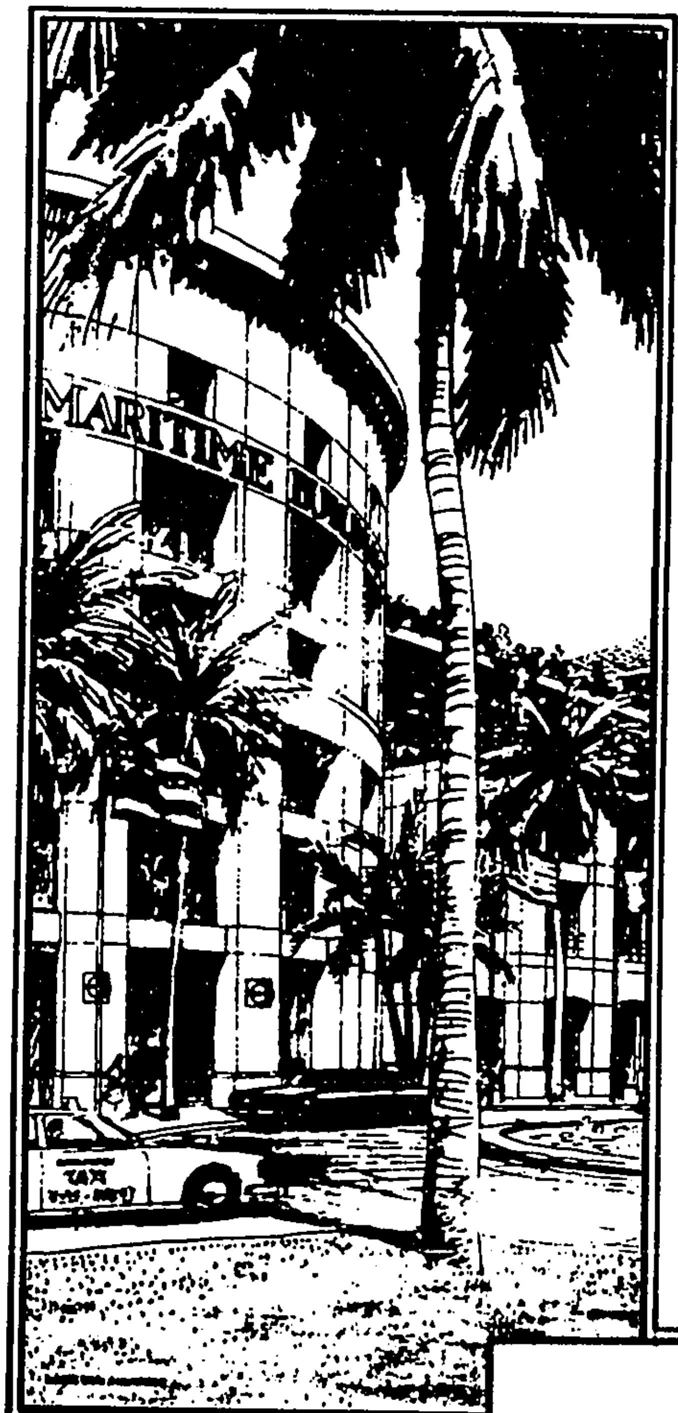

APPENDICES

APPENDIX A

AIR QUALITY STUDY

Prepared By

Barry D. Neal & Associates

AIR QUALITY STUDY
FOR THE PROPOSED
WATERFRONT AT ALOHA TOWER PROJECT

HONOLULU, OAHU, HAWAII

Prepared for:

Wilson Okamoto & Associates, Inc.

August 1990

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1.0 INTRODUCTION AND PROJECT DESCRIPTION

Aloha Tower Associates has been selected by the state's Aloha Tower Development Corporation to redevelop the waterfront area at the base of Bishop Street in downtown Honolulu (see Figure 1). The project area, located makai of Nimitz Highway at Piers 5 through 14 (excluding portions of Pier 7) in Honolulu Harbor, comprises a land area of approximately 22.4 acres. The Aloha Tower area is approximately equidistant between Honolulu International Airport and Waikiki and contains the famous landmark, Aloha Tower, as well as Irwin Memorial Park. Specifically, proposed development components will include: the Maritime Building and Passenger Terminal with commercial and governmental offices at Piers 5 and 6; the Pedestrian Promenade extending from Piers 5 to 14 with retail emphasis between Piers 6 and 9; Aloha Tower Marketplace retail and office space at Piers 8 and 9 with maritime improvements at the pier fronts; a refurbished and beautified Aloha Tower; the Harbor Centre Hotel at Piers 10 and 11; an international cruise ship terminal at Piers 10 and 11; the Harbor Centre office complex at Pier 11; Honolulu Fort Historic Park at Pier 12; and Honolulu Harborside condominiums at Piers 13 and 14 with maritime facilities at pier level.

The purpose of this study is to describe existing air quality in the project area and to assess the potential short-term and long-term direct and indirect air quality impacts that could result from the redevelopment and subsequent use of the proposed facilities. Measures to mitigate adverse impacts are suggested where possible and appropriate.

2.0 AMBIENT AIR QUALITY STANDARDS

Ambient concentrations of air pollution are regulated by both national and state ambient air quality standards (AAQS). National

AAQS are specified in Section 40, Part 50 of the Code of Federal Regulations (CFR), while State of Hawaii AAQS are defined in Chapter 11-59 of the Hawaii Administrative Rules (Department of Health). Table 1 summarizes both the national and the state AAQS that are specified in the cited documents. As indicated in the table, AAQS have been established for six air pollutants: particulate matter, sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone and lead. National AAQS are stated in terms of primary and secondary standards. National primary standards are designed to protect the public health with an "adequate margin of safety". National secondary standards, on the other hand, define levels of air quality necessary to protect the public welfare from "any known or anticipated adverse effects of a pollutant". Secondary public welfare impacts may include such effects as decreased visibility, diminished comfort levels, or other potential injury to the natural or man-made environment, e.g., soiling of materials, damage to vegetation or other economic damage. In contrast to the national AAQS, Hawaii State AAQS are given in terms of a single standard that is designed "to protect public health and welfare and to prevent the significant deterioration of air quality".

Each regulated air pollutant has the potential to create or exacerbate some form of adverse health effect or to produce environmental degradation when present in sufficiently high concentration for prolonged periods of time. The AAQS specify a maximum allowable concentration for a given air pollutant for one or more averaging times to prevent harmful effects. Averaging times vary from one hour to one year depending on the pollutant and type of exposure necessary to cause adverse effects. In the case of the short-term (i.e., 1- to 24-hour) AAQS, both national and state standards allow one exceedance per year.

State of Hawaii AAQS are in some cases considerably more stringent than comparable national AAQS. In particular, the State of Hawaii

1-hour AAQS for carbon monoxide is four times more stringent than the comparable national limit.

Under the provisions of the Federal Clean Air Act [1], the U.S. Environmental Protection Agency (EPA) is required to periodically review and re-evaluate national AAQS in light of research findings more recent than those that were available at the time the standards were originally set. Occasionally, new standards are established as well. Most recently, the national standards for particulate matter have been revised to include specific limits for particulate 10 microns or less in diameter (PM-10) [2]. The State of Hawaii has not explicitly addressed the question of whether to set limits for this category of air pollutant, but national AAQS prevail where states have not set their own more stringent levels.

Hawaii relaxed its AAQS for sulfur dioxide in 1986 to make them essentially the same as national limits. Various forums have proposed that the state also relax its carbon monoxide standards to the national levels, but at present there are no indications that such a change is being considered.

3.0 REGIONAL AND LOCAL CLIMATOLOGY

Regional and local climatology significantly affect the air quality of a given location. Wind, temperature, atmospheric turbulence, mixing height and rainfall all influence air quality. Although the climate of Hawaii is relatively moderate throughout most of the state and most of the year, significant differences in these parameters may occur from one location to another. Most differences in regional and local climates within the state are caused by the mountainous topography.

Hawaii lies well within the belt of northeasterly trade winds generated by the semi-permanent Pacific high pressure cell to the north and east. On the island of Oahu, the Koolau and Waianae Mountain Ranges are oriented almost perpendicular to the trade winds, which accounts for much of the variation in the local climatology of the island. Downtown Honolulu, the site of the proposed project, is located in a coastal area leeward of the Koolau Mountains. Although large urban areas may create their own microclimates to some extent, long-term weather data available from the Honolulu International Airport, located about 4 miles to the northwest, is at least semi-representative of the project site.

Wind frequency data given in Table 2 for Honolulu International Airport show that the annual prevailing wind direction for this area of Oahu is east northeast. On an annual basis, 34.7 percent of the time the wind is from this direction, and nearly 75 percent of the time the wind is in the northeast quadrant. Winds from the south are infrequent, occurring only a few days during the year, and mostly in winter, in association with Kona storms. Wind speeds average about 10 knots (12 mph) and mostly vary between about 5 and 15 knots (6 and 17 mph). Surface winds in downtown Honolulu are similar to those recorded at the airport but are undoubtedly deflected and channeled at some locations by the many high-rise buildings.

The volumes of air pollutants emitted by motor vehicles, the formation of photochemical smog, and the ceilings of smoke plumes all depend in part on air temperature. Colder temperatures tend to increase pollutant emissions from automobiles but reduce concentrations of photochemical smog and ground-level concentrations of pollutants from elevated plumes. In Hawaii, the annual and daily variations in temperature depend, to a large degree, on elevation above sea level, distance inland, and exposure to trade winds. Average temperatures near sea level generally are warmer than those at higher elevations. Areas exposed to trade winds tend to have the least temperature variation, while inland and leeward areas often have the most. Downtown Honolulu's coastal, leeward location produces a moderate temperature profile relative to other locations around Oahu and the state. At the airport, average annual daily minimum and maximum temperatures are 70°F and 84°F, respectively [3]. The extreme minimum temperature was 53°F during February 1983, and the extreme maximum was 94°F during September 1988. Temperatures in the downtown area may be slightly higher compared to the airport due to urban effects.

Small scale, random motions in the atmosphere (turbulence) cause air pollutants to be dispersed as a function of distance or time from the point of emission. Turbulence is caused by both mechanical and thermal forces in the atmosphere. It is often measured and described in terms of Pasquill-Gifford stability class. Stability class 1 is the most turbulent and class 6 the least. Thus, air pollution dissipates best during stability class 1 conditions and worst when stability class 6 prevails. In urbanized areas like downtown Honolulu, stability class 4 is generally the highest that occurs, developing during the nighttime and/or during cloudy daytime conditions.

Mixing height is defined as the height above the surface through which relatively vigorous vertical mixing occurs. Low mixing heights can produce high ground-level air pollutant concentrations because contaminants emitted from or near the surface can become trapped within the mixing layer. In Hawaii, minimum mixing heights tend to be high because of mechanical mixing caused by the trade winds and because of the temperature moderating effect of the surrounding ocean. Low mixing heights may sometimes occur, however, at inland locations and, at times, along coastal areas early in the morning following a clear, cool, windless night. Coastal areas also may experience low mixing heights during sea

breeze conditions when cooler ocean air rushes in over warmer land. Mixing heights in the state typically are above 3000 feet (1000 meters). Low mixing heights in the downtown Honolulu area will tend to be inhibited by urban effects but may occur occasionally.

Rainfall can have a beneficial affect on the air quality of an area in that it helps to suppress fugitive dust emissions, and it also may "washout" water soluble gaseous contaminants. Rainfall in Hawaii is highly variable, depending on elevation and on location with respect to trade winds. Downtown Honolulu, in a leeward location and near sea level, has a relatively dry climate. Average annual rainfall amounts to about 24 inches with summer months being the driest. Monthly rainfall may vary from as little as a trace to more than 20 inches.

4.0 PRESENT AIR QUALITY

Present air quality in the project area is mostly affected by air pollutants from vehicular, industrial and/or natural sources, and perhaps to a lesser and occasional extent from distant agricultural sources. Table 3 presents an air pollutant emission summary for the City and County of Honolulu that was compiled in 1980. These are the latest data that are available. Emissions are undoubtedly higher at this time, but the proportional relationships may continue to be about the same. The mineral products industry was the most significant source category for emissions of particulate matter. Sulfur dioxide emissions originated mainly from power plants, while motor vehicles accounted for much of the emissions of nitrogen oxides, carbon monoxide and hydrocarbons.

Nimitz Highway, adjacent to the project site, is a major arterial carrying heavy motor vehicle traffic much of the time. Emissions from motor vehicles on this roadway, primarily nitrogen oxides and carbon monoxide, will tend to be carried over the project site by the prevailing winds.

Also adjacent to the project site is the Honolulu Power Plant operated by Hawaiian Electric Company (HECO). This steam-electric generating facility consists of two units fueled by low sulfur oil. Existing air quality in the project vicinity may be affected by nitrogen oxides and sulfur dioxide emissions from the boiler chimneys. HECO currently plans to close down this facility in the 1994-95 timeframe with no intent to replace it.

Natural sources of air pollutants that also could affect the project area but cannot be accurately quantified include the ocean (sea spray), plants (aero-allergens), wind-blown dust, and perhaps distant volcanoes on the Island of Hawaii.

The State Department of Health operates a network of air quality monitoring stations at various locations on Oahu. Each station typically monitors only selected air quality parameters. Table 4 shows an annual summary of air quality measurements that were made nearest to the project site for each of the regulated air pollutants for the period 1985 through 1989.

Sulfur dioxide is monitored by the State Department of Health at an air quality station located in Campbell Industrial Park at Barbers Point, several miles west of the project site. Monitoring consisted of measurements of 24-hour average sulfur dioxide concentration every sixth day. There were no exceedances of the state/national 24-hour AAQS for sulfur dioxide during the 5-year period. Concentrations monitored during the last 4 years reported were consistently low with daily mean values at or below 5 $\mu g/m^3$.

Total suspended particulate concentrations were monitored at the Department of Health Building in downtown Honolulu, just a few

blocks southeast of the project site. During the 1985-89 reporting period, the highest 24-hour average total suspended particulate concentration measured was 61 $\mu g/m^3$. Average daily concentrations were about 25 to 30 $\mu g/m^3$. No exceedances of the state AAQS for this parameter were recorded.

The nearest PM-10 monitoring station is located about 1.5 miles north of the project site at Kauluwela School. Twenty-four hour average PM-10 concentrations monitored at this location ranged from 7 to 52 $\mu g/m^3$ between 1985 and 1989. Average daily concentrations were generally less than 20 $\mu g/m^3$. All values reported were within the national AAQS.

The nearest carbon monoxide measurements were made at the Department of Health building in downtown Honolulu. The average daily maximum 1-hour concentration measured at this location was about 2 mg/m^3. During the most recent year reported, 1989, the daily maximum 1-hour concentration ranged from 0.3 to 7.8 mg/m^3, and no exceedances of the state 1-hour AAQS were recorded. During previous years (1985-88), maximum 1-hour concentrations were higher, and one to three exceedances of the state 1-hour AAQS were measured each year. Daily maximum 8-hour values for 1988 and 1989 have not been reported at this writing, but concentrations for the 1985-87 period ranged from 0.1 to 4.7 mg/m^3. The average of the daily maximum 8-hour values was about 1.3 mg/m^3. No exceedances of the state 8-hour AAQS were recorded. Present concentrations of carbon monoxide in the project area are estimated later in this study based on air quality modeling of vehicular emissions.

The nearest available ozone measurements were obtained at Sand Island (about 1/2 mile northwest of the project site). Except for 1985, the maximum 1-hour concentration each year during the past few years has averaged about 90 $\mu g/m^3$. No exceedances of the state AAQS have been recorded since 1985.

The closest and most recent measurements of ambient lead concentrations that have been reported were made at the downtown Honolulu monitoring station between 1985 and 1987. Lead concentrations at this location had a downward trend, most probably reflecting the increased use of unleaded gasoline. Average quarterly concentrations were near or below the detection limit. No exceedances of the state AAQS have ever been recorded.

Nitrogen dioxide is no longer monitored by the Department of Health anywhere in the state. Concentrations of this pollutant were measured from 1971 through 1976 at Barbers Point, and annual mean values were found to vary from 11 to 29 $\mu g/m^3$, safely inside the state and national AAQS.

Based on the data and discussion presented above, it appears likely that the State of Hawaii AAQS for particulate, sulfur dioxide, nitrogen dioxide and lead are currently being met at the project site. The ozone AAQS has not been exceeded during the past four years at the Sand Island monitoring station. Carbon monoxide readings from urban Honolulu indicate that the state AAQS for carbon monoxide may be exceeded at a rate of one to three times per year in traffic congested areas.

5.0 SHORT-TERM IMPACTS OF PROJECT

Short-term direct and indirect impacts on air quality could potentially result from project construction. Of concern for a project of this nature are two potential types of air pollutants emitted during project construction: (1) fugitive dust from demolition work and from vehicle movement and soil excavation; and (2) exhaust emissions from on-site construction equipment. Indirectly, there also could be short-term impacts from slow-moving

construction equipment traveling to and from the project site and from a temporary increase in local traffic caused by commuting construction workers.

Fugitive dust emissions may occur during the demolition and removal of existing structures on the site and during the grading and dirt-moving activities associated with site preparation once the area is cleared. The emission rate for fugitive dust from construction activities is difficult to estimate accurately because of its elusive nature and because of variables such as the type of soil at the construction site and its moisture content, the amount and type of soil disturbing activity required, and the wind speed. The EPA [4] has developed a rough estimate for uncontrolled fugitive dust emitted during construction: 1.2 tons per acre per month under conditions of "medium" activity, moderate soil silt content (30%), and a precipitation/evaporation (P/E) index of 50. Uncontrolled fugitive dust emissions in the project area would likely be somewhat higher because the PE index for the downtown Honolulu area is probably less than 50, due to the relatively dry climate. In any case, State of Hawaii Air Pollution Control Regulations [5] prohibit visible emissions of fugitive dust from construction activities at the property line. Thus, an effective dust control plan for the project construction phase is essential.

Adequate fugitive dust control can usually be accomplished by establishment of a frequent watering program to keep demolition areas and bare-dirt surfaces in construction areas from becoming significant dust generators. Using wind screens and/or limiting the area that can be disturbed at any given time are additional control measures that may be required. Control regulations also require that open-bodied trucks be covered at all times when in motion if they are transporting materials likely to give rise to airborne dust. Paving of parking areas and/or establishment of landscaping as early in the construction process as possible can also lower the potential for fugitive dust emissions.

On-site mobile and stationary construction equipment also will emit air pollutants from engine exhausts. The largest of this equipment is usually diesel-powered. Nitrogen oxides emitted from diesel engines can be relatively high compared to gasoline-powered equipment, but the standard for nitrogen dioxide is set on an annual basis and is not likely to be violated by short-term construction equipment emissions. Carbon monoxide emissions from diesel engines, on the other hand, are low and should be relatively insignificant compared to vehicular emissions on nearby roadways.

Indirectly, slow-moving construction vehicles on roadways leading to and from the project site could obstruct the normal flow of traffic to such an extent that overall vehicular emissions are increased, but this impact can be mitigated by moving heavy construction equipment during periods of low traffic volume. Likewise, the schedules of commuting construction workers can be adjusted to avoid peak hours in the project vicinity. Thus, most potential short-term air quality impacts from project construction can be mitigated.

6.0 LONG-TERM IMPACTS OF PROJECT

6.1 Roadway Traffic

By serving as an attraction for increased motor vehicle traffic on nearby roadways, the proposed project can be regarded as an indirect air pollution source. Motor vehicles with gasoline-powered engines are significant sources of carbon monoxide. They also emit nitrogen oxides, and those few vehicles burning leaded gasoline contribute lead to the atmosphere. The use of leaded gasoline in new automobiles is now prohibited. As older vehicles

continue to be removed from the state's roadways through attrition, lead emissions are approaching zero. Nationally, so few vehicles now require leaded gasoline that the EPA is proposing a total ban on leaded gasoline to take effect immediately. Even without such a ban, reported quarterly averages of lead in air samples collected in urban Honolulu have been near zero since early 1986. Thus, lead in the atmosphere is not considered a problem anywhere in the state.

Federal air pollution control regulations also call for increased efficiency in removing carbon monoxide and nitrogen oxides from the exhausts of new motor vehicles. By the year 1995 carbon monoxide emissions are expected to be about 30 percent less than present due to the replacement of older vehicles with newer models with more efficient emission control devices. Further reductions in vehicular emissions have recently been proposed by the President for areas of the country that do not currently meet AAQS, mainly through the use of alternative fuels.

To evaluate the potential long-term indirect air quality impact of increased roadway traffic associated with the proposed project, a computerized emission and atmospheric dispersion models was used to estimate ambient carbon monoxide concentrations along roadways leading to and from the project. Carbon monoxide is selected for modeling because it is the most stable as well as the most abundant of the pollutants generated by motor vehicles. Furthermore, carbon monoxide pollution is generally considered a microscale problem, whereas nitrogen oxide emissions most often is a regional issue. This is reflected in the fact that the AAQS for carbon monoxide are specified on a short-term basis (1-hour and 8-hour averaging times) while the AAQS for nitrogen dioxide are set on an annual basis.

For this project, three scenarios were selected for the carbon monoxide modeling study: year 1990 with present conditions, year

1995 without the project, and year 1995 assuming the project is completed. To begin the modeling study, critical receptor areas in the vicinity of the project were identified for analysis. Generally speaking, roadway intersections are the primary concern because of traffic congestion and because of the increase in vehicular emissions associated with traffic cycling: decelerating, stopping, queuing and accelerating. For this study, six key intersections identified in the Traffic Study for the Waterfront at Aloha Tower [6] were selected for air quality analysis. These include: Nimitz Highway at Bethel Street, Nimitz Highway at Fort Street, Nimitz Highway at Bishop Street, Nimitz Highway at Alakea Street, Nimitz Highway at Richards Street and Ala Moana Boulevard at Punchbowl Street. The Traffic Study describes the present and future conditions and configurations of these intersections in detail.

The main objective of the modeling study is to estimate both current and projected levels of maximum 1-hour average carbon monoxide concentrations that could then be directly compared to the national and state AAQS. The Traffic Study indicates that traffic volumes generally are or will be higher during the afternoon peak hour than during the morning peak period. Worst-case emission and meteorological dispersion conditions typically occur during the morning hours at many locations. However, due to possible effects from the queuing of vehicles at intersections and to vehicle cold-start considerations, both morning and afternoon peak traffic hours were examined to ensure that worst-case concentrations were identified.

The EPA computer model MOBILE4 [7] was used to calculate vehicular carbon monoxide emissions for each year studied. One of the key inputs to MOBILE4 is vehicle mix. Based on recent vehicle registration figures, the present and projected vehicle mix in the project area is estimated to be 91.9% light-duty gasoline-powered

vehicles, 5% light-duty gasoline-powered trucks and vans, 0.5% heavy-duty gasoline-powered vehicles, 0.6% light-duty diesel-powered vehicles, 1% heavy-duty diesel-powered trucks and buses, and 1% motorcycles.

Other key inputs to the MOBILE4 emission model are the cold/hot start fractions. Motor vehicles operating in a cold- or hot-start mode emit excess air pollution. Typically, motor vehicles reach stabilized operating temperatures after about 4 miles of driving. For traffic operating within the project area, it was assumed that during the morning peak hour about 25 percent of all vehicles would be operating in the cold-start mode and that about 5 percent would be operating in the hot-start mode. During the afternoon peak hour, the cold/hot start percentages were assumed to be 50 percent and 10 percent, respectively. These operational mode values were estimated based on a report from the California Department of Transportation [8] and taking into consideration the likely origins of morning/afternoon traffic in the project area. MOBILE4 idle emissions were adjusted to account for excess cold/hot-start emissions per a recent U.S. EPA memorandum [9].

Ambient temperatures of 59 and 68 degrees F were used for morning and afternoon peak-hour emission computations, respectively. These are conservative assumptions since morning/afternoon ambient temperatures will generally be warmer than this and emission estimates given by MOBILE4 are inversely proportional to the ambient temperature.

After computing vehicular carbon monoxide emissions through the use of MOBILE4, these data were then input to the latest version of the computer model CALINE4 [10]. CALINE4 was developed by the California Transportation Department to simulate vehicular movement and atmospheric dispersion of vehicular emissions. It is designed to predict 1-hour average pollutant concentrations along roadways based on input traffic and emission data, roadway/receptor geometry and meteorological conditions.

Input peak-hour traffic data were obtained from the traffic study cited previously. The traffic volumes given in the traffic study for the future scenario include project traffic as well as traffic from other growth that is expected to occur in the area by the year 1995. Traffic queuing estimates were made based on the Traffic Study, Transportation Research Board procedures [11], U.S. EPA guidelines [12], and traffic observations at the subject intersections. In all modeling assessments, vehicle speeds were assumed to be limited to 25 mph either due to posted speed limits or to congested traffic conditions. Deceleration and acceleration times of 10 and 12 seconds, respectively, were assumed.

Model roadways were set up to reflect actual roadway geometry, physical dimensions and operating characteristics. Pedestrian walkways in the project area are located very close to the traveled roadways as is typical of central business district locations. Thus, model receptor sites were located approximately 1 to 2 meters from the edge of the roadways near the intersections studied. All receptor heights were placed at 1.5 meters above ground to simulate levels within the normal human breathing zone.

Downtown Honolulu is a typical central business district location in that street canyons have been created by the construction of many high-rise buildings. This results in channeling of the wind and may reduce the dispersion of air pollutants emitted by motor vehicles traversing the area. To account for this, CALINE4 was run both with and without the street canyon option, and the higher of the two predicted concentrations was used.

Input meteorological conditions for this study were defined to provide "worst-case" results. One of the key meteorological inputs

is atmospheric stability category. For these analyses, atmospheric stability category 4 was assumed for both morning and afternoon cases. This is the most conservative stability category that can be used for estimating pollutant dispersion in urban locations. A surface roughness length of 300 cm was assumed with a mixing height of 300 meters. Worst-case wind conditions were defined as a wind speed of 1 meter per second with a wind direction resulting in the highest predicted concentration.

Existing background concentrations of carbon monoxide in the project vicinity are believed to be at moderate levels. Hence, background contributions of carbon monoxide from sources or distant roadways not directly considered in the analysis were accounted for by adding a background concentration of 1 ppm to all predicted concentrations for both the 1990 and the 1995 scenarios.

Table 5 summarizes the final results of the modeling study in the form of the estimated worst-case 1-hour morning and afternoon ambient carbon monoxide concentrations. These results can be compared directly to the state and the national AAQS. Estimated worst-case carbon monoxide concentrations are presented in the table for three scenarios: year 1990 with existing traffic, year 1995 without project traffic and year 1995 with project traffic. The locations of these estimated worst-case 1-hour concentrations all occurred at or very near the indicated intersections.

All afternoon peak hour concentrations estimated for the existing case were higher than the morning peak hour values. This is because afternoon traffic volumes are higher and afternoon emissions were estimated to be higher also due to a larger percentage of cold-start vehicles. As indicated in the table, the estimated present (1990) worst-case 1-hour carbon monoxide concentration in the project area, 24.3 mg/m^3, occurs during the afternoon peak hour near the intersection of Nimitz Highway and

Richards Street. Worst-case 1-hour values at other locations in the project vicinity were generally in the 18 to 22 mg/m^3 range.

In the year 1995 without the proposed project, a worst-case 1-hour concentration of 17.2 mg/m^3 was predicted to occur during the afternoon peak traffic hour near the intersection of Nimitz Highway and Richards Street, the same location and time as the highest concentration for the existing case. Concentrations near this level also can be expected to occur in the vicinity of Nimitz Highway and Bethel Street. Worst-case values at the other locations studied for this scenario ranged between about 11 and 16 mg/m^3 during the afternoon peak hour. Morning peak-hour concentrations were generally about 20 to 30 percent lower than the afternoon worst-case values.

Predicted 1-hour worst-case concentrations for the 1995 with project scenario ranged from 10.4 mg/m^3 during the morning at Nimitz Highway and Alakea Street to 21.0 mg/m^3 during the afternoon at Nimitz Highway and Bethel Street. Compared to the without project case, predicted worst-case concentrations were generally about 20 to 30 percent higher. The afternoon concentration predicted at Nimitz Highway and Bethel Street, the highest for this scenario, is about 1 mg/m^3 higher than the existing case, whereas concentrations at the other intersections studied are about 10 percent lower than the 1990 values.

Thus, all estimated worst-case 1-hour carbon monoxide levels for all scenarios are within the national AAQS of 40 mg/m^3. It appears likely, however, that existing concentrations of carbon monoxide as well as future concentrations either without or with the project may exceed the State of Hawaii 1-hour AAQS of 10 mg/m^3 on occasion at several locations in the project area.

Worst-case 8-hour carbon monoxide concentrations were estimated by multiplying the worst-case 1-hour values by a persistence factor of 0.5. This accounts for two factors: (1) traffic volumes averaged over eight hours are lower than peak 1-hour values, and (2) meteorological dispersion conditions are more variable (and hence more favorable) over an 8-hour period than they are for a single hour. Based on monitoring data, 1-hour to 8-hour persistence factors for most locations generally vary from 0.4 to 0.8 with 0.6 being the most typical. One recent study based on modeling [13] concluded that 1-hour to 8-hour persistence factors could typically be expected to range from 0.4 to 0.5. EPA guidelines [12] recommend using a value of 0.6 to 0.7 unless a locally derived persistence factor is available. Recent monitoring data for Honolulu reported by the Department of Health [14] suggests that this factor may range between about 0.35 and 0.55 depending on location and traffic variability. Considering the location of the project and the traffic pattern for the area, a 1-hour to 8-hour persistence factor of 0.5 is probably most appropriate for this application.

The resulting estimated worst-case 8-hour concentrations are indicated in Table 6. For the 1990 scenario, the estimated worst-case 8-hour carbon monoxide concentration was 12.2 mg/m^3 at the intersection of Nimitz Highway and Richards Street. Other locations ranged from 6.6 mg/m^3 near Nimitz Highway and Alakea Street to 11.0 mg/m^3 near Nimitz Highway and Bethel Street. The predicted maximum values for the year 1995 without and with project scenarios were 8.6 and 10.5 mg/m^3, respectively; both occurred at the Nimitz Highway/Bethel Street intersection (and also at the Nimitz Highway/Richards Street intersection in the without project case). Other locations were generally in the 7 to 8 mg/m^3 range without project and 9 to 10 mg/m^3 with project. Either with or without the project, 1995 concentrations should be about the same or lower than existing concentrations. Comparing the predicted values for the existing case to the AAQS, it appears that both the state and the national 8-hour standard may be exceeded at several locations in the project vicinity. In 1995 with or without the project, worst-case concentrations will likely continue to exceed the state 8-hour AAQS but comply with the national standard, except possibly in the with project scenario near the intersections of Nimitz Highway at Bethel Street and Nimitz Highway at Richards Street.

The results of this study reflect several assumptions concerning traffic movement and worst-case meteorological conditions. A worst-case meteorological condition is the occurrence of a wind speed of 1 meter per second with a steady direction for 1 hour. A steady wind of 1 meter per second blowing from a single direction for an hour is not very likely, and it may occur only once a year or less. With wind speeds of 2 meters per second, for example, computed carbon monoxide concentrations would be only about one-half the conceptual value.

6.2 Parking Facilities

The proposed project provides for the elimination of the present surface parking areas at Piers 5 and 6 and at Irwin Park and the development of both underground and above ground parking facilities. One of the underground parking facilities will be located at the Maritime Building (Piers 5 and 6) and will provide a total of about 600 parking spaces on two levels. The other underground parking facility will be located at the Aloha Tower Marketplace, Harbor Centre Hotel and the Maritime Terminal (Piers 8 through 11) and will provide a total of about 2000 parking stalls on three levels. Traffic will both enter and exit the underground parking facilities via Ala Moana Boulevard. Above ground parking stalls will be built on Piers 13 and 14 to provide a total of up to 500 spaces for condominium units.

Although there are no specific air pollution standards pertaining to parking structures, the State Department of Health specifies ventilation design guidelines for enclosed parking garages in Chapter 11-39 of the Hawaii Administrative Rules. These guidelines require that each level of an enclosed parking structure be mechanically vented unless: (1) more than half the wall area is open along at least 40 percent of the perimeter; (2) there are no employees who normally work in the space; and (3) there is adequate natural ventilation. Mechanical ventilation equipment, either supply or exhaust, must provide a minimum of 1.50 cubic feet per minute (cfm) of outdoor air per square foot of space over the entire floor area. (This is the design criteria also currently recommended by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) for ventilating parking garages [15].) At locations where traffic congestion may occur, such as at exits, more ventilation capacity is required.

The state design guidelines referenced above also specify that an engineered system may be employed using the formula:

$$Q = K\, n \,/\, C$$

where ,

Q = exhaust ventilation rate (cfm)
K = 1,380,000
n = number of cars running at one instant
C = allowable concentration (ppm)

For engineered systems, C must be selected with regard to the "threshold limit value" for carbon monoxide and as approved by the Director of the Department of Health.

Threshold Limit Values (TLVs) are set by the American Conference of Governmental Industrial Hygienists (ACGIH) and pertain to the air within the industrial workplace (16). The ACGIH TLV for carbon monoxide is stated in terms of a time-weighted average (TWA) concentration of 55 mg/m^3 (50 ppm) for an 8-hour period (40 hours per week). A TLV short-term exposure limit (STEL) of 440 mg/m^3 (400 ppm) is also specified for a 15-minute period. Thus, compared to the state and the national AAQS (see Table 1), the ACGIH TLVs for carbon monoxide are much less restrictive.

The formula given above pertaining to the design of ventilation systems for enclosed parking facilities was promulgated in January 1983 when the state rule for air conditioning and ventilating was established. Motor vehicles in the 1990's emit less carbon monoxide on the average than earlier models did during the early 1980's when this rule was adopted. Thus, use of this formula for designing parking garage ventilation systems for today's or future facilities probably will result in overly conservative ventilation requirements.

In 1995 when the proposed project will be complete, motor vehicles will emit a maximum of about 11 grams per minute each of carbon monoxide while idling or operating at low speeds in the parking garages in the cold-start mode. This assumes an ambient temperature of 59°F. Because Honolulu's average minimum temperature is 70°F and since emissions are inversely proportional to ambient temperature, cold-start emissions will usually be lower. Motor vehicles typically reach stabilized operating temperatures within about 7 to 8 minutes after a cold start. After reaching stabilized temperatures, emissions will amount to less than 3 grams per minute per vehicle on the average. Shown in Table 7 are the estimated worst-case 15-minute average concentrations that will occur in the underground parking garages assuming that 1.5 cubic feet per minute (cfm) of outdoor air per square foot of space is provided. Worst-case concentration estimates assume that 25 percent of the capacity of the parking level operates continuously with 100 percent of the

vehicles in the cold-start mode. As indicated in the table, worst-case concentrations are estimated to range from 130 mg/m^3 on level 1 of the Maritime Building parking facility to 190 mg/m^3 on each of the three parking levels at the hotel and passenger terminal. Thus, worst-case carbon monoxide levels within the underground parking facilities should be well below the TLV-STEL (440 mg/m^3) even with the minimum required ventilation.

To comply with the state design guidelines as well as to provide an adequate margin of safety, a minimum ventilation capacity of 1.50 cubic feet per minute per square foot of floor space should be provided within each of the proposed underground parking garages. However, as suggested by ASHRAE, and if approved by the Department of Health, carbon monoxide sensors could be used to reduce ventilation rates during inactive periods and thereby cut down energy consumption while maintaining carbon monoxide concentrations below the TLV-STEL.

Air vented from the underground parking garages and which affect public areas will be subject to state and national AAQS. Thus, all air from underground parking garages should be vented as far from pedestrian areas as is practicable so as to achieve a dilution factor of at least five to ten.

It should be noted that the estimated concentrations given in Table 7 pertain to the year 1995. In future years, concentrations will decrease as more and more older model vehicles are retired from the fleet. It also should be noted that the number of parking stalls, floor space and ventilation rates shown in the table are preliminary estimates and are subject to modification. However, it is unlikely that these figures will change significantly in the final design.

Design of the above ground parking facilities at Piers 13 and 14 is still in the preliminary stage; however, it is anticipated that these facilities will rely on natural ventilation to control carbon monoxide levels within and adjacent to the parking facilities. Architectural screening will be used to provide for both an aesthetically pleasing appearance and adequate natural air flow. In compliance with Department of Health design guidelines, more than half the wall area will be open along at least 40 percent of the perimeter of each parking level. It is expected that the waterfront location of these facilities will provide for good natural ventilation with winds from any direction. Even with wind speeds as low as 1 mph, natural ventilation should provide sufficient outdoor air.

6.3 Electrical Demand

The proposed project also will cause indirect emissions from power generating facilities as a consequence of electrical power usage. The annual electrical demand of the project when fully developed is not expected to exceed about 70 million kilowatt-hours. This power demand, some of which will be offset by the present demand at the site, would most probably be provided by oil-fired generating facilities located on Oahu. However, with H-Power now online and plans for a coal-fired power plant at Campbell Industrial Park in the near future, some of the project power could well come from sources burning other fuels. In order to meet the electrical power needs of the proposed project, power generating facilities will be required to burn more fuel and hence more air pollution will be emitted at these facilities. Given in Table 8 are estimates of the indirect air pollution emissions that would result from the project electrical demand assuming all power is provided by burning more fuel oil at Oahu's power plants. If power is supplied instead or in part by coal or solid waste burning facilities, emissions will likely be higher than the values given in the table.

6.4 Solid Waste Disposal

Solid waste generated by the completed project is expected to amount to less than 20 tons of refuse per day. Most, if not all, of this refuse will likely be hauled away in three to four truckloads per day and either landfilled or burned at another location. If all refuse is landfilled, the only air pollution emissions will be due to exhaust fumes and fugitive dust from the trucks and heavy equipment used to place the refuse in the landfill. If, on the other hand, all or part of the refuse is burned at a municipal incinerator or other facility (such as H-Power), disposal of solid waste from the project will also result in emissions of particulate, carbon monoxide and other contaminants from the incineration facility. Table 9 gives emission factors for municipal refuse incinerators (without controls) in terms of pounds of air pollution per ton of refuse material charged. Thus, uncontrolled air pollutant emission rates in terms of pounds per day, for example, can be estimated by multiplying the emission factors given in the table by the number of tons per day of refuse that is burned. Particulate emissions from the H-Power facility are much lower because emissions will be treated by a high-efficiency particulate control system. It should also be noted that if the project's electrical demand is met entirely or partially by H-Power, emissions from oil or coal burning generators will be reduced.

7.0 SUMMARY OF IMPACTS AND MITIGATIVE CONSIDERATIONS

7.1 Impacts Summary

The major short-term air quality impact will be the potential emission of significant quantities of fugitive dust during demolition and project construction. Uncontrolled fugitive dust emissions from construction activities are estimated to amount to about 1.2 tons per acre per month. During construction phases, emissions from engine exhausts (primarily consisting of carbon monoxide and nitrogen oxides) will also occur both from on-site construction equipment and from vehicles used by construction workers and from trucks traveling to and from the project.

The primary long-term air pollution impact from the project will arise from the increased motor vehicle traffic associated with the project. Redevelopment of the site will result in a net increase of about 2500 parking stalls, and new office, commercial/retail and residential facilities on the site will generate more traffic entering/exiting the project area and on adjacent streets. Potential increased levels of carbon monoxide concentrations along roadways leading to and from the proposed development and from and within parking facilities will be the primary concern. Based on mathematical modeling of projected vehicular traffic and on atmospheric dispersion estimates of vehicular emissions, it is predicted that with the proposed project, carbon monoxide concentrations along roadways in the project vicinity will be unavoidably higher compared to the without project case, but concentrations will be about the same or lower than existing levels. With or without the project, worst-case concentrations should remain within the national 1-hour ambient air quality standard set by the U.S. Environmental Protection Agency. The U.S. EPA 8-hour standard for carbon monoxide, however, may be exceeded occasionally near the intersections of Nimitz Highway at Bethel Street and Nimitz Highway at Richards Street with the project in the year 1995; current levels may also exceed this standard. The more stringent State of Hawaii ambient air quality standards for carbon monoxide may presently be exceeded at times. In the year 1995, this is projected to occur at several locations in the study area, with or without the project. The state standard is set so low, however, that it is probably exceeded at many intersections in the state

with even moderate traffic volumes. It is also worth noting that, although the national AAQS allow higher levels of carbon monoxide, these standards were developed after extensive research with the objective of defining levels of air quality that would protect the public health with an adequate margin of safety.

Carbon monoxide concentrations within the underground parking facilities will be controlled by mechanical ventilation equipment. Under worst-case conditions, it is projected that concentrations within the underground parking garages will be maintained well within safety guidelines by supplying 1.5 cubic feet per minute of outdoor air per square foot of floor space on each parking level.

Carbon monoxide concentrations within above ground parking facilities will be maintained at acceptable levels by means of natural ventilation. Architectural screening will be used to provide an aesthetically pleasing appearance while allowing sufficient natural air flow.

Some potential long-term impacts could also result from indirect emissions produced by power generating facilities supplying the project with electricity and from the burning of waste materials generated by the project. Quantitative estimates of these impacts were not made, but it appears likely that any impacts would be relatively small since such emissions would be much less than 1 percent of current Oahu emissions.

7.2 Mitigative Considerations

Strict compliance with State of Hawaii Air Pollution Control Regulations regarding establishment of a regular dust-watering program and covering of dirt-hauling trucks will be required to effectively mitigate fugitive dust emissions from construction activities. Twice daily watering is estimated to reduce dust emissions by up to 50 percent. Paving of parking areas and establishment of landscaping early in the construction schedule will also help to control dust. Increased vehicular emissions due to disruption of traffic by construction equipment and/or commuting construction workers can be alleviated by moving equipment and personnel to the site during off-peak traffic hours.

Options available to mitigate traffic-related air pollution are to improve roadways, reduce traffic or reduce individual vehicular emissions. Long-term projections of carbon monoxide emissions from vehicular traffic associated with the completed development are based on the traffic impact study findings. It has been assumed that the roadway improvements recommended on Nimitz Highway will be implemented to move traffic efficiently through the project area and adjacent locations. Aside from improving roadways, air pollution impacts from vehicular emissions can be mitigated by reducing traffic through the use of mass transit and car pooling and/or by adjusting local school and business hours to begin and end during off peak times. Although it is conceivable that the efficiency of motor vehicle engines and/or emission control equipment will be improved or that vehicles will be developed which burn cleaner fuels at some point in the future, it is not likely that these developments will occur before project completion in 1995. With regard to cleaner burning fuels, vehicles burning methanol or compressed natural gas or powered by electrical motors are some of the possibilities for technological development that are currently being contemplated. Lastly, even without technological breakthroughs, it is also possible that the State may adopt either a motor vehicle inspection and maintenance program to ensure that emission control devices are properly maintained or more restrictive emission control standards.

Carbon monoxide concentrations within the underground parking structures can be minimized by providing mechanical ventilation

capacity that conforms to Hawaii Administrative Rules and to ASHRAE standards. At least 1.5 cubic feet of fresh air per minute per square foot of floor space should be provided with additional capacity near exits or other areas where traffic congestion may occur. If fresh air intake fans are utilized, intake vents should be located as far away from roadway traffic fumes as is practicable. Exhaust vents should be located so as to avoid recirculation and to ensure that exhaust air is diluted by a factor of 5-10 by the time it reaches outside pedestrian areas. Use of carbon monoxide sensors within the parking structures to monitor air pollution concentrations and to control ventilation equipment will ensure safety and conserve energy (by reducing ventilation rates during off-peak hours). Sufficient ingress/egress capacity to permit entry and exit with minimal delays will also mitigate air pollution impacts both within and adjacent to the facilities. As an extra safety measure, emergency procedures and equipment should be provided to counter potential problems arising from power outages and/or ventilation equipment failure.

Air pollution within above ground parking facilities can be kept to a minimum by opening wall areas facing the prevailing wind direction to the maximum extent possible. In downtown Honolulu, the prevailing winds are from the northeast. Thus, open or screened wall areas on the northeast side of the facilities are advisable. Sufficient entry/exit capacity will also reduce air pollution within and adjacent to the above ground parking facilities.

Indirect emissions from project electrical demand could be reduced somewhat by utilizing solar energy design features to the maximum extent possible. This might include installing solar water heaters, designing condominiums and office/retail space so that window positions maximize indoor light without unduly increasing indoor heat, and using landscaping where feasible to provide afternoon shade to cut down on the use of air conditioning. Use of wind power generating units and other alternative energy sources by the utility instead of fuel-burning facilities also would lessen indirect emissions from project electrical demand. Additionally, use of carbon monoxide sensors in the underground parking facilities to control ventilation equipment could reduce electrical power demand.

Any air pollution impacts from burning solid waste generated by the project could be reduced substantially if the incinerator is fitted with pollution control equipment, i.e., electrostatic precipitators or fabric filters. Conservation and recycling programs could also reduce solid waste which would reduce any related air pollution emissions proportionately. Quite likely, solid waste from the project will processed by the H-Power garbage-to-energy facility which is fitted with fabric filters to control air pollution. Use of solid waste to generate power offsets emissions from fossil-fueled power plants.

Table 1

SUMMARY OF STATE OF HAWAII AND NATIONAL AMBIENT AIR QUALITY STANDARDS

Pollutant	Units	Averaging Time	Maximum Allowable Concentration: National Primary	National Secondary	State of Hawaii
Suspended Particulate Matter	$\mu g/m^3$	Annual	-	-	60[a]
		24 Hours	-	-	150[b]
Particulate Matter[c]	$\mu g/m^3$	Annual	50	50	-
		24 Hours	150[b]	150[b]	-
Sulfur Dioxide	$\mu g/m^3$	Annual	80	-	80
		24 Hours	365[b]	-	365[b]
		3 Hours	-	1300[b]	1300[b]
Nitrogen Dioxide	$\mu g/m^3$	Annual	100	100	70
Carbon Monoxide	mg/m^3	8 Hours	10[b]	-	5[b]
		1 Hour	40[b]	-	10[b]
Ozone	$\mu g/m^3$	1 Hour	235[b]	235[b]	100[b]
Lead	$\mu g/m^3$	Calendar Quarter	1.5	1.5	1.5

[a]Geometric mean

[b]Not to be exceeded more than once per year

[c]Particles less than or equal to 10 microns aerodynamic diameter

$\mu g/m^3$ = microgram (10^{-6} g) per cubic meter
mg/m^3 = milligram (10^{-3} g) per cubic meter

Table 2

ANNUAL WIND FREQUENCY FOR HONOLULU INTERNATIONAL AIRPORT (%)

Wind Direction	Wind Speed (knots) 0-3	4-6	7-10	11-16	17-21	22-27	28-33	34-40	>40	Total
N	0.5	2.5	1.3	0.5						4.8
NNE	0.3	1.2	1.6	1.5	0.2					4.7
NE	0.3	2.1	6.1	11.0	3.2	0.3				23.0
ENE	0.2	2.5	10.9	16.6	4.1	0.3				34.7
E	0.1	1.0	2.5	2.8	0.5					7.0
ESE	0.0	0.3	0.4	0.3						1.1
SE	0.0	0.3	0.8	1.0	0.1					2.2
SSE	0.1	0.4	1.2	0.7	0.1					2.4
S	0.1	0.5	1.4	0.6	0.1					2.7
SSW	0.0	0.3	0.8	0.3						1.5
SW	0.0	0.2	0.8	0.4						1.5
WSW	0.0	0.3	0.5	0.4						1.2
W	0.1	0.5	0.2	0.2						1.1
WNW	0.2	1.4	0.3	0.1						2.0
NW	0.4	2.3	0.8	0.1						3.8
NNW	0.5	2.3	0.8	0.2						3.8
CALM	2.5									2.5
TOTAL	5.4	18.3	30.6	36.5	8.5	0.7				100.0

Source: Climatography of the United States No. 90 (1965-1974), Airport Climatological Summary, Honolulu International Airport, Honolulu, Hawaii, U.S. Department of Commerce, National Climatic Center, Asheville, NC, August 1978.

Table 3

AIR POLLUTION EMISSIONS INVENTORY FOR CITY AND COUNTY OF HONOLULU, 1980

Source Category	Emissions (tons/year) Particulate	Sulfur Oxides	Nitrogen Oxides	Carbon Monoxide	Hydrocarbons
Steam Electric Power Plants	2,092	36,736	12,455	1,065	184
Gas Utilities	14	0	199	0	0
Fuel Combustion in Agricultural Industry	1,088	579	358	0	31
Refinery Industry	622	7,096	2,149	266	2,584
Petroleum Storage	0	0	0	0	1,261
Metallurgical Industries	28	96	40	0	0
Mineral Products Industry	6,884	1,883	597	0	31
Municipal Incineration	42	145	2,029	0	184
Motor Vehicles	1,413	1,014	17,270	239,198	22,853
Construction, Farm and Industrial Vehicles	184	193	2,507	3,729	338
Aircraft	382	145	1,751	5,594	1,476
Vessels	42	386	438	533	123
Agricultural Field Burning	1,399	0	0	15,982	1,692
Total:	14,190	48,273	39,793	266,367	30,757

Source: State of Hawaii, Department of Health

Table 4

ANNUAL SUMMARY OF AIR QUALITY MEASUREMENTS FOR
MONITORING STATIONS NEAREST WATERFRONT AT ALOHA TOWER PROJECT

Parameter / Location	1985	1986	1987	1988	1989
Sulfur Dioxide / Barbers Point					
No. of 24-Hr Samples	59	57	53	59	54
Range of 24-Hr Values (µg/m3)	10-48	<5-10	<5-13	<5-19	<5-20
Average Daily Value (µg/m3)	24	<5	5	<5	<5
No. of State AAQS Exceedances	0	0	0	0	0
Particulate / Downtown Honolulu					
No. of 24-Hr Samples	59	57	53	59	59
Range of 24-Hr Values (µg/m3)	10-48	11-61	14-59	12-45	16-48
Average Daily Value (µg/m3)	24	25	25	26	30
No. of State AAQS Exceedances	0	0	0	0	0
PM-10 / Liliha					
No. of 24-Hr Samples	10	51	42	53	55
Range of 24-Hr Values (µg/m3)	13-52	7-35	10-33	9-25	10-33
Average Daily Value (µg/m3)	23	18	17	17	16
No. of State AAQS Exceedances	NA	NA	NA	NA	NA
Carbon Monoxide / Downtown Honolulu					
No. of Days of 1-Hr Samples	342	348	345	360	323
Range of Daily Max. 1-Hr Values (mg/m3)	0.0-10.4	0.2-13.5	0.3-11.1	0.2-10.4	0.3-7.8
Avg. Daily Maximum 1-Hr Value (mg/m3)	1.5	2.2	1.7	1.7	1.9
No. of State 1-Hr AAQS Exceedances	1	3	1	1	0
No. of Days of 8-Hr Samples	246	213	228	-	-
Range of Daily Max. 8-Hr Values (mg/m3)	0.1-4.4	0.3-4.7	0.3-3.9	-	-
Avg. Daily Maximum 8-Hr Value (mg/m3)	1.3	1.4	1.2	-	-
No. of State 8-Hr AAQS Exceedances	0	0	0	-	-
Ozone / Sand Island					
No. of Days of 1-Hr Samples	341	346	342	362	342
Range of Daily Max. 1-Hr Values (µg/m3)	8-198	10-88	4-84	0-94	0-96
Avg. Daily Maximum 1-hr Value (µg/m3)	43	39	38	13	15
No. of State AAQS Exceedances	3	0	0	0	0
Lead / Downtown Honolulu					
No. of 24-Hr Samples	58	57	57	-	-
Range of 24-Hr Values (µg/m3)	0.0-0.3	0.0-0.2	0.0-0.2	-	-
Average Quarterly Value (µg/m3)	0.2	0.0	0.0	-	-
No. of State AAQS Exceedances	0	0	0	-	-

Source: State of Hawaii Department of Health

Table 5

ESTIMATED WORST-CASE 1-HOUR CARBON MONOXIDE CONCENTRATIONS
ALONG ROADWAYS NEAR WATERFRONT AT ALOHA TOWER PROJECT
(milligrams per cubic meter)

Roadway	Year/Scenario							
Intersection	1990/ Present AM	1990/ Present PM	1995/ Without Project AM	1995/ Without Project PM	1995/ With Project AM	1995/ With Project PM		
Nimitz/Bethel/Nuuanu	14.4	22.1	12.9	17.1	14.8	21.0		
Nimitz/Fort	19.4	21.2	14.2	15.2	12.8	19.2		
Nimitz/Bishop	17.7	21.0	13.6	15.0	17.2	19.8		
Nimitz/Alakea	11.6	13.2	8.9	11.2	10.4	13.6		
Nimitz/Richards	18.1	24.3	13.7	17.2	16.6	20.1		
Ala Moana/Punchbowl	15.6	18.1	11.2	15.8	14.4	17.8		

Hawaii State AAQS: 10
National AAQS: 40

Table 6

ESTIMATED WORST-CASE 8-HOUR CARBON MONOXIDE CONCENTRATIONS ALONG ROADWAYS NEAR WATERFRONT AT ALOHA TOWER PROJECT (milligrams per cubic meter)

	Year/Scenario		
Intersection	1990/ 1995/ Present	1995/ Without Project	With Project
Nimitz/Bethel/Nuuanu	11.0	8.6	10.5
Nimitz/Fort	10.6	7.6	9.6
Nimitz/Bishop	10.5	7.5	9.9
Nimitz/Alakea	6.6	5.6	6.8
Nimitz/Richards	12.2	8.6	10.0
Ala Moana/Punchbowl	9.0	7.9	8.9

Hawaii State AAQS: 5
National AAQS: 10

Table 7

ESTIMATED WORST-CASE 15-MINUTE CARBON MONOXIDE CONCENTRATIONS WITHIN WATERFRONT AT ALOHA TOWER PROJECT UNDERGROUND PARKING FACILITIES

Parking Structure	Number Parking Stalls	Floor Space (sq. ft.)	Ventilation Rate (cfm)[a]	Worst-Case Concentration[b,c] (mg/m^3)
Maritime Building				
Level 1	287	144,000	216,000	130
Level 2	324	144,000	216,000	147
Marketplace Building				
Level 1	446	154,000	231,000	188
Level 2	446	154,000	231,000	188
Level 3	451	154,000	231,000	188
Hotel and QE2 Terminal				
Level 1	280	96,000	144,000	190
Level 2	280	96,000	144,000	190
Level 3	280	96,000	144,000	190

[a]Based on 1.50 cubic feet per minute per square foot of floor space.

[b]Includes background concentration of 1 mg/m^3 and assumes ambient temperature of 59 degrees F.

[c]Assumes 1/4 capacity of parking level operating throughout 15-minute period and average emissions of 11 grams per minute per vehicle (100% in cold-start mode).

[c]Threshold Limit Value/Short-Term Exposure Limit for carbon monoxide: 440 mg/m^3.

Table 8

ESTIMATED INDIRECT AIR POLLUTION EMISSIONS FROM WATERFRONT AT ALOHA TOWER PROJECT ELECTRICAL DEMAND[a]

Air Pollutant	Emission Rate (tons/year)
Particulate	5
Sulfur Dioxide	178
Carbon Monoxide	12
Volatile Organics	<1
Nitrogen Oxides	50

[a]Based on U.S. EPA emission factors for industrial boilers [4]. Assumes electrical demand of 70 million kw-hrs per year and low sulfur oil used to generate power.

Table 9

UNCONTROLLED AIR POLLUTION EMISSION FACTORS FOR MUNICIPAL REFUSE INCINERATORS (lb/ton)[a]

Air Pollutant	Emission Factor
Particulate	14[b]
Sulfur Oxides	2.5
Carbon Monoxide	35
Organics	1.5
Nitrogen Oxides	3

[a]Emission factors are given in terms of weight of material emitted per unit weight of refuse material charged.
[b]Assumes incinerator equipped with settling chamber and water spray.

Source: U.S. Environmental Protection Agency [4]

APPENDIX B

NOISE STUDY

Prepared By

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ENVIRONMENTAL NOISE ASSESSMENT
FOR THE PROPOSED
WATERFRONT AT ALOHA TOWER PROJECT

HONOLULU, OAHU, HAWAII

Prepared for:

Wilson Okamoto & Associates, Inc.

June 1990
(Revised November 1990)

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1. **SUMMARY OF FINDINGS**

1.1 Most existing buildings on the mauka side of Nimitz Highway, in the immediate vicinity of the project site, are commercial. The only noise-sensitive buildings nearby are the Harbor Square condominiums, between Richards and Alakea Streets.

1.2 Existing background (L90) noise levels at and near the project site are typically 55 to 65 dBA during the daytime. The main noise sources are traffic on Nimitz Highway and aircraft operations associated with Honolulu International Airport and Hickam Air Force Base. Noise from the HECO power station is also quite noticeable at certain locations.

1.3 During tradewind departures from Honolulu International Airport, civilian jet aircraft typically produce maximum noise levels of 60 to 70 dBA at the project site. During Kona wind landings, civilian aircraft typically produce slightly lower maximum noise levels, of 55 to 65 dBA. Certain military jets are significantly louder (by 10 dBA or more) than the noisier civilian aircraft.

1.4 The most noise-sensitive areas within the development, the condominium towers and the hotel, will be subjected to estimated Day-Night Average Sound Levels of up to about 75 dB. These areas will also be subjected to typical single-event civilian aircraft noise levels of up to about 70 dBA and to typical single-event military aircraft noise levels of up about 80 dBA.

1.5 To ensure acceptable interior noise levels in the condominium towers and the hotel, it will be necessary to design the buildings to provide an exterior-to-interior noise reduction of at least 30 dBA. This will necessitate the use of heavy monolithic or laminated glass windows, or acoustically double-glazed windows. These buildings will also be air conditioned, allowing windows to be kept closed for noise reduction purposes.

A more thorough investigation into the most appropriate window construction, including additional site noise measurements, should be made during the detail design phase.

1.6 Apart from the proposed multi-plex cinema, which may need to be specially designed to reduce intrusive noise from aircraft to acceptable levels, most other areas within the proposed development, including outdoor gathering places, such as pedestrian promenades and outdoor restaurants, should not be significantly impacted by noise from aircraft, road traffic, the HECO power station or maritime operations.

1.7 Provided that appropriate noise control measures are incorporated in the design, noise levels at the property lines due to the operation of mechanical and electrical equipment associated with the proposed development (air conditioning equipment, exhaust fans, emergency generators, etc.) will be in compliance with the appropriate Department of Health and Land Use Ordinance regulations.

1.8 The additional traffic on Nimitz Highway and other city streets generated by the proposed development should not cause any significant environmental noise impact.

1.9 Use of the proposed amphitheatre for informal performances during the daytime should not have any significant impact on adjacent areas within the development or on existing noise-sensitive areas near the development. However, aircraft noise could affect amphitheatre performances, particularly if it occurs during quiet passages of music.

1.10 Piledrivers will probably be the loudest equipment used during construction and, because extensive piledriving will be carried out at the project site, noise from these activities could cause annoyance to occupants of the closest noise-sensitive buildings (the Harbor Square condominiums). Piledriving may also be audible inside some of the closest commercial buildings, e.g., Grosvenor Center and the Amfac Building.

1.11 Blasting, if required, could also have noise impacts. However, current methods for controlling noise from blasting are very effective. With the appropriate blast design techniques, the noise from blasting can be controlled within acceptable limits at the closest noise-sensitive areas.

1.12 In cases where construction noise exceeds, or is expected to exceed, the Department of Health's property line limits, a permit must be obtained from the DOH to allow the operation of equipment which emits noise levels in excess of the DOH property line limits. Required permit conditions include restrictions on permissible operating hours.

2. **PROJECT DESCRIPTION**

The project comprises an extensive redevelopment of waterfront areas near the historic Aloha Tower in Honolulu, between Piers 5 and 14 inclusive. Apart from Pier 7 and the HECO power station, most existing waterfront areas in the vicinity of Aloha Tower will be affected.

Project features include offices and maritime facilities on Piers 5 and 6; retail and entertainment areas, including the Aloha Marketplace and an amphitheater, on Piers 8, 9, 10 and 11; an office/hotel/passenger terminal complex on Piers 10 and 11; and two new condominium towers on and near Piers 13 and 14. Also included are construction of the Honolulu Historic Fort Park on Pier 12 and revitalization of Irwin Park.

Although the current surface parking on Piers 5 and 6, Ala Moana Mini-Park and Irwin Park will be eliminated, underground parking will be provided at Piers 5 and 6, and Piers 8, 9, 10 and 11; and above-ground parking will be provided at Piers 13 and 14; resulting in a net increase of approximately 2,500 parking spaces.

Minor improvements will be made to Nimitz Highway, Ala Moana Boulevard and Bishop Street to facilitate access to the new parking areas, but there will be no major reconfiguration of any of these streets or intersections.

Most existing buildings on the mauka side of Nimitz Highway, in the immediate vicinity of the project site, are commercial. The only noise-sensitive buildings nearby are the Harbor Square condominiums, between Richards and Alakea Streets.

3. THE EXISTING ACOUSTICAL ENVIRONMENT

Ambient noise measurements were made at and near the project site on the morning of April 20, 1990. Noise levels were recorded over 10-minute sampling periods at Locations A through F, shown in Figure 1, using a Larson-Davis Laboratories Model 700 Sound Level Meter. The measurement locations are described below:

A. At the Diamond Head/makai corner of the Harbor Square condominiums (Harbor Tower, 700 Richards Street).

B. On the grassed area at the end of Pier 7, in front of Coasters Restaurant.

C. On the makai side of Irwin park, adjacent to the area currently used for public parking.

D. On the Hall Level of the existing Aloha Tower complex.

E. At the makai end of Pier 12, about 150 ft from Nimitz Highway.

F. On Pier 14, about 200 ft from Nimitz Highway.

Weather conditions during the measurements were partly overcast, with temperatures of around 80^0 and tradewinds at 10 to 20 mph.

The noise measurement results, in terms of the Equivalent Continuous Noise Level (Leq), the minimum noise level (Lmin), the levels exceeded for 90%, 50%, 10% and 1% of the time (L90, L50, L10 and L1, respectively), and the maximum noise level (Lmax), are presented in Table 1 and summarized below. These statistical levels are commonly-used descriptors of environmental noise; for example, the L1 level describes the near-maximum noise, while L90 is a good measure of the background noise level. (A brief description of acoustical terminology is presented in the Appendix.)

Location	Measured Noise Levels - dBA						
	Leq	Lmin	L90	L50	L10	L1	Lmax
A	68	64	66	68	70	71	73
B	60	55	56	58	63	68	69
C	66	57	59	61	66	79	81
D	60	55	56	58	62	70	76
E	69	64	64	68	70	76	78
F	68	60	64	66	71	74	75

Thus, existing background (L90) noise levels at and near the project site were typically 55 to 65 dBA during the daytime. The main noise sources were traffic on Nimitz Highway and aircraft operations associated with Honolulu International Airport (HIA) and Hickam Air Force Base. Noise from the HECO power station was also quite noticeable at certain locations.

During the noise measurements described above, aircraft operations at HIA were typical of normal tradewind patterns with wide-body jet departures from Runway 8R, the reef runway, and inter-island jet departures from Runway 8L (i.e., departure tracks 01 and 07; and 04, 05 and 08; respectively, shown in Figure 2 - from Reference 1). Tradewind departures currently represent about 90% of the annual departures from HIA.

The maximum noise level (Lmax) from civilian jet departures was typically 60 to 70 dBA at most of the measurement locations. At location C, two F18 military jets taking off simultaneously produced an Lmax of 81 dBA. At Location D, a commuter aircraft flying directly overhead produced an Lmax of 76 dBA.

Figure 3 indicates that noise from aircraft arriving on tracks 27, 28 and 29, during Kona weather operations, which occur about 10% of the time (on an annual average basis), may also impact the site. Further noise measurements, taken at Locations B and D on April 28 and 29, 1990, showed that civilian jet aircraft arrivals during Kona weather produced slightly lower noise levels at the project site than tradewind departures, with Lmax levels ranging from about 55 to 65 dBA. At Location B, a C-5A military jet on a Kona wind landing pattern produced an Lmax of 75 dBA.

Table 2 presents a summary of the measured single-event aircraft noise levels at selected locations.

An extract from the 1992 HIA Noise Exposure Map, presented in Figure 4, shows that the project site will be exposed to a Day-Night Average Sound Level (Ldn) due to aircraft noise of 59 to 62 dB. Based on these aircraft noise data and the short term noise measurements described above, the estimated overall noise exposure levels at the project site currently range from approximately 63 dB Ldn in areas well screened from traffic noise to approximately 74 dB Ldn at those locations right next to Nimitz Highway. The estimated Ldn at the closest existing noise-sensitive building to the project site, the Harbor Square condominiums, is about 65 to 68 dB (at the closest facade to Nimitz Highway).

Note that there should be some reduction in aircraft noise exposure levels at the project site when the older, Stage 2 civilian aircraft are eventually phased out. However, changes in the type of military aircraft and their operations can also affect the Ldn contours. Thus, predictions of HIA noise impact into the future can show a large variability.

A comparison between the projected 1992 and 2007 contours in the 1988 FAA, Part 150 Study (Reference 2) indicates a reduction of about 5 dBA in the aircraft noise exposure levels at the project site in spite of increased operations, primarily because the 2007 contours reflect a situation where the majority of aircraft are Stage 3.

4. NOISE STANDARDS AND GUIDELINES

Land-use compatibility guidelines are commonly presented in terms of the Day-Night Average Sound Level (Ldn), a measure of noise exposure over a typical 24-hour period.

For example, the U.S. Environmental Protection Agency and the Department of Housing and Urban Development (HUD) specify that residential and other noise-sensitive developments can normally be constructed in areas subjected to noise exposure levels of up to Ldn 65, with no special noise control measures required in buildings of conventional construction (References 3 and 4). Sites exposed to Ldn's in the range of 65 to 75 dB are considered normally unacceptable for residential development, with building approval subject to additional noise control measures. These criteria are generally consistent with the land use compatibility guidelines shown in Figure 5.

In Hawaii, the State Department of Transportation stipulates an aircraft noise exposure limit of Ldn 60 for residential buildings.

Land use compatibility guidelines are typically less restrictive for transient lodging buildings such as hotels and motels, which are normally air conditioned and better acoustically insulated than conventional residential buildings. The California Department of Transportation's "Airport Land Use Planning Handbook" (Reference 6) notes that, with proper sound insulation, hotels and motels may be constructed in areas subjected to noise exposures of up to Ldn 80.

Criteria for noise exposure levels inside buildings are commonly presented in terms of Ldn and, for single-event noise sources such as aircraft movements, criteria are also presented in terms of the maximum noise level (Lmax). For example, HUD has a design goal of Ldn 45 or less for the interior spaces of dwelling units. The above-referenced "Airport Land Use Planning Handbook" recommends an Lmax of 40 dBA or less due to aircraft noise in sleeping areas of residential and transient lodging buildings (although less restrictive Lmax criteria, of up to 50 dBA, have also been proposed).

Turning to guidelines for noise generated by proposed developments, the Department of Health's (DOH)'s Community Noise Control for Oahu (Title 11, Chapter 43) specifies a maximum allowable noise level at property lines in apartment, hotel and business areas of 60 dBA (7 am to 10 pm) and 50 dBA (10 pm to 7 am). The regulations state that these limits shall not be exceeded for more than 10% of the time in any 20-minute period. A summary of the DOH property line noise limits is presented in Figure 6.

Section 3-100 of the City/County Building Department's Land Use Ordinance (LUO) sets forth the following property line limits for areas which permit residences, apartments or hotels.

Octave Band Center Frequency (Hz)	31	63	125	250	500	1000	2000	4000	8000
Maximum Octave Band Noise Level (dB)									
- 8 am to 6 pm	72	72	67	59	52	46	40	34	32
- 6 pm to 8 am	69	69	64	56	49	43	37	31	29

These octave band limits are equivalent to overall noise levels of 56 dBA (daytime) and 53 dBA (nighttime).

5. POTENTIAL IMPACTS AND DESCRIPTION OF CONTROLS

5.1 Additional Traffic Generated by the Project - A traffic count was performed during the noise measurement at Location E to permit calibration of the Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (Reference 7). The FHWA traffic noise model was then used, in conjunction with the "Traffic Study for the Waterfront at Aloha Tower Development" (Reference 8) projections of future (1995) traffic volumes with and without the project, to estimate increases in noise levels due to project-generated traffic. The results, presented in Tables 3 and 4, show that the project-generated traffic will cause noise level increases of 2 dB or less. This is not considered a significant increase in terms of subjective response.

Thus, the additional traffic on Nimitz Highway and other city streets, generated by the proposed Waterfront at Aloha Tower development, will not cause any significant environmental noise impact.

5.2 Project Operational Noise - The noise from mechanical and electrical equipment associated with the proposed development, including air conditioning equipment, garage exhaust fans, transformers and emergency generators, will be reduced to acceptable levels at the property lines (i.e., in compliance with the appropriate DOH and LUO limits) and within the development itself, provided the appropriate noise control measures are incorporated in the design. The required noise control measures may include the following:

1) Sound attenuators on building and garage exhaust fans.

2) Inlet and discharge silencers on cooling towers.

3) Acoustical louvers or silencers at mechanical and electrical equipment room air intake and discharge openings.

4) Appropriate selection of vibration isolation mounts; mechanical and electrical equipment room wall, floor and ceiling constructions; acoustical linings; etc.

Noise from service areas, such as loading docks and trash pickup points, can also be reduced to acceptable levels at the closest noise-sensitive buildings by suitably locating these facilities, use of acoustical treatments, etc.

5.3 Aircraft and Traffic Noise - It is estimated that the most noise-sensitive areas within the development, the condominium towers and the hotel, will be subjected to overall noise exposure levels of up to about 75 dB Ldn. These areas will also be subjected to typical single-event civilian aircraft noise levels of up to about 70 dBA Lmax and to typical single-event military aircraft noise levels of up to about 80 dBA Lmax.

Thus, using interior design criteria of Lmax 50 dBA or less and Ldn 45 or less, it will be necessary to design the building envelopes of the condominium towers and the hotel to provide an exterior-to-interior noise reduction of at least 30 dBA. This will necessitate the use of heavy (at least 1/4" thick) monolithic or laminated glass windows, or acoustically double-glazed windows. These buildings must be air conditioned, allowing windows to be kept closed for noise reduction purposes.

A more thorough investigation into the most appropriate window construction, including additional site noise measurements, should be made during the detail design phase.

Apart from the proposed multi-plex cinema, which may need to be specially designed to reduce intrusive noise from aircraft to acceptable levels, most other areas within the proposed development, including outdoor gathering places, pedestrian promenades and outdoor restaurants, should not be significantly impacted by aircraft or traffic noise. (These areas will be subjected to an estimated overall noise exposure level of approximately Ldn 63 to 64. Although the guidelines in Figure 5 do not specifically cover areas such as pedestrian promenades and outdoor restaurants, they show that a noise exposure of up to Ldn 65 is compatible for "Office Buildings, Personal Services, Business and Professional," and for "Commercial-Retail, Movie Theaters, Restaurants.")

5.4 Amphitheatre - The proposed amphitheatre will be used mostly during the daytime (although occasional evening use is also possible), for activities such as performances by the Royal Hawaiian Band when trans-ocean cruise ships are berthing, and informal performances by small groups. Use of the amphitheatre should not, therefore, have any significant impact on adjacent areas within the development or on

...

existing noise-sensitive areas near the development.

The amphitheatre will be in a relatively quiet location, in terms of noise from traffic on Nimitz Highway. However, aircraft noise could at times affect performances, particularly if it occurs during quiet passages of music. The amphitheatre will be subjected to an estimated overall noise exposure level of Ldn 63 to 64, which is "marginally compatible" according to the guidelines in Figure 5.

5.5 <u>HECO Power Station</u> - Noise from the HECO power station was quite noticeable at certain measurement positions but it is not expected to have any significant impact on the proposed development. The power station noise will be inaudible or barely audible at the most noise-sensitive areas (the condominium towers and the hotel), and at the Aloha Tower Marketplace and the amphitheater.

5.6 <u>Maritime Operations</u> - Although noise from the existing cargo loading and unloading operations at Piers 1 and 2 within the Fort Armstrong area was inaudible at the project site, proposed improvements to these facilities include two new 100 ft wide, 125 ft high, diesel-powered gantry cranes on Pier 1. This equipment will be used on a 24-hour basis while vessels are in port.

However, based on noise data presented in Reference 9, the predicted crane noise at the proposed Waterfront at Aloha Tower development is less than 45 dBA. The two new gantry cranes at Pier 1 should, therefore, be inaudible at the project site, even at night.

The noise from other maritime operations, including the docking of trans-ocean and inter-island cruise ships and intra-island ferry and dinner cruise vessels, is not expected to have any significant impact on the proposed development.

5.7 <u>Construction Noise</u> - Development of the project site will involve demolition, excavation, grading and the construction of infrastructure and buildings. The various construction phases of the development project may generate significant amounts of noise; the actual amounts are dependent upon the methods employed during each stage of the process. Typical construction equipment noise ranges in dBA are shown in Figure 7.

In cases where construction noise exceeds, or is expected to exceed, the DOH's "allowable" property line limits, a permit must be obtained from the DOH to allow the operation of vehicles, construction equipment, power tools, etc. which emit noise levels in excess of the "allowable" limits. Required permit conditions for construction activities are:

"No permit shall allow construction activities creating excessive noise...before 7:00 am and after 6:00 pm of the same day."

"No permit shall allow construction activities which emit noise in excess of ninety-five dB(A)...except between 9:00 am and 5:30 pm of the same day."

"No permit shall allow construction activities which exceed the allowable noise levels on Sundays and on...

[certain] holidays. Activities exceeding ninety-five dB(A) shall [also] be prohibited on Saturdays."

In addition, construction equipment and on-site vehicles or devices requiring an exhaust of gas or air must be equipped with mufflers. Also, construction vehicles using traffic-ways must satisfy the DOH's vehicular noise requirements defined in Reference 10.

Piledrivers will probably be the loudest equipment used during construction and, because extensive piledriving will be carried out at the project site, noise from these activities could cause annoyance to occupants of the closest existing noise-sensitive buildings (the Harbor Square condominiums), who will be exposed to estimated peak exterior noise levels of up to about 80 dBA. Piledriving may also be audible inside some of the closest existing commercial buildings, e.g., Grosvenor Center and the Amfac Building. But, because of the distances involved, noise from most other construction activities is not expected to have any significant impact on the Harbor Square residents or on occupants of the closest commercial buildings.

Blasting, if required, could also have noise impacts. However, blasting at construction sites near populated areas is usually accomplished by using numerous small charges detonated with small time delays. Blast mats can also be used to assist in directing the explosive energy into the rock, control flying debris and muffle the noise. Thus, with the appropriate blast design techniques, the noise from blasting can be controlled within acceptable limits at the closest noise-sensitive areas.

If excavated material is trucked away from the project site (rather than being disposed of at sea), there could be some increase in the number of heavy vehicles on Nimitz Highway. However, assuming an additional 10 trucks/hour during the daytime (7 am to 6 pm), calculations show that there will be negligible increase in traffic noise along Nimitz.

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2. *Preliminary Ldn Contours for Current HIA Master Plan and Noise Compatibility Program*, FAA, Part 150 Study, by E. K. Noda & Associates, 1988.

3. *HUD Environmental Criteria and Standards*, 24 CFR Part 51, Federal Register, Volume 44, No. 135, July 12, 1979; amended 49 FR 880, January 6, 1984.

4. *Toward a National Strategy for Noise Control*, U.S. Environmental Protection Agency, April 1977.

5. Appendix to American National Standard ANSI 53.23-1980, *Sound Level Descriptors for Determination of Compatible Land Use.*

6. *Airport Land Use Planning Handbook - A reference and Guide for Local Agencies*, prepared for the California Department of Transportation by the Metropolitan Transportation Commission and the Association of Bay Area Governments, July 1983.

7. *FHWA Highway Traffic Noise Prediction Model*, FHWA - RD - 77 - 108; U.S. Department of Transportation, December 1978.

8. *Traffic Study for the Waterfront at Aloha Tower*, prepared by Barton-Aschman Associates, Inc. for Aloha Tower Association and Aloha Tower Development Corporation, July 1990.

9. *Fort Armstrong Container Yard Improvements Draft Environmental Assessment*, prepared by Kennedy/Jenks/Chilton on behalf of American President Lines, Ltd., September 1989.

10. *Chapter 42 - Vehicular Noise Control for Oahu*, Department of Health, State of Hawaii, Administrative Rules, Title 11, November 6, 1981.

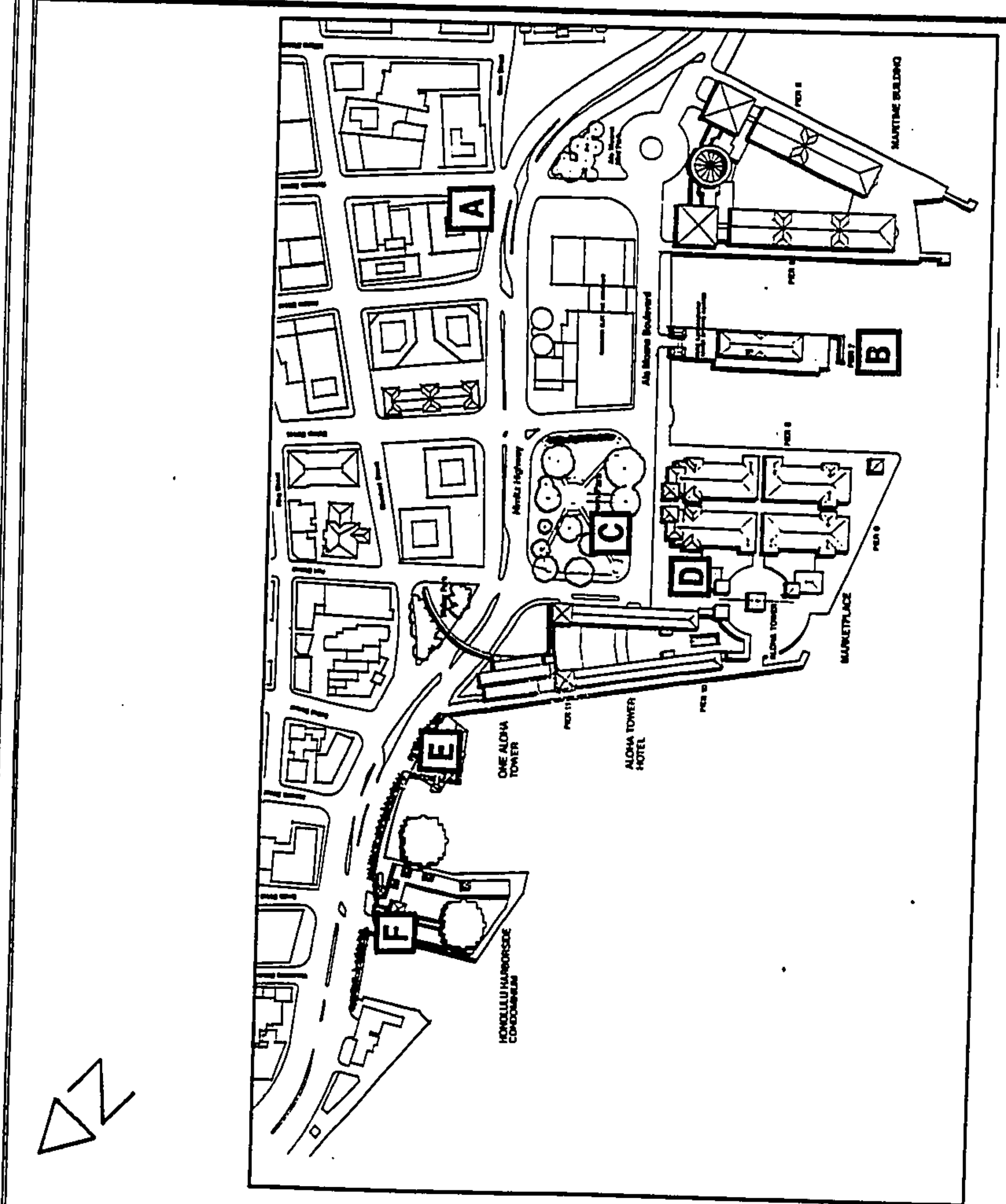

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FIGURE 1 SITE PLAN SHOWING NOISE MEASUREMENT LOCATIONS

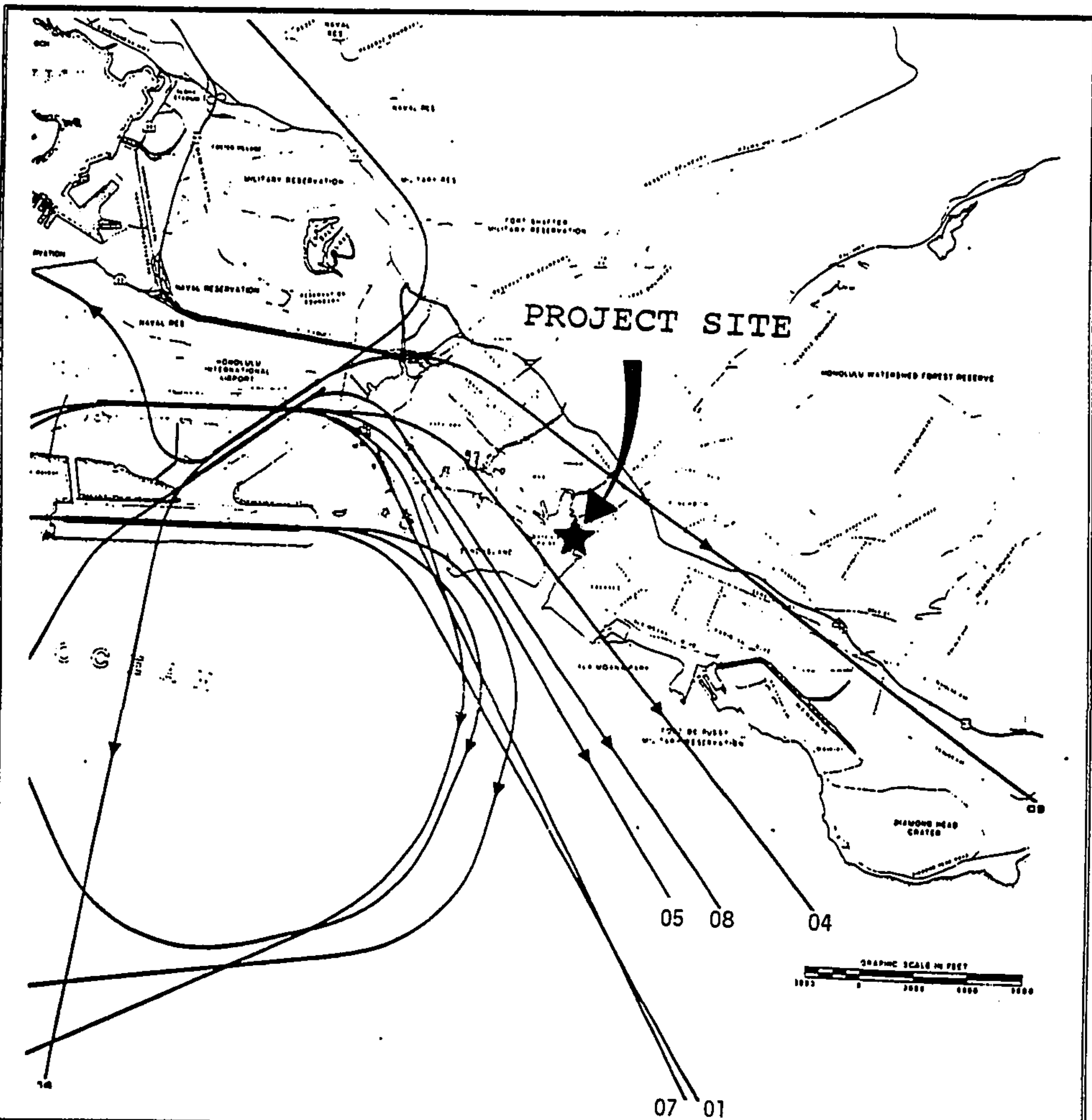

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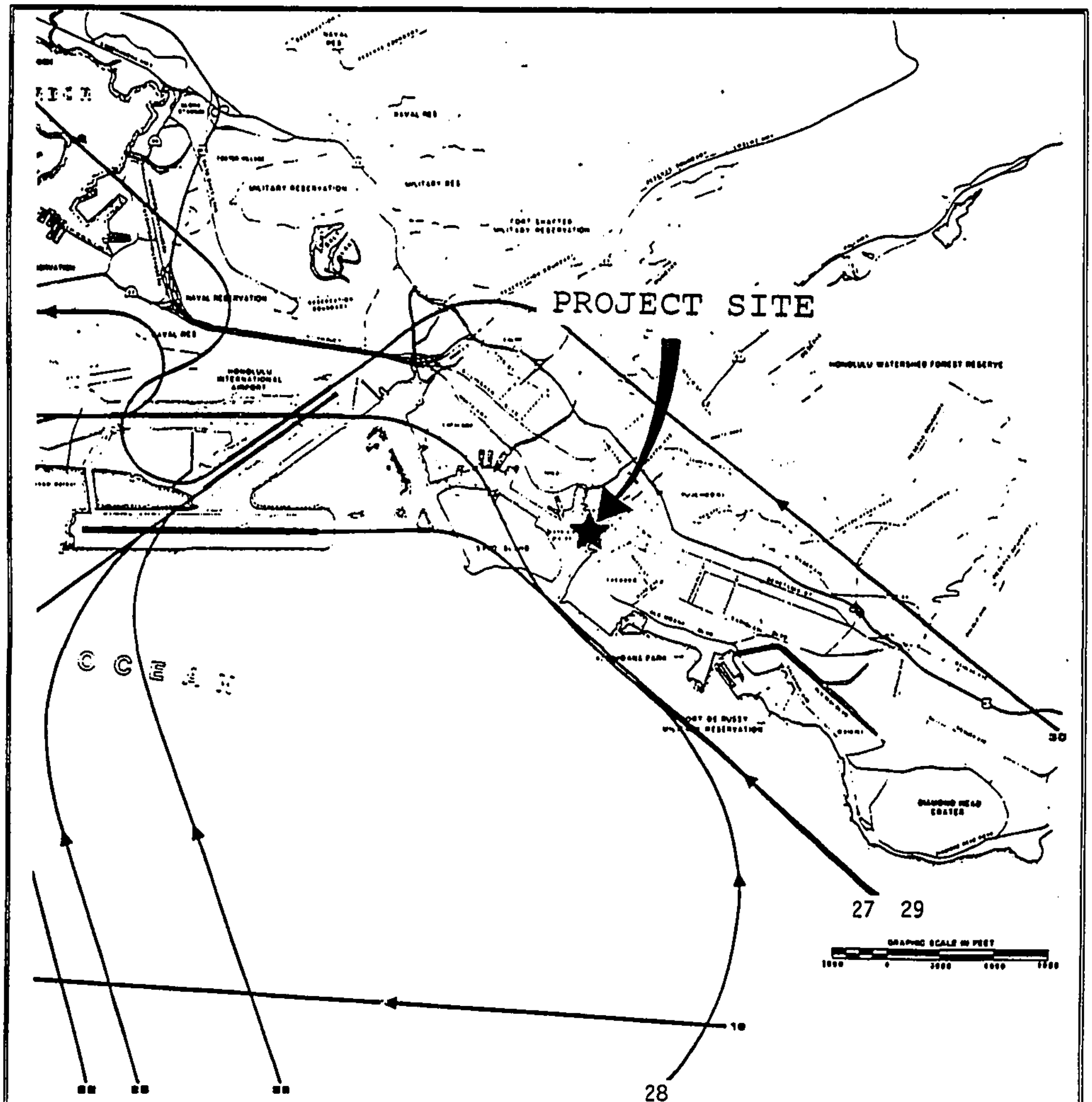
FIGURE 2 EXTRACT FROM PLAN SHOWING HIA FLIGHT DEPARTURE TRACKS (FROM REFERENCE 1)



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FLIGHT 3 EXTRACT FROM PLAN SHOWING HIA FLIGHT ARRIVAL TRACKS (FROM REFERENCE 1)

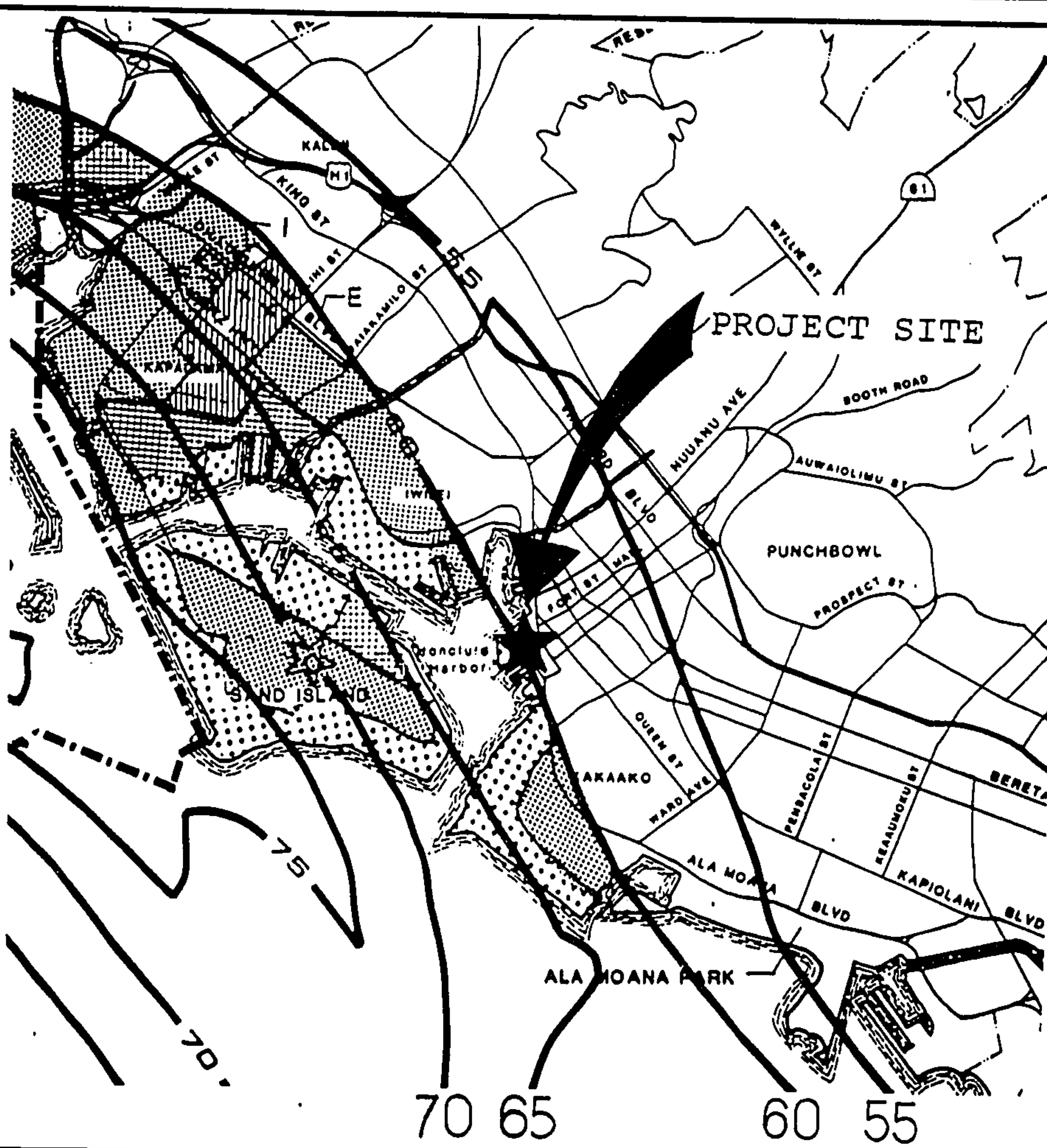

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FIGURE 4 EXTRACT FROM THE 1992 HONOLULU INTERNATIONAL AIRPORT NOISE CONTOUR MAP, SHOWING PROJECT SITE IN RELATION TO LDN CONTOURS

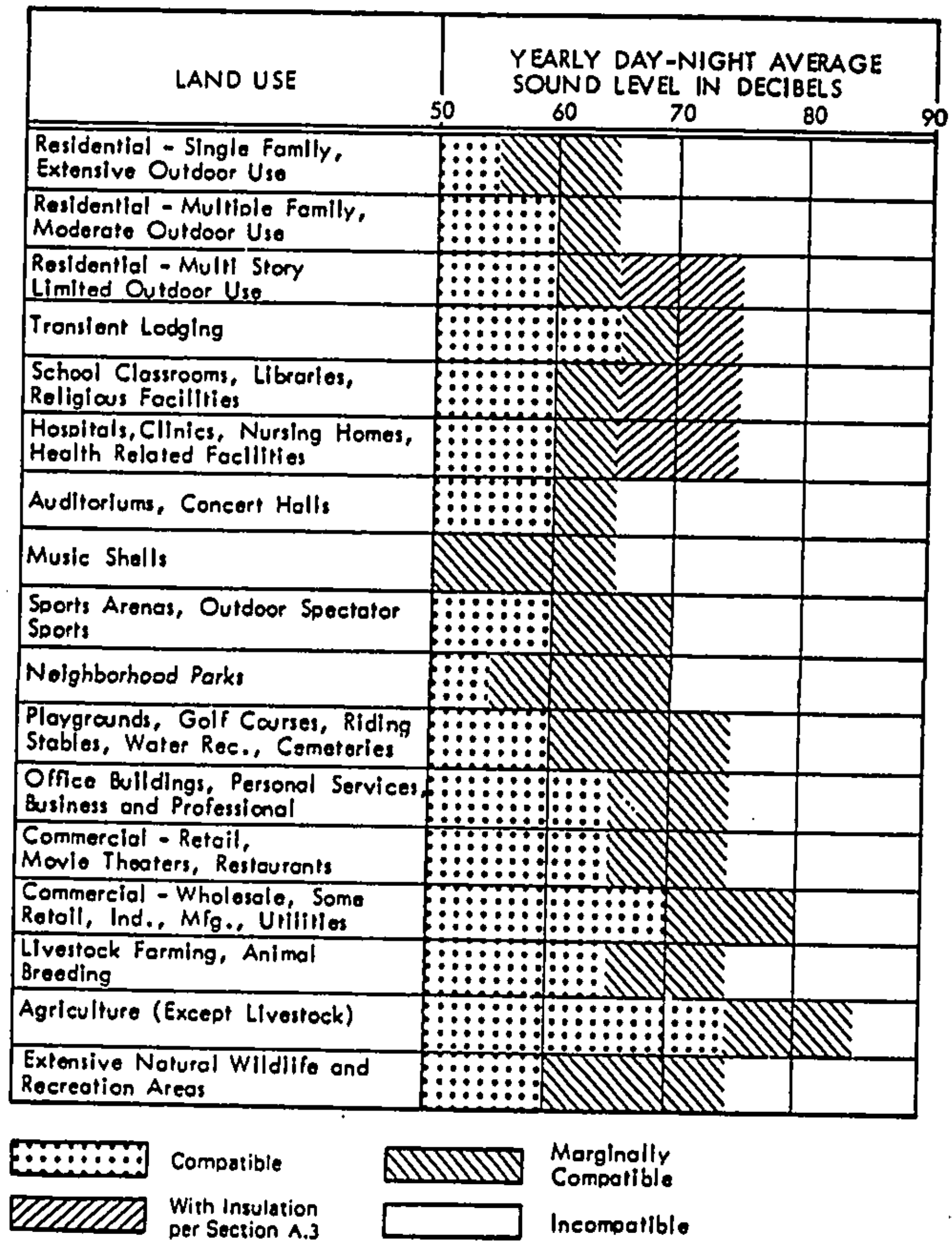

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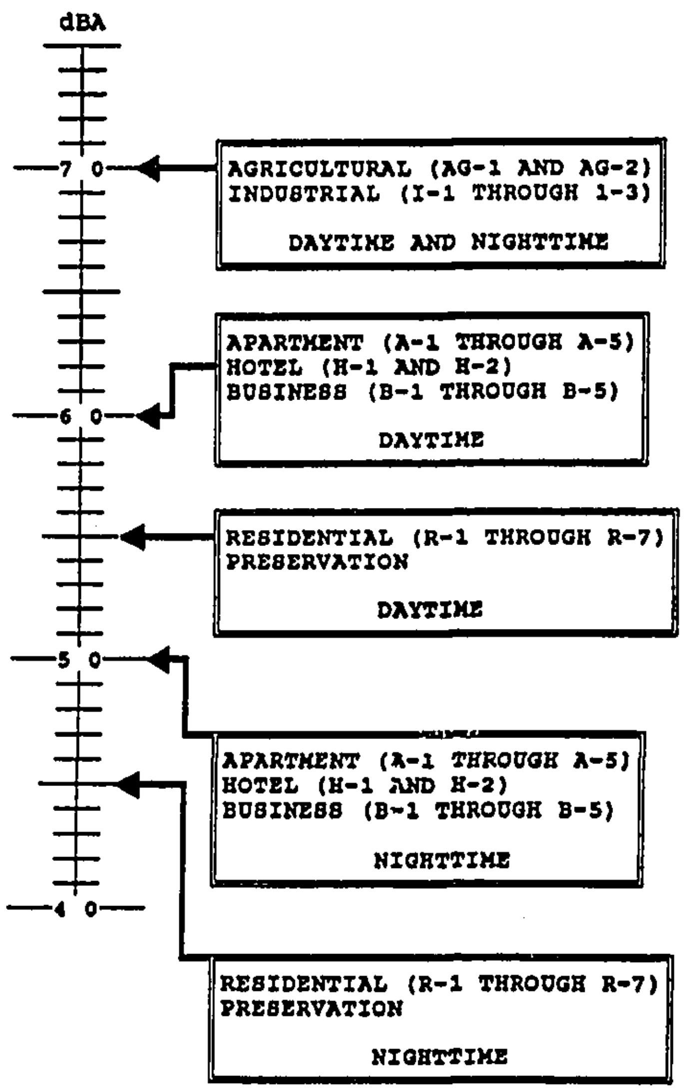
FIGURE 5 LAND USE COMPATIBILITY FOR BUILDINGS AS COMMONLY CONSTRUCTED (FROM REFERENCE 5)



Daytime: 7 am - 10 pm
Nighttime: 10 pm - 7 am

Note: The regulations state that the "allowable" noise levels shall not be exceeded for more than 10% of the time within any 20-minute period.

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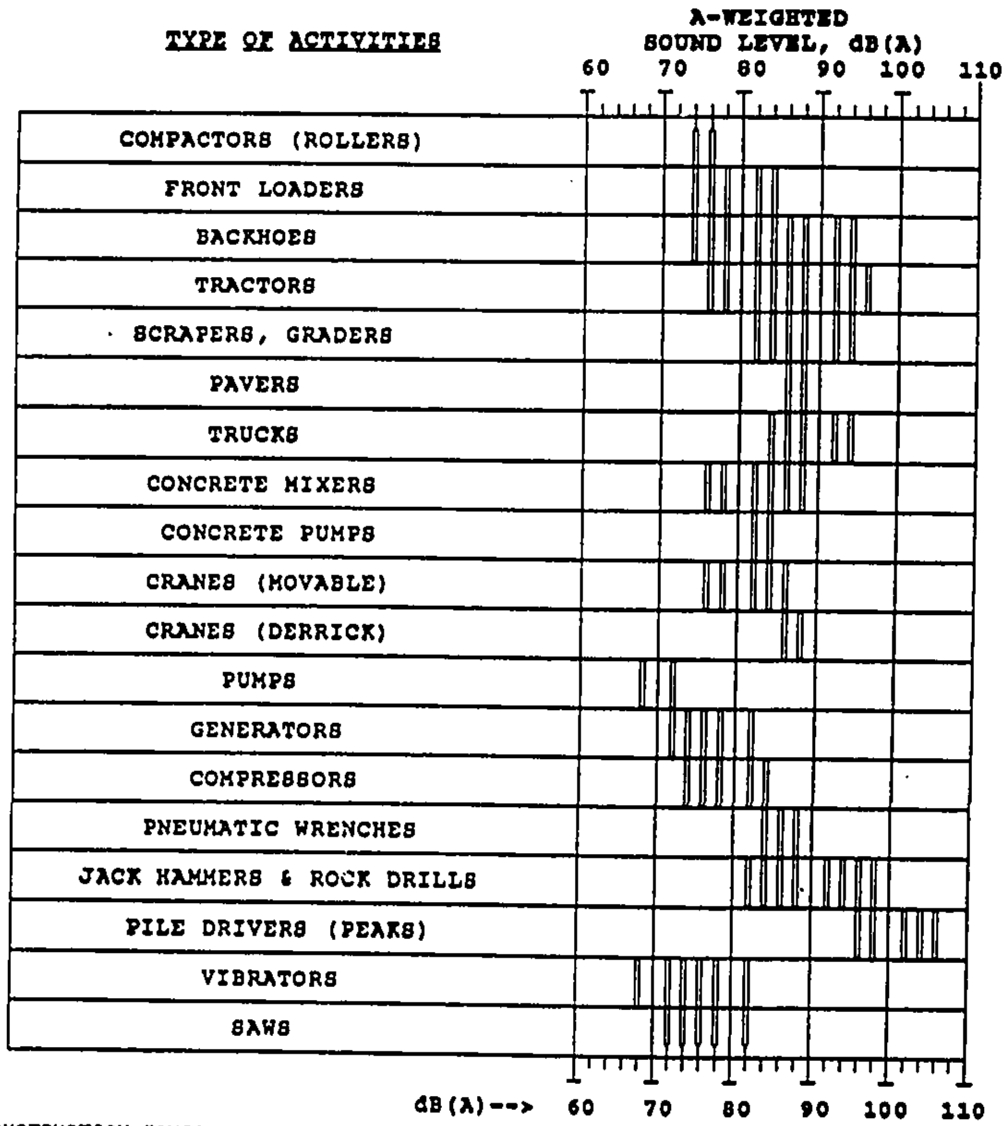
FIGURE 6 DEPARTMENT OF HEALTH PROPERTY LINE NOISE LIMITS FOR VARIOUS ZONING DISTRICTS



CONSTRUCTION EQUIPMENT NOISE RANGES @ 50 FEET
NOTE: BASED ON LIMITED AVAILABLE DATA SAMPLES

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FIGURE 7 TYPICAL CONSTRUCTION NOISE LEVELS @ 50' DISTANCE

APPENDIX

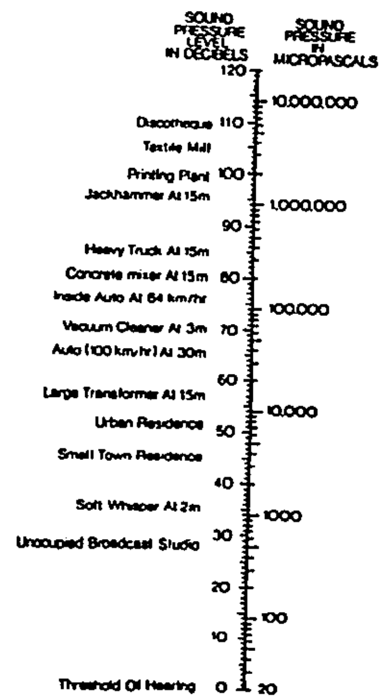
ACOUSTICAL TERMINOLOGY

Sound (Noise) Level

Sound or noise consists of minute fluctuations in atmospheric pressure capable of evoking the sense of hearing. It is measured using precision instruments known as sound level meters, in terms of decibels, abbreviated dB. Sound Level, or Sound Pressure Level, is defined as:

$$SPL = 20 \log (P/Pref) \text{ dB}$$

where P is the sound pressure fluctuation (above or below atmospheric pressure) and Pref is 20 micropascals, which is approximately the lowest sound pressure that can be detected by the human ear. So if P is 20 micropascals, SPL = 0 dB, if P is 200 micropascals, SPL = 20 dB, and so on. The chart below indicates the relation between sound pressure and sound pressure level, and also shows typical dBA levels of various sources of noise.



When two sound levels are combined, the result is the logarithmic sum. For example, two sound levels of 50 dB produce a combined level of 53 dB, not 100 dB; two sounds of 40 and 50 dB produce a combined level of 50.4 dB.

dBA

Sound level, or noise level, is usually expressed in terms of dBA which is measured using the "A-weighting" filter incorporated in sound level meters. This is an electronic filter having a similar frequency response to the human ear, which is most sensitive to sounds in the range 1000 to 4000 Hz, and less sensitive to lower and higher frequencies. The level of a sound in dBA is a good measure of the loudness of that sound, and so different sounds having the same dBA level sound about equally as loud.

A change of 1 or 2 dBA in the level of a sound is difficult for most people to detect, but a 3 to 5 dBA change corresponds to a small but noticeable change in loudness. A 10 dBA change corresponds to an approximate doubling or halving in loudness.

Statistical Sound (Noise) Levels

Sounds that vary in level over time, like road traffic noise and most community noise, are commonly described in terms of Lx, where L is the noise level exceeded for x% of a given measurement period, and/or Leq, the Equivalent Continuous Noise Level. For example, L1 is the noise level exceeded for 1% of the time, L10 the noise exceeded for 10% of the time, and so on. Leq is defined as the steady sound level that contains the same amount of acoustical energy as the given time-varying sound.

Figure A-1 illustrates the relationship between selected statistical sound levels.

Day-Night Average Sound Level (Ldn)

Ldn is essentially the Equivalent Continuous Noise Level measured over a 24-hour period. However, in calculating the Day-Night Average Sound Level, 10 dBA is added to the noise levels recorded between 10 pm and 7 am to account for people's higher sensitivity to noise at night. Figure A-2 shows typical Ldn levels in outdoor locations.

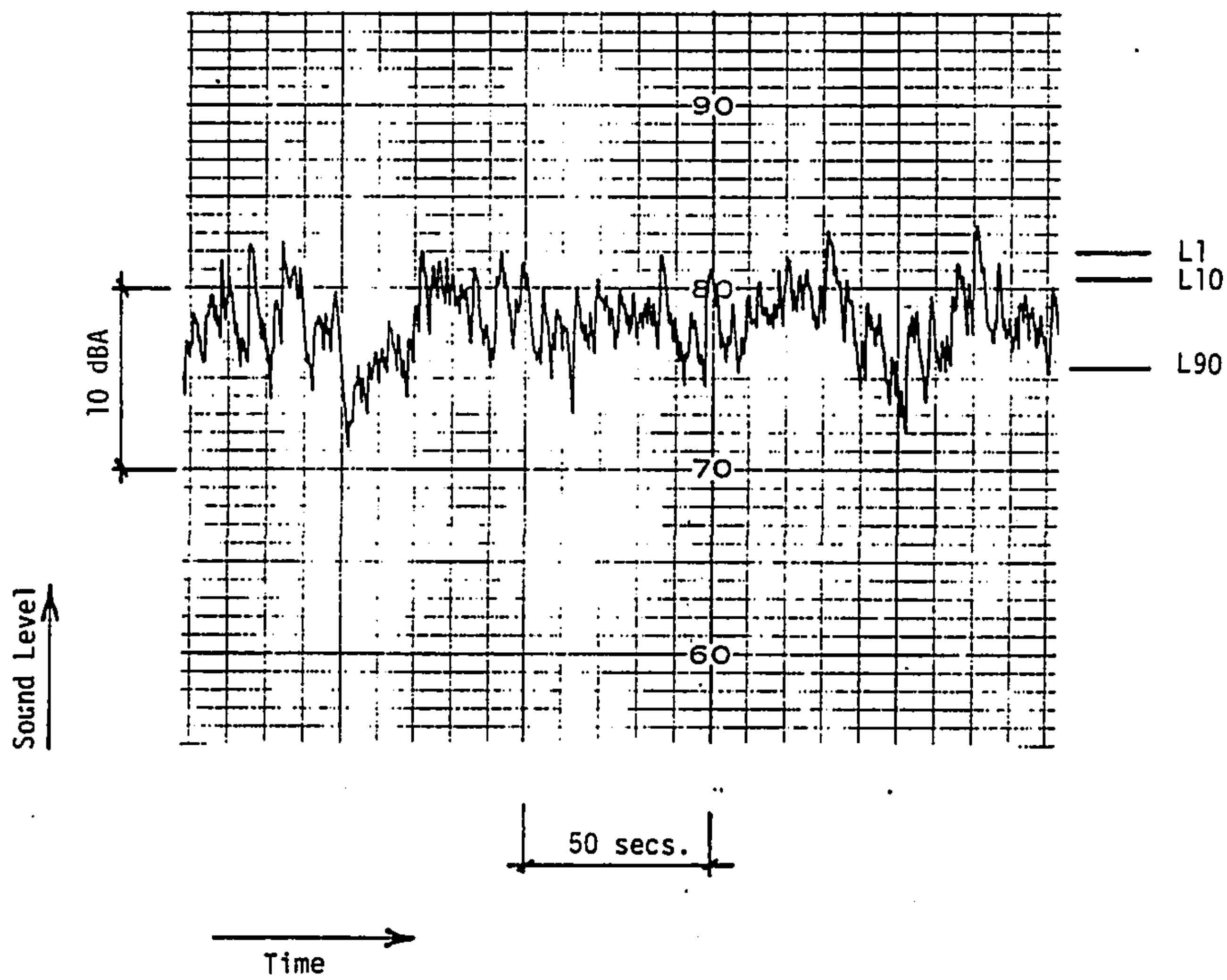


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FIGURE A-1 USE OF STATISTICAL SOUND LEVEL DESCRIPTORS FOR TIME-VARYING SOUND

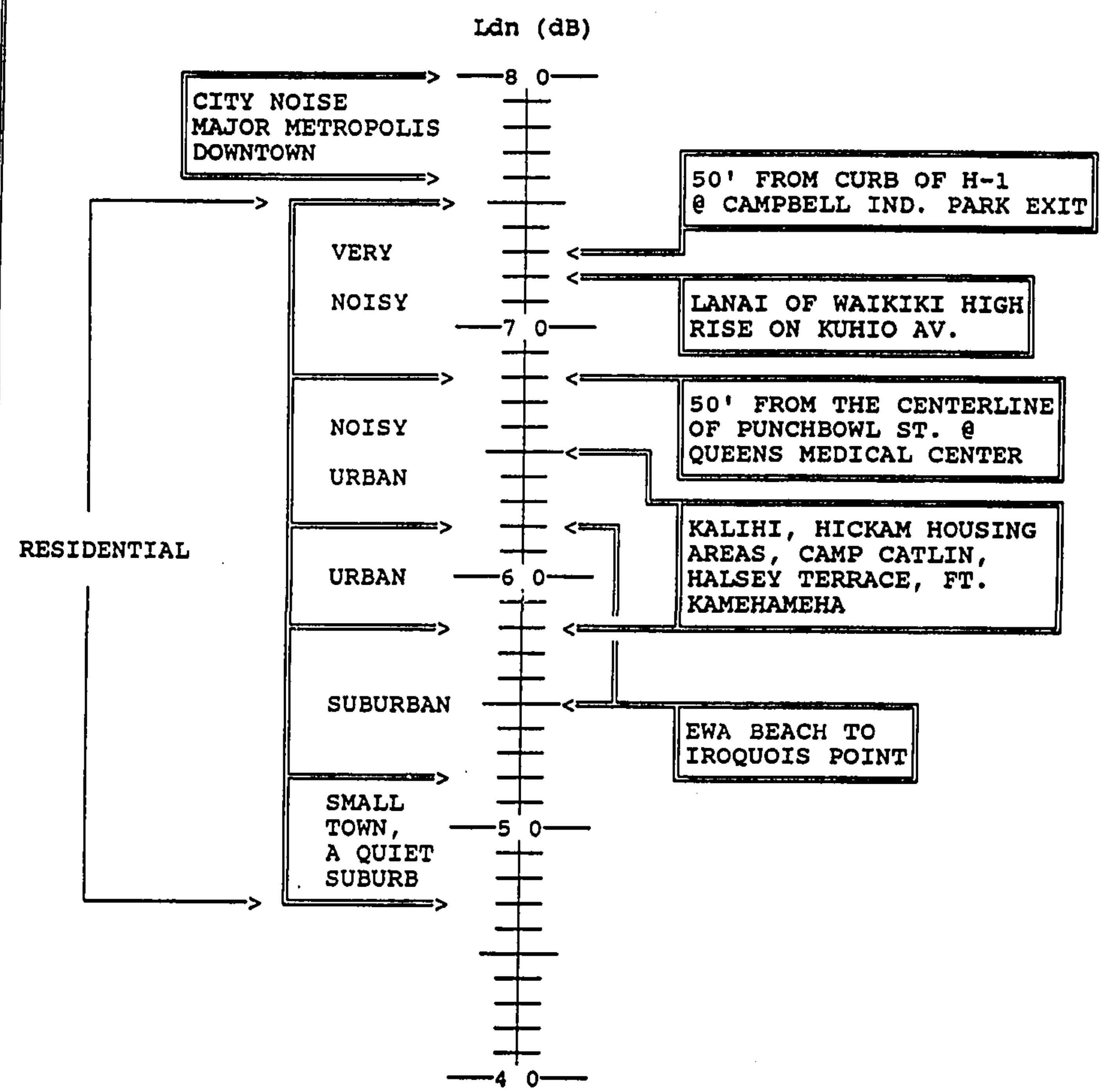

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FIGURE A-2 TYPICAL LDN LEVELS IN OUTDOOR LOCATIONS

APPENDIX C

TRAFFIC STUDY

Prepared By

Barton-Aschman Associates, Inc.

TRAFFIC STUDY FOR

THE WATERFRONT AT ALOHA TOWER

IN HONOLULU, HAWAII

Prepared For

ALOHA TOWER ASSOCIATES
AND
ALOHA TOWER DEVELOPMENT CORPORATION

Prepared By

BARTON-ASCHMAN ASSOCIATES, INC.
HONOLULU, HAWAII

June 1990
Revised November 1990

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TRAFFIC STUDY FOR THE WATERFRONT AT ALOHA TOWER

EXECUTIVE SUMMARY

PROJECT LOCATION AND DESCRIPTION

The Waterfront at Aloha Tower is a multi-use development to be located south of Nimitz Highway between Smith Street and one block east of Richards Street. The center of the project is the existing Aloha Tower. See Figure S-1.

The traffic study is based upon a plan that represents the maximum densities anticipated for various uses in order to examine a worst-case scenario. It is expected that as the project approaches final design, the development plan described below will be modified. The project is to consist of office, retail, cinema, hotel, condo and maritime uses. The following traffic study was prepared using the following land use plan:

Office (General)	997,850 Gross Square Feet
Office (HDOT)	42,150 Gross Square Feet
Retail	291,800 Leasable Square Feet
Cinema	30,000 Square Feet
Hotel	300 Rooms
Maritime Uses	256,930 Gross Square Feet
Condominiums	350 Units

SCOPE OF STUDY

The scope of the traffic study was established based on the input from Hawaii Department of Transportation (HDOT) and the City and County of Honolulu Department of Transportation Services (DTS) and experience from other traffic studies conducted in Downtown Honolulu. This was done to insure that the issues and concerns of these agencies would be addressed in the study.

The study area is bounded by Vineyard Boulevard on the north, South Street on the east, Ala Moana Boulevard/Nimitz Highway on the south and River Street on the west. Within this area, all intersections that would be impacted were included in the study. Any development projects either under construction or planned for construction within or adjacent to the study area were identified and used in the development of future background traffic projections.

METHODOLOGY AND ASSUMPTIONS

Existing traffic counts were collected for 37 intersections within the study area. It was determined that traffic count data would be collected for Friday morning and afternoon peak hours and for Saturday peak hours, which typically occur during the late morning and early

THE WATERFRONT AT ALOHA TOWER	Fig. 6–1 **ROOF PLAN**	ALOHA TOWER DEVELOPMENT CORPORATION

afternoon, at selected intersections. Where appropriate, counts were obtained from previous studies and factored to represent increases in traffic resulting from background growth. The basis of these factors were counts conducted during weekdays (Tuesday through Friday) at various intersections for which there were no previously collected data available.

The design year for the traffic impact analysis is used to estimate the background traffic growth component of the future traffic projections. During discussions with HDOT and DTS, it was determined that the traffic impact analysis for the Waterfront would be conducted for a design year of 1995. This design year was selected because it is the maximum time frame within which reliable related project data can be obtained, even though the Waterfront and the other related projects may or may not be completed.

Future background traffic conditions are referred to as "cumulative" traffic conditions. Cumulative traffic projections were estimated using an annual growth rate of 1.48 per cent per year and traffic generated from 18 other development projects in the study area. The list of related projects was reviewed by the Department of Housing and Community Development, which provided project descriptions and an undated listing of related projects.

Traffic generated by the Waterfront was estimated and superimposed on the cumulative traffic projections to obtain "cumulative plus project" traffic projections. The impacts of the Waterfront were then determined by comparing the results of the level-of-service analysis for cumulative versus cumulative plus project conditions.

A level-of-service analysis was conducted for existing, cumulative, and cumulative plus project conditions. The level-of-service (LoS) analysis was initially conducted using the operations method described in Chapter 9 of the 1985 Highway Capacity Manual (HCM) and is referred to as the HCM method. For existing conditions, this procedure resulted in volume-to-capacity (V/C) ratios exceeding 1.0 indicating that existing volumes exceeded the capacity of several intersections. This indicated that use of this method would underestimate the existing capacity of the intersections to be analyzed and indicate lower levels-of-service than actually being experienced by drivers.

The traffic conditions were then analyzed using the Critical Movement Analysis (CMA) method which is comparable to the Planning Method, also described in Chapter 9 of the HCM. The difference between the Planning Method and the CMA method is that the CMA method considers the traffic signal phasing whereas the Planning Method assumes that all traffic signals have separate left-turn phases for all approaches. Because of the actual traffic signal conditions in Honolulu, the CMA method is more appropriate.

1995 CUMULATIVE (BACKGROUND) TRAFFIC CONDITIONS

The 1995 cumulative traffic conditions are the basis upon which the project's traffic related impacts are determined. The 1995 cumulative traffic projections represent estimated conditions resulting from background growth plus traffic from the related projects. Traffic studies were available for only four of the related projects. For the remaining 14 projects, traffic volumes were estimated based on the planned development densities and assumptions regarding access and egress locations. The resulting traffic projections therefore do not necessarily represent expected

1995 traffic volumes but instead represent a worst-case condition that could result if all the related projects are built-out to the maximum densities planned.

The level-of-service analysis for 1995 cumulative traffic conditions without the Waterfront traffic indicates that the capacities of 12 intersections may be exceeded as a result of background growth and traffic generated by other planned projects. Analyses of mitigations for these conditions should be examined as part of the traffic analysis for these projects.

PROJECT TRIP GENERATION

Trips generated by office, retail, hotel, cinema, and condo uses at the Waterfront were estimated using trip generation rates and equations in Trip Generation, An Informational Report (Fourth Edition, 1987); which is the standard reference for traffic impacts studies and has been used in previous traffic studies in Honolulu. Trip rates for the maritime facilities were determined from counts conducted at Aloha Tower during a Saturday during which cruise ships docked at the terminal.

The number of trips calculated using the trip generation rates was adjusted to reflect special conditions associated with the mix of uses at the Waterfront. The adjustments were as follows:

(1) The office trips were discounted 30% to account for transit usage and ride sharing.

(2) Retail trips were discounted 40% to account for trips that would be from other uses within the project. This was based on past experience at the festival marketplace in Baltimore.

(3) Cinema trips were discounted 10%.

(4) Hotel trips were discounted 50%.

The results of the trip generation analysis is presented in Table S-1. As shown the project will generate approximately 24,000 trips during a typical weekday. During the morning peak hour, a total of 1,878 trips will generated. During the afternoon peak hour, 2,674 trips will be generated.

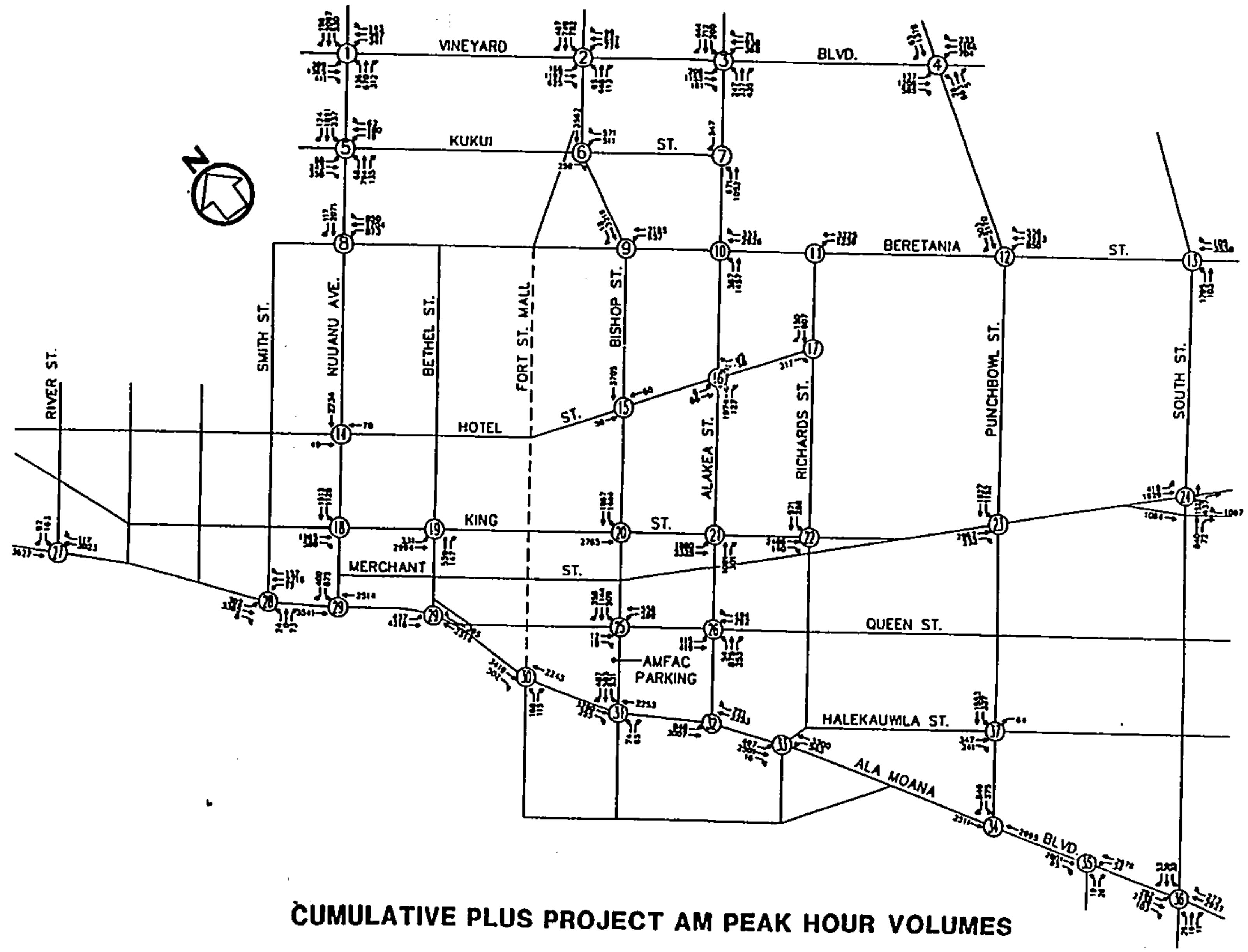
On a typical Saturday, approximately 21,000 trips will be generated, of which 2,545 will be generated during the peak hour.

1995 CUMULATIVE PLUS PROJECT TRAFFIC CONDITIONS

Cumulative plus project traffic volumes are obtained by superimposing the project generated traffic on 1995 cumulative traffic projections. These volumes are shown in Figures S-2, S-3, and S-4 for weekday morning peak hour, weekday afternoon peak hour and Saturday peak hour conditions, respectively.

Table S-1
TRIP GENERATION ANALYSIS FOR PROJECT
ALOHA TOWER TRAFFIC STUDY
June 1990

		Weekday Traffic Volumes							Weekend Traffic Volumes			
			AM Peak Hour			PM Peak Hour				Peak Hour		
Location	Land Use	Daily Total	Total	In	Out	Total	In	Out	Daily Total	Total	In	Out
Piers 5 & 6	Office	3266	542	472	70	514	82	432	605	186	100	86
	HDOT Office	2948	248	108	140	465	74	391	295	25	11	14
	Retail	2736	69	48	21	280	137	143	3546	355	181	174
	Maritime	343	35	28	7	35	7	28	410	82	50	32
	Subtotal	9293	894	656	238	1294	300	994	4856	648	342	306
	Adjustments	2959	265	193	71	406	102	304	1688	205	106	100
	Total	6334	629	463	167	888	198	690	3168	443	236	206
Piers 8 - 11	Office	5777	1042	907	135	966	155	811	1200	360	194	166
	Retail	13435	311	218	93	1054	495	559	17521	1669	851	818
	Cinema	2334	6	5	1	184	138	46	3337	591	296	295
	Hotel	2180	174	103	71	185	111	74	2180	185	111	74
	Maritime	686	70	56	14	70	14	56	820	164	100	64
	Subtotal	24412	1603	1289	314	2459	913	1546	25058	2969	1552	1417
	Adjustments	8243	474	381	92	804	308	496	8806	990	510	480
	Total	16169	1129	908	222	1655	605	1050	16252	1979	1042	937
Piers 12 & 14	Condos	1464	120	23	97	131	81	50	1507	123	53	70
Project Total		23967	1878	1394	486	2674	884	1790	20927	2545	1331	1213



CUMULATIVE PLUS PROJECT AM PEAK HOUR VOLUMES

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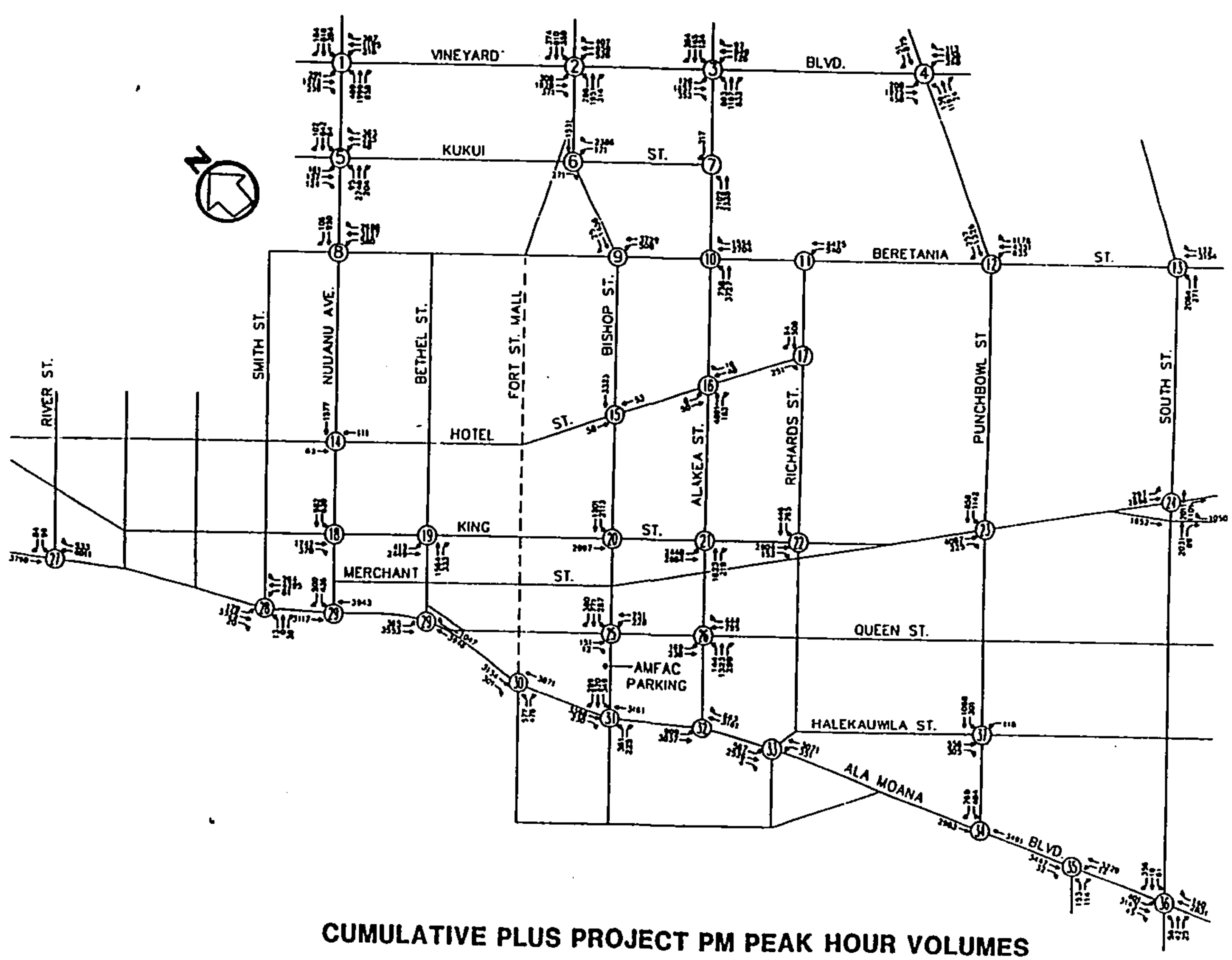
FIGURE S-2



CUMULATIVE PLUS PROJECT PM PEAK HOUR VOLUMES

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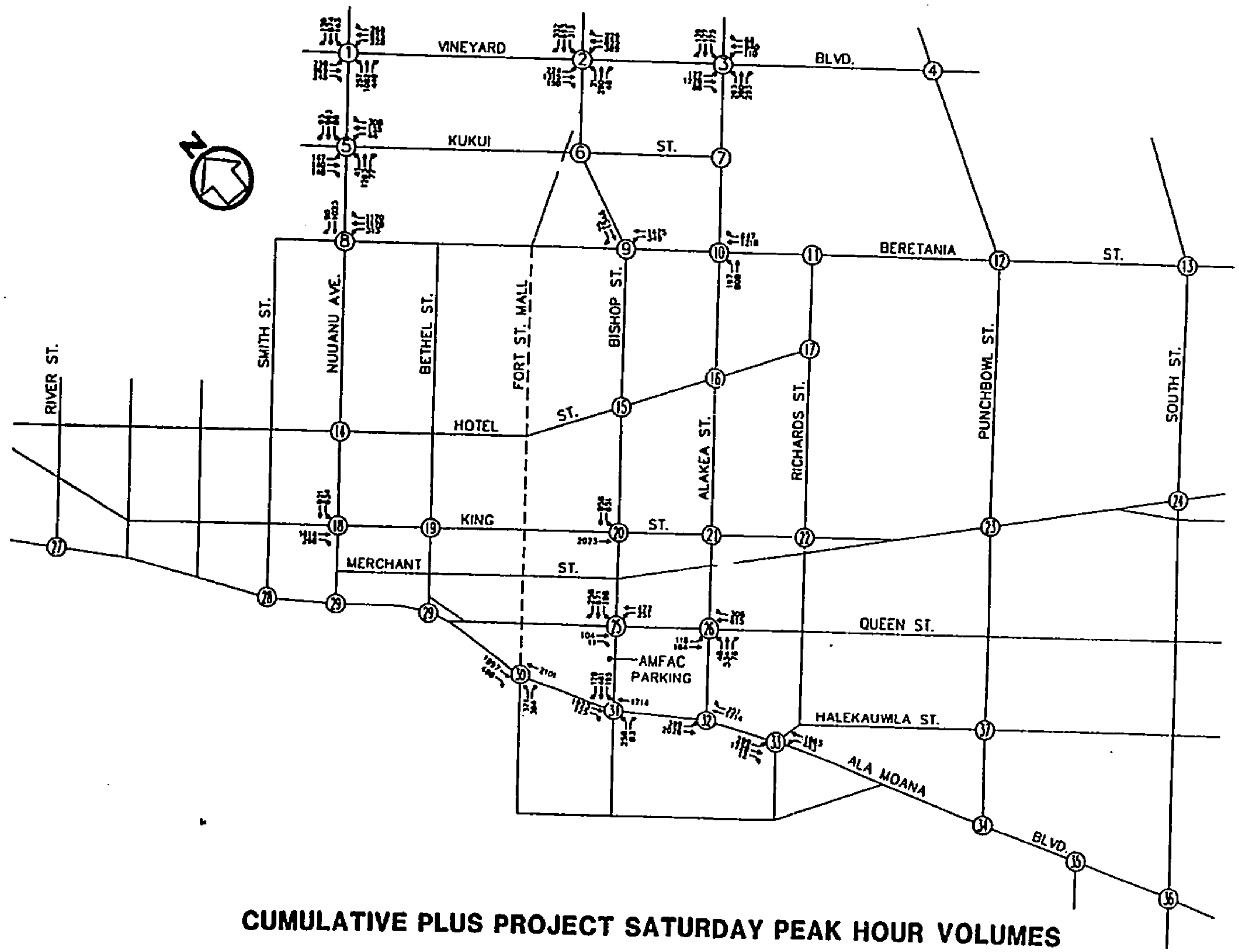
FIGURE S-3



CUMULATIVE PLUS PROJECT SATURDAY PEAK HOUR VOLUMES

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FIGURE S-4

A level-of-service analysis for 1995 cumulative plus project conditions is then compared to the analysis for 1995 cumulative conditions. The change in the V/C ratio is the indicator of the project's traffic related impacts at the intersections analyzed. The level-of-service results are presented in Tables S-2 and S-3 for weekday and Saturday traffic conditions, respectively.

IMPACT ANALYSIS AND CONCLUSIONS

The addition of project-generated traffic to 1995 cumulative traffic volumes determines the impact of the proposed project. It is important to note that the results of the analysis is relative. The traffic volumes generated by the related projects and background growth are estimates of 1995 traffic, not projections. Related projects may not be built to the specified size, if at all. Therefore, the results of this analysis are intended to focus on the impacts of the proposed project traffic on the street system and the mitigations needed to mitigate those impacts where feasible.

Mitigation measures have been recommended for all intersections where the proposed project has a significant traffic impact. some of these locations are not in the immediate are of the Waterfront, and therefore, recommended improvements cannot be implemented by the developer. Previous traffic studies have recommended similar measures at some of these locations to mitigate their respective impacts.

At most locations where a significant impact occurs, restriping, signage and peak-hour parking prohibition would serve as the mitigation measure. At several intersections, addition of a single lane to mitigate the impacts could require right-of-way acquisition and minor reconstruction of sidewalk and curb facilities.

In the immediate vicinity of the project, the significant impacts at several intersections along Nimitz Highway can only be partially mitigated. The heavy through volumes along Nimitz Highway, which are not project-related, cause the intersections to operate at undesirable levels-of-service. These intersections are on Nimitz Highway at Bishop Street, Alakea Street, and Richards Street.

PROJECT TRAFFIC CIRCULATION PLAN

Access to and egress from the Waterfront described in this section incorporates the plan as initially developed and mitigations developed as part of the traffic analysis. The access-egress plan is shown as Figure S-5 and is summarized as follows:

(1) Vehicular access for Ewa bound traffic will provided for by left turns at Smith Street (for the condominiums), Fort Street (during the off-peak hours only), Richards Street and a new intersection of Ala Moana Boulevard at Nimitz Highway to be located Diamond Head of Richards Street. The intersection of Ala Moana Boulevard and Nimitz Highway will replace the existing intersection of Nimitz Highway and Ala Moana Diamond Head of Piers 5 and 6.

(2) Vehicular access for Diamond Head bound traffic is to be provided via right turns into the project at Smith Street (for the condominiums), Fort Street, Bishop Street, Richards Street and Ala Moana Boulevard.

(3) Access is also provided for southbound traffic along Bishop Street into the project.

(4) Vehicular egress will be provided for Ewa bound and Diamond Head bound traffic along Nimitz Highway at Smith Street, Fort Street, Bishop Street and Ala Moana Boulevard.

(5) An entrance on Nimitz Highway to Pier 11 for service vehicles and buses will be located at the existing median opening Ewa of the Fort Street intersection. Diamond Head bound vehicles may turn right and Ewa bound vehicles may turn left at the median opening. No vehicles may exit onto Nimitz Highway.

PROJECT PARKING PLAN

There are 531 parking spaces presently located at the Waterfront. These spaces are as follows:

374	4-Hour Metered Spaces
86	Unmetered Spaces
56	Reserved Spaces
15	Bus Spaces
531	Total Spaces

The plan for the Waterfront provides 2,000 spaces at Piers 8 through 11 and 600 spaces at Piers 5 and 6, for a total of 2,600 spaces. An analysis of the parking demand for the project determined that the peak parking demand will be accommodated by the number planned parking spaces.

Approximately 500 spaces will be located at Piers 12 and 14 for the condominiums. This is one and one-quarter spaces per unit plus an additional 60 spaces for visitors and service vehicles. Any additional parking for the condominiums is to be provided at the parking structure at Piers 8 through 11.

Table S-2
LEVEL OF SERVICE ANALYSIS FOR 1995 WEEKDAY CONDITIONS
ALOHA TOWER TRAFFIC STUDY

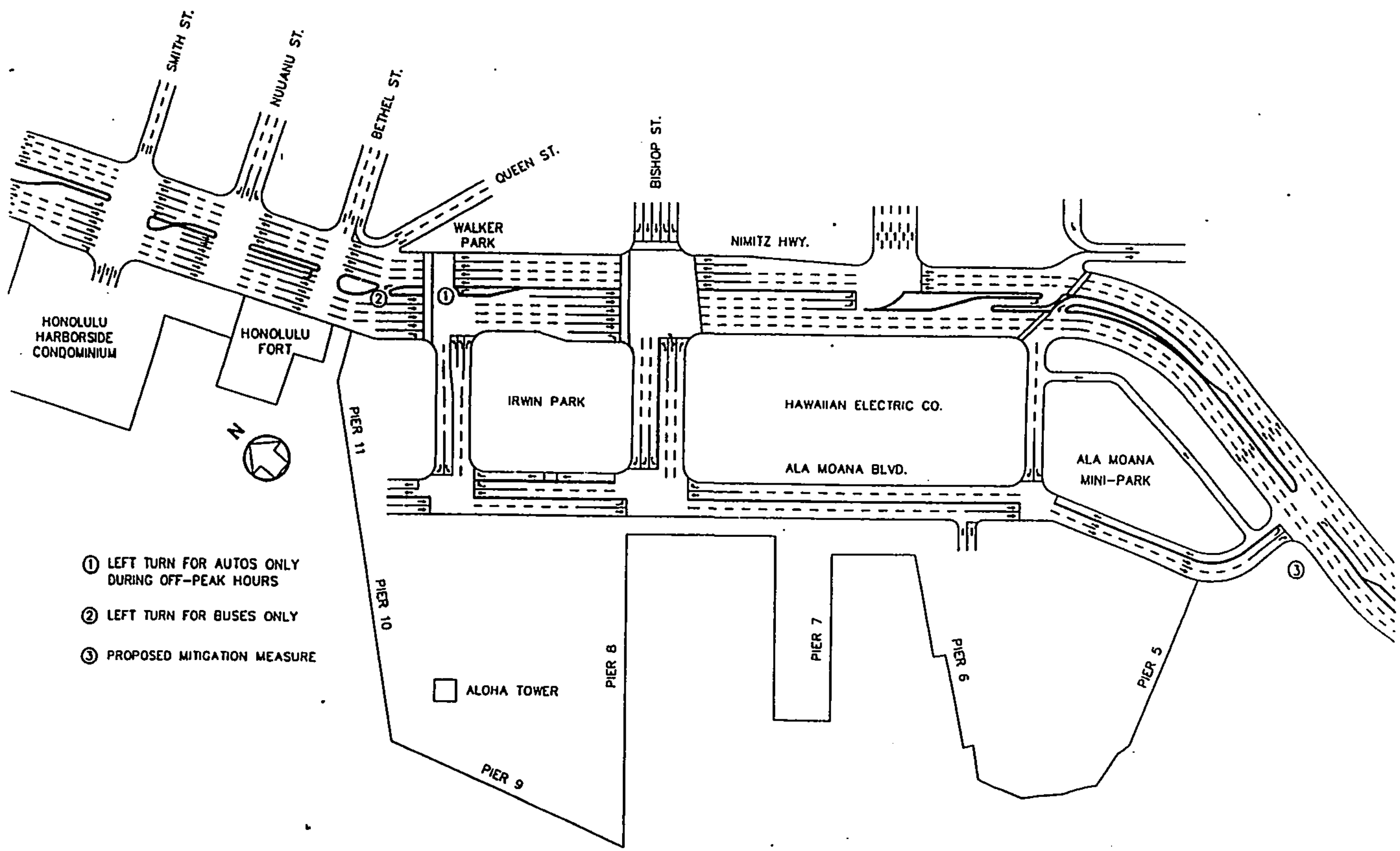
NO	EAST-WEST STREET	NORTH-SOUTH STREET	WITHOUT PROJECT AM PEAK HOUR V/C (HCM)	LOS	V/C (CMA)	LOS	WITHOUT PROJECT PM PEAK HOUR V/C (HCM)	LOS	V/C (CMA)	LOS	WITH PROJECT AM PEAK HOUR V/C (HCM)	LOS	V/C (CMA)	LOS	WITH PROJECT PM PEAK HOUR V/C (HCM)	LOS	V/C (CMA)	LOS	V/C ANALYSIS V/C CHANGE AM (HCM)	(CMA)	PM (HCM)	(CMA)
1	VINEYARD BL	NUUANU AV	2.293	F	1.080	F	4.016	F	1.390	F	2.680	F	1.140	F	4.030	F	1.450	F	0.387	0.060	0.014	0.060
2	VINEYARD BL	PALI HWY	2.184	F	1.430	F	3.104	F	1.330	F	2.334	F	1.480	F	3.155	F	1.400	F	0.150	0.050	0.051	0.070
3	VINEYARD BL	Q. EMMA ST	2.395	F	1.420	F	2.833	F	1.600	F	2.444	F	1.420	F	2.935	F	1.660	F	0.049	0.000	0.102	0.060
4	VINEYARD BL	PUNCHBOWL ST	1.478	F	1.370	F	1.616	F	1.410	F	1.492	F	1.390	F	1.679	F	1.470	F	0.014	0.020	0.063	0.060
5	KUKUI ST	NUUANU AV	3.366	F	0.870	D	3.108	F	1.050	F	3.366	F	0.930	E	3.108	F	1.160	F	0.000	0.060	0.000	0.110
6	KUKUI ST	PALI HWY	-		0.700	C	-		0.290	A	-		0.740	C	-		0.320	A	-	0.040	-	0.030
7	KUKUI ST	Q. EMMA ST	0.449	A	0.420	A	1.406	F	1.300	F	0.517	A	0.450	A	1.491	F	1.400	F	0.068	0.030	0.085	0.100
8	BERETANIA ST	NUUANU AV	1.267	F	0.840	D	1.506	F	0.860	D	1.409	F	0.890	D	1.570	F	0.930	E	0.142	0.050	0.064	0.070
9	BERETANIA ST	PALI HWY	1.097	F	0.900	E	0.897	D	0.690	B	1.152	F	0.970	E	0.938	E	0.710	C	0.055	0.070	0.041	0.020
10	BERETANIA ST	Q. EMMA ST	0.932	E	0.660	B	2.695	F	1.430	F	0.967	E	0.680	B	2.742	F	1.470	F	0.035	0.020	0.047	0.040
11	BERETANIA ST	RICHARDS ST	0.992	E	0.740	C	0.796	C	0.590	A	1.113	F	0.830	D	0.807	D	0.600	B	0.121	0.090	0.011	0.010
12	BERETANIA ST	PUNCHBOWL ST	1.465	F	1.150	F	1.390	F	1.040	F	1.528	F	1.200	F	1.449	F	1.080	F	0.063	0.050	0.059	0.040
13	BERETANIA ST	ALAPAI ST	1.062	F	0.850	D	1.069	F	0.860	D	1.110	F	0.890	D	1.111	F	0.900	E	0.048	0.040	0.042	0.040
14	HOTEL ST	NUUANU AV	0.981	E	0.850	D	0.591	A	0.510	A	1.120	F	0.970	E	0.692	B	0.600	B	0.139	0.120	0.101	0.090
15	HOTEL ST	BISHOP ST	0.641	B	0.490	A	0.595	A	0.460	A	0.684	B	0.530	A	0.621	B	0.480	A	0.043	0.040	0.026	0.020
16	HOTEL ST	ALAKEA ST	0.462	A	0.320	A	0.812	D	0.600	B	0.469	A	0.330	A	0.843	D	0.620	B	0.007	0.010	0.031	0.020
17	HOTEL ST	RICHARDS ST	0.841	D	0.660	B	0.608	B	0.450	A	0.944	E	0.750	C	0.675	B	0.510	A	0.103	0.090	0.067	0.060
18	KING ST	NUUANU AV	1.562	F	1.300	F	1.020	F	0.870	D	1.579	F	1.320	F	1.030	F	0.880	D	0.017	0.020	0.010	0.010
19	KING ST	BETHEL ST	0.950	E	0.730	C	1.194	F	0.930	E	1.015	F	0.780	C	1.411	F	1.110	F	0.065	0.050	0.217	0.180
20	KING ST	BISHOP ST	1.132	F	1.330	F	1.458	F	1.790	F	1.132	F	1.330	F	1.466	F	1.790	F	0.000	0.000	0.008	0.000
21	KING ST	ALAKEA ST	1.125	F	0.800	D	1.444	F	1.030	F	1.145	F	0.820	D	1.494	F	1.070	F	0.020	0.020	0.050	0.040
22	KING ST	RICHARDS ST	0.656	B	0.540	A	0.833	D	0.920	E	0.684	B	0.500	A	0.895	D	0.820	D	0.028	-	0.062	-
23	KING ST	PUNCHBOWL ST	0.921	E	0.780	C	1.082	F	0.900	E	0.921	E	0.780	C	1.082	F	0.900	E	0.000	0.000	0.000	0.000
24	KING ST	ALAPAI ST	0.730	C	0.660	B	1.257	F	0.930	E	0.801	D	0.610	B	1.590	F	1.220	F	0.071	-	0.333	0.290
	KAPIOLANI BL	SOUTH ST	0.510	A	0.360	A	0.547	D	0.670	B	0.525	A	0.370	A	0.904	E	0.720	C	0.015	0.010	0.057	0.050
25	QUEEN ST	BISHOP ST	0.679	B	0.570	A	0.662	B	0.550	A	0.707	C	0.620	B	0.692	B	0.580	A	0.028	0.050	0.030	0.030
26	QUEEN ST	ALAKEA ST	0.773	C	0.660	B	1.309	F	0.780	C	1.010	F	0.710	C	1.472	F	0.850	D	0.237	0.050	0.163	0.070
27	NIMITZ HWY	RIVER ST	1.020	F	0.690	B	1.098	F	0.780	C	1.045	F	0.710	C	1.157	F	0.820	D	0.025	0.020	0.059	0.040
28	NIMITZ HWY	SMITH ST	0.791	C	0.680	B	0.973	E	0.830	D	0.802	D	0.700	C	1.026	F	0.860	D	0.011	0.020	0.053	0.030
29	NIMITZ HWY	NUUANU AV	0.907	E	0.640	B	1.002	F	0.840	D	0.993	E	0.840	D	1.224	F	0.950	E	0.086	0.200	0.222	0.110
	NIMITZ HWY	BETHEL ST	0.757	C	0.600	B	1.051	F	0.830	D	0.818	D	0.700	C	1.241	F	0.970	E	0.061	0.100	0.190	0.140
30	NIMITZ HWY	PORT ST	0.721	C	0.600	B	0.900	E	0.670	B	0.801	D	0.630	B	1.422	F	0.900	E	0.080	0.030	0.522	0.230
31	NIMITZ HWY	BISHOP ST	1.091	F	0.860	D	1.112	F	0.930	E	1.079	F	0.940	E	1.159	F	0.930	E	-	0.080	0.047	0.000
32	NIMITZ HWY	ALAKEA ST	0.948	E	0.830	D	1.125	F	0.980	E	0.983	E	0.850	D	1.275	F	1.090	F	0.035	0.020	0.150	0.110
33	NIMITZ HWY	RICHARDS ST	1.248	F	0.650	B	1.145	F	0.670	B	1.286	F	0.970	E	1.334	F	0.840	D	0.038	0.320	0.189	0.170
34	ALA MOANA BL	PUNCHBOWL ST	1.214	F	0.940	E	1.411	F	1.030	F	1.463	F	0.892	D	1.546	F	0.980	E	0.249	-	0.135	-
35	ALA MOANA BL	TRADE ZONE ENTR	1.109	F	0.690	B	1.312	F	0.820	D	1.160	F	0.720	C	1.342	F	0.880	D	0.051	0.030	0.030	0.060
36	ALA MOANA BL	SOUTH ST	1.116	F	0.900	E	1.194	F	1.000	F	1.153	F	0.960	E	1.216	F	1.200	F	0.037	0.060	0.022	0.200
37	HALEKAUWILA ST	PUNCHBOWL ST	0.602	B	0.530	A	0.756	C	0.550	A	0.602	B	0.620	B	0.756	C	0.690	B	0.000	0.090	0.000	0.140

Notes:
V/C = Volume-to-Capacity Ratio
LOS = Level-of-Service
HCM = Operations method
CMA = Planning method

Table S-3
LEVEL OF SERVICE ANALYSIS FOR 1995 SATURDAY CONDITIONS
ALOHA TOWER TRAFFIC STUDY
June 1990

NO	EAST-WEST STREET	NORTH-SOUTH STREET	WITHOUT PROJECT V/C (HCM)	WITHOUT PROJECT LOS	WITHOUT PROJECT V/C (CMA)	WITHOUT PROJECT LOS	WITH PROJECT V/C (HCM)	WITH PROJECT LOS	WITH PROJECT V/C (CMA)	WITH PROJECT LOS	V/C ANALYSIS (CHANGE IN V/C) (HCM)	V/C ANALYSIS (CHANGE IN V/C) (CMA)
1	VINEYARD BL	NUUANU AV	2.124	F	0.880	D	2.138	F	0.920	B	0.014	0.040
2	VINEYARD BL	PALI HWY	0.955	E	0.840	D	1.057	F	0.920	E	0.102	0.080
3	VINEYARD BL	Q. EMMA ST	0.970	E	0.900	E	1.013	F	0.940	E	0.043	0.040
5	KUKUI ST	NUUANU AV	2.114	F	0.640	B	3.243	F	0.710	C	1.129	0.070
8	BERETANIA ST	NUUANU AV	0.662	B	0.400	A	0.771	C	0.500	A	0.109	0.100
9	BERETANIA ST	PALI HWY	0.295	A	0.390	A	0.557	A	0.460	A	0.262	0.070
10	BERETANIA ST	Q. EMMA ST	0.878	D	0.450	A	0.893	D	0.470	A	0.015	0.020
18	KING ST	NUUANU AV	0.970	E	0.830	D	0.986	E	0.840	D	0.016	0.010
20	KING ST	BISHOP ST	0.433	A	0.640	B	0.647	B	0.700	C	0.214	0.060
25	QUEEN ST	BISHOP ST	0.433	A	0.360	A	0.486	A	0.430	A	0.053	0.070
26	QUEEN ST	ALAKEA ST	0.419	A	0.430	A	0.560	A	0.510	A	0.141	0.080
29	NIMITZ HWY	NUUANU AV	0.669	B	0.500	A	0.721	C	0.690	B	0.052	0.190
	NIMITZ HWY	BETHEL ST	0.576	A	0.450	A	0.708	C	0.580	A	0.132	0.130
30	NIMITZ HWY	FORT ST	0.511	A	0.380	A	0.960	E	0.610	B	0.449	0.230
31	NIMITZ HWY	BISHOP ST	0.576	A	0.490	A	0.673	B	0.580	A	0.097	0.090
32	NIMITZ HWY	ALAKEA ST	0.573	A	0.500	A	0.643	B	0.550	A	0.070	0.050
33	NIMITZ HWY	RICHARDS ST	0.733	C	0.560	A	0.819	D	0.720	C	0.086	0.160

Notes:
V/C = Volume-to-Capacity Ratio
LOS = Level-of-Service
HCM = Operations Method
CMA = Planning Method



PROPOSED LANE CONFIGURATIONS FOR PROJECT

Barton-Aschman Associates, Inc.

FIGURE S-5

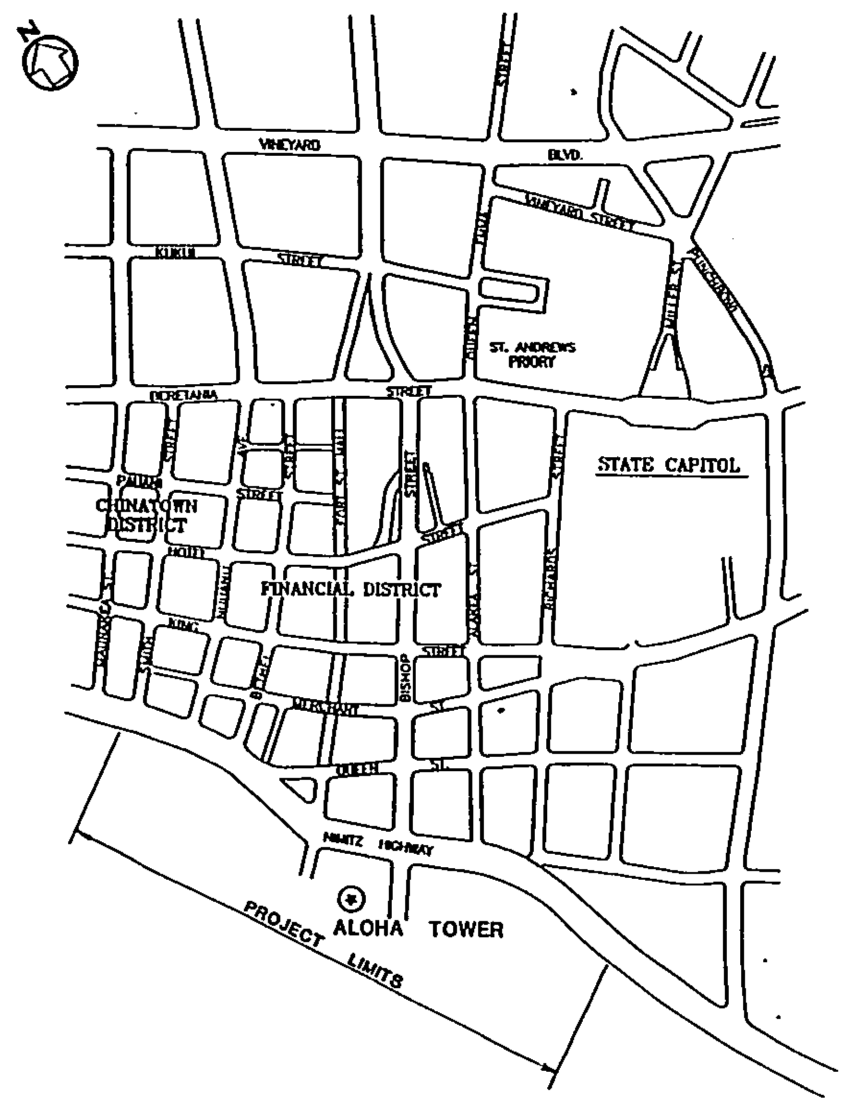
1. INTRODUCTION

Barton-Aschman Associates Inc. has been retained to conduct a traffic study as part of the Environmental Impact Statement being prepared for the Waterfront at Aloha Tower. The proposed multi-use development and festival marketplace is located at the site of the Aloha Tower in Honolulu, Hawaii.

The following report has been prepared to describe the traffic characteristics of the project and likely impacts to the adjacent roadway network. This introductory chapter discusses the location of the project, the proposed development, and the study methodology.

PROJECT LOCATION AND DESCRIPTION

The location of the proposed project is shown on Figure 1. The project site is bounded by Nimitz Highway to the north and the Honolulu Harbor to the east, south and west.



PROJECT LOCATION

FIGURE 1

The proposed development plan is summarized in Table 1. The densities shown in the table are the maximum anticipated. As the development is refined, these densities are likely to decrease. The values have been used for the traffic study in order to analyze a worst-case condition. The site plans are shown in Figure 2. The project extends from Smith Street to approximately one block east of Richards Street along Nimitz Boulevard.

Parking for the non-residential portions of the project will be provided by non-visible facilities. The facility at Piers 5 and 6 will provide approximately 600 spaces and the facility at Piers 8 through 11 will provide approximately 2,000 spaces. Parking for the condominiums will include approximately 500 spaces on-site.

STUDY METHODOLOGY

In order to conduct this traffic study, a number of tasks were performed, which are discussed in the following paragraphs.

1. Data Collection

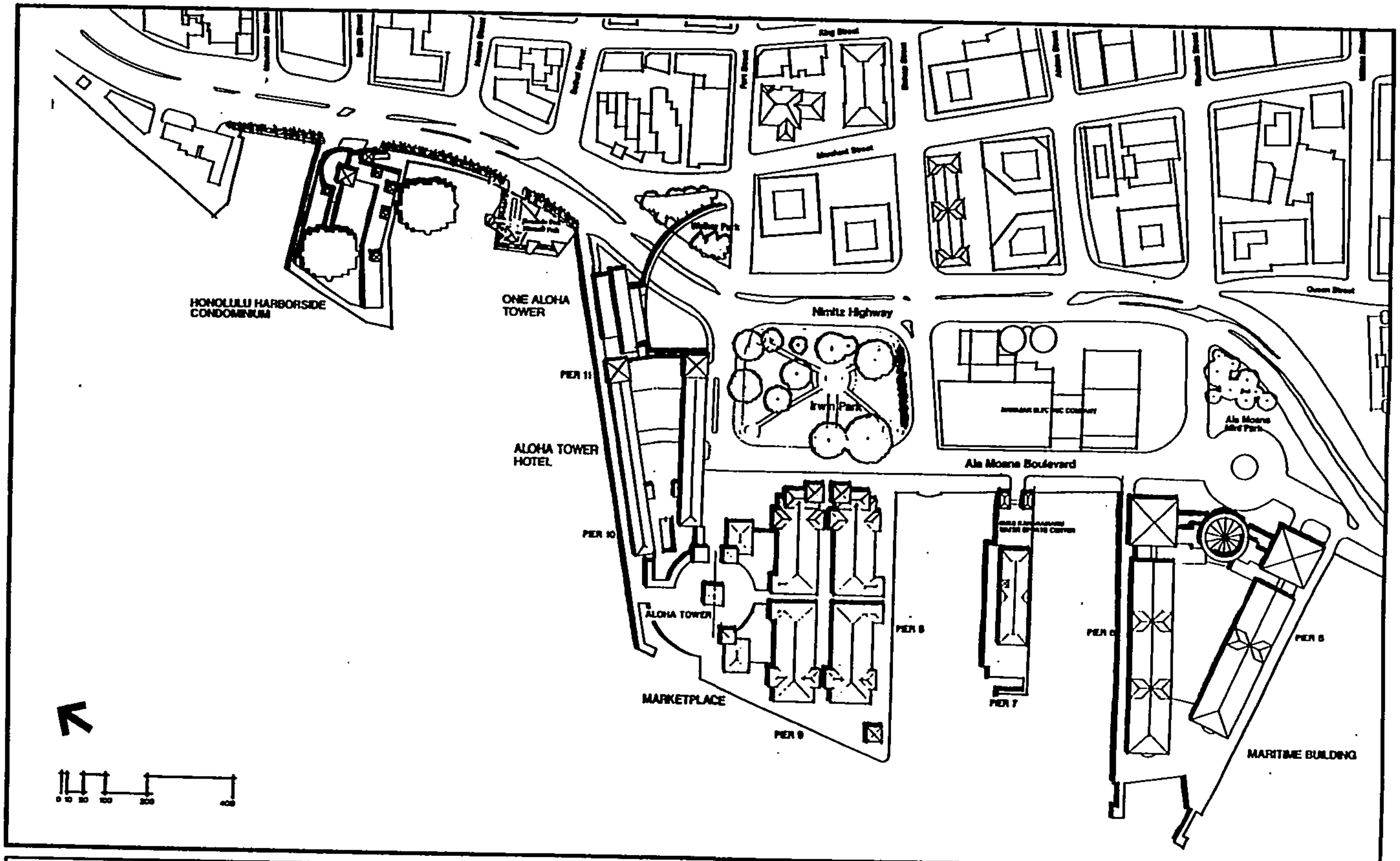
Prior to collection of any data, the Hawaii Department of Transportation (HDOT) and the Department of Transportation Services (DTS) for the City and County of Honolulu were contacted to determine the intersections to be studied, along with any particular concerns. These discussions identified the intersections to be analyzed within the area bounded by Vineyard Boulevard to the north, South Street to the east, Ala Moana Boulevard and Nimitz Highway to the south and River Street to the west. It was also determined that Friday weekday traffic conditions would be analyzed using the methodology described in the following paragraphs. Selected intersections would also be analyzed for Saturday traffic conditions. The intersections analyzed in this study are summarized in Table 2.

Table 1
PROPOSED DEVELOPMENT PLAN (1)
ALOHA TOWER TRAFFIC STUDY
June 1990

Proposed Use	Units (2)	Piers 5 & 6	Piers 8 - 11	Piers 12 & 14	Other	Total
Office(General)	Gr SF	317,850	680,000	0	0	997,850
Office (HDOT)	Gr SF	42,150	0	0	0	42,150
Retail	Net SF	21,250	260,950	0	9,600 (3)	291,800
Cinema	Sq Ft	0	30,000	0	0	30,000
Hotel	Occ Rooms	0	300 (4)	0	0	300
Maritime Uses	Gr SF	155,500	101,430	0	0	256,930
Condominiums	Units	0	0	350	0	350

Notes:

(1) Plan shown includes maximum estimated densities of project components.
(2) Units listed as Gr SF (Gross Square Feet) are approximate areas.
(3) Portable vendor-type operations at various locations along promenade.
(4) Estimated maximum number of rooms.



THE WATERFRONT AT ALOHA TOWER

Fig. 2
ROOF PLAN

ALOHA TOWER DEVELOPMENT CORPORATION

ALOHA TOWER ASSOCIATES

Table 2
LIST OF INTERSECTIONS AND DAY OF WEEK ANALYZED
ALOHA TOWER TRAFFIC STUDY
June 1990

NO	EAST-WEST STREET	NORTH-SOUTH STREET	FRIDAY WEEKDAY	SATURDAY
1	VINEYARD BL	NUUANU AV	X	X
2	VINEYARD BL	PALI HWY	X	X
3	VINEYARD BL	Q. EMMA ST	X	X
4	VINEYARD BL	PUNCHBOWL ST	X	
5	KUKUI ST	NUUANU AV	X	X
6	KUKUI ST	PALI HWY	X	
7	KUKUI ST	Q. EMMA ST	X	
8	BERETANIA ST	NUUANU AV	X	X
9	BERETANIA ST	PALI HWY	X	X
10	BERETANIA ST	Q. EMMA ST	X	X
11	BERETANIA ST	RICHARDS ST	X	
12	BERETANIA ST	PUNCHBOWL ST	X	
13	BERETANIA ST	ALAPAI ST	X	
14	HOTEL ST	NUUANU AV	X	
15	HOTEL ST	BISHOP ST	X	
16	HOTEL ST	ALAKEA ST	X	
17	HOTEL ST	RICHARDS ST	X	
18	KING ST	NUUANU AV	X	X
19	KING ST	BETHEL ST	X	
20	KING ST	BISHOP ST	X	X
21	KING ST	ALAKEA ST	X	
22	KING ST	RICHARDS ST	X	
23	KING ST	PUNCHBOWL ST	X	
24	KING ST	SOUTH ST	X	
25	QUEEN ST	BISHOP ST	X	X
26	QUEEN ST	ALAKEA ST	X	X
27	NIMITZ HWY	RIVER ST	X	
28	NIMITZ HWY	SMITH ST	X	
29	NIMITZ HWY	NUUANU AV/BETHEL ST	X	
30	NIMITZ HWY	FORT ST	X	X
31	NIMITZ HWY	BISHOP ST	X	X
32	NIMITZ HWY	ALAKEA ST	X	X
33	NIMITZ HWY	RICHARDS ST	X	X
34	ALA MOANA BL	PUNCHBOWL ST	X	
35	ALA MOANA BL	TRADE ZONE ENTR	X	
36	ALA MOANA BL	SOUTH ST	X	
37	HALEKAUWILA ST	PUNCHBOWL ST	X	

A substantial amount of traffic-related information was collected in order to analyze the existing traffic conditions and to estimate the future traffic volumes on the roadways adjacent to the study site. The data collected included the following:

- development plan data;
- roadway network;
- existing morning and afternoon peak hour traffic volumes;
- other planned developments in the area;
- traffic information for other planned projects; and
- previous traffic studies conducted for the adjacent area.

2. Analysis of Existing Traffic Conditions

Using the data collected, the existing traffic conditions in the vicinity of the project were determined. Traffic conditions can be described by the level-of-service (LOS) at each study intersection. Two methods were used in these analyses to determine the LOS.

The operational method described in the 1985 Highway Capacity Manual (HCM) was used to determine the level-of-service at the intersections. Since the results of this analysis were not consistent with actual conditions observed in the field during traffic counts, the level-of-service was recalculated using the Critical Movement Analysis (CMA) method. The results of the CMA method more closely represented actual observed conditions. A comparative analysis is presented for each scenario (i.e. existing and future conditions without and with the project)using these two methods. A more detailed explanation of both methods, the level-of-service concept and the results are presented in Chapter 2.

3. Determination of 1995 Cumulative Traffic Projections

As previously noted, 1995 was used as the design year. This does not necessarily represent the

project completion date. It represents occupancy for purposes of conducting the impact analysis.

Future cumulative traffic has two components. The first is background growth. The second is traffic generated by other planned projects in the vicinity and these volumes are referred to as "related project trips." Projects which would impact the study intersections were identified and discussed with the Department of Housing and Community Development. The total future traffic volumes without the project is the sum of existing plus background growth plus related project trips and are referred to as "cumulative trips."

The assumptions used to estimate the 1995 cumulative trips and the resulting traffic projections are presented in Chapter 3 of this report.

4. Analysis of Project-Related Traffic Impacts

The next step in the traffic analysis of the project was to estimate the daily and peak-hour (morning, afternoon and Saturday) traffic that would be generated by the proposed development. This was done using trip generation rates from Trip Generation (Fourth Edition, 1987), an informational report prepared by the Institute of Transportation Engineers (ITE), which is the standard reference for traffic impact studies.

These trips were distributed and assigned to the various traffic movements at the adjacent intersections. The project-related traffic was then superimposed on 1995 cumulative traffic volumes at the subject intersections. The HCM and CMA methods were then used again to conduct a level-of-service analysis for this condition which was compared to 1995 cumulative conditions in order to determine the impact of this project. The resulting traffic projections are presented in Chapter 4.

The analysis of the project-related impacts and the conclusions of the analyses are presented in Chapter 6.

5. Analysis of Project-Related Parking Needs

An analysis of the project's parking needs was conducted using the shared parking concept. This concept analyzes the interaction of the parking demand for the various land uses within the project and determines the actual peak parking demand of the project, not of the sum of the individual uses. Standard generation rates of parking demand determined by the Institute of Transportation Engineer and presented in the Parking Generation Manual were used in the analyses. The results of the parking analysis is presented in Chapter 5.

2.
ANALYSIS OF EXISTING CONDITIONS

This chapter presents and discusses the existing traffic conditions and volumes on the roadways in the vicinity of the proposed project, the level-of-service concept, and the results of the level-of-service analysis for existing conditions. The purpose of this analysis is to establish the base conditions for the determination of the project's impacts.

The intersections which were analyzed to establish the base conditions were selected based upon the access routes to and departure routes from the project. The intersections selected for analysis were discussed with HDOT and DTS to insure that the scope of the study was appropriate and would address the concerns of the respective agencies. It should be noted that the majority of the intersections under study are outside the immediate area of the proposed project (i.e. along Nimitz Boulevard). The Waterfront at Aloha Tower development will not be able to mitigate traffic problems outside this immediate area because of right-of-way restrictions and jurisdictional considerations. However, these additional intersections were analyzed to satisfy the requirements of the EIS process which mandates the identification of the project's significant impacts even at locations where the developer cannot implement improvements.

EXISTING ROADWAY NETWORK AND LANE CONFIGURATIONS

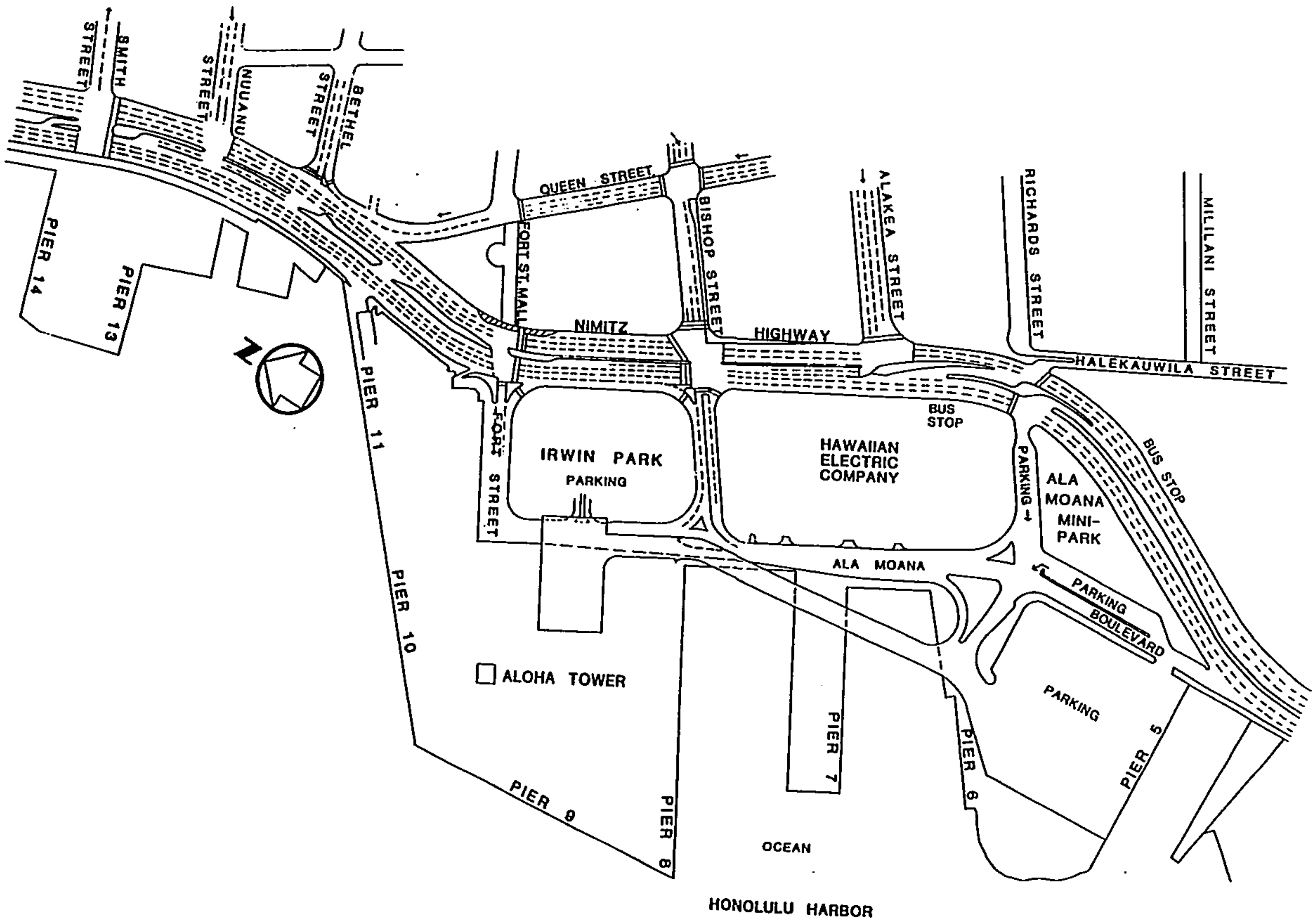
The existing roadway network and lane configurations at the intersections adjacent to the project site along Nimitz Highway are shown on Figure 3. Also shown are the locations of the crosswalks along Nimitz Highway which are again addressed in Chapter 6. Figure 4 shows the existing lane configurations at each of the study intersections.

EXISTING PEAK HOUR TRAFFIC VOLUMES

The existing morning and afternoon (AM and PM) peak hour traffic volumes at 19 intersections were obtained from field counts conducted during weekdays in February and March, 1989. Counts for the remaining intersections were obtained from the Pacific Nations Center Traffic Study completed in October 1988 and the traffic study for One Alii Place completed in July 1989. Counts were conducted at the intersection of Beretania Street at Bishop Street during 1988, 1989 and 1990 to determine growth factors to adjust counts previously conducted to 1990 Friday traffic volumes. Since no significant changes were noted, use of these counts, with the appropriate adjustments, was deemed valid for this study. The results of the traffic counts are summarized for the AM, PM and Saturday peak hours on Figures 5, 6 and 7, respectively.

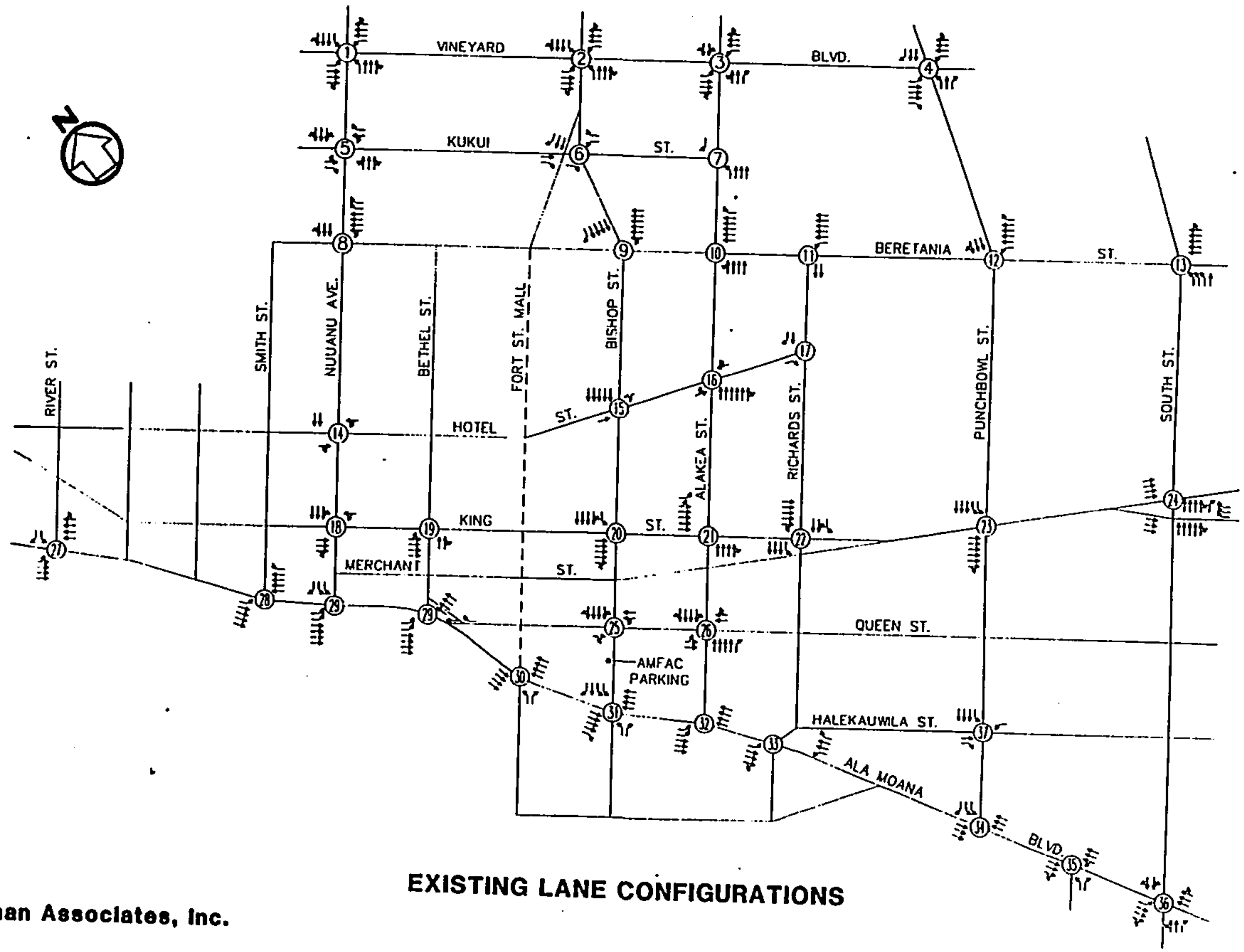
LEVEL-OF-SERVICE CONCEPT

The methodology described in the 1985 Highway Capacity Manual (HCM) and the Critical Movement Analysis (CMA) were used to analyze the operational efficiency of the intersections adjacent to the study site. These methods involve the calculation of a volume/capacity (V/C) ratio which is related to a level-of-service (LOS).



EXISTING ROADWAY NETWORK PIERS 5 TO 14

FIGURE 3



EXISTING LANE CONFIGURATIONS

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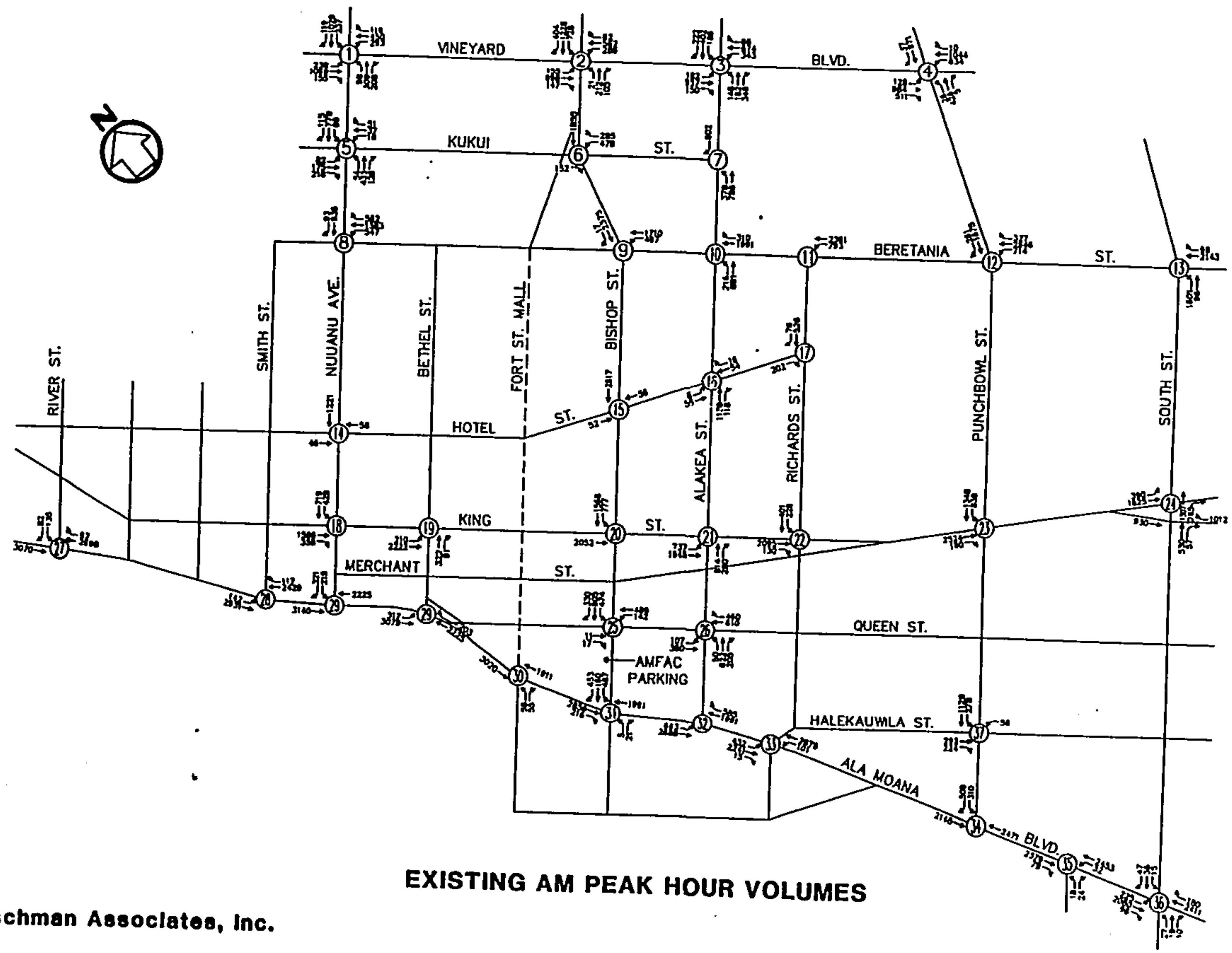
FIGURE 4



EXISTING AM PEAK HOUR VOLUMES

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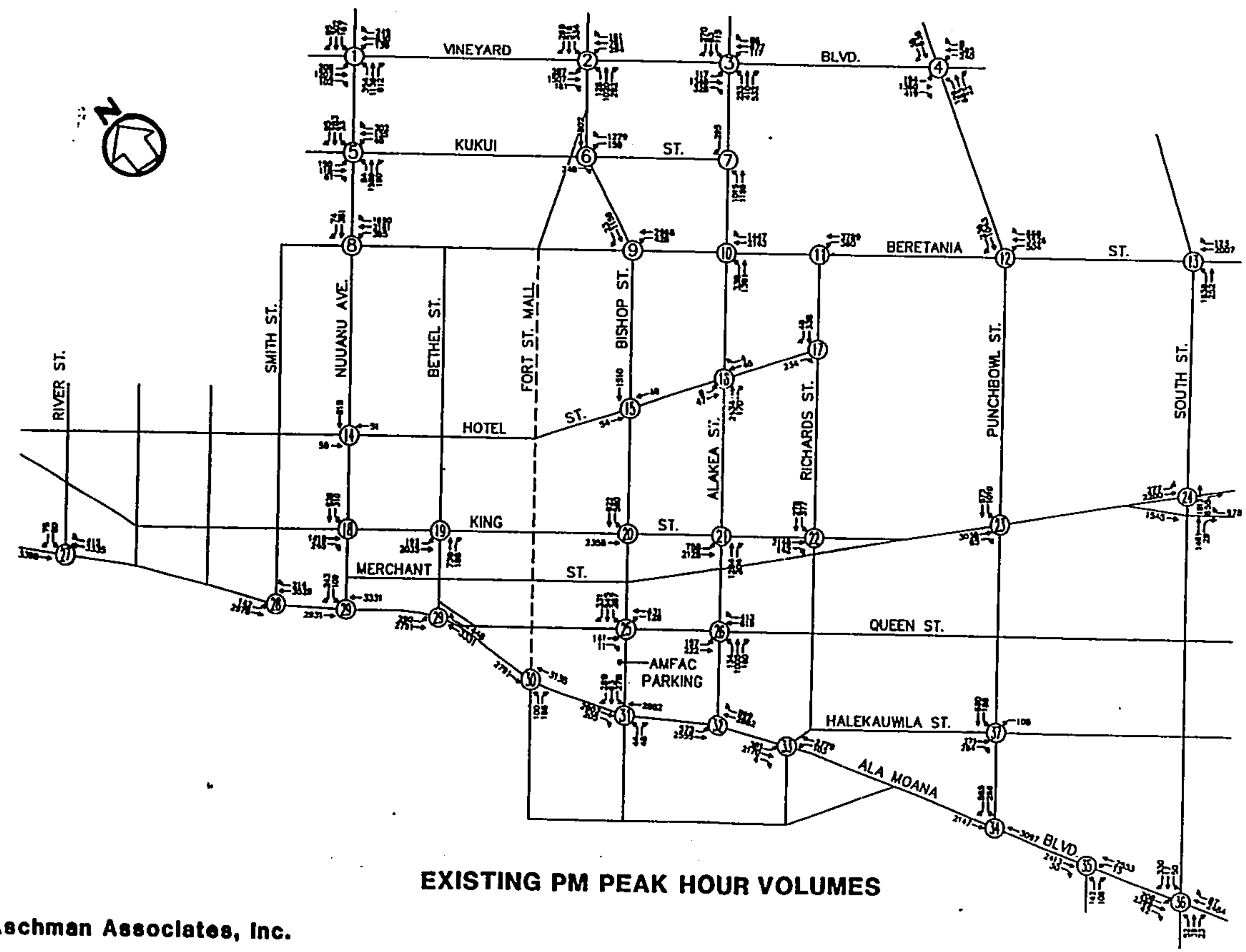
FIGURE 5



EXISTING PM PEAK HOUR VOLUMES

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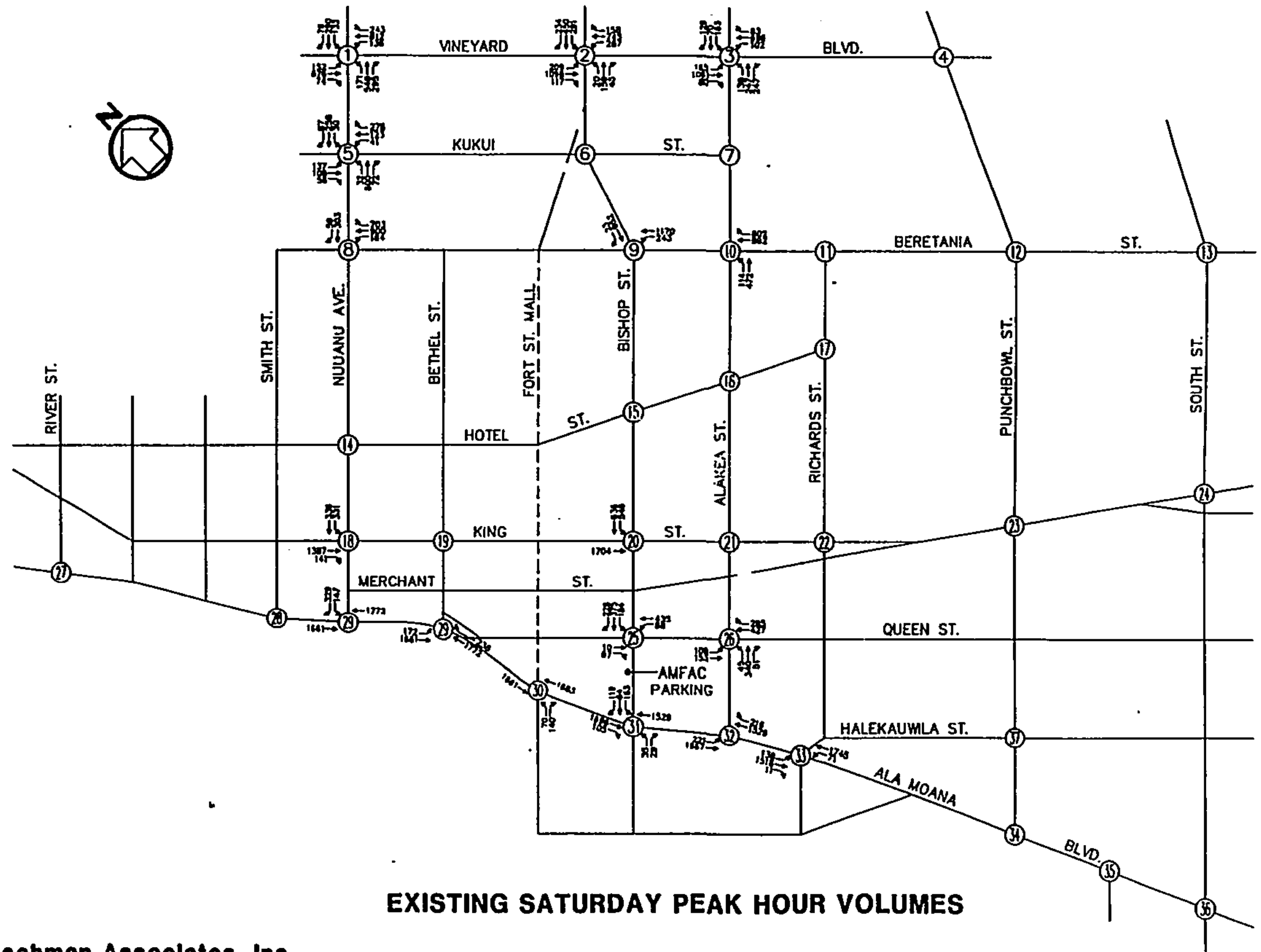
FIGURE 6



EXISTING SATURDAY PEAK HOUR VOLUMES

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FIGURE 7

"Level-of-Service" is a term which denotes any of an infinite number of combinations of traffic operating conditions that may occur on a given lane or roadway when it is subjected to various traffic volumes. Level-of-service is a qualitative measure of the effect of a number of factors which include speed, travel time, traffic interruptions, freedom to maneuver, safety, driving comfort, and convenience.

There are six (6) levels-of-service, A through F, which relate to the driving conditions from best to worst, respectively. The characteristics of traffic operations for these levels-of-service are summarized in Table 3. In general, Level-of-Service A represents free-flow conditions with no congestion. Level-of-Service F, on the other hand, represents severe congestion with stop-and-go conditions.

Corresponding to each level-of-service shown in the table is a range of volume/capacity ratios. The V/C ratio is the ratio of either existing or projected traffic volumes to the capacity of the intersection. "Capacity" is defined as the maximum number of vehicles that can be accommodated by the roadway during a specified period of time. The capacity of a particular roadway is dependent upon its physical characteristics such as the number of lanes, the operational characteristics of the roadway (one-way, two-way, turn prohibitions, bus stops, etc.), the type of traffic using the roadway (trucks, buses, etc.), and turning movements

EXISTING LEVEL-OF-SERVICE ANALYSIS

The results of the level-of-service analysis for existing traffic conditions at the study intersections are summarized in Tables 4 and 5. Shown in the table are the levels-of-service calculated using the operational method described in the HCM and the Critical Movement Analysis (CMA) method. The CMA method is described in the HCM as the Planning Method and it is recommended in "testing design alternatives for new intersections in areas of new development, where details of signalization and demand characteristics are not yet under consideration."

Table 3
INTERSECTION LEVEL-OF-SERVICE DEFINITIONS (1)
ALOHA TOWER TRAFFIC STUDY
June 1990

Level -of- Service	Interpretation	Volume to Capacity Ratio (2)	Delay Per Vehicle (Seconds)
A,B	Uncongested operations; all vehicles clear in a single cycle	0.000-0.700	<15.0
C	Light congestion; occasional backups on critical approaches	0.701-0.800	15.1 - 25.0
D	Congestion on critical approaches, but intersection functional. Vehicles required to wait through more than on cycle during short peaks. No long standing lines formed.	0.801-0.900	25.1 - 40.0
E	Severe congestion with some long-standing lines on critical approaches. Blockage on intersection may occur if traffic signal does not provide for protected turning movements.	0.901-1.000	40.1 - 60.0
F	Breakdown or forced flow operation. Volume of traffic exceeds capacity of intersection.	1.001+	>60

Notes:

(1) Source: Highway Capacity Manual, 1985
(2) Represents the ratio of calculated critical volume to Level-of-Service E capacity.

Table 4
EXISTING WEEKDAY LEVEL-OF-SERVICE AND INVENTORY
ALOHA TOWER TRAFFIC STUDY
June 1990

				AM Peak					PM Peak				
NO	E-W STREET		N-S STREET	HCM V/C	LOS	CMA V/C	LOS	Observed LOS	HCM V/C	LOS	CMA V/C	LOS	Observed LOS
1	VINEYARD BL	@	NUUANU AV	1.161	F	0.740	C	C	2.304	F	0.940	E	E
2	VINEYARD BL	@	PALI HWY	1.360	F	0.940	E	E	2.683	F	0.950	E	E
3	VINEYARD BL	@	QUEEN EMMA ST	1.129	F	0.950	E	E	1.680	F	0.940	E	E
4	VINEYARD BL	@	PUNCHBOWL ST	1.224	F	0.970	E	E	1.110	F	0.970	E	E
5	KUKUI ST	@	NUUANU AV	0.626	B	0.450	A	A	1.736	F	0.760	C	C
6	KUKUI ST	@	PALI HWY	0.767	C	0.650	B	A	0.309	A	0.260	A	A
7	KUKUI ST	@	QUEEN EMMA ST	0.272	A	0.250	A	A	0.757	C	0.700	B	C
8	BERETANIA ST	@	NUUANU AV	0.765	C	0.590	A	A	0.966	E	0.570	A	A
9	BERETANIA ST	@	PALI HWY	0.893	D	0.730	C	C	0.744	C	0.580	A	A
10	BERETANIA ST	@	QUEEN EMMA ST	0.609	B	0.450	A	A	2.019	F	0.960	E	E
11	BERETANIA ST	@	RICHARDS ST	0.712	C	0.530	A	A	0.683	B	0.510	A	A
12	BERETANIA ST	@	PUNCHBOWL ST	1.130	F	0.850	D	D	1.124	F	0.870	D	D
13	BERETANIA ST	@	ALAPAI ST	0.815	D	0.650	B	B	0.865	D	0.690	B	B
14	HOTEL ST	@	NUUANU AV	0.516	A	0.450	A	A	0.359	A	0.310	A	A
15	HOTEL ST	@	BISHOP ST	0.496	A	0.380	A	A	0.303	A	0.240	A	A
16	HOTEL ST	@	ALAKEA ST	0.262	A	0.190	A	A	0.443	A	0.330	A	A
17	HOTEL ST	@	RICHARDS ST	0.711	C	0.550	A	A	0.525	A	0.380	A	A
18	KING ST	@	NUUANU AV	0.822	D	0.710	C	C	0.655	B	0.570	A	A
19	KING ST	@	BETHEL ST	0.705	C	0.540	A	A	0.871	D	0.680	B	B
20	KING ST	@	BISHOP ST	0.777	C	0.790	C	C	0.700	B	0.710	C	C
21	KING ST	@	ALAKEA ST	0.646	B	0.680	B	B	0.754	C	0.750	C	C
22	KING ST	@	RICHARDS ST	0.564	A	0.470	A	A	0.578	A	0.560	A	A
23	KING ST	@	PUNCHBOWL ST	0.748	C	0.610	B	B	0.872	D	0.720	C	C
24	KING ST	@	ALAPAI ST	0.620	B	0.490	A	A	0.848	D	0.670	B	B
	KAPIOLANI ST	@	SOUTH ST	0.452	A	0.310	A	A	0.684	B	0.540	A	A
25	QUEEN ST	@	BISHOP ST	0.614	B	0.530	A	A	0.584	A	0.470	A	A
26	QUEEN ST	@	ALAKEA ST	0.736	C	0.580	A	A	1.008	F	0.700	B	C
27	NIMITZ HWY	@	RIVER ST	0.885	D	0.600	A	A	0.961	E	0.680	B	B
28	NIMITZ HWY	@	SMITH ST	0.615	B	0.520	A	A	0.839	D	0.720	C	C
29	NIMITZ HWY	@	NUUANU AV	0.793	C	0.630	B	B	0.749	C	0.640	B	B
	NIMITZ HWY	@	BETHEL ST	0.657	B	0.550	A	A	0.937	E	0.780	C	C
30	NIMITZ HWY	@	FORT ST	0.648	B	0.540	A	A	0.819	D	0.660	B	B
31	NIMITZ HWY	@	BISHOP ST	0.991	E	0.780	C	C	1.019	F	0.850	D	D
32	NIMITZ HWY	@	ALAKEA ST	0.826	D	0.720	C	C	1.025	F	0.900	D	D
33	NIMITZ HWY	@	RICHARDS ST	1.109	F	0.600	A	A	1.045	F	0.580	A	A
34	ALA MOANA BL	@	PUNCHBOWL ST	1.075	F	0.830	D	D	1.291	F	0.940	E	E
35	ALA MOANA BL	@	TRADE ZONE ENTR	0.959	E	0.600	A	B	1.191	F	0.750	C	C
36	ALA MOANA BL	@	SOUTH ST	0.956	E	0.780	C	C	1.071	F	0.960	E	E
37	HALEKAUWILA ST	@	PUNCHBOWL ST	0.548	A	0.480	A	A	0.524	A	0.470	A	A

Notes:
HCM = Operations Method described in the Highway Capacity Manual.
CMA = Planning Method described in the Highway Capacity Manual.
V/C = Volume-to-Capacity Ratio
LOS = Level-of-Service

Table 5
EXISTING SATURDAY LEVEL-OF-SERVICE AND INVENTORY
ALOHA TOWER TRAFFIC STUDY
June 1990

NO	E-W STREET		N-S STREET	Saturday HCM V/C	LOS	CMA V/C	LOS	Obsvd LOS
1	VINEYARD BL	@	NUUANU AV	0.734	C	0.650	B	B
2	VINEYARD BL	@	PALI HWY	0.832	D	0.740	C	B
3	VINEYARD BL	@	QUEEN EMMA ST	0.722	C	0.620	B	B
4	VINEYARD BL	@	PUNCHBOWL ST					
5	KUKUI ST	@	NUUANU AV	1.452	F	0.460	A	A
6	KUKUI ST	@	PALI HWY					
7	KUKUI ST	@	QUEEN EMMA ST					
8	BERETANIA ST	@	NUUANU AV	0.406	A	0.260	A	A
9	BERETANIA ST	@	PALI HWY	0.397	A	0.320	A	A
10	BERETANIA ST	@	QUEEN EMMA ST	0.747	C	0.380	A	A
11	BERETANIA ST	@	RICHARDS ST					
12	BERETANIA ST	@	PUNCHBOWL ST					
13	BERETANIA ST	@	ALAPAI ST					
14	HOTEL ST	@	NUUANU AV					
15	HOTEL ST	@	BISHOP ST					
16	HOTEL ST	@	ALAKEA ST					
17	HOTEL ST	@	RICHARDS ST					
18	KING ST	@	NUUANU AV	0.639	B	0.560	A	A
19	KING ST	@	BETHEL ST					
20	KING ST	@	BISHOP ST	0.541	A	0.590	A	A
21	KING ST	@	ALAKEA ST					
22	KING ST	@	RICHARDS ST					
23	KING ST	@	PUNCHBOWL ST					
24	KING ST	@	SOUTH ST					
	KING ST	@	SOUTH ST					
25	QUEEN ST	@	BISHOP ST	0.386	A	0.330	A	A
26	QUEEN ST	@	ALAKEA ST	0.381	A	0.390	A	A
27	NIMITZ HWY	@	RIVER ST					
28	NIMITZ HWY	@	SMITH ST					
29	NIMITZ HWY	@	NUUANU AV	0.526	A	0.460	A	A
	NIMITZ HWY	@	BETHEL ST	0.508	A	0.420	A	A
30	NIMITZ HWY	@	FORT ST	0.461	A	0.370	A	A
31	NIMITZ HWY	@	BISHOP ST	0.519	A	0.440	A	A
32	NIMITZ HWY	@	ALAKEA ST	0.509	A	0.440	A	A
33	NIMITZ HWY	@	RICHARDS ST	0.654	B	0.510	A	A
34	ALA MOANA BL	@	PUNCHBOWL ST					
35	ALA MOANA BL	@	TRADE ZONE ENTR					
36	ALA MOANA BL	@	SOUTH ST					
37	HALEKAUWILA S	@	PUNCHBOWL ST					

Notes:
V/C = Volume-to-Capacity Ratio
Obsvd = Observed in the field.
HCM = Operations Method described in the HCM Manual.
CMA = Planning Method described in the HCM Manual.

Because the results of the CMA method more closely represented actual conditions observed in the field, the results obtained from this method appear more realistic when examining existing, cumulative and cumulative plus project conditions; the latter two of which are described in subsequent chapters. With the CMA method, it is possible to adjust the maximum lane capacities to represent conditions observed at the time of the traffic counts. This is not possible with the HCS method. The use of the CMA methodology has been used on previous state projects including the Castle Junction and Airport area traffic studies.

The LOS results indicate that congestion occurs along Vineyard Boulevard, along Nimitz Highway and at the intersection of Beretania Street and Queen Emma Street based on the levels-of-service (LOS E) calculated by the CMA method. The HCM method results in a V/C ratio of greater than 1.0 which is not consistent with the definition of capacity.

3.

1995 CUMULATIVE TRAFFIC CONDITIONS

Cumulative traffic conditions are defined as those conditions resulting from background growth and traffic generated by related projects in the vicinity. Cumulative traffic conditions are the basis upon which the project's traffic-related impacts are determined. The purpose of this chapter is to discuss the assumptions and data used to estimate 1995 cumulative traffic conditions.

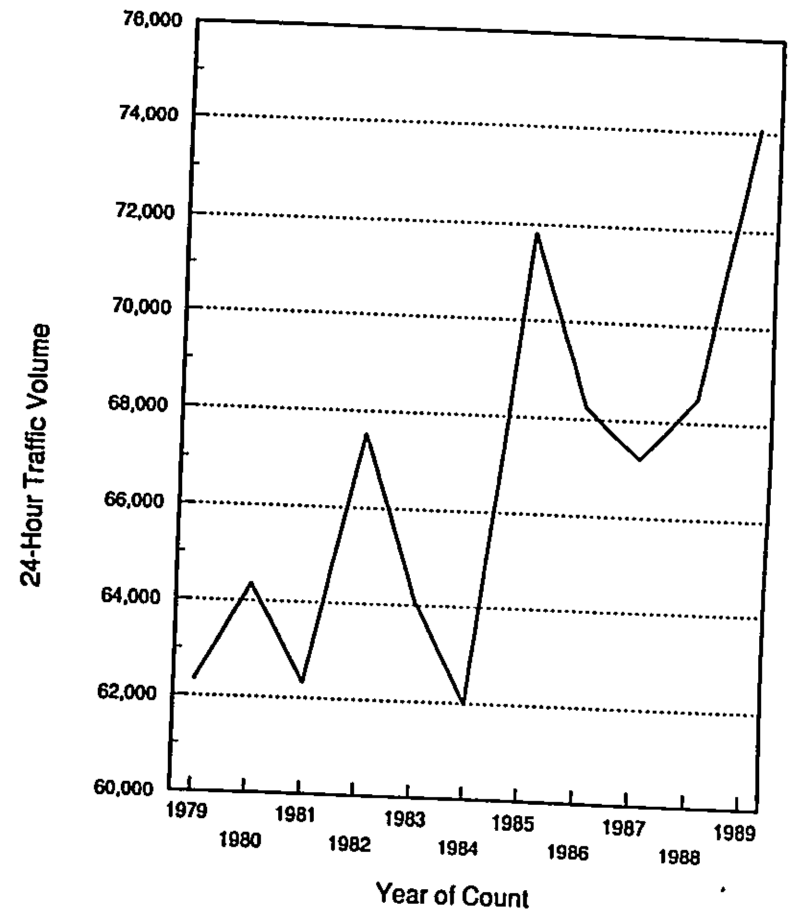
BACKGROUND TRAFFIC GROWTH RATE

In order to estimate the future traffic conditions, the first step is to apply an annual growth rate to the existing traffic volumes. To determine the background growth rate of traffic in the study area, historical traffic counts from 1979 through 1989 were obtained from HDOT. A summary of these counts is presented in Table 6 and shown graphically in Figure 8. A linear regression

Table 6
HISTORICAL TRAFFIC GROWTH ALONG NIMITZ
ALOHA TOWER TRAFFIC STUDY
June 1990

Year	24-Hour Traffic Volume	Percent Growth
1979	62,331	N/A
1980	64,342	3.23 %
1981	62,319	-3.14 %
1982	67,558	8.41 %
1983	64,106	-5.11 %
1984	61,976	-3.32 %
1985	71,827	15.89 %
1986	68,238	-5.00 %
1987	67,226	-1.48 %
1988	68,481	1.87 %
1989	74,082	8.18 %

Source: HDOT 24-Hour Traffic Count Summary



Historical Traffic Counts Along Nimitz Highway

Barton-Aschman Associates, Inc.

FIGURE 8

analysis of the historical counts concluded that the historical background growth along Nimitz Highway has been 1.48 per cent per year over the past ten years.

This is consistent with information provided by the City of Honolulu DTS indicating that the growth rate has been between one and two per cent per year. Therefore, a background growth rate of 1.48 per cent per year was used for this study.

RELATED PROJECTS

The second component in estimating cumulative traffic conditions is the traffic generated by other proposed projects in the vicinity. Related projects are defined as those projects that are under construction or have been approved for construction by the City and would significantly impact traffic in the study area. Some projects may have been completed since the traffic counts were conducted but are included in this analysis as the project traffic was not part of the counts.

Based upon the information obtained from the City Department of Housing and Community Development and information from other traffic studies conducted for projects in the vicinity, 16 projects were identified that were either under construction or in the final planning stages and would have a potential impact on the intersections under study. These projects are listed in Table 7 and their locations are shown on Figure 9.

1995 CUMULATIVE TRAFFIC VOLUMES

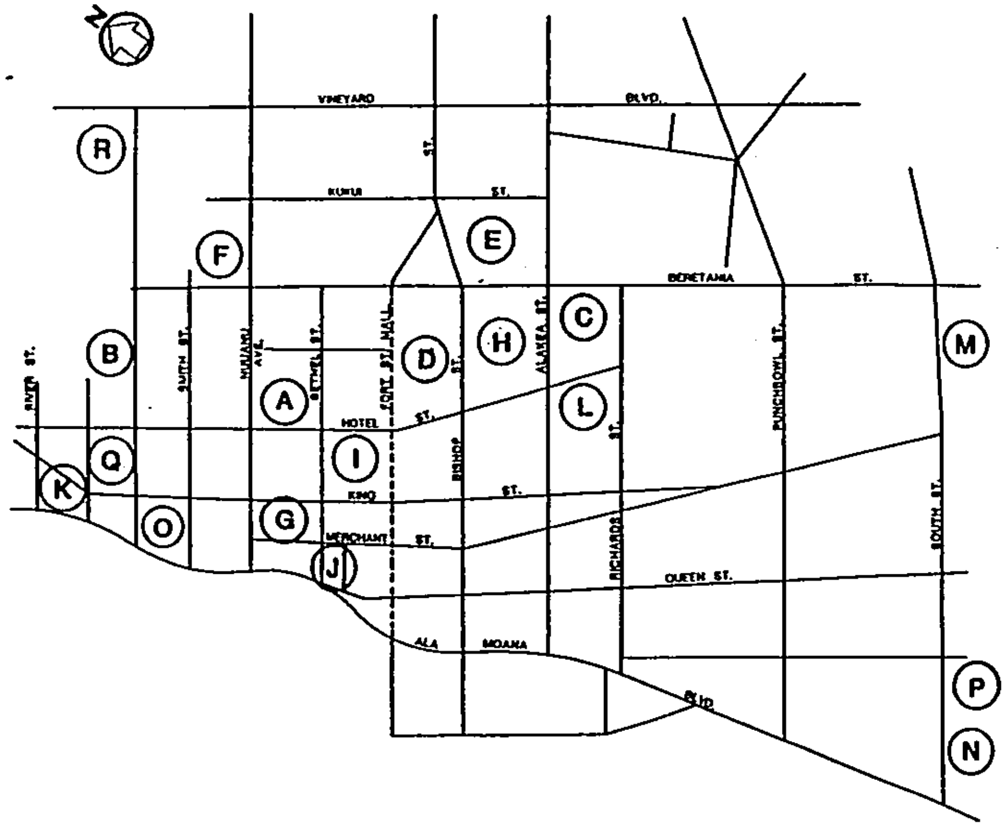
Cumulative traffic volumes are defined as the total of existing plus background growth plus related project traffic. These traffic volumes are obtained by superimposing background growth and related traffic volumes onto existing traffic volumes.

Table 7
LISTING OF RELATED PROJECTS
ALOHA TOWER TRAFFIC STUDY
June 1990

Map Location	Project Name	Status (1)
A	Chinatown Gateway Plaza	UC
B	Maunakea Marketplace	UC
C	State Office Tower	UC
D	Pan Pacific Plaza	UC
E	Pacific Nations Center	PL
F	Honolulu Park Place	UC
G	Hawaii National Bank	UC
H	Hotel St/Alakea St Office Bldg	PL
I	Campbell Estate Office	PL
J	Harbor Court	PL
K	River St/Nimitz Hwy Apts	UC
L	One Alii Place	UC
M	HPD HQ & Transportation Center	UC
N	Waterfront Towers & Plaza	UC
O	Maunakea/Smith Parking Lot Dev.	PL
P	Waterpark Towers	UC
Q	Kekaulike Parking Lot	PL
R	Foster Gardens Estate	PL

Note:

(1) Status at time of traffic counts (March 1990) where:
UC = Under Construction
PL = Planned



LOCATIONS OF RELATED PROJECTS

FIGURE 9

Cumulative traffic volumes are estimates of the total traffic that results from background growth and related projects and are used as the basis for estimating the impacts of the proposed project under study; therefore, they should not be considered as traffic projections for the design year.

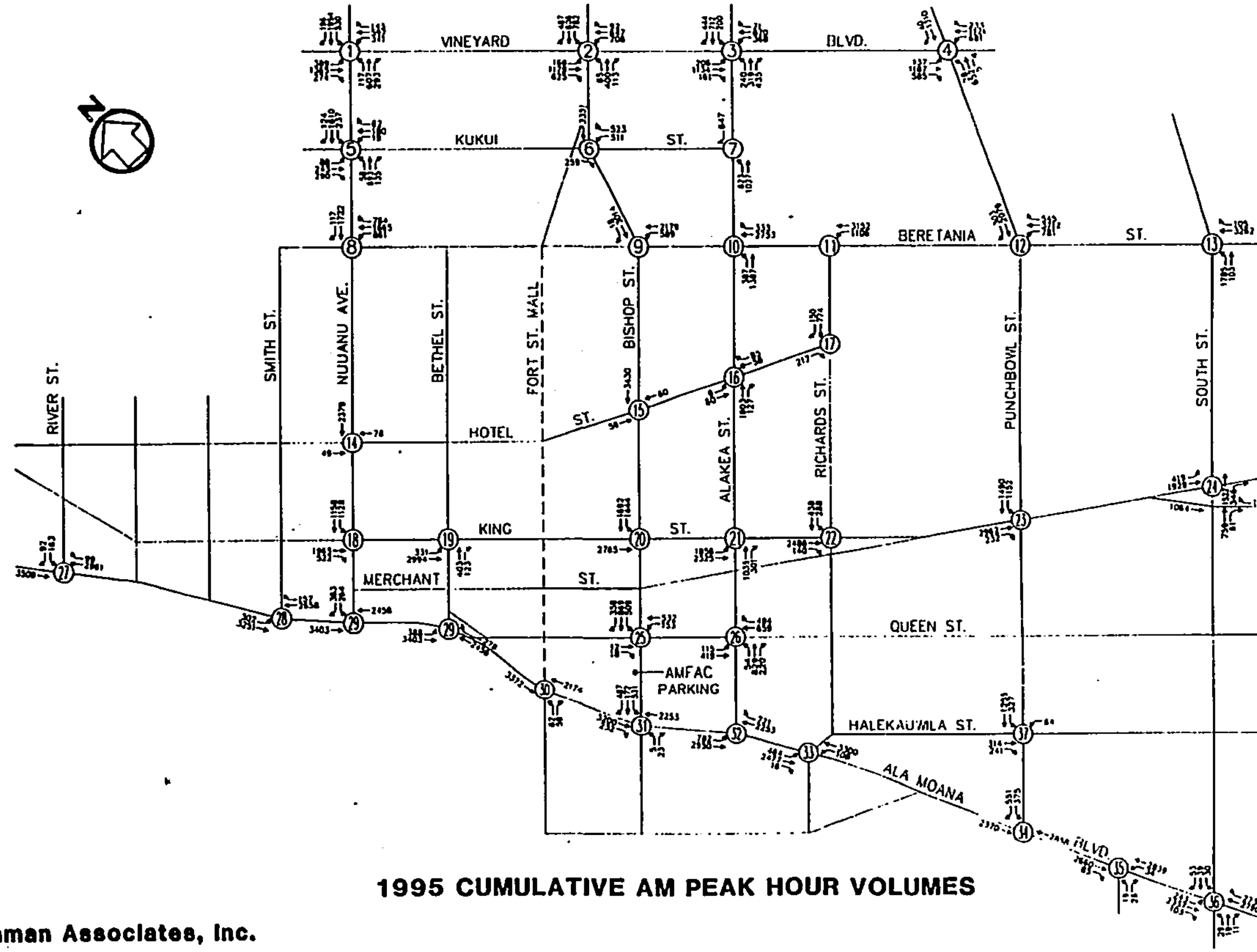
The peak hour trips generated by the related projects were estimated using trip generation rates and/or equations presented in Trip Generation, 4th Edition. This is the standard reference for trip generation analyses. A summary of the trip generation analysis for the related projects is presented as Table 8.

A 20% discount was applied to the trip estimates for the related projects to account for interaction between mixed uses, public transportation, car-pools and other travel demand management schemes. For primarily residential developments, a 60% discount was applied to trip estimates because of their close proximity to the downtown area, which would reduce the peak hour work-related trips. Points of access and egress were assumed at the most logical locations since site plans were not available for all of the projects.

The AM peak hour, PM peak hour and Saturday peak hour cumulative traffic volumes are presented on Figures 10, 11, and 12, respectively. The level-of-service analysis is presented in the final chapter of this report along with the cumulative plus project conditions for comparison.

Table 8
ANALYSIS FOR RELATED PROJECTS TRIP GENERATION
ALOHA TOWER TRAFFIC STUDY
June 1990

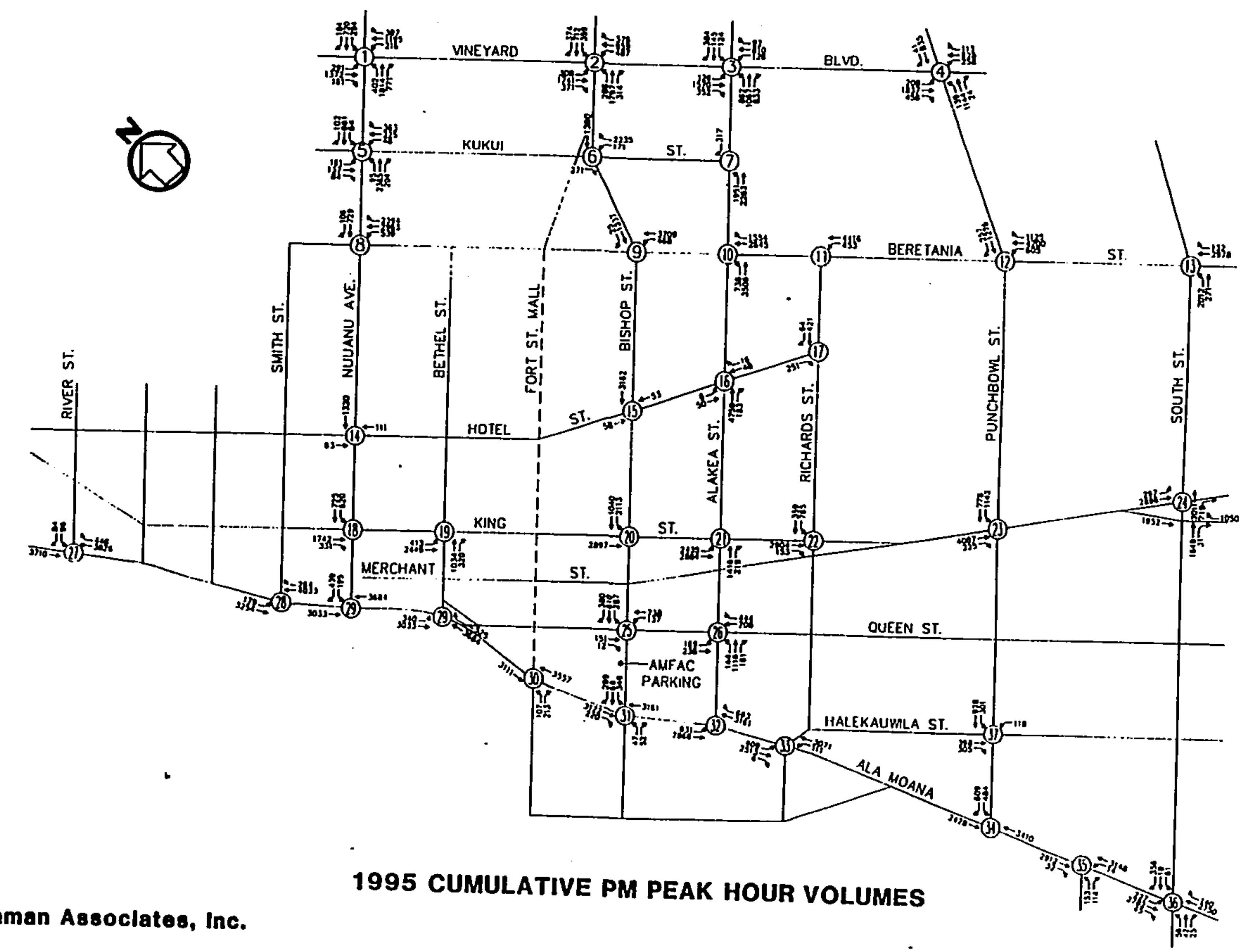
		WEEKDAY TRIPS					SATURDAY		
	RELATED PROJECT	DAILY TOTAL	AM IN	AM OUT	PM IN	PM OUT	DAILY TOTAL	PEAK IN	PEAK OUT
A	CHINATOWN GATEWAY	3,118	56	57	133	204	3,962	198	182
B	MAUNAKEA MARKETPLACE	1,462	26	11	73	75	1,892	97	93
C	STATE OFFICE TOWER	6,434	454	86	162	852	0	0	0
D	PAN PACIFIC PLAZA	3,642	552	82	95	498	722	239	204
E	PACIFIC NATIONS	17,510	1,373	421	626	1,489	0	0	0
F	HONOLULU PARK PLACE	1,462	22	97	82	50	1,505	53	70
G	HAWAII NAT'L BANK	1,413	186	28	34	174	231	24	20
H	HOTEL-ALAKEA OFFICE BLDG	1,670	226	34	40	210	283	32	27
I	CAMPBELL ESTATE OFFICE	2,247	318	47	56	292	404	57	49
J	HARBOR COURT	3,390	509	76	88	461	662	177	150
K	RIVER-NIMITZ APTS	378	7	22	19	13	358	17	12
L	ONE ALII PLACE	2,623	378	57	66	346	608	102	86
M	HPD HQ & TRANSP CENTER	5,100	720	140	164	636	0	84	64
N	WATERFRONT TOWERS/PLAZA	1,038	16	69	58	35	1,084	38	50
O	MAUNAKEA/SMITH	1,100	21	63	56	38	1,306	60	45
P	WATERPARK TOWERS	1,322	21	87	74	45	1,360	48	63
Q	KEKAULIKE PARKING	552	9	36	31	19	568	20	26
R	FOSTER GARDENS ESTATE	6,693	104	443	372	228	6,888	242	320



1995 CUMULATIVE AM PEAK HOUR VOLUMES

Barton-Aschman Associates, Inc.

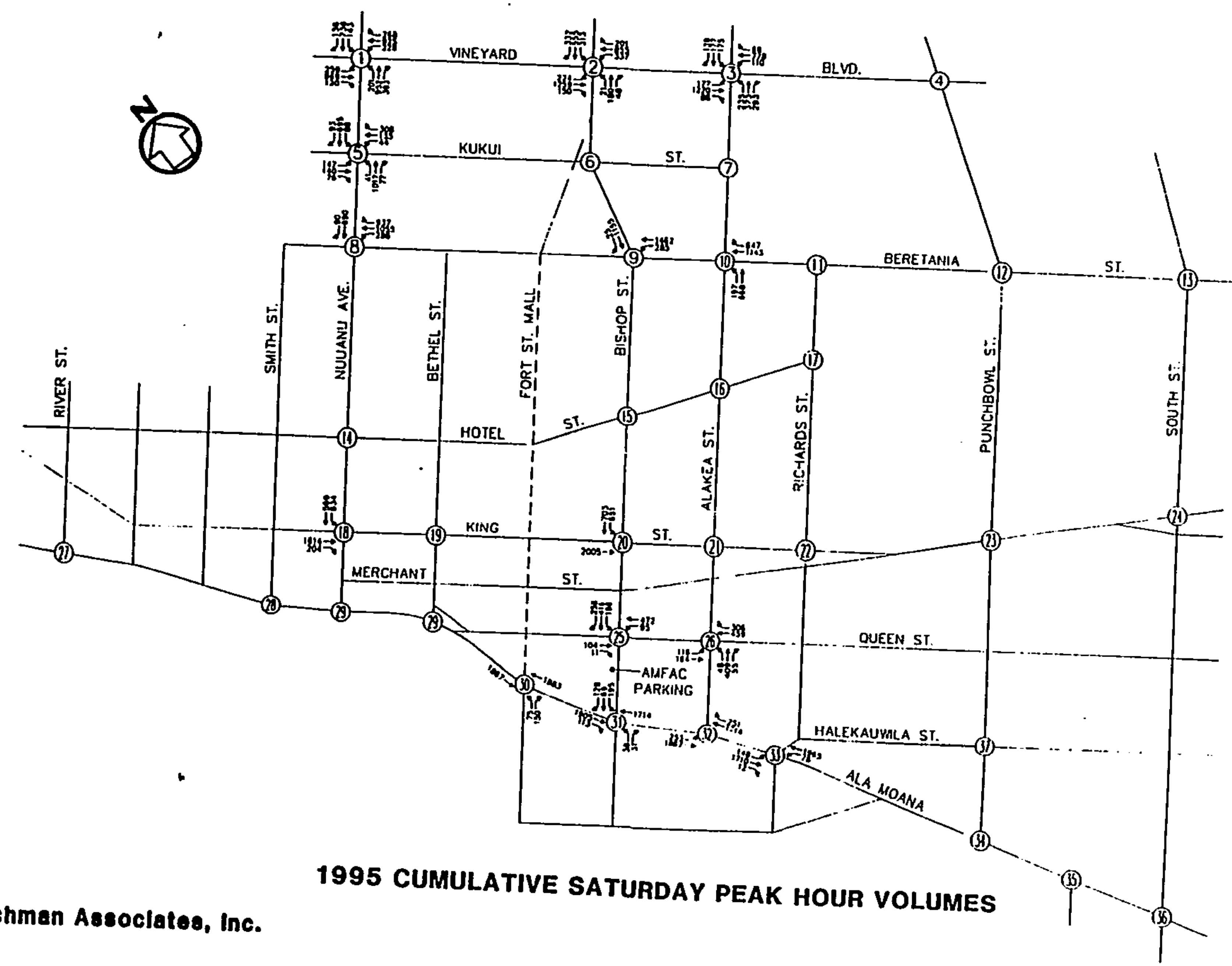
FIGURE 10



1995 CUMULATIVE PM PEAK HOUR VOLUMES

Barton-Aschman Associates, Inc.

FIGURE 11



1995 CUMULATIVE SATURDAY PEAK HOUR VOLUMES

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FIGURE 12

4. PROJECT-RELATED TRAFFIC CONDITIONS

This chapter discusses the methodology used to identify the traffic-related impacts of the proposed project. Generally, the process involves the determination of weekday and peak-hour trips that would be generated by the proposed project, distribution and assignment of these trips on the approach and departure routes, and finally, determination of the levels-of-service at affected intersections subsequent to implementation of the project.

TRIP GENERATION

Future traffic volumes for the proposed project were determined using trip generation equations contained in Trip Generation (Fourth Edition, 1987), an informational report prepared by the ITE. The generation analysis and the resulting daily and peak hour volumes are summarized in Table 9.

Table 9
TRIP GENERATION ANALYSIS FOR PROJECT
ALOHA TOWER TRAFFIC STUDY
June 1990

		Weekday Traffic Volumes							Weekend Traffic Volumes			
			AM Peak Hour			PM Peak Hour				Peak Hour		
Location	Land Use	Daily Total	Total	In	Out	Total	In	Out	Daily Total	Total	In	Out
Piers 5 & 6	Office	3266	542	472	70	514	82	432	605	186	100	86
	HDOT Office	2948	248	108	140	465	74	391	295	25	11	14
	Retail	2736	69	48	21	280	137	143	3546	355	181	174
	Maritime	343	35	28	7	35	7	28	410	82	50	32
	Subtotal	9293	894	656	238	1294	300	994	4856	648	342	306
	Adjustments	2959	265	193	71	406	102	304	1688	205	106	100
	Total	6334	629	463	167	888	198	690	3168	443	236	206
Piers 8 - 11	Office	5777	1042	907	135	966	155	811	1200	360	194	166
	Retail	13435	311	218	93	1054	495	559	17521	1669	851	818
	Cinema	2334	6	5	1	184	138	46	3337	591	296	295
	Hotel	2180	174	103	71	185	111	74	2180	185	111	74
	Maritime	686	70	56	14	70	14	56	820	164	100	64
	Subtotal	24412	1603	1289	314	2459	913	1546	25058	2969	1552	1417
	Adjustments	8243	474	381	92	804	308	496	8806	990	510	480
	Total	16169	1129	908	222	1655	605	1050	16252	1979	1042	937
Piers 12 & 14	Condos	1464	120	23	97	131	81	50	1507	123	53	70
Project Total		23967	1878	1394	486	2674	884	1790	20927	2545	1331	1213

The total number of trips generated by the project was discounted to account for the trip interaction between the multiple uses, public transportation, car-pool, vanpools, etc. The office trips were discounted 30% to account for transit usage and ride sharing.

Discount is based on data provided in the 1980 travel census for Honolulu [1]. The 1980 travel census determined that approximately 11.6% of Oahu employees rode transit and roughly 22 percent participated in carpools. Dividing the carpools by two persons per auto, the total discount would be 22.6%. The remainder of the discount (7.8%) is well below the 10% typical allowed for mixed use development.

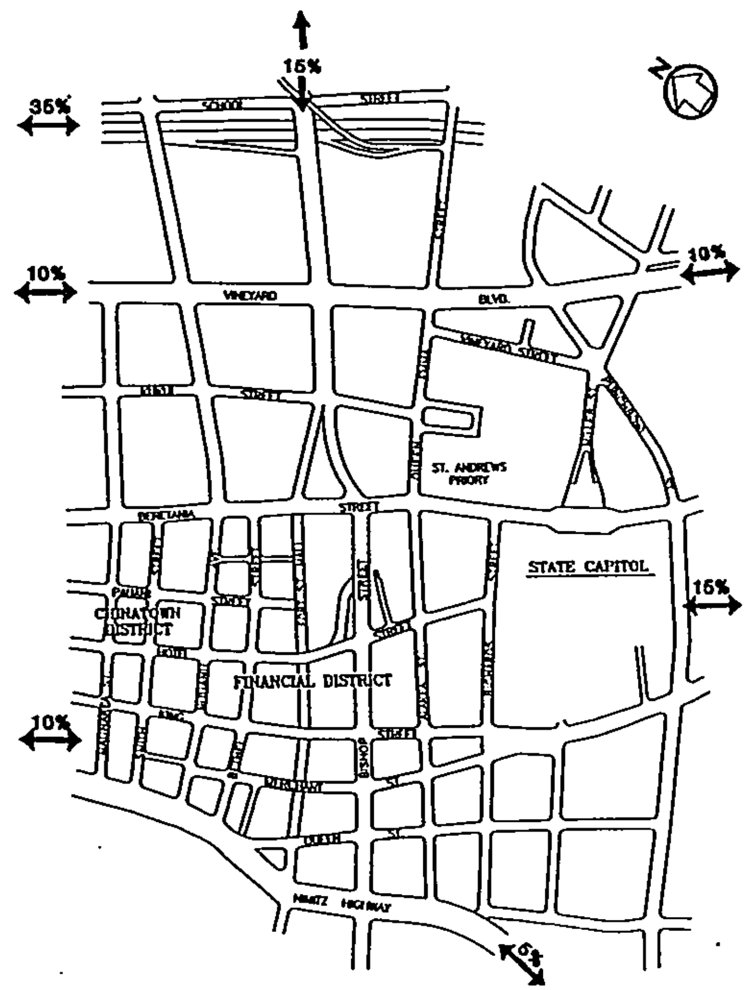
Retail trips were discounted 40% with the assumption that 40% of the trips would be from other uses in the development. This discount has been established by experienced operators of a festival marketplace in Baltimore. The cinema trips were also discounted 10% and the hotel trips were discounted 50%.

Weekend (Saturday or Sunday) trip generation data was not provided in the Trip Generation Manual for all categories of land uses. Therefore, to estimate the Saturday trips, it was assumed that (1) for the HDOT offices, Saturday traffic would equal 10% of the weekday daily and PM peak hour traffic, (2) for the hotel, the Saturday daily and peak hour trips would equal the weekday PM peak, and (3) Saturday trips for the maritime facilities were extrapolated from traffic counts conducted for the current Saturday maritime operations.

TRIP DISTRIBUTION

The project-related trips were distributed based on the future distribution of population as shown in the HALI 2010 socio-economic data and the anticipated approach routes to the project site. This information was obtained from previously conducted traffic studies in the area, which have been accepted by the reviewing agency. The approach distribution is shown on Figure 13.

[1] U.S. Department of Transportation, Federal Highway Administration, Transportation Planning Data for Urbanized Areas, January 1985



PROJECT TRIP DISTRIBUTION

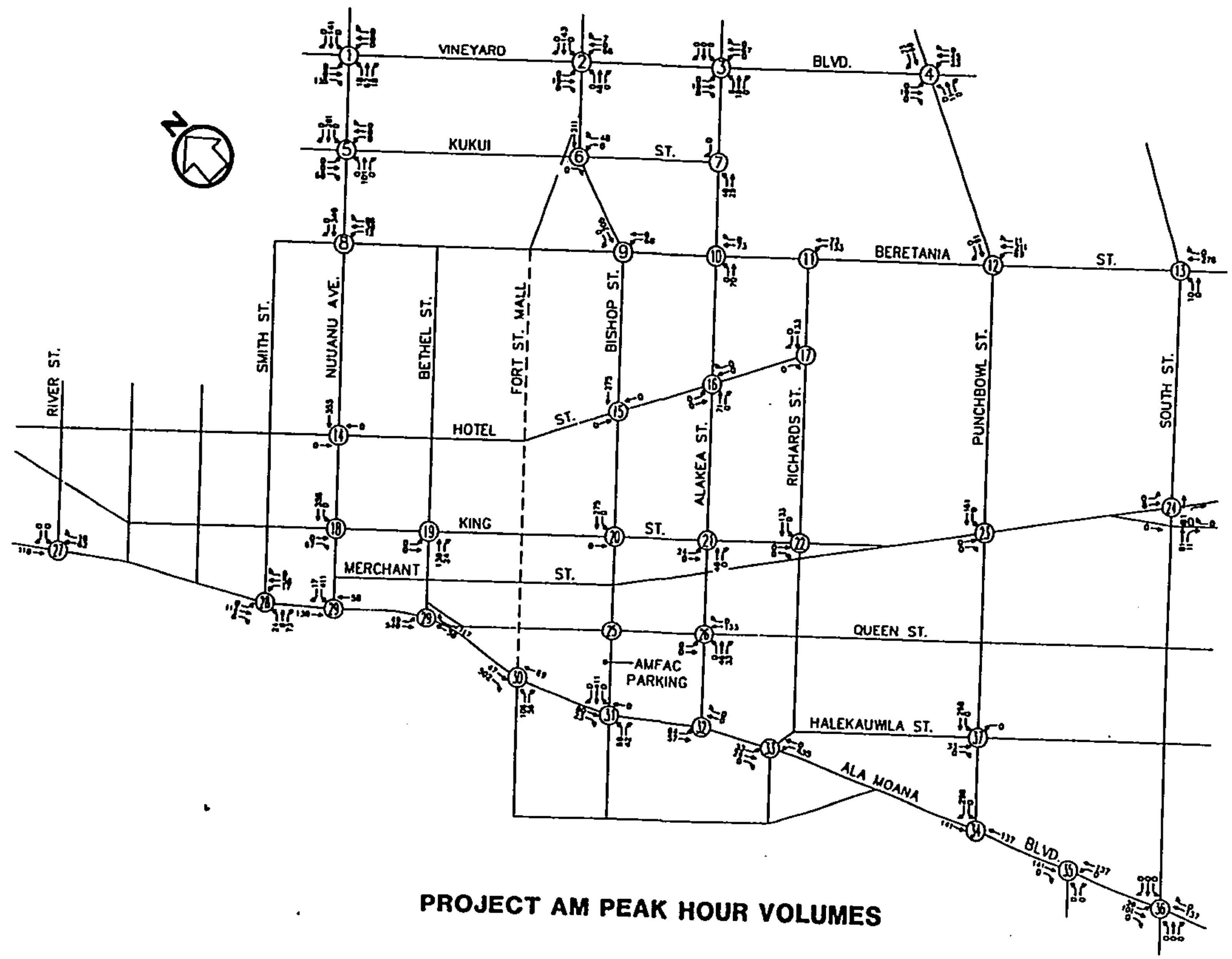
FIGURE 13

TRIP ASSIGNMENT

Using the trip generation and trip distribution previously discussed, project-related traffic was assigned to the various traffic movements at the intersections studied. The trip assignments for the AM and PM peak hours are shown on Figures 14 and 15 for weekday conditions. Saturday peak hour assignments are presented on Figure 16.

1995 CUMULATIVE PLUS PROJECT PEAK HOUR TRAFFIC VOLUMES

Future traffic volumes with the project were determined by superimposing the project-generated traffic on the 1995 cumulative traffic volumes presented in Chapter 3. The resulting traffic volumes are shown for the AM and PM peak hours on Figures 17 and 18, respectively. Saturday peak hour cumulative traffic projections are shown on Figure 19.



PROJECT AM PEAK HOUR VOLUMES

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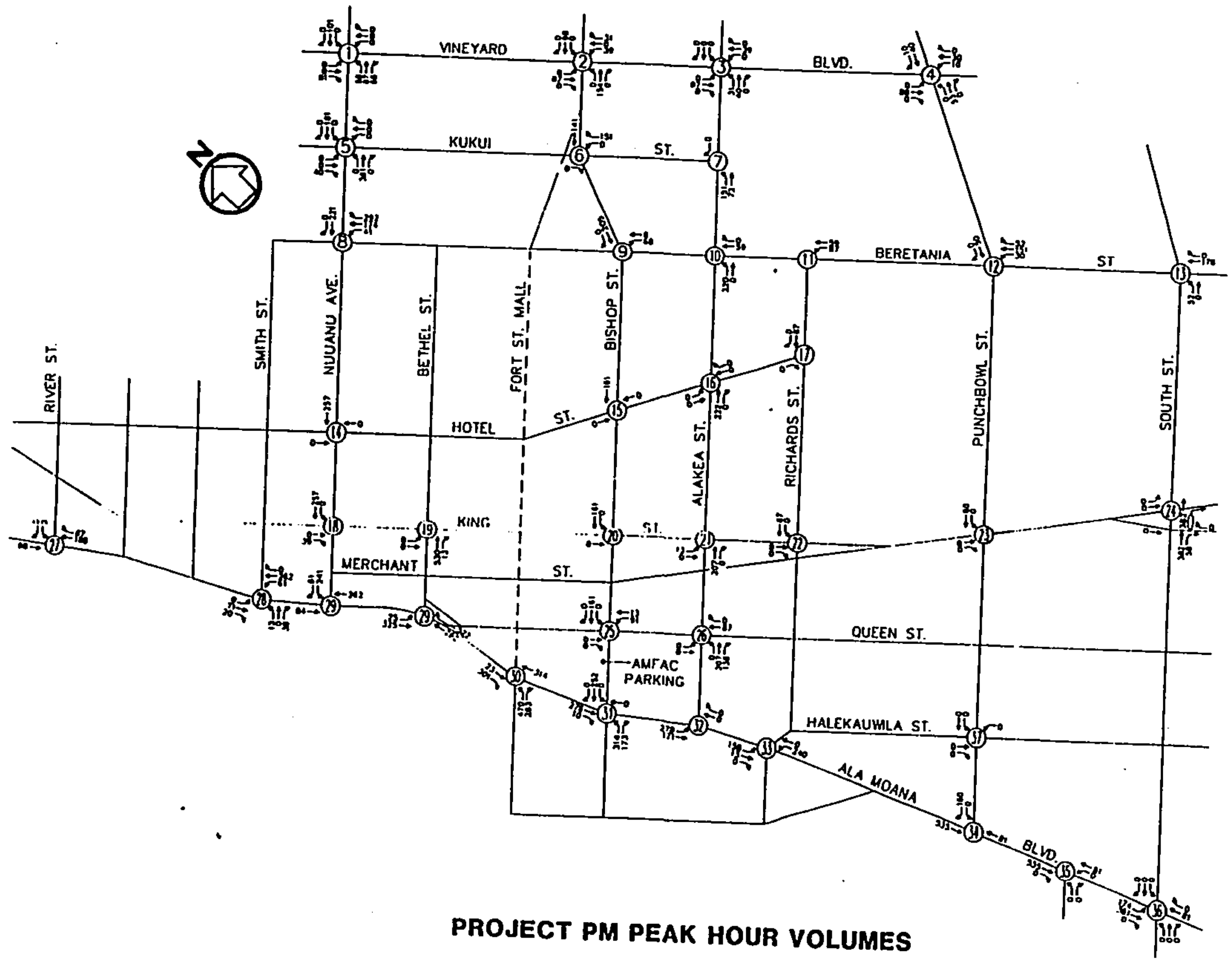
FIGURE 14



PROJECT PM PEAK HOUR VOLUMES

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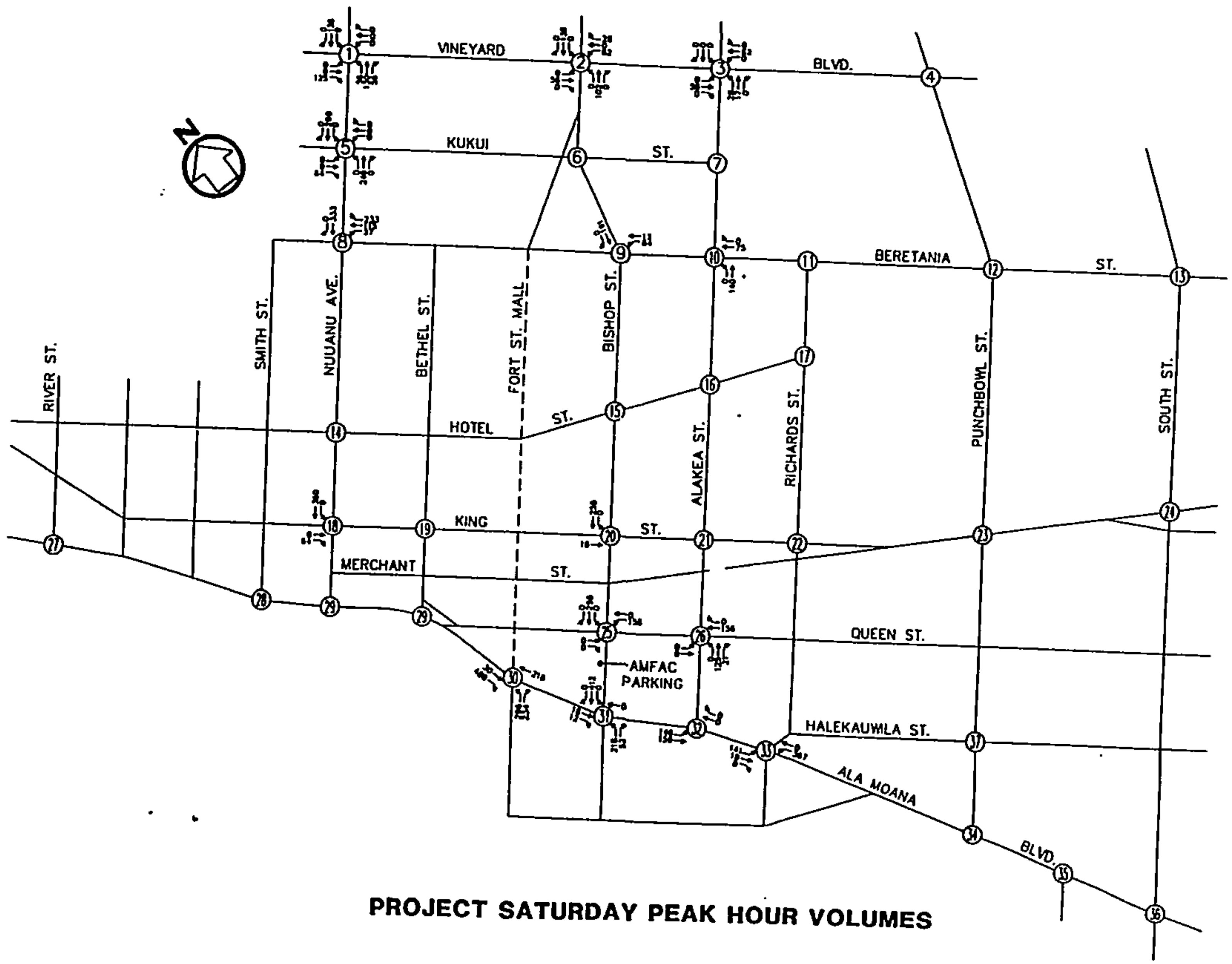
FIGURE 15



PROJECT SATURDAY PEAK HOUR VOLUMES

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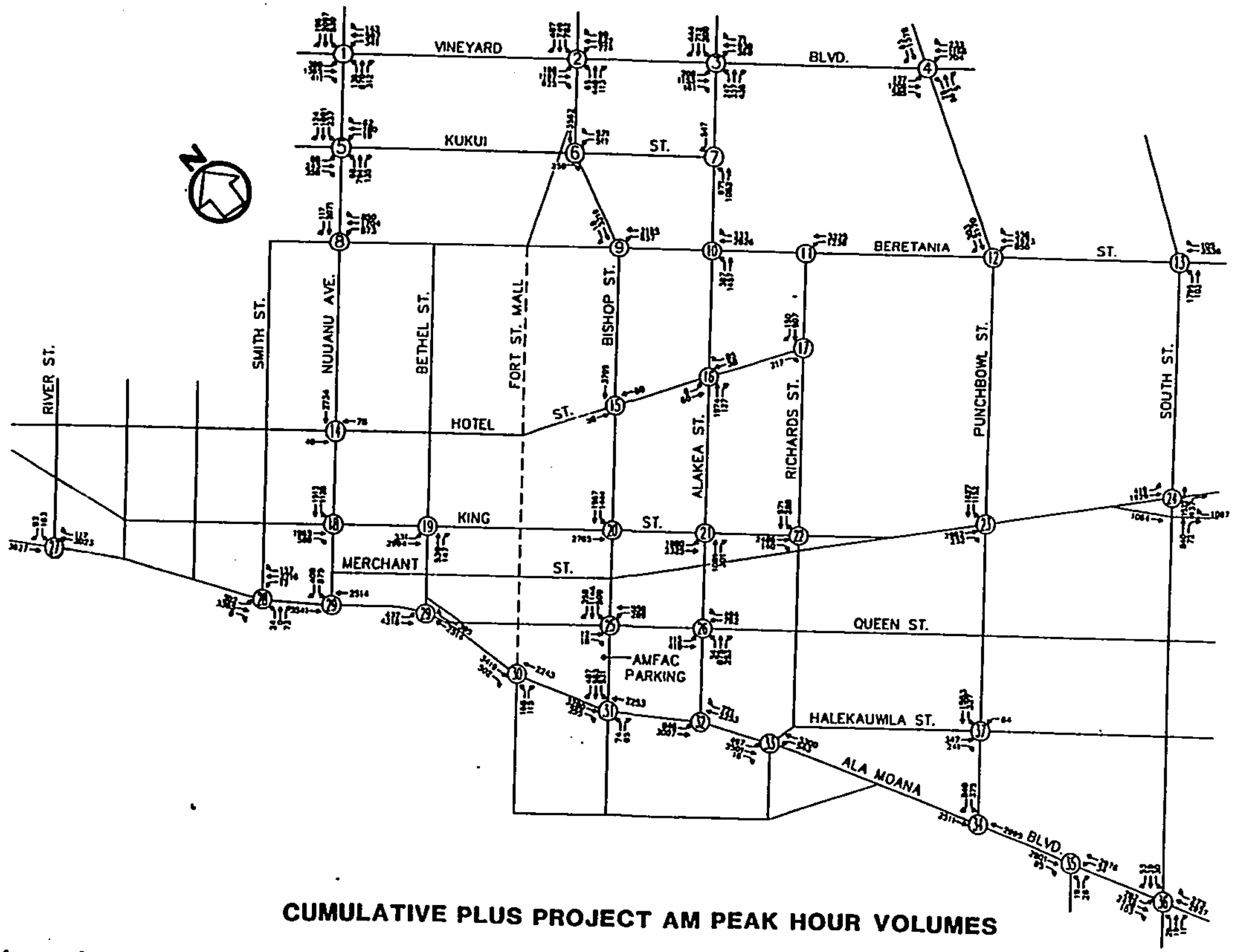
FIGURE 16



CUMULATIVE PLUS PROJECT AM PEAK HOUR VOLUMES

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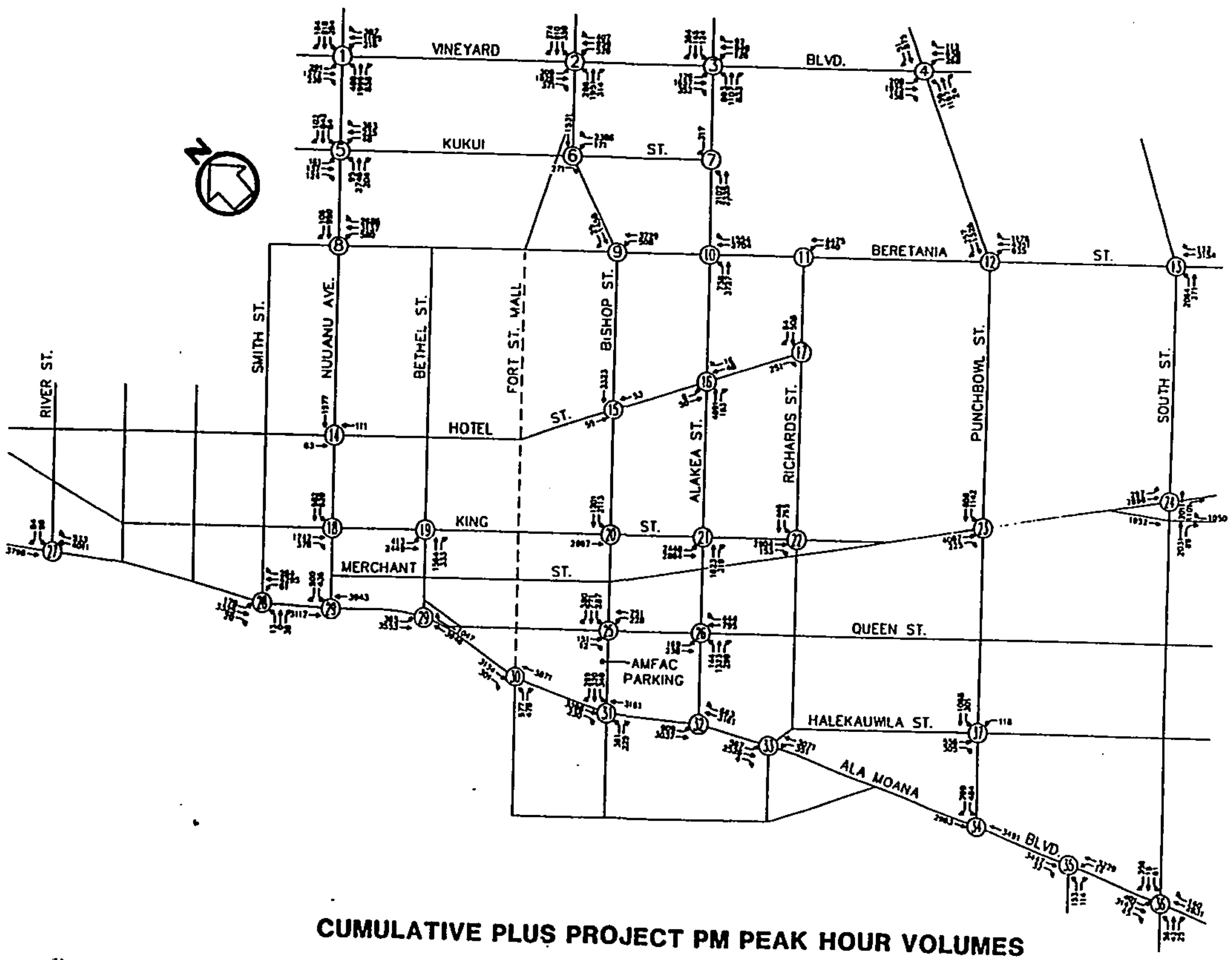
FIGURE 17



CUMULATIVE PLUS PROJECT PM PEAK HOUR VOLUMES

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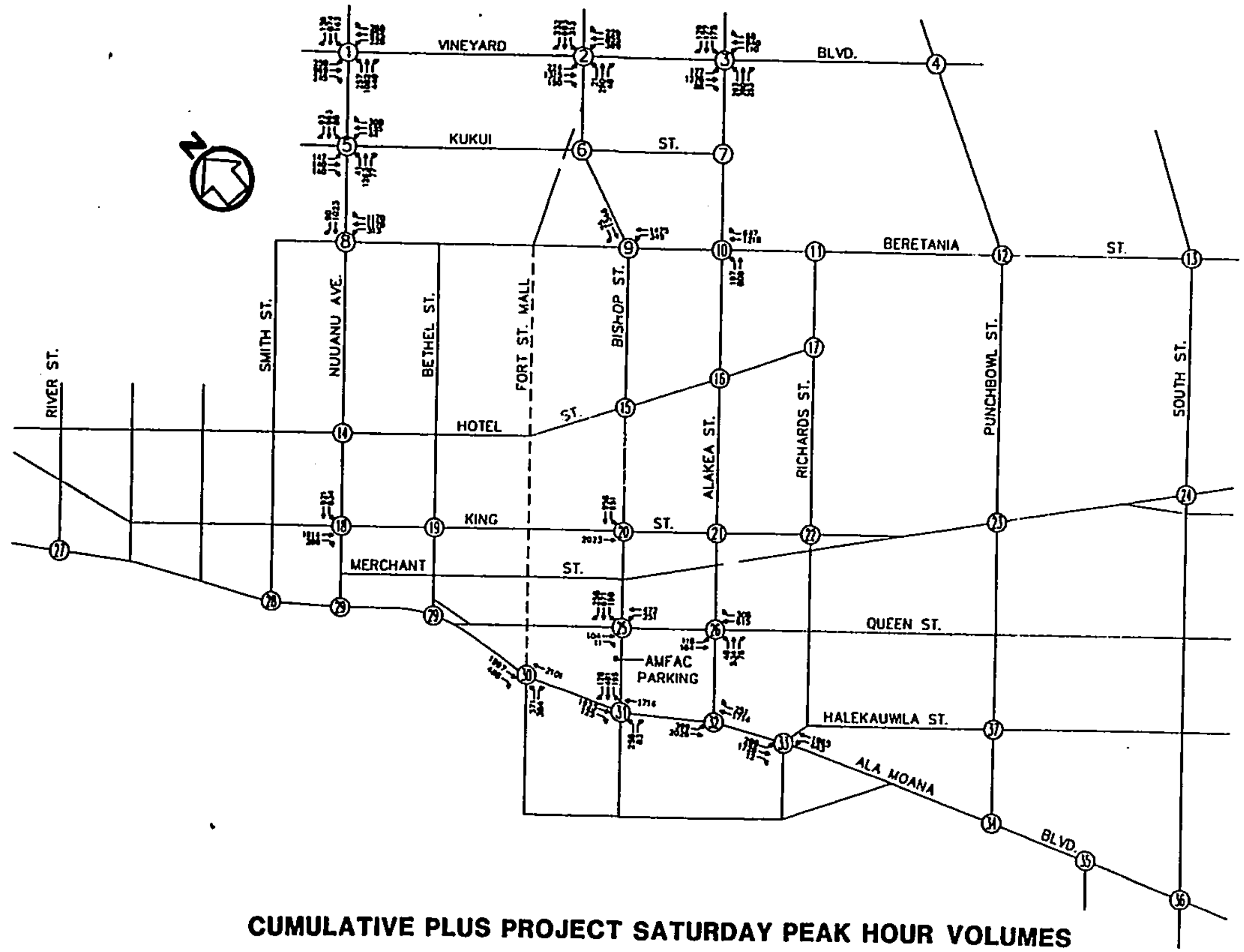
FIGURE 18



CUMULATIVE PLUS PROJECT SATURDAY PEAK HOUR VOLUMES

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FIGURE 19

5.
PARKING ANALYSIS

The purpose of this chapter is to present a discussion of the parking-related aspects of the proposed project as the impact of this project on the downtown parking supply is part of the impact analysis. The parking analysis was conducted by determining the parking required to satisfy the demand of each of the individual uses and then comparing that demand to the number of spaces required using the shared parking concept.

EXISTING PARKING FACILITIES

With construction of the Waterfront at Aloha Tower, some of the existing parking facilities will be removed and replaced by spaces in the two new parking structures. The various types and numbers of parking spaces that will be replaced are as follows: 374 metered spaces, 86 unmetered spaces, 56 reserved spaces and 15 spaces for bus parking. In addition, the parking spaces provided for existing Department of Transportation offices are accounted for in the new parking structure under Piers 5 & 6.

SHARED PARKING CONCEPT

The Waterfront at Aloha Tower project is a mixed use project with uses that have peak parking demands at different times of the day. Since trips to office portions of the development result in high daytime parking demands but little or no demand during the evenings and on weekends, shared parking is particularly applicable to this project.

The shared parking concept considers the interaction of the parking demand for various uses within a mixed use development to determine the number of parking spaces needed to satisfy a project's demand. Generally, the shared parking analysis yields a peak parking demand less than the peak code requirements for each individual use because of these variations in the times of peak demand. A more detailed discussion of this concept is presented as Appendix A.

The shared parking concept has been accepted as valid in Los Angeles (Downtown) and San Diego for similar mixed use projects.

SUMMARY

The shared parking analysis for the non-residential portions of the project is presented as Table 10. The analysis indicates that the peak weekday parking demand is 2,612 spaces and that the weekend peak parking demand is 1,529. Condominiums are not included in this analysis because there are 400 parking spaces provided on-site at Piers 12 and 14.

The current plan for the project provides for a total of approximately 2,600 parking spaces for the non-residential portions (Piers 5 through 11). This would indicate a deficiency of 12 spaces on a typical weekday which can be mitigated in the design of the garage and a surplus of 1,071 spaces on a typical Saturday.

Table 10
SUMMARY OF SHARED PARKING ANALYSIS
ALOHA TOWER TRAFFIC STUDY
June 1990

	Weekday	Saturday
Minimum Parking		
w/o Shared Parking	2,874	1,909
w/ Shared Parking	2,612	1,529
Shared Parking Savings	263	380
Assumed Spaces Provided	2,600	2,600
Surplus (Deficiency)	(12)	1,071

6.
CONCLUSIONS AND RECOMMENDATIONS

The purpose of this chapter is to present the results of the level-of-service analysis, which identifies the project-related impacts. In addition, any mitigation measures necessary and feasible are identified and other access, egress and circulation issues are discussed.

SUMMARY OF IMPACTS AND MITIGATION MEASURES

The addition of project-generated traffic to 1995 cumulative volumes determines the impact of the proposed project. It is important to note that the results of the analysis are relative. That is, traffic volumes generated by the related projects and background growth described in Chapter 3 are estimates of traffic in 1995. These volumes are not traffic projections. Related projects may not be built to the specified size, if at all, and projected growth could easily be less than estimated. Therefore, the results of this analysis are intended to focus on the impacts of the proposed project traffic on the street system and the mitigations needed to alleviate those impacts where feasible.

However, even under existing conditions, the levels of operation of intersections along Nimitz Highway are approaching or are already at unacceptable levels. Recommended mitigations are designed to minimize project impacts and improve operating conditions, where possible.

Mitigation measures have been recommended for all of the intersections (except for those along Nimitz Highway) where the proposed project has a significant traffic impact and they are listed below. Improvements to intersections along Nimitz Highway immediately adjacent to the proposed site would be implemented by the developer as part of the project. Since the remaining intersections are not in the immediate area of the Waterfront at Aloha Tower, recommended improvements cannot be implemented by the developer. Previous traffic studies have recommended similar measures at some of these locations to mitigate their respective impacts. The recommended measures have been listed to describe what improvements would be necessary to alleviate the project's impacts. The definition of a significant impact is described below.

At most locations where a significant impact occurs, restriping, signage and peak-hour parking prohibition would serve as the mitigation measure. At several intersections, the addition of a single lane would be necessary and could possibly require some right-of-way acquisition and minor reconstruction of sidewalk and curb facilities. At the remaining locations, mitigation measures could require additional right-of-way and construction of new sections of roadway.

In the immediate vicinity of the proposed development, significant impacts at two intersections along Nimitz Highway can only be partially mitigated. That is, the heavy through volume on Nimitz Highway, which is <u>not</u> project-generated, causes the intersections to operate at an unacceptable level-of-service. These intersections are on Nimitz Highway at Alakea and Richards Streets.

DEFINITION OF SIGNIFICANT IMPACTS

Criteria for determining if a project has a significant traffic impact for which mitigation measures must be investigated have been established based on traffic impact study guidelines used in various other cities. Generally, the criteria are as follows: if the level-of-service

(LOS) without the project is E or F and the volume/capacity (V/C) ratio changes less than 0.030, the project's traffic impacts are considered insignificant. However, if the V/C ratio change is greater than 0.030, then mitigation measures which will reduce the V/C ratio change to less than 0.030 must be identified. If the LOS with the project is D or better, then no mitigation measures need to be identified.

The above criteria has been used on several traffic impact studies reviewed and accepted by DTS over the past two years, and therefore has been used for this study.

PROJECT-RELATED TRAFFIC IMPACTS AND MITIGATION MEASURES

The anticipated level-of-service analysis for 1995 and anticipated traffic impacts are summarized in Tables 11 and 12. The lane configurations along Nimitz Highway required to provide adequate access to the Aloha Tower project as proposed by the developer are shown on Figure 20. A number of other intersections are significantly impacted at which the feasibility of mitigation measures should be examined further by the appropriate transportation agency. Intersections with project-related impacts (a charge in the v/c ratio of 0.03 or greater) requiring mitigation measures are discussed individually in the following paragraphs. However, it should be noted that the mitigation measures identified are not required solely as a result of project-related traffic, but also traffic generated by the related projects.

Intersection 1. Vineyard Boulevard at Nuuanu Avenue

Installation of northbound and southbound right-turn only lanes would mitigate the project's significant impacts. However, the intersection would continue to operate at LOS F during both weekday peak hours.

Intersection 2. Vineyard Boulevard at Pali Highway

The addition of separate right turn lanes on the east and west approaches would be required to mitigate project impacts. The addition of northbound and southbound left-turn lanes could

Table 11
LEVEL OF SERVICE ANALYSIS FOR 1995 WEEKDAY CONDITIONS
ALOHA TOWER TRAFFIC STUDY

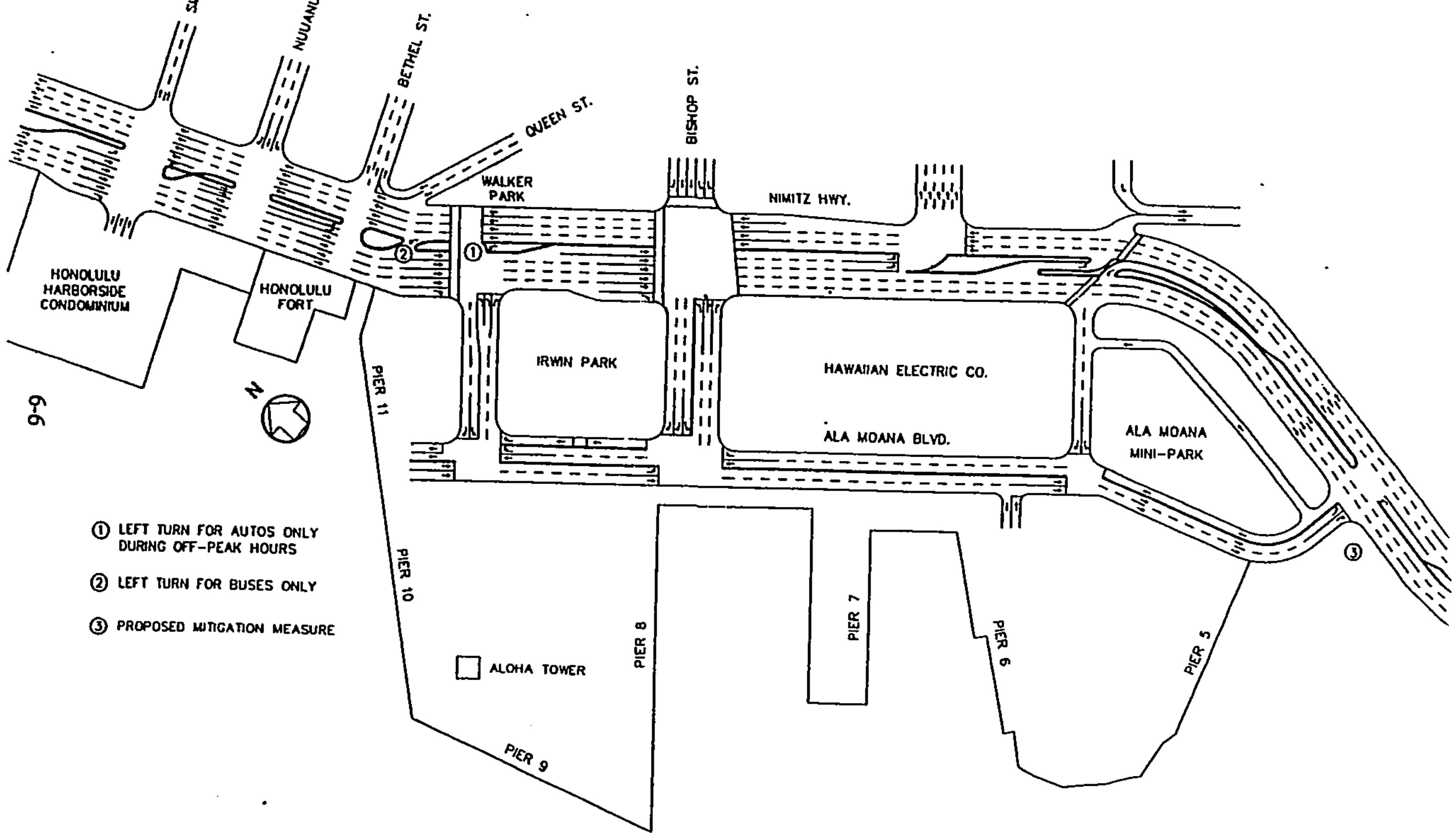
			WITHOUT PROJECT								WITH PROJECT								V/C ANALYSIS			
			AM PEAK HOUR				PM PEAK HOUR				AM PEAK HOUR				PM PEAK HOUR				V/C CHANGE			
NO	EAST-WEST STREET	NORTH-SOUTH STREET	V/C (HCM)	LOS	V/C (CMA)	LOS	V/C (HCM)	LOS	V/C (CMA)	LOS	V/C (HCM)	LOS	V/C (CMA)	LOS	V/C (HCM)	LOS	V/C (CMA)	LOS	AM (HCM)	(CMA)	PM (HCM)	(CMA)
1	VINEYARD BL	NUUANU AV	2.293	F	1.080	F	4.016	F	1.390	F	2.680	F	1.140	F	4.030	F	1.450	F	0.387	0.060	0.014	0.060
2	VINEYARD BL	PALI HWY	2.184	F	1.430	F	3.104	F	1.330	F	2.334	F	1.480	F	3.155	F	1.400	F	0.150	0.050	0.051	0.070
3	VINEYARD BL	Q. EMMA ST	2.395	F	1.420	F	2.833	F	1.600	F	2.444	F	1.420	F	2.935	F	1.660	F	0.049	0.000	0.102	0.060
4	VINEYARD BL	PUNCHBOWL ST	1.478	F	1.370	F	1.616	F	1.410	F	1.492	F	1.390	F	1.679	F	1.470	F	0.014	0.020	0.063	0.060
5	KUKUI ST	NUUANU AV	3.366	F	0.870	D	3.108	F	1.050	F	3.366	F	0.930	E	3.108	F	1.160	F	0.000	0.060	0.000	0.110
6	KUKUI ST	PALI HWY	-		0.700	C	-		0.290	A	-		0.740	C	-		0.320	A	-	0.040	-	0.030
7	KUKUI ST	Q. EMMA ST	0.449	A	0.420	A	1.406	F	1.300	F	0.517	A	0.450	A	1.491	F	1.400	F	0.068	0.030	0.085	0.100
8	BERETANIA ST	NUUANU AV	1.267	F	0.840	D	1.506	F	0.860	D	1.409	F	0.890	D	1.570	F	0.930	E	0.142	0.050	0.064	0.070
9	BERETANIA ST	PALI HWY	1.097	F	0.900	E	0.897	D	0.690	B	1.152	F	0.970	E	0.938	E	0.710	C	0.055	0.070	0.041	0.020
10	BERETANIA ST	Q. EMMA ST	0.932	E	0.660	B	2.695	F	1.430	F	0.967	E	0.680	B	2.742	F	1.470	F	0.035	0.020	0.047	0.040
11	BERETANIA ST	RICHARDS ST	0.992	E	0.740	C	0.796	C	0.590	A	1.113	F	0.830	D	0.807	D	0.600	B	0.121	0.090	0.011	0.010
12	BERETANIA ST	PUNCHBOWL ST	1.465	F	1.150	F	1.390	F	1.040	F	1.528	F	1.200	F	1.449	F	1.080	F	0.063	0.050	0.059	0.040
13	BERETANIA ST	ALAPAI ST	1.062	F	0.850	D	1.069	F	0.860	D	1.110	F	0.890	D	1.111	F	0.900	E	0.048	0.040	0.042	0.040
14	HOTEL ST	NUUANU AV	0.981	E	0.850	D	0.591	A	0.510	A	1.120	F	0.970	E	0.692	B	0.600	B	0.139	0.120	0.101	0.090
15	HOTEL ST	BISHOP ST	0.641	B	0.490	A	0.595	A	0.460	A	0.684	B	0.530	A	0.621	B	0.480	A	0.043	0.040	0.026	0.020
16	HOTEL ST	ALAKEA ST	0.462	A	0.320	A	0.812	D	0.600	B	0.469	A	0.330	A	0.843	D	0.620	B	0.007	0.010	0.031	0.020
17	HOTEL ST	RICHARDS ST	0.841	D	0.660	B	0.608	B	0.450	A	0.944	E	0.750	C	0.675	B	0.510	A	0.103	0.090	0.067	0.060
18	KING ST	NUUANU AV	1.562	F	1.300	F	1.020	F	0.870	D	1.579	F	1.320	F	1.030	F	0.880	D	0.017	0.020	0.010	0.010
19	KING ST	BETHEL ST	0.950	E	0.730	C	1.194	F	0.930	E	1.015	F	0.780	C	1.411	F	1.110	F	0.065	0.050	0.217	0.180
20	KING ST	BISHOP ST	1.132	F	1.330	F	1.458	F	1.790	F	1.132	F	1.330	F	1.466	F	1.790	F	0.000	0.000	0.008	0.000
21	KING ST	ALAKEA ST	1.125	F	0.800	D	1.444	F	1.030	F	1.145	F	0.820	D	1.494	F	1.070	F	0.020	0.020	0.050	0.040
22	KING ST	RICHARDS ST	0.656	B	0.540	A	0.833	D	0.920	E	0.684	B	0.500	A	0.895	D	0.820	D	0.028	-	0.052	-
23	KING ST	PUNCHBOWL ST	0.921	E	0.780	C	1.082	F	0.900	E	0.921	E	0.780	C	1.082	F	0.900	E	0.000	0.000	0.000	0.000
24	KING ST	ALAPAI ST	0.730	C	0.660	B	1.257	F	0.930	E	0.801	D	0.610	B	1.590	F	1.220	F	0.071	-	0.333	0.290
	KAPIOLANI BL	SOUTH ST	0.510	A	0.360	A	0.847	D	0.670	B	0.525	A	0.370	A	0.904	E	0.720	C	0.015	0.010	0.057	0.050
25	QUEEN ST	BISHOP ST	0.679	B	0.570	A	0.662	B	0.550	A	0.707	C	0.620	B	0.692	B	0.580	A	0.028	0.050	0.030	0.030
26	QUEEN ST	ALAKEA ST	0.773	C	0.660	B	1.309	F	0.760	C	1.010	F	0.710	C	1.472	F	0.850	D	0.237	0.050	0.163	0.070
27	NIMITZ HWY	RIVER ST	1.020	F	0.690	B	1.098	F	0.780	C	1.045	F	0.710	C	1.157	F	0.820	D	0.025	0.020	0.059	0.040
28	NIMITZ HWY	SMITH ST	0.791	C	0.680	B	0.973	E	0.830	D	0.802	D	0.700	C	1.026	F	0.860	D	0.011	0.020	0.053	0.030
29	NIMITZ HWY	NUUANU AV	0.907	E	0.640	B	1.002	F	0.840	D	0.993	E	0.840	D	1.224	F	0.950	E	0.086	0.200	0.222	0.110
	NIMITZ HWY	BETHEL ST	0.757	C	0.600	B	1.051	F	0.830	D	0.818	D	0.700	C	1.241	F	0.970	E	0.061	0.100	0.190	0.140
30	NIMITZ HWY	FORT ST	0.721	C	0.600	B	0.900	E	0.670	B	0.801	D	0.630	B	1.422	F	0.900	E	0.080	0.030	0.522	0.230
31	NIMITZ HWY	BISHOP ST	1.091	F	0.860	D	1.112	F	0.930	E	1.079	F	0.940	E	1.159	F	0.930	E	-	0.080	0.047	0.000
32	NIMITZ HWY	ALAKEA ST	0.948	E	0.830	D	1.125	F	0.980	E	0.983	E	0.850	D	1.275	F	1.090	F	0.035	0.020	0.150	0.110
33	NIMITZ HWY	RICHARDS ST	1.248	F	0.650	B	1.145	F	0.670	B	1.286	F	0.970	E	1.334	F	0.840	D	0.038	0.320	0.189	0.170
34	ALA MOANA BL	PUNCHBOWL ST	1.214	F	0.940	E	1.411	F	1.050	F	1.463	F	0.892	D	1.546	F	0.980	E	0.249	-	0.135	-
35	ALA MOANA BL	TRADE ZONE ENTR	1.109	F	0.690	B	1.312	F	0.820	D	1.160	F	0.720	C	1.342	F	0.880	D	0.051	0.030	0.030	0.060
36	ALA MOANA BL	SOUTH ST	1.116	F	0.900	E	1.194	F	1.000	F	1.153	F	0.960	E	1.216	F	1.200	F	0.037	0.060	0.022	0.200
37	HALEKAUWILA ST	PUNCHBOWL ST	0.602	B	0.530	A	0.756	C	0.550	A	0.602	B	0.620	B	0.756	C	0.690	B	0.000	0.090	0.000	0.140

Notes:
V/C = Volume-to-Capacity Ratio
LOS = Level-of-Service
HCM = Operations method
CMA = Planning method

Table 12
LEVEL OF SERVICE ANALYSIS FOR 1995 SATURDAY CONDITIONS
ALOHA TOWER TRAFFIC STUDY
June 1990

NO	EAST-WEST STREET	NORTH-SOUTH STREET	WITHOUT PROJECT V/C (HCM)	WITHOUT PROJECT LOS	WITHOUT PROJECT V/C (CMA)	WITHOUT PROJECT LOS	WITH PROJECT V/C (HCM)	WITH PROJECT LOS	WITH PROJECT V/C (CMA)	WITH PROJECT LOS	V/C ANALYSIS (CHANGE IN V/C) (HCM)	V/C ANALYSIS (CHANGE IN V/C) (CMA)
1	VINEYARD BL	NUUANU AV	2.124	F	0.880	D	2.138	F	0.920	E	0.014	0.040
2	VINEYARD BL	PALI HWY	0.955	E	0.840	D	1.057	F	0.920	E	0.102	0.080
3	VINEYARD BL	Q. EMMA ST	0.970	E	0.900	E	1.013	F	0.940	E	0.043	0.040
5	KUKUI ST	NUUANU AV	2.114	F	0.640	B	3.243	F	0.710	C	1.129	0.070
8	BERETANIA ST	NUUANU AV	0.662	B	0.400	A	0.771	C	0.500	A	0.109	0.100
9	BERETANIA ST	PALI HWY	0.295	A	0.390	A	0.557	A	0.460	A	0.262	0.070
10	BERETANIA ST	Q. EMMA ST	0.878	D	0.450	A	0.893	D	0.470	A	0.015	0.020
18	KING ST	NUUANU AV	0.970	E	0.830	D	0.986	E	0.840	D	0.016	0.010
20	KING ST	BISHOP ST	0.433	A	0.640	B	0.647	B	0.700	C	0.214	0.060
25	QUEEN ST	BISHOP ST	0.433	A	0.360	A	0.486	A	0.430	A	0.053	0.070
26	QUEEN ST	ALAKEA ST	0.419	A	0.430	A	0.560	A	0.510	A	0.141	0.080
29	NIMITZ HWY	NUUANU AV	0.669	B	0.500	A	0.721	C	0.690	B	0.052	0.190
	NIMITZ HWY	BETHEL ST	0.576	A	0.450	A	0.708	C	0.580	A	0.132	0.130
30	NIMITZ HWY	FORT ST	0.511	A	0.380	A	0.960	E	0.610	B	0.449	0.230
31	NIMITZ HWY	BISHOP ST	0.576	A	0.490	A	0.673	B	0.580	A	0.097	0.090
32	NIMITZ HWY	ALAKEA ST	0.573	A	0.500	A	0.643	B	0.550	A	0.070	0.050
33	NIMITZ HWY	RICHARDS ST	0.733	C	0.560	A	0.819	D	0.720	C	0.086	0.160

Notes:
V/C = Volume-to-Capacity Ratio
LOS = Level-of-Service
HCM = Operations Method
CMA = Planning Method



PROPOSED LANE CONFIGURATIONS FOR PROJECT

Barton-Aschman Associates, Inc.

FIGURE 20

also be installed, which would result in double left-turn lanes on both approaches serve as a mitigation. However, this would require elimination of the median, and modification of the traffic signals and thus, would not be feasible. Under either scenario, the intersection would continue to operate at LOS F. These improvements have been recommended by previous traffic studies in the area.

Intersection 3. Vineyard Boulevard at Queen Emma Street

Northbound and southbound left-turn lanes and separate left-turn signal phasing should be installed, however the intersection would continue to operate at LOS F because of background traffic conditions. These measures have also been recommended by previous traffic impact studies.

Intersection 4. Vineyard Boulevard at Punchbowl Street

Improvement of this intersection would require widening of northbound Punchbowl Street from one to two lanes to allow two northbound through lanes. To accomplish this, the H-1 underpass would have to be widened, as well as the on-ramps. The length of the weaving area between Punchbowl Street and Pali Highway limits the viability of this improvement. In conclusion, no mitigation of the poor level-of-service resulting from cumulative traffic conditions at this intersection is feasible. This improvement would still result in LOS F at this intersection.

Intersection 5. Kukui Street at Nuuanu Avenue

The north and south approaches should be restriped to provide separate left-turn lanes. In addition, a separate right turn lane should be provided on the south approach. These mitigations would improve the AM LOS from E to C, but the PM LOS would remain at F, as a result of anticipated background traffic conditions.

Intersection 7. Kukui Street at Queen Emma Street

The northbound approach needs an additional left turn lane to allow dual left turn lanes. The added capacity is needed to accommodate the heavy left turn volume demand in the PM peak hour. This mitigation would improve the PM LOS from F to C and the AM LOS would continue to operate at A. This improvement was also recommended by the traffic study for Pacific Nations.

Intersection 8. Beretania Street at Nuuanu Avenue

An additional left turn lane is needed on the east approach. Implementation of this mitigation results in improvements from LOS F to D and LOS F to E in the AM and PM peak hours, respectively.

Intersection 9. Beretania Street at Pali Highway

The shared left and through lane on the east approach should be restriped as an exclusive left turn lane and left turns on red should be permitted. Also, the next adjacent through lane needs to be restriped as an exclusive left turn lane resulting in a total of two left turn lanes and four through lanes on this approach. In the AM peak hour, the LOS would improve from E to D while the PM LOS would be reduced from C to D. Improvements at this location have been recommended as part of previous traffic studies in the area.

Intersection 10. Beretania Street at Queen Emma Street

The mitigation for this intersection is the addition of right turn lane on the east approach to form a dual right turn configuration.

Intersection 12. Beretania Street at Punchbowl Street

The addition of a separate right turn lane on the north approach would improve intersection operation and mitigate the project impacts, however, the intersection LOS would still be F during both peak hours because of the heavy background traffic conditions. The north approach would include one right turn and three through lanes.

Intersection 14. Hotel Street at Nuuanu Avenue

The mitigation for this intersection is the addition of a southbound through lane. This could be accomplished with restriping and the prohibition of peak hour parking. This mitigation would improve the AM LOS from E to B and the PM LOS from B to A.

Intersection 19. King Street at Bethel Street

The south approach needs a separate right turn lane and two exclusive through lanes to mitigate project impacts. The AM and PM LOS would continue to be C and F, respectively. This could also be accomplished with a restriction on peak hour parking and restriping the existing pavement.

Intersection 29. Nimitz Highway at Bethel Street

Recommended lane configurations for this intersection presented in the traffic study for the Kaahumanu Parking Structure Redevelopment will accommodate 1995 cumulative plus project traffic. However, the exclusive right turn lane from Ewa bound Nimitz Highway should be lengthened from that shown in the study.

Intersection 32. Nimitz Highway at Alakea Street

The mitigation for this intersection is the widening of the east approach to accommodate four through lanes of traffic. This mitigation would improve the AM LOS from D to C and PM LOS from F to D, however right-of-way restrictions make this mitigation impractical.

Intersection 33. Nimitz Highway at Richards Street

Installing an additional left turn lane on the east approach or the addition of a fourth through lane on the west approach would reduce the critical volume. Both improvements would require right-of-way acquisition and realignment of the roadway which is not practical. The LOS would improve from E to C and D to C in the AM and PM peak hours, respectively. However, it shoud be noted that the level of service without the improvements indicate that this intersection would continue to function.

Intersection 34. Ala Moana Boulevard at Punchbowl Street

The north approach should be modified to provide an additional second right turn lane. Right turns on red should be permitted from the outside lane only. This improvement changes the LOS from E to D in the AM peak hour and from F to E in the PM peak hour.

Intersection 36. Ala Moana Boulevard at South Street

The westbound approach needs a separate right turn lane to South Street in order to mitigate the impacts of project traffic in the AM peak hour improving the LOS from E to D. Mitigating the project impacts in the PM peak hour requires the installation of a second left turn lane on the west approach which would improve the LOS from F to E.

Other Improvements

In order to reduce the ewa-bound left turns into the project site at Richards Street, a left turn lane from Ala Moana Boulevard should be provided. Inbound traffic would only require a left turn pocket where turning vehicles would yield to Diamond Head-bound traffic on Nimitz Highway. A left turn out could also be provided at this location, however, this movement would require realignment of the approach to Nimitz Highway and installation of traffic signals. The results of this mitigation measure would be provision of an alternate egress point for vehicles destined for Alakea Street and points north and a more even distribution of project traffic along Nimitz Highway. There is, however, no significant improvement in the level-of-service at intersections along Nimitz Highway.

ARTERIAL PROGRESSION

An arterial progression analysis was conducted for the section of Nimitz Highway immediately in front of the project site for 1995 conditions without and with the project. This section between Smith Street and Ala Moana Boulevard was analyzed using the Urban/Suburban Arterial methodology described in Special Report 209: Highway Capacity Manual, published by the Transportation Research Board (TRB) in 1985. It should be noted that the total number of signals, the extremely short distances between each signalized intersection and the estimated 1995 cumulative volumes, flow of traffic along this roadway becomes more a function of individual intersection operation as opposed to strict analysis as an arterial.

The overall level-of-service for this section of Nimitz Highway is projected to be F under 1995 conditions without and with the project due to the heavy east-west through volumes on this facility. That is, this roadway facility will operate at unacceptable levels based on the projected 1995 background conditions without the project. Further detailed study at the regional level is required to adequately address this problem. Average travel speed along this section is estimated to be below 10 mph. These results are consistent with similar conclusions developed for intersection operation in the surrounding Downtown area which anticipate unacceptable levels of operation.

OTHER TRAFFIC-RELATED ISSUES

Tour Bus Access and Parking

One of the major concerns is provision of adequate parking and access for the tour buses that will bring persons to the festival market place, the dinner cruises and the cruise ships. Buses from Nimitz Highway will access the project by turning into the service entrance located at the mauka end of Pier 11. This entrance will allow the buses to conveniently serve the pier and the marketplace provides an efficient one-way path through the project. Additional parking could be made available along this route if necessary.

Limited parking can be provided along Fort Street. There is adequate space for eight to ten buses if both sides of the street are utilized. Based on surveys at Honolulu International Airport, each space can accommodate 100 bus passengers per hour. However, sight distance, noise and air pollution, and appearances may become a problem if all of the available curb space is used for bus parking. Therefore, loading and unloading areas for the buses should be located on the first level of the maritime facility buildings on both Piers 8 through 11 and Piers 5 & 6. An additional stacking lane for buses will be provided in Ala Moana Mini-Park to serve Piers 5 & 6. It should be noted, however, that buses serving cruise ship passengers on Piers 10 & 11 would only require parking for approximately 30 days per year. Consequently, bus parking along Fort Street would be a very rare occurrence.

Column spaces, height clearances, and ventilation for structures adjacent to the roadways are issues that will have to be addressed during the design.

Transportation Coordinator

It is anticipated that the management of the Aloha Tower project will have a full-time Transportation Coordinator whose responsibilities will include overseeing general traffic circulation, optimizing the loading and unloading of patrons and deliveries, and maintaining safe and efficient pedestrian movement. The Coordinator may manage the operation of the parking facilities and implement and supervise ride sharing programs. These programs include: rideshare matching, commuter information networks, employee surveys, transit and carpool/vanpool subsidy management, and city bus service coordination. Enhancement of these transportation systems management (TSM) programs will reduce the peak hour trips generated, especially by the office portions of the development.

Mass Transit Impacts

It should be noted that the study was conducted assuming current modal split characteristics. As the City develops mass transit programs, the trip generation rates of the various uses will decrease. In this event, the magnitude of the projects traffic will be significantly reduced.

Pedestrian Crossing Impacts

The Waterfront at Aloha Tower will generate new pedestrian traffic, shift existing patterns and result in an overall increase in traffic across Nimitz Highway. However, new crossings at ingress/egress locations opposite existing intersection approaches will be controlled by signals. Crossing times can be integrated with new signal timings to have no impact to the flow of traffic on Nimitz Highway and intersecting streets. A pedestrian level-of-service analysis examining crosswalk capacities is included as Appendix B to this report.

Construction Traffic

Construction activities of the Waterfront at Aloha Tower will have impacts on the surrounding roadway system, specifically Nimitz Highway and streets providing access to the site.

Heavy trucks, pile driving equipment, earth movers and various construction vehicles will need access to and from the site. These vehicles can be difficult to maneuver and are often slow-moving. Consequently, it may be necessary to temporarily close part of the curb (makai) lane of Nimitz Highway under certain conditions. However, this is expected to be a rare occurrence.

Due to the capacity constraints of Nimitz Highway, it is recommended that the construction vehicles described above minimize travel on this roadway and limit turns into and out of the site between 7 AM and 7 PM on weekdays. The temporary closure of a lane(s) should not occur within the same time frame, in order to avoid impacting traffic flow on Nimitz Highway.

Summary

In summary, traffic generated by the project will have impacts on the surrounding roadway system. Mitigations recommended to alleviate significant impacts in the immediate vicinity of the project site would result in no detrimental effects to traffic operations on Nimitz Highway and streets serving the Waterfront at Aloha Tower.

APPENDIX A

DISCUSSION OF SHARED PARKING CONCEPT

SHARED PARKING STUDY

Prepared for
THE URBAN INSTITUTE
Washington, D.C.

By Barton-Aschman Associates, Inc.
Evanston, Illinois
May 1983

EXECUTIVE SUMMARY

This study has examined the concept of shared parking with the objective of explaining how it works and developing a method to estimate its magnitude at locations throughout the United States.

The significance of shared parking is related to growth in mixed-use developments across the United States. Experience indicates that combining land-uses results in a demand for parking space that is less than the demand generated by separate free-standing developments of similar size and character.

For the purpose of this study, shared parking data was collected for 162 development projects in several urban areas throughout the nation. These projects were selected to represent five basic types and seven combinations of land-use in downtown and suburban areas. All had varying amounts of floor space.

For the shared parking analysis, peak parking ratios and hourly parking accumulation were determined for single developments in freestanding situations with maximum use of the auto as transportation. These characteristics provide the means to combine land-uses and estimate the impact on peak parking space requirements.

The results of the analysis are summarized in terms of technical findings and recommendations.

Technical Findings

Peak parking demand factors determined for single land-users were:

- Offices: 3.0 spaces per 1,000 square feet, weekday (GLA-occupied).
- Retail: 5.0 spaces per 1,000 square feet, Saturday (GLA-occupied).
- Restaurants: 25.0 spaces per 1,000 square feet, weekday or Saturday (GLA-occupied).
- Cinemas: 0.3 spaces per seat.
- Residential: 1.0 space per dwelling unit.
- Hotel guests: 1.25 spaces per occupied room.

Hourly accumulation of parking vehicles is significantly different among land-uses. These differences in time provide an opportunity to share the use of parking facilities. the overall pattern is as follows:

- Offices: midday peak, evening periods at less than 10 percent of peak.
- Retail: midday peak, evening periods at 60 percent of peak.
- Restaurants: evening peak, midday at 50 percent of peak.
- Cinemas: evening peak, midday at 67 percent of peak.
- Residential: evening peak, midday at 60 to 85 percent of peak.
- Hotel guests: evening peak, midday at 50 percent of peak.

Seasonal variations represent another form of time offset. These differences can be used to achieve multiple use of parking facilities. Occupancy of retail and office facilities peaks in fall or winter. Restaurants, hotels, and cinemas experience peak occupancy is the summer.

The analysis of existing mixed-use projects indicates that reductions in parking space requirements due to shared parking have occurred. An analysis indicated the following:

- Actual peak parking occupancy is at least 25 percent lower than a gross parking demand estimate using single land-use peak parking demands added together.
- Using the method, the estimated shared parking demand for space would be 10 to 25 percent lower than gross parking estimates.
- Estimates of shared parking demand produce reasonably consistent results compared to actual parking demand.
- Captive market effects can reduce shared parking requirements significantly. These effects may average about 60 percent for downtown, mixed-use projects. However, they are site-specific and cannot be estimated as a general value.

Recommendations

- To estimate shared parking, a four-step method is recommended. The four steps are:
- Step 1: Initial project review.
- Step 2: Peak parking factor adjustment.
- Step 3: Hourly accumulations analysis.
- Step 4: Shared parking estimation.

- The method can be used for any project. The results of the research can be used or different parking factors or accumulation data can be inserted.

- The method can be used as a project-planning tool. It is possible to identify optimal land-use square footage in order to achieve maximum efficiency in providing parking space.

- The design and implementation aspects of shared parking were analyzed. There are no fundamental conditions that preclude the practical operation and management of shared parking facilities. A series of guidelines is recommended to achieve optimal operating and management conditions.

- In order to implement the findings of the research, the following implementation actions should be taken:

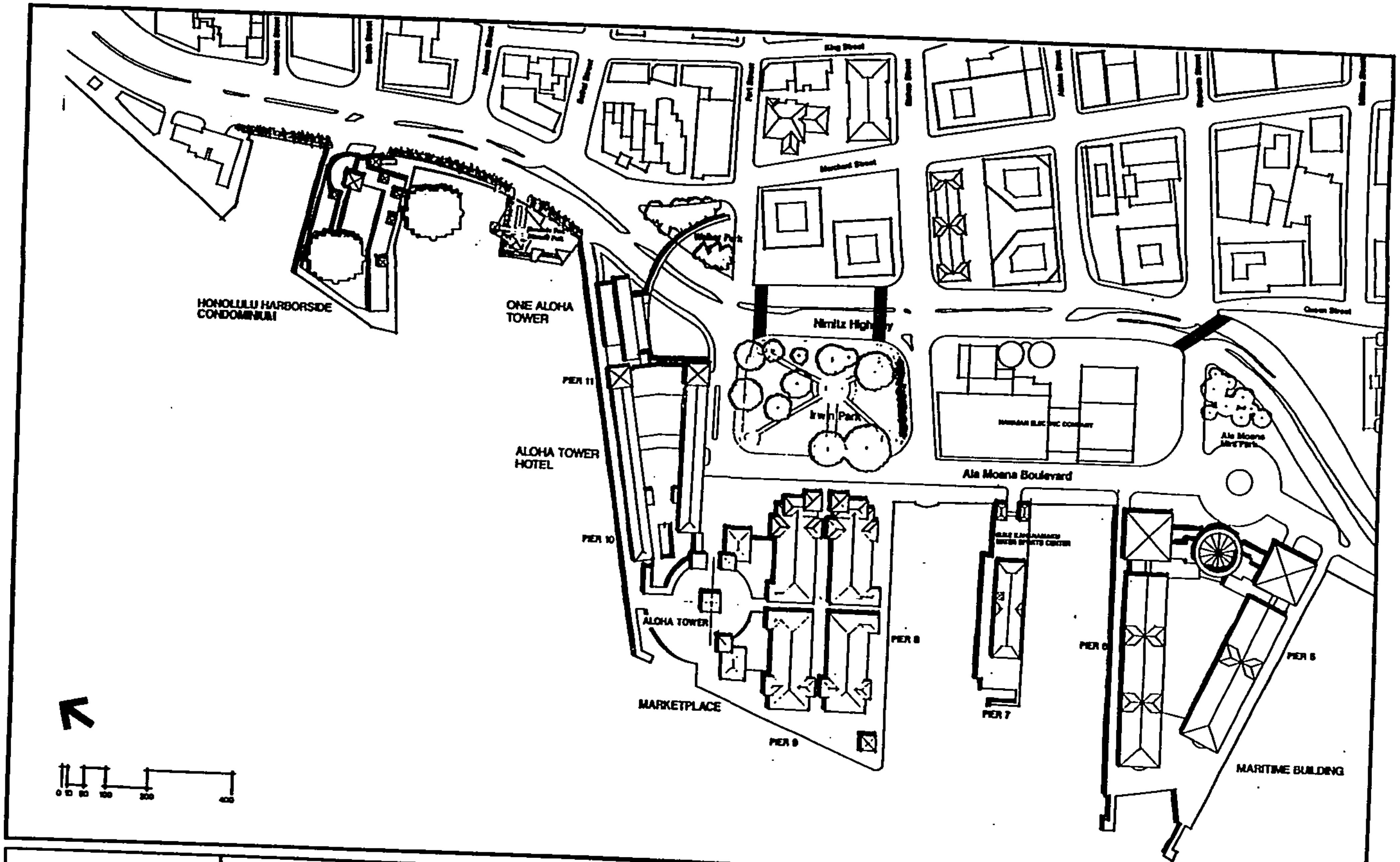
• Raise the profile of the shared parking concept to achieve acceptance.
• Increase the number of test case analyses.
• Evaluate existing zoning codes that allow shared parking in order to develop testimonials.
• Prepare prototypical zoning provision for shared parking.
• Develop ULI data base with service bureau features.

APPENDIX B
PEDESTRIAN CROSSING ANALYSIS

THE WATERFRONT AT ALOHA TOWER PEDESTRIAN LEVEL-OF-SERVICE ANALYSIS

As part of the Traffic Study for the Waterfront at Aloha Tower, an analysis of pedestrian crossings along Nimitz Highway in the vicinity of the project was conducted in response to comments from City of Honolulu Department of Transportation Services and Hawaii Department of Transportation Highways Division. The Waterfront at Aloha Tower project includes a proposed pedestrian bridge over Nimitz Highway at Fort Street. This is a continuation of the Fort Street pedestrian mall. Pedestrians would also be able to cross Nimitz Highway at-grade at the intersections of Fort Street, Bishop Street and Richards Street. The locations of pedestrian crossings are shown on Figure B-1.

The pedestrian analysis methodology for crosswalks described in the 1985 Highway Capacity Manual (HCM) was used to determine the level-of-service for pedestrians attempting to cross Nimitz Highway at the intersections listed above. It should be noted that for the purpose of this study, only the crosswalks were analyzed. The concept of pedestrian level-of-service analysis is similar to that for vehicles. As the volume and density of the pedestrian stream increase from free-flow to more crowded conditions, ease of movement and speed decrease. The level-of-service for a pedestrian crosswalk is determined by the space per pedestrian available during the time allowed to cross a street. The level-of-service for crosswalks is described in terms of square feet per pedestrian in Table B-1.



THE WATERFRONT AT ALOHA TOWER

Fig. B-1

PEDESTRIAN CROSSWALKS

Prepared for: ALOHA TOWER DEVELOPMENT CORPORATION

Prepared by: ALOHA TOWER ASSOCIATES

TABLE B-1
PEDESTRIAN LEVEL-OF-SERVICE
ON CROSSWALKS

LEVEL OF SERVICE	SPACE (SQ FT/PED)
A	≥ 130
B	≥ 40
C	≥ 24
D	≥ 15
E	≥ 6
F	< 6

Source: 1985 Highway Capacity Manual

PEDESTRIAN TRIP GENERATION/DISTRIBUTION

There is no source of pedestrian generation rates as there is for vehicular trip generation. Therefore, pedestrian trips were generated based on the proposed land use mix of the project, typical employment density ratios and related modal split data. During the peak hours, the majority of the pedestrian traffic would be generated by people using the public transit system who work or wish to shop, eat, etc. at the project. It is anticipated that these persons would board and disembark at bus stops along King Street and other locations on the north side of Nimitz Highway, and then walk to the Waterfront. During the midday peak hour, pedestrian traffic would also be generated by employees in the downtown area eating and shopping at the project during their lunch hour and, to a lesser degree, the reverse for Waterfront employees.

In order to determine existing pedestrian activity in the vicinity of the project, peak hour counts were taken at existing pedestrian crossings. These counts were utilized in the analysis to reflect non-project pedestrian crossing activity.

The majority of the vehicular trips generated by the project during the AM and PM peak hours are due to project employees. Pedestrian trips were generated by determining the number of employees and subtracting those commuting to the site by automobile (a vehicle occupancy rate of 1.25 persons per vehicle was used). The remaining employees, as well as the non-project pedestrians noted in the previous paragraph make up the pedestrian trips.

Midday pedestrian trips were determined by examining the relationship between midday and PM peak hours in the Baltimore Harbor pedestrian counts. The midday peak pedestrian volumes were 115% of the PM pedestrian counts. A similar relationship was assumed for the Waterfront at Aloha Tower project. It should also be noted that the analysis did not examine weekend pedestrian movements as the weekend pedestrian volumes would be similar to the midday peak and vehicular traffic volumes along Nimitz Highway are lower on weekends. Therefore, the weekday condition would be the worst case.

Pedestrian trips were estimated for build-out and full occupancy of the project. It was estimated that there would be 1090 pedestrians during the AM peak hour, 906 pedestrians during the PM peak hour, and 1038 pedestrians during the midday peak hour. Pedestrian trips by analysis period and intersection are shown in Table B-2.

TABLE B-2
WATERFRONT AT ALOHA TOWER
PEDESTRIAN CROSSWALK VOLUMES

INTERSECTION/ CROSSWALK	AM PEAK HOUR	PM PEAK HOUR	MIDDAY PEAK HR.
1. NIMITZ HWY. @ FORT ST.	335	262	304
2. NIMITZ HWY. @ BISHOP ST.	353	320	345
3. NIMITZ HWY. @ RICHARDS ST.	66	61	85
4. PEDESTRIAN OVERPASS	336	263	304
TOTAL	1090	906	1038

The pedestrian trips were distributed among the pedestrian overpass and three crosswalks on Nimitz Highway based on development densities. The distribution is shown on Figure B-2.

LEVEL OF SERVICE ANALYSIS

Each crosswalk was analyzed for AM, PM, and midday peak hours using the HCM pedestrian analysis method. The results of the level-of-service analysis are shown in Table B-3.

TABLE B-3
PEDESTRIAN LEVEL-OF-SERVICE ANALYSIS[1]
WATERFRONT AT ALOHA TOWER

INTERSECTION/ CROSSWALK	LEVEL-OF-SERVICE					
	AM PEAK HOUR		PM PEAK HOUR		MIDDAY HOUR	
	NORMAL	MAX[2] SURGE	NORMAL	MAX[2] SURGE	NORMAL	MAX[2] SURGE
1. NIMITZ HWY. @ FORT STREET	A	A	A	A	A	A
2. NIMITZ HWY. @ BISHOP STREET	A	B	A	A	A	B
3. NIMITZ HWY. @ RICHARDS STREET	A	A	A	A	A	A

Note: (1) Calculation sheets for this analysis are found at the end of this text.
(2) Maximum Surge represents a brief maximum flow or surge condition during the WALK phase that occurs when the two lead platoons, formed during the waiting phase, are simultaneously in the crosswalk.

As Table B-3 shows, all crosswalks on Nimitz Highway in the Waterfront at Aloha Tower project area will operate at Level-of- Service A during average conditions and Level-of-Service B or better under maximum surge conditions. The analysis was conducted using existing signal timing and phasing, which is presently a 150 second cycle at the three intersections. The WALK phase ranged from 32-34 seconds for pedestrians crossing Nimitz Highway. Signal phasing modifications are likely once

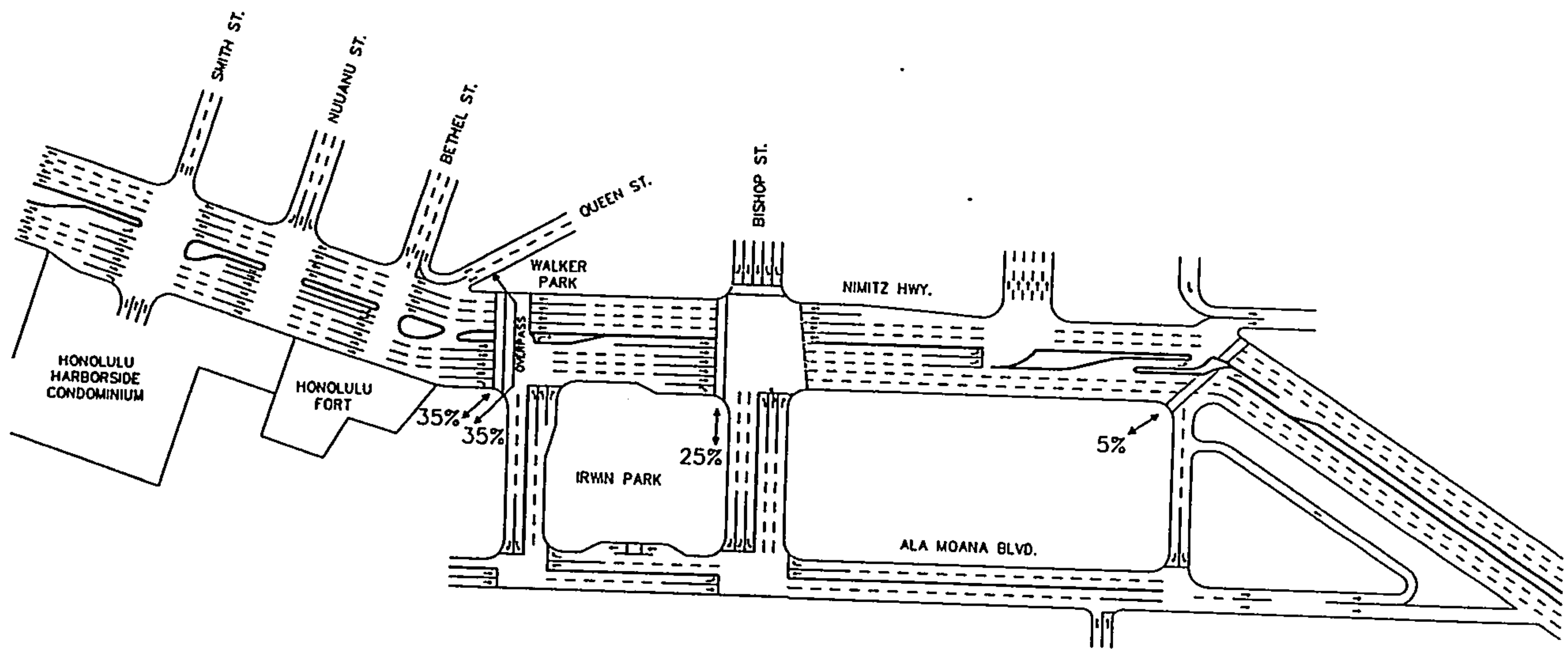


FIGURE B-2
WATERFRONT AT ALOHA TOWER
PEDESTRIAN TRIP DISTRIBUTION

the project is completed. These modifications are not the result of additional pedestrian traffic but to accommodate vehicular volumes and are not expected to lower pedestrian crossing levels-of-service.

With the pedestrian overpass at the Fort Street Mall in place, the Nimitz Highway at-grade crosswalk at Fort Street may not be warranted. If any or all of the pedestrians shown crossing at-grade at Fort Street in this analysis shifted to the Nimitz Highway crosswalk at Bishop Street, it would still maintain a Level-of-Service B even under maximum surge conditions.

The adequate at-grade capacity for pedestrians shown in this analysis indicate that no additional pedestrian overpasses are warranted as part of the Waterfront at Aloha Tower project. These at-grade crossings and the pedestrian overpass at the Fort Street Mall would maintain an acceptable level-of-service for pedestrians crossing Nimitz Highway with the project completed.

APPENDIX D

HISTORICAL ASSESSMENT

Prepared By

Paul H. Rosendahl, Ph.D., Inc.

Aloha Tower Complex Historical Assessment

Honolulu Harbor, Island of Oahu

by

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SUMMARY

At the request of Mr. Earl Matsukawa of Wilson Okamoto and Associates, Inc., on behalf of his client, Aloha Tower Associates, Paul H. Rosendahl, Ph.D., Inc. (PHRI) conducted a historic assessment study of the proposed Aloha Tower Complex project site. The project site fronts Honolulu Harbor, Island of Oahu, and includes the area from Pier 5 to Pier 14. The overall objective of the study was to provide information appropriate to and sufficient for the preparation of planning documents for the redevelopment of the Aloha Tower Complex site.

The current study has determined that the entire project area sits on historic period fill which has been placed over an area once submerged. There are no intact prehistoric remains in the area, or if there are such remains, they are subsurface and have been brought in with the fill. The information from the current study indicates that the only historically significant structures in the project area are Aloha Tower and its associated grounds, and Piers 8-12. The historical and cultural significance of Aloha Tower is well established; it has been placed on historical registers, and current development plans make it the focal point of the waterfront area. Pier 12 has been chosen as the site of Honolulu Fort Historic Park. Piers 8, 9, 10, and 11 are over 50 years old. According to the State Historic Sites Section, the fact that these piers are over 50 years old in itself suggests they are historically significant (pers. comm., Carol Kawachi 6/20/90). According to Historic Sites Office Director, Don Hibbard, the piers have both architectural and cultural significance due to their design and association with history (pers. comm., 6/26/90).

Based on the current findings, Piers 8-11 are assessed as significant for criteria (a) and (c) of the National Register criteria. Criterion (a) of the register requires the site be associated with events that made significant contributions to broad patterns of history. Criterion (c) requires that a site must embody distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic value or represent a significant and distinguishable entity whose components may lack individual distinction. The present plans for the project area include incorporating a replica of the facade of Pier 11 into the overall project design. This seems adequate mitigation of the historical values of Piers 8-11.

Cover: Honolulu Harbor, vicinity of Nuuanu Ave. 1873. Courtesy of Hawai'i Maritime Museum.

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INTRODUCTION

BACKGROUND

At the request of Mr. Earl Matsukawa of Wilson Okamoto & Associates, Inc., on behalf of his client, Aloha Tower Associates, Paul H. Rosendahl, Ph.D., Inc. (PHRI) conducted a historic assessment study of the proposed Aloha Tower Complex project site. The project site fronts Honolulu Harbor, Island of Oahu, and includes the area from Pier 5 to Pier 14. The overall objective of the study was to provide information appropriate to and sufficient for the preparation of planning documents for the redevelopment of the Aloha Tower Complex site.

SCOPE OF WORK

The basic purpose of the study was to identify all structures, features, and areas of potential historical significance present within the specified project site. The basic objectives of the survey were fourfold: (a) to identify all historical structures, features, and areas present within the project area, (b) to evaluate the potential general significance of all identified historical remains, (c) to determine the possible impacts of proposed development upon the identified remains, and (d) to define the general scope of any subsequent further data collection and/or other mitigation work that might be necessary or appropriate.

Based on a review of readily available background literature, basic familiarity with the general project area, extensive familiarity with the current requirements of pertinent review authorities, and discussions with Mr. Matsukawa of WO&A, Inc., the following specific tasks were determined to constitute an adequate and appropriate scope of work for the proposed historical assessment study:

1. Conduct historical documentary research involving location, review, evaluation, and synthesis of readily available historical literature, historic documents and records, and cartographic sources relevant to the immediate project area;
2. Conduct limited archaeological background documentary research;
3. Conduct limited archaeological field inspection of project site; and
4. Analyze background and field data, and prepare appropriate reports.

The historical assessment study was carried out in accordance with the standards for such research recommended by the Department of Land and Natural Resources-Historic Sites Section/State Historic Preservation Office (DLNR-HSS/SHPO). The significance of historical/archaeological remains identified within the project area was assessed in terms of (a) the National Register criteria contained in the Code of Federal Regulations (36 CFR Part 60), and (b) the criteria for evaluation of traditional cultural values prepared by the National Advisory Council on Historic Preservation. DLNR-HHS/SHPO uses these criteria to evaluate eligibility for both the Hawaii State and National Register of Historic Places.

To further facilitate client management decisions regarding the subsequent treatment of resources, the historical remains identified during the survey were also evaluated in terms of three PHRI CRM (Cultural Resource Management) value modes, which are derived from the previously mentioned federal evaluation criteria. CRM value modes are discussed further in the Conclusion section.

PROJECT AREA DESCRIPTION

The Aloha Tower Complex project area is located ma kai of Nimitz Highway and fronts Honolulu Harbor. The area includes Piers 5 through 14 (but excludes portions of Pier 7). The entire Aloha Tower Development Corporation project area includes submerged lands surrounding the piers and includes approximately 52 acres. The present project area consists of approximately 17.5 acres (Figure 1). Piers 5 through 14 constitute the waterfront edge of the central business district of Honolulu.

Rainfall in the project area averages 20-30 inches per year (Armstrong 1973). Terrain in the project area is totally altered; vegetation in the area consists of landscaping ornamentals and grass.

PREVIOUS ARCHAEOLOGICAL WORK

A search through available records indicates that there have been no previous archaeological studies within or in the vicinity of the project area. This was confirmed by Archaeologist Carol Kawachi of the DLNR (pers. comm., 6/29/90). McAllister's Archaeology of Oahu states, "Information regarding former sites within the present limits of Honolulu must come entirely from literary sources" (1933:80). This statement was made in 1933; however, it

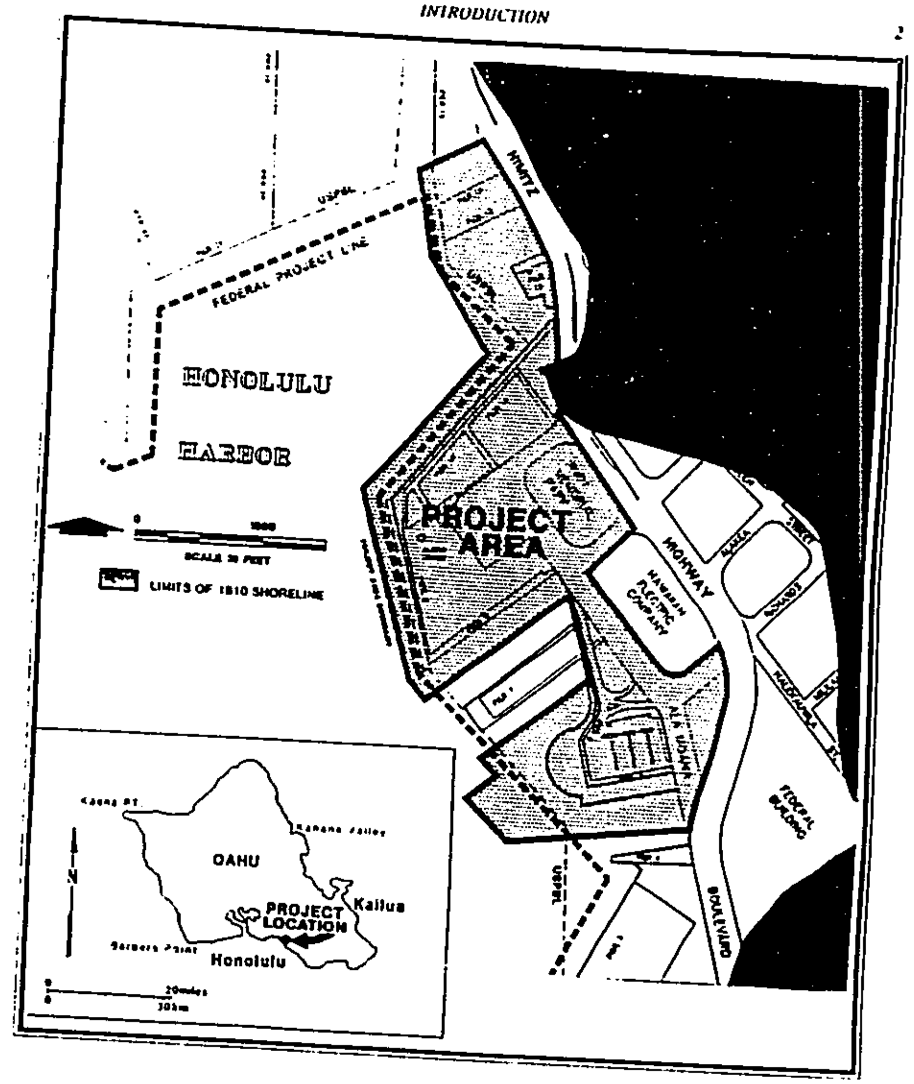

Figure 1. PROJECT AREA AND SITE LOCATION MAP
ALOHA TOWER COMPLEX HISTORICAL ASSESSMENT
Honolulu Harbor, Island of Oahu
PHRI Project 90-823 *June 1990*

still holds true today. Various historical records do mention a few archaeological sites in the general waterfront area—Honolulu Fort (Cartwright 1932:56-61), former heiau in the ahupua'a (The Friend 1898:48), and a few early historic buildings (Greer 1963:77-92; Jardin 1961:141-142). Also found was a historical study of Mokauea, an islet off Sand Island (Oppenheimer 1976).

HISTORICAL DOCUMENTARY RESEARCH

This report includes the general history of Honolulu Harbor, as well as the history of specific piers (5-14) that will be affected by the proposed development. Numerous maps and photographs are presented to document the many and sometimes dramatic changes the waterfront has undergone over the years.

NAME TRANSLATIONS AND HISTORIC DESCRIPTIONS

The name "Honolulu" has been translated variously as "sheltered hollow," "abundance of peace," and "a pleasant slope of restful land" (Westervelt 1910:24). Westervelt writes of Honolulu:

> Honolulu was a small district, a pleasant land looking toward the west,—a fat land, with flowing streams and springs of water, abundant water for taro patches. Mists resting inland breathed softly on the flowers of the hala. (ibid.)

Native historian Samuel Kamakau adds a note on the origin of the name:

> Honolulu was originally a small place at Niukukahi [at the junction of Liliha and School Streets] which some man turned into a small taro patch. Because of their aloha for him, his descendants gave this name to the whole ahupua'a. (Kamakau 1976:7)

MYTHS AND PRE-CONTACT HISTORY

The earliest mythological reference to Honolulu is found in Stokes' review of literature on Honolulu. Stokes notes that Malo (1903:323) records that Luanuu, son of Laka, died in Honolulu and was buried in Nuuanu, while his great-grandson, Pau, son of Hua, was born in Kewalo. Based on Malo's genealogical calculations, the year of death would be c. AD 1100, but Stokes does not accept Malo's dates in general (Stokes 1933:43).

Honolulu is one of the settings in the legend of Hiiaka. Hiiaka was the sister of Pele, the volcano goddess. Pele sent Hiiaka to retrieve her lover Lohiau from Kauai and bring him back to Halemaumau. In the process, Hiiaka and Lohiau became lovers, and later encountered Pele's deadly wrath. At Honolulu the following took place:

> Hiiaka and Lohiau, immortal lovers of legend, entered this harbor in the course of their voyage from Kauai to Hawaii, and a little farther up the valley (at Nuuanu and Vineyard streets) Hiiaka's skill at the game of kilu won her sweetheart from the wiles of the local enchantress Peleula. (Gessler 1942:6)

According to Westervelt, when Kakuhihewa, the noted ancient king of Oahu, divided the island among his favorite chiefs, the area lying roughly between Hotel Street and the ocean, and between Nuuanu and Alakea Streets, was given to and named after Kou, who was an "Iiamuku" or "Marshal" for Kakuhihewa. The area was known as Kou up to the time of Kamehameha's reign (Westervelt 1910:24). Stokes surmises that Honolulu was the name for the whole ahupua'a, of which Kou at best was a very small part (Stokes 1933:61). He also notes that since the name Kou is found only in myths and legends, it is likely only a poetic name in reference to the kou trees that were in the area. The name apparently has been kept alive by the saying "Hui na maka i Kou" (literally, "The eyes meet at Kou"; figuratively, "We shall meet again at Kou"), which was a farewell common among the older people. Tropic Landfall, a book about the port of Honolulu, states that Iiamuku Kou was ruler of the fishing village known as Kulolia, and that the fiefdom of a chief named Honolulu was farther up the valley (Gessler 1942:8).

Westervelt provides us with place names for the general vicinity of the project area, as he relates stories associated with the names. Remember that his points of reference are based on Honolulu in 1910:

> Ke-Kai-o-Mamala was the name of the surf which came in the outer entrance of the harbor of Kou. It was named after Mamala, a chiefess who loved to play konane (Hawaiian checkers), drink awa, and ride the surf. Her first husband was the shark man Ouha, who later became a shark god, living as a great shark outside the reefs of Waikiki and Koko Head. (Westervelt 1910:24)
>
> Her second husband was the chief Hono-kau-pu, to whom the King gave the land east of the land of Kou. This land afterwards bore the name of its chief, Hono-kau-pu.
>
> Ula-kua was the place where idols were made.

This was near the lumber yards at the foot of the present Richards Street.

Ke-kau-kukui was close to Ula-kua, and was the place where small konane boards were laid. These were flat stones with rows of little holes in which a game was played with black and white stones. Here Mamala and Ouha drank awa and played konane. Here also Kekuanaoa, father of Kamehameha V, built his home.

In "Hono-kau-pu" was one of the noted places for rolling the flat-sided stone disc known as the "maika" stone. This was not far from Richards and Queen Streets, although the great "Ulu-maika" place for the gathering of the chiefs was in "Kou."

"Ka-ua-noho-ula," the "rain with the red rainbow," was the place in this district for the "wai-lua," or ghosts, to gather for their nightly games and sports. Under the shadows of the trees, near the present Hawaiian Board rooms at the junction of Alakea and Merchant Streets, these ghosts made night a source of dread to all the people.

Another place in Honolulu for the gathering of ghosts was at the corner of King Street and Nuuanu Avenue. (Westervelt 1910:25)

Kou was probably the most noted "konane" place on Oahu. There was a famous large stone almost opposite the site of the temple. Here the chiefs gathered for many a game. Property and even lives were freely gambled away. The Spreckels building covers the site of this famous gambling resort.

One of the finest "Ulu-maika" places on the islands was the one belonging to Kou. This was a hard, smooth track about twelve feet wide extending from the corner on Merchant and Fort Streets now occupied by the Bank of Hawaii along the seaward side of Merchant Street to the place beyond Nuuanu Avenue known as the old iron works at Ula-ko-heo. It was used by the highest chiefs for rolling the stone-disc known as "the maika stone." Kamehameha I is recorded as having used this maika track. (ibid:28)

In Kou itself was the noted Pakaka temple. This temple was standing on the western side of the foot of Fort Street long after the fort was built, after which the street was named. It was just below the fort. Pakaka was owned by Kinau, the mother of Kamehameha V. It was a heiau built before the time of Kakuhihewa. In this temple the school of the priests of Oahu had its headquarters for centuries. The walls of the temple were adorned all around with heads of men offered in sacrifice. (ibid:27-28)

Kamakau (IN McAllister 1933) adds the following details on Pakaka heiau:

> Pakaka was an ancient temple, a Waihau pookena. It was built by Kamaunuihalakaipo the chief. Kuhooneenuu was the god.
>
> Holena and popoulu bananas hung in front of the female idols of the paehumu, and maoli bananas in front of the male idols at the altar (lele) inside the paehumu, which was of lama.
>
> At the back of the male images is the anuu, 24 ft. high, 18 ft. wide, covered with white oloa, standing on the North side of the house, and also the opu its height and width similar to the anuu, but this was laid with kapa aeokahaloa, resembling the Moeloa kapa. The small lama branches at top are like hair standing on end. The opu stands on the south side of the house facing the images and anuu, the space between the altar and the opu is well paved. In the middle of the space is...the house. The house is covered with dry...leaves (and made like the Hale o keawe) and is called Hale o Lono, made of lama wood; here the young chiefs stay. Two other houses called Hale Hui and Hale o Kaili were also enclosed. The former was for the collective gods, the other was for Kaili. Two lama posts were crossed at the entrance gate, before entering which one must divest himself of his clothing. Hale ai (Mua house?) was where the chief and others were, in which was the fireplace (umu).

The locations of Pakaka Heiau and other places Westervelt refers to are depicted on Figure 2.

Honolulu Harbor was created by the fresh water runoff from Nuuanu Stream; the runoff inhibits the coral growth in the bay (Stroup 1959:9). In Tropic Landfall, the author mentions "a rather obscure fishing settlement known as Kulolia...as an entry point for canoes...[entering] ...Nuuanu stream to [go to] villages in the valley" (Gessler 1942:6). This landing [entry point] and the harbor were known to the early Hawaiians as Ke Awa o Kou (The Harbor of Kou)

(Thrum 1893). Later, the area at the mouth of Nuuanu Stream would be referred to as Kapuukolu, "where white men and such dwelt" (Bishop Museum Press 1957). Around 1810, about 60 ha'ole residents lived in the vicinity (Wendt 1989:76).

Mary Kawena Pukui offers the following proverbs for the entrance to Honolulu Harbor, referred to as "Mamala":

> He kai hele kohana ko Mamala.
> A sea for going naked is at Mamala.
>
> The entrance to Honolulu Harbor was known as Mamala. In time of war the people took off their clothes and traveled along the reef to avoid meeting the enemy on land. (Pukui 1983:74 #656)
>
> Ka nuku o Malama.
> The mouth of Mamala.
>
> The entrance to Honolulu Harbor, named for a shark goddess who once lived in the vicinity. (ibid:163 #1510)
>
> Ke kai 'au umauma o Mamala.
> The sea of Mamala, where one swims at the surface. (ibid:185 #1718)
>
> Na 'ale kuehu o Mamala.
> The billows of Mamala with windblown sprays. (ibid:241 #2202)

Despite a reference to a fishing village known as Kulolia (Gessler 1942, p.8) in the Kou area, Kou is described in Stokes as a shoreline area having "no special importance to the natives" (Stokes 1933:41). According to Grace 1974:129), the area consisted "mostly mud flats and coral reefs rather than attractive beaches; it was not popular with the Hawaiians."

WESTERN DISCOVERY

English Captain William Brown of the *Butterworth* is usually credited as being the first Westerner to see and enter Honolulu Harbor; he entered the harbor in November of 1794 (Krauss 1987, Thrum 1893, Stroup 1959:10, Fornander 1969:II264, Bingham 1822:46, Alexander 1907:13, Westervelt 1910:81). Two sources, however, indicate that other visitors were the first to enter the harbor. The first reference is from the Archives Land Index, which cites Vancouver's Voyage of 1794:

> Mr. Whidby, in boats of the ship Discovery, apparently found Kalihi channel and [the] harbor to eastward, for he mentions another harbor, "Honoonono," which is probably Honolulu. (1801 Vol.III:361-2)

The second citation is from an article entitled "The First Discovery of Honolulu Harbor":

> Captain Portlock's Mr. Hayward "found a small bay with very deep water, close to a sandy beach,"....We must give the credit of discovering Honolulu Harbor to Mr. Hayward of the King George. He was the first white man to see and enter it, having been piloted there by "Towanooha" the awa-chewer, in December 1786. (Cartwright 1922:15)

The *Butterworth* was a fur trading ship that stopped in Hawaii for supplies. Captain Brown called the harbor "Fair Haven," but it was less romantically referred to for years by seamen as "Brown's Harbor" (Stroup 1959:11). In Brown's entourage were the schooner, *Jackall*, which is said to be the first vessel to enter the harbor, and her tender, *Prince Leeboo*, which followed shortly after (Krauss 1987, Thrum 1893:77, Kuykendall 1948:46).

Brown's discovery of the harbor came at a time when Kalanikupule, ruler of Oahu, was defending his land from Kaeo of Maui. Fornander writes of Brown's involvement in the battle between the two rulers:

> In the month of November 1794 Kaeo broke up his camp at Waianae and marched on Ewa. At a place named Punahawele he encountered the troops of Kalanikupule, who had received an auxiliary force of armed seamen from the English vessels "Jackal" and "Prince Leboo," under command of Captain Brown, who shortly previous had been the first to enter the harbour of Honolulu, known to the natives by the name of Kou. (Fornander 1969:264)

The only reference indicating payment for Brown's aid to Kalanikupule is by Westervelt:

> Captain Brown et al. demanded of Kalanikupule, to make the government of Oahu as payment...of their having assisted in the war with Kaeo. Kalanikupule refused them, [saying] "It is not right that the government be the reward for your help in the war, because, it was first agreed that the reward was one lau of pigs, which is ten forties, and is now four hundred." Brown et al. refused this, and still demanded that the government be the

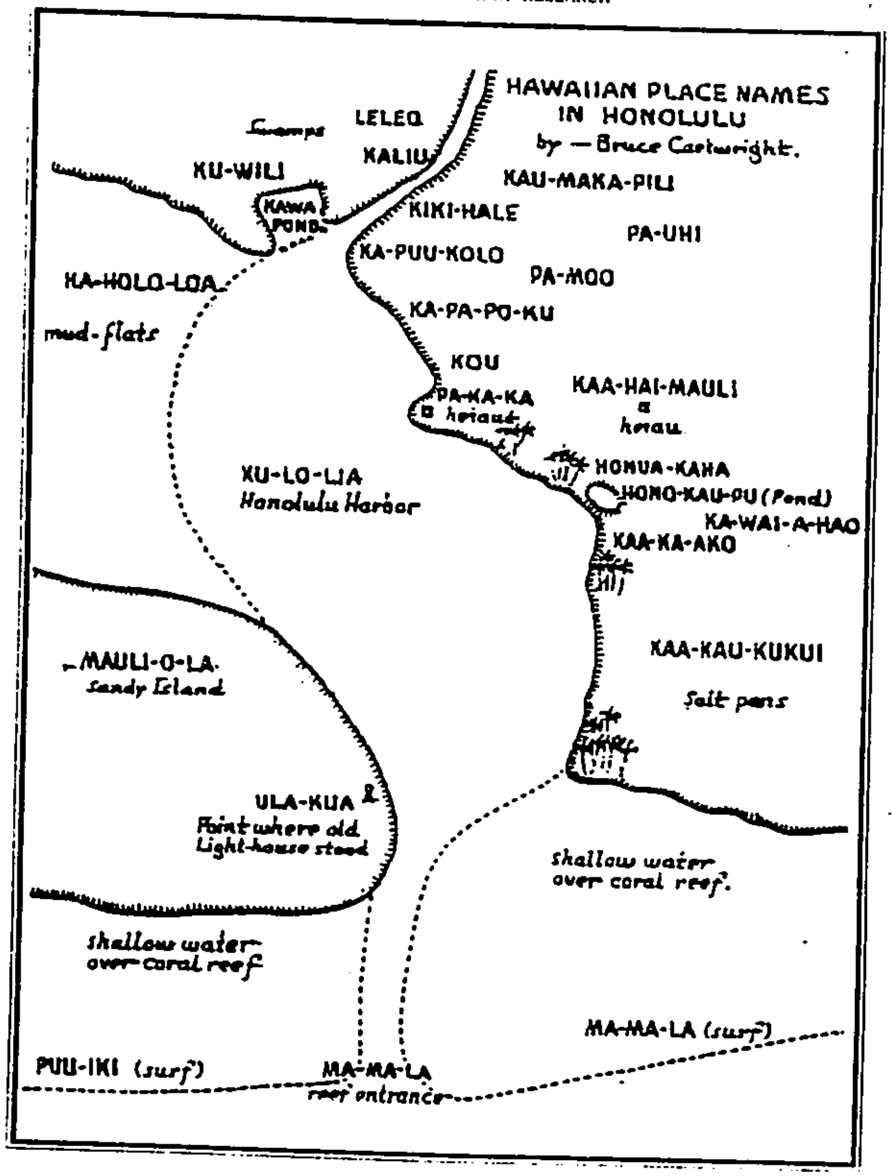

Figure 2. HAWAIIAN PLACE NAMES IN HONOLULU HARBOR BY CARTWRIGHT (1938)

reward. And because of this, the chiefs conspired to kill Brown et al. (Translation from Mr. E.H. Hart, interpreter of the Archives of Hawaii, IN Westervelt 1910:81)

The Reverend Hiram Bingham gives us a more detailed account of Captain Brown's aid to Kalanikupule, and an account of subsequent events:

> Captain Brown, who had returned from China with the Jackall and the Prince Leboo, was induced, injudiciously, to allow his mate and several men with muskets and ammunition to take part with the Oahu chief against Kaeo, who fell in battle, with many others, according to his wish not to die alone Kalanikupule and his party being victorious, maintained the appearance of friendliness towards Brown, to whom they had pointed out the entrance through the coral reef into the harbor of Honolulu, not before known to the civilized world.
>
> But, notwithstanding the aid which Captain Brown had rendered to Kalanikupule and his party, in defeating Kaeo, a plot was soon laid by them to cut him off, and capture the Jackall and Prince Leboo, the first foreign vessels that ever entered the harbor of Honolulu.
>
> Captain Brown having apparently formed an alliance with Kalanikupule (if he had not stipulated to have the island ceded to him, as has been hinted), and notwithstanding his exposure within a recently discovered reef harbor, he, on the 1st of Jan., 1795, employed most of the men of the two vessels in slaughtering and packing pork, on shore, and in procuring salt from a place at a little distance from his mooring. Armed natives, taking advantage of this, boarded the vessels, killed the captains and took possession. The ship-men on shore, and the boat's crew collecting salt, were by other natives assaulted and captured. These captives were shortly employed to fit the vessels for sea; under the immediate inspection of Kalanikupule and Kamohomoho, his prime agent, who had but a little before been commissioned by Kahekili to assist Vancouver in bringing to justice the murderers of Hergest, but who had now been the instigator of this barbarous piracy.
>
> The vessels were warped out of the harbor. The natives becoming sea-sick, the English rose upon them, and firing upon them, and beating them with the butts of their guns, drove overboard those who were on deck, and confined the king and queen and one or two attendants, in the cabin. The vessels being thus retaken, they stood out to sea till morning, then coming within five leagues of Waikiki, put their captives into a canoe and sent them ashore, and pursued their voyage, under the command of Messrs. Lamport and Bonallack. (Bingham 1969: 45-47)

Following Captain Brown's murder on Jan. 1, 1795, Lamport found:

> ...Capt. Brown's body stripped and tied by the hands and feet to a pole. The following day Mr. Lamport was sent for by the King, who was on board the Jackall, and being required to fit the vessels for sea, in order to attack Owhihee, he thought it prudent to consent. (Stokes 1933:83)

Alexander comments that the "conquest of Oahu by Kamehameha, which followed four months later, was a just retribution on them for this crime" (Alexander 1907:13).

Under Kamehameha's rule, Honolulu Harbor became the favored "resort for shipping" (ibid.). Although previously encamped at Waikiki, Kamehameha moved to the harbor area to conduct trading with visiting captains. A description of the area at the time of Kamehameha I's rule is given by Gideon Laanui, a retainer in Kamehameha's court:

> We came down to the shore of Kou (Honolulu Harbor), my parents and I. The king was awake night and day. My father was drilling with him. Our house was erected where the foreign church (Bethel) stands. Below that was the place of Hoaai folks. There stood the cluster of houses belonging to Kaainahuna folks. Adjoining was the drill house, their place. There we lived till the arrival of Kaumualii from Kauai on a foreign ship, commanded by Winship....It anchored outside Mamala....On landing at Pakaka they held audience there, after which was a prostration hookupu, at the close of which Kaumuali'i sailed for Kauai. (Thrum 1930: 87-88)

Another description of the area accompanies Paul Rockwood's map "Honolulu in 1810" (1957) (Figure 3):

> Near his place was the home of Kehimakai, full brother of Kamehameha, on the coral point "where the first custom house stood." There on the beach

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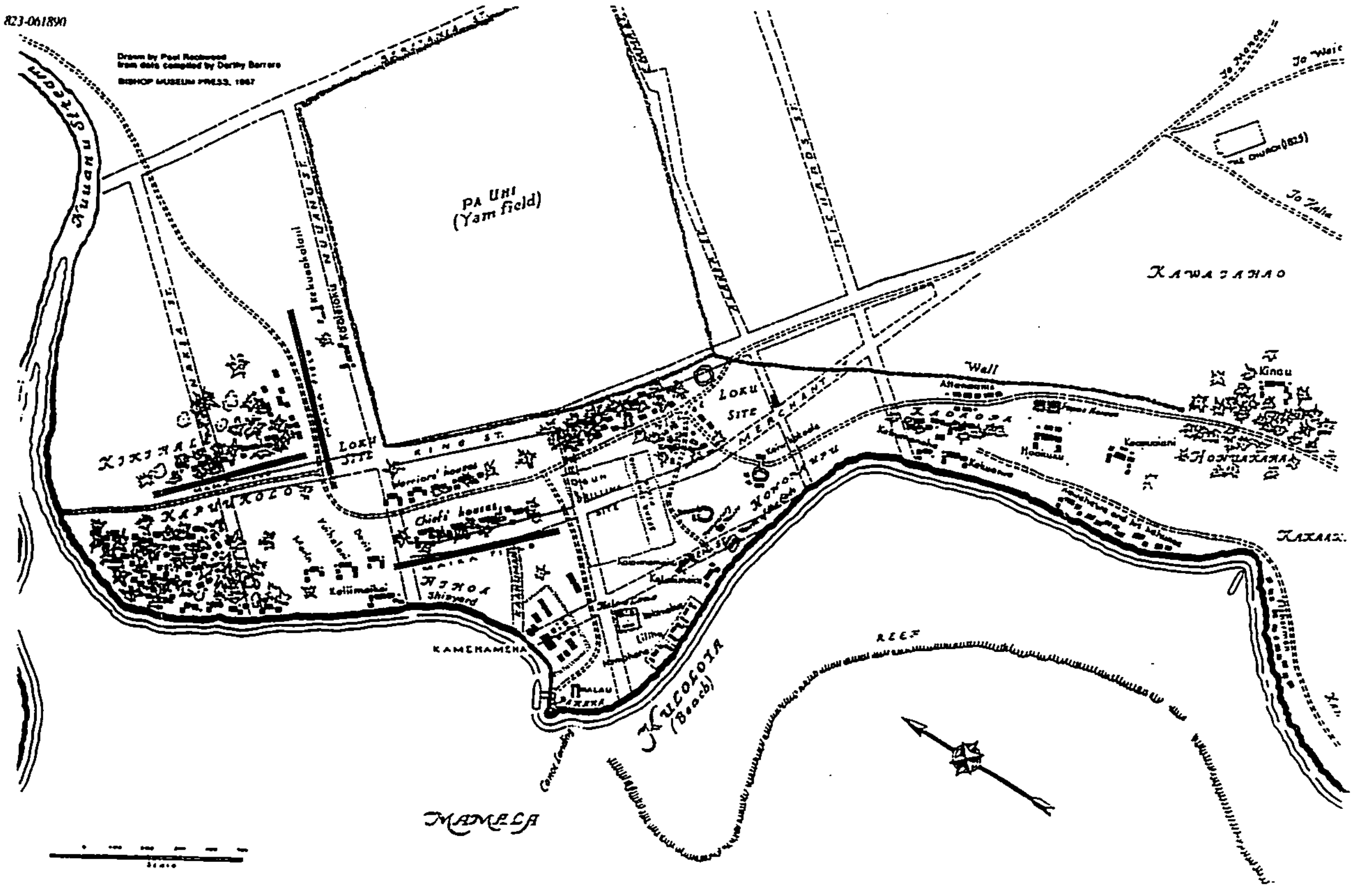

Figure 3. ROCKWOOD MAP

was a house for "the very first Chinese ever seen here."....Makai of the yam field were homes of warriors and lesser chiefs and on the shore at Nihoa, "between Kaahumanu and Nuuanu Streets," was a shipyard where foreign style vessels were being made by the Hawaiians under the tutelage of whites.

Next along the shoreline "surrounded by a fence" was the establishment of Kamehameha himself, consisting of many houses, for himself, for Kaahumanu and other chiefesses, and for his gods and his personal attendants. Close by were two drilling sites and a "foot racing" and maika field, where the king kept a personal eye on the performances of his warriors and chiefs. Near the shore, "in front of the courthouse," was a Hale-o-Lono, where Liholiho, later Kamehameha II, regularly kept the kapus of the gods therein. Next along the beach of Kulolia was the home of the chiefess Namahana, mother of Kaahumanu; that of Liliha, mother of Kamehamehas II and III; then that of Kalaniakua, sister or cousin of Liliha. Then came the residence of Kalanimoku, the king's prime minister, known to the foreigners as "Billy Pit." His residences were called Papakanene and Mokuaikaua, and the land long bore the name of Mokuaikaua.

One of Brown's crew, John Harbottle, either of the *Jackall* or *Prince Leeboo*, is recognized as the first harbor pilot (Paradise of the Pacific Dec. 1925:59). He acted in this capacity during Kamehameha I's reign (1795-1819). Although it is known that Alexander Adams was the harbormaster from 1820 to 1841, some argue that Harbottle was master as well as pilot (Stroup 1959:10).

The first known survey of the harbor was done by Captain William R. Broughton of the British ship *Providence* in 1796 (ibid.). The location of the chart resulting from this survey is not known.

The Rev. Archibald Campbell described the harbor in 1809-1810:

> The harbor is formed by the reef, which shelters it from the sea, and ships can ride within it in safety in any weather, upon a fine sandy bottom. There is a good channel through the reef, with three or four fathoms water; but if there is a swell it is not easily discovered, as the sea often breaks completely across. Pilots, however, are always to be had; John Hairbottle, [sic] captain of the Lilly Bird, generally acted as such. The best anchorage is in five fathoms water, about two cable lengths from the shore, directly in front of the village. Ships sometimes anchor on the outside of the reef, but they run the risk of having their cables cut by the coral. (Campbell 1816:157 IN Judd 1975, p.42))

In the first half of the 19th century, Levi Chamberlain stated that Premier Kinau refused a trading house lease in the vicinity of Piers 11 and 12, because, among other reasons, "it was the only place where the natives could bring in their canoes" (Stokes 1933:40). A map made in 1825 by Lt. Charles Malden of the *HMS Blonde* supports this statement by illustrating that deep water touches the shore only in the stated section, and that between this channel and the rest of the shore there were broad reef flats, more or less dry at low tide (Stokes 1933:42).

HONOLULU FORT

From the years 1816 to 1857, the most prominent structure on the Honolulu waterfront was Honolulu Fort. It was situated at the present location of Walker Park and the Hawaii Building at the foot of Fort Street Mall, between Queen Street and Nimitz Highway. The following paragraphs concerning Honolulu Fort are taken from Judd's Palaces and Forts of the Hawaiian Kingdom:

> Governor Alexander Baranov of the Russian-American Co. had long wished to establish a trading post in the Hawaiian Islands. The Russian trading vessels "Ilmena" and "Kodiak" arrived in Honolulu in the summer of 1816 with a complement of 80 to 90 men and, as was normal practice for the Russians (i.e. Alaska), they began to build a blockhouse trading post near the entrance of the harbor and ran up the Russian flag. (Judd 1975:41)
>
> King Kamehameha I, who was on the island of Hawaii at the time, sent his war leaders Kalanimoku and Pauli Kaoleioku with the Okaka Regiment to Oahu and ordered them: "You go fight the foreigner, but if there is no war, provide food and pigs for the foreigners." (Westervelt 1921)
>
> After a small contingent of Russians awoke one morning and found themselves surrounded by a large number of armed and hostile warriors, they left Honolulu and the island of Oahu in a hurry.

> Once he had evicted the Russians, Kalanimoku began to build a fort to protect the harbor on the same location as the partially constructed blockhouse. This fort was variously known to the Hawaiians as Kekuanohu (the Thorny Back, because of the bristling guns on the walls) or Kepapu (the Gun Wall). The location of Honolulu Fort was just makai of the present intersection of Fort Street Mall and Queen Streets. Fort Street at the time the fort was constructed was only a trail to the Pakaka canoe landing at the water's edge; in time it grew to a road known as Alanui Papu (street of/to the Gun Enclosure), and in more modern times received its present name. Queen St. was a path along the shore at the time of the fort's construction. (Judd 1975:42)

Kalanimoku issued a kuauhau (proclamation) requiring all subjects on Oahu to assemble at stated times to assist in building the fort (Judd 1975:43). (A few historians, including Stroup 1959:10, cite John Young as the overseer during construction of the fort.) The fort was a rectangular structure approximately 340 feet long by 300 feet wide, with walls 12 feet high and 20 feet thick at the base, encompassing a stockade of some 1,200 square feet (Judd 1975:42, Stroup 1959:10). Coral blocks from the nearby reef were used for the faces of the walls, and soil and rubble were used as filler. Its main entrance, fronting Fort Street, was closed by heavy wooden gates hung on massive iron hinges. Other entrances included a wicket (small door) in the eastern gate, and a sally port on the sea wall near the southeastern corner. The section fronting the harbor was on the edge of the water, and had curved surfaces designed to deflect cannonballs (ibid.:42).

Obviously, the Hawaiian kingdom felt foreigners had no business visiting the fort while construction was in progress; at least, without just cause. In November of 1816, Captain Otto von Kotzebue wrote:

> My intention of seeing the fort was frustrated by a sentinel calling out the word "Taboo." I afterwards learned that admission is refused to every stranger, especially Europeans. Karimoku (Kalanimoku) is always in the fort, where they are still at work, and the natives not being familiar with the use of cannon, they have appointed an Englishman, named George Beckley, who had formerly served in a merchantman, as commandant. The fort is nothing more than a square, supplied with loop-holes, the walls of which are two fathoms high, and built of coral stone. (von Kotzebue 1821:99 IN Judd 1975, p.46)

Another Russian explorer, Vasili Golovnin, visited Honolulu in 1818 and published a map of the shore of the harbor area. In addition to the fort, the map shows a stone storehouse on Pakaka Point, surrounded on three sides by narrow docks or landings, belonging to Kamehameha I; the stone house of Don Francisco de Marin is nearby. These were the only permanent structures in Honolulu (Wendt 1989:76). Alii residence in the area is indicated by the birth of Victoria Kamamlu who was boran at Honolulu Fort on June 2, 1825. On June 2, 1825, the first harbor regulations were issued and enforced (ibid.:11; Stroup 1959:11).

Various sketches and descriptions of the interior of the fort indicate considerable modifications during the 41 years it was used (between 1816 and 1857) (Judd 1975:47). Between 1816 and about 1830, ordnance at the fort increased to 40 cannon, ranging from six to thirty-two pounders, the larger cannon being mounted on the seaward wall. In 1838, 52 cannon were reported (Judd 1975:46). During the fort's existence, not a shot was fired in defense or anger; only saluting rounds were fired (ibid.).

The first capital punishment administered in the fort was on October 20, 1840, when Chief Kamanawa was hanged for poisoning his wife Kamokuiki. The gallows was set up on the parapet just east of the main gate, and the execution was attended by some 10,000 viewers (Judd 1975:50).

In Sketches and Maps of Old Honolulu, Ray Jerome Baker tells of the fort's role in the kingdom's system:

> Every kind of business was transacted here, taxes were paid in poi, fish, tapas, sandalwood and dollars. Captains came for sailors and for help in catching runaways. Marriage permits, criminals and offenders of all sorts were given short shift by the stern but fun-loving governor. (Judd 1975:50)

The prison cells of Honolulu Fort became infamous among seamen throughout the Pacific as well worth avoiding. In Personal Reminiscences of William Cooper Parke, Marshal of the Hawaiian Islands from 1850 to 1884, Parke states:

> The Fort continued to be used as a prison and insane asylum as well until 1857, so that at times it was very difficult to carry out the rules and regulations. The cells were very crowded at this time, the larger one holding thirty persons, and the small fifteen; in addition to these, in the fall of 1850, I had forty or fifty sailors locked up, who had

deserted from whale ships, and as these men were rather bad characters, I had hard work to enforce the discipline of the Fort. (Parke IN Judd 1975:50)

The Hawaiian Kingdom lost control of Honolulu Fort three times, each time without bloodshed. In 1830 a small Hawaiian internal power struggle erupted; in 1843 the British took over, ruling the kingdom for five months; and in 1849, the French sacked the fort. The French occupied the fort for ten days, and among other activities they destroyed gun carriages, threw the cannon off the parapets, and dumped fifty kegs of gunpowder into the sea. The Hawaiian Kingdom later presented a claim for over $100,000 in damages to the French Republic, but it was never paid (Judd 1975:51-55).

The whaling heyday in Hawaii lasted from about 1820 to 1860. Honolulu Harbor attempted to lure ships by waiving the harbor fees and giving free pilotage (Wendt 1989:11; Krauss 1987:2). Unimaginable crowding in the harbor resulted. Reports tell of 100 ships anchored in the harbor at one time (Wendt 1989:11). In 1850 it became evident that the harbor, crowded with Pacific whalers and ships trading in the California gold rush, required additional wharfs. After it was determined that Honolulu Fort was not a necessary part of the Hawaiian Kingdom's military establishment, with its peaceful policies, it was demolished in 1857. The 1,500 cubic yards of coral blocks that made up its walls became a 2,000-foot retaining wall used to extend the land out onto the shallow reef in the harbor. The core of the walls was used for backfill. The resultant increased area in the waterfront area (some fifteen-odd acres) was called Ainahau, or Esplanade. The Marshal's department was relocated, and a new prison was built at Iwilei at a cost of $10,000 (Alexander 1907:25). Later, wharves and slips were built, and additional valuable expansion space was acquired by the Government (Paradise of the Pacific, Feb. 1898:18; Judd 1975:59).

DEVELOPMENT OF THE HARBOR

In 1822, James Robinson and Robert Lawrence, survivors of a shipwreck at French Frigate Shoals, started a ship repair service at Honolulu that later became "Robinson's Shipyard," the first in Hawaii (Polynesian Oct. 23:2). (Note that Figure 3 depicts a "shipyard.") In 1827, a combined wharf and shipyard was built by Robinson & Co. in the vicinity of the fort (Stroup 1959:12).

The first wharf was improvised in 1825 at a point a little to the northward of the foot of Nuuanu Street, and was used by Ladd & Co. For eight years it was Honolulu Harbor's only terminal facility (Stroup 1959:11). This first wharf was composed of a sunken hulk that was hauled in and placed there with the consent of the King and Kinau. In 1837, the hulk was removed and a substantial wharf was built in its place; the building was overseen by Captain John Meek, and was at the joint expense of Messrs. Ladd & Co. and E. Grimes & Co. While the piles for the wharves were being driven, the King sent for a member of the firm of Ladd & Co. (Mr. P. Brinsmade) to inquire about the proceeding: "They met in Hale Kauwila (a noted building that stood makai or seaward of the present site of Hackfeld & Co.'s store), and on answering the natural enquiries the King expressed himself as pleased with the work and evidence of progress" (Thrum 1891:143).

Figure 4 shows the harbor area and notes channel depths. A market wharf, as well as two privately built wharves that are most likely Robinson's and Ladd's, are shown. The "Tombs of Kings" shown on the map has been relocated to the grounds of Iolani Palace. The fort area is now where Walker Park and part of the Nimitz Highway are located. Nuuanu Stream, as depicted on the map, is shown as a small stream winding beneath concrete bridges of the city (Wendt 1989:20).

Beginning in 1840, the dredging of the harbor and filling in of tidelands extended the waterfront. As mentioned earlier, the bulk of this area was created in 1857 and was known as the Esplanade. Later, the area of the Esplanade became an area of many piers (Stroup 1959:12). About 1847, the Privy Council was concerned about the mud from Nuuanu Stream filling up the harbor. The following entry dated June 24, 1847, describes their plan of action:

> "...Resolved, That Governor Kekuanaoa be directed to request Capt. Baillie and Capt. de la Borgne to accompany Judge Lee, and to examine the mouths of the streams which empty into the harbor of Honolulu, and to give their opinion as to the best means to prevent the west from filling up the harbor, whether it be necessary to destroy the fishpond, and how much of it, whether it be necessary to build any new walls, and to give the conclusions in writing." In the report of the Minister of the Interior to the Legislature of 1848 it is stated that the above committee recommended "the construction of a breakwater or wall, to intercept the deposit of mud and to change the direction of the current; which recommendation has since been acted upon." This breakwater extended from the Emmes wharf, near the old lime kiln, about 940 feet W.S.W. across the inner harbor. (Alexander 1907:15)

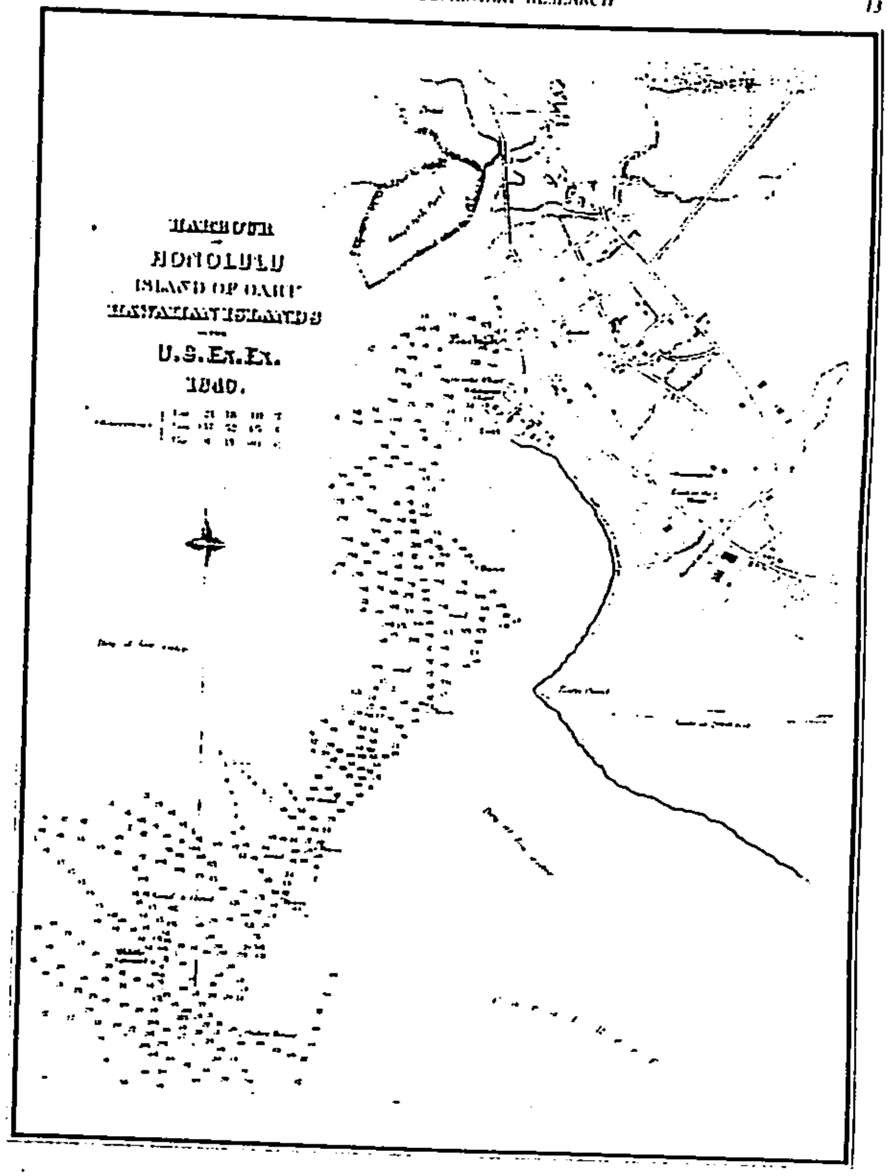

Figure 4. LT. MALDEN'S MAP OF HONOLULU HARBOR (1840)

In order to develop the waterfront into a lucrative harbor facility, the Hawaiian Government recognized that they needed to fill in much of the shallow water (reef tidelands) between the existing shore and the wall (breakwater) mentioned above. Legal title to some 3.21 acres of Waikahalulu, the land section fronting the proposed fill, was awarded to Queen Kalama during the Mahele (LCA 4452, Board of Commissioners 1929:729). At the time of the award, the portion seaward of the land was not considered to be within the award. The Land Commissioners generally assumed as a principle of Common Law that "the rights of the King as Sovereign, extend from high water mark, a marine league to sea, and to all channels between the islands, and that no private rights can be sustained except rights of fishing and of cutting stone, as provided for and reserved by Law" (Privy Council, Aug. 29, 1850). Accordingly, nothing more than fishing rights beyond that limit were awarded. The only cases which raised any question were in and around the harbor of Honolulu (Alexander 1907:19).

In March of 1852, when the King and Privy Council granted a lease of a part of the reef in question to the North Pacific Steamship Co., Kanaina, Kalama's uncle and guardian, protested, claiming the reef in the name of Queen Kalama; his claim was disregarded by the Council. After a full hearing of evidence from both sides, the Land Commission awarded the Waikahalulu Water Lots to the Government (LCA 11,219) on Jan. 31, 1854 (Alexander 1907:19).

Queen Kalama, however, was unwilling to abide by this decision. In excerpts from correspondence undertaken by Kamehameha III, we can follow the negotiations that took place:

> [I say] that my Queen had a claim to one-eighth of the said place, for the sum of $10,000, as her right in equity. We do not at all yield the rights which we have by law to the place now in dispute, but for the sake of peace, we consent to receive the sum of $25,000 for our rights therein.

Following a counter-offer, the king replied as follows:

> It has been reported to me that you contemplate appropriating the sum of $15,000 to purchase the right and title of my wife to the reef of Waikahalulu on the seaward side of Honolulu. This is my communication to you. My wife will be satisfied if you appropriate $30,000 for that object; but if you deem that to be impossible, then that will be the end of the matter. Respectfully, Kamehameha.

On July 8, 1854, Dr. Judd presented "a petition from a responsible company for the right to purchase the Waikahalulu reef for $100,000 with the privilege of taking the material for filling out of the harbor on the west side, beginning at the wall or breakwater, and from the foot of Punch Bowl Hill, and of laying down rails to the hill, with a free right of way while the work was going on" (Alexander 1907:23). On September 11, 1854, the Queen offered to sell her claim to the Government for $25,000. Thereupon a resolution was passed, stating that an Act had passed the Legislature appropriating $22,000 to adjust all conflicting claims (ibid.). The deed of the Waikahalulu reef property from Queen Dowager Kalama to the Government, in accordance with Webster's survey, was executed Jan. 17, 1855 and was recorded on March 22, 1855, in Book 6, page 538 (ibid.:24). To commence with improvements, the Legislature of 1854 appropriated $30,000 for dredging the harbor, and $15,000 for improving the Waikahalulu lots (Alexander 1907:25).

Prior to 1854, ships were hauled into docking positions, first by manned canoes, then with lines hand-drawn by men who trudged up Richards Street. Later, oxen were employed to pull on the lines (Wendt 1989:11, Bush 1957:14). In 1854 the first steam tugboat, the *Pele*, was put into use in Honolulu Harbor to assist in docking vessels. (Figure 5 shows the configuration of Honolulu Harbor in 1854.) The Minister of Interior's report for 1857 indicates that Honolulu Harbor had five wharves and a total berthing frontage of 600 feet and was capable of handling ships of 1,500 gross tons. Between 1857 and 1870, 22 acres of reef land between Fort Street and Alakea Street was filled in with material dredged from the harbor at a cost of approximately $239,000. A harbor light was placed on Sand Island in 1860 at a cost of $6,340 (Bush 1957:14).

On May 15, 1867, the Hawaiian Gazette announced:

> The water along the wharf, from Messrs. Robinson & Co.'s yard to the first jetty, will be deepened to 24 feet; sand and mud have filled it in so that a loaded ship can not anchor at the wharf without grounding.

On August 10th of the same year, the Advertiser reported on the establishment of a bonded warehouse near the then-existing custom house. These were both located mauka (inland) of the Esplanade. These two structures were razed in 1926 to make room for Piers 8 through 11.

In 1876, the signing of the Reciprocity Treaty with the U.S., which allowed the duty-free importation of Hawaiian sugar, was the impetus for much new development in the

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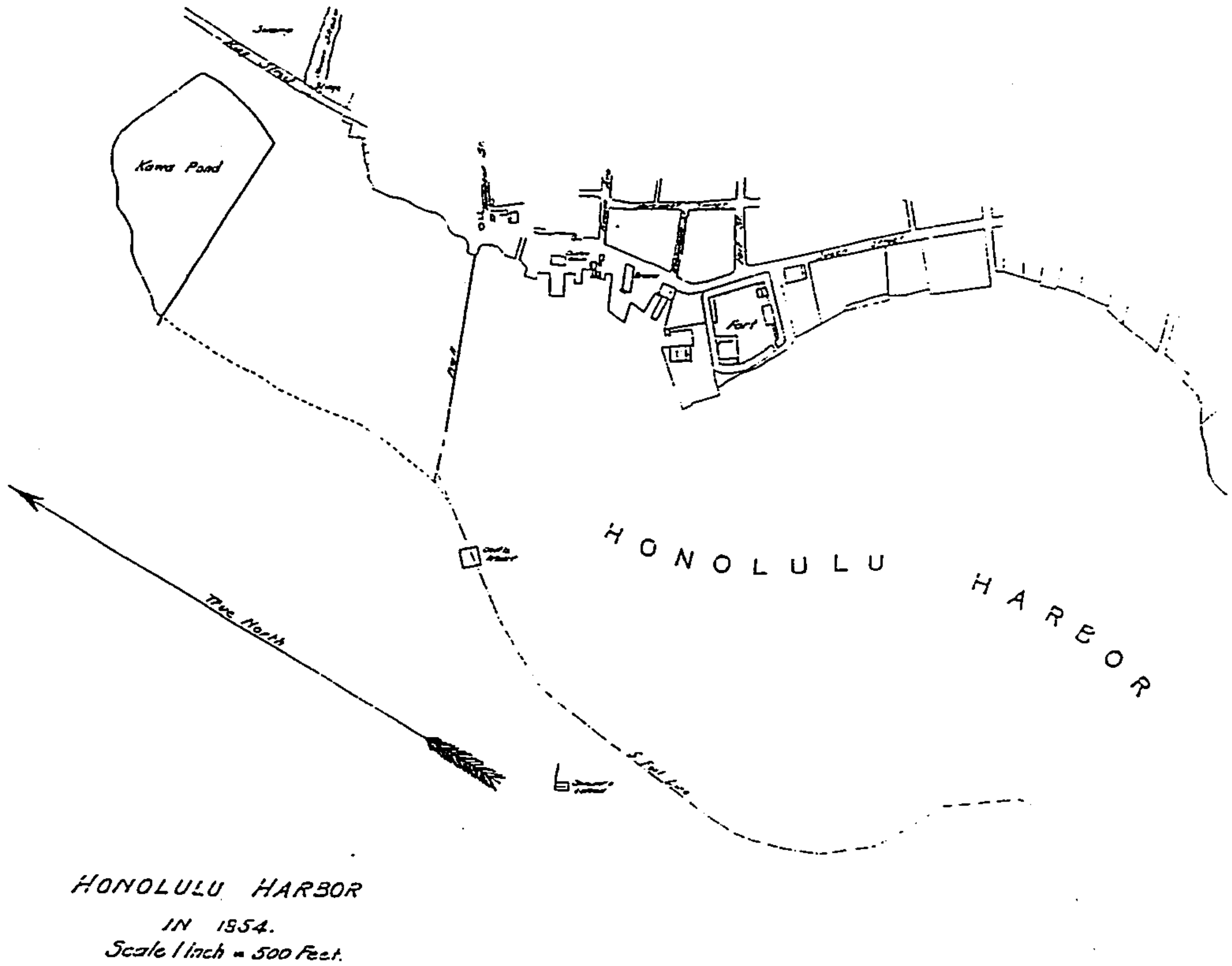

Figure 5. HONOLULU HARBOR, 1854

harbor area. During the years 1884-85, about 61,000 cubic yards of mud were dredged from the harbor and deposited on shore at a cost of nearly $40,000 to the Government (Allardt 1890:5). In a special 1890 report to the Minister to the Interior, the status of the harbor is noted:

> The harbor of Honolulu is a deep, narrow channel extending from the shoreline out to the deep waters of the open sea, a distance of about 7000 feet. It is flanked on both sides by extensive mud and sand flats which are bounded on the sea-ward side by a line of coral reefs, more or less broken, upon which the surf is constantly breaking. The width of the channel directly in front of the city is from 800 to 900 feet, gradually contracting to a width of about 450 feet at its mouth [sic]. The bar is situated near the outer end of the channel, is about one thousand feet in length above the plane of 30 feet depth, and has on its apex a minimum depth of 21 feet at low tide....It is proposed to excavate across this bar a straight channel two hundred feet in width to a uniform depth of thirty feet at low tide, with side-slopes of two horizontal to one vertical. (Allardt 1890:2)

Until 1893, the bar mentioned above prevented all vessels of over 22 feet draught from entering (Paradise of the Pacific Feb. 1898:18). During the period 1891 to 1898, the Hawaiian Government expended $347,000 in dredging the harbor basin and improving the entrance channel (Bush 1957:14). Figure 6 depicts the harbor area in 1893. In 1898, the method used to remove the bar was described:

> The work removing the bar was attended with some difficulty although it was not such a task as was at first anticipated. Owing to the strength of the waves and the force of the tide it was found necessary to abandon the use of the government dredger. A cast iron mouthpiece was connected to the suction pipe in place of the teeth and the sand pumped out to the full capacity of the pipe. The current of water that was sucked in by the pump was sufficient to loosen the sand. The bottom was found to be a succession of hummocks and pits. These were removed and leveled until the required depth of 30 feet at mean low water was reached. A distance of 1,200 feet was cleared and it was found unnecessary to dredge further as the channel was, for the remainder of the 4,200 feet to the light-house, deep enough. The Oceanic was the first ocean steamer to take advantage of the increased depth and enter the harbor. She came in on May 9, 1893. The whole work was completed the same month. (Paradise of the Pacific Feb. 1898)

A NEW CENTURY

After Hawaii's annexation by the United States, jurisdiction of harbor affairs changed hands. In 1900, with the passage of the Organic Act, duties pertaining to harbors that were formerly handled by the Minister of the Interior fell into the hands of the Superintendent of Public Works (Bush 1957:15). In 1902, the department had jurisdiction over 13 publicly owned wharves in Honolulu Harbor, a cattle pen, and a landing on Quarantine (now Sand) Island (ibid.). Quarantine Island was constructed on the harbor's offshore reef area, a reflection of public health concerns resulting from the influx of immigrants and increasing visits of ships from everywhere (Wendt 1989:22).

Formerly known as a dry area, with only a limited supply of brackish water, the harbor area became a thriving community with the development of artesian water sources. Figure 7 shows the location of various artesian wells in the Honolulu area, as well as the rapidly growing Honolulu of 1901. The coastal plain west of Nuuanu Stream was about that time subdivided into agricultural land tracts. The business districts of Aala and Iwilei were defined. A new executive mansion and a jail were located at opposite ends of the business area. At the lower right of the map, the Esplanade and the beginnings of the piers are shown.

In 1913, 1,909 vessels tied up at 22 available berths (Grace 1972:129). During the next 12 years, miscellaneous improvements to wharves and the dredging of slips took place. Between 1900 and 1957, the Honolulu Construction and Dredging Co. completely modified the original harbor, and much of the Kewalo-Waikiki area as well.

A June 30, 1914 report by the Superintendent of Public Works assigns numbers to the wharves, which were to be used henceforth in referring to them. The numbers assigned to wharves within the project area are as follows:

Pier No.
- 5 - Naval Wharf No. 1
- 5a - Naval Wharf No. 2
- 6 - Richards Street Wharf
- 7 - Alakea Street Wharf
- 8 - Fort Street Bulkhead (slip)
- 9 - Fort Street Bulkhead (front)
- 10 - Oceanic Wharf
- 11 - Allen & Robinson Frontage
- 12 - Brewers Wharf
- 13 - Nuuanu Wharf

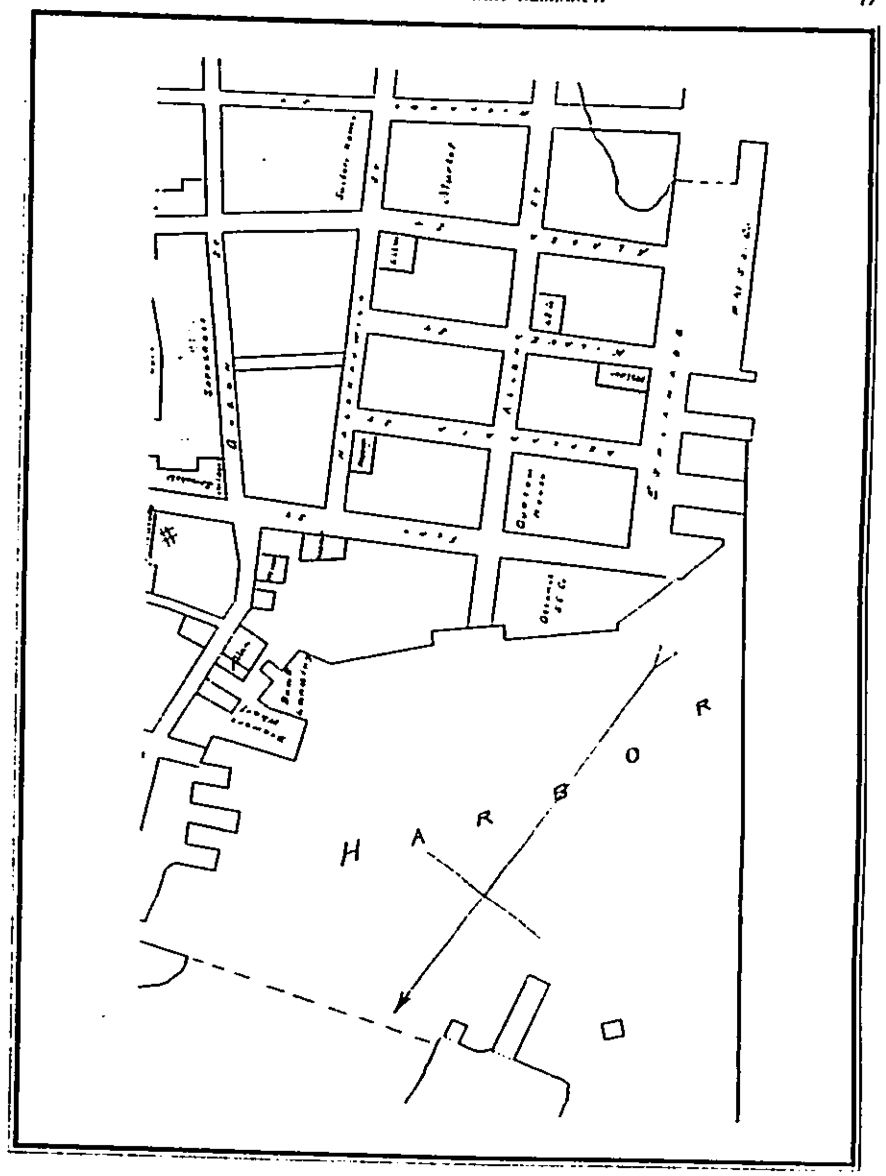

Figure 6. HONOLULU HARBOR BY F.S. DODGE (DEC. 30, 1893)

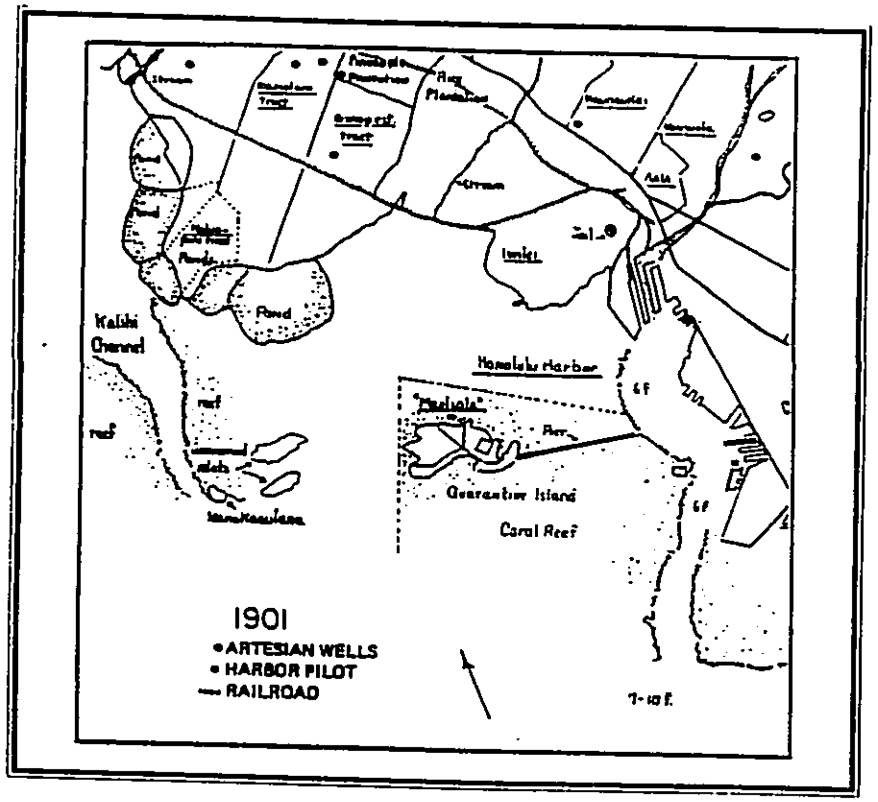

Figure 7. MODIFIED BISHOP MUSEUM MAP (1901) TAKEN FROM WENDT (1989)

Pier No. 14 - Sorenson's or Maunakea Wharf
15 - Queen Street Bulkhead.
(Bush 1957:15)

By 1923, Quarantine Island had been enlarged using landfill, and part of it was being used as a U.S. reservation (Wendt 1989:24). The enlarging of the island eliminated the need for a breakwater in the harbor (Maritime Museum, Aloha Tower File). Figure 8 shows that the harbor has been enlarged and improved.

A preliminary examination of Honolulu Harbor by the Secretary of War in 1932 found that improvements by the local and federal governments had included enlarging the entrance of the channel to a width of 400 feet, increasing its depth to 35 feet, giving the harbor basin the same depth, and enlarging its dimensions to 3,800 feet long by 1,200 feet wide (Hurley 1932:9).

Here is a capsule summary of some of the physical changes in the harbor area since 1923, as documented by Wendt (1989):

> 1923 - The Iwilei district has been extended seaward by considerable landfill to joining Quarantine Island. Fill was obtained primarily from dredging of the inner harbor areas. [see Figure 9]
>
> Quarantine Island, in turn, has been enlarged by landfill. Part of the island became a U.S. reservation area.
>
> Harbor wharf areas are improved and enlarged, and Honolulu town has expanded eastward and into lower valley regions. (1989:24).
>
> 1938 - The landfill connection between Iwilei and Sand Island has been severed, creating a channel between Kalihi Basin and Honolulu Harbor. A possible reason might have been to promote better circulation (ibid:26).
>
> 1962 - A rear entrance from Honolulu Harbor to Kapalama Basin has been dredged across the old fill that once connected Sand Island to the shore.
>
> During the war the islands were under military rule. The gradually built-up Honolulu reef that protected the harbor was used as an internee camp. Large areas were awash during very high tides.

Quarantine Island, also known as Sand Island, was renamed Anuenue Island for a brief period. It was finally renamed Sand Island. Sand Island was once a small, nearly submerged reef fronting the harbor. Over time, it was elevated and enlarged by harbor dredge materials, construction debris, and solidified incinerator wastes. Today the ocean and channel side is a large public park (ibid:30). For several years, one or more incinerators dumped solid residue along a section of the shore as fill (ibid:28).

ALOHA TOWER

The timbers, mud bricks, and coral blocks from the old Honolulu Fort were used for landfill to extend the harbor waterfront. This newly created area, well beyond the old shoreline, at the location of the Esplanade, is where Aloha Tower and its Piers 8, 9, 10, and 11 are located. Construction of Piers 8 and 9 commenced at the end of World War I (pers. comm., Stan Melman 6/25/90). Construction of Pier 10 was started in 1922, and construction of Pier 11 was started in 1927. Pier 11's facade is notable for its rounded arches, which will be incorporated into the proposed renovation.

Construction of Aloha Tower was begun in December 1924 by C.W. Winstedt and the National Construction Co., under the direction of a Harbor Board composed at that time of Chairman Lyman H. Bigelow, and Commissioners James H. Wakefield and James Winne (Bosthwick; article in Hawaii Maritime Center). According to Harbor Board minutes, Piers 8, 9, and 10 were completed at a cost of $480,000; the steel frame of the tower was built by Honolulu Iron Works for $161,053; and construction of the tower itself was done at a cost of $190,000 (ibid.). The structure, then and for several decades the tallest in Honolulu, was opened for business in June 1926, as a "clearing house" for the arrival of ships. During World War II, the tower was completely camouflaged and was closed to the public. In 1947 the tower was refurbished; the refurbishing included restoring its original Spanish white, visible 16 miles out at sea (Paradise of the Pacific, March 1949 B1-3).

In 1926, the U.S. Government exchanged with Damon estate other lands for lots at the Esplanade. In 1930, Helene Irwin Fagan, in memory to her father, William, deeded to the Board of Harbor Commissioners a portion of the lot that is now known as Irwin Memorial Park.

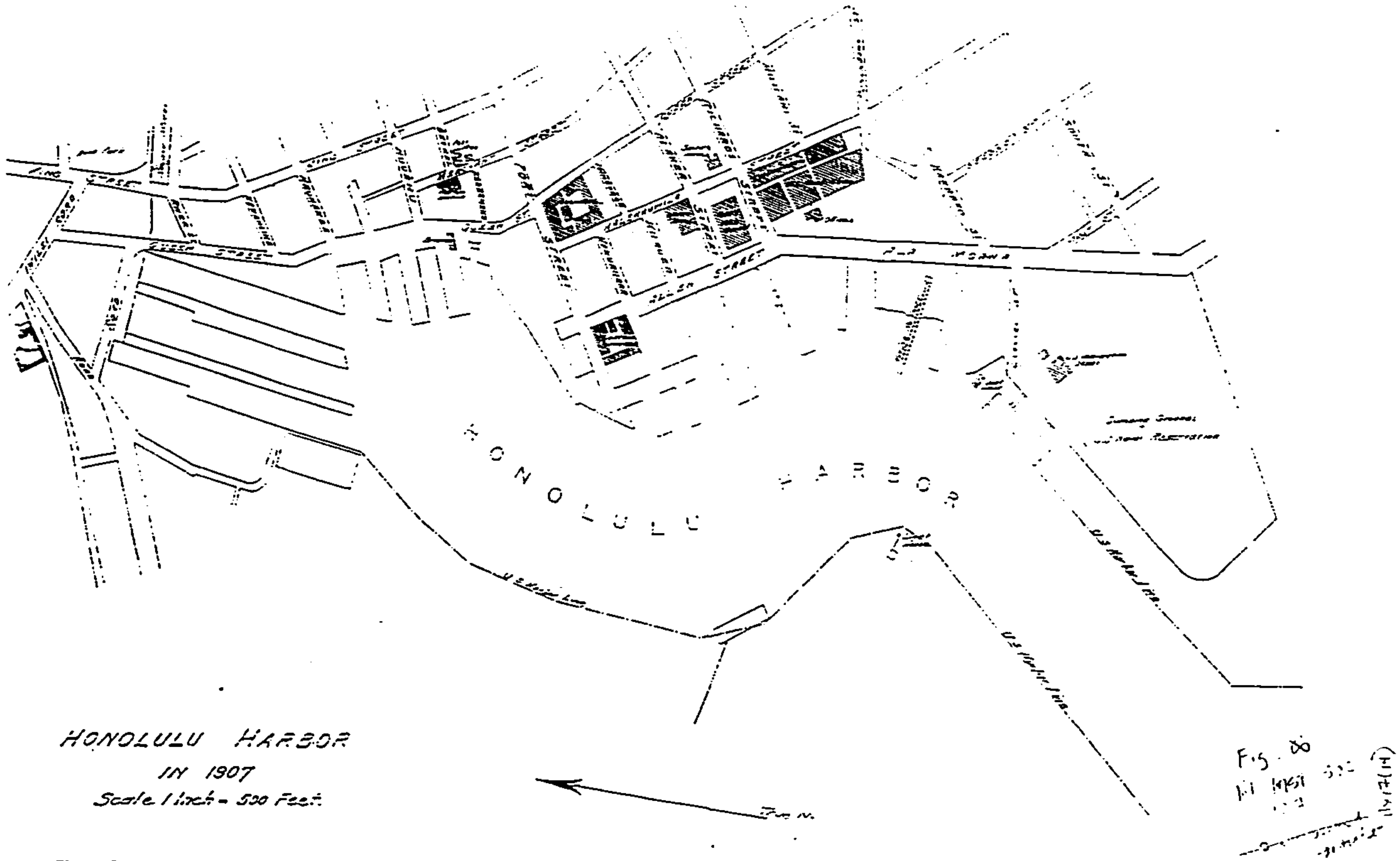

Figure 8. HONOLULU HARBOR 1907

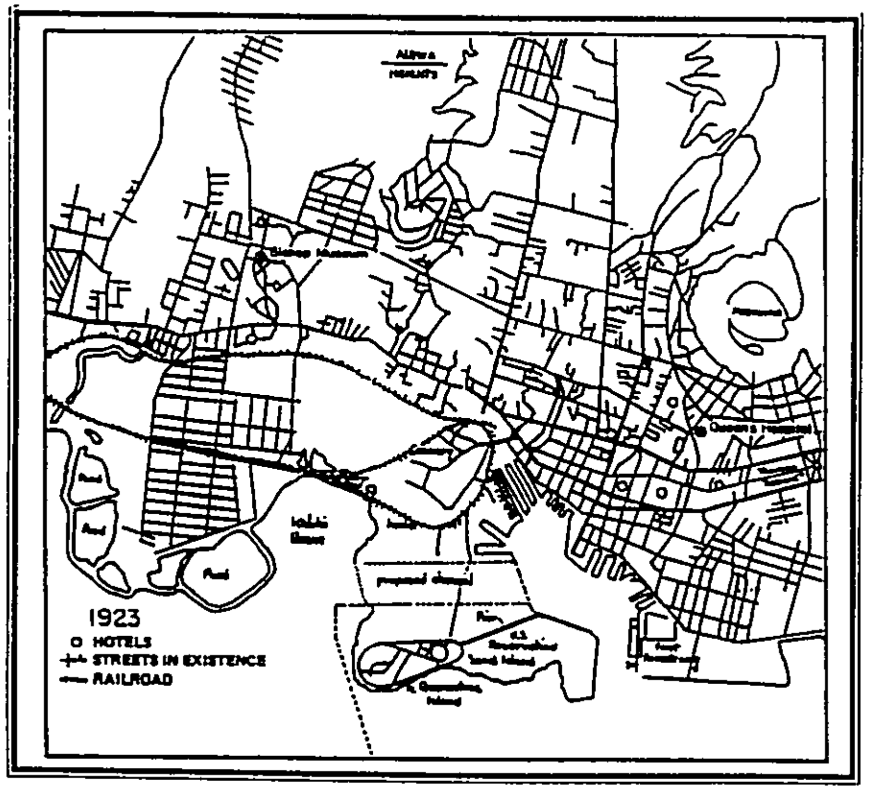

Figure 9. ***MODIFIED BISHOP MUSEUM MAP (1923) TAKEN FROM WENDT (1989)***

Aloha Tower was the scene of what can be termed the "Gala Harbor Days." The following description of the days when a ship's arrival was the biggest event in town is given by Wendt:

> From the mid-1800s to the late 1930s Honolulu Harbor was the focus of attention whenever a ship arrived. The crew and passengers were sources of news from the rest of the world. The letters and parcels the ship carried were prized personal news.
>
> Townspeople were alerted to boat arrivals by a lookout stationed on top of Puowaina (Punchbowl). A tar barrel was set afire and rolled down the hill. Later, a less dangerous semaphore system was installed in the Kaimuki "saddle" area. Because each ship and shipping company insisted on its own signals, no one could recall what the various signals meant. The system quickly collapsed, but Kaimuki was known as "Telegraph Hill" for a long time thereafter. Once a telegraph system was established with the West Coast and sail was replaced by steampower in the mid-1850s, ships could maintain schedules. By the early 1920s, passenger ships and cargo ships were arriving about every 12 days (1989:15).

WORLD WAR II

Just prior to U.S. involvement in World War II, controversy regarding harbor growth was building. Excerpts from an article published on March 29, 1941, in the short-lived magazine <u>Hawaii</u>, present both sides of the argument:

> BUILD PIER FIFTEEN - NOW! urge proponents of public development of Honolulu harbor. Just as urgent is the voice of opponents: "DON'T over-build the harbor!"
>
> A strong case has been built up by proponents of the pier 15 plan for immediate provision for the project. The Maritime committee of the Chamber of Commerce, the Harbor Board, Matson, Inter-Island, American President Lines, and NYK have declared themselves solidly behind the project, complete as laid out in the Harbor Board plans, site and all. Since these backers include those who must use Honolulu's harbor facilities, their arguments cannot be dismissed lightly.
>
> On several points Pier 15 backers are emphatic: 1) there is serious congestion in the harbor affecting freight movement and turn-around of ships, 2) obsolescence of piers and increased difficulty in handling freight threatens to put the Territory out of the pier business unless immediate remedial action is taken, 3) abnormal present conditions aside, future growth of Honolulu will insure continued need of planned wharf space, 5) [sic] congestion is not due in large measure to lack of stevedore labor, 6) the Harbor Board should be given immediate authorization to expend $2,500,000—to be raised by bond issue—for construction of pier 15 (in three stages, first stage planned for completion in two years, balance as conditions permit).
>
> Just as emphatically, opponents of immediate expansion contend: 1) congestion of port is due to the abnormal shipping of the defense program, shortage of stevedore labor, Kauai strike (freight to and from has to be re-handled in Honolulu harbor), 2) wharf space is sufficient to handle much more than normal freight; not often hopelessly congested even with present abnormal flow (day-by-day graph covering past three months showing slightly more than 50 percent pier utilization offered as evidence), 3) Hawaii's population growth expectancy is not sufficient to justify further harbor expansion for some time to come, 4) present apparent congestion due primarily to split-cargo practice in unloading, coupled with insufficiency of stevedore labor quickly and efficiently to unload ships, 5) proposed pier 15 site is not best suited to alleviate congestion if such existed, 6) shortage of labor and materials, uncertainty of financial future make it unwise to embark on a $2,500,000 harbor expansion program at the present time.
>
> Obsolescence and shortage of wharf area has taken serious toll of Territorial revenue, income from tolls and wharfage charges dropping from $467,819.72 in 1938 to $265,323.90 in 1940—biggest year in the history of the port. Presently private piers, with 521,735 sq. ft area are handling approximately 67% of freight moving through the port, while public piers, with 607,944 sq ft. handle only 33%. Modern, efficient facilities of private wharves attract shippers away from the obsolete, inefficient public wharves.

It is interesting to note, however, that while territorial facilities have remained static since 1931, private construction—mostly in 1938—increased private wharf areas from 213,235 sq. ft. to the present 521,735 sq. ft.

On December 7, 1941, Aloha Tower was strafed by Japanese warplanes, and the harbormaster at that time, James Friel, was almost hit (Krauss 1987:9). During the war, the Army Port & Service Command took over control of all operations at the harbor (U.S. Army Forces 1948:5). Their headquarters were located on Sand Island. Prior to the war, the Port of Honolulu was handling an average of 70,000 tons of Army cargo monthly. With the commencement of the war, a doubling of that tonnage was expected. Volume was much greater than expected, averaging 470,000 tons, with a peak in July 1944 of 538,000 tons (ibid.:13). During the war the area of the built-up reef was used for an internee camp (Wendt 1989:28).

POST WORLD WAR II AND MODERN USES

Following the war, in 1947, Pier 6 was removed when it became a hazard to navigation. Piers 5 and 5a were turned over to the Territory for Harbor Board Control by executive order of the President. After the removal of Pier 6, Pier 5a was designated as 6. Both Piers 5 and 5a were in the future to be demolished (Wendt 1989:16). In 1956, $6.5 million were expended on Piers 5, 6, 7, and 8 (Krauss 1987). This work included filling in the area between Piers 5 and 6, building the mezzanine and ramp, and rebuilding of Piers 8, 9, and 10 (pers. comm., Stan Melman 6/25/90). Like Piers 5 and 6, Pier 12 has since been demolished; it is currently used as a parking lot.

Just prior to building Aloha Tower, Piers 8, 9, and 10 were taking form. The piling and decking for these piers had been built from 1918 to 1920. In April of 1921 the pier sheds, two story warehouse structures, were being built. In photos it is evident that the area of Pier 11 at that time was still occupied by buildings and a crooked street. In 1925-26, the pier facing for Pier 11 was constructed, and a structure was completed by 1927. It is obvious that Piers 8,9, and 10 are of a different time and style from Pier 11 by the window design on the promenade and Pier 11's ornate facade (Stan Melman, pers. comm. 6/26/90).

The present Pier 13-14 replaced two old wooden Piers 13 and 14, which were located one on either side of the present piers; the wooden piers were torn out to make way for the present reinforced concrete pier constructed in 1931 for use by Inter-Island Steam Navigation Co.. Owned by the State, the pier is presently the base of a company called Pacific Marine, which repairs ships (Higa 1983:2).

A large portion of the former area of Pier 15 was taken when the waterfront highway (Nimitz Highway) was constructed in 1952 (Bush 1957:16).

Presently docked at Pier 7 is the *Falls of Clyde*, the first four-masted, full-rigged ship to call at the Port of Honolulu. Built in 1878, it was originally designed for the wool trade with Australia. Captain Matson bought the ship in December of 1898, and used it primarily to haul cane and goods to and from Hilo Harbor. In 1907 it was converted to a tanker, transporting oil to the plantations and molasses to California. Its tanks could hold 750,000 gallons of either commodity. The *Falls of Clyde* was retired in 1922. In 1959 it was taken to Alaska; the ship was returned home to Honolulu in 1963 (pers. comm., Stan Melman 6/25/90). In 1971, the ship moved to Pier 5 where it was opened to the public (Annual Report, State Dept. of Transportation 1971:23). In 1982, Hurricane Iwa caused a surge that broke the ship's mooring lines and damaged the ship and its mooring facility. Dillingham tugs towed it to Pier 39. Today the ship is on display at Pier 7; the hole in its hull (damaged at the time of the hurricane) has been cosmetically repaired.

In 1989, the various piers in the project area were used as shown in Table 1.

ARCHAEOLOGICAL FIELD INSPECTION

A pedestrian field inspection of the project area was conducted by Principal Archaeologist Dr. Paul H. Rosendahl on June 27, 1990. Dr. Rosendahl inspected all exposed areas of the waterfront. At Pier 12, the submerged coral blocks were viewed. Dr. Rosendahl reports that the blocks extend up to ten feet out from the pier. They are obviously cut coral blocks; average size of the blocks are 2-3 feet by 1.0 foot by 2.5 feet. In some areas, the blocks are double-stacked and retain fill over which Pier 12 has been built. The blocks appear to also be mortared.

Table 1.

PIER USE IN 1989

Pier #	Cargo/Pier Use	Users
5	Alii Kai Catamaran, Oceania	Alii Kai Catamaran
6	Windjammer Cruises	Windjammer Cruises
7	HI Maritime Center, Falls of Clyde, small cruise ships	HI Maritime Center, Windjammer Cruises
8	Cruise ships, passeng., auto parking	Aloha Pacific Cruises, Sea Link of Hawaii, The Webe Corp.
9	Cruise ships, passeng., auto parking	American Hawaii Cruises, Caleb Brett (USA) Inc., Hawaii Exam Prep Center, Hawaii Pilots Association
10	Cruise ships, passeng., auto parking	U.S. Customs, S G. Lam
11	Cruise ships, passeng., auto parking	American Hawaii Cruises, Hawaii-Pacific Maritime Inc., McCabe, Hamilton & Renney Co., Ltd., Harbors Division Admin., Theo Davies Marine Agencies
12	Same as 11 and Hokulea emergency tie-up space	Nahoku Catamaran, Polynesian Voyaging Society
13	Tugs, auto park., barges, bunker fuel	Mid-Pacific Towing, American Workboats
14	Tugs, auto park., bunker fuel	American Workboats, Umikewa Diving Salvage & Fishing
15	Fireboat	Honolulu Fire Dept.

(Information in this table taken from Wendt 1989:41)

CONCLUSION

DISCUSSION

The present research has contributed data useful in understanding physical changes in the area of Honolulu Harbor. Obviously, the area has over the years undergone massive, extensive changes. It is evident during the prehistoric period that the project area was almost entirely submerged. Figure 1 shows the project area in relation to the shoreline in 1810. Only a small portion of the 1810 shoreline (a land point) overlaps the project area. This land point was later removed during channel dredging. The project area, then, consists entirely of historic period fill. There are no intact prehistoric remains in the area, or if there are such remains, they are subsurface and have been brought in with the fill.

The information gathered during the current study indicates that the only historically significant structures in the project area are Aloha Tower and its associated grounds, and Piers 8-12. The historical and cultural significance of Aloha Tower is well established; it has been placed on historical registers, and current development plans make it the focal point of the waterfront area. Pier 12 has been chosen as the site of Honolulu Fort Historic Park. Piers 8, 9, 10, and 11 are over 50 years old. According to David Lyman (pers. comm. 6/28/90), the blocks from Honolulu Fort were used as bulkheads for Piers 8 through 12. According to the State Historic Sites Section, the fact that these piers are over 50 years old in itself suggests they are historically significant (pers. comm., Carol Kawachi 6/20/90); however, to date none of the piers have been nominated to the Hawaiian Register of Historic Places. According to Historic Sites Office Director, Don Hibbard, the piers have both architectural and cultural significance due to their character of design and association with history (pers. comm., 6/26/90). Hibbard believes that the visual elements inherent in the piers' design are important facets of the waterfront. Other piers in the project area are unlikely candidates for preservation—they have been dramatically reconstructed.

As mentioned, Pier 12 has been chosen as the site of the Honolulu Fort Historic Park. Although it is not the original site of the Honolulu Fort (the fort's location would be closer to the Amfac courtyard, it's outer boundaries in the middle of Nimitz Highway), its planned location affords a view of several historical areas. These include a canoe landing, Pakaka Heiau, the submerged coral blocks from Honolulu Fort (located off Pier 12), and the location of the ship hulk that was used as the first pier (based on the lack of any records of the moving of the hulk from its location as a pier, Captain David Lyman suspects that the hulk is still in the Pier 12 vicinity, submerged).

GENERAL SIGNIFICANCE ASSESSMENTS AND RECOMMENDED GENERAL TREATMENTS

Based on the information from the current project, the only structures in the project area that require assessment for significance are Piers 8, 9, 10, and 11. Significance categories used in the site evaluation process are based on the National Register criteria for evaluation, as outlined in the Code of Federal Regulations (36 CFR Part 60). GHPO uses these criteria for evaluating cultural resources. The purpose of the National Register is to list properties that are "...significant in American history, architecture, archaeology and culture..." (NHPA Sec 101 [a][1]). A property has significance if it satisfies each of two categories comprising the National Register criteria for evaluation (36 CFR Part 60.4): (1) the site must possess integrity of location, design, setting, materials, workmanship, feeling, and association; and (2) it must be characterized by at least one of the following:

(a) It must be associated with events that made significant contributions to broad patterns of history;

(b) It must be associated with the lives of persons significant in the past;

(c) It must embody distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic value or represent a significant and distinguishable entity whose components may lack individual distinction (representative examples of site types); or

(d) It must have yielded, or may be likely to yield, information important in prehistory or history (information content) (36 CFR Part 60.6)

Sites with potential cultural significance (Category C) are evaluated under guidelines prepared by the Advisory Council on Historic Preservation (ACHP) entitled "Guidelines for Consideration of Traditional Cultural Values in Historic Preservation Review" (ACHP 1985). The guidelines define cultural value as "...the contribution made by an historic property to an ongoing society or cultural system. A traditional cultural value is a cultural value that has historical depth" (1985:1). The guidelines further specify that "[a] property need not have been in consistent use since antiquity by a cultural system in order to have traditional cultural value" (1985:7).

In order to facilitate future client management decisions regarding site treatments, Piers 8, 9, 10, and 11 are further evaluated in terms of PHRI CRM (Cultural Resource Management) value modes, which are derived from the previously mentioned state and federal evaluation criteria. The archaeological sites are evaluated in terms of potential scientific research, interpretive, and/or cultural values. *Research value* refers to the potential of archaeological resources for producing information useful in the understanding of culture history, past lifeways, and cultural processes at the local, regional, and interregional levels of organization. *Interpretive value* refers to the potential of archaeological resources for public education and recreation. *Cultural value* refers to the potential of archaeological resources to preserve and promote cultural and ethnic identity and values.

Based on the above federal/state criteria, Piers 8, 9, 10, and 11 are assessed as significant for (a) and (c) above. Based on the CRM value modes, the piers are assessed as moderately significant for interpretive value, and of low significance in terms of cultural value and information content.

As indicated by these assessments, and as indicated in this report, the piers provide a link to Hawaii's past, primarily through their architecture. The present plans for the project area include incorporating a replica of the facade of Pier 11 into the overall project design. This seems adequate mitigation of the historical values of Piers 8-11.

During the course of the present study, much information was perused, and much information has been presented. If, however, it is decided that further documentary research should be conducted, it is recommended that that the following be done: (a) research U.S. military activities during and after World War II, (b) ascertain exact cartographic coordinates for pre-1856 maps and modern maps to show more precisely the changes in the waterfront shoreline, and (c) conduct interviews with people familiar with the waterfront area. The military information would be useful in that it may provide insight on structural changes within the project area. For the interviews, it is suggested that Abraham Pi'ianai'a, University of Hawaii at Manoa geography lecturer, be interviewed. Mr. Pi'ianai'a's association with the waterfront goes back to the 1920s, when he worked on interisland steamships. Other persons who could be interviewed include Robert Pfeiffer, CEO of Alexander & Baldwin, who worked for Interisland Steamship before WWII; Captains David Lyman, and Frank Kapele.

The evaluations and recommendations presented within this final report have been based on an archaeological field inspection of the project area, and historical documentary information. It should be noted, however, that there is always the possibility that potentially significant, unidentified subsurface cultural remains will be encountered in the course of future archaeological investigations or subsequent development activities. In such situations, archaeological consultation should be sought immediately.

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APPENDIX A

MARITIME CHRONOLOGY FOR HONOLULU HARBOR

Taken mostly verbatim from Krauss (1987) and Wendt (1989)

1794 Capt Brown of the British ship *Butterworth* is the first European to anchor in "Fair Haven." (Earlier arrivals thought the narrow, coral-filled passageway was too dangerous.) The harbor is first entered by the British schooner *Jackall* and her tender, followed shortly after by *Prince Leeboo* and *Lady Washington*. The reef inclosed lagoon provides a safe haven in any weather. Trade between the ships' officers and the chiefs begins immediately, especially for guns, which results in bad blood on both sides.

1795 John Harbottle, crew member of either the *Jackall* or *Prince Leeboo*, comes ashore and becomes one of the first harbor pilots of Honolulu. Early recognition that regulations were necessary for safety.

1820-60 Hawaii's whaling spree period. Unimaginable crowding in the harbor. Some reports claim 100 ships were anchored in the harbor at one time.

1816 Construction of Honolulu Fort on the area now covered by Nimitz Highway.

1820 The Brig *Thaddeus* arrives. Its 160-day voyage from Boston brought the first missionary passengers.

1822 James Robinson and Robert Lawrence, survivors of a shipwreck at French Frigate Shoals, start a ship repair service at Honolulu. It becomes Robinson's Shipyard, Honolulu's first.

1825 The first wharf is put in place, a sunken hulk hauled to the foot of Nuuanu St. It is used by Ladd & Co. First harbor regulations are issued and enforced. One of the first two laws promulgated in the Hawaiian Kingdom proclaims that seamen who riot or disturb the peace shall be imprisoned in the Fort until $30 is paid.

1826 First American vessel visits Honolulu.

1828 Eighty ships can be moored in safety and the bottom is mud varying from three to six fathoms (18 to 36 feet).

1836 Visitor Theodore Barret says he landed in Honolulu at a wharf built of large timbers and filled in with stones.

1844 Wharves listed at Honolulu this year are James Robinson & Co.; Reynolds Wharf, French & Charlton Wharf. Longtime H.H. pilot Alexander Adams retires. the new pilot is D.P. Penhallow.

1847 Harbor fees at Honolulu are remitted and ships given free pilotage in an attempt to lure more of the whaling fleet there. The Government wharf collapses under the weight of oil, bricks, anchors and wooden casks landed from the Bremen ship *Patriot*.

1850 Honolulu Harbor is closed for two weeks by a Kona weather. Ships cannot get out against a strong southwesterly wind. Merchants are pleased by the number of vessels loading produce for San Francisco where the Forty Niners are paying high prices. Honolulu also serves as a center for the transhipment of whale oil and bone. The newspaper editor calls for more dock space. Only three or four vessels can unload at once. Shipping produce to California has become so profitable that ships are now touching at Kalepolepo at Maui for Kula potatoes at $3.50 per barrel, and at Mahukona on Hawaii for Kohala potatoes and onions.

1853 First interisland steamship company is founded. *Akamai*, first sidewheeler, enters interisland service. It is hard to believe that steam vessels were already in use 135 years ago. As late as 1928, some steamships were required to carry a full set of sails in case of engine failure.

1853 Vessels in Honolulu Harbor are trapped for two weeks in January by unfavorable winds. Passengers arriving by ship in February cause the worst smallpox epidemic seen at the port. The clipper ship *Sovereign of the Seas* dumps 200 tons of stone ballast, the clipper *Onward* 100 tons, which is used for harbor fill to create building lots near Robinson's wharf.

1854 The Polynesian editor complains of poor loading facilities at H.H. A ship drawing 18 feet or more must commence discharging while six to 20 feet from the wharf and haul in as it lightens up. The legislature appropriates $40,000 for dredging the bar and the harbor. A steam tug is first used at Honolulu when the steamer *Akamai* is taken off interisland runs and is used to tow the clipper *N.B. Palmer* out of the harbor. Civil engineer William Webster submits a plan to use fill from dredging the harbor for land reclamation. This is much discussed among shippers and government officials.

1854 First steamer, *Akamai*, built in 1849 at Eastport, Maine arrives in Honolulu. It replaced the oxen that were used to pull ships into the harbor. The oxen had taken the place of men who trudged up Richards Street pulling ships toward shore (Wendt 1989).

1856 A harbor dredger named *Kaulu* is brought in and assembled at Honolulu but the work goes slowly and the machinery cannot cut the bar. It is used solely inside the harbor. A bid by James Munroe is accepted to build a propeller steam tug. She is named *Pele* and is launched on July 31 off Mauna Kea Street. She makes money immediately. *Pele* was in serve until 1885 (Krauss 1987).

1857 Honolulu boasts 5 "good wharves" & at least 5 stone houses.

1857 The most visible landmark on Honolulu Harbor, the Fort, is torn down and its coral blocks used as fill to create building lots and a wharf called the Esplanade at the foot of Fort Street. Honolulu Harbor has spawned a city with four ship chandleries, 20 importing houses, 50 to 60 retail stores, 12 hotels, 10 physicians, five printing offices and six churches.

1859 A visitor writes that the entrance of Honolulu Harbor is very narrow. The channel is marked by barrels used as buoys, and a bell which rings each time a wave passes by. The bell permits pilots to find the channel at night.

1860 Five sidewheelers are in interisland service. *Annie Laurie #5* is the first steam schooner built in Hawaii.

1865 Arrival of first Chinese immigrants.

1865 The dredge has deepened Honolulu Harbor from 16 to 21 feet at the Market Wharf and from 18 to 23 feet at the Custom House Wharf.

1869 A lighthouse is erected on Sand Island at the entrance to Honolulu Harbor. It is first lit on Aug 8. The cost is $6,340. First yacht races in Honolulu Harbor.

1877 Samuel G. Wilder enters interisland trade w/the steamer *Likelike*.

1878 The first interisland steamer, *James Makee*, goes into service.

1878 Arrival of Portuguese immigrants.

1884 A newspaper editor complains about the lack of a landing for the Quarantine Station in Honolulu Harbor. Immigrants must wade to shore. They cut their feet on coral. Wilder Steam Ship Co. is building a wharf 110 feet long. A new harbor landmark, the Lucas Planing Mill tower, is inaugurated by the installation of a clock and the blowing of a steam whistle to announce ship arrivals.

1892 The bar of Honolulu Harbor is dredged to a depth of 20 feet and widened 200 feet for a distance of 1,100 feet. The fill is used to construct 28 new acres. Oahu Railway & Land Co. installs coal handling machinery.

1898 The U.S. annexes the Kingdom of Hawaii.

1918 A civilian coaling station is constructed at Pier 27.

1918 Union and Associated Oil companies sublease tract from Dowsett estate where Honolulu Coaling Station was built.

1919 Pier 2 near the entrance to the harbor is under construction. During recent renovation of this pier, very large, hand-hewn ohia timbers used to build the original wharf were discovered in perfect condition.

1921 Aloha Tower complex construction begins in response to increasing tourist trade.

1920s Interisland steamship company adds air service, but interisland steamers remain popular until World War II.

1924 Honolulu Harbor has 28 wharves and piers.

1926 Aloha Tower is completed, at 10 stories the tallest building in Honolulu. Writers wax poetic: "Piercing the eternal blue of Hawaii's skies, Aloha Tower, beacon of tropic friendship to the world, will stand forth in all its splendor and glory on Thursday, May 20, for that date will mark the completion of Honolulu's newest architectural triumph." Piers 8,9,10 & 11 are opened for business.

1930s A ferry boat landing is constructed on Sand Island, now built up above the high-tide level. A remnant of the landing still exists.

1937 Coal-handling equipment on pier finally scrapped, and wharf converted to a profitable addition to the Interisland Overseas Terminal.

1938 Interisland Steam Navigation Co. moves docking operations from Piers 12, 13, and 14 to newly constructed Piers 27, 28, and 29 (Thomas 1983).

1941 Construction of Pier 29 by Interisland Steam Navigation Co. is started early in the year.

1950s A bascule drawbridge connecting Sand Island to Oahu is built but rarely used.

1954 Diamond Head Terminal is built along the west side of Honolulu Harbor adjacent to Fort Armstrong and occupied by Matson Co.

1980s Matson Co. moves to Sand Island Terminal.

1985 Barbers Point Harbor, the extension of Honolulu Harbor, is dedicated.

1986 More than half of our international trade is focused on petroleum products.

1986 Half of our imports are automobiles. Electronic products account for much of the balance.

1986 Total ship movements number 4,300. Of these 1,968 were overseas voyages.

APPENDIX B

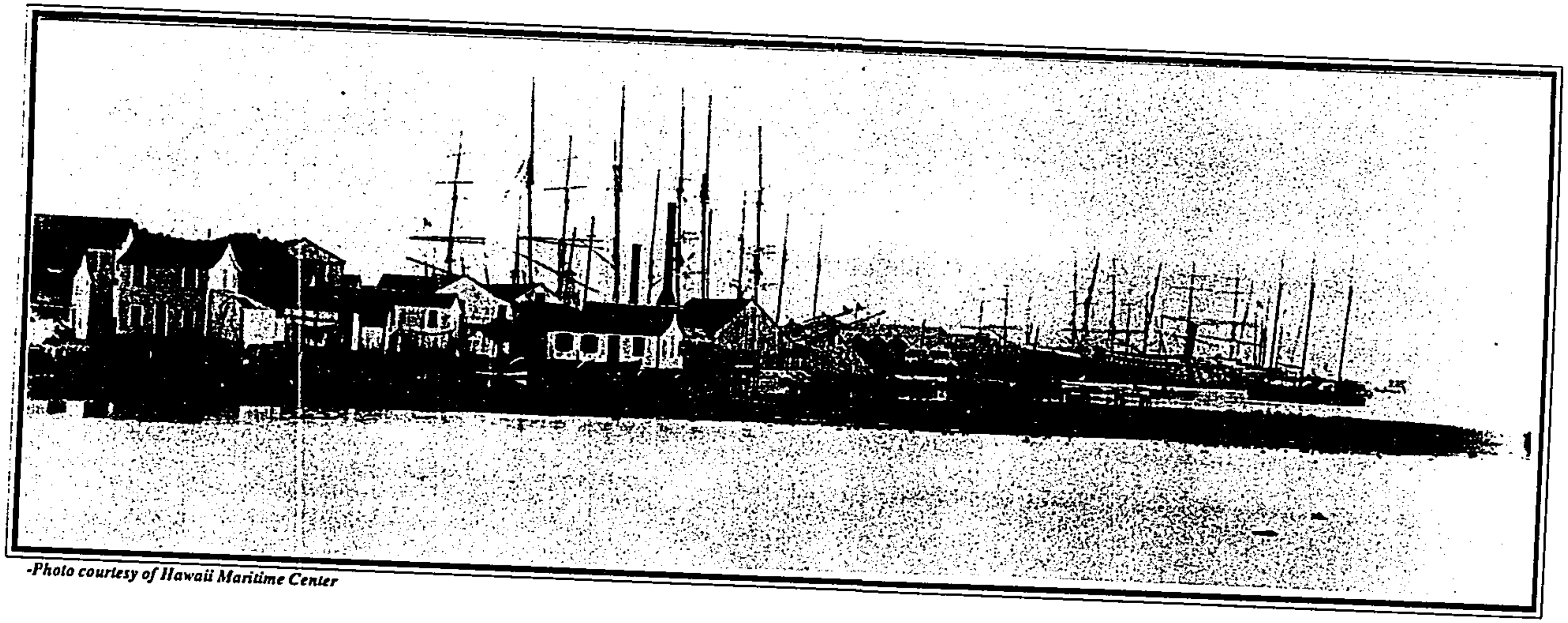
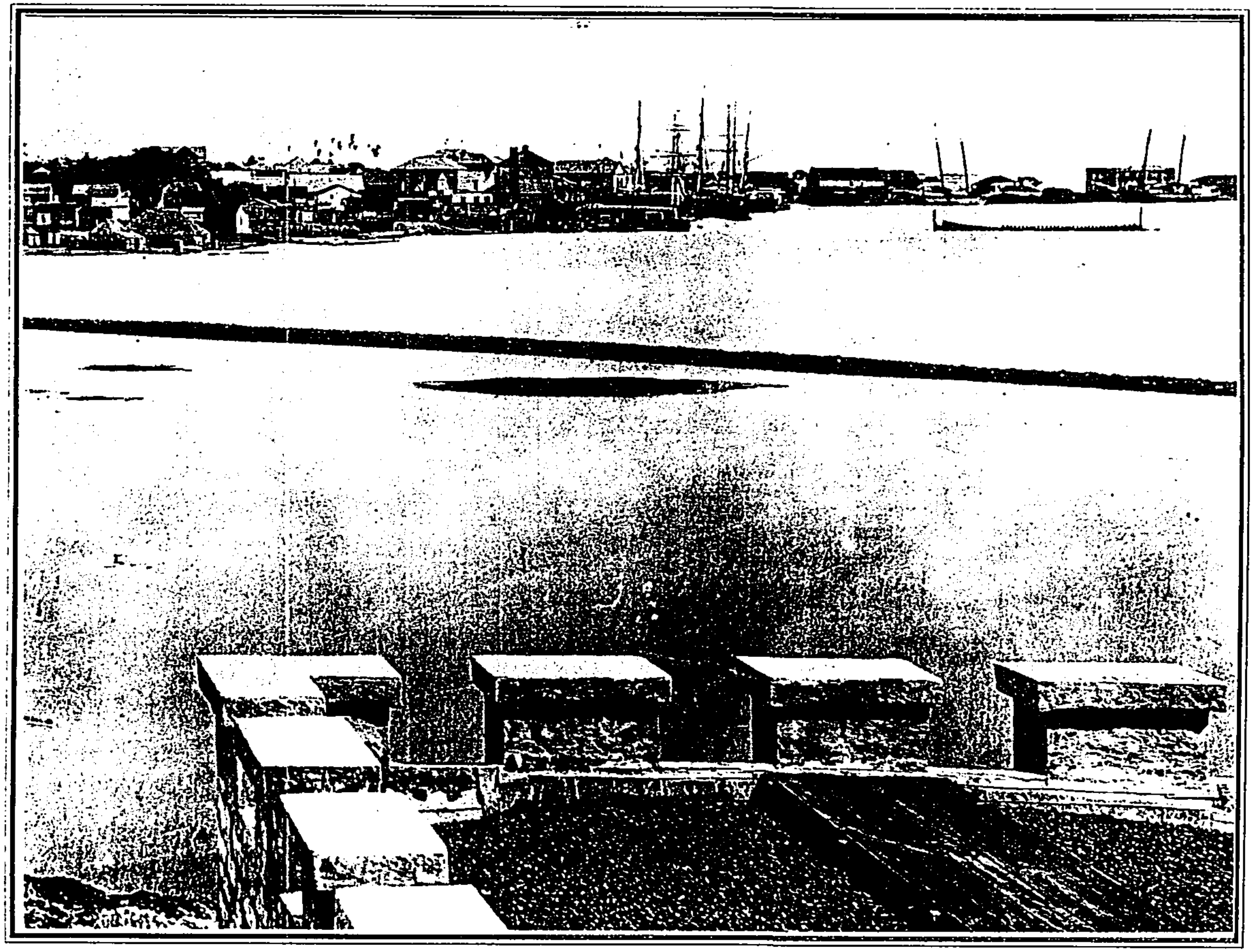

-Photo courtesy of Hawaii Maritime Center

Figure B-1. HONOLULU HARBOR c. 1850. Vicinity of Pier 15, the mouth of Nuuanu Stream. To the right, The Australia, a passenger vessel is docked at Pier 10.

-Photo courtesy of R. J. Baker Collection, B.P. Bishop Museum

Figure B-2. HONOLULU LOOKING MA KAI, c. 1853. (CHARITY SCHOOL)



·Photo courtesy of Hawaii State Archives

Figure B-3. HONOLULU HARBOR FROM PRISON AT IWILEI c. 1858.
Fishpond in foreground and fishtrap in right background.

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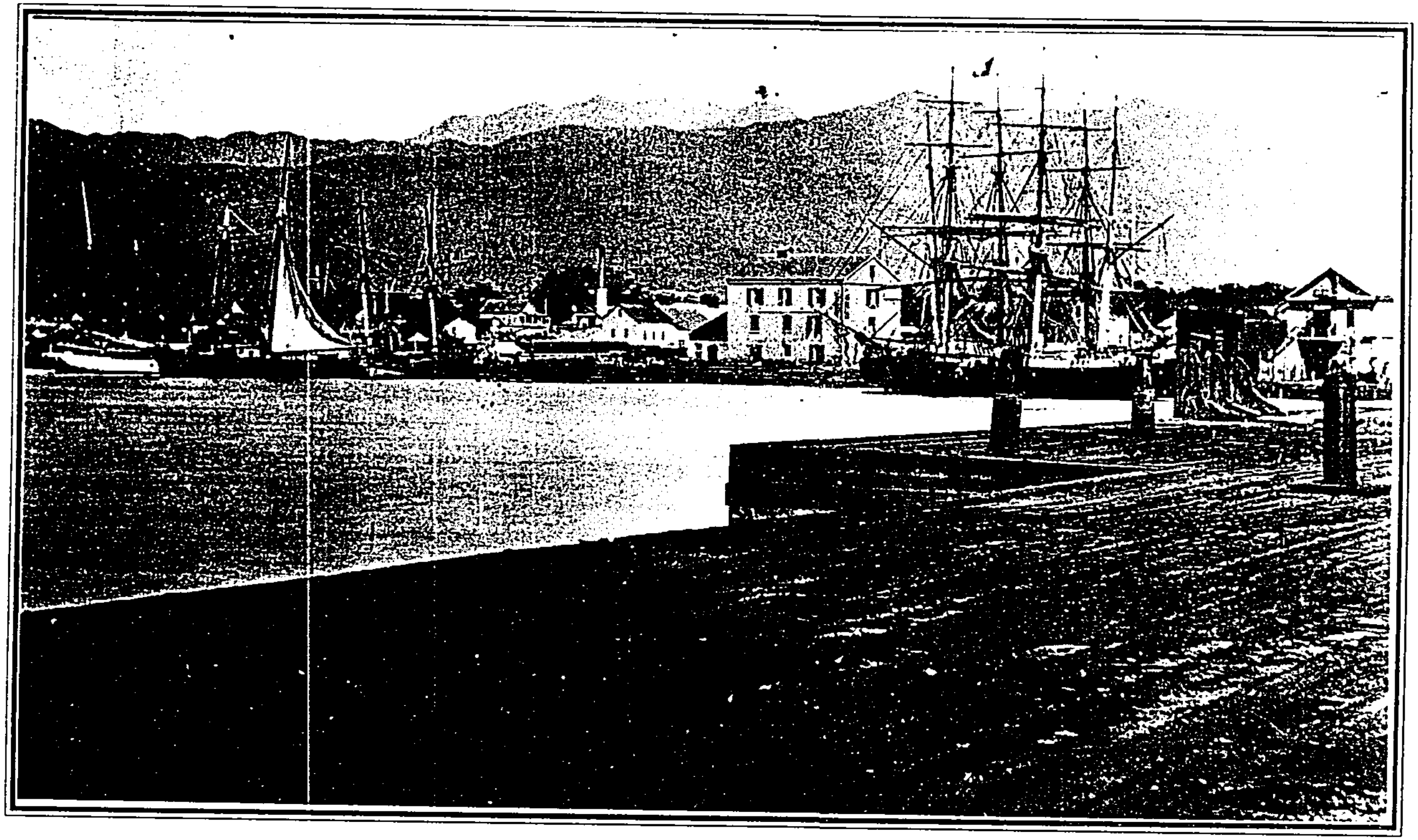
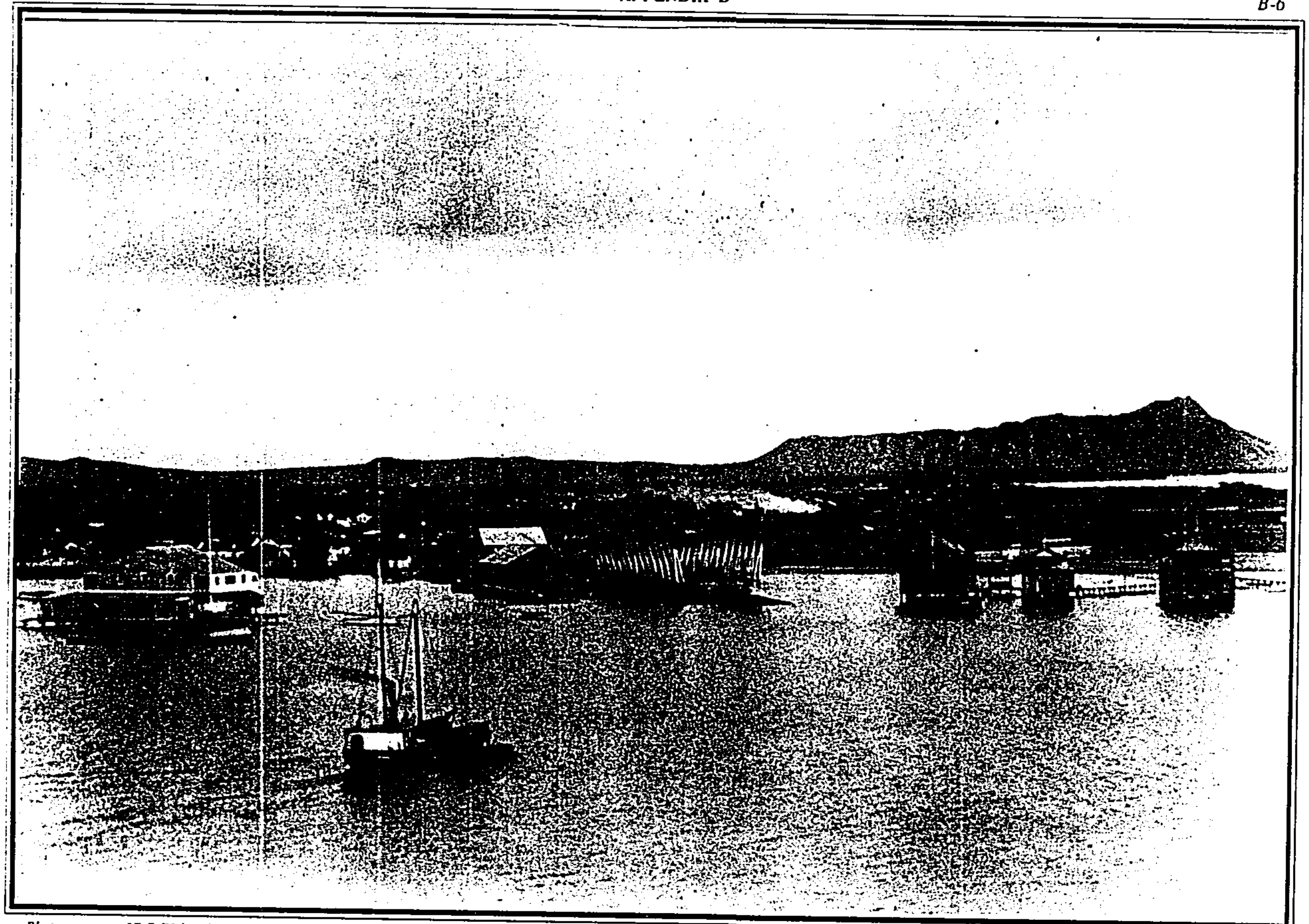


-Photo courtesy of Hawaii Maritime Center

Figure B-4. VICINITY OF NUUANU AVENUE c. 1873. The prominent building is the Custom House. Taken from Robinson's Ship Yard (Vicinity of Piers 10 and 11)

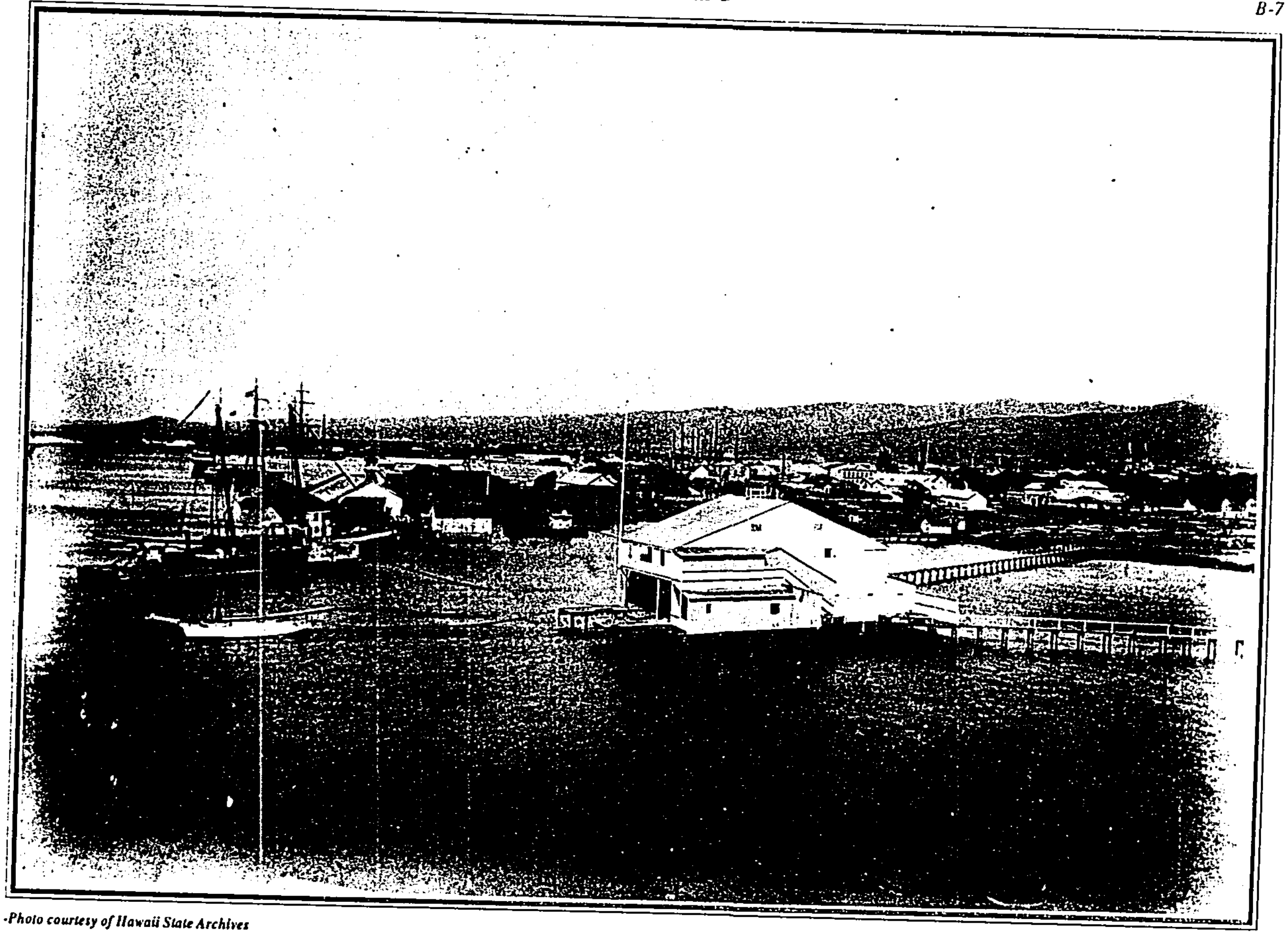
-Photo courtesy of B.P. Bishop Museum

Figure B-5. HONOLULU HARBOR FROM PIERS 7-9 c. 1890 *The slips here were eventually filled in, then knocked down for construction of Piers 8, 9, and 10. The tower with the round "face" is the Alexander and Baldwin building on Fort Street. Farther to the left are the twin steeples of Kaumakapili Church. In the right foreground is the Wilder Steamship wharf.*



-Photo courtesy of B.P. Bishop Museum

Figure B-6. ***HONOLULU HARBOR LOOKING TOWARDS DIAMOND HEAD c. 1890.*** *The houses seen in Figure B-2 are located to the left of this photo. The structure in the middle is the Marine Railway. The three structures on the right (in the vicinity of the present Pier 2) are rowing boathouses.*



-Photo courtesy of Hawaii State Archives

Figure B-7. KING'S BOATHOUSE c. 1890. Slightly north of Figure B-6, vicinity of Piers 3-5.

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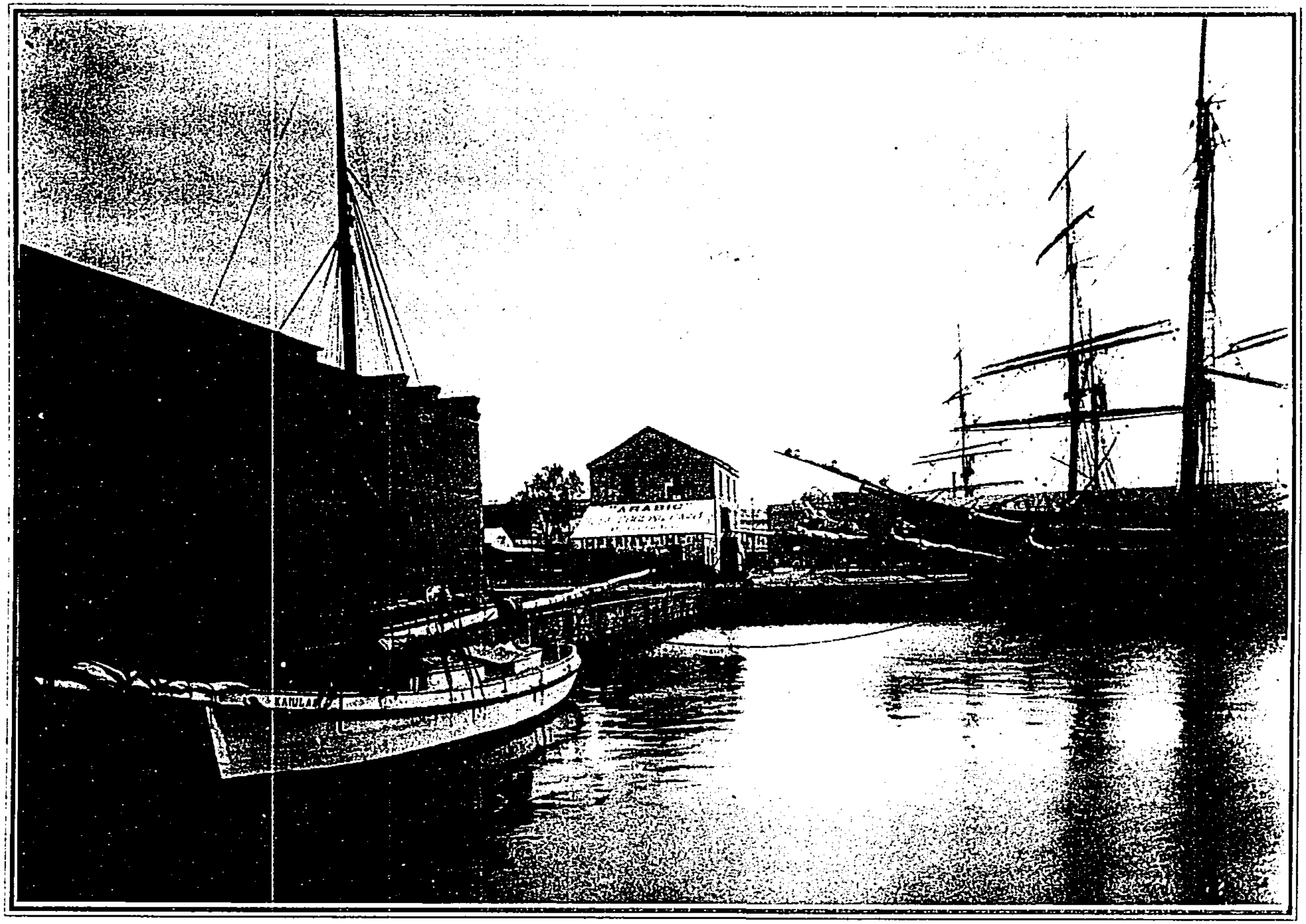
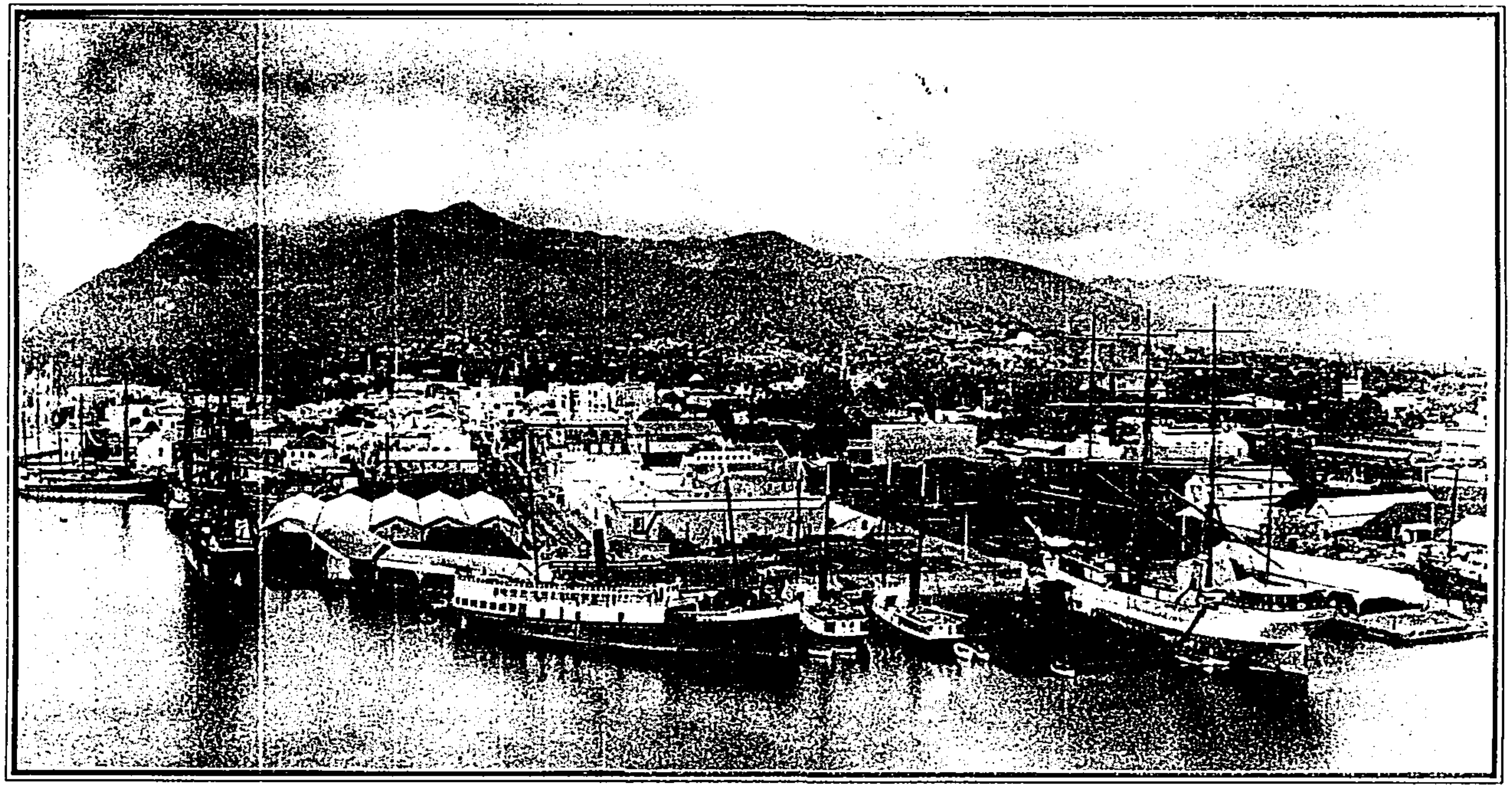


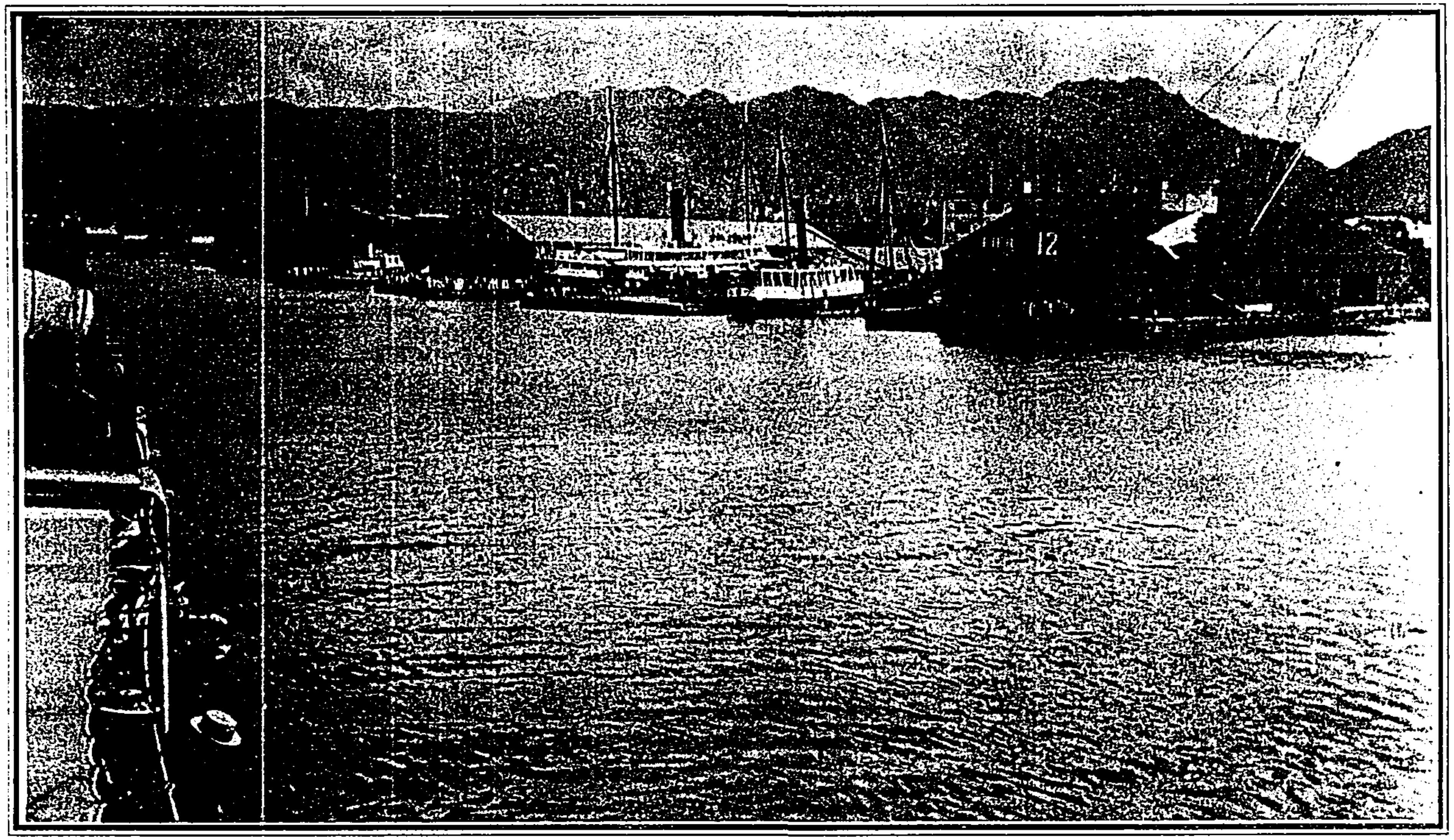
-Photo courtesy of Hawaii Maritime Center

Figure B-8. PIERSIDE - NUUANU WHARF c. 1902. Pier 13 now located in this vicinity.



-Photo courtesy of B.P. Bishop Museum

Figure B-9. HONOLULU HARBOR WATERFRONT c. 1902. The five-topped warehouses to the left are Piers 10 and 11. Running immediately to the right is Fort Street.



-Photo courtesy of Hawaii Maritime Center

Figure B-10. HONOLULU HARBOR PIERS 12, 13 AND 14 c. 1902.

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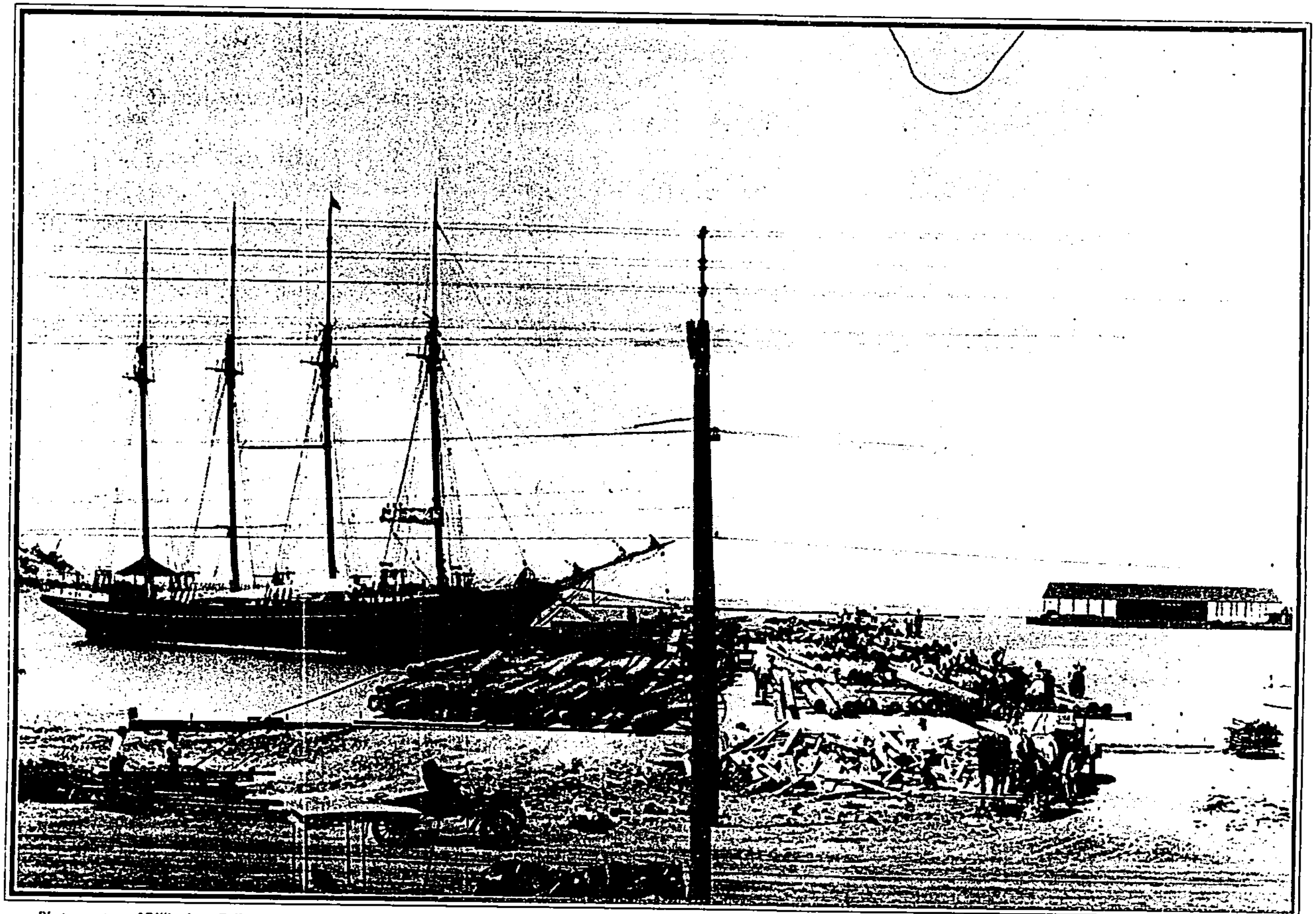
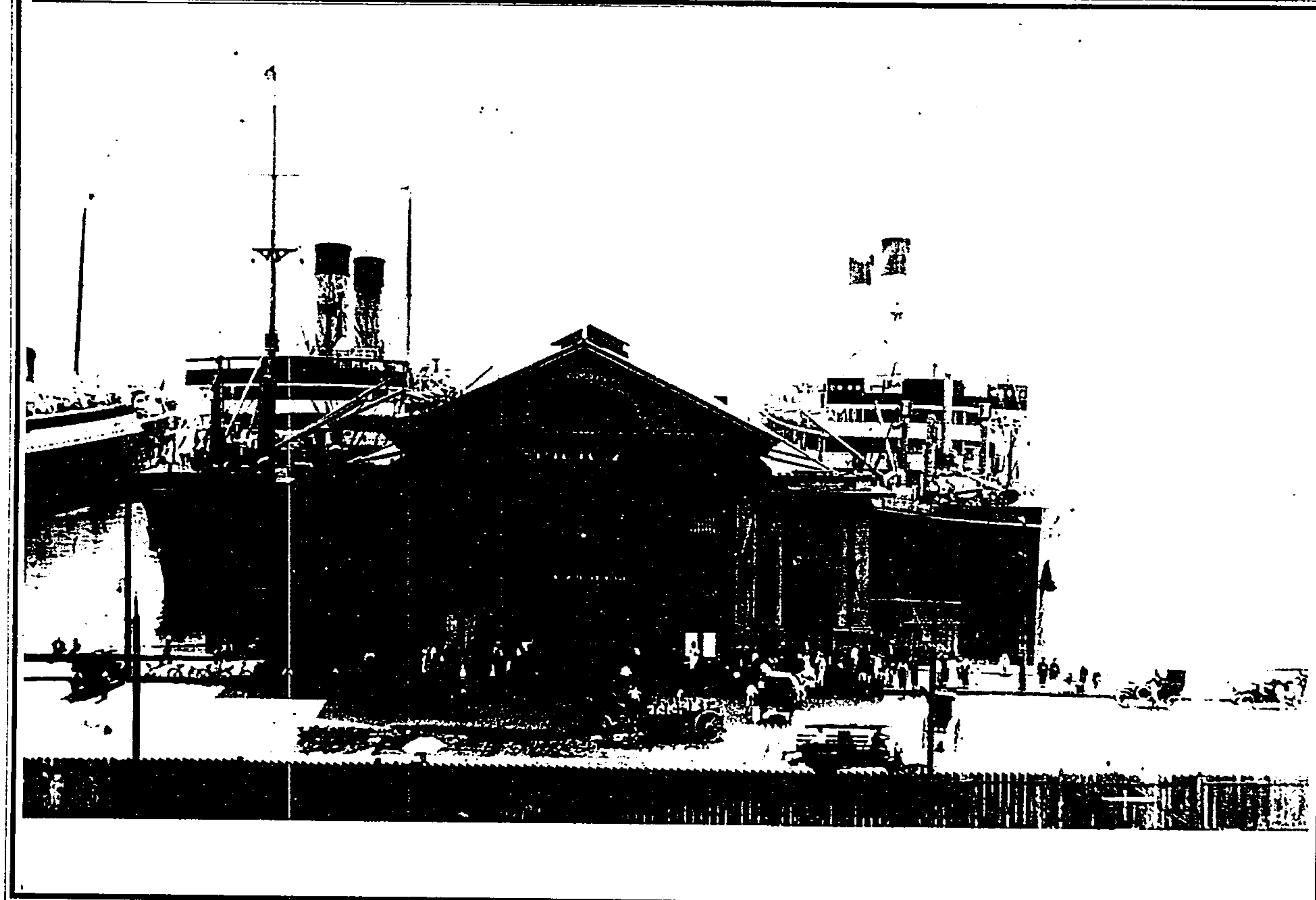


-Photo courtesy of Dillingham Collection, B.P. Bishop Museum

Figure B-11. CONSTRUCTION OF PIER 7. UNLOADING PILES FOR ENLARGEMENT OF PIER 7, APRIL 4, 1907.



-Photo courtesy of B.P. Bishop Museum

Figure B-12. PIER 7 c. 1912.

-Photo courtesy of Fifth Group (OBS), B.P. Bishop Museum

Figure B-13. *AERIAL VIEW OF HONOLULU HARBOR c. 1921.*
Sand Island in the foreground

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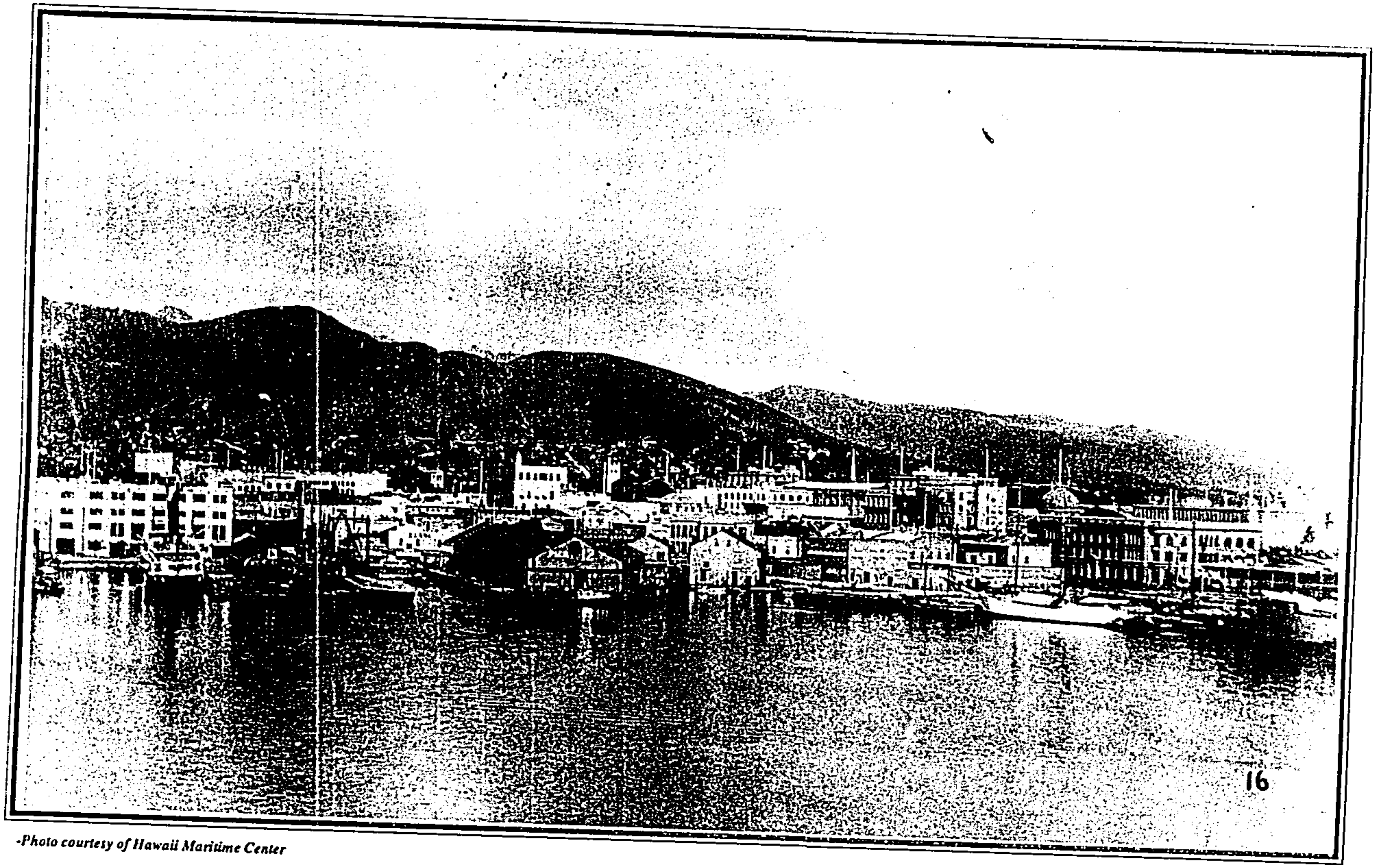

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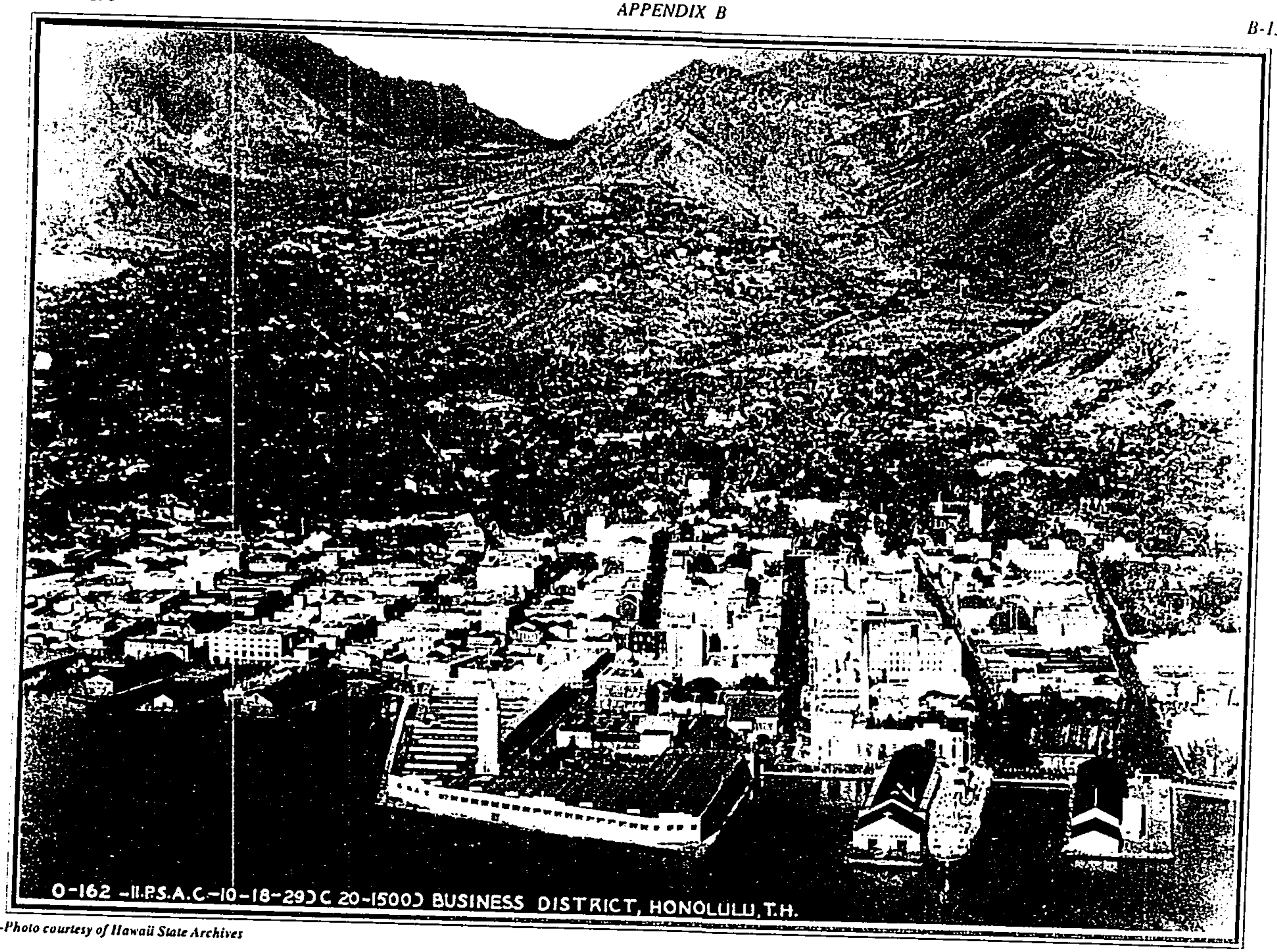
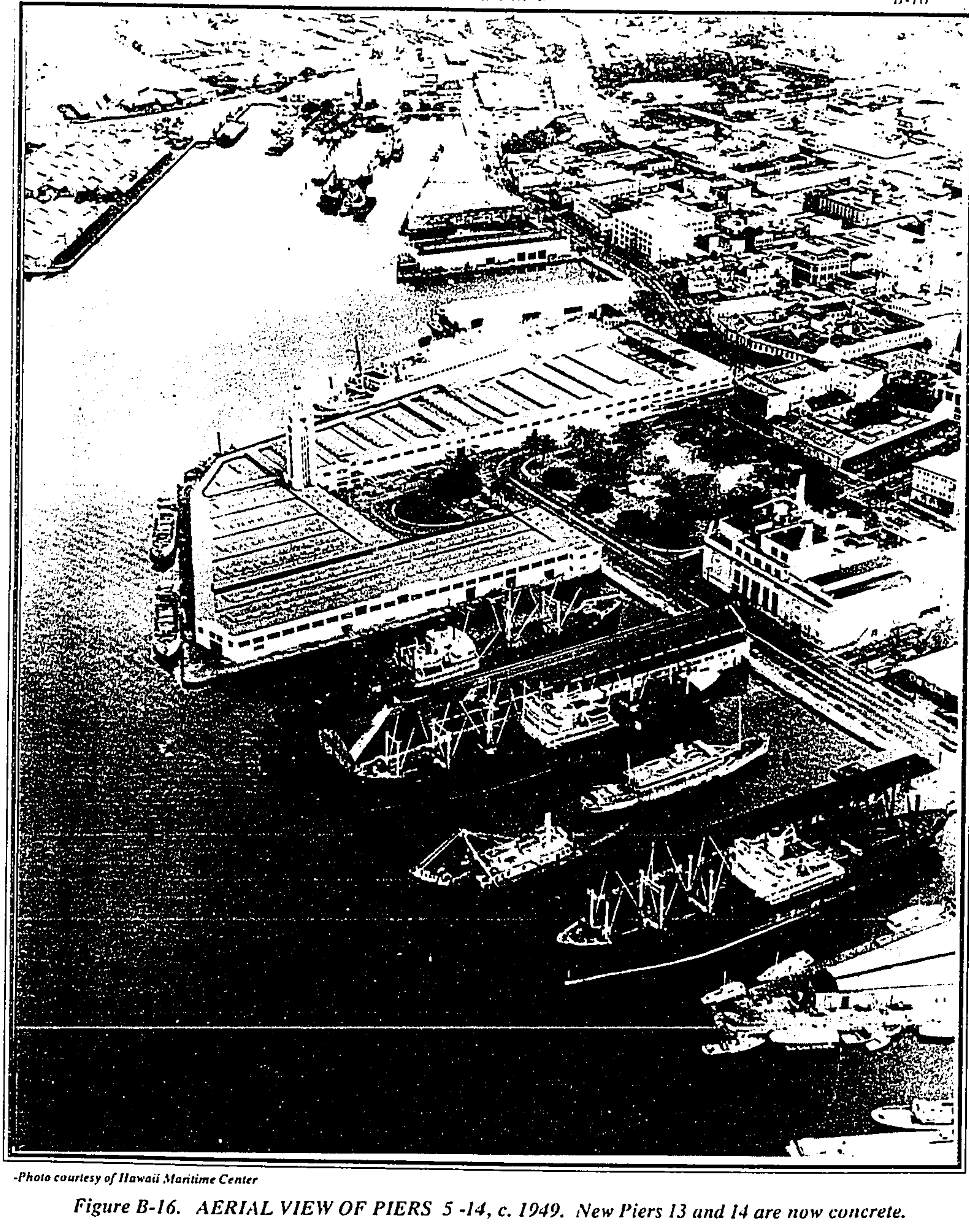
Figure B-14. HONOLULU HARBOR PIERS 11, 12, AND 13 c. 1923.



-Photo courtesy of Hawaii State Archives

Figure B-15. ***BUSINESS DISTRICT OF HONOLULU c. 1929.*** *On the right are Piers 6 and 7. On the left of Aloha Tower are Piers 12, 13, and 14. This is the last known photo of the original piers at 13 and 14.*



-Photo courtesy of Hawaii Maritime Center

Figure B-16. AERIAL VIEW OF PIERS 5 -14, c. 1949. New Piers 13 and 14 are now concrete.

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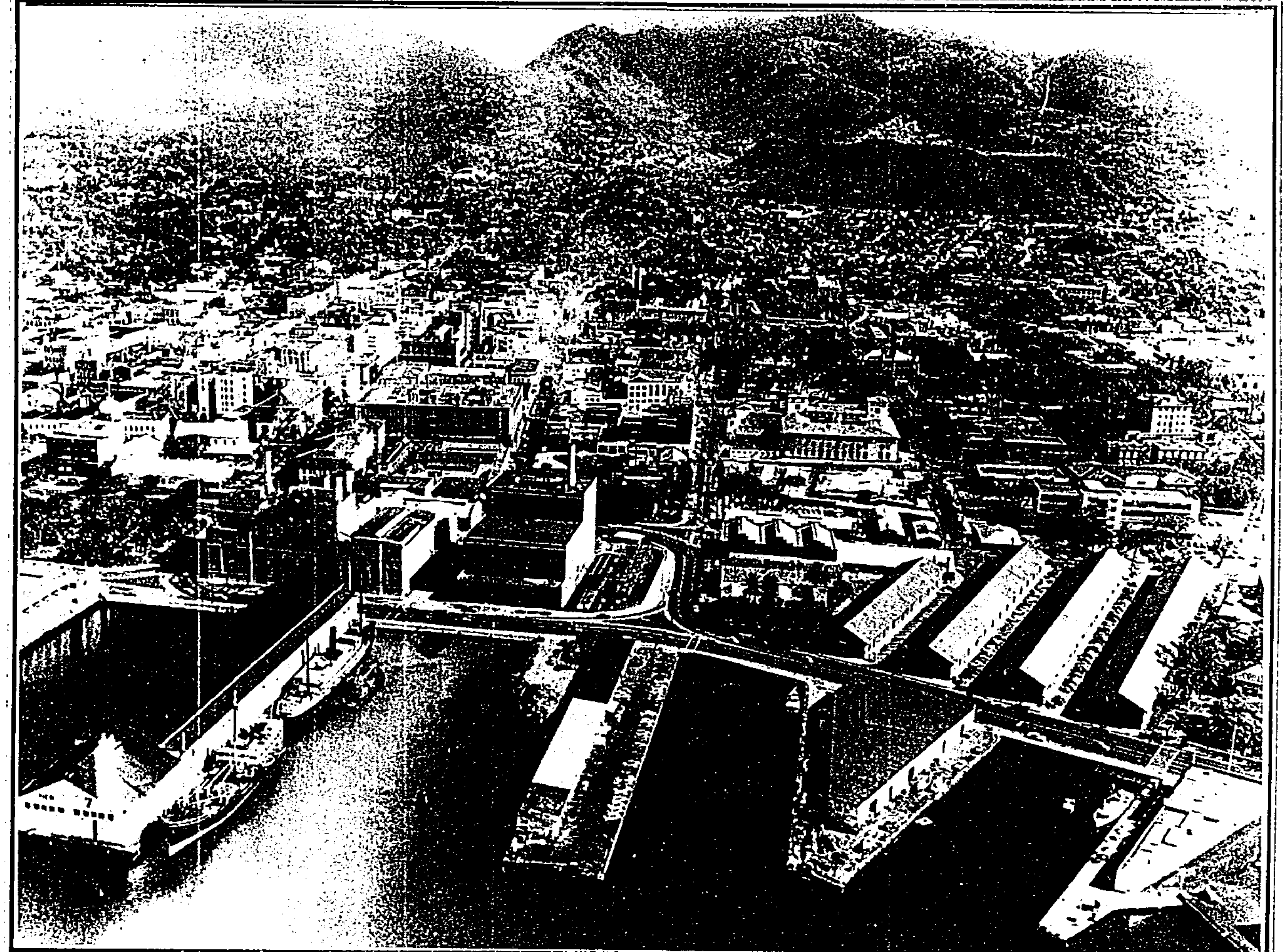

·Photo courtesy of Hawaii Maritime Center

Figure B-17. PIERS 5 -7, JANUARY 6, 1955. Piers 5 and 6 still separate. Old Pier 7 intact.

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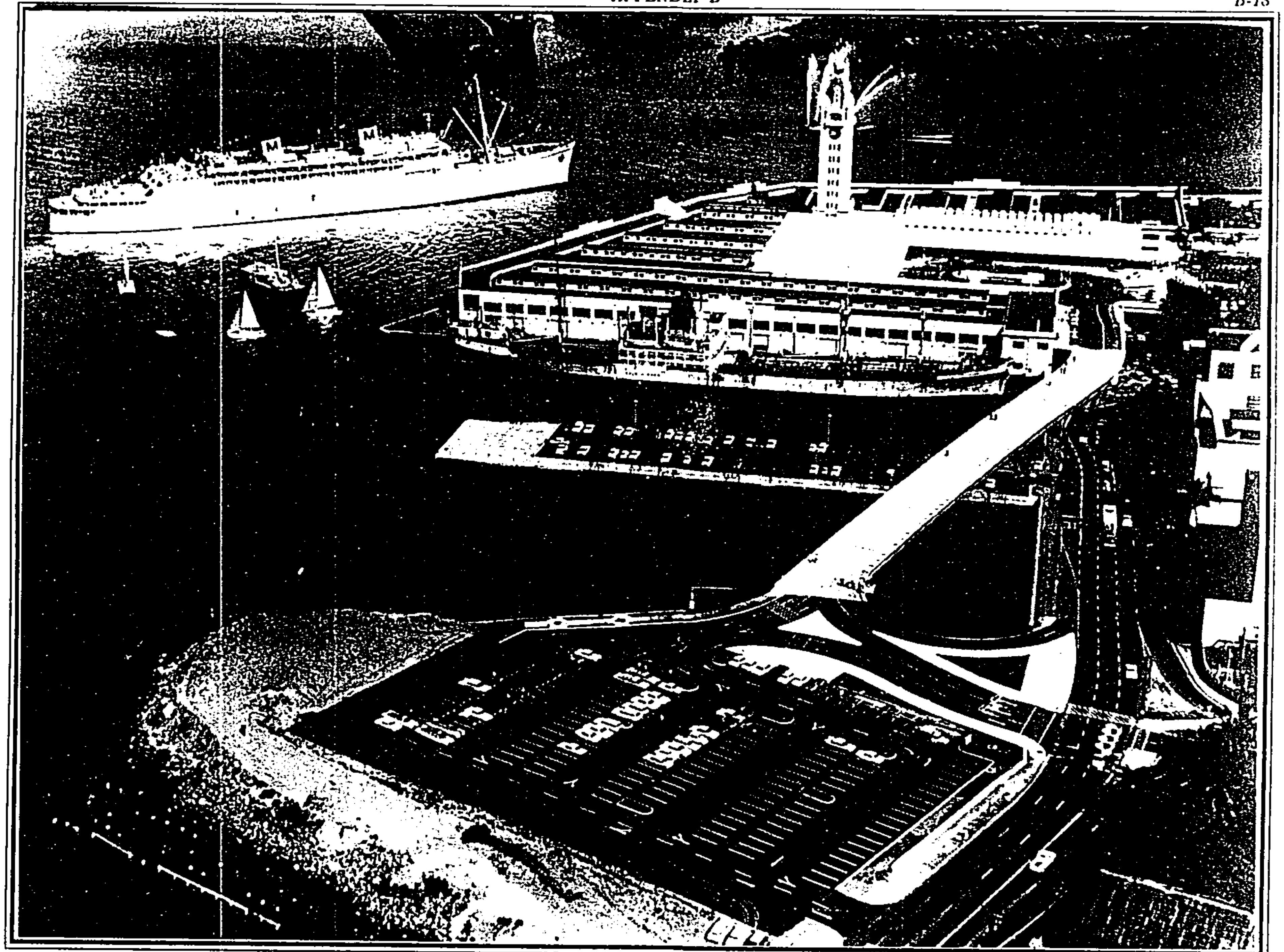
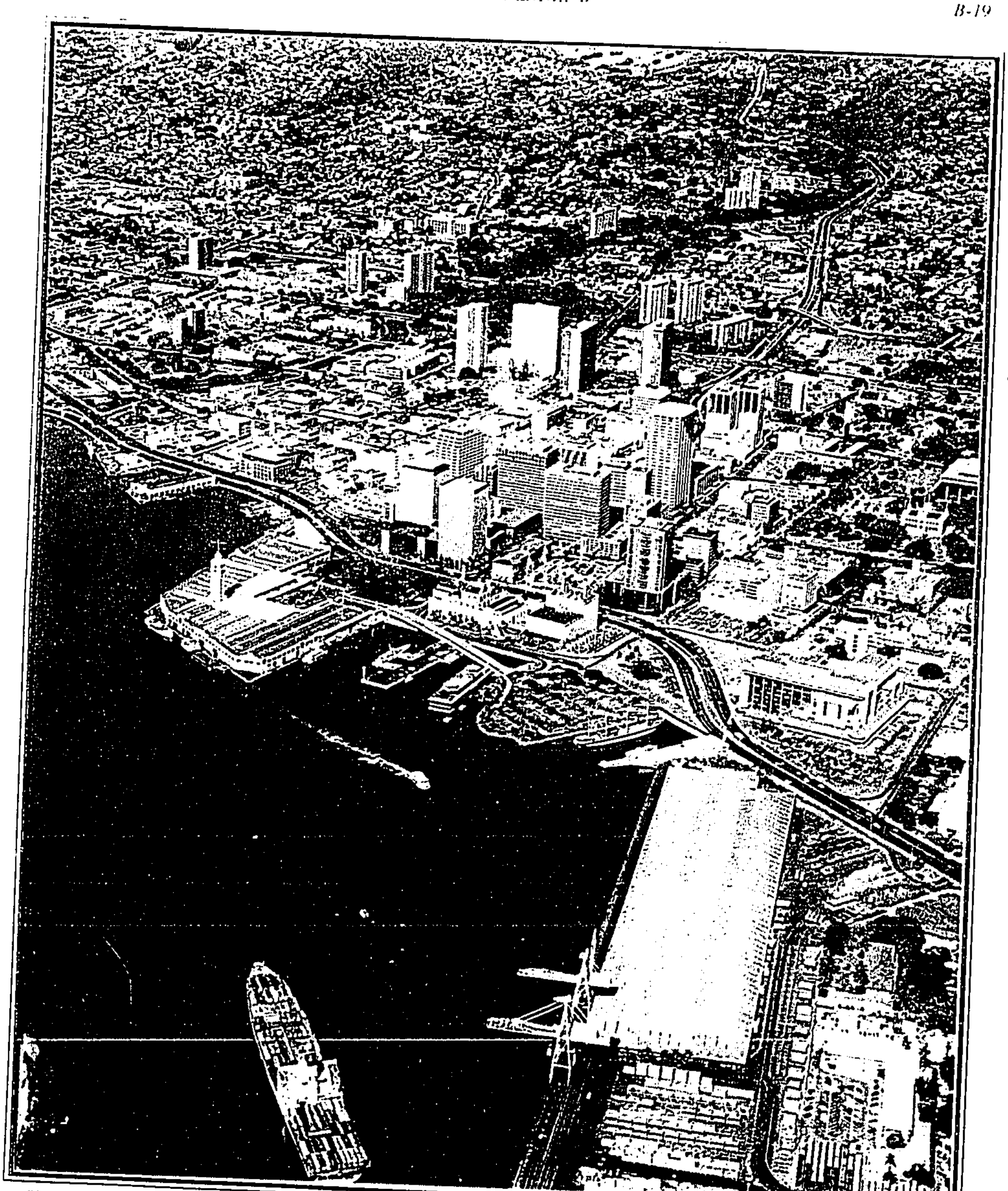


Photo courtesy of Hawaii Maritime Center *Figure B-18. Piers 5 -7, early 1965. Piers 5 and 6 are filled in to form the parking lot in foreground. Pier 7, razed, is also used for a parking lot. The elevated ramp leads to new structures mauka of Aloha Tower.*



-Photo courtesy of Hawaii State Archives

Figure B-19. AERIAL VIEW OF HONOLULU HARBOR c. 1978. Pier 12 razed.

APPENDIX E

MARINE ENVIRONMENTAL ASSESSMENT

Prepared By

Oceanit Laboratories, Inc.

Oceanit Laboratories, Inc.
coastal & offshore engineering services • research & development

MARINE ENVIRONMENTAL ASSESSMENT FOR THE WATERFRONT AT ALOHA TOWER

prepared for:

STATE OF HAWAII
ALOHA TOWER DEVELOPMENT CORPORATION

AND

ALOHA TOWER ASSOCIATES

JULY 1990

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EXECUTIVE SUMMARY

The site of the proposed Waterfront at Aloha Tower development is along the Honolulu Harbor waterfront from Piers 5 to 14. Honolulu Harbor is located on the south coast of Oahu adjacent to the city of Honolulu. The harbor is approximately 2 miles long and varies in width from 600 to 2,900 feet. Average depth is between 35 and 40 feet. The harbor area adjacent to the proposed development is approximately 250 acres.

Planned construction activities include extending Piers 5 and 6 into the harbor an additional 100 to 150 feet to the Federal Project Line (FPL). Construction beyond the FPL will be limited to catwalks and breasting dolphins to berth larger ships. The area enclosed by Piers 8, 9, 10, and 11 will be extensively reconstructed, including the excavation and removal of fill material. At Piers 13 and 14, a new condominium tower is planned for construction on the existing pier structure. An additional tower will be built on piles over the water between Piers 12 and 13. Detailed development planning is continuing.

Field measurements and observations were conducted and historical literature was reviewed to determine existing environmental conditions of the harbor area adjacent to the planned development. Measurements and observations were made between May and June 1990 and generally represent summer conditions with trade winds. Wave gauges were used to monitor offshore waves and resulting surge conditions within the harbor adjacent to the proposed development. Drogues and dye were used to observe current and circulation under an ebbing tide with trade wind conditions. Water quality monitoring was performed insitu and samples were also collected and analyzed in the laboratory. Sediment samples were collected and analyzed for size fraction and composition, including selected metals and compounds. Marine life surveys were conducted, and ciguatera data were collected. Fishermen and other recreational users were queried.

A review of wave environment indicates that the harbor is relatively protected from most wave conditions. Tsunami risk around Honolulu Harbor is relatively low. However, under certain conditions, waves penetrating into the harbor cause surge conditions around Piers 5 to 8. The Falls of Clyde, moored at the Maritime Museum Pier 7, uses very heavy cables and anchors to maintain her position during Kona storm conditions. Waves are known to wash up onto the roadway at the base of Piers 5 and 8 during certain storm conditions.

Results from surge measurements (during June 1990) indicate that surge conditions result principally from incoming waves penetrating the harbor entrance, not from resonant phenomenon. Additional surge measurements are planned for construction design purposes. In general, conditions are not expected to exceed engineering technology capabilities; design methods are available to ensure suitable structural design.

Circulation currents in the harbor during field measurements were found to vary in speed from 4 to 22 ft/min. Both drogue and dye measurements indicated similar flow patterns. Flow velocities out of the main entrance channel were found to be higher than normally would be anticipated from tidal exchange alone. This is probably the result of tidal eddies, flow from the Hawaiian Electric Company (HECO) power plant, and slight stratification at the entrance.

Sediment samples taken from Piers 5 and 6 indicate that most of the material (greater than 60 percent) is silt and clay sized (less than 63 microns) with approximately 6-10 percent organic and 20 percent terrigenous. The grain size and quantity of metals found in the samples were somewhat different from that found at Piers 8-11 by the State Harbors Division during testing prior to maintenance dredging.

Water quality results indicate that the harbor is in relatively good condition during the summer season and falls within State Department of Health (DOH) water quality standards. However, historical data reveal times when standards were exceeded, especially for fecal coliforms. Additionally, ship activities and stream discharge typically cause turbidity plumes that last from hours to weeks. Turbidity plumes from tugboats guiding large cargo ships into the harbor were observed on a daily basis. These plumes settled below the surface within a few hours. Measurements were not taken during these activities so because they would interfere with harbor operations.

Tests show that both turbidity and total non-filtrable solids (TNFS) decrease between the harbor and the offshore sampling stations, suggesting that fine sediments in plumes tend to settle in the harbor. The DOH turbidity standards for both wet and dry embayments are within the range of established certainty for the geometric mean of the turbidity measurements. Salinity measurements did not identify fresh water or significant stratification, nor did temperature measurements. Nutrient levels indicate that the harbor is nitrogen limited during the summer season. Introduction of inorganic nitrogen through fresh water discharges during the winter season may cause phytoplankton blooms that will persist until these discharges are sufficiently diluted

and flushed. Chlorophyll a and phaeopigment results indicated a relatively long residence time at station 3, between Piers 12 and 13. However, results from other areas of the harbor showed phytoplankton to be at relatively equal developmental stages.

Fecal coliform counts were low relative to previous DOH monitoring data. This variation in fecal coliform counts can be attributed to short-term impacts of prohibited activities.

Results from marine life and benthic habitat investigations show that marine life is neither abundant nor diverse in most areas of Honolulu Harbor. There are no rare, endangered, or threatened species identified within or near the project area. The harbor bottom is typically thick unconsolidated sediments, i.e., mud, with occasional burrows and limited fish life. This substrate forms the habitat for burrowing polychaete worms, shrimp and crabs. Most of the organisms common to the soft bottom areas are capable of rapid recolonization of disturbed areas. In the Kapalama channel fronting the Matson pier and extending from Piers 23-32, the consolidated coral bottom is completely clean and devoid of mud, sand or small gravel, possibly the result of propeller induced turbulence or recent dredging.

Fish and fauna under and around most of the piers are limited. Piers 1 and 2, which stretch from the central harbor to the harbor mouth, displayed an increased abundance of corals toward the ocean. A major area of abundant sea-life in the harbor is the sea-wall extending from the base of Pier 8 (electric plant cooling water inlet) to Pier 7 (electric plant outlet) and around the rock revetment surrounding Piers 5 and 6. Coral, invertebrate and fish life are more abundant and diverse in these areas than other areas of the harbor. Of the 47 species of fish and 12 species of coral previously identified in the harbor, most can be found in this general area. However, abundance of both fish and invertebrates is limited to the nearshore top 5 meters of water. Benthic life below this depth is generally restricted to mud dwelling organisms. Corals and fish are also present around Pier 12 but not in relative abundance.

The area around Piers 5/6 is a popular recreational fishing site due to its proximity to a highly populated area, a relatively high population of fish, and currents produced by the Hawaiian Electric outflow. Results from ciguatera monitoring show that levels of toxicity in harbor fish are currently within normal levels, but should be monitored during construction.

In general, short-term impacts from construction activities are expected to be similar to those resulting from dredging, ship induced plumes, and stream discharge. The major environmental impact from construction is expected to result from dewatering activities and airborne dust and sediment. The level of impact will depend on construction duration and methods, and each can be programmed and designed to minimize environmental stress. Even though circulation within the harbor is complex, particularly because of the Hawaiian Electric Company power plant discharge, more detailed investigations of circulation will provide a better understanding of dewatering plume movements.

In the long-term, reconstructing Piers 5 and 6 into a ship berthing facility will destroy a portion of the developing coral reef on the surface of the existing seawalls and rock revetments extending from Piers 5 to 8. In addition, the DOT will likely restrict access to Piers 5 and 6 for fishermen because these piers will be used as working piers for an active cruise ship handling operation. No other impact on the marine environment is anticipated from excavation and construction activities or from new harbor structures such as piles at Piers 5 and 6 and at Piers 12 and 13.

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I. INTRODUCTION

A. BACKGROUND

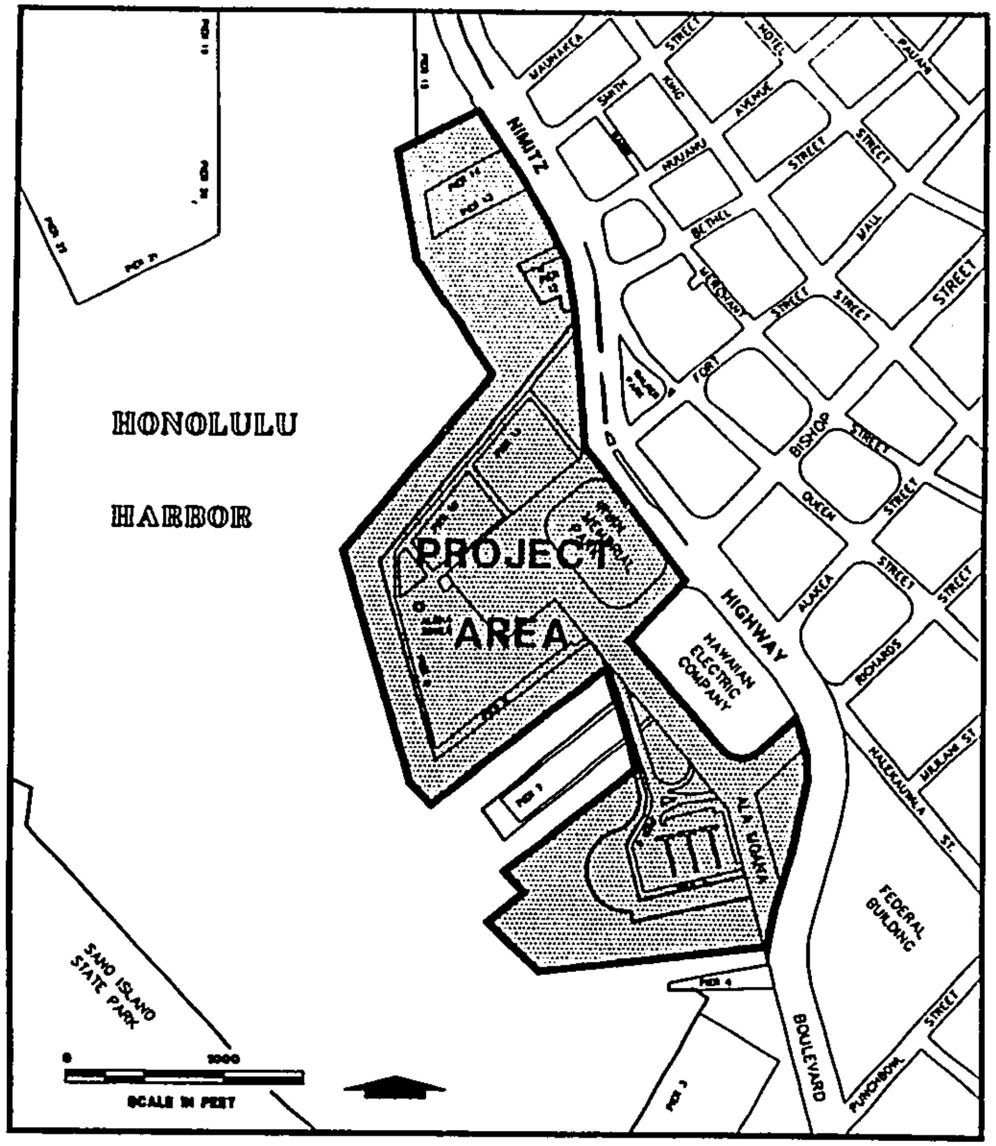
Oceanit Laboratories, Inc. (OLI) was contracted to investigate Environmental Impact Statement (EIS) matters related to the marine environment around 'The Waterfront at Aloha Tower' project area including waves, currents, harbor bathymetry, sediments, water quality, and marine life. OLI's approach to evaluating the impact of the proposed development on the marine environment included extensive field investigations as well as laboratory and computer analysis. The results of these investigations and analyses are presented in the following chapters.

B. DESCRIPTION OF PROPOSED ACTION

The proposed Waterfront at Aloha Tower development extends from Pier 5 to Pier 14, excluding Pier 7 (Figure I-1). Since the project will require construction in and near the water, this assessment addresses those activities that directly affect the marine environment.

A new Maritime Building and Passenger Terminal is planned for the area between Piers 5 and 6. Part of this facility will be constructed on piles driven into the harbor bottom. The pile supported structures will extend to the Federal Project Line. This will extend the existing Pier 5/6 into the harbor an additional 100 to 150 feet beyond the water's edge. Catwalks and breasting dolphins will extend further into the harbor to accommodate large cruise ships. Land side excavation will be used for constructing an underground parking structure.

The area enclosed by Piers 8, 9, 10, and 11 will be extensively reconstructed. This reconstruction will require excavation for an underground parking structure in the vicinity of Aloha Tower. The method of excavation has not yet been decided; however, two general methods are being considered, either of which may affect the marine environment. One method is by conventional land-based equipment. Land based excavation will require dewatering the project site with the resulting effluent flowing into the harbor. An alternative method of excavating is by dredging equipment. This alternative would require breaching the quay wall to give access to the dredger. Control of turbid water from construction activity would be necessary. Disposal of excavated material may be done at an approved offshore disposal site (contingent upon approval of appropriate permits) for either method of excavation.



prepared by Wilson Okamoto & Associates, Inc.

Figure I-1 THE WATERFRONT AT ALOHA TOWER PROJECT AREA MAP

A portion of the area at the corner of Piers 9 and 10 will be demolished to construct an amphitheater at the water's edge. This amphitheater will be open to the harbor, but will not extend into the harbor farther than the existing structure.

One new condominium tower will be built on the existing pier structure between Piers 13 and 14. A second condominium tower will be built on piles over the water between Piers 12 and 13. Construction methods for these condominiums are still being planned.

C. GENERAL SITE CONDITIONS

Honolulu Harbor is located on the south coast of Oahu adjacent to the city of Honolulu. The harbor is the principal commercial port for Hawaii. It was created by dredging the drainage basins of Kapalama and Nuuanu Streams. The dredged material was used to construct Sand Island. Shown in Figure I-2, the harbor is approximately 2 miles long and varies in width from 600 to 2,900 feet. Its average depth is between 35 and 40 feet. Two channels serve the harbor, the Main Channel on the east and Kalihi Channel on the west. The Kalihi Channel has been permanently closed to large ship traffic since about 1982 when a fixed bridge replaced the Sand Island draw bridge. The Main Channel leads from the open ocean to the main turning basin, while an additional smaller turning basin is located at the end of Kalihi Channel. Sand Island provides protection from the open ocean making Honolulu Harbor secure in most weather conditions.

II. METHODOLOGY

A. WAVES

The wave environment in Honolulu Harbor was evaluated by observations, historical data, various predictive techniques, and direct measurement. The wave climate has been observed by OLI personnel; by various harbor users, including harbor pilots, tour boat operators, the Maritime Museum and Falls of Clyde personnel; and by the staff of the Harbor Master's office. OLI gathered these data by interviewing harbor users. Wave climate was extracted from historical data and various predictive techniques as compiled by Gerritsen (1978). Additionally, wave climate was measured by OLI over a one-month period, May-June 1990, using wave gauges placed at three locations; two inside and one outside the harbor. Wave data was analyzed to obtain wave spectra, significant wave heights, and transfer functions between inside and outside wave heights. Results were used to investigate surge conditions in the harbor.

B. CIRCULATION

Circulation in the harbor was measured by two techniques - tracking drogues and dye dispersion. Current drogues are underwater sails, approximately 30 inches square, that are suspended at a specific depth beneath a float. The drogue drifts with the current and its position is tracked as a function of time. The path of the drogue is plotted on a map, and its speed calculated from distance traveled and time elapsed.

Dye is used to simulate the movement of runoff or silt plumes in the ocean. A highly visible dye, such as fluorescein, is released in the water at a specific location. The movement of the dye is periodically photographed from the air. The shape, position and speed of the dye patch is calculated from successive photographs that have been transferred to a map. The distance between the center points of the dye patches divided by the elapsed time gives an estimate of the speed at which the dye is moved by currents. Diffusion coefficients are calculated from graphical data.

C. BATHYMETRY

Bathymetry in the vicinity of the project site was determined based on bathymetric charts produced by the State of Hawaii, Department of Transportation, Harbors Division. The depth shown on these charts was checked with a fathometer at selected locations.

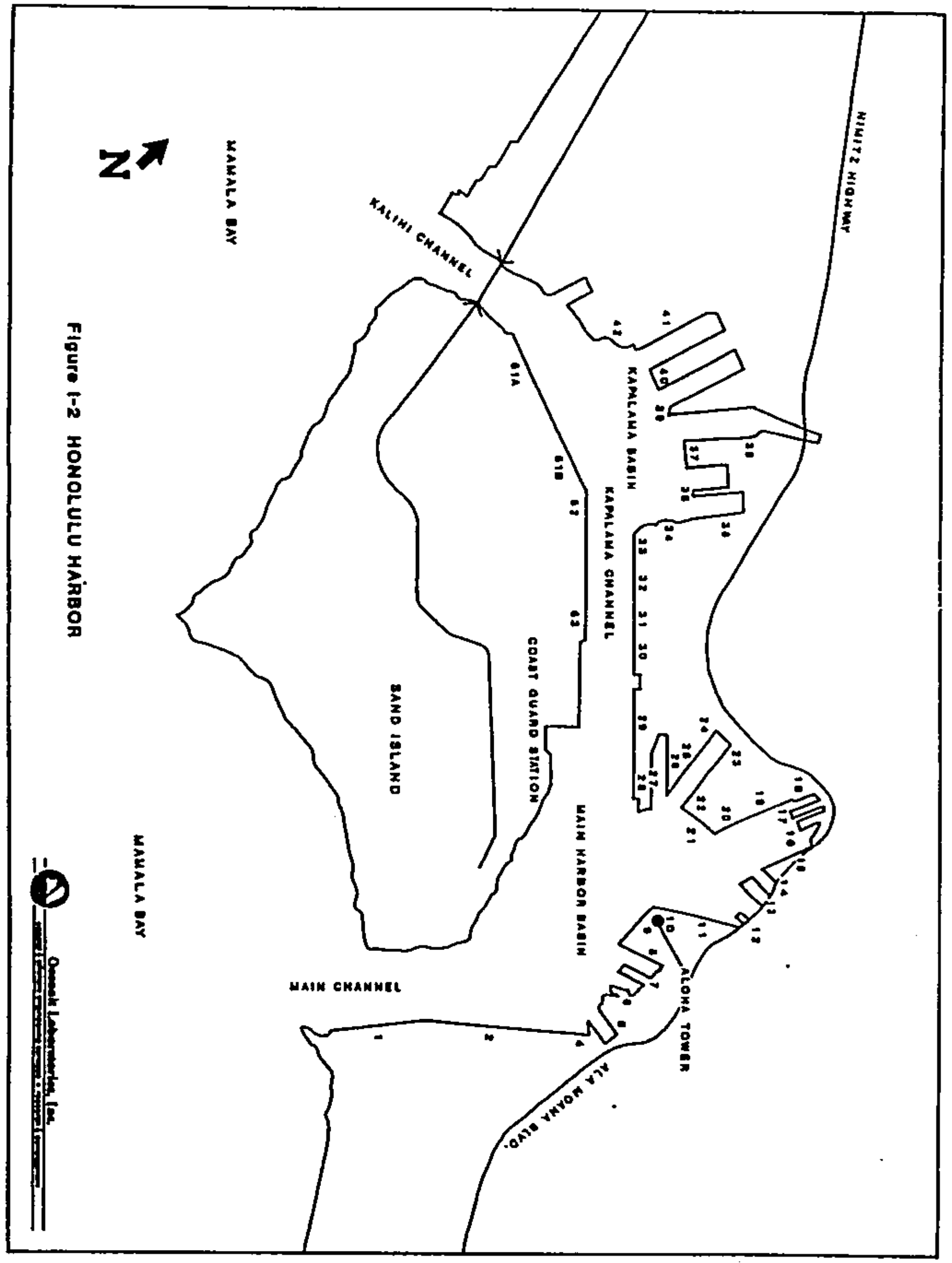


Figure I-2 HONOLULU HARBOR

Bathymetry was used to assist in the estimation of harbor circulation.

D. SEDIMENTS

Sediments were sampled from four locations near Piers 5 and 6. These samples were analyzed for size distribution and composition, including calcium carbonate, organics, total petroleum hydrocarbons, oil and grease, and the following metals: lead, chromium, copper, zinc, nickel, cadmium, arsenic, and mercury.

The results of these analyses were compared to similar analyses performed on sediments at Piers 8-11 in 1988 by the U.S. Army Corps of Engineers. The 1988 tests were conducted to obtain approval for disposal of dredged material at an EPA approved offshore dump site. This comparison was made to determine if the sediments at Piers 5-6 are similar in type and composition to those at Piers 8-11. If results are similar, offshore disposal at the same site may be possible.

Size and composition analysis of the sediment was used to determine the source (terrigenous or marine) and to estimate the speed of dispersion and settling of sediment plumes that may be generated in the harbor by construction activities.

E. WATER QUALITY

Initial water quality measurements of surface, mid, and bottom waters were made at thirteen locations around the harbor (Figure II-1). These sample locations are categorized by environment as follows: station 1, Kalihi Channel; station 2, Kapalama Channel; stations 3-8, harbor; station 9, Main Channel; stations 10-12, nearshore; and station 13, offshore. Station locations were selected to yield a representative characterization of the water chemistry and physical processes within the harbor, adjacent to the proposed development, and in nearshore areas. Measurements made included temperature, salinity, conductivity, turbidity, nutrients, Chlorophyll a, phaeopigments, dissolved oxygen, and non-filterable residues.

Temperature, salinity and conductivity measurements provide information on water structure and indicate the existence of vertical stratification and the amount of fresh water entering the harbor. Turbidity is a measure of the light scattering properties of the water and is a convenient measurement of water clarity. Nutrients regulate biological activity in the oceanic waters. The nutrients with greatest effect on productivity are nitrogen and

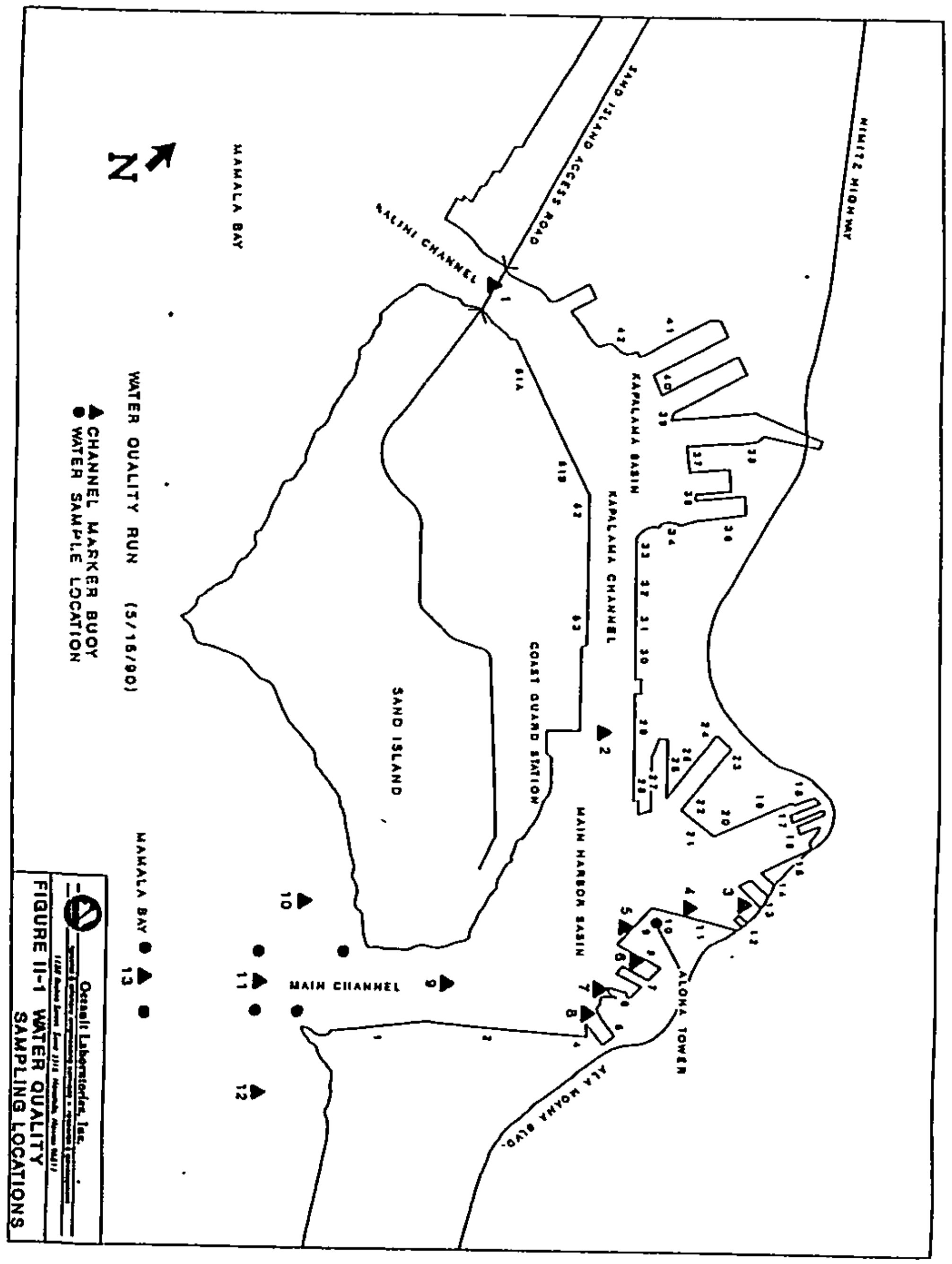


FIGURE II-1 WATER QUALITY SAMPLING LOCATIONS phosphorous. Chlorophyll a is the primary photosynthetic pigment found in living plants. It is measured to estimate the phytoplankton biomass in marine waters. Phaeopigments provide a

measurement of Chlorophyll a degradation. Dissolved oxygen is a measure of free, atmospheric oxygen in the water. Non-filterable residues are a measure of the particulate material filtered from a known volume of seawater.

Salinity, temperature and conductivity
Salinity, temperature, and conductivity measurements were performed using a Beckman RS3-5 portable salinometer. Conductivity was calibrated with a standardized circuit of known resistance. Calibration was periodically checked.

Dissolved oxygen
Dissolved oxygen was measured insitu with a Yellow Springs Instrument (YSI) Model 57 oxygen meter. Each measurement was allowed to stabilize for approximately two minutes. The probe was calibrated in air and fresh water.

Turbidity
Turbidity measurements were performed with a Turner Model 40 Nephelometer. Calibration was performed using a Turner standard calibration cell of 20 nephelometric turbidity units. Calibration was periodically checked.

Nutrients
Nutrient measurements included total nitrogen, nitrate plus nitrite, total phosphorous and orthophosphate. Measurements were performed using a Technicon Autoanalyzer II. Samples collected from the harbor were kept on ice in a dark cooler prior to analysis.

Chlorophyll a and Phaeopigments
Chlorophyll a and Phaeopigment measurements were performed using a spectrophotometer following the method outlined by Strickland and Parsons (1972).

Non-filtrable Residue
Non-filtrable residue measurements were performed according to the method outlined by Strickland and Parsons (1972).

Fecal Coliforms
Fecal Coliform measurements were performed according to standard methods published by the American Public Health Association et al (1981).

Data collected was analyzed using log-normal statistics, per methods discussed by the DOH (1977) and Sullivan et al (1986, 1988). Confidence intervals are important statistical parameters because they reflect a measure of accuracy. Confidence intervals were calculate according to the following equation:

$$C_I(F(c)) = \exp\left[\ln C_{f(c)} \pm \frac{\mu\sigma_*}{\sqrt{n\left(1-\frac{[f(c)-50]}{50}\right)}}\right]$$

where
$C_I(F(c))$ = confidence interval at F(c)
F(c) = cumulative distribution function percent freq.
$C_{f(c)}$ = true concentration at F(c)
σ_* = standard deviation of the normal distribution of ln(c)
μ = normal distribution factor related to desired confidence interval (e.g. 1.96 for 95%)

F. MARINE ECOLOGY

General field investigations were conducted to characterize the overall environmental condition of the harbor. Specific field surveys were conducted to investigate certain features, particularly those identified in previous environmental studies. Surveys included: benthic observations and transects at various key harbor locations; a fisherman creel census; ciguatera studies; and an assessment of the nehu fishery in the harbor.

1. Benthic Marine Ecology Observations

Seven representative sites within the harbor were chosen for observation. All observations were made using SCUBA and recorded on an underwater writing tablet.

a. Kapalama Stream Entrance
Qualitative observations were made at the entrance of Kapalama Stream to Honolulu Harbor, approximately 50 meters downstream from the Nimitz highway, and along the rock revetment sea-wall at the outer western corner of Pier 37 down to a depth of 10 meters.

b. Kapalama Channel

One short dive was made at mid channel and another along the edge of Matson's Marginal Wharf between berths 52 and 53. Pier pile fouling organisms, benthic organisms, and fish fauna were characterized.

c. Nuuanu Stream Entrance

Pier pile and concrete sea-wall fouling organisms, benthic substrate, and fish were observed along the base of pier 16 and along the sea-wall to the entrance of Nuuanu Stream at the Nimitz highway overpass.

d. Pier 12

Observations were made around the perimeter of pier 12 and extending out onto the relatively shallow area of submerged pilings fronting this short pier.

e. Pier 9

Observations were made at both ends of Pier 9 of pilings back to the concrete pier face, and of bottom substrate and fish species.

f. Piers 5, 6, and 7.

Qualitative underwater observations were made along the following:

- The sea wall from the base of Pier 8, past the Honolulu Electric Company (HECO) water inlet, to the base of Pier 7 under the "Falls of Clyde".
- The sea wall from the base of Pier 7, past the HECO warm water outfall, under the roadway and to the end of the concrete seawall of Pier 6.
- The rock revetment fronting Pier 5/6.
- Under the end of Pier 4.

A quantitative transect was completed perpendicular to shore at the apex of the Pier 5/6 peninsula from the shore across the rock revetment and down onto the sloped mud bottom. A standard 20 meter transect line was used and data was recorded on underwater writing paper. Fish and macro-invertebrate species were noted within 2 meters (6.6 feet) either side of the transect line. The substrate was described at the point of contact every half meter along the transect line. In addition, percent cover was estimated based on three meter square areas centered at meter 5, 10, and 15 along the line. These standard methods are derived from those used by the Marine Options Program at the University of Hawaii.

g. Piers 1 and 2

To help define the "healthy" portions of the harbor, observations were made along Piers 1 and 2 and to document where corals begin to grow in the harbor. Coral counts on pier columns were made

beginning near the stern of a cable laying vessel, approximately 150 meters from Nimitz Highway, and opposite "Warehouse 35". The pier pilings nearest the edge are spaced about 4-5 meters apart, have an outer face about 60 cm wide and extend to the bottom in about 12 meters of water. On the outer face of 104 pier pilings, individual coral colonies approximately 10 cm^2 in area or larger were counted.

h. Sand Island Channel Sea Wall

Qualitative observations were made along 150 meters of the Sand Island rubble revetment sea wall fronting the park area adjacent to the main ship channel. The relative abundance of coral and fish species was noted for comparison with other areas of the harbor.

2. <u>Creel Census</u>

Recreational fishing is a popular pastime in Hawaii, and Honolulu Harbor has its share of popular fishing sites. Only fishermen in the project area (i.e. not Sand Island) were surveyed. Initial observations indicated that fishermen could be observed at various areas within the project area, including Pier 18 and Pier 12. However, the majority of fishermen observed in the project area were noted near Pier 5/6 and the cooling water inlets and outlets for the HECO power plant. A one-day creel survey was conducted at the Pier 5/6 site.

The survey was conducted on Sunday, June 17, 1990 from 5:50 AM to 1:30 PM. The total number and general make-up of fishermen was noted on an hourly basis. Seventeen fishermen were interviewed and asked the following questions:

(1) How many times have you fished here during the past month, (30 days)?
(2) How many fish did you catch here during the past month?
(3) How many hours do you spend here each time you come?
(4) What species of fish are most commonly caught here?
(5) How many fish and what type have you caught today?

3. <u>Commercial Fishing Activities (Nehu Fishing)</u>

Commercial fishing activities are primarily limited to vessel berthing. Piers 13, 14, 15, and 16 are generally used by Hawaii based U.S. registered vessels. Japanese longline vessels and other large foreign fishing vessels are often berthed along Piers 28-33 on the mauka side of the Kapalama channel. The only active commercial fishery within the harbor area is for baitfish, primarily "nehu" (<u>Stolephorus purpureus</u>), although other species are occasionally caught and used. Nehu are captured during daylight hours at stream mouths using fine mesh screen or fence nets. Night fishing for nehu is seldom practiced in the state and this technique has not been used in Honolulu Harbor for several years. The State Division of Aquatic Resources maintains statistics on the location and amount of baitfish captured by the commercial aku-boat fleet. These statistics were reviewed, and then validated through conversations with fishermen.

4. Ciguatera Monitoring

Ciguatera monitoring was conducted using two methods:

(1) population density monitoring of the causative dinoflagellate
(2) direct toxicity testing of selected fish species

Algae samples from both the project site and from the Sand Island site were collected in sealed "zip-lock" plastic bags for processing by an analytical lab. At the lab, bags containing the algae were agitated to remove any diatoms from the surface of the algae. The resulting supernatant was filtered through a 250 micrometer screen to exclude large debris and then re-filtered at 40 micrometers to retain the dinoflagellates. The dinoflagellates were re-suspended in a known amount of water and the species associated with ciguatera, (Gambierdiscus toxicus) were counted in a hemocytometer under low power of a microscope. The algae samples were identified to species, blotted dry and weighed to the nearest gram. Results are reported as number of cells per gram of algae.

Fish samples for ciguatera analyses were collected by spear from along the Sand Island park sea-wall adjacent to the Main Channel, and from the waters off of Pier 5/6. Samples were analyzed using techniques developed by the University of Hawaii Medical School Pathology Laboratory. Tissues from the head, mid section, tail, and organs were analyzed for the presence of ciguatoxin. Results are reported by species.

III. DESCRIPTION OF MARINE ENVIRONMENT AND RESULTS OF INVESTIGATIONS

A. WAVES, TIDES, AND TSUNAMI

1. Waves

The south shore of Oahu is subject to local wind waves, southern swell generated by storms in the Southern Hemisphere, Kona storm waves generated by local storms, and hurricane waves. Gerritsen (1978) compiled the results of wave studies and observations from several sources. His summary is shown in Table III-1.

TABLE III-1
RESULTS OF STUDIES ON HAWAIIAN WAVES

Wave Type	Expected Freq of Occurrence %	Significant Height, ft	Significant Period, sec
Kona storm	10.3	3.52	6.18
Wind wave	85.6	4.31	11.45
South swell	53.0	2.6	13.07

after Gerritsen (1978)

Deepwater wave heights generated by a 50-year hurricane are estimated to be over 26 feet. The corresponding period is 11 seconds. A wave of this size will generate storm surge in the harbor of approximately 6.4 feet. A deep water swell 10 feet high with a period of 13 seconds will generate a surge of 3.8 feet in the harbor.

Wave data obtained by gauges placed in the harbor during May and June 1990 show the relationship between wave heights outside the harbor and at two locations inside the harbor. These wave heights do not reflect the range of heights that the harbor experiences over the course of a year. A summary of the wave data is given in Table III-2. The average significant wave height inside the harbor is approximately one-tenth the height of waves outside the harbor mouth. No Kona storms occurred during the measurement period. Wave data can be used to show the transformation of waves in this size range as they enter the harbor.

TABLE III-2
MEASURED WAVE CHARACTERISTICS, MAY-JUNE 1990

LOCATION	MAX HT, m	MIN HT, m	AVE SIG HT, m
OUTSIDE	1.73	0.5	0.85
PIER 6	0.13	0.05	0.08
PIER 9/10	0.12	0.07	0.09

Honolulu Harbor is well protected from most offshore waves by Sand Island. However, Kona storm waves or southern swell can penetrate the harbor when the direction of travel is parallel to the main entrance channel. Harbor users report that waves traveling down the Main Channel occasionally make mooring difficult for tour boats at Piers 5, 7, and 8. During such conditions, these boats must be moved to safer moorings. Piers 5, 7, and 8 are directly exposed to waves approaching from the Main Channel. In addition, the Falls of Clyde, moored at the Maritime Museum Pier 7, uses very heavy cables and anchors to maintain her position during Kona storm waves. Waves are known to wash up onto the roadway at the base of Pier 5 and Pier 8 during some storm conditions.

The proposed construction of berths at Piers 5 and 6 will not significantly change the wave environment inside the harbor. Construction at Piers 8, 9, 10, and 11 is expected to have very little affect on the wave environment. Some wave damping will probably occur from the proposed floating docks at Pier 9.

2. Tides

The mean tide in Honolulu Harbor is 0.8 feet above Mean Lower Low Water (MLLW). The mean tidal range between MLLW and Mean Higher High Water (MHHW) is 2.0 feet. The tidal range in 1990 is -0.5 to +2.7 feet MLLW. Historically, tides have ranged from a minimum of -1.3 ft to a maximum of 3.5 feet.

3. Tsunami

Predicted water rise from a 100-year tsunami at a point 200 feet inland on the outer side of Sand Island is 3.8 feet (U.S. Army Corps of Engineers, Aug 1978). Inundation of the coast is shown in Figure III-1 (Flood Insurance Rate Map, 1987). No flooding in the vicinity of Aloha Tower is predicted.

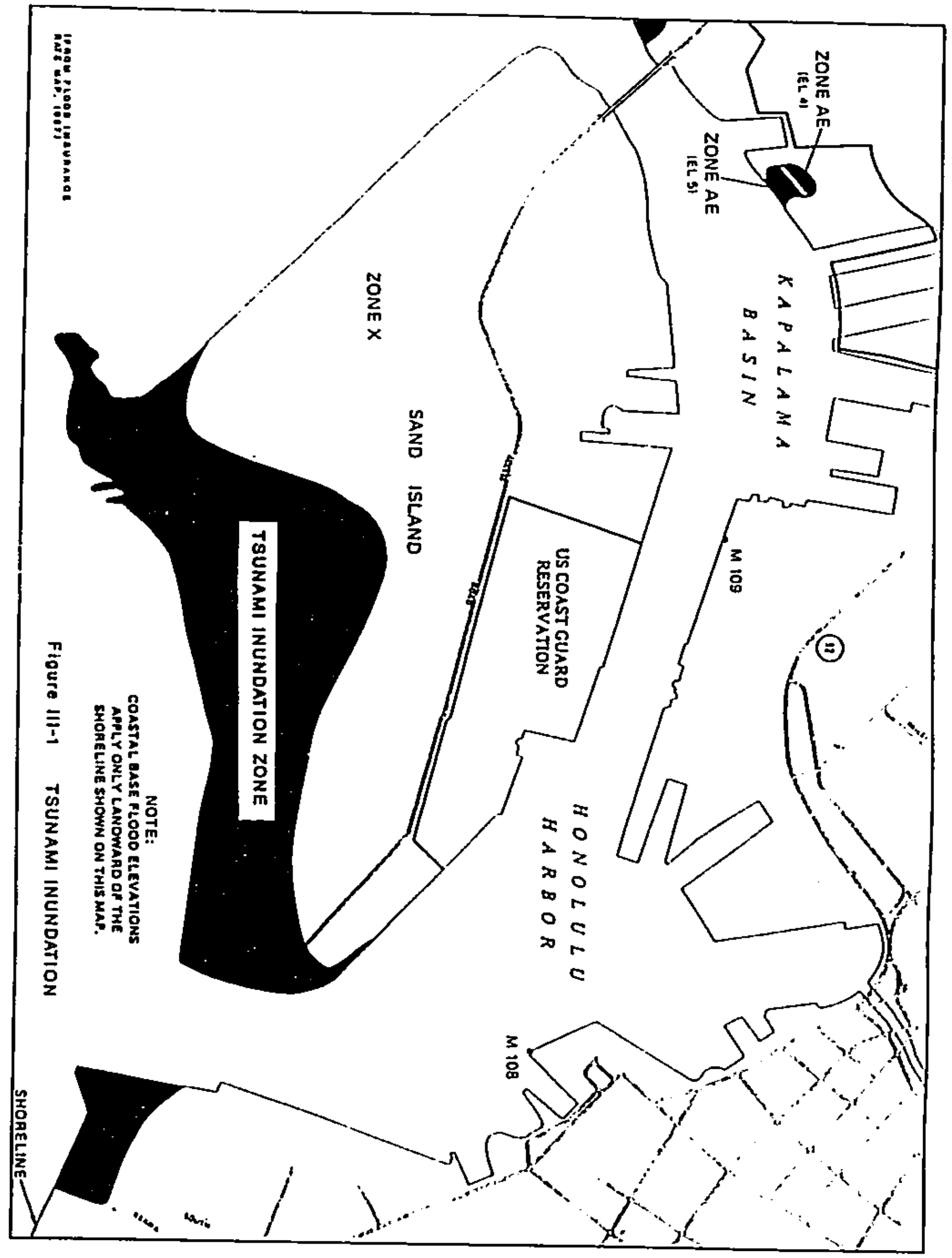


Figure III-1 TSUNAMI INUNDATION

B. CIRCULATION

Circulation in the vicinity of Aloha Tower was determined by tracking the drift of current drogues, and by following the drift and dispersion of fluorescent dye released into the water at several locations. The drogues measured currents at a depth of approximately 12 feet. The dye measured surface currents. Measurements were made during an ebb tide to determine whether silt or freshwater plumes might leave the harbor and impact the outside ocean environment. Drogue paths are shown in Figure III-2.

Drogue 1 was released at the end of Kapalama Channel adjacent to Pier 29. This drogue moved back and forth within 470 feet about its initial position over a two hour time period. Average speed was 6.4 ft/min. This motion indicates that a harbor oscillation node may exist at this position under these tidal conditions, resulting in small net movement of water.

Drogue 2 was released near the corner of Piers 9 and 10. The area behind Piers 8, 9, 10, and 11 will be reconstructed during the redevelopment project and freshwater or silt plumes may enter the harbor in this area. Drogue 2 moved on a counter clockwise circular path towards the center of the harbor turning basin. Average speed was 9.4 ft/min. Movement in this direction would be expected during ebb tide if water flow occurs out the main entrance channel.

Drogue 3 was released in front of Pier 6 and moved directly toward the corner of Pier 8. This movement appears to be due to the combined effect of the tide and the inflow/outflow of the Hawaiian Electric plant. The plant outflow parallels Pier 6 and tends to push the drogue toward the Main Channel. However, the plant intake between Piers 7 and 8 tends to pull the drogue toward Pier 8. The drogue moved at right angles to the plant outflow and came to rest against Pier 8. Average speed was 7.6 ft/min.

Drogue 4 was released in the Main Channel between Pier 1 and Sand Island. This drogue was carried seaward down the channel until it reached the vicinity of the outer channel buoy where it began to drift toward Waikiki. The average speed of drogue 4 was 16.9 ft/min. It moved 31.6 ft/min in the channel but slowed outside the harbor mouth.

Dye was released at several locations including the starting points of the drogues. The progressive locations of the dye patches are shown in Figure III-3 and an aerial photograph of the dye is shown in Figure III-4. The dye patch speed was determined by calculating the patch center of area speed. The average speeds are given in Table III-3.

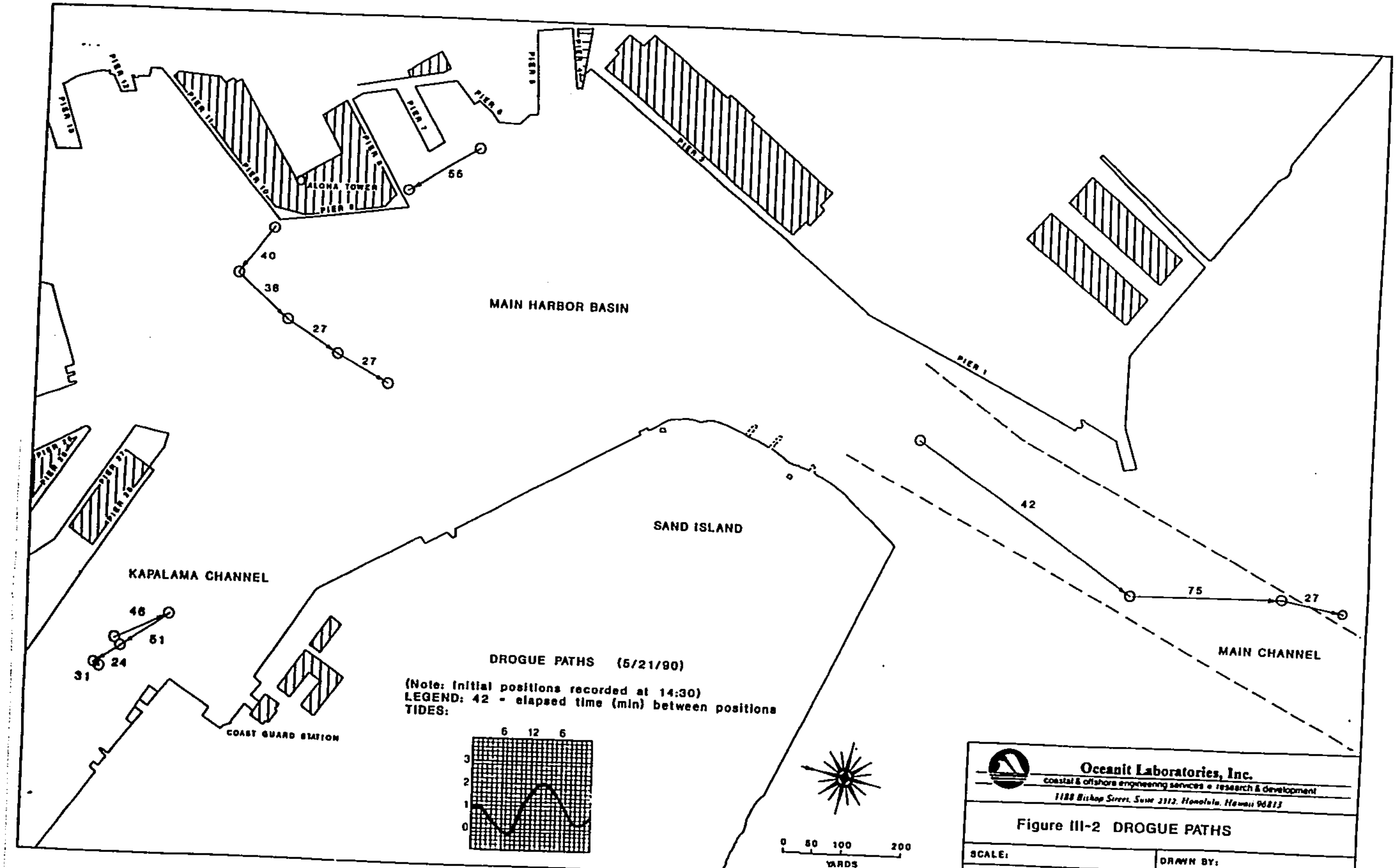
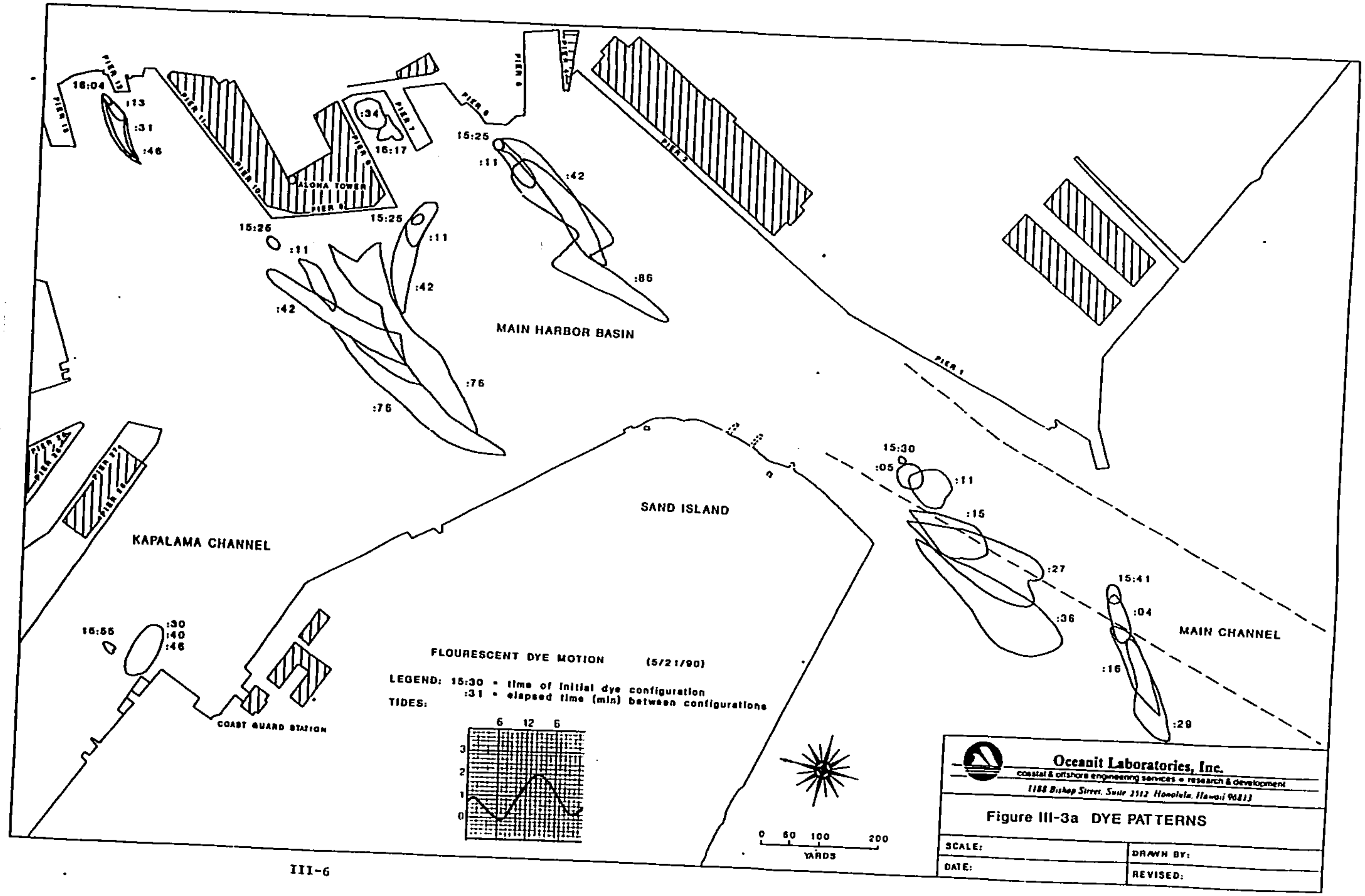


Figure III-2 DROGUE PATHS


PIER 15
PIER 13
16:04
:13
:31
:46
PIER 11
PIER 10
ALOHA TOWER
PIER 9
PIER 8
:34
16:17
PIER 7
PIER 6
PIER 5
PIER 2
PIER 1
15:25
:11
:42
:86
15:26
:11
:42
:76
:76
15:25
:11
:42
MAIN HARBOR BASIN
KAPALAMA CHANNEL
SAND ISLAND
MAIN CHANNEL
15:30
:05
:11
:15
:27
:36
15:41
:04
:16
:29
16:55
:30
:40
:46
COAST GUARD STATION
FLOURESCENT DYE MOTION (5/21/90)
LEGEND: 15:30 = time of initial dye configuration
:31 = elapsed time (min) between configurations
TIDES:
6 12 6
3
2
1
0
0 50 100 200
YARDS
Oceanit Laboratories, Inc.
coastal & offshore engineering services • research & development
1188 Bishop Street, Suite 2112 Honolulu, Hawaii 96813
Figure III-3a DYE PATTERNS
SCALE:
DATE:
DRAWN BY:
REVISED:

Photograph not reproducible.

Please refer to Figure III-a, Dye Patterns.

FIGURE III-3b AERIAL PHOTOGRAPH OF DYE PATTERNS IN HONOLULU HARBOR

TABLE III-3
AVERAGE SPEED OF DYE MOVEMENT

Dye Patch Location	Average Speed, ft/min
Kapalama Channel	4.0
Pier 12	3.4
Pier 9/10	13.4
Pier 8/9	8.5
Pier 6	7.7
Main Channel	27.5
Outside Harbor Mouth	22.0

Dye placed at the entrance to Kapalama Channel moved in a manner similar to drogue 1. There was very little net motion along the axis of the channel; however, the dye patch did move to the south side of the channel. The entrance to Kapalama Channel appears to be the location of a harbor node under the tidal conditions at the time of the study. There is very little flow in either direction at this point. The dye placed next to Pier 12 moved slowly toward the turning basin. The dye placed at the corners of Piers 9/10 and 8/9 moved in a large counterclockwise rotation through the turning basin toward the Main Channel. Both wind and ebb tide appear to drive this circulation. A dye patch placed in between Piers 7 and 8 near the intake to the Hawaiian Electric plant spread out but moved very little. It did not appear to be drawn into the plant, probably because the dye was on the surface and the plant intake is beneath the surface. The dye placed at Pier 6 moved initially on a clockwise path toward the Main Channel. This path became convoluted after some time probably due to the combined effects of outflow from the electric plant and tide. The difference between the behavior of the dye patch and the drogue at Pier 6 is probably due to the inflow/outflow of the power plant. Outflow is near the surface, while inflow is deeper.

Dye placed in the main channel moved seaward as expected during ebb tide. The dye followed the channel until it reached the harbor mouth. Outside the harbor mouth the dye moved in the Eva direction in contrast to the drogue at the same location, which moved toward Waikiki. This indicates that the surface water is moving in a direction different from the deeper water.

A conservative substance such as the dye used in this study or a silt plume is transported by advection and diffusion. Advection is the transport by movement of the water mass, i.e., currents. Diffusion is the dilution that results from mixing and spreading of the plume. Diffusion is a process where the concentration of a substance injected into a water mass changes with distance and time. A diffusion coefficient can be calculated that indicates how fast the injected substance mixes or dilutes in the water. Calculations of the diffusion coefficient were made using the time dependent spreading of the dye. The diffusion coefficient compared well with that calculated by Krock (1985) for deep harbors. A more detailed explanation of the diffusion equations and the results are given in Appendix A.

The speed and paths of the drogues and the dye indicate that the circulation patterns in the harbor are complex. Calculated flow rates are greater than rates that would be generated by tidal exchange alone. Flow rates are comparable to those measured by Environmental Consultants (1974), about 20 ft/min in mid-channel, when they investigated the impact of outflow from the Hawaiian Electric Plant. Circulation by the electric plant is substantial, amounting to approximately two-thirds of the volumetric rate of the tide (assuming no flow from Kapalama Channel into the main basin). This circulation plus that contributed by Nuuanu Stream, storm drains, and possible flow from Keehi Lagoon results in the relatively high rate of surface flow and the elongated and curved shape of the dye patches. The flow rates also indicate the possibility of stratified flow within the basin and Main Channel.

C. BATHYMETRY

The depth of the harbor was measured at several locations and compared with existing bathymetric charts (Department of Transportation, Harbors Division Sounding Charts and NOAA Chart 19367). Results are shown in Figure III-4. The measured depths compare well with the charts. There do not appear to be any pronounced flow channels that would significantly affect harbor circulation.

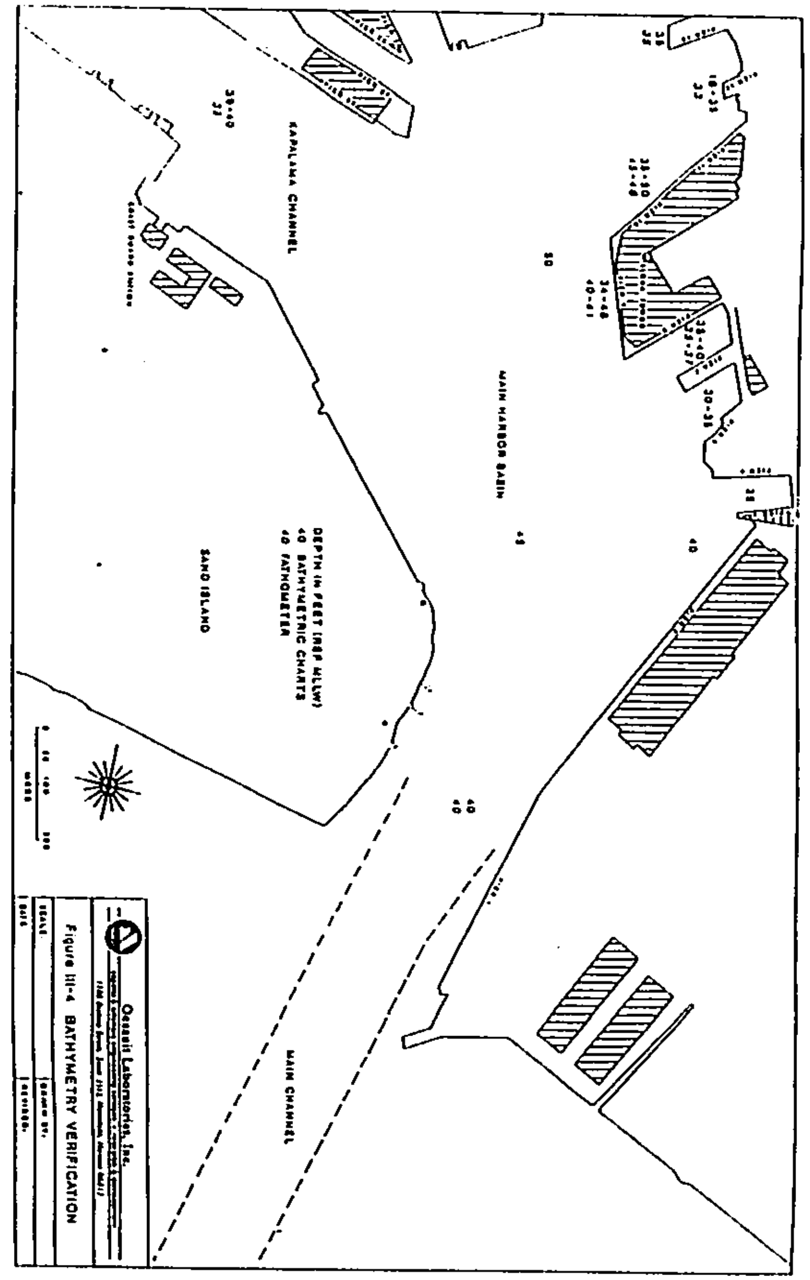


Figure III-4 BATHYMETRY VERIFICATION

D. SEDIMENTS

The results of size and composition analysis of sediment samples taken at Piers 5 and 6 are shown graphically and in tabular form in Appendix B. For comparison, Appendix B also contains a soil grain size classification chart. Four grab samples were taken at the locations shown on Figure III-5. The composition of the samples is shown in Table III-4. Three of the samples, 5-2, 6-1, and 6-2 consist of over 60% calcium carbonate ($CaCO_3$) indicating marine origin. Approximately 7.5-10.4% of these samples was organic, a product of plants or animals. The remainder, 10.2-25.7%, is non-organic terrigenous material, i.e., it originated on land. Sample 5-1, taken between Piers 4 and 5, is significantly different. This sample is over 83% terrigenous and, although the source is unknown, it appeared to be small gravel of the type used in street and parking lot construction.

TABLE III-4
COMPOSITION OF SEDIMENT SAMPLES FROM PIERS 5-6

SAMPLE	% $CaCO_3$	% ORGANIC	% TERRIGENOUS
5-1	10.4	6.2	83.4
5-2	66.8	7.5	25.7
6-1	66.0	10.4	23.6
6-2	82.2	7.6	10.2

Sediment size fractions are shown in Figures III-6 and III-7. Size analysis of sample 5-1 shows that very little of the material is silt and clay sized sediment. The median grain size is about 0.95 mm, medium sized sand. This contrasts markedly with the other three samples. Sample 5-2 is about 68% silt and clay sized material with a median grain size of 0.023 mm. Sample 6-1 is 68.5% silt and clay and has median grain size of 0.023, almost identical to Sample 5-2. Sample 6-2 has slightly more silt and clay, 72%, and a median size of 0.02 mm.

Turbidity in the harbor depends, in part, upon the grain size of the harbor sediments. Finer sediments become suspended easier and remain in suspension for a longer period. Harbor sediment normally becomes suspended in the water column by two general means. It may be carried into the harbor by runoff, or, as frequently

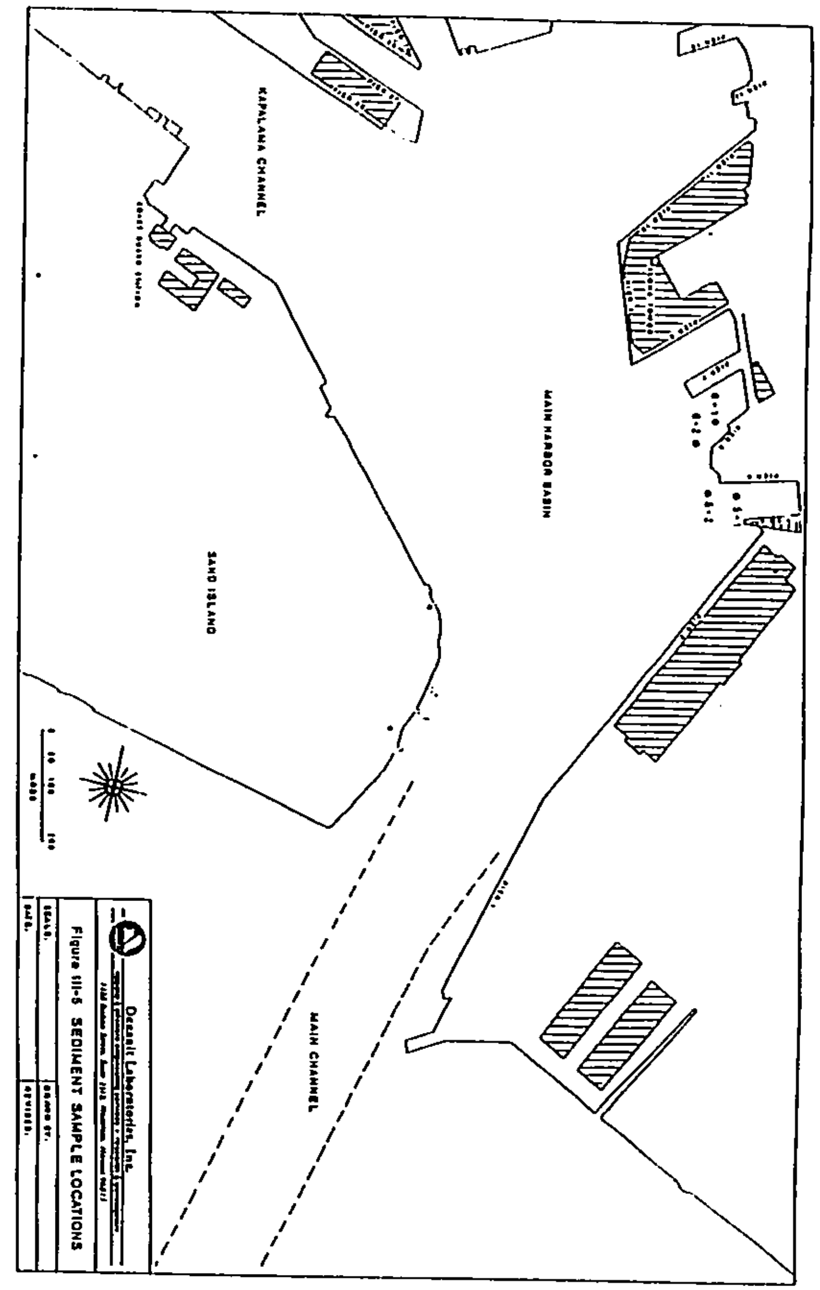
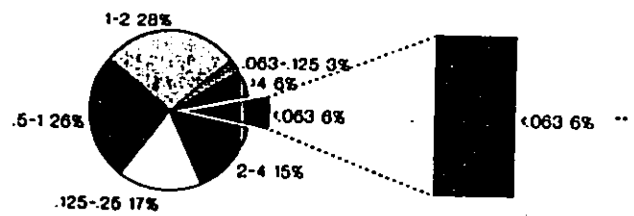


Figure III-5 SEDIMENT SAMPLE LOCATIONS

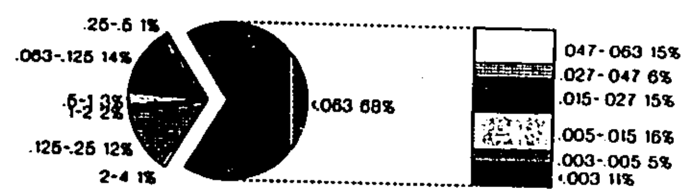
Honolulu Harbor Sediment

Size Fraction (Percent) •



Pier 5-1

• all sizes in mm
•• breakdown below threshold of instrument

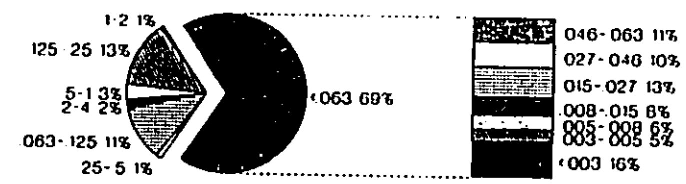


Pier 5-2

Figure III-6 SEDIMENT SIZE FRACTION, PIER 5

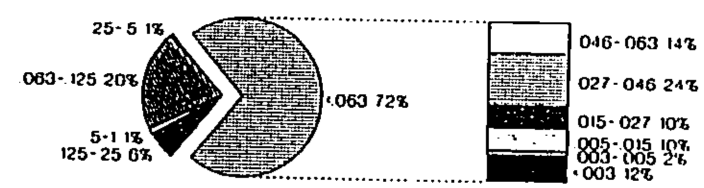
Honolulu Harbor Sediment

Size Fraction (Percent) •



Pier 6-1

• all sizes in mm



Pier 6-2

Figure III-7 SEDIMENT SIZE FRACTION, PIER 6 occurs, it is stirred up from the bottom by the propellers of ships or tugs. By estimating the settling velocity of the sediments and the currents in the harbor, the distance sediment will be carried before it is deposited on the bottom can be calculated. This will define the physical limits of impact that a sediment plume might have on the environment. This estimate could then be applied to sediment plumes generated by construction activity in the harbor.

One method of estimating the settling velocity of sediment is to use the settling velocity of equivalent quartz spheres. The settling rate of quartz spheres is given in Table III-5.

TABLE III-5
SETTLING VELOCITY OF EQUIVALENT QUARTZ SPHERES IN DISTILLED WATER AT 20 deg C

SIZE mm	SETTLING VEL ft/sec	TIME TO FALL 40 FEET, hrs	CRITICAL RESUS VEL, ft/sec
0.063	0.01143	1.0	0.218
0.021	0.00286	3.9	0.197
0.016	0.00071	15.6	0.151
0.008	0.00018	62.3	0.100
0.004	0.00005	243.8	0.070

Based on these settling rates, some of the sediment found at Piers 5 and 6 would remain in suspension for long periods of time; however, observations of sediment stirred up by ship traffic in the harbor show that sediment settles rapidly, disappearing from view within one hour. Sediment stirred up by ships in the main turning basin has not been observed leaving the harbor through the Main Channel. It appears to settle before being carried out by harbor currents. However, plumes from onshore construction have been observed moving out through the Main Channel (Environmental Consultants, 1974). The extent to which suspended sediment will be circulated in the harbor depends on quantities involved; tide, runoff, and wind conditions; and on methods used to control the sediment input.

Measurements of oil and grease, total petroleum hydrocarbons, and selected metals were made on the samples taken from Piers 5 and 6. The results of these measurements are given in Table III-6.

TABLE III-6 MEASUREMENT OF HYDROCARBONS AND METALS IN SEDIMENT SAMPLES AT PIERS 5 AND 6

(all units in mg/kg wet weight)

	PIER 5-1	PIER 5-2	PIER 6-1	PIER 6-2
Arsenic	3.0	5.0	5.8	5.8
Cadmium	1.2	1.9	1.8	2.2
Chromium	36.0	27.5	27.5	25.2
Copper	169	24.8	35.0	19.2
Lead	53.1	63.4	86.1	62.6
Mercury	0.05	0.16	0.21	0.16
Nickel	161	53.5	47.8	35.2
Silver	3.5	5.7	5.8	6.9
Zinc	170	71.9	190	65.9
Oil & Grease	110	360	450	290
Total Pet Hydrocarb	60	280	340	220

To determine how similar sediments at Piers 5 and 6 are to sediments at Piers 8-11, the results shown above were compared to those obtained by the State Department of Transportation, Harbors Division in 1988 (Aecos, Inc. 1988). This comparison is made to assist in determining whether further testing will be necessary should dredging be required at Piers 5 and 6. The Harbors Division data is given in Table III-7.

TABLE III-7
ANALYSIS OF SEDIMENTS AT PIERS 8-11
BY HARBORS DIVISION, 1988

	STATION 1	STATION 2	STATION 3
Arsenic	3.66	3.5	2.98
Cadmium	0.99	0.94	0.92
Chromium	20.7	17.2	16.6
Copper	56.1	25.1	34.8
Lead	138.4	58.9	70.4
Mercury	1.3	0.54	0.54
Nickel	28.5	18.1	21.8
Zinc	353.9	319.3	311.6
% $CaCO_3$	55.9	77.8	68.2
% Organic	10.0	10.9	10.3
Oil & Grease	35.0	N/A	175.0
% Silt and Clay	33.8	N/A	25.7

Marine sediments and organic material make up approximately the same portion of sediments at Piers 5-6 and Piers 8-11 (except for sample 5-1). The silt and clay size fraction of samples 5-2, 6-1,2 is higher than the samples from Piers 8-11, 67.7-72.1 % versus 25.7-33.8 %. Oil and grease and total petroleum hydrocarbon measurements are also higher at Piers 5-6. A comparison of metals shows that arsenic, cadmium, chromium, and nickel are higher at Piers 5-6 while copper, mercury, and zinc are lower. Sample 5-1 again shows results that differ from samples 5-2, 6-1, and 6-2, e.g., much higher copper and nickel than any of the other locations. The results of the above analyses indicate that further testing should be done before a decision is made on the necessity of performing bioassay or bioaccumulation tests on sediments at Piers 5-6.

E. WATER QUALITY

Honolulu Harbor is classified as a Class A embayment by the Hawaii State Department of Health (DOH) [ref DOH Nov 20, 1990]. Embayments are defined by the DOH as coastal bodies with a ratio of total volume to cross-sectional area of the entrance of 700:1 or greater. The cross sectional area of the main entrance channel to Honolulu Harbor (in front of Aloha Tower) is approximately 35,000 ft^2; the volume of Honolulu Harbor (area around development only) is approximately 340 million ft^3 -- a ratio of 11,400:1.

In general, results indicate that the harbor is consistent with DOH standards for a seasonally dry embayment (wet if average fresh water inflow from the land equals or exceeds 1% of the embayment volume per day, otherwise dry if less than 1% fresh water inflow).

A summary of test results is given in Table III-8. Data from field measurements are provided in the Appendix. Table III-9 shows results from previous measurements in the Harbor, as well as the corresponding DOH Water Quality Standards. In general, water quality in the Harbor is within the water quality standards because the uncertainty in the data is high.

The State of Hawaii water quality standards were designed such that compliance or non-compliance does not depend on a single result from a single day of sampling. Moreover, it was designed so that the natural variations in water quality would be statistically balanced to describe a water quality condition based on several samples collected during a variety of environmental conditions, such as occurs in Honolulu Harbor. During the winter season the harbor experiences more discharge from Nuuanu and Kapalama Streams than in the summer season. Additionally, large turbidity plumes are periodically generated from some of the large ships that use the harbor.

Turbidity is a measure of light scattering properties of water and is a convenient measurement of water clarity at discrete depths. It typically indicates the presence of suspended sediments, although it is also influenced by biological activity. Turbidity measurements at the thirteen stations ranged from 0.1 to 28.1 nephelometric turbidity units (NTU). The higher turbidity values were measured near the bottom of the harbor at a depth of approximately 40 ft. Turbidity measurements within the harbor (stations 3-8) had a geometric mean of 0.8 NTU's, with the 95% and 70% confidence intervals calculated to be 3.81/0.17 and 1.83/0.35 NTU, respectively. State DOH water quality criteria for wet and dry embayments are 1.5 NTU and 0.4 NTU, respectively. This is illustrated in Figure III-8. Although mean turbidity is greater than the state standard for wet embayments, the confidence interval

TABLE III-8 SUMMARY OF RESULTS FROM HONOLULU HARBOR WATER QUALITY MONITORING (geometric mean values)

DESCRIP.	STA. #	TURB. NTU	TNFS mg/l	NO3 µg/l	T NITRO µg/l	PO4 µg/l	T PHOS µg/l	PHAO µg/l	CHL µg/l
Kalihi Channel	1	3.95	8.52	3.56	125.63	7.70	46.07	.18	.46
Kapalama Channel	2	.96	5.60	3.12	99.80	4.26	19.41	.18	.57
Harbor	3-8	.80	6.86	4.44	112.03	3.47	18.33	.19	.55
Main Channel	9	.32	4.43	4.09	100.47	3.12	12.99	.19	.30
Nearshore	10-12	.34	5.15	2.47	102.55	2.53	12.60	.11	.27
Offshore	13	.13	3.56	4.07	101.25	3.23	12.92	.05	.15

TURB = turbidity in nephelometric turbidity units (NTU)
TNFS = total nonfiltrable solids
NO3 = nitrate
T NITRO = total nitrogen
PO4 = orthophosphate
T PHOS = total phosphorus
PHAO = phaeopigments
CHL = chlorophyll a

TABLE III-9 RESULTS OF PREVIOUS MONITORING AND STATE STANDARDS (geometric mean values)

Descrip.	Date	T Nito µg/l	No2/No3 µg/l	T Phos µg/l	Po4 µg/l	Chl A µg/l	TNFS mg/l	Turb. NTU	Fecal Coliforms #/100ml
Pier 11 Mean DOH	01 '73-12 '75	230	10	30.00	30.00	--	--	1.88	1671.1
Pier 39 G Mean/DOH	9-15-82	249.4	4.73	66.00	2.78	2.44	5.13	2.52	---
Pier 10 G Mean/DOH	9-15-82	213.8	4.21	35.11	5.00	1.43	4.03	1.83	---
Keehi Dock G Mean/DOH	9-15-82	270.2	7.16	29.75	2.76	1.85	5.22	2.37	---
Hon. Hrbr G Mean/DOH	9-7-82	180.9	9.60	12.33	3.81	0.07	6.55	2.39	---
Pier 8 G Mean/DOH	9-7-82	136.0	2.87	43.34	4.35	0.06	2.98	0.82	---
Embayment Wet DOH Std	---	200	8.0	25.00	--	1.5	--	1.5	< 200
Embayment Dry DOH Std	---	150	5.0	20.00	--	0.5	--	0.4	---

TURB = turbidity in nephelometric turbidity units (NTU)
TNFS = total nonfiltrable solids
NO3 = nitrate
T NITRO = total nitrogen
PO4 = orthophosphate
T PHOS = total phosphorus
PHAO = phaeopigments
CHL = chlorophyll a

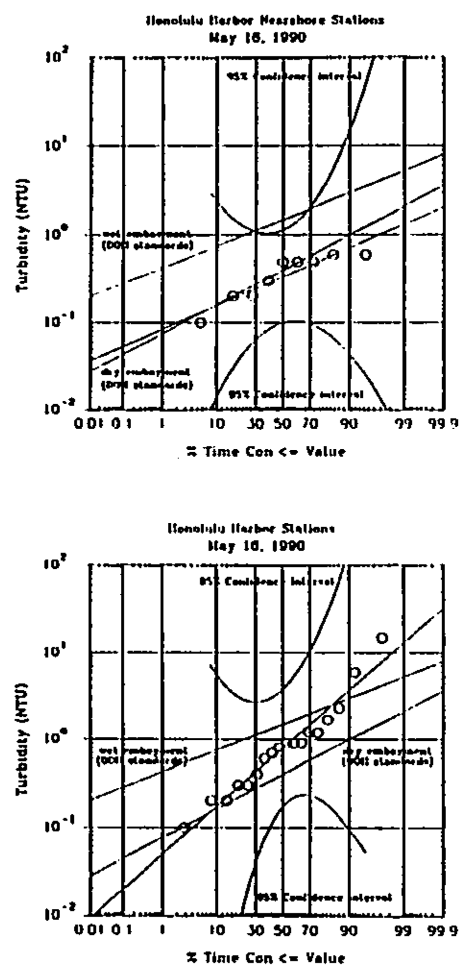


Figure III-8 TURBIDITY MEASUREMENTS

around the mean includes the state standard. Therefore, results do not indicate a violation of DOH water quality standards. Experience and general observations made of the harbor during the study period indicate that the harbor experiences frequent turbidity plumes from boat traffic. These plume patterns and freshwater discharge from the streams were not measured during the study.

Salinity measurements varied from 34.51 to 34.82 parts per thousand. Results do not indicate significant amounts of fresh water at any of the stations measured in the harbor. Although freshwater enters the harbor from a few sources, e.g., Nuuanu and Kapalama Streams, their discharge is quickly mixed into harbor waters. It should be noted that water flow from both streams was minimal when harbor measurements were taken. A slight gradient was found between the top and bottom samples, over a depth of approximately 40 feet; however, this is probably a result of the slightly cooler and more dense water falling to the lower depths.

Average harbor flushing time is dependent on tides, wind and waves. However, because the entrance is relatively small and deep, tide is the major force flushing the harbor. If it is assumed that the area adjacent to the development (illustrated in Figure III-9) is approximately 10,440,000 ft^2 and the volume is approximately 399,000,000 ft^3, then tidal flushing time can be calculated with the following equation:

$$\textit{Flushing Time} = \frac{V}{H \cdot A}$$

where V = volume of the harbor at MLLW
H = height of tide/unit time
A = surface area of bay

The calculated flushing time is between 12 and 15 days, depending on tidal heights.

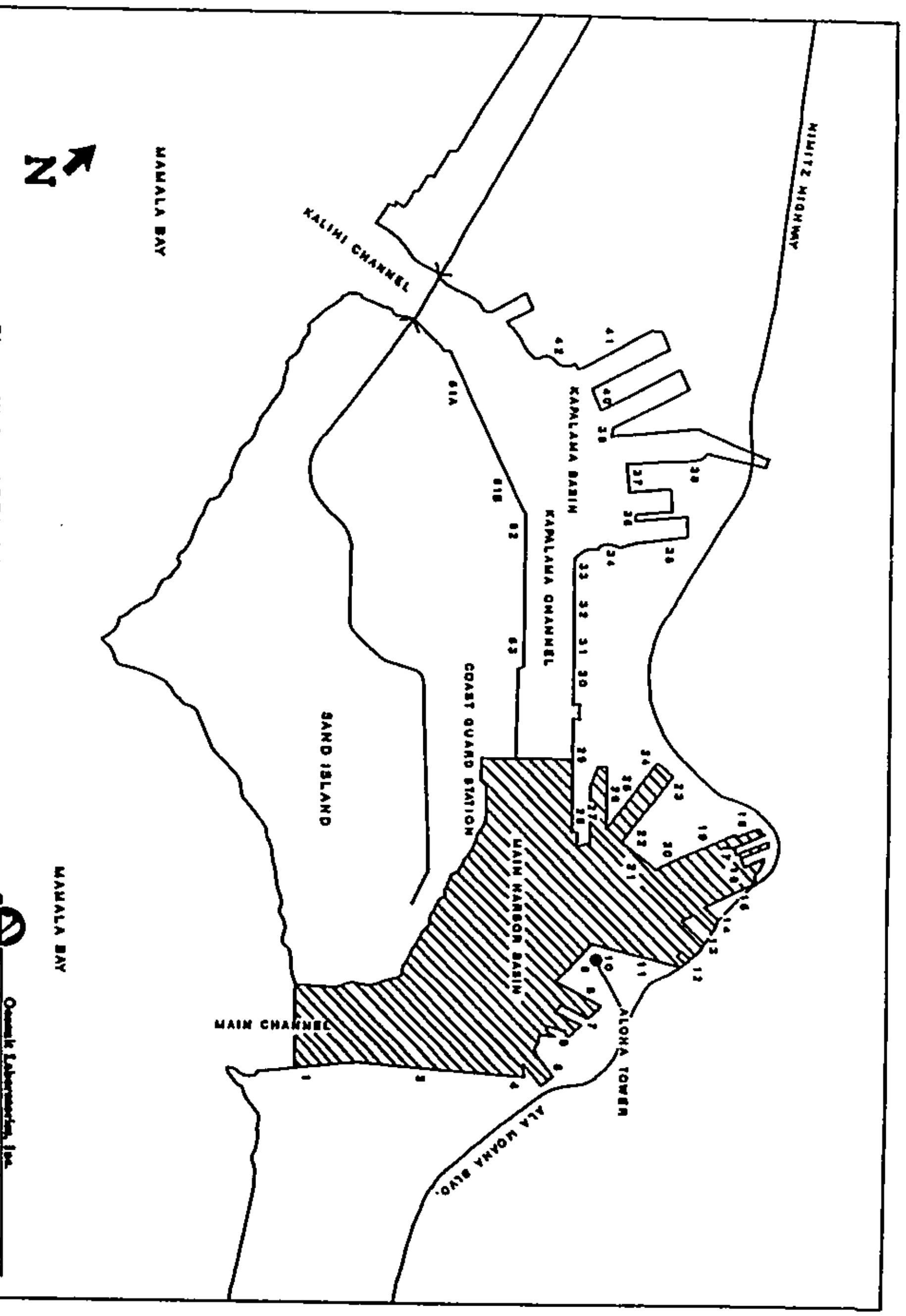


Figure III-9 AREA OF HARBOR USED IN FLUSHING CALCULATIONS

Oceanit Laboratories, Inc.

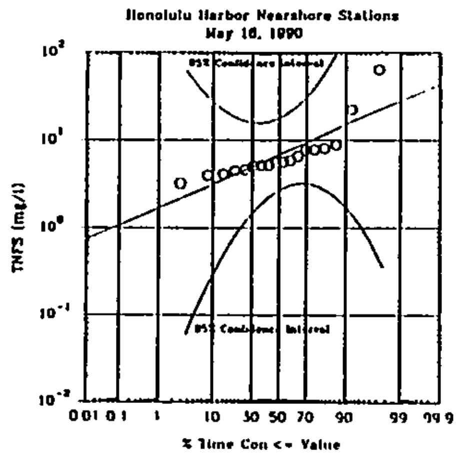
Nitrogen and phosphorus are the nutrients that most influence productivity in ocean waters. The availability of these nutrients generally increases shoreward due to terrigenous influences. Total nitrogen values varied from 91.3 to 197.5 ug/l with a geometric mean value within the harbor (stations 3-8) of 112.03 ug/l-N. Nearshore and offshore stations had geometric mean values of 102.54 ug/l-N and 101.24 ug/l-N, respectively. These values are low in relation to embayment criteria used by the DOH. Nitrate and nitrite measurements (the primary inorganic nitrogen constituent) varied from 2.1 ug/l-N to 16.2 ug/l-N, with an overall median value of 3.6 ug/l-N. Total phosphorous varied from 10.8 ug/l-P to 139.2 ug/l-P. The geometric mean value of total phosphorus inside the Harbor was 18.33 ug/l-P. This compares with the DOH standards of 20 ug/l-P for a dry embayment. Nearshore and offshore values were 12.60 ug/l-P and 12.92 ug/l-P, respectively. Orthophosphate values varied between 2.3 ug/l-P and 11.6 ug/l-P, with geometric mean values in the harbor of 3.5 ug/l-P. Nearshore and offshore values of orthophosphate were 2.53 ug/l-P and 3.23 ug/l-P, respectively.

Ratios of inorganic nitrogen and phosphorus (N:P) are typically used as indicators of nutrient limitations in an environment, e.g., which nutrient is needed to cause the growth of plankton. Phytoplankton typically require N:P ratios of 3.6 to 7.2 by weight.

Results indicate that the harbor and nearby area are nitrogen limited.

Total non-filtrable solids (TNFS) is the total dry weight of particulate material filtered from a known volume of seawater -- typically including organic and inorganic material, e.g., phytoplankton, detritus, sediment and microzooplankton. TNFS values measured in Honolulu Harbor had a geometric mean of 6.85 mg/l. Values measured nearshore and offshore were 5.15 mg/l and 3.56 mg/l, respectively. Results are illustrated in Figure III-10.

Chlorophyll a is the primary photosynthic pigment of living plants. Its measurement typically indicates phytoplankton biomass in marine waters. Phaeopigments are a measure of chlorophyll degradation products that constitute a significant fraction of the total green pigment in seawater. Chlorophyll a measurements had a geometric mean value of 0.56 ug/l inside Honolulu Harbor. Nearshore and offshore values were 0.27 ug/l and 0.15 ug/l, respectively. Phaeopigment values had a geometric mean value of 0.19 ug/l inside Honolulu Harbor and 0.11 ug/l and 0.05 ug/l at the nearshore and offshore stations, respectively. In general, values of phaeopigments and chlorophyll a increase with depth. Ratios of phaeopigment and chlorophyll a concentrations indicate the development state of phytoplankton in the water column. Results generally indicate that the developmental stage of phytoplankton



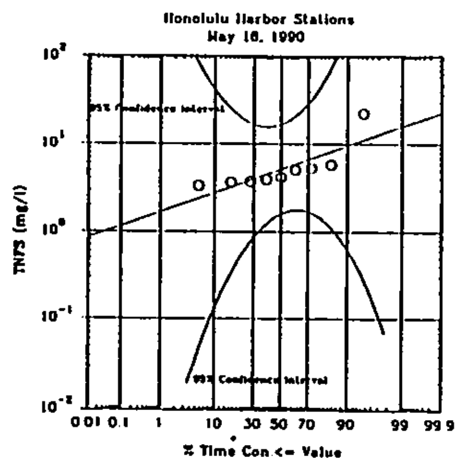


Figure III-10 NONFILTRABLE SOLIDS MEASUREMENTS

throughout the various stations is similar. However, specific measurements at certain locations show greater relative degradation, indicating slightly stagnant pockets of water.

Chlorophyll a measurements can be used to estimate the relative residence time at certain locations within the Harbor, e.g., locations with relatively poorer circulation. If it is assumed that the proliferation of Chlorophyll a requires nutrients and time, and that time is the controlling factor for growth, then a relative residence time can be calculated using a standard rate equation such as:

$$\frac{dC}{dt} = k * C$$

where, C = concentration of Chlorophyll a (ug/l)
k = combined rate constant (growth, predation and removal)
t = time

Based on this reasoning, there is a slightly higher residence time at station 3.

Dissolved oxygen values ranged from 6.1 ppm to 7.1 ppm throughout the monitoring stations, clearly indicating well oxygenated seawater. Results do not indicate any form of oxygen deprived environment.

Temperature values ranged from 25.06 deg-C to 26.9 deg-C. The coolest values were found at the bottom of the offshore station and other deep locations. The warmest values were measured near Pier 6 and are probably influenced by the warm water discharge from the Hawaiian Electric Power Plant.

Fecal coliforms, part of the total coliform bacteria group, are typically used as indicators of human waste concentrations in seawater because they inhabit human intestines and are present in human feces. If these bacteria are present in appreciable numbers, the water is considered to have a high disease producing potential. Waste disposal from ships or from upstream run-off probably occurs periodically in Honolulu Harbor, even though it is strictly forbidden. Department of Health data indicate that measurements in Honolulu Harbor between April 25, 1987 to March 31, 1990 found fecal coliforms ranging from 2/100 ml to 13000/100 ml. Ongoing monitoring of the harbor is necessary to ensure that harbor users and adjacent property users dispose of their waste properly. Results of the counts taken range from less than 1 (zero) to 8/100 ml. The highest counts came from samples taken at stations 3 and 4. However, these results are well below the accepted public health criteria of 200/100 ml.

F. MARINE ECOLOGY

Alterations to the harbor through dredge and fill operations have left little of the original biofauna intact. Habitats within the harbor have developed on the altered substrate to varying degrees of complexity. The degree of habitat development has depended upon the length of time the substrate has been in place, water movement characteristics, nutrient sources, fresh water input, and the water quality at the site.

The waters of Honolulu Harbor are designated Class A. The objective of Class A waters are that their use for "recreational purposes and aesthetic enjoyment be protected." These waters shall not act as receiving waters for any discharge that has not received the best degree of treatment or control compatible with the criteria established for this class.

The marine bottom ecosystem of the harbor is designated as class II:

> The uses to be protected in this class of marine bottom ecosystems are all uses compatible with the protection and propagation of fish, shellfish, and wildlife, and with recreation. Any action which may permanently or completely modify, alter, consume, or degrade marine bottoms, such as - - - navigational structures, - - - [and] structural shore protection may be allowed upon securing approval in writing from the director of health, considering the environmental impact and the public interest pursuant to section 342-6, HRS, section 342-32, HRS and section 342-33, HRS in accordance with the applicable provisions of chapter 91, HRS.

The harbor receives freshwater input from two primary sources, Kapalama Stream and Nuuanu Stream. These are major sources of organic matter and nutrients that enter the harbor. Both streams run through extensive housing and light industrial districts and are probably a source of intermittent pollutants from industrial waste and urban runoff. Both Nuuanu and Kapalama streams have been significant sources of sediments entering the harbor. Stream mouths in Hawaii typically foster an assemblage of juvenile fishes

and other important baitfishes. Both stream mouths have, in the past, been important sites for "Nehu" bait fishing in support of Oahu's Aku-boat (skipjack tuna) fishery.

Other freshwater input to the harbor occurs from run-off either directly or through numerous small storm drain, roof gutter, and parking lot drainage outlets. Various pollutants, nutrients, and particulate matter carried by this run-off can have specific impacts on the adjacent marine community. Surface runoff from the Pier 5/6 Park and from portions of the streets that are within the project area is collected at catch basins and discharged into Honolulu Harbor at four locations: Nimitz Highway near the mauka-ewa corner of Pier 11 via a 30-inch outlet; at Pier 10-11 bulkhead via a 24-inch outlet; and, between Pier 7 and Pier 8 via an 18 inch outlet and a 24-inch outlet. Roof and floor runoff from the existing Pier 8-11 structures is carried via underground drains through the bulkhead wall into the harbor at various locations around the periphery of the piers.

Fisheries within the harbor are limited to commercial "Nehu" (Stolephorus purpureus) bait fishing near the stream mouths and recreational fishing from Sand Island State Recreation Area, non-commercial piers, and sea-walls. The extent and importance of these fisheries, and the potential impact of the proposed project on them were investigated. Field surveys of marine life in selected areas of Honolulu Harbor were conducted as a basis for assessing potential construction impacts as well as potential long-term environmental modifications.

Shoreline construction is often associated with outbreaks of a fish poison known as ciguatera. Population levels of the causative agent, a dinoflagellate (Gambierdiscus toxicus), as well as toxin levels in selected fish common to the area were assessed.

Benthic - Results

a. Kapalama Stream Entrance

The water depth 50 meters from the Nimitz Highway overpass was 2 meters, shoaling to 1 meter within 25 meters of the overpass. There was no noticeable flow, and the horizontal visibility was about 2 meters. The bottom is very soft mud with numerous burrow holes (est. 16-25 per 25 cm x 25 cm square area). These burrows are consistent in size and shape to those of the snapping shrimp, Alpheus malabaricus mackayi. Several blennies were also seen fleeing into these burrows. Gas bubbles were observed rising from the muddy substrate. The adjacent concrete wharf face was covered with typical fouling growth. Oyster shells (2-3 cm maximum shell length) dominated the upper 20 cm, with sponges, algae (Dictyota), hydroids, tunicates, and other fouling organisms below.

Several colonies of the encrusting coral Lepastrea purpurea were noted on the wall. There was evidence of recreational fishing activity (tackle caught in bushes). The area is a likely habitat for mullet, milkfish, and juvenile hammerhead sharks. No fish other than the few blennies, were seen.

At the corner of the rock revetment seawall opposite Pier 38 where Kapalama Stream enters Honolulu Harbor Kapalama Basin, a qualitative transect was made from shore to a depth of 10 meters. The rock and boulder revetment was replaced at a depth of 6 meters by a sloping mud bottom. The underwater visibility was 3 meters. Fish seen include; 3 Sergeant majors (Maomao, Abedefduf abdominalis), 12 white bar surgeon fish (Acanthuris lucoparieus), 1 snapper (Lutianus fulvus), 3 butterfly fish (2 Chaetodon lunula, 1 C. miliaris). Boulders apparently provide habitat for fish. No fish were noted over the mud slope where there were no boulders.

b. Kapalama Channel

In the middle of Kapalama Channel off of Piers 31 and 53 at a depth of 13.5 meters the visibility was 4-5 meters. There was no visible plant or animal life on the bottom. At least eighty percent of the bottom is bare calcareous substrate or large rubble. There was no mud, sand, or small rubble, and no marine life in the water, holes, crevices, or under rocks. The area appears as if it was recently dredged. Some rock surfaces exhibited a slight growth of an unidentified tough pale short filamentous algae.

Along the pilings at the edge of the Matson wharf (Pier 53) the depth was 8 meters to a sloping mud over rubble bottom. The visibility was 5 meters. Fish seen include 2 Chaetodon auriga, 1 C. lunula, 10 Zanclus cansencens, and 1 Acanthurus leucoparius. While the area appeared to be an excellent fish habitat with piled up pilings and other three dimensional relief under the wharf, it seemed rather devoid of fish life. There was typical fouling growth on the pier pilings, including some encrusting coral (Lepastrea purpurea). No bait fish or predators were noted along 50 meters of wharf.

c. Nuuanu Stream

Visibility was about 3 meters over a soft mud bottom. The fouling community on the pier pilings was much more developed than in other areas of the harbor. Tunicates, Sponges, Feather duster worms, hydroids and myriads of other organism formed a 5 - 20 cm thick layer around each pier piling. Several rotting fish (probably trash from nearby fishing boats) were seen floating in the water. There was a small school of several hundred nehu larvae - still transparent, swimming along the seawall. Other fish seen included one Sergeant major (Maomao, Abedefdur abdominalis), and one white bar surgeon fish (Acanthuris lucoparieus).

d. Pier 12

This pier is fronted by cut coral blocks from the old Honolulu Fort each measuring approximately 10" x 20" x 30". At high tide the blocks extend 3 feet above the water and 5 to 10 feet below to an unidentified solid base material. The face of the wall, particularly around the lower low tide level, has thick and abundant encrusting marine invertebrate fauna including several species of sponges, hydroids, feather duster worms, and small Lepastrea corals. Fish in this zone hide in the cracks and holes formed between eroded coral blocks. Species seen in this zone include the mamao (Abedefduf abdominalis), kupipi (Abedefduf sordidus) manini (Acanthurus triostegus) damsal fish (Abedefduf imparipennis), and blennies. A sizable (several thousand) school of nehu (Stolephorus purpureus) was seen in the surface waters around the pier.

At least six species of corals were identified beneath the lower low tide level on the rocks forming the pier support. Corals identified include, Lepastrea purpureum, Porties lobata, Porites compressa, Montipora patula, Montipora verucosa, and Pocilipora damicornis. Although coral cover was not as abundant as in the area of Pier 5/6, the coral heads appeared healthy and probably made up 20% of the benthic cover. Additional fish identified in this zone include a few yellow tangs (Zebrasoma flavescens), moorish idols (Zanclus canescens), saddleback wrasse (Thalassoma duperreyi) a surgeon fish (Acanthurus nigrofuscus) and one-spot damselfish (Dascyllus albisella).

The floor of the berth was only about 10-15 feet deep around the edge of the pier. Substrate consisted of the typical mud bottom with abundant mud-dwelling invertebrate burrows. Fronting the pier the bottom remains fairly shallow (15-20 feet) with occasional unidentifiable junk and old rotten pier pilings protruding up through the mud. Recreational fishermen at the site reported catching juvenile hammerhead sharks, surgeonfish, and occasional papio from the end of the pier. The abundance and species diversity of fish was not as great as the reef area surrounding Pier 5/6. However, the presence of healthy corals suggests that, historically, the water quality has been quite good, even this far into the harbor and near a major fresh water inlet.

e. Piers 8, 9, and 10

At the corner of Piers 8 and 9 the depth was 12 meters to a talus slope mud bottom strewn with debris. The visibility was about 7 meters and a current (approx 20 cm/sec) was sweeping around the corner of the pier from inside the berthing area out into the main basin towards Ewa. No fish or macroinvertebrates were evident within 20 meters of the pier into the harbor basin. The pier has a poured concrete base under the warehouse area. At the base of the wall, a small community of fish was noted including 8 one spot damsel-fish (Dascyllus albisell), 4 moorish idols (Zanclus canescens), 1 spotted pufferfish (Canthigaster jactator), and 1 manini (Acanthurus sandvicensis). Typical fouling organisms noted on the pier pilings included the encrusting coral Lepastrea purpurea but no other live corals.

At the corner of Piers 9 and 10, the visibility was 2-3 meters (different day from the above observation). No fish were seen either under the pier to its base or 20 meters out into the harbor basin. The bottom slope was similar to that at the other end of Pier 9 with mud, rocks, and miscellaneous debris. Pier pile fouling was typical of other areas in the harbor.

At the base of Pier 8, 15 live coral colonies (Lepastrea, Porites, and Pocillipora) were counted on one outer pile face that measured 5 meters deep by 40 cm wide. The floor of the berth was mud with the typical mud burrow holes and an absence of visible fish or macro-invertebrates. The cement seawall parallel to the roadway at the base of the pier is rooted on a coral covered shelf in about 1.5 meters of water. The coral covered shelf is about 2-3 meters wide, and then drops off (4-5 meters) to the mud and debris bottom. The shelf and drop-off were covered (est 75%) with live corals of at least 6 common species, including Pocillopora meandrina, Pocillopora damicornis, Porites lobata, Montipora verrucosa, Montipora patula, and Pavona varians. Small reef fish were abundant including a dozen yellow tangs (Zebrasoma flavescens), manini (Acanthurus sandvicensis) common butterflyfish (Chaetodon miliaris), three banded butterfly (C. trifasciatus) juvenile wrasse (Bodianus bilunulatus) and several bird wrasse (Gomphosus varius). The density and complexity of the fauna was consistent across the seawall and past the HECO water inlet.

f. Piers 5, 6, and 7

On the south side of Pier 6 and 7 and the Maritime Museum, there is a coral shelf similar to Pier 8 at the base of the seawall. The visibility here was about 7 meters. Corals were abundant (similar to the seawall base of Pier 8) on the shelf at base of sea wall in the North (Ewa-Mauka) corner of the berth. Fish observed include 2 long-nosed butterfly fish (Forcipiger sp.), 10 yellow tangs (Zebrasoma flavescens), 1 Kole (Ctenochaetus strigosus), 1 wrasse (Stathojulis baltsata), 6 small surgeon fish (Naso unicornis), 1 surgeon fish (Acanthurus mata), 6 one-spot damsel fish (Dascyllus albisella), 2 female white-spot boxfish (Ostracion meleagris) and 1 yellow morph trumpet fish (Aulostomus chinensis).

A fresh water outfall empties through the seawall about midway along its width. A gravel and sand talus slope and alluvial fan has formed here that can bury any living coral. On the other side of the inlet (closest to the electric plant outlet) the coral growth is not as abundant, and there is a strong (0.5 m/sec) flow parallel to shore towards the outflow. Fish are relatively plentiful near the outfall plume, including 3 small (1/4 lb) papio (Caranx sp.) a school of surgeonfish (Acanthurus mate), two dozen yellow tangs (Zebrasoma flavescens), a pair of one spot butterflyfish (Chaetodon unimaculatus), and one spotted boxfish (Ostracion meleagris).

Directly in the outfall plume and all along the wall, under the road overpass and to the former mooring site of the Oceania floating restaurant there were no corals observed. Although the transect in the current was brief and the view was obscured by entrapped bubbles, it is obvious that there is scarce (if any) coral growth on the substrate in direct contact with the plume itself.

The velocity of the plume and the entrapped bubbles was greatly reduced by the time the current reached the previous docking site of the Oceania (Pier 6). At the base of the concrete seawall of Pier 6 there is a large assemblage of rocks, concrete and miscellaneous junk which provides habitat for schools of fish including; a dozen One spot damsel-fish (Dascyllus albisella), two racoon masked butterflyfish (Chaetodon lunula), three ring-tailed surgeon fish (Acanthurus mata), five kole (Ctenochaetus strigosus), one trumpet fish (Aulostomus chinensis), two butterflyfish (Chaetodon auriga), a pair of moorish idols (Zanclus), and several brown surgeon fish (A. nigrofuscus). Fishermen report that papio are commonly caught at this site.

Continuing out to the end of the pier to where the rock revetment begins, several manini (A. triostegus), a school of at least 30 quarter-pound size papio (Caranx sp.), eight large tilapia, and a small school (<10) of nightmare weke (Upeneous arge) were noted.

Further (30 meters) along the wall adjacent to the second set of pier pilings it was noted that coral was once again abundant on the rocks at an estimated density of two large coral colonies per square meter. Most of the coral in this area is Pocillipora damicornis, Montipora verrucosa, Montipora patula, Pocillipora meandrina, and Porites lobata. Dascyllus were present in several of the larger meandrina heads, several red-line wrasse (Stethojulis balteata) and a small school of yellow goatfish (Mulloidichtys auriflamm) were noted. One Christmas tree wrasse (Thalassoma purpureum), three surgeon fish (Naso unicornis), and one saddle-back wrasse (Thalassoma duperreyi) were also seen. A layer of silt covers most of the exposed rock surfaces, but does not prevent the growth of algae (primarily Dictyota sp.) on most of the rock surfaces. The species make-up of benthic algae communities is typically cyclical. Within two weeks following initial observations, the Dictyota algae was noted to be dead and totally overcome with epiphytic growth and silt. At least a dozen short spined black collector urchins (Pseudoboletia indiana) were noted among the rocks making up the sea-wall. Several longspined sea urchins (Diadema paucispinum or Echinothrix diadema) were noted on the sea-wall and upon the near-shore pier pilings. Continuing around the perimeter of the Pier 5/6 sea wall, a similar abundance of fish and invertebrates on the rock revetment was noted.

A 20 meter transect was conducted from the end of the Pier 5/6 peninsula out across the rock revetment into the harbor area. The results of this transect are given below.

TABLE III-10 TRANSECT TOUCH POINT ANALYSES
(identification of substrate at 1/2 meter intervals along transect line)

meter	substrate	meter	substrate
0	rock	10	rock
-	rock w/Dictyota algae	-	rock, with mud cover
1	rock	11	mud
-	rock w algae mat	-	rock
2	rock w algae mat	12	rock
-	sponge on rock	-	mud
3	rock with algae mat	13	mud
-	rock with Dictyota algae	-	mud
4	rock	14	rock, w/ black sponge
-	rock	-	mud (Spongia oceania)
5	rock	15	mud
-	rock	-	mud
6	rock	16	mud
-	coral, P damicornis	-	mud
7	rock	17	mud
-	coral, Porites lobata	-	mud
8	rock, with mud cover	18	mud
-	rock, with mud cover	-	mud
9	coral, P. meandrina	19	mud
-	rock, with black tunicate	-	mud
		20	mud

Fishes seen within two meters either side of the transect are noted in the table below. Only one fish (blennie) was seen in the lower half (meters 10 - 20) of the transect over the mud bottom.

TABLE III-11
FISH OBSERVED ON TRANSECT

Number	Type
4	Naso unicornis
1	un-ID blue damsel-fish
3	Mulloidichthys samoensis
2	Thalassoma duperreyi
3	Stethojulis balteata
8	Dascyllus albisella
3	Scarus sp, 15-20 cm small grey
1	Stethojulis balteatus
1	Diodon histrix
1	Aulostomus chinensis
1	Blennie, in mud burrow

Corals noted within the transect (also all in the upper 10 meters) in order of estimated abundance include:

Pocillopora damicornis
Porites lobata
Pocillopora meandrina
Montipora verrucosa
Lepastrea purpurea

Significant invertebrates included six black collector sea urchins (Pseudoboletia indiana), two white collector urchins (Tripneustes gratilla) and various unidentified sponges. At least a dozen massive black sponges tentatively identified as Spongia oceania were apparent in the lower half of the transect.

The dominant algae was Dictyota bartayresii and an algae mat consisting primarily of a hair-like, wiry algae tentatively identified as Gelediopsis. All of the algae was covered with a fouling layer of diatom and/or micro algae and silt. Within 2 weeks following these initial observations the Dictyota population had almost completely died off. Such cyclical population fluctuations are typical of benthic macro-algae.

Three meter square areas centered at meter 5, 10 and 15 were closely examined to determine percent cover.

- Meter 5. One square meter at a depth of 2 meters contained 3 live coral heads encompassing approximately 6% of the total area, one featherduster worm, and a single collector sea urchin. The substrate was rock and rubble covered with an algae mat the principal species of which was Dictyota bartayresii.
- Meter 10. One square meter at a depth of 4 meters contained 2 live coral heads encompassing approximately 3% of the total area. Four large sponges (S. oceania) accounted for 12% of the area. The balance of the area was mud.
- Meter 15. One square meter at a depth of 6 meters contained no macro-invertebrates or algae on the 100% mud substrate.

g. Piers 1 and 2

The pier pilings nearest the edge of the wharf are spaced about 4-5 meters apart with an outer face about 60 cm wide and extend to the bottom in about 12 meters of water. Individual coral colonies larger than about 10 cm² were counted on the outer face of each piling. There is a general trend of increasing coral growth on the pilings nearer to the ocean. Also of interest, however, is the scalloped distribution of coral abundance which corresponds generally to the normal mooring position of ships using the pier (Figure III-11).

During these observations a few miscellaneous fish were seen but not noted. A large school (50-100) of 3-5 pound size papio (Caranx sp) was seen several times under Pier 1.

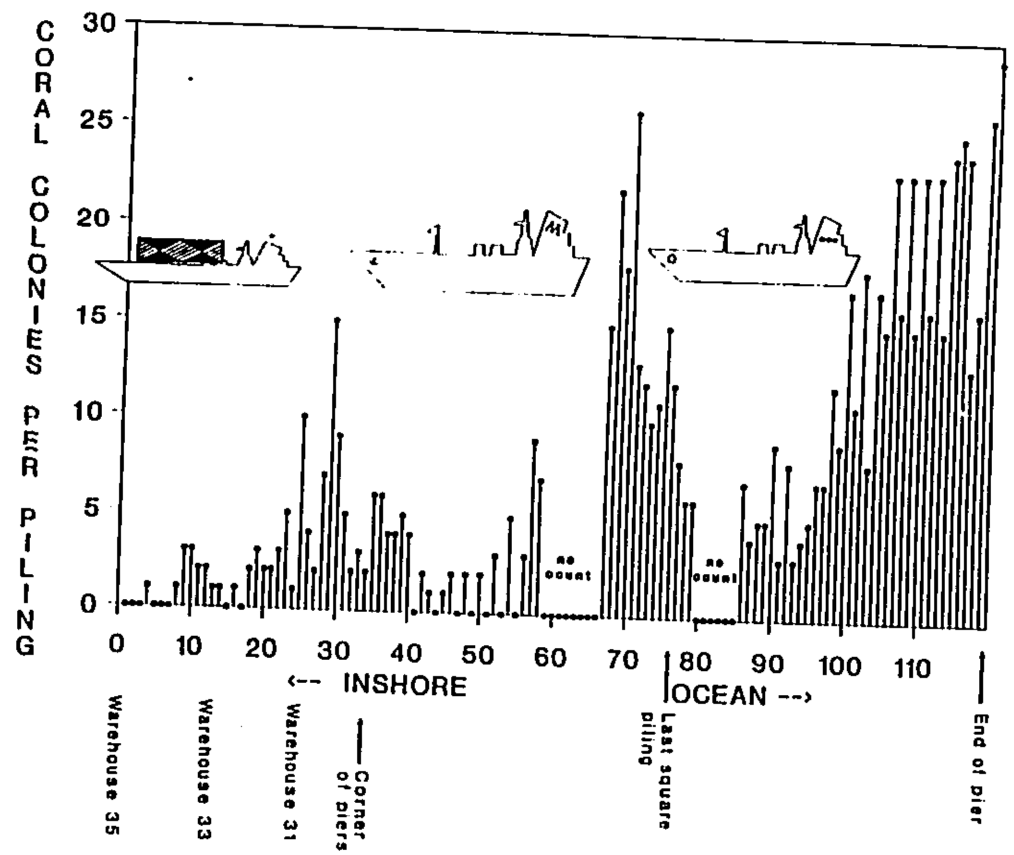
h. Sand Island

Qualitative observations were made in shallow waters along about 150 meters of the seawall fronting Sand Island Park and the harbor channel. Most of the live coral is Pocillopora damicornis, but Pocillopora meandrina, Montipora verrucosa and Porites lobata were also observed. Most of the area supports about 1/2 to 1 live coral head per square meter. A moderate number of fish were present, particularly around pilings or rock outcroppings. Fish species seen, in order of their estimated relative abundance include; the one spot damselfish (Dascyllus albisell), manini (Acanthurus triostegus), moorish idol (Zanclus canescens), Nehu (Stolephorus Purpureus) black spot weke (Mulloidichthys samoensis), maomao (Abedefduf abdominalis), and black tailed snapper (Lutjanis fulvus).

Creel Census - Results

At 0600 on Sunday, June 17 there were 5 active recreational fishermen in the vicinity of Pier 5/6. Four of these fishermen (two adults and two juveniles) had spent the entire night fishing. By 12:00 noon 22 recreational fishermen had been noted at

Figure III-11 CORAL COLONIES ALONG PIERS 1 & 2



the site. The fishermen were equally distributed in age categories, but only two were women. One fisherman was confined to a wheel chair. This was termed a "medium to light" population by one of the "regular" fishermen. Fishing on this particular day, according to the fishermen, was generally poor in comparison to other days. From 0600 to 1200, only one small papio, a juvenile hammerhead shark, two tilapia, and a balloon fish had been caught. One fisherman fought an unseen fish for about 3 minutes before his 20 pound-test line snapped.

Of the seventeen fishermen surveyed, six had made one or more visits to this site per week during the past month, eight had come 2 or 3 times and three indicated that this was their first visit to the site. The average fishermen tended to spend 2 to 4 hours fishing and caught less than one fish per trip. These fishermen estimated that they had made a total of 82 separate visits to the site during the past month and caught a total of 118 fish. One fisherman who fishes the site for one hour every morning, plus a second who fished here only 5 times in the last month, accounted for over half of all the fish caught. According to the fishermen, the most common fish caught are papio, hammerhead shark, palani, half beak, tilapia, lae, balloonfish, kala, maomao, weke and opelu.

It is not unusual to find fishermen at the site at any hour of the day. During the week it is common to find several people who come down to fish for an hour or two in the morning before work or in the afternoon before going home. The weekend crowd tends to encompass a younger cross section of fishermen.

<u>Ciguatera - Results</u>
Both the algae/diatom samples and the fish flesh analyses indicate a current low threat of ciguatera poisoning from fish caught within the harbor. Analyses of four algae samples indicated *Gambierdiscus toxicus* diatom levels at 7, 0, 6.8, and 6.8 cells per gram of algae. This is well below the cautionary level of 20 per gram set by the state Department of Health. For comparison, levels in the 1000's of diatoms per gram have been recorded in the past from various "hot" sites around the state.

Analysis of flesh from eleven fish caught in the harbor indicates there is a low level of ciguatoxin currently in the population. Toxicity is measured on a relative 0 to 5 scale. Values less than 1.4 are considered to be non-toxic. Values greater than 1.8 are termed toxic, with values greater than 3.5 very toxic. Because there can be cross reactivity in the monoclonal antibody test used, it is possible to get a high reading from a non-toxic fish, but impossible to get a low (non-toxic) reading from a toxic fish. Of

the 11 fish tested, one was in the toxic range, four were in an indeterminant range, and six were clearly non-toxic (Figure III-12).

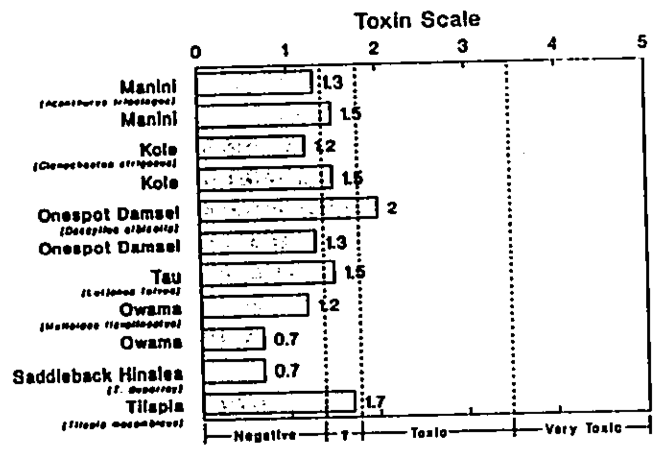
<u>Commercial Fishing (Nehu) - Results</u>
The only commercial fishing currently practiced within Honolulu Harbor is for baitfish - nehu and sardine. The State Division of Aquatic Resources lists the following statistics regarding baiting activity at various locations around Oahu.

TABLE III-12
BAITING ACTIVITY ON OAHU

	1988			1989			1990 (3 mo's)		
	Nehu	Eau	Sardine	Nehu	Eau	Sardine	Nehu	Eau	Sardine
Honolulu	65	-	46	38	-	64	-	-	-
Kewalo	775	135	-	192	-	-	-	-	-
Kalhihi	393	-	53	157	40	-	31	-	-
Pearl H.	4866	-	409	3062	-	674	151	-	20

Nehu can be found in shallow waters in many areas around the state. But they are captured primarily in stream mouths where they presumably congregate to feed. Although bait-size (2-3 cm) nehu were seen in the harbor near the Sand Island Park sea wall, none were seen in the Kapalama Channel, and only a few juveniles were seen near the mouth of the Nuuanu stream. Discussions with fishermen indicate that Honolulu Harbor has not been a productive baiting site for the past several years. During 1988 and 1989, Honolulu Harbor accounted for only about 11% of the Nehu captured.

FIGURE III-12 CIGUATERA: Fish Analysis Results



IV. DISCUSSION AND IMPACTS OF PROPOSED ACTION

Analyses of Honolulu Harbor's physical and biological marine environment indicate the harbor has no major environmental problems and is not expected to develop any due to the proposed redevelopment. The harbor environment is considered relatively good when compared with other working harbors. The physical and biological factors that influence the harbor environment were evaluated by both field and analytical work. While these studies were not comprehensive, results are sufficient to make both qualitative and quantitative estimates of the effect from redevelopment activity. The discussion presented in the following paragraphs summarizes the existing conditions and potential impacts determined by the study.

Wave penetration into the harbor during south swell or Kona storm conditions is of some concern to harbor users. No other wave phenomena, such as harbor resonance, appear to be major factors that need to be considered for proposed harbor modifications. Wave penetration does affect harbor operations for smaller vessels such as dinner cruise ships, requiring some vessels to move to secure berths several times per year. These conditions are not expected to be changed by the proposed redevelopment activities. Wave penetration will have to be considered when planning for large cruise ship operations at Piers 5 and 6 and may have some effect on design of the pier structures. During severe storm conditions, wave splash and runup may reach the roadway along the harbor between Piers 5 and 8. Under storm conditions, access by pedestrians to proposed facilities on Piers 9 and 10 may have to be restricted.

Honolulu Harbor is a catchment basin for fresh water runoff containing large quantities of sediment. Most of the sediment settles out in the harbor, and the fresh water mixes with seawater. Circulation patterns are not expected to change significantly as a result of the proposed harbor structures. Silt plumes generated during construction will generally settle out before reaching the open ocean; however, during strong trade winds or periods of heavy storm runoff, silt plumes may travel the length of the main channel and reach the open ocean. Should large volumes of silt be generated by the construction, a silt curtain may be necessary to contain the material within the harbor and allow it to settle. In general the proposed construction activities are not expected to generate effluent that would impact the harbor more than normal runoff or silt churned up by ships using the harbor.

Water quality in Honolulu Harbor is relatively good in spite of the fact that it is a very important working harbor for the State of Hawaii. Results from previous monitoring in the harbor support this finding. Almost on a daily basis large turbidity plumes are generated by tugboats guiding large container ships into and out of the harbor. Within hours after the large plumes are generated, the visible turbidity patterns disappear below the surface. During heavy winter rains the harbor may develop a milky brown color as a result of fresh water runoff from streams. Most of the fine materials will resettle below the surface within hours. During the next few days most of the remaining material will settle to the bottom. This occurs because the harbor acts like a large settling pond and collects fine materials before they can exit into the nearshore area. This was reflected in the results of our TNFS measurements. Geometric mean concentrations of TNFS decreased from 6.8 mg/l to 5.1 mg/l from the harbor to the nearshore area. Concentrations further decreased from the nearshore stations to the offshore station. Geometric mean turbidity values similarly decreased from the harbor to the nearshore areas from 0.79 NTU to 0.33 NTU, respectively. Turbidity continued to decrease from the nearshore to the offshore station (measured at 0.12 NTU).

Analysis of sediment samples taken at Piers 5 and 6 indicate that sediments are somewhat different from those at Piers 8-11. To more clearly define and quantify these differences, more sampling and analysis would be required.

Harbor water quality is influenced by nearshore oceanic conditions, as well as periodic stream discharges. On the average Nuuanu stream discharges approximately 670,000 ft^3/day into the harbor. Average tidal flushing amounts to approximately 39 million ft^3/day. Therefore, on the average, approximately 2 percent of the daily harbor flushing volume is Nuuanu stream discharge. The average daily Nuuanu stream volume represents approximately 0.2 percent of the harbor's total water volume. Put into perspective, harbor volume calculations are roughly 10 percent accurate; therefore, the relatively small average flux of Nuuanu stream water through the harbor is, on the average, not significant. As a result, the average water quality in the Harbor is not influenced by average stream discharge, except for the mixing zone at the point of entry or during extreme events.

Construction activities associated with the waterfront at the Aloha Tower development are expected to affect Honolulu Harbor waters as a result of the following:

1) dewatering while constructing parking facilities
2) airborne dust and sediment
3) turbidity plumes from dredging

Impacts from dewatering will depend on dewatering flow rates and constituents found in the water. Because fresh water already enters the harbor on a daily basis, dewatering impacts will depend on the relative quantity, constituency, and duration of the activity. This activity should also be considered in the context of large storm flows entering the harbor during winter rain seasons, discharging freshwater and sediments. Potential concerns include impacts on nearby corals and marine life. In general, if discharge flows and constituents are similar to those found in 10 and 50 year storm events, then the impact is expected to be negligible. If discharge flows are greater than a 100 year stream discharge event, then construction methods, materials and schedules need to be reviewed to determine methods to control impacts. In any case, a monitoring program before, during and after construction is planned.

Airborne dust and fine sediments resulting from construction activity will increase the turbidity of harbor waters. This impact will depend on the methods and duration of construction. However, because of the nature of present activities in the harbor, a measurable difference in water clarity is not anticipated.

Turbidity plumes from maintenance dredging occur in Honolulu Harbor from time-to-time and are a result of necessary harbor maintenance activity. Based on the results of our water quality measurements as well as reports of past dredging activities, any impact on the harbor water quality is expected to be temporary.

Marine life is generally neither abundant nor diverse in most areas of Honolulu Harbor. There have been no rare, endangered, or threatened species identified within or near the project area that could be affected by the project.

The harbor bottom is typically thick unconsolidated sediments (mud) with occasional burrows (more common in shallow water) and limited fish life. This substrate forms habitat for burrowing polychaete worms, shrimp, and crabs. Most of the organisms common to the soft bottom areas are capable of rapidly recolonizing disturbed areas. One major fish species inhabiting the mud bottom ecosystem is the juvenile hammerhead shark which feeds off mud dwelling invertebrates.

In the Kapalama channel fronting the Matson pier and probably extending from Piers 28 - 32, the consolidated coral bottom is completely clean and devoid of mud, sand or small gravel. Some patches of unidentified pale filamentous algae were the only major marine life form found in this area. Tooth marks from dredging equipment are visible on the coralline rock surface. Sediments may be kept clear of this area by the constant prop-wash of passing ships.

Fish and coral fauna under and around most of the piers were also limited. Piers 1 and 2, which stretch from the central harbor to the harbor mouth, display an increased abundance of corals toward the open ocean. The abundance of corals along this pier appears to decrease adjacent to the normal berthing sites of cargo ships. This could be due to light limitations or possibly from exposure to antifoulant bottom paint toxins.

An area of relatively abundant sea-life is the sea-wall extending from the base of Pier 8 (electric plant cooling water inlet) to Pier 7 (electric plant outlet) and out around the rock revetment surrounding Pier 5/6. Coral, invertebrate, and fish life are both abundant and diverse in these areas relative to other areas in the harbor. Of the 47 species of fish and 12 species of coral identified in the harbor, most can be found in this general area. The abundance of both fish and invertebrates is limited, however, to the near-shore top 5 meters of water. Benthic life below this depth is generally restricted to mud dwelling organisms. Coral and other benthic life directly within the Hawaiian Electric Company (HECO) plant warm water outflow plume are scarce in comparison to the surrounding areas. Conversations with researchers active in the HECO environmental studies (1970-74) indicate that there have probably not been significant changes in this area during the past two decades.

Pier 5/6 is a popular recreational fishing site on Oahu. This popularity is due to its proximity to a highly populated area, the ease of access, the current generated by the HECO plant outfall, and the perceived abundance of game fish.

There is currently a small or minimal threat of ciguatera poisoning from fish caught within the harbor. The level of the ciguatoxin producing diatoms and the level of toxicity in fish flesh is currently within normal bounds. Because ciguatera outbreaks are associated with underwater disturbances such as construction, it would be prudent to monitor for ciguatoxin during and after construction.

The marine life environment may be affected by the proposed development as a result of the following:

1) direct impacts of dredging, pile driving, and construction associated perturbations in water quality
2) permanent changes brought about by alterations in water circulation and/or residence times

Perturbations in water quality and its effect on marine life, due to project dredging, runoff from construction sites, and dewatering

(assuming no acute toxins in the dewatering fluids) are likely to be much less severe than the periodic siltation impacts common in the harbor currently occurring under normal operations and maintenance. Prop wash from tugboats and ships stirs up bottom sediment and creates plumes on a daily basis within the harbor. During periods of medium to heavy rain the harbor is often colored by sediment load from fresh water inputs. During 1973 sediment was discharged into the harbor from a construction site adjacent to Piers 4 and 5. The sediment plume was clearly visible and could be seen flowing from the area bounded by the Falls of Clyde (former mooring site at Pier 5] and the U.S. Coast Guard pier, to the mouth of the harbor (Environmental Consultants, 1974). Dredging operations in the harbor every five years are known to decrease visibility to less than one foot for the 4 to 6 weeks required to complete dredging (Environmental Consultants, 1974).

Pile driving for new facilities at Pier 12/13 is not expected to have long term effects on marine life. Piles will be placed in an area with a low productivity mud bottom. Marine life on the rocks at Pier 12 will be temporarily disturbed during construction but should recover.

The biological impact brought about by alterations in water circulation patterns is difficult to predict. A major driving force of water circulation in the harbor area, and the location where the marine life is most abundant, is the HECO plant intake and effluent. This flow is not likely to change as a result of the project. Furthermore, the presence of healthy coral reef on limited hard substrate around Pier 12 indicates that constant currents may not be necessary for coral growth in the harbor.

If pier construction is extended over the existing rock revetment and coral growth area at Pier 5/6, an environmental impact will occur. The corals and associated marine life may be impacted by either direct physical damage caused from construction or lack of light caused by shading. If the coral and associated marine life are substantially impacted, this will also affect recreation fishing at the site. However, the opportunity for new coral growth and recreation fishing exists at adjacent areas if suitable substrate is available.

Additionally, depending on the degree of access and other restrictions imposed by the State Department of Transportation, Harbors Division, recreational fishing at Piers 5/6 may be limited. However, access to alternate recreation fishing sites may be included in the development plan.

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APPENDIX A
DISPERSION CALCULATIONS

The diffusion of a mass of solute in a fluid with no mean velocity is given by:

$$\frac{\partial C}{\partial t} + D\left[\frac{\partial^2 C}{\partial x^2} + \frac{\partial^2 C}{\partial y^2} + \frac{\partial^2 C}{\partial z^2}\right]$$

where C = concentration of solute
D = dispersion coefficient
x,y,z = coordinate directions

If the fluid is moving with velocity u, transport of the mass is by both advection and diffusion. These are separate additive processes. We assume that diffusion takes place in the moving fluid as though the fluid was stationary.

In two dimensions the diffusion equation becomes:

$$\frac{\partial C}{\partial t} + u\frac{\partial C}{\partial x} = D\frac{\partial^2 C}{\partial y^2}$$

where u = velocity component in x direction
y = transverse direction

For a point discharge into a three-dimensional flow, the concentration becomes:

$$C(x,y,z) = \frac{M}{4\pi Dx}\exp\left[-\frac{(y^2+z^2)u}{4Dx}\right]$$

where M = mass flow rate of solute

Diffusion in the direction of flow has been neglected.

The diffusion coefficient, D, can be estimated from dye studies. By measuring the area, A, of a dye patch at two successive times, T, D is calculated by:

$$D=0.04\frac{A_2-A_1}{T_2-T_1}$$

Characteristic length of the dye patch is given by:

$$L=\sqrt{\frac{A_2+A_1}{2}}$$

L was calculated from aerial photographs of dye spreading in the harbor. The following relationship between D and L is assumed:

$$D=kL^p$$

The values of k and p were determined by plotting the calculated values on a log-log plot and curve fitting (Figure A-1). Best fit gives:

$$D=0.019L^{0.52}$$

The results are given in the following table. Also included are coefficients typically used for diffusion in various water bodies (Krock, 1985).

GENERAL AREA	COEFFICIENT	POWER
HONOLULU HARBOR	0.019	0.52
SHALLOW MARINA	0.04	0.05
DEEP HARBOR	0.006	0.5
EXPOSED COVE	0.005	0.9
NEARSHORE	0.003	1.0
OFFSHORE	0.0005	1.4

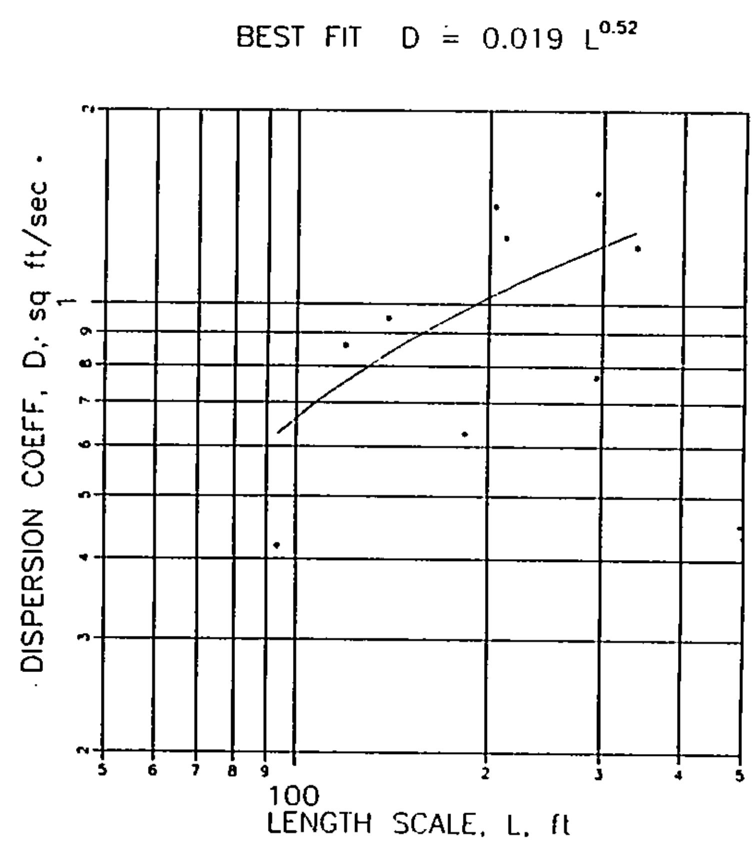


FIGURE A–1 DISPERSION COEFFICIENT VS. CHARACTERISTIC LENGTH FOR HONOLULU HARBOR

APPENDIX B
SEDIMENT SIZE ANALYSIS RESULTS

The size distribution of sediment samples taken at Piers 5 and 6 is given in the following table and graphs.

PERCENT IN SIZE FRACTION

Size in mm

Samp	>4	4-2	2-1	1-.5	.5-.25	.25-.125	.125-.063	<.063
5-1	5.53	15.12	27.65	25.65	0.13	17.10	2.73	6.09
5-2		0.93	1.60	2.53	1.02	12.04	14.18	67.70
6-1		2.19	1.5	3.06	1.09	12.86	10.81	68.50
6-2		0.03	0.04	1.11	0.64	5.81	20.31	72.05

Size fraction for silt and clay sized portion of samples.

Pier 5 sample 1

particle size micrometers	summation percent
69.58	0
49.20	0
28.41	0
15.62	0
8.98	0
5.19	0
2.94	0

Pier 5 sample 2

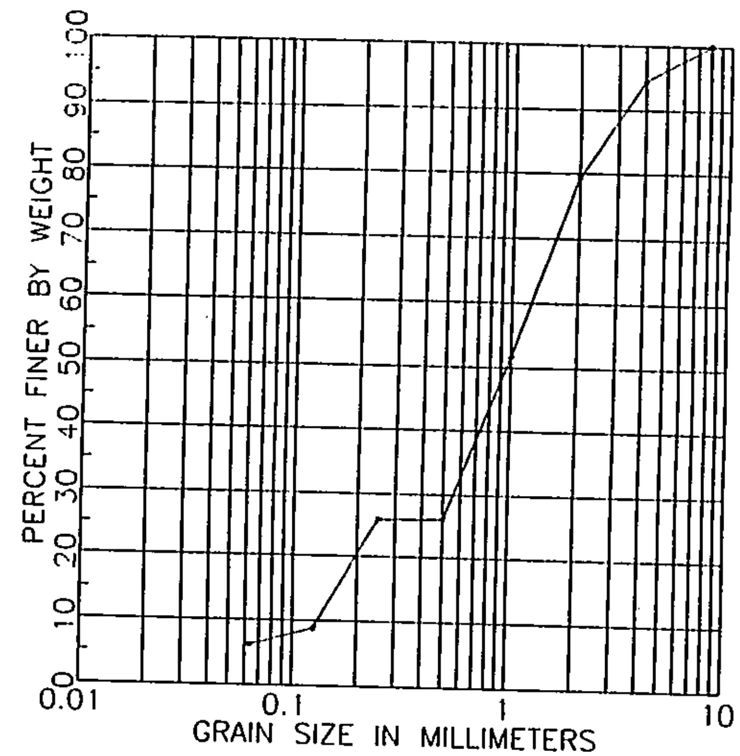
particle size micrometers	summation percent
64.91	58
46.7	45
27.14	40
15.08	27
8.30	13
5.10	13
2.91	9

Pier 6 sample 1

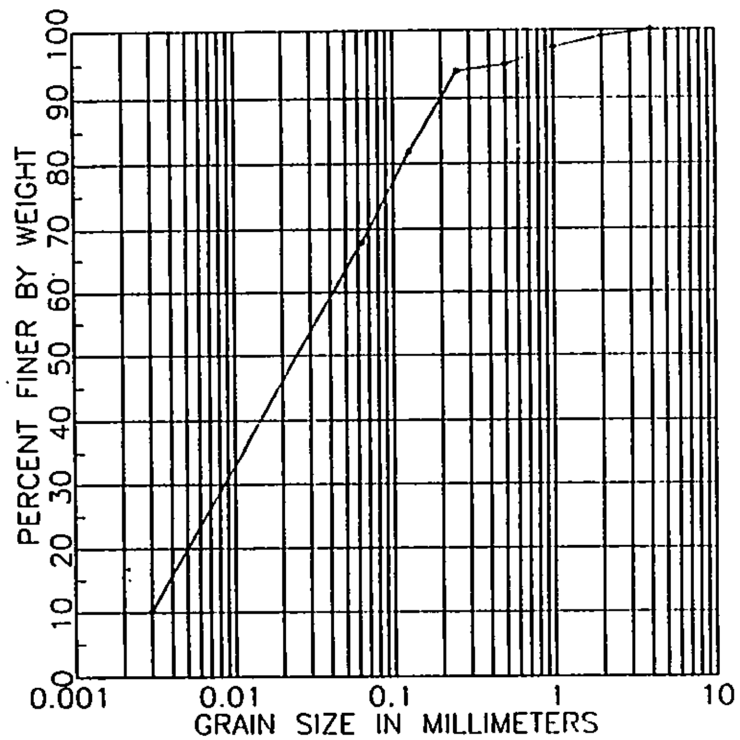
particle size micrometers	summation percent
64.91	61.55
46.40	52.1
27.13	42.6
15.03	30.8
8.34	23.7
5.08	18.9
2.89	14.2

Pier 6 sample 2

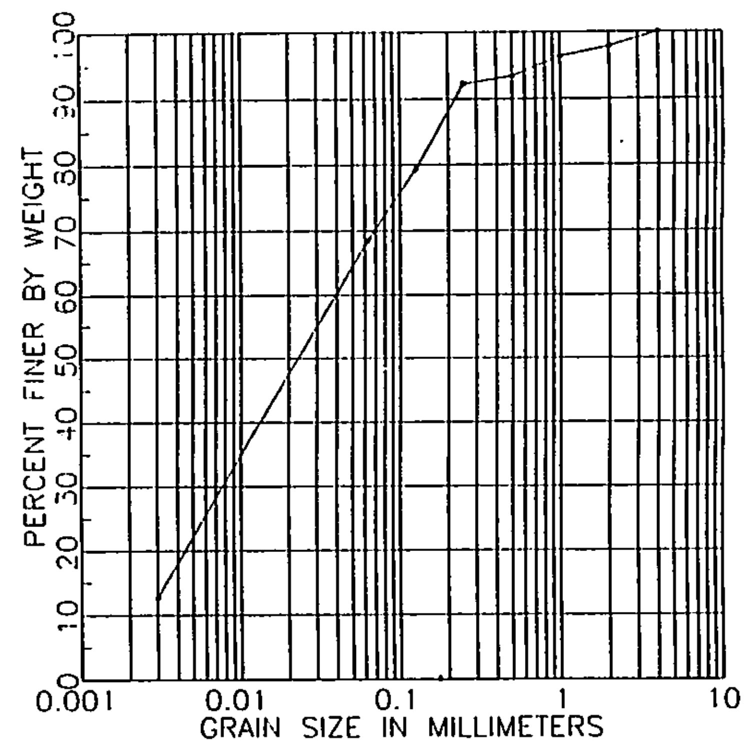
particle size micrometers	summation percent
64.06	60.3
46.20	48.2
27.36	28.1
15.14	20.1
8.84	12.1
5.12	10.0
2.89	12.1



SEDIMENT SIZE FRACTION PIER 5 SAMPLE 1



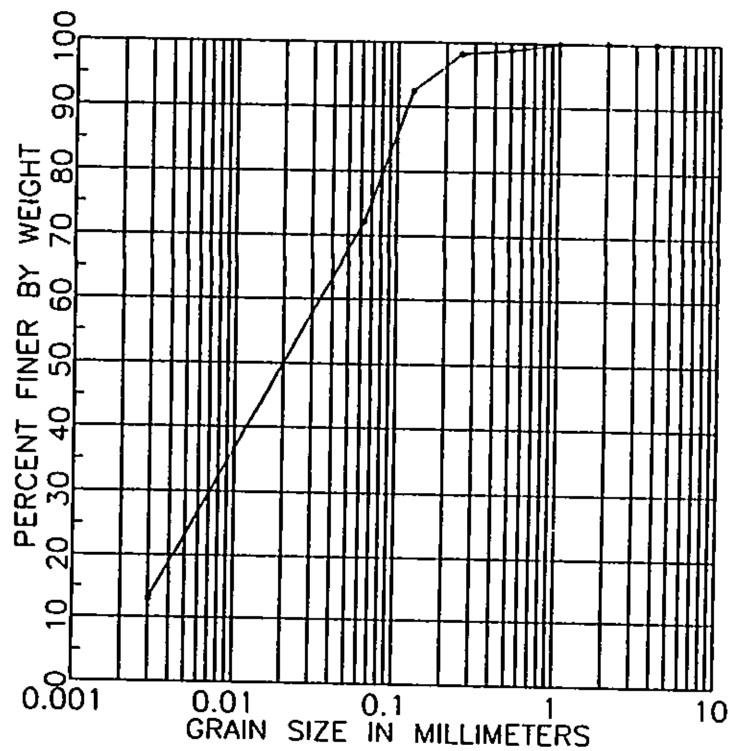
SEDIMENT SIZE FRACTION PIER 5 SAMPLE 2



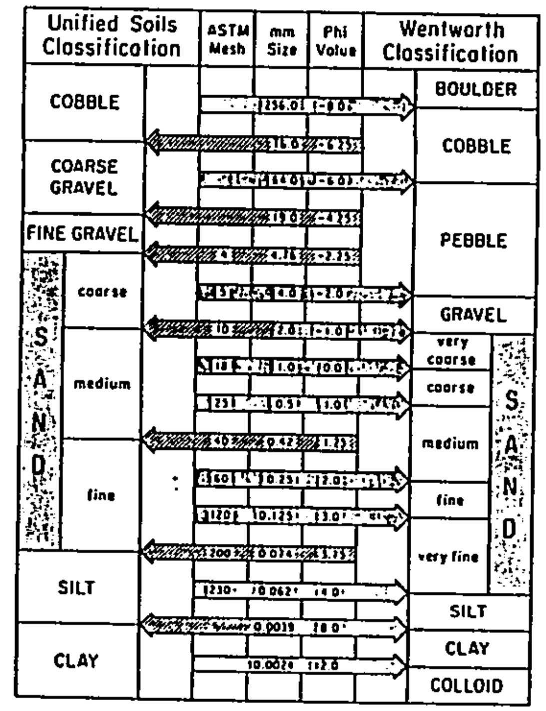
SEDIMENT SIZE FRACTION PIER 6 SAMPLE 1

Oceanit Laboratories, Inc.

Oceanit Laboratories, Inc.



SEDIMENT SIZE FRACTION PIER 6 SAMPLE 2



SOIL SIZE CLASSIFICATION CHART
(SHORE PROTECTION MANUAL, 1984)

Oceanit Laboratories, Inc.

APPENDIX C
WATER QUALITY MONITORING DATA

Oceanit Laboratories, Inc.

HONOLULU HARBOR RESULTS - RUN #1 5/16/90

Sta/ Dpth	Salin ppt	Chl A µg/l	NO3 NO2 µg/l	T Nit µg/l	PO4 µg/l	T Pho µg/l	TNFS mg/l	Turb NTU	PHAO µg/l	Temp oC	D/O PPM	Fec Col #/ 100ml
1.1	24.91	0.34	4.76	94.22	11.16	26.06	4.75	1.00	0.13	25.89	6.6	0
1.2	34.70	0.45	3.08	106.54	7.75	26.97	8.37	2.20	0.15	25.69	6.3	0
1.3	34.60	0.61	3.08	197.54	5.27	139.19	10.94	28.1	0.29	25.57	6.4	1
2.1	34.64	0.45	3.36	96.46	5.27	15.81	6.91	0.70	0.08	25.90	6.4	0
2.2	34.69	0.64	3.08	109.90	6.20	17.36	5.55	0.90	0.19	25.51	6.6	3
2.3	34.76	0.42	2.94	95.76	2.33	26.66	6.44	1.30	0.31	25.43	6.6	2
3.1	34.74	0.43	2.94	97.02	2.33	15.50	6.52	0.80	0.13	25.75	6.2	4
3.2	34.79	1.28	2.94	119.42	2.33	18.60	6.57	1.70	0.26	25.45	6.4	8
3.3	34.81	1.13	2.94	108.66	2.33	18.60	7.81	2.30	0.31	25.29	6.4	5
4.1	34.59	0.38	16.26	124.01	6.82	18.60	5.15	0.90	0.12	25.75	6.1	2
4.2	34.82	0.59	4.90	109.34	2.33	14.57	5.21	1.20	0.19	25.41	6.5	6
4.3	34.80	1.23	4.76	126.06	2.33	30.38	8.08	5.90	0.32	25.32	6.4	7
5.1	34.76	0.35	3.50	106.54	2.33	13.64	3.99	0.20	0.11	26.21	6.4	4
5.2	34.78	0.48	4.06	104.86	2.33	12.09	4.13	0.48	0.19	25.45	6.5	0
5.3	34.80	0.97	2.80	105.28	2.33	15.50	21.65	1.20	0.41	25.40	6.3	7
6.1	34.65	0.42	4.06	117.88	2.33	20.46	5.57	0.30	0.08	26.06	6.1	0
6.2	34.78	0.45	11.34	97.58	5.89	13.02	5.20	0.60	0.15	25.60	6.6	2
6.3	34.76	0.92	7.28	177.94	5.27	95.79	43.34	14.9	1.31	25.35	6.5	0
7.1	34.75	0.37	3.50	119.98	2.33	12.71	5.68	0.70	0.13	26.90	6.6	2
7.2	34.78	0.40	2.66	111.86	2.33	15.81	3.24	0.90	0.18	26.53	6.5	4
7.3	34.78	0.44	6.16	108.08	10.54	23.25	8.85	0.90	0.15	25.67	6.4	1
8.1	34.74	0.41	10.78	109.62	8.99	17.98	5.90	0.10	0.12	25.98	6.3	4
8.2	34.72	0.46	2.38	97.58	4.96	16.57	4.40	0.20	0.18	25.66	6.6	5
8.3	34.75	0.38	2.38	97.72	4.96	15.50	7.71	0.30	0.12	25.25	6.5	1
9.1	34.72	0.38	5.88	102.06	5.58	13.64	4.29	0.40	0.15	25.89	6.7	1
9.2	34.78	0.41	4.90	92.54	2.33	13.64	3.91	0.20	0.12	25.37	6.8	4
9.3	34.80	0.17	2.38	107.38	2.33	11.78	5.20	0.40	0.07	25.08	7.0	0
10.1	34.70	0.41	2.26	100.80	2.33	11.78	3.72	0.60	0.12	25.88	6.9	2
10.2	34.72	0.23	2.24	107.38	2.33	11.78	5.83	.50	0.08	25.80	6.9	1
10.3	34.75	0.30	2.24	97.02	2.33	10.85	5.28	0.50	0.11	25.75	7.0	0
11.1	34.73	0.36	2.24	98.00	2.33	11.78	3.34	0.60	0.17	25.58	6.9	0
11.2	34.81	0.20	2.52	113.12	4.96	16.74	3.93	0.10	0.09	25.29	7.1	0
11.3	34.78	0.17	2.24	93.94	2.33	10.85	5.06	0.20	0.07	25.10	6.9	2
12.1	34.75	0.32	2.24	113.40	2.33	13.02	3.65	0.20	0.13	25.43	7.1	0
12.2	34.80	0.31	2.24	107.46	2.33	13.64	4.15	0.50	0.13	25.40	7.0	0
12.3	34.81	0.22	4.76	93.94	2.33	13.95	22.29	0.30	0.12	25.35	7.1	0
13.1	34.83	0.18	2.10	117.88	2.33	13.02	3.96	0.10	0.04	25.35	6.7	1
13.2	34.80	0.12	15.26	94.46	6.20	13.02	3.77	0.20	0.05	25.17	6.9	0
13.3	43.84	0.15	2.10	91.28	2.33	12.71	3.01	0.10	0.04	25.06	6.7	1
GEO MEAN	4.73	0.40	3.64	108.05	3.43	17.18	5.91	0.60	0.14			
Geo S.D.	1.0	1.75	1.73	1.14	1.69	1.68	1.79	3.50	1.89			
ARITH MEAN	34.73	0.46	4.39	109.50	3.99	21.30	7.73	1.86	0.18			
ARITH S.D.	0.06	0.28	3.41	20.43	2.46	23.60	10.00	4.96	0.20			

Sta/Dpth=Station/Depth Salin=Salinity Chl A=Chlorophyll a NO3/NO2=Nitrite/Nitrate T Nit=Total Nitrogen
PO4=Orthophosphate T Pho=Total Phosphorus TNFS=Total Nonfilterable Solids Turb=Turbidity
PHAO=Phaeopigments Temp=Temperature D/O=Dissolved Oxygen Fec Col=Fecal Coliforms Geo Mean=Geometric Mean
Geo S.D.=Geometric Standard Deviation Arith Mean=Arithmetic Mean Arith S.D.=Arithmetic Standard Deviation

Station: 1
File: CHLSta1

Project: Mon Kar Sta 1
File:
Date: May 16
Number of points: 3

Values of parameterCHL (ug/l)

Point	Value	F(I)
1	.368	.167
2	.448	.500
3	.608	.833

Geometric mean:	.4645	Arith Mean:	.4746
Geom. Std. dev.:	1.2870	Arith Std Dev:	.1222
84.1% frequency:	.5982	Smallest Number:	.368
15.9% frequency:	.3606	Largest Number:	.608

STATISTICAL PARAMETERS

Freq %	Concen units	95% Conint(+)	95% Conint(-)	70% Conint(+)	70% Conint(-)
.02	.25	22164.58	0.00	106.12	0.00
1.39	.27	1664.73	0.00	27.51	0.00
2.28	.28	257.76	0.00	10.47	.01
3.59	.29	67.01	0.00	5.20	.02
5.48	.31	25.30	0.00	3.20	.03
8.08	.33	12.21	.01	2.23	.05
11.51	.34	7.15	.02	1.72	.07
15.87	.36	4.79	.03	1.42	.09
21.19	.38	3.56	.04	1.24	.12
27.42	.40	2.86	.06	1.13	.14
34.46	.42	2.43	.07	1.07	.17
42.07	.44	2.16	.09	1.03	.19
50.00	.46	1.99	.11	1.01	.21
57.93	.49	2.39	.10	1.14	.21
65.54	.51	2.97	.09	1.30	.20
72.58	.54	3.87	.08	1.54	.19
78.81	.57	5.34	.06	1.87	.17
84.13	.60	7.95	.05	2.36	.15
88.49	.63	13.12	.03	3.15	.13
91.92	.66	24.05	.02	4.53	.10
94.52	.70	56.04	.01	7.20	.07
96.41	.73	164.60	0.00	13.13	.04
97.72	.77	709.13	0.00	28.01	.02
98.61	.81	5867.54	0.00	83.75	.01

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Station: 2
File: CHLSta2

Project: Mon Kar Sta 2
File:
Date: May 16
Number of points: 3

Values of parameterCHL (ug/l)

Point	Value	F(I)
1	.448	.167
2	.624	.500
3	.656	.833

Geometric mean:	.5681	Arith Mean:	.576
Geom. Std. dev.:	1.2303	Arith Std Dev:	.112
84.1% frequency:	.6989	Smallest Number:	.448
15.9% frequency:	.4617	Largest Number:	.656

STATISTICAL PARAMETERS

Freq %	Concen units	95% Conint(+)	95% Conint(-)	70% Conint(+)	70% Conint(-)
.02	.35	10109.24	0.00	110.57	0.00
1.39	.36	1523.26	0.00	30.24	0.00
2.28	.38	254.61	0.00	11.94	.01
3.59	.39	70.62	0.00	6.16	.02
5.48	.41	27.34	.01	3.80	.04
8.08	.43	13.57	.01	2.67	.07
11.51	.44	8.07	.02	2.07	.10
15.87	.46	5.47	.04	1.71	.12
21.19	.48	4.09	.06	1.50	.15
27.42	.50	3.29	.08	1.36	.19
34.46	.52	2.80	.10	1.27	.21
42.07	.55	2.49	.12	1.22	.24
50.00	.57	2.29	.14	1.19	.27
57.93	.59	2.70	.13	1.32	.26
65.54	.62	3.30	.12	1.50	.25
72.58	.64	4.22	.10	1.74	.24
78.81	.67	5.69	.08	2.09	.22
84.13	.70	8.27	.06	2.59	.19
88.49	.73	13.26	.04	3.40	.16
91.92	.76	24.24	.02	4.77	.12
94.52	.79	53.07	.01	7.37	.08
96.41	.83	140.92	0.00	13.80	.05
97.72	.86	583.35	0.00	27.35	.03
98.61	.90	3791.64	0.00	75.28	.01

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Station: 3-8
File: CHLHARB

Project: Hon Har Stations
File:
Date: May 16
Number of points: 18

Values of parameterCHL (ug/l)

Point	Value	F(i)
1	.332	.020
2	.360	.083
3	.389	.139
4	.389	.194
5	.400	.250
6	.433	.306
7	.416	.361
8	.432	.417
9	.440	.472
10	.460	.528
11	.464	.583
12	.480	.639
13	.502	.694
14	.521	.750
15	.572	.806
16	1.125	.861
17	1.220	.917
18	1.279	.972

Geometric mean:	.5539	Arith Mean:	.6174
Geom. Std. dev.:	1.5772	Arith Std Dev:	.3244
84.13 frequency:	.8732	Smallest Number:	.332
15.87 frequency:	.3512	Largest Number:	1.279

STATISTICAL PARAMETERS

Freq %	Concen units	95% Confint(+)	95% Confint(-)	70% Confint(+)	70% Confint(-)
.62	.19	54.98	0.00	5.08	.01
1.39	.20	16.82	0.00	2.87	.02
2.28	.22	6.25	.01	1.36	.05
3.59	.24	3.70	.02	1.05	.06
5.48	.27	2.41	.05	.86	.08
8.08	.29	1.79	.05	.77	.11
11.51	.32	1.46	.07	.72	.14
15.87	.35	1.28	.10	.70	.18
21.19	.38	1.18	.13	.70	.21
27.42	.42	1.13	.16	.71	.25
34.46	.46	1.11	.19	.75	.29
42.07	.51	1.12	.23	.77	.33
50.00	.55	1.15	.27	.82	.38
57.93	.61	1.24	.27	.92	.40
65.54	.66	1.40	.28	1.06	.42
72.58	.73	1.55	.27	1.23	.43
78.81	.80	2.41	.26	1.45	.44
84.13	.87	3.10	.25	1.74	.44
88.49	.96	4.32	.21	2.11	.43
91.92	1.05	6.42	.17	2.74	.40
94.52	1.15	10.32	.13	3.63	.36
96.41	1.26	19.80	.08	5.32	.30
97.72	1.38	41.80	.05	8.13	.23
98.61	1.51	119.33	.02	15.31	.15

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Station: 9
File: CHLSta9

Project: Hon Har Sta 9
File:
Date: May 16
Number of points: 3

Values of parameterCHL (ug/l)

Point	Value	F(i)
1	.168	.167
2	.309	.500
3	.489	.833

Geometric mean:	.2977	Arith Mean:	.3283
Geom. Std. dev.:	1.6329	Arith Std Dev:	.1325
84.13 frequency:	.4891	Smallest Number:	.168
15.87 frequency:	.1872	Largest Number:	.489

STATISTICAL PARAMETERS

Freq %	Concen units	95% Confint(+)	95% Confint(-)	70% Confint(+)	70% Confint(-)
.62	.09	182152.89	0.00	200.31	0.00
1.39	.10	6951.01	0.00	37.07	0.00
2.28	.11	666.30	0.00	11.19	0.00
3.59	.12	125.59	0.00	4.81	0.00
5.48	.13	36.56	0.00	2.55	.01
8.08	.15	15.15	0.00	1.73	.01
11.51	.16	7.91	0.00	1.28	.02
15.87	.18	4.91	.01	1.04	.03
21.19	.20	3.48	.01	.91	.04
27.42	.22	2.72	.02	.84	.06
34.46	.24	2.29	.03	.80	.07
42.07	.27	2.05	.04	.79	.09
50.00	.30	1.91	.05	.80	.11
57.93	.33	2.50	.04	.86	.11
65.54	.36	3.41	.04	1.19	.11
72.58	.40	4.94	.03	1.52	.11
78.81	.44	7.70	.03	2.02	.10
84.13	.49	13.25	.02	2.82	.08
88.49	.54	26.03	.01	4.22	.07
91.92	.60	60.04	.01	6.94	.05
94.52	.66	181.01	0.00	12.57	.03
96.41	.73	750.25	0.00	28.09	.02
97.72	.80	4851.74	0.00	82.54	.01
98.61	.89	61772.44	0.00	325.90	0.00

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Station: 10-12
File: CHLNear

Project: Hon Har Nearshore
File:
Date: May 16
Number of points: 9

Values of parameterCHL (ug/l)

Point	Value	F(i)
1	.168	.056
2	.200	.167
3	.216	.278
4	.232	.389
5	.276	.500
6	.312	.611
7	.328	.722
8	.330	.833
9	.405	.944

Geometric mean:	.2646	Arith Mean:	.279
Geom. Std. dev.:	1.3136	Arith Std Dev:	.0797
84.13 frequency:	.3025	Smallest Number:	.168
15.87 frequency:	.1999	Largest Number:	.405

STATISTICAL PARAMETERS

Freq %	Concen units	95% Confid(+)	95% Confid(-)	70% Confid(+)	70% Confid(-)
.02	.13	125.90	0.00	5.82	0.00
1.39	.14	27.15	0.00	2.25	.01
2.28	.15	9.80	0.00	1.32	.02
3.59	.16	4.10	.01	.90	.03
5.48	.17	2.32	.01	.60	.05
8.08	.18	1.50	.02	.52	.06
11.51	.19	1.17	.03	.50	.07
15.87	.20	.95	.05	.46	.09
21.19	.21	.82	.06	.43	.10
27.42	.23	.79	.07	.42	.12
34.46	.24	.83	.08	.42	.14
42.07	.25	.66	.10	.42	.15
50.00	.27	.83	.11	.43	.17
57.93	.28	.74	.11	.47	.17
65.54	.30	.87	.11	.53	.17
72.58	.32	1.05	.10	.60	.17
78.81	.34	1.50	.09	.70	.17
84.13	.36	1.71	.08	.85	.16
88.49	.38	2.39	.06	1.00	.15
91.92	.40	3.61	.05	1.29	.13
94.52	.43	6.11	.03	1.76	.11
96.41	.46	12.10	.02	2.60	.08
97.72	.48	23.59	.01	4.50	.05
98.61	.52	99.53	0.00	8.91	.03

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Station: 13
File: CHLOff

Project: Hon Har Offshore
File:
Date: May 16
Number of points: 3

Values of parameterCHL (ug/l)

Point	Value	F(i)
1	.120	.167
2	.152	.500
3	.176	.833

Geometric mean:	.1475	Arith Mean:	.1493
Geom. Std. dev.:	1.2151	Arith Std Dev:	.028
84.13 frequency:	.1789	Smallest Number:	.12
15.87 frequency:	.1215	Largest Number:	.176

STATISTICAL PARAMETERS

Freq %	Concen units	95% Confid(+)	95% Confid(-)	70% Confid(+)	70% Confid(-)
.02	.09	1190.50	0.00	27.40	0.00
1.39	.10	363.15	0.00	7.61	0.00
2.28	.10	62.95	0.00	3.04	0.00
3.59	.10	17.49	0.00	1.50	.01
5.48	.11	6.85	0.00	.90	.01
8.08	.11	3.42	0.00	.69	.02
11.51	.12	2.05	.01	.53	.03
15.87	.12	1.39	.01	.44	.03
21.19	.13	1.04	.02	.39	.04
27.42	.13	.84	.02	.35	.05
34.46	.14	.71	.03	.33	.06
42.07	.14	.63	.03	.31	.06
50.00	.15	.58	.04	.31	.07
57.93	.15	.58	.03	.31	.07
65.54	.16	.63	.03	.30	.07
72.58	.17	1.06	.03	.44	.06
78.81	.17	1.42	.02	.53	.06
84.13	.18	2.05	.02	.65	.05
88.49	.19	3.25	.01	.85	.04
91.92	.19	5.00	.01	1.10	.03
94.52	.20	12.71	0.00	1.81	.02
96.41	.21	35.87	0.00	3.17	.01
97.72	.22	134.50	0.00	6.50	.01
98.61	.23	899.86	0.00	17.82	0.00

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Station: 1
File: TPHOSSta1

Project: Hon Har Sta 1
File:
Date: May 16
Number of points: 3

Values of parameter TPHOS (ug/l)

Point	Value	F(i)
1	25.890	.167
2	26.590	.500
3	139.190	.833

Geometric mean:	46.8655	Arith Mean:	61.8666
Geom. Std. dev.:	2.5859	Arith Std Dev:	65.8683
84.13 Frequency:	120.9836	Smallest Number:	25.89
15.87 Frequency:	17.5772	Largest Number:	139.19

STATISTICAL PARAMETERS

Freq %	Concen units	95% Confid(+)	95% Confid(-)	70% Confid(+)	70% Confid(-)
11.51	14.60	6015.11	.03	300.60	.56
15.87	17.50	3316.09	.09	279.13	1.10
21.19	21.91	1905.90	.23	236.09	1.91
27.42	25.58	1390.56	.40	214.50	3.13
34.46	32.40	1085.59	.50	206.80	4.77
42.07	38.09	997.05	1.53	209.92	6.91
50.00	46.07	879.55	2.11	220.25	9.63
57.93	55.79	1309.11	2.24	307.18	10.13
65.54	67.52	2357.32	1.99	499.55	10.25
72.58	81.09	5300.00	1.53	677.00	9.89
78.81	99.12	9191.52	1.07	1056.97	8.56

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Station: 2
File: TPHOSSta2

Project: Hon Har Sta 2
File:
Date: May 16
Number of points: 3

Values of parameter TPHOS (ug/l)

Point	Value	F(i)
1	15.010	.167
2	17.360	.500
3	26.660	.833

Geometric mean:	19.4139	Arith Mean:	19.9133
Geom. Std. dev.:	1.3213	Arith Std Dev:	5.8682
84.13 Frequency:	25.652	Smallest Number:	15.01
15.87 Frequency:	14.6320	Largest Number:	26.66

STATISTICAL PARAMETERS

Freq %	Concen units	95% Confid(+)	95% Confid(-)	70% Confid(+)	70% Confid(-)
.82	9.55	117050.76	0.00	4070.10	.02
1.39	10.52	62512.49	0.00	1725.03	.09
2.28	11.12	12210.55	.03	456.72	.27
3.59	11.76	3116.75	.04	227.00	.61
5.48	12.43	1157.56	.14	136.55	1.13
8.08	13.14	542.07	.32	94.59	1.83
11.51	13.90	313.57	.42	72.42	2.66
15.87	14.69	200.00	1.03	60.00	3.59
21.19	15.53	151.45	1.56	52.55	4.59
27.42	16.43	123.79	2.10	47.35	5.63
34.46	17.37	105.17	2.87	45.16	6.60
42.07	18.36	93.72	3.60	43.61	7.73
50.00	19.41	86.59	4.35	42.92	8.78
57.93	20.53	104.77	4.02	48.75	8.61
65.54	21.70	131.44	3.50	56.44	8.35
72.58	22.95	172.02	3.05	66.99	7.86
78.81	24.26	241.22	2.44	82.07	7.17
84.13	25.65	361.53	1.87	109.09	6.27
88.49	27.12	612.00	1.20	141.73	5.19
91.92	28.68	1182.71	.70	206.37	3.98
94.52	30.32	2774.64	.33	333.05	2.76
96.41	32.06	8990.25	.12	619.10	1.66
97.72	33.89	37743.77	.03	1352.14	.83
98.61	35.84	201161.25	0.00	4177.02	.31

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Station: 1
File: TURBSt1

Project: Non Har Sta 1
File:
Date: May 16
Number of points: 3

Values of parameterturbidity (NTU)

Point	Value	F(t)
1	1.000	.167
2	2.200	.500
3	28.100	.833

Geometric mean:	3.951	Arith Mean:	10.4333
Geom. Std. dev.:	5.717	Arith Std Dev:	15.3115
84.1% frequency:	22.6056	Smallest Number:	1
15.9% frequency:	.6916	Largest Number:	28.1

STATISTICAL PROPERTIES

Freq %	Concen units	95% ConInt(+)	95% ConInt(-)	70% ConInt(+)	70% ConInt(-)
11.51	[illegible]	358296.77	0.00	621.73	0.00
15.87	.69	67190.60	0.00	306.26	0.00
21.19	.98	20206.85	0.00	191.15	.01
27.42	1.39	8645.67	0.00	143.19	.01
34.46	1.97	4770.90	0.00	123.02	.03
42.07	2.79	3225.83	0.00	117.73	.07
50.00	3.95	2558.92	.01	122.43	.13
57.93	5.60	4479.83	0.00	236.46	.13
65.54	7.94	15214.25	0.00	456.25	.13
72.58	11.26	70049.73	0.00	1160.17	.11
78.81	15.95	330135.07	0.00	3110.69	.08

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Station: 2
File: TURBSta2

Project: Non Har Sta2
File:
Date: May 16
Number of points: 3

Values of parameterturbidity (NTU)

Point	Value	F(t)
1	.700	.167
2	.900	.500
3	1.300	.833

Geometric mean:	.9356	Arith Mean:	.9666
Geom. Std. dev.:	1.3652	Arith Std Dev:	.3055
84.1% frequency:	1.2773	Smallest Number:	.7
15.9% frequency:	.6853	Largest Number:	1.3

STATISTICAL PROPERTIES

Freq %	Concen units	95% ConInt(+)	95% ConInt(-)	70% ConInt(+)	70% ConInt(-)
.82	.44	76806.51	0.00	267.06	0.00
1.39	.47	9985.84	0.00	64.90	0.00
2.28	.50	696.19	0.00	23.33	.01
3.59	.53	170.49	0.00	11.39	.03
5.48	.57	60.46	.01	6.76	.05
8.08	.61	28.24	.01	4.65	.08
11.51	.64	16.12	.03	3.56	.12
15.87	.69	10.64	.04	2.94	.16
21.19	.73	7.83	.07	2.57	.21
27.42	.78	6.25	.10	2.35	.26
34.46	.83	5.31	.13	2.22	.31
42.07	.88	4.74	.16	2.15	.36
50.00	.94	4.39	.20	2.12	.41
57.93	1.00	5.37	.30	2.43	.41
65.54	1.06	6.83	.16	2.04	.39
72.58	1.13	9.08	.14	3.48	.37
78.81	1.20	12.80	.11	4.23	.34
84.13	1.28	19.03	.08	5.47	.30
88.49	1.36	31.82	.05	7.51	.25
91.92	1.45	67.52	.03	11.12	.19
94.52	1.54	163.73	.01	18.32	.13
96.41	1.64	522.94	.01	31.92	.08
97.72	1.74	2110.50	0.00	81.04	.04
98.61	1.86	19618.84	0.00	253.40	.01

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Station: 3-8
File: TURHON

Project: Hon Har
File:
Date: May 16
Number of points: 18

Values of parameterTurbidity (NTU)

Point	Value	F(i)
1	.100	.028
2	.200	.083
3	.200	.139
4	.300	.194
5	.300	.250
6	.400	.306
7	.600	.361
8	.700	.417
9	.800	.472
10	.900	.528
11	.900	.583
12	.900	.639
13	1.200	.694
14	1.200	.750
15	1.700	.806
16	2.300	.861
17	5.900	.917
18	14.900	.972

Geometric mean:	.7906	Arith Mean:	1.0611
Geom. Std. dev.:	3.3896	Arith Std Dev:	3.5136
84.1% frequency:	2.703	Smallest Number:	.1
15.9% frequency:	.2353	Largest Number:	14.9

STATISTICAL PARAMETERS

Freq %	Concen units	95% Conf(+)	95% Conf(-)	70% Conf(+)	70% Conf(-)
.62	.04	6513.00	0.00	27.07	0.00
1.39	.05	645.99	0.00	7.92	0.00
2.28	.07	105.53	0.00	3.79	0.00
3.59	.09	30.49	0.00	1.97	0.00
5.48	.11	12.77	0.00	1.39	.01
8.08	.14	7.08	0.00	1.19	.02
11.51	.18	4.84	.01	1.09	.03
15.87	.24	3.79	.01	1.03	.05
21.19	.30	3.33	.03	1.00	.08
27.42	.38	3.17	.05	1.10	.13
34.46	.49	3.22	.07	1.33	.18
42.07	.63	3.44	.11	1.55	.25
50.00	.80	3.81	.17	1.83	.35
57.93	1.02	5.60	.19	2.52	.41
65.54	1.30	8.55	.20	3.53	.48
72.58	1.66	13.71	.20	5.09	.51
78.81	2.12	23.39	.19	7.50	.53
84.13	2.70	43.37	.17	11.79	.62
88.49	3.45	89.76	.13	19.44	.61
91.92	4.40	215.24	.09	31.67	.56
94.52	5.62	632.89	.05	68.86	.46
96.41	7.17	2453.25	.02	158.56	.32
97.72	9.15	13049.06	.01	445.39	.19
98.61	11.68	130065.19	0.00	1651.81	.08

Station: 9
File: TURBSta9

Project: Hon Har Sta 9
File:
Date: May 16
Number of points: 3

Values of parameterTurbidity (NTU)

Point	Value	F(i)
1	.200	.167
2	.400	.500
3	.400	.833

Geometric mean:	.3174	Arith Mean:	.3333
Geom. Std. dev.:	1.4928	Arith Std Dev:	.1154
84.1% frequency:	.4737	Smallest Number:	.2
15.9% frequency:	.2127	Largest Number:	.4

STATISTICAL PARAMETERS

Freq %	Concen units	95% Conf(+)	95% Conf(-)	70% Conf(+)	70% Conf(-)
.62	.12	69666.52	0.00	132.72	0.00
1.39	.13	3291.37	0.00	28.38	0.00
2.28	.14	307.34	0.00	9.47	0.00
3.59	.15	84.24	0.00	4.37	.01
5.48	.17	27.46	0.00	2.51	.01
8.08	.18	12.09	0.00	1.60	.02
11.51	.20	6.63	.01	1.27	.03
15.87	.21	4.26	.01	1.04	.04
21.19	.23	3.00	.02	.91	.06
27.42	.25	2.44	.03	.84	.07
34.46	.27	2.07	.04	.80	.09
42.07	.29	1.85	.05	.78	.11
50.00	.32	1.72	.06	.78	.13
57.93	.34	2.17	.05	.91	.13
65.54	.37	2.05	.05	1.10	.13
72.58	.40	3.95	.04	1.35	.12
78.81	.44	5.85	.03	1.73	.11
84.13	.47	9.45	.02	2.32	.10
88.49	.51	17.32	.02	3.32	.08
91.92	.56	37.00	.01	5.16	.06
94.52	.60	98.01	0.00	9.02	.04
96.41	.65	355.79	0.00	18.40	.02
97.72	.71	1919.95	0.00	46.93	.01
98.61	.77	19146.75	0.00	165.09	0.00

Station: 10-12
File: TURNear

Project: Nawiliwili Nearshore
File:
Date: May 16
Number of points: 9

Values of parameter turbidity (NTU)

Point	Value	F(i)
1	.100	.056
2	.200	.167
3	.200	.278
4	.300	.389
5	.500	.500
6	.500	.611
7	.500	.722
8	.600	.833
9	.600	.944

Geometric mean:	.3355	Arith Mean:	.3000
Geom. Std. dev.:	1.0759	Arith Std Dev:	.19
84.1% frequency:	.6295	Smallest Number:	.1
15.9% frequency:	.1788	Largest Number:	.6

STATISTICAL PARAMETERS

Freq %	Concen units	95% Conf(+)	95% Conf(-)	70% Conf(+)	70% Conf(-)
.62	.07	1062.94	0.00	11.39	0.00
1.39	.08	130.96	0.00	4.16	0.00
2.28	.10	29.65	0.00	2.00	0.00
3.59	.11	10.90	0.00	1.22	.01
5.48	.12	4.97	0.00	.87	.02
8.08	.14	2.93	.01	.70	.03
11.51	.16	2.03	.01	.61	.04
15.87	.18	1.50	.02	.57	.06
21.19	.20	1.33	.03	.55	.07
27.42	.23	1.20	.04	.55	.10
34.46	.26	1.14	.06	.57	.12
42.07	.30	1.13	.08	.60	.15
50.00	.34	1.14	.10	.61	.18
57.93	.38	1.45	.10	.77	.19
65.54	.43	1.89	.10	.91	.20
72.58	.49	2.56	.09	1.10	.20
78.81	.56	3.65	.08	1.51	.20
84.13	.63	5.54	.07	2.00	.20
88.49	.71	9.19	.06	2.77	.18
91.92	.81	17.00	.04	4.00	.16
94.52	.92	37.22	.02	6.55	.13
96.41	1.04	100.94	.01	11.79	.09
97.72	1.18	367.20	0.00	24.03	.06
98.61	1.34	2006.05	0.00	66.70	.03

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Station: 13
File: TUROffsh

Project: Mon Nar Offshore
File:
Date: May 16
Number of points: 3

Values of parameter turbidity (NTU)

Point	Value	F(i)
1	.100	.167
2	.100	.500
3	.200	.833

Geometric mean:	.1259	Arith Mean:	.1333
Geom. Std. dev.:	1.4921	Arith Std Dev:	.0577
84.1% frequency:	.1879	Smallest Number:	.1
15.9% frequency:	.0844	Largest Number:	.2

STATISTICAL PARAMETERS

Freq %	Concen units	95% Conf(+)	95% Conf(-)	70% Conf(+)	70% Conf(-)
.62	.05	25662.93	0.00	52.67	0.00
1.39	.05	1306.18	0.00	11.26	0.00
2.28	.06	153.72	0.00	3.76	0.00
3.59	.06	33.43	0.00	1.71	0.00
5.48	.07	10.90	0.00	.99	0.00
8.08	.07	4.00	0.00	.67	.01
11.51	.08	2.63	0.00	.50	.01
15.87	.08	1.69	0.00	.41	.02
21.19	.09	1.22	.01	.36	.02
27.42	.10	.97	.01	.33	.03
34.46	.11	.82	.01	.32	.04
42.07	.12	.73	.02	.31	.04
50.00	.13	.68	.02	.31	.05
57.93	.14	.86	.02	.34	.05
65.54	.15	1.13	.02	.41	.05
72.58	.16	1.57	.02	.51	.05
78.81	.17	2.32	.01	.69	.04
84.13	.19	3.75	.01	.92	.04
88.49	.20	6.07	.01	1.32	.03
91.92	.22	14.72	0.00	2.05	.02
94.52	.24	39.21	0.00	3.50	.02
96.41	.26	141.20	0.00	7.33	.01
97.72	.28	761.93	0.00	18.62	0.00
98.61	.30	7530.39	0.00	65.52	0.00

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Station: 1
File: NO3Sta1

Project: Hon Har Sta 1
File:
Date: May 16
Number of points: 3

Values of parameterNO-3 (mg/l)

Point	Value	F(i)
1	3.000	.167
2	3.000	.500
3	4.760	.833

Geometric mean:	3.5609	Arith Mean:	3.64
Geom. Std. dev.:	1.2057	Arith Std Dev:	.5699
84.13 frequency:	4.5799	Smallest Number:	3.00
15.87 frequency:	2.7656	Largest Number:	4.76

STATISTICAL PARAMETERS

Freq %	Concen units	95% ConInt(+)	95% ConInt(-)	70% ConInt(+)	70% ConInt(-)
.02	1.55	16787.53	0.00	800.55	0.00
1.39	2.05	12023.25	0.00	210.05	.02
2.28	2.15	1580.17	0.00	80.05	.06
3.59	2.27	516.70	.01	40.40	.13
5.48	2.38	155.00	.03	29.53	.23
8.08	2.50	95.46	.07	17.85	.32
11.51	2.63	59.65	.13	13.16	.53
15.87	2.77	36.64	.21	10.50	.70
21.19	2.91	27.22	.31	9.53	.89
27.42	3.06	21.09	.43	8.69	1.00
34.46	3.22	18.50	.56	8.16	1.27
42.07	3.39	16.54	.69	7.86	1.46
50.00	3.56	15.26	.83	7.71	1.65
57.93	3.79	18.25	.77	8.69	1.68
65.54	3.94	22.72	.68	9.50	1.55
72.58	4.19	29.52	.58	11.79	1.46
78.81	4.55	40.63	.47	11.25	1.33
84.13	4.50	60.50	.35	10.82	1.16
88.49	4.80	99.85	.23	21.86	.96
91.92	5.06	180.50	.19	34.55	.71
94.52	5.32	457.50	.07	54.02	.52
96.41	5.60	1276.57	.02	99.04	.31
97.72	5.89	5526.74	.01	210.76	.16
98.61	6.19	38445.19	0.00	634.72	.06

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Station: 2
File: NO3Sta2

Project: Hon Har Sta 2
File:
Date: May 16
Number of points: 3

Values of parameterNO-3 (mg/l)

Point	Value	F(i)
1	2.990	.167
2	3.000	.500
3	3.360	.833

Geometric mean:	3.1210	Arith Mean:	3.1266
Geom. Std. dev.:	1.0701	Arith Std Dev:	.2138
84.13 frequency:	3.3987	Smallest Number:	2.99
15.87 frequency:	2.9172	Largest Number:	3.36

STATISTICAL PARAMETERS

Freq %	Concen units	95% ConInt(+)	95% ConInt(-)	70% ConInt(+)	70% ConInt(-)
.02	2.65	33321.97	0.00	400.72	.02
1.39	2.69	5036.09	0.00	126.06	.06
2.28	2.73	791.35	.01	55.25	.13
3.59	2.76	253.59	.03	30.40	.25
5.48	2.80	100.62	.07	19.51	.40
8.08	2.85	57.79	.14	14.09	.57
11.51	2.88	35.91	.23	10.50	.75
15.87	2.92	25.03	.34	9.15	.93
21.19	2.96	19.00	.46	7.93	1.10
27.42	3.00	15.50	.58	7.11	1.26
34.46	3.04	13.07	.71	6.59	1.40
42.07	3.08	11.53	.82	6.21	1.53
50.00	3.12	10.40	.93	5.99	1.64
57.93	3.16	11.05	.85	6.50	1.57
65.54	3.21	13.79	.75	6.96	1.48
72.58	3.25	16.60	.63	7.79	1.37
78.81	3.30	21.37	.51	8.89	1.23
84.13	3.34	28.66	.39	10.45	1.07
88.49	3.39	42.25	.27	12.52	.89
91.92	3.43	69.41	.17	16.57	.69
94.52	3.48	134.55	.09	24.23	.50
96.41	3.53	325.67	.04	50.00	.32
97.72	3.58	1057.01	.01	72.96	.18
98.61	3.62	5169.05	0.00	170.91	.08

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Station: 3-8
File: NO3Harb

Project: Nan Har Stations
File:
Date: May 16
Number of points: 18

Values of parameterNO-3 (mg/l)

Point	Value	F(i)
1	2.300	.028
2	2.300	.083
3	2.660	.139
4	2.800	.194
5	2.900	.250
6	2.900	.306
7	2.900	.361
8	3.500	.417
9	3.500	.472
10	4.000	.528
11	4.000	.583
12	4.700	.639
13	4.900	.694
14	6.100	.750
15	7.200	.806
16	10.200	.861
17	11.300	.917
18	16.240	.972

Geometric mean:	4.4399	Arith Mean:	5.3122
Geom. Std. dev.:	1.7752	Arith Std Dev:	3.3182
84.13 Frequency:	7.8813	Smallest Number:	2.30
15.87 Frequency:	2.5002	Largest Number:	16.24

STATISTICAL PARAMETERS

Freq %	Concen units	95% Conf.Int(+)	95% Conf.Int(-)	70% Conf.Int(+)	70% Conf.Int(-)
.02	1.12	677.54	0.00	33.50	.04
1.39	1.26	172.00	.01	17.00	.09
2.28	1.41	65.42	.03	10.81	.18
3.59	1.50	33.74	.07	8.82	.31
5.48	1.77	21.11	.15	6.58	.48
8.08	1.99	15.29	.26	5.87	.62
11.51	2.25	12.32	.40	5.52	.90
15.87	2.50	10.72	.58	5.41	1.15
21.19	2.80	9.89	.80	5.47	1.44
27.43	3.15	9.52	1.04	5.66	1.75
34.46	3.53	9.40	1.31	5.96	2.09
42.07	3.96	9.60	1.62	6.36	2.46
50.00	4.44	10.00	1.95	6.86	2.87
57.93	4.98	12.10	2.04	8.00	3.10
65.54	5.59	15.00	2.00	9.44	3.31
72.58	6.27	18.57	2.07	11.20	3.40
78.81	7.05	24.70	1.59	13.72	3.60
84.13	7.88	33.82	1.94	17.82	3.64
88.49	8.84	48.85	1.60	21.54	3.52
91.92	9.92	76.35	1.25	29.30	3.36
94.52	11.15	132.61	.95	41.44	2.93
96.41	12.50	266.63	.58	63.36	2.46
97.72	14.00	632.53	.30	107.51	1.82
98.61	15.78	2152.15	.11	213.73	1.15

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Station: 9
File: NO3Sta9

Project: Nan Har Sta 9
File:
Date: May 16
Number of points: 3

Values of parameterNO-3 (mg/l)

Point	Value	F(i)
1	2.300	.167
2	4.900	.500
3	5.000	.833

Geometric mean:	4.093	Arith Mean:	4.3066
Geom. Std. dev.:	1.6133	Arith Std Dev:	1.8055
84.13 frequency:	6.6036	Smallest Number:	2.30
15.87 frequency:	2.5369	Largest Number:	5.00

STATISTICAL PARAMETERS

Freq %	Concen units	95% Conf.Int(+)	95% Conf.Int(-)	70% Conf.Int(+)	70% Conf.Int(-)
.02	1.30	201006.53	0.00	2504.61	0.00
1.39	1.43	81372.25	0.00	476.79	0.00
2.28	1.57	8121.42	0.00	146.82	.02
3.59	1.73	1574.50	0.00	61.30	.05
5.48	1.90	472.81	.01	35.52	.10
8.08	2.10	156.63	.02	23.32	.19
11.51	2.31	103.60	.05	17.36	.31
15.87	2.54	64.82	.10	14.16	.45
21.19	2.79	46.11	.17	12.36	.63
27.43	3.07	36.15	.26	11.36	.83
34.46	3.38	30.40	.37	10.86	1.05
42.07	3.72	27.22	.51	10.69	1.29
50.00	4.09	25.41	.66	10.78	1.55
57.93	4.50	32.56	.62	12.95	1.57
65.54	4.96	44.63	.55	15.92	1.54
72.58	5.45	64.10	.46	20.17	1.47
78.81	6.00	99.15	.36	26.58	1.36
84.13	6.60	160.72	.26	36.06	1.10
88.49	7.27	326.51	.16	54.73	.96
91.92	8.00	750.35	.09	89.81	.72
94.52	8.80	2101.52	.04	164.15	.47
96.41	9.68	8010.63	.01	339.01	.26
97.72	10.65	55825.67	0.00	994.73	.11
98.61	11.72	647579.35	0.00	3311.63	.04

Oceanit Laboratories, Inc.
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Station: 10-12
File: NO3Near

Project: Mau Nar Nearshore
File:
Date: May 16
Number of points: 9

Values of parameterNO-3 (ug/l)

Point	Value	f(i)
1	2.210	.056
2	2.210	.167
3	2.210	.278
4	2.210	.389
5	2.210	.500
6	2.210	.611
7	2.210	.722
8	2.520	.833
9	4.760	.944

Geometric mean:	2.4577	Arith Mean:	2.5511
Geom. Std. dev.:	1.2852	Arith Std Dev:	.8331
84.13 frequency:	3.1660	Smallest Number:	2.21
15.87 frequency:	1.923	Largest Number:	4.76

STATISTICAL PARAMETERS

Freq %	Concen units	95% Conlmt(+)	95% Conlmt(-)	70% Conlmt(+)	70% Conlmt(-)
.02	1.36	995.35	0.00	43.75	.04
1.39	1.43	217.68	.00	20.55	.10
2.28	1.50	76.00	.05	12.85	.19
3.59	1.58	35.59	.07	8.29	.30
5.40	1.66	20.04	.13	6.35	.43
8.00	1.74	14.00	.22	5.26	.58
11.51	1.83	10.58	.32	4.62	.72
15.87	1.92	8.52	.43	4.29	.87
21.19	2.02	7.33	.56	4.00	1.02
27.42	2.12	6.59	.68	3.87	1.17
34.46	2.23	6.13	.80	3.82	1.33
42.07	2.35	5.86	.91	3.80	1.45
50.00	2.47	5.71	1.02	3.85	1.58
57.93	2.59	6.47	1.04	4.21	1.60
65.54	2.73	7.19	.99	4.66	1.60
72.58	2.87	8.85	.92	5.23	1.57
78.81	3.01	10.92	.85	5.97	1.52
84.13	3.17	14.03	.72	6.98	1.44
88.49	3.33	19.11	.58	8.71	1.32
91.92	3.50	28.17	.43	10.58	1.16
94.52	3.68	46.29	.29	14.10	.96
96.41	3.87	88.34	.17	20.34	.73
97.72	4.06	206.89	.08	32.54	.52
98.61	4.27	632.24	.03	61.57	.30

Oceanit Laboratories, Inc.
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Station: 13
File: NO3Off

Project: Mau Nar Offshore
File:
Date: May 16
Number of points: 3

Values of parameterNO-3 (ug/l)

Point	Value	f(i)
1	2.100	.167
2	2.100	.500
3	15.260	.833

Geometric mean:	4.0675	Arith Mean:	6.4866
Geom. Std. dev.:	3.1426	Arith Std Dev:	7.5979
84.13 frequency:	12.7027	Smallest Number:	2.1
15.87 frequency:	1.2943	Largest Number:	15.26

STATISTICAL PARAMETERS

Freq %	Concen units	95% Conlmt(+)	95% Conlmt(-)	70% Conlmt(+)	70% Conlmt(-)
11.51	1.03	1704.38	0.00	52.56	.02
15.87	1.29	713.53	0.06	36.07	.05
21.19	1.63	393.63	.01	29.53	.09
27.42	2.05	249.10	.02	26.16	.16
34.46	2.57	186.55	.04	24.90	.27
42.07	3.23	156.17	.07	25.31	.41
50.00	4.07	142.49	.12	26.04	.42
57.93	5.11	246.90	.11	40.01	.55
65.54	6.43	466.25	.09	62.43	.66
72.58	8.09	901.62	.07	103.35	.63
78.81	10.17	2336.51	.04	184.50	.56

Oceanit Laboratories, Inc.
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Station: 3-8
File: TPHOSHar

Project: Hon Har Stations
File:
Date: May 16
Number of points: 18

Values of parameterTPHOS (ug/l)

Point	Value	F(i)
1	12.050	.028
2	12.710	.085
3	13.020	.139
4	13.640	.194
5	14.520	.250
6	14.530	.306
7	15.300	.361
8	15.300	.417
9	15.300	.472
10	15.800	.528
11	17.300	.583
12	18.600	.639
13	18.600	.694
14	19.600	.750
15	20.950	.806
16	23.250	.861
17	30.300	.917
18	55.790	.972

Geometric mean:	18.3311	Arith Mean:	21.4761
Geom. Std. dev.:	1.4027	Arith Std Dev:	11.0035
84.13 Frequency:	25.3297	Smallest Number:	12.05
15.87 Frequency:	11.4594	Largest Number:	55.79

STATISTICAL PARAMETERS

Freq %	Concen units	95% Confnt(+)	95% Confnt(-)	70% Confnt(+)	70% Confnt(-)
.02	5.30	1916.45	.02	177.02	.27
1.39	6.49	550.55	.08	68.52	.62
2.28	7.19	220.75	.22	44.55	1.15
3.59	7.84	129.32	.49	33.98	1.81
5.48	8.52	80.62	.92	28.29	2.63
8.08	9.47	59.74	1.50	25.17	3.56
11.51	10.41	48.30	2.22	23.60	4.59
15.87	11.44	42.57	3.07	22.97	5.63
21.19	12.52	39.20	4.05	22.90	6.82
27.43	13.80	37.54	5.08	23.40	8.13
34.46	15.10	37.05	6.22	24.37	9.46
42.07	16.60	37.39	7.41	25.60	10.87
50.00	18.33	38.44	8.74	27.15	12.38
57.93	20.14	45.16	8.59	30.52	13.13
65.54	22.11	54.00	9.02	35.54	13.75
72.58	24.33	66.12	8.55	41.35	14.31
78.81	26.73	85.52	8.57	48.00	14.42
84.13	29.30	109.35	7.85	59.00	14.63
88.49	32.29	151.09	6.90	75.22	14.21
91.92	35.40	225.02	5.62	94.20	13.35
94.52	38.99	364.50	4.17	127.75	11.50
96.41	42.85	679.13	2.70	185.63	9.87
97.72	47.09	1580.25	1.57	276.65	7.40
98.61	51.75	6590.10	.43	516.85	4.50

Oceanit Laboratories, Inc.
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Station: 9
File: TPHOSSta9

Project: Hon Har Sta 9
File: /Water8/HONOLULU/TPHOSSta9
Date: May 16
Number of points: 3

Values of parameterTPHOS (ug/l)

Point	Value	F(i)
1	11.700	.167
2	13.640	.500
3	13.640	.833

Geometric mean:	12.9891	Arith Mean:	13.02
Geom. Std. dev.:	1.0843	Arith Std Dev:	1.0738
84.13 frequency:	14.1367	Smallest Number:	11.70
15.87 frequency:	11.9352	Largest Number:	13.64

STATISTICAL PARAMETERS

Freq %	Concen units	95% Confnt(+)	95% Confnt(-)	70% Confnt(+)	70% Confnt(-)
.02	10.60	159189.40	0.00	1741.79	.06
1.39	10.78	17901.65	.01	543.07	.21
2.28	10.97	3505.73	.03	231.94	.51
3.59	11.15	1105.35	.11	127.01	.97
5.48	11.34	460.14	.27	81.66	1.58
8.08	11.54	246.97	.54	58.63	2.27
11.51	11.73	152.85	.90	45.01	3.01
15.87	11.94	106.22	1.34	38.07	3.71
21.19	12.14	80.50	1.83	33.12	4.45
27.43	12.35	65.13	2.34	29.84	5.11
34.46	12.56	55.35	2.85	27.59	5.72
42.07	12.77	48.90	3.31	26.04	6.26
50.00	12.99	44.51	3.79	24.97	6.76
57.93	13.21	50.59	3.95	26.94	6.90
65.54	13.41	59.23	3.65	29.52	6.12
72.58	13.67	72.09	2.59	33.03	5.65
78.81	13.90	92.17	2.10	37.93	5.09
84.13	14.14	125.01	1.59	45.09	4.43
88.49	14.38	187.27	1.10	56.13	3.68
91.92	14.62	313.02	.68	74.31	2.88
94.52	14.87	613.77	.36	107.07	2.07
96.41	15.13	1499.11	.15	173.34	1.32
97.72	15.39	4918.31	.05	328.20	.72
98.61	15.65	25254.00	.01	708.13	.31

Oceanit Laboratories, Inc.
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Station: 3-8
File: TPHOSHar

Project: Hon Har Stations
File:
Date: May 16
Number of points: 18

Values of parameter TPHOS (ug/l)

Point	Value	F(i)
1	12.890	.028
2	12.710	.083
3	13.820	.139
4	13.640	.194
5	14.500	.250
6	14.570	.306
7	15.500	.361
8	15.500	.417
9	15.500	.472
10	15.810	.528
11	17.500	.583
12	18.600	.639
13	18.600	.694
14	18.600	.750
15	20.400	.806
16	25.230	.861
17	30.300	.917
18	55.790	.972

Geometric mean:	18.3311	Arith Mean:	21.4761
Geom. Std. dev.:	1.6827	Arith Std Dev:	10.8595
84.13 frequency:	29.5797	Smallest Number:	12.89
15.87 frequency:	11.4574	Largest Number:	55.79

STATISTICAL PARAMETERS

Freq %	Concen units	95% Confnl(+)	95% Confnl(-)	70% Confnl(+)	70% Confnl(-)
.02	5.98	1916.45	.02	127.82	.27
1.39	6.49	550.55	.08	68.52	.62
2.28	7.14	220.73	.22	44.55	1.13
3.59	7.84	124.31	.49	33.98	1.81
5.48	8.62	80.57	.92	28.29	2.63
8.08	9.57	59.75	1.58	25.11	3.56
11.51	10.48	48.78	2.22	23.60	4.59
15.87	11.49	42.57	3.07	22.97	5.63
21.19	12.57	39.28	4.05	22.90	6.07
27.42	13.80	37.54	5.00	23.40	8.15
34.46	15.18	37.05	6.22	24.57	9.46
42.07	16.60	37.35	7.44	25.60	10.87
50.00	18.33	38.44	8.24	27.15	12.38
57.93	20.14	45.16	8.39	30.52	13.33
65.54	22.14	54.08	9.02	35.54	13.79
72.58	24.33	66.12	8.55	41.35	14.51
78.81	26.73	88.37	8.57	48.08	14.62
84.13	29.38	105.35	7.85	59.81	14.63
88.49	32.25	151.85	6.90	75.22	14.24
91.92	35.48	223.82	5.42	94.28	13.35
94.52	38.99	364.98	4.17	122.75	11.98
96.41	42.85	629.19	2.78	165.65	9.85
97.72	47.09	1509.23	1.47	256.41	7.48
98.61	51.75	4590.10	.51	546.83	4.58

Oceanit Laboratories, Inc.
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Station: 9
File: TPHOSSta9

Project: Hon Har Sta 9
File: /Water0/HONOHAR/TPHOSSta9
Date: May 16
Number of points: 3

Values of parameter TPHOS (ug/l)

Point	Value	F(i)
1	11.700	.167
2	13.640	.500
3	13.640	.833

Geometric mean:	12.9891	Arith Mean:	13.02
Geom. Std. dev.:	1.0883	Arith Std Dev:	1.0730
84.13 frequency:	14.1367	Smallest Number:	11.70
15.87 frequency:	11.9352	Largest Number:	13.64

STATISTICAL PARAMETERS

Freq %	Concen units	95% Confnl(+)	95% Confnl(-)	70% Confnl(+)	70% Confnl(-)
.02	10.60	159109.90	0.00	1713.79	.06
1.39	10.78	17901.65	.01	513.07	.21
2.28	10.97	3505.73	.03	233.94	.51
3.59	11.15	1105.35	.11	127.03	.97
5.48	11.34	460.14	.27	81.66	1.50
8.08	11.54	246.97	.54	58.63	2.27
11.51	11.73	152.85	.90	45.81	3.01
15.87	11.94	106.22	1.34	38.07	3.74
21.19	12.14	80.50	1.83	33.12	4.45
27.42	12.35	65.13	2.34	29.84	5.11
34.46	12.56	55.35	2.85	27.59	5.72
42.07	12.77	48.90	3.34	26.04	6.26
50.00	12.99	49.51	3.79	24.97	6.76
57.93	13.21	50.59	3.45	26.94	6.10
65.54	13.44	59.23	3.05	29.52	6.12
72.58	13.67	72.09	2.59	33.03	5.65
78.81	13.90	92.17	2.10	37.93	5.09
84.13	14.14	125.01	1.59	45.09	4.43
88.49	14.38	187.27	1.10	56.13	3.60
91.92	14.62	313.02	.60	74.31	2.80
94.52	14.87	613.77	.36	107.07	2.07
96.41	15.13	1499.11	.15	173.34	1.32
97.72	15.39	4910.31	.05	320.20	.72
98.61	15.65	25251.00	.01	700.13	.31

Oceanit Laboratories, Inc.
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Station: 10-12
File: TPHOSNear

Project: [illegible] Nearshore
File: /Water0/[illegible]/TPHOSNear
Date: May 16
Number of points: 9

Values of parameter TPHOS (mg/l)

Point	Value	F(t)
1	10.050	.056
2	10.850	.167
3	11.700	.278
4	11.700	.389
5	11.700	.500
6	13.020	.611
7	13.640	.722
8	13.950	.833
9	16.700	.944

Geometric mean:	12.5958	Arith Mean:	12.71
Geom. Std. dev.:	1.1582	Arith Std Dev:	1.8792
84.13 frequency:	14.4883	Smallest Number:	10.05
15.93 frequency:	10.9505	Largest Number:	16.71

STATISTICAL PARAMETERS

Freq %	Concen units	95% Conlmt(+)	95% Conlmt(-)	70% Conlmt(+)	70% Conlmt(-)
.62	9.00	3103.00	.03	202.50	.50
1.39	9.26	839.31	.10	100.19	.85
2.28	9.52	321.37	.20	61.61	1.17
3.59	9.79	161.74	.59	43.36	2.21
5.48	10.07	97.45	1.09	33.50	3.02
8.08	10.35	67.14	1.60	27.92	3.89
11.51	10.65	50.99	2.22	24.45	4.61
15.87	10.95	41.57	2.88	22.22	5.40
21.19	11.26	35.72	3.55	20.70	6.10
27.43	11.58	31.95	4.20	19.84	6.76
34.46	11.91	29.45	4.82	19.25	7.37
42.07	12.25	27.79	5.40	18.92	7.93
50.00	12.60	26.71	5.91	18.77	8.45
57.93	12.95	29.19	5.71	20.01	8.39
65.54	13.32	32.94	5.39	21.53	8.24
72.57	13.70	37.79	4.97	23.17	8.00
78.81	14.09	44.69	4.44	25.99	7.61
84.13	14.49	54.99	3.82	29.40	7.11
88.49	14.90	71.35	3.11	34.21	6.49
91.92	15.32	99.36	2.36	41.32	5.60
94.52	15.76	152.52	1.63	52.55	4.72
96.41	16.21	267.70	.98	71.77	3.66
97.72	16.67	582.57	.49	107.04	2.58
98.61	17.14	1553.02	.19	187.33	1.57

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Station: 13
File: TPHOSoff

Project: [illegible] Offshore
File: /Water0/[illegible]/TPHOSOFF
Date: May 16
Number of points: 3

Values of parameter TPHOS (mg/l)

Point	Value	F(t)
1	12.710	.167
2	13.020	.500
3	13.020	.833

Geometric mean:	12.9158	Arith Mean:	12.9166
Geom. Std. dev.:	1.014	Arith Std Dev:	.1789
84.13 frequency:	13.0967	Smallest Number:	12.71
15.93 frequency:	12.7373	Largest Number:	13.02

STATISTICAL PARAMETERS

Freq %	Concen units	95% Conlmt(+)	95% Conlmt(-)	70% Conlmt(+)	70% Conlmt(-)
.62	12.49	97267.71	0.00	1450.17	.11
1.39	12.53	12200.11	.01	402.76	.33
2.28	12.56	2700.37	.06	217.43	.73
3.59	12.60	912.05	.17	122.28	1.30
5.48	12.63	404.33	.39	79.46	2.01
8.08	12.67	219.95	.73	57.60	2.79
11.51	12.70	130.49	1.16	45.18	3.57
15.87	12.74	97.64	1.66	37.53	4.32
21.19	12.77	74.44	2.19	32.54	5.01
27.43	12.81	60.32	2.72	29.15	5.63
34.46	12.84	51.17	3.22	26.74	6.17
42.07	12.88	45.00	3.69	25.01	6.63
50.00	12.92	40.63	4.10	23.74	7.03
57.93	12.95	45.25	3.71	25.15	6.67
65.54	12.99	51.74	3.26	27.04	6.24
72.57	13.02	61.33	2.77	29.64	5.72
78.81	13.06	76.11	2.24	33.20	5.13
84.13	13.10	100.39	1.71	38.59	4.44
88.49	13.13	143.56	1.20	46.72	3.69
91.92	13.17	229.69	.76	59.85	2.90
94.52	13.21	422.73	.41	83.00	2.10
96.41	13.24	950.05	.18	128.47	1.37
97.72	13.28	2863.37	.06	229.07	.77
98.61	13.32	12970.79	.01	513.21	.35

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Station: 1
File: PHAEOSta1

Project: Hon Har Sta 1
File: /Water8/HONOHIA/PHAEOSta1
Date: May 16
Number of points: 3

Values of parameterPHAEO (ug/l)

Point	Value	F(i)
1	.131	.167
2	.151	.500
3	.290	.833

Geometric mean:	.179	Arith Mean:	.1906
Gem. Std. dev.:	1.5277	Arith Std Dev:	.0665
84.13 frequency:	.2731	Smallest Number:	.131
15.87 frequency:	.1171	Largest Number:	.29

STATISTICAL PARAMETERS

Freq %	Concen units	95% Conlat(+)	95% Conlat(-)	70% Conlat(+)	70% Conlat(-)
.02	.06	17706.92	0.00	63.57	0.00
1.39	.07	2211.05	0.00	17.27	0.00
2.28	.08	251.61	0.00	5.63	0.00
3.59	.08	52.92	0.00	2.56	0.00
5.48	.09	16.89	0.00	1.45	.01
8.08	.10	7.29	0.00	.97	.01
11.51	.11	3.95	0.00	.73	.02
15.87	.12	2.52	.01	.60	.02
21.19	.13	1.82	.01	.52	.03
27.42	.14	1.43	.01	.48	.04
34.46	.15	1.21	.02	.46	.05
42.07	.16	1.08	.02	.45	.06
50.00	.18	1.01	.03	.45	.07
57.93	.19	1.20	.03	.53	.07
65.54	.21	1.70	.03	.61	.07
72.58	.23	2.30	.02	.80	.07
78.81	.25	3.50	.02	1.03	.06
84.13	.27	5.80	.01	1.39	.05
88.49	.30	10.93	.01	2.01	.04
91.92	.32	23.09	0.00	3.17	.03
94.52	.35	65.35	0.00	5.63	.02
96.41	.38	213.32	0.00	11.77	.01
97.72	.42	1370.80	0.00	30.66	.01
98.61	.45	19402.06	0.00	111.47	0.00

Oceanit Laboratories, Inc.
coastal & offshore engineering services • research & development

Station: 2
File: PHAEOSta2

Project: Hon Har Sta 2
File: /Water8/HONOHIA/PHAEOSta2
Date: May 16
Number of points: 3

Values of parameterPHAEO (ug/l)

Point	Value	F(i)
1	.081	.167
2	.193	.500
3	.300	.833

Geometric mean:	.1789	Arith Mean:	.1919
Gem. Std. dev.:	1.9311	Arith Std Dev:	.112
84.13 frequency:	.33	Smallest Number:	.081
15.87 frequency:	-.0005	Largest Number:	.300

STATISTICAL PARAMETERS

Freq %	Concen units	95% Conlat(+)	95% Conlat(-)	70% Conlat(+)	70% Conlat(-)
.02	.04	907246.20	0.00	301.90	0.00
1.39	.04	19772.70	0.00	42.10	0.00
2.28	.05	1275.06	0.00	10.96	0.00
3.59	.05	182.84	0.00	3.96	0.00
5.48	.06	43.08	0.00	1.90	0.00
8.08	.07	15.61	0.00	1.22	0.00
11.51	.08	7.38	0.00	.87	.01
15.87	.09	4.20	0.00	.69	.01
21.19	.10	2.90	0.00	.60	.02
27.42	.12	2.20	.01	.55	.02
34.46	.13	1.83	.01	.53	.03
42.07	.15	1.62	.01	.53	.04
50.00	.17	1.52	.02	.51	.05
57.93	.19	2.11	.02	.69	.06
65.54	.22	3.09	.02	.90	.06
72.58	.25	4.85	.01	1.21	.05
78.81	.29	8.30	.01	1.72	.05
84.13	.33	15.97	.01	2.50	.04
88.49	.38	35.00	0.00	4.22	.03
91.92	.43	90.50	0.00	7.68	.02
94.52	.49	360.13	0.00	16.26	.01
96.41	.56	1945.01	0.00	42.33	.01
97.72	.61	17732.85	0.00	145.93	0.00
98.61	.73	357790.04	0.00	761.03	0.00

Oceanit Laboratories, Inc.
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Station: 3-8
File: PHAEOHar

Project: Hon Har Stations
File: /Water8/HONORIA/PHAEOHar
Date: May 16
Number of points: 18

Values of parameterPHAEO (ug/l)

Point	Value	F(i)
1	.083	.028
2	.111	.083
3	.115	.139
4	.122	.194
5	.123	.250
6	.131	.306
7	.134	.361
8	.151	.417
9	.152	.472
10	.170	.528
11	.182	.583
12	.186	.639
13	.190	.694
14	.264	.750
15	.311	.806
16	.315	.861
17	.411	.917
18	1.314	.972

Geometric mean:	.1901	Arith Mean:	.2506
Geom. Std. dev.:	1.8985	Arith Std Dev:	.2794
84.1% frequency:	.3594	Smallest Number:	.083
15.9% frequency:	.1005	Largest Number:	1.314

STATISTICAL PARAMETERS

Freq %	Concen units	95% Conf(+)	95% Conf(-)	70% Conf(+)	70% Conf(-)
.02	.04	37.76	0.00	1.54	0.00
1.39	.05	8.82	0.00	.75	0.00
2.28	.05	3.10	0.00	.47	.01
3.59	.06	1.57	0.00	.34	.01
5.48	.07	.96	0.00	.28	.02
8.08	.08	.68	.01	.25	.02
11.51	.09	.55	.01	.23	.03
15.87	.10	.57	.02	.23	.04
21.19	.11	.44	.03	.23	.06
27.42	.13	.42	.04	.24	.07
34.46	.15	.42	.05	.26	.08
42.07	.17	.43	.06	.28	.10
50.00	.19	.46	.08	.30	.12
57.93	.22	.56	.08	.36	.13
65.54	.25	.70	.09	.43	.14
72.58	.28	.91	.09	.52	.15
78.81	.32	1.21	.08	.61	.16
84.13	.36	1.69	.08	.82	.16
88.49	.41	2.52	.07	1.07	.16
91.92	.46	4.07	.05	1.47	.15
94.52	.53	7.37	.04	2.14	.13
96.41	.60	15.57	.02	3.37	.11
97.72	.68	40.53	.01	5.95	.08
98.61	.77	145.35	0.00	12.43	.05

Oceanit Laboratories, Inc.
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Station: 9
File: PHAEOSta9

Project: Hon Har Sta 9
File: /Water8/HONORIA/PHAEOSta9
Date: May 16
Number of points: 3

Values of parameterPHAEO (ug/l)

Point	Value	F(i)
1	.073	.167
2	.123	.500
3	.138	.833

Geometric mean:	.1099	Arith Mean:	.1116
Geom. Std. dev.:	1.4126	Arith Std Dev:	.0301
84.1% frequency:	.1506	Smallest Number:	.073
15.9% frequency:	.0762	Largest Number:	.138

STATISTICAL PARAMETERS

Freq %	Concen units	95% Conf(+)	95% Conf(-)	70% Conf(+)	70% Conf(-)
.02	.05	15687.26	0.00	39.52	0.00
1.39	.05	877.63	0.00	8.06	0.00
2.28	.05	110.42	0.00	3.05	0.00
3.59	.06	25.16	0.00	1.49	0.00
5.48	.06	8.97	0.00	.81	0.00
8.08	.07	3.82	0.00	.57	.01
11.51	.07	2.13	0.00	.43	.01
15.87	.08	1.38	0.00	.35	.02
21.19	.08	1.03	0.00	.31	.02
27.42	.09	.80	.01	.28	.03
34.46	.09	.68	.01	.27	.03
42.07	.10	.61	.01	.26	.04
50.00	.11	.56	.02	.26	.05
57.93	.12	.70	.02	.30	.05
65.54	.13	.91	.02	.36	.04
72.58	.14	1.29	.02	.44	.04
78.81	.15	1.81	.02	.56	.04
84.13	.16	2.80	.01	.74	.03
88.49	.17	5.13	.01	1.04	.03
91.92	.18	10.66	.01	1.58	.02
94.52	.20	27.38	0.00	2.71	.01
96.41	.21	94.11	0.00	5.39	.01
97.72	.23	478.32	0.00	13.22	0.00
98.61	.25	1982.06	0.00	41.43	0.00

Oceanit Laboratories, Inc.
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Station: 10-12
File: PHAEONear

Project: [illegible] Nearshore
File: /Alter0/[illegible]/PHAEONear
Date: May 16
Number of points: 9

Values of parameterPHAEO (ug/l)

Point	Value	F(i)
1	.073	.056
2	.084	.167
3	.091	.278
4	.112	.389
5	.117	.500
6	.123	.611
7	.129	.722
8	.129	.833
9	.174	.944

Geometric mean:	.1112	Arith Mean:	.1146
Geom. Std. dev.:	1.3000	Arith Std Dev:	.0301
84.13 frequency:	.1446	Smallest Number:	.073
15.92 frequency:	.0854	Largest Number:	.174

STATISTICAL PARAMETERS

Freq %	Concen units	95% Conf(+)	95% Conf(-)	70% Conf(+)	70% Conf(-)
.62	.06	45.10	0.00	2.03	0.00
1.39	.06	10.28	0.00	.93	0.00
2.28	.07	3.52	0.00	.54	.01
3.59	.07	1.65	0.00	.37	.01
5.48	.07	.95	.01	.29	.02
8.08	.08	.64	.01	.24	.03
11.51	.08	.48	.01	.21	.03
15.87	.09	.39	.02	.19	.04
21.19	.09	.33	.02	.18	.05
27.42	.09	.30	.03	.17	.05
34.46	.10	.28	.04	.17	.06
42.07	.11	.27	.04	.17	.06
50.00	.11	.26	.05	.17	.07
57.93	.12	.30	.05	.19	.07
65.54	.12	.34	.04	.21	.07
72.58	.13	.41	.04	.24	.07
78.81	.14	.51	.04	.27	.07
84.13	.14	.65	.03	.32	.06
88.49	.15	.90	.03	.39	.06
91.92	.16	1.33	.02	.49	.05
94.52	.17	2.21	.01	.66	.04
96.41	.18	4.26	.01	.96	.03
97.72	.19	10.07	0.00	1.56	.02
98.61	.20	32.45	0.00	2.97	.01

Station: 13
File: PHAEOOff

Project: [illegible] Offshore
File: /Alter0/[illegible]/PHAEOOff
Date: May 16
Number of points: 3

Values of parameterPHAEO (ug/l)

Point	Value	F(i)
1	.039	.167
2	.046	.500
3	.057	.833

Geometric mean:	.0467	Arith Mean:	.0473
Geom. Std. dev.:	1.2095	Arith Std Dev:	.009
84.13 frequency:	.0565	Smallest Number:	.039
15.92 frequency:	.0386	Largest Number:	.057

STATISTICAL PARAMETERS

Freq %	Concen units	95% Conf(+)	95% Conf(-)	70% Conf(+)	70% Conf(-)
.62	.03	1290.55	0.00	8.60	0.00
1.39	.03	113.00	0.00	2.40	0.00
2.28	.03	19.93	0.00	.96	0.00
3.59	.03	5.49	0.00	.50	0.00
5.48	.03	2.15	0.00	.31	0.00
8.08	.04	1.00	0.00	.22	.01
11.51	.04	.65	0.00	.17	.01
15.87	.04	.44	0.00	.14	.01
21.19	.04	.33	0.00	.12	.01
27.42	.04	.26	.01	.11	.02
34.46	.04	.23	.01	.10	.02
42.07	.05	.20	.01	.10	.02
50.00	.05	.18	.01	.10	.02
57.93	.05	.22	.01	.11	.02
65.54	.05	.26	.01	.12	.02
72.58	.05	.33	.01	.14	.02
78.81	.05	.45	.01	.17	.02
84.13	.06	.64	0.00	.21	.02
88.49	.06	1.02	0.00	.27	.01
91.92	.06	1.84	0.00	.37	.01
94.52	.06	3.96	0.00	.57	.01
96.41	.07	10.89	0.00	.99	0.00
97.72	.07	41.59	0.00	2.05	0.00
98.61	.07	261.21	0.00	5.51	0.00

Station: 1
File: TNITSta1

Project: Hon Har Sta 1
File:
Date: May 16
Number of points: 3

Values of parameterTNT (ug/l)

Point	Value	F(i)
1	91.220	.167
2	106.590	.500
3	197.540	.833

Geometric mean:	125.6329	Arith Mean:	132.7666
Geom. Std. dev.:	1.4863	Arith Std Dev:	56.4325
84.13 frequency:	186.8109	Smallest Number:	91.22
15.87 frequency:	84.4500	Largest Number:	197.54

STATISTICAL PARAMETERS

Freq %	Concen units	95% Confid(+)	95% Confid(-)	70% Confid(+)	70% Confid(-)
11.52	78.85	2682.75	2.34	580.78	12.14
15.87	84.45	1674.58	4.26	412.16	17.52
21.19	91.47	1212.80	6.98	368.49	23.23
27.42	99.82	960.56	10.21	338.62	29.66
34.46	107.28	801.64	14.12	310.23	36.57
42.07	116.85	726.62	18.53	307.16	43.85
50.00	125.63	675.00	25.35	306.00	51.45
57.93	136.01	654.59	21.72	355.50	54.35
65.54	147.24	1117.56	19.40	431.61	58.23
72.58	159.40	1346.25	16.43	522.27	47.74
78.81	172.56	2280.87	13.00	680.85	43.78

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Station: 2
File: TNITSta2

Project: Hon Har Sta 2
File:
Date: May 16
Number of points: 3

Values of parameterTNT (ug/l)

Point	Value	F(i)
1	91.960	.167
2	95.760	.500
3	109.900	.833

Geometric mean:	99.8829	Arith Mean:	100.84
Geom. Std. dev.:	1.0873	Arith Std Dev:	8.5637
84.13 frequency:	108.5294	Smallest Number:	91.96
15.87 frequency:	91.7856	Largest Number:	109.9

STATISTICAL PARAMETERS

Freq %	Concen units	95% Confid(+)	95% Confid(-)	70% Confid(+)	70% Confid(-)
.82	81.65	1215194.19	.01	13365.67	.50
1.39	83.01	133800.85	.05	4166.16	1.65
2.28	84.41	26844.62	.27	1795.72	3.97
3.59	85.84	8471.47	.87	981.45	7.51
5.48	87.29	3590.84	2.12	627.25	12.15
8.08	88.76	1894.78	4.16	458.58	17.49
11.51	90.26	1172.93	6.95	351.95	23.15
15.87	91.79	815.25	10.33	292.46	28.81
21.19	93.34	617.80	14.10	254.15	34.24
27.42	94.91	499.55	18.82	229.28	39.58
34.46	96.52	424.98	21.52	211.95	43.96
42.07	98.15	375.35	25.66	199.58	48.17
50.00	99.80	341.68	28.16	191.73	51.95
57.93	101.49	380.19	26.54	206.79	49.81
65.54	103.20	454.34	23.44	226.59	47.00
72.58	104.95	552.00	19.92	253.13	43.46
78.81	106.72	706.47	16.12	290.95	39.15
84.13	108.52	963.89	12.22	345.70	34.06
88.49	110.35	1431.82	8.49	430.29	28.58
91.92	112.22	2395.37	5.26	569.39	22.12
94.52	114.11	4693.30	2.77	828.01	15.80
96.41	116.04	11452.10	1.18	1326.77	10.15
97.72	118.00	37525.92	.37	2510.22	5.55
98.63	119.99	192369.49	.07	6822.22	2.39

Oceanit Laboratories, Inc.
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Station: 3-8
File: TNITHar

• Project: Non Har Harbor Stations
File:
Date: May 16
Number of points: 18

Values of parameterTotal Nitrogen (ug/l)

Point	Value	F(I)
1	97.020	.028
2	97.500	.083
3	97.500	.139
4	97.720	.194
5	104.060	.250
6	105.280	.306
7	106.590	.361
8	108.000	.417
9	108.640	.472
10	113.390	.528
11	117.620	.583
12	117.860	.639
13	117.000	.694
14	119.420	.750
15	119.900	.806
16	124.040	.861
17	124.890	.917
18	177.940	.972

Geometric mean:	112.0317	Arith Mean:	113.19
Geom. Std. dev.:	1.1513	Arith Std Dev:	18.4317
84.13 frequency:	128.99	Smallest Number:	97.02
15.92 frequency:	97.3020	Largest Number:	177.94

STATISTICAL PARAMETERS

Freq %	Concen units	95% Confid(+)	95% Confid(-)	70% Confid(+)	70% Confid(-)
.82	79.00	5001.66	1.25	723.71	8.02
1.39	82.16	1995.09	3.30	446.99	15.12
2.28	84.52	1020.20	7.00	316.09	22.54
3.59	86.93	632.70	11.94	249.23	30.32
5.48	89.41	445.03	17.93	209.72	38.12
8.08	91.97	345.37	24.49	185.59	45.57
11.51	94.60	286.65	31.22	170.36	52.53
15.87	97.30	250.12	37.85	160.58	58.96
21.19	100.08	226.58	44.21	154.40	64.80
27.42	102.95	211.13	50.20	150.71	70.32
34.46	105.89	200.96	55.80	148.77	75.37
42.07	108.92	194.51	60.99	148.16	80.07
50.00	112.03	190.70	65.82	148.56	84.40
57.93	115.23	205.79	64.53	156.75	84.71
65.54	118.53	224.95	62.46	166.52	84.37
72.58	121.92	250.09	59.65	178.40	83.20
78.81	125.40	283.90	55.79	193.46	81.29
84.13	128.99	331.50	50.10	212.87	78.16
88.49	132.68	402.04	43.79	238.93	73.68
91.92	136.47	512.49	36.34	275.39	67.63
94.52	140.37	699.94	28.15	329.25	59.85
96.41	144.39	1051.06	19.83	413.97	50.36
97.72	148.52	1792.06	12.30	556.90	39.61
98.61	152.76	3710.95	6.29	838.16	28.11

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Station: 9
File: TNITSta9

Project: Non Har Sta 9
File:
Date: May 16
Number of points: 3

Values of parameterTNIT (ug/l)

Point	Value	F(I)
1	92.540	.167
2	102.060	.500
3	107.380	.833

Geometric mean:	100.4699	Arith Mean:	100.66
Geom. Std. dev.:	1.0785	Arith Std Dev:	7.5104
84.13 frequency:	108.3599	Smallest Number:	92.54
15.92 frequency:	93.1544	Largest Number:	107.38

STATISTICAL PARAMETERS

Freq %	Concen units	95% Confid(+)	95% Confid(-)	70% Confid(+)	70% Confid(-)
.82	83.00	1153956.44	.01	13164.86	.53
1.39	85.00	178969.30	.06	4136.35	1.75
2.28	86.37	26213.89	.20	1792.40	4.16
3.59	87.63	8337.63	.52	902.50	7.82
5.48	89.02	3552.73	2.23	629.57	12.59
8.08	90.50	1801.54	4.34	452.59	18.05
11.51	91.76	1167.82	7.21	353.85	23.79
15.87	93.15	812.00	10.60	294.85	29.51
21.19	94.57	616.55	11.50	255.74	31.97
27.42	96.01	498.99	18.17	230.21	40.05
34.46	97.48	424.80	22.41	212.66	44.60
42.07	98.96	374.30	26.16	200.40	48.05
50.00	100.47	340.47	29.65	191.99	52.58
57.93	102.00	385.00	26.56	206.51	50.35
65.54	103.55	458.44	23.80	225.92	47.47
72.58	105.13	546.37	20.23	252.07	43.85
78.81	106.73	655.83	16.57	280.42	39.47
84.13	108.36	915.57	12.92	312.84	34.33
88.49	110.01	1400.15	8.61	424.25	28.53
91.92	111.69	2325.61	5.36	559.20	22.30
94.52	113.39	4525.82	2.84	800.00	16.85
96.41	115.12	10945.60	1.21	1290.96	10.27
97.72	116.87	35470.00	.33	2425.30	5.63
98.61	118.65	173160.85	.08	5760.79	2.44

Oceanit Laboratories, Inc.
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Station: 10-12
File: TNITNear

Project: Hon Harbor Nearshore
File:
Date: May 16
Number of points: 9

Values of parameterTotal Nitro (mg/l)

Point	Value	F(i)
1	93.940	.056
2	93.940	.167
3	97.020	.278
4	98.000	.389
5	100.000	.500
6	107.300	.611
7	107.660	.722
8	113.120	.833
9	113.400	.944

Geometric mean:	102.5409	Arith Mean:	102.0066
Geom. Std. dev.:	1.0779	Arith Std Dev:	7.7532
84.13 frequency:	110.5305	Smallest Number:	93.94
15.87 frequency:	95.1367	Largest Number:	113.4

STATISTICAL PARAMETERS

Freq %	Concen units	95% Conint(+)	95% Conint(-)	70% Conint(+)	70% Conint(-)
.02	85.65	20990.35	.35	1584.70	4.63
1.39	86.95	5337.20	1.27	817.66	9.25
2.28	88.26	2307.58	3.26	507.05	15.34
3.59	89.53	1240.76	6.47	361.35	22.21
5.48	90.95	763.20	10.09	281.19	29.42
8.08	92.32	532.27	16.01	233.09	36.44
11.51	93.72	406.71	21.60	204.21	43.01
15.87	95.19	332.06	27.26	184.67	49.01
21.19	96.57	284.09	32.79	171.46	54.90
27.42	98.04	253.79	37.80	162.30	59.19
34.46	99.52	232.44	42.61	156.09	63.65
42.07	101.02	217.69	46.80	151.02	67.22
50.00	102.56	207.38	50.71	149.01	70.57
57.93	104.10	224.32	40.31	156.95	69.77
65.54	105.67	246.82	45.24	165.75	67.37
72.58	107.27	277.61	41.45	177.67	64.76
78.81	108.89	321.22	36.91	193.32	61.34
84.13	110.54	385.02	31.67	214.57	56.95
88.49	112.21	486.95	25.06	244.50	51.50
91.92	113.91	656.70	19.76	288.57	44.96
94.52	115.63	970.29	13.70	357.19	37.40
96.41	117.38	1625.49	8.40	473.19	29.10
97.72	119.15	3223.66	4.90	685.60	20.71
98.61	120.95	8259.40	1.77	1137.16	12.06

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Station: 13
File: TNITOff

Project: Hon Har Offshore
File:
Date: May 16
Number of points: 3

Values of parameterTNIT (mg/l)

Point	Value	F(i)
1	91.280	.167
2	96.960	.500
3	117.000	.833

Geometric mean:	101.2182	Arith Mean:	101.0735
Geom. Std. dev.:	1.144	Arith Std Dev:	19.102
84.13 frequency:	115.0331	Smallest Number:	91.28
15.87 frequency:	88.4950	Largest Number:	117.00

STATISTICAL PARAMETERS

Freq %	Concen units	95% Conint(+)	95% Conint(-)	70% Conint(+)	70% Conint(-)
.02	73.30	1000902.02	0.00	15557.19	.34
1.39	75.30	177580.42	.03	4635.90	1.22
2.28	77.36	33223.64	.10	1930.87	3.10
3.59	79.47	9964.50	.63	1031.71	6.12
5.48	81.63	4075.64	1.64	650.17	10.25
8.08	83.86	2009.50	3.35	463.12	15.19
11.51	86.15	1779.83	5.30	360.02	20.50
15.87	88.50	1000.09	8.05	299.56	26.15
21.19	90.91	661.19	12.44	261.16	31.65
27.42	93.39	536.40	16.26	236.15	36.94
34.46	95.94	456.52	20.17	219.47	41.94
42.07	98.56	401.25	24.03	208.42	46.61
50.00	101.25	363.51	27.29	201.24	50.94
57.93	104.01	325.60	25.56	219.95	49.19
65.54	106.85	500.18	22.47	244.41	46.71
72.58	109.76	630.51	19.11	277.53	43.41
78.81	112.76	823.77	15.43	323.90	39.25
84.13	115.83	1152.56	11.64	392.00	34.22
88.49	118.99	1767.56	8.01	490.10	28.43
91.92	122.24	3060.00	4.80	675.06	22.13
94.52	125.57	6263.33	2.52	1000.12	15.77
96.41	129.00	16175.02	1.03	1521.79	9.94
97.72	132.52	56915.23	.31	3306.39	5.31
98.61	136.15	320609.44	.06	8300.19	2.21

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Station: 1
File: PO4Sta1

Project: [illegible] Sta 1
File:
Date: Aug 16
Number of points: 3

Values of parameterPO-4 (mg/l)

Point	Value	F(i)
1	5.270	.167
2	7.750	.500
3	11.160	.833

Geometric mean:	7.6958	Arith Mean:	8.06
Geom. Std. dev.:	1.4552	Arith Std Dev:	2.9572
84.13 frequency:	11.1997	Smallest Number:	5.27
15.87 frequency:	5.2882	Largest Number:	11.16

STATISTICAL PARAMETERS

Freq %	Concen units	95% Confint(+)	95% Confint(-)	70% Confint(+)	70% Confint(-)
.62	3.13	1202150.16	0.00	2891.32	0.00
1.39	3.37	65553.57	0.00	636.54	.02
2.28	3.63	8020.75	0.00	217.52	.06
3.59	3.92	1820.34	.01	102.14	.15
5.48	4.22	618.70	.03	59.14	.30
8.08	4.55	275.63	.08	40.40	.52
11.51	4.90	151.03	.16	30.32	.79
15.87	5.29	98.35	.28	24.94	1.12
21.19	5.70	71.54	.45	21.82	1.49
27.42	6.14	56.79	.66	20.00	1.89
34.46	6.62	48.15	.90	18.90	2.31
42.07	7.14	42.99	1.13	18.51	2.75
50.00	7.70	39.94	1.40	18.44	3.21
57.93	8.30	49.55	1.30	21.51	3.20
65.54	8.95	63.00	1.23	25.82	3.12
72.58	9.64	89.05	1.01	31.37	2.96
78.81	10.39	130.39	.83	39.77	2.71
84.13	11.20	208.30	.60	52.82	2.37
88.49	12.07	373.63	.39	79.60	1.95
91.92	13.01	782.55	.22	119.40	1.48
94.52	14.03	2029.17	.10	196.46	1.00
96.41	15.12	7057.00	.05	354.30	.58
97.72	16.30	36424.00	.02	575.66	.27
98.61	17.57	342152.03	0.00	3327.91	.09

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Station: 2
File: PO4Sta2

Project: [illegible] Sta 2
File:
Date: Aug 16
Number of points: 3

Values of parameterPO-4 (mg/l)

Point	Value	F(i)
1	2.330	.167
2	5.270	.500
3	6.200	.833

Geometric mean:	4.2582	Arith Mean:	4.6
Geom. Std. dev.:	1.6495	Arith Std Dev:	2.0201
84.13 frequency:	7.1687	Smallest Number:	2.33
15.87 frequency:	2.5805	Largest Number:	6.2

STATISTICAL PARAMETERS

Freq %	Concen units	95% Confint(+)	95% Confint(-)	70% Confint(+)	70% Confint(-)
.62	1.20	3567012.31	0.00	3310.21	0.00
1.39	1.34	127664.49	0.00	586.05	0.00
2.28	1.48	11903.51	0.00	171.79	.01
3.59	1.65	2863.59	0.00	72.68	.04
5.48	1.83	590.00	.01	39.23	.09
8.08	2.03	236.50	.02	25.37	.16
11.51	2.26	121.47	.04	18.71	.27
15.87	2.51	74.63	.08	15.19	.41
21.19	2.79	52.53	.15	13.24	.59
27.42	3.09	40.50	.23	12.10	.79
34.46	3.44	34.30	.34	11.66	1.01
42.07	3.82	30.60	.47	11.53	1.26
50.00	4.24	28.60	.63	11.69	1.54
57.93	4.71	32.04	.58	14.23	1.56
65.54	5.23	52.30	.52	17.74	1.54
72.58	5.81	76.75	.44	22.85	1.48
78.81	6.45	121.50	.34	30.63	1.36
84.13	7.16	213.28	.24	43.35	1.10
88.49	7.95	427.67	.15	65.09	.96
91.92	8.83	1027.83	.08	110.17	.71
94.52	9.81	3160.21	.03	210.11	.46
96.41	10.89	13675.00	.01	400.19	.25
97.72	12.10	93560.59	0.00	1399.40	.10
98.61	13.44	1283055.30	0.00	5050.17	.03

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Station: 3-8
File: PO4Harb

Project: Hon Har Stations
File:
Date: May 16
Number of points: 18

Values of parameterPO-4 (ug/l)

Point	Value	F(i)
1	2.330	.028
2	2.330	.083
3	2.330	.139
4	2.330	.194
5	2.330	.250
6	2.330	.306
7	2.330	.361
8	2.330	.417
9	2.330	.472
10	2.330	.528
11	2.330	.583
12	4.960	.639
13	4.960	.694
14	5.270	.750
15	5.850	.806
16	6.820	.861
17	8.990	.917
18	10.540	.972

Geometric mean:	3.4736	Arith Mean:	4.8500
Gem. Std. dev.:	1.7240	Arith Std Dev:	2.5072
84.13 frequency:	5.9915	Smallest Number:	2.33
15.87 frequency:	2.0135	Largest Number:	10.54

STATISTICAL PARAMETERS

Freq %	Concen units	95% ConInt(+)	95% ConInt(-)	70% ConInt(+)	70% ConInt(-)
.02	.91	173.82	0.00	25.58	.03
1.39	1.05	124.59	.00	13.22	.08
2.28	1.17	40.79	.03	8.46	.16
3.59	1.30	25.98	.07	6.31	.27
5.48	1.45	16.12	.13	5.21	.40
8.08	1.62	11.35	.22	4.64	.57
11.51	1.80	9.52	.34	4.36	.75
15.87	2.01	8.29	.49	4.27	.95
21.19	2.25	7.64	.66	4.30	1.17
27.42	2.50	7.35	.85	4.43	1.42
34.46	2.79	7.29	1.07	4.65	1.68
42.07	3.11	7.43	1.31	4.95	1.96
50.00	3.47	7.71	1.52	5.30	2.23
57.93	3.87	9.23	1.63	6.11	2.41
65.54	4.32	11.28	1.65	7.19	2.60
72.58	4.82	13.13	1.64	8.53	2.72
78.81	5.37	18.27	1.58	10.25	2.80
84.13	5.99	24.55	1.46	12.43	2.83
88.49	6.68	35.17	1.27	16.13	2.77
91.92	7.45	54.05	1.03	21.53	2.60
94.52	8.31	92.24	.75	29.80	2.32
96.41	9.27	180.31	.47	44.58	1.91
97.72	10.33	433.39	.25	74.85	1.43
98.61	11.52	1371.91	.10	165.53	.91

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Station: 9
File: PO4Sta9

Project: Hon Har Sta 9
File:
Date: May 16
Number of points: 3

Values of parameterPO-4 (ug/l)

Point	Value	F(i)
1	2.330	.167
2	2.330	.500
3	5.500	.833

Geometric mean:	3.1173	Arith Mean:	3.4133
Gem. Std. dev.:	1.6556	Arith Std Dev:	1.8763
84.13 frequency:	5.1612	Smallest Number:	2.33
15.87 frequency:	1.8828	Largest Number:	5.50

STATISTICAL PARAMETERS

Freq %	Concen units	95% ConInt(+)	95% ConInt(-)	70% ConInt(+)	70% ConInt(-)
.02	.93	2099176.50	0.00	2185.99	0.00
1.39	1.03	70017.25	0.00	379.99	0.00
2.28	1.11	7319.49	0.00	119.59	.01
3.59	1.26	1560.50	0.00	51.39	.03
5.48	1.39	399.25	0.00	28.83	.07
8.08	1.54	162.60	.01	18.25	.13
11.51	1.70	85.51	.03	13.52	.21
15.87	1.88	52.37	.07	10.99	.32
21.19	2.08	37.83	.12	9.59	.45
27.42	2.30	29.52	.18	8.82	.60
34.46	2.55	24.54	.27	8.44	.77
42.07	2.82	21.73	.37	8.33	.95
50.00	3.12	20.30	.40	8.42	1.15
57.93	3.45	20.59	.45	10.19	1.17
65.54	3.81	36.43	.40	12.63	1.15
72.58	4.22	52.96	.34	16.15	1.10
78.81	4.67	82.96	.26	21.99	1.01
84.13	5.16	143.56	.19	30.19	.88
88.49	5.71	283.44	.11	45.33	.72
91.92	6.31	667.52	.06	74.00	.53
94.52	6.98	2004.33	.02	140.70	.35
96.41	7.73	8485.50	.01	315.66	.19
97.72	8.55	55220.41	0.00	870.66	.08
98.61	9.45	717726.50	0.00	3672.03	.02

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Station: 10-12
File: PO4Near

Project: Hon Nar Nearshore
File:
Date: May 16
Number of points: 9

Values of parameterPO-4 (ug/l)

Point	Value	F(i)
1	2.330	.056
2	2.330	.167
3	2.330	.278
4	2.330	.389
5	2.330	.500
6	2.330	.611
7	2.330	.722
8	2.330	.833
9	4.560	.944

Geometric mean:	2.534	Arith Mean:	2.6222
Geom. Std. dev.:	1.2863	Arith Std Dev:	.7766
84.13 frequency:	3.2597	Smallest Number:	2.33
15.87 frequency:	1.9630	Largest Number:	4.56

STATISTICAL PARAMETERS

Freq %	Concen units	95% Confid(+)	95% Confid(-)	70% Confid(+)	70% Confid(-)
.02	1.30	900.61	0.00	45.85	.01
1.35	1.46	225.82	.08	21.12	.10
2.28	1.53	78.40	.05	12.36	.19
3.59	1.62	37.00	.07	8.51	.30
5.48	1.63	21.45	.13	6.51	.44
8.08	1.70	14.41	.22	5.40	.59
11.51	1.87	10.80	.32	4.79	.74
15.87	1.97	8.76	.44	4.35	.89
21.19	2.07	7.53	.57	4.11	1.04
27.42	2.10	6.70	.70	3.90	1.19
34.46	2.29	6.53	.85	3.92	1.31
42.07	2.41	6.02	.56	3.92	1.40
50.00	2.53	5.87	1.09	3.96	1.42
57.93	2.66	6.66	1.07	4.33	1.51
65.54	2.80	7.71	1.02	4.80	1.54
72.58	2.95	9.17	.55	5.30	1.61
78.81	3.10	11.27	.85	6.15	1.56
84.13	3.26	14.49	.73	7.19	1.48
88.49	3.43	19.76	.59	8.68	1.35
91.92	3.61	25.17	.45	10.55	1.19
94.52	3.79	40.85	.30	11.50	.99
96.41	3.99	91.00	.17	21.06	.75
97.72	4.19	214.70	.08	33.05	.52
98.61	4.41	680.57	.05	65.50	.30

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Station: 13
File: PO4Off

Project: Hon Nar Offshore
File:
Date: May 16
Number of points: 3

Values of parameterPO-4 (ug/l)

Point	Value	F(i)
1	2.330	.167
2	2.330	.500
3	6.200	.833

Geometric mean:	3.2207	Arith Mean:	3.62
Geom. Std. dev.:	1.7595	Arith Std Dev:	2.2313
84.13 frequency:	5.601	Smallest Number:	2.33
15.87 frequency:	1.835	Largest Number:	6.2

STATISTICAL PARAMETERS

Freq %	Concen units	95% Confid(+)	95% Confid(-)	70% Confid(+)	70% Confid(-)
.02	.83	1783241.33	0.00	3185.00	0.00
1.35	.53	115020.33	0.00	526.07	0.00
2.28	1.04	11605.79	0.00	146.86	.01
3.59	1.17	1563.00	0.00	60.21	.02
5.48	1.31	535.05	0.00	31.79	.05
8.08	1.46	207.28	.01	20.27	.11
11.51	1.64	105.95	.03	14.82	.18
15.87	1.84	62.08	.05	11.57	.28
21.19	2.05	43.75	.10	10.41	.41
27.42	2.30	33.04	.16	9.58	.55
34.46	2.58	28.35	.23	9.20	.72
42.07	2.88	25.27	.33	9.12	.91
50.00	3.23	23.65	.44	9.29	1.12
57.93	3.62	31.68	.41	11.44	1.19
65.54	4.05	44.54	.37	11.45	1.13
72.58	4.53	66.02	.31	18.07	1.05
78.81	5.07	100.85	.24	25.71	1.00
84.13	5.68	191.07	.17	37.86	.87
88.49	6.36	403.45	.10	57.52	.70
91.92	7.12	1008.44	.05	90.62	.51
94.52	7.97	3253.10	.02	153.92	.33
96.41	8.93	15060.59	.01	460.34	.17
97.72	10.0	117004.29	0.00	1907.61	.07
98.61	11.19	1710157.00	0.00	6320.92	.02

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Station: 1
File: TNFSSta1

Project: Nan Nar Sta 1
File:
Date: May 16
Number of points: 3

Values of parameterTNFS (mg/l)

Point	Value	F(i)
1	6.750	.167
2	8.370	.500
3	10.940	.833

Geometric mean:	8.5102	Arith Mean:	8.6866
Geom. Std. dev.:	1.2736	Arith Std Dev:	2.1120
84.1% frequency:	10.8395	Smallest Number:	6.75
15.9% frequency:	6.6820	Largest Number:	10.94

STATISTICAL PARAMETERS

Freq %	Concen units	95% Conlat(+)	95% Conlat(-)	70% Conlat(+)	70% Conlat(-)
.62	4.77	36200.71	0.00	1069.71	.01
1.39	5.00	29100.27	0.00	491.19	.05
2.28	5.25	9402.60	.01	180.63	.15
3.59	5.51	1190.76	.03	95.67	.32
5.48	5.78	449.08	.07	58.28	.57
8.08	6.07	218.97	.17	40.69	.91
11.51	6.37	128.50	.32	31.37	1.29
15.87	6.69	86.37	.52	25.99	1.72
21.19	7.02	69.21	.77	22.72	2.17
27.42	7.37	51.53	1.05	20.69	2.62
34.46	7.73	43.09	1.36	19.43	3.00
42.07	8.12	39.06	1.69	18.68	3.53
50.00	8.52	36.00	2.02	18.30	3.56
57.93	8.94	43.03	1.86	20.50	3.80
65.54	9.38	53.26	1.65	23.50	3.74
72.58	9.85	64.97	1.41	27.66	3.51
78.81	10.34	91.61	1.13	33.47	3.19
84.13	10.85	140.11	.84	42.17	2.79
88.49	11.39	229.65	.56	56.06	2.31
91.92	11.95	431.09	.33	80.11	1.78
94.52	12.54	975.49	.16	126.39	1.25
96.41	13.17	2851.39	.06	228.56	.76
97.72	13.82	11797.41	.02	496.41	.38
98.61	14.50	82382.26	0.00	1421.00	.15

Station: 2
File: TNFSSta2

Project: Nan Nar Sta 2
File:
Date: May 16
Number of points: 3

Values of parameterTNFS (mg/l)

Point	Value	F(i)
1	4.910	.167
2	5.550	.500
3	6.440	.833

Geometric mean:	5.5906	Arith Mean:	5.6333
Geom. Std. dev.:	1.1451	Arith Std Dev:	.7683
84.1% frequency:	6.4132	Smallest Number:	4.91
15.9% frequency:	4.8875	Largest Number:	6.44

STATISTICAL PARAMETERS

Freq %	Concen units	95% Conlat(+)	95% Conlat(-)	70% Conlat(+)	70% Conlat(-)
.62	4.04	100563.41	0.00	869.84	.02
1.39	4.15	9878.22	0.00	256.95	.07
2.28	4.27	1856.62	.01	106.89	.17
3.59	4.38	553.13	.03	57.11	.34
5.48	4.51	226.03	.09	35.97	.56
8.08	4.63	116.39	.18	25.62	.84
11.51	4.76	70.50	.32	19.95	1.13
15.87	4.89	48.79	.49	16.57	1.44
21.19	5.02	36.78	.69	14.45	1.75
27.42	5.16	29.71	.90	13.06	2.04
34.46	5.30	25.27	1.11	12.19	2.32
42.07	5.45	22.39	1.33	11.53	2.57
50.00	5.60	20.47	1.53	11.14	2.83
57.93	5.75	23.69	1.40	12.18	2.72
65.54	5.91	28.17	1.21	13.59	2.58
72.58	6.07	34.97	1.06	15.30	2.40
78.81	6.24	45.71	.85	17.95	2.17
84.13	6.41	64.02	.64	21.74	1.89
88.49	6.59	98.22	.44	27.64	1.57
91.92	6.77	170.25	.27	37.40	1.22
94.52	6.96	349.10	.14	55.56	.87
96.41	7.15	901.99	.06	93.12	.55
97.72	7.35	3179.45	.02	184.04	.29
98.61	7.55	17957.73	0.00	467.11	.12

Station: 3-8
File: TNFSHar

Project: Hon Har Stations
File:
Date: May 16
Number of points: 18

Values of parameter TNFS (mg/l)

Point	Value	F(i)
1	3.210	.028
2	3.990	.083
3	4.130	.139
4	4.520	.194
5	4.600	.250
6	5.150	.306
7	5.200	.361
8	5.210	.417
9	5.570	.472
10	5.600	.528
11	5.900	.583
12	6.570	.639
13	7.710	.694
14	7.810	.750
15	8.000	.806
16	8.050	.861
17	21.650	.917
18	63.340	.972

Geometric mean:	6.8564	Arith Mean:	9.0444
Geom. Std. dev.:	2.0001	Arith Std Dev:	13.958
84.1% frequency:	13.7131	Smallest Number:	3.21
15.9% frequency:	3.4279	Largest Number:	63.34

STATISTICAL PARAMETERS

Freq %	Concen units	95% Conlat(+)	95% Conlat(-)	70% Conlat(+)	70% Conlat(-)
.82	1.30	1766.01	0.00	53.74	.03
1.39	1.49	388.72	.01	28.24	.08
2.28	1.71	125.79	.02	17.83	.17
3.59	1.97	61.92	.06	12.27	.32
5.48	2.26	36.86	.14	9.99	.51
8.08	2.60	25.00	.26	8.80	.77
11.51	2.98	20.90	.43	8.29	1.07
15.87	3.43	17.67	.66	8.10	1.41
21.19	3.94	16.28	.95	8.36	1.85
27.42	4.52	15.75	1.30	8.77	2.33
34.46	5.20	15.85	1.71	9.30	2.86
42.07	5.97	16.34	2.18	10.19	3.50
50.00	6.86	17.27	2.72	11.20	4.20
57.93	7.88	21.57	2.80	13.41	4.62
65.54	9.05	27.51	2.97	16.33	5.01
72.58	10.39	36.20	2.90	20.15	5.36
78.81	11.94	49.36	2.89	25.35	5.62
84.13	13.71	70.71	2.66	32.74	5.74
88.49	15.75	100.09	2.30	43.77	5.67
91.92	18.10	180.25	1.82	61.20	5.31
94.52	20.79	330.04	1.28	94.41	4.73
96.41	23.88	757.06	.75	190.63	3.83
97.72	27.43	2077.37	.36	272.52	2.75
98.61	31.51	8011.01	.12	596.43	1.66

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Station: 9
File: TNFSSta9

Project: Hon Har Sta 9
File:
Date: May 16
Number of points: 3

Values of parameter TNFS (mg/l)

Point	Value	F(i)
1	3.910	.167
2	4.290	.500
3	5.200	.833

Geometric mean:	4.4340	Arith Mean:	4.4666
Geom. Std. dev.:	1.1565	Arith Std Dev:	.6620
84.1% frequency:	5.129	Smallest Number:	3.91
15.9% frequency:	3.8345	Largest Number:	5.2

STATISTICAL PARAMETERS

Freq %	Concen units	95% Conlat(+)	95% Conlat(-)	70% Conlat(+)	70% Conlat(-)
.82	3.13	85821.45	0.00	708.17	.01
1.39	3.22	8257.61	0.00	207.37	.05
2.28	3.32	1521.42	.01	85.60	.13
3.59	3.41	451.20	.03	45.57	.26
5.48	3.51	183.10	.07	28.63	.43
8.08	3.62	93.83	.14	20.36	.61
11.51	3.72	56.98	.24	15.84	.88
15.87	3.83	39.14	.38	13.15	1.12
21.19	3.95	29.97	.53	11.47	1.36
27.42	4.06	23.80	.69	10.38	1.59
34.46	4.18	20.24	.86	9.66	1.81
42.07	4.31	17.94	1.03	9.18	2.02
50.00	4.43	16.42	1.20	8.88	2.21
57.93	4.57	19.02	1.10	9.73	2.19
65.54	4.70	22.74	.97	10.85	2.04
72.58	4.84	28.33	.83	12.36	1.89
78.81	4.98	37.20	.67	14.48	1.71
84.13	5.13	52.35	.50	17.53	1.50
88.49	5.28	80.78	.35	22.45	1.24
91.92	5.44	141.00	.21	30.59	.97
94.52	5.60	291.61	.11	45.60	.69
96.41	5.76	761.61	.04	76.93	.43
97.72	5.93	2722.03	.01	153.29	.23
98.61	6.11	15650.07	0.00	393.23	.09

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Station: 10-12
File: TNFSNear

Project: Hon Harbor Nearshore
File:
Date: May 16
Number of points: 9

Values of parameterTNFS (mg/l)

Point	Value	f(i)
1	3.340	.056
2	3.660	.167
3	3.720	.278
4	3.930	.389
5	4.150	.500
6	5.060	.611
7	5.200	.722
8	5.630	.833
9	22.290	.944

Geometric mean:	5.1543	Arith Mean:	6.3611
Geom. Std. dev.:	1.7866	Arith Std Dev:	6.0329
84.1% frequency:	9.2091	Smallest Number:	3.34
15.9% frequency:	2.8849	Largest Number:	22.29

STATISTICAL PARAMETERS

Freq %	Concen units	95% Conf.Int(+)	95% Conf.Int(-)	70% Conf.Int(+)	70% Conf.Int(-)
.02	1.20	11637.76	0.00	161.34	.01
1.35	1.44	1570.16	0.00	59.02	.04
2.28	1.63	382.82	.01	29.36	.09
3.59	1.83	141.39	.02	18.30	.18
5.48	2.04	69.21	.06	13.23	.31
8.08	2.25	41.72	.13	10.60	.49
11.51	2.57	29.26	.23	9.34	.71
15.87	2.88	22.91	.36	8.66	.96
21.19	3.24	19.17	.54	8.79	1.25
27.43	3.64	17.60	.75	8.00	1.58
34.46	4.09	16.67	1.00	8.42	1.94
42.07	4.59	16.38	1.25	9.02	2.34
50.00	5.15	16.56	1.48	9.58	2.77
57.93	5.79	20.67	1.62	11.37	2.95
65.54	6.50	26.52	1.59	13.71	3.00
72.57	7.30	35.32	1.51	16.85	3.16
78.81	8.20	49.26	1.36	21.23	3.17
84.13	9.21	73.12	1.16	27.65	3.07
88.49	10.34	117.82	.91	37.61	2.84
91.92	11.62	211.09	.61	51.22	2.49
94.52	13.05	443.34	.38	84.72	2.08
96.41	14.65	1142.27	.19	147.02	1.65
97.72	16.45	3892.09	.07	299.10	.98
98.61	18.48	28283.67	.02	758.55	.45

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Station: 13
File: TNFSOff

Project: Hon Harbor Offshore
File: /Water8/[illegible]/TNFSOff
Date: May 16
Number of points: 3

Values of parameterTNFS (mg/l)

Point	Value	f(i)
1	3.010	.167
2	3.770	.500
3	3.960	.833

Geometric mean:	3.5552	Arith Mean:	3.58
Geom. Std. dev.:	1.1579	Arith Std Dev:	.5026
84.1% frequency:	4.1151	Smallest Number:	3.01
15.9% frequency:	3.0714	Largest Number:	3.96

STATISTICAL PARAMETERS

Freq %	Concen units	95% Conf.Int(+)	95% Conf.Int(-)	70% Conf.Int(+)	70% Conf.Int(-)
.02	2.50	69296.06	0.00	569.36	.01
1.35	2.58	6658.60	0.00	166.51	.04
2.28	2.65	1223.02	.01	68.76	.10
3.59	2.73	362.63	.02	35.56	.20
5.48	2.81	147.07	.05	22.96	.31
8.08	2.90	75.34	.11	16.32	.51
11.51	2.98	45.79	.19	12.70	.70
15.87	3.07	31.41	.30	10.55	.89
21.19	3.16	23.65	.42	9.20	1.09
27.42	3.26	19.09	.56	8.32	1.27
34.46	3.35	16.79	.69	7.75	1.45
42.07	3.45	14.90	.83	7.37	1.62
50.00	3.56	13.17	.96	7.12	1.77
57.93	3.66	15.27	.88	7.01	1.72
65.54	3.77	18.26	.79	8.71	1.63
72.58	3.88	22.76	.66	9.92	1.52
78.81	4.00	29.09	.53	11.62	1.37
84.13	4.12	42.08	.40	14.13	1.20
88.49	4.24	64.97	.28	18.04	1.00
91.92	4.36	113.47	.17	21.58	.77
94.52	4.49	238.81	.09	36.66	.55
96.41	4.63	613.95	.03	61.89	.35
97.72	4.76	2196.00	.01	123.42	.18
98.61	4.90	12657.48	0.00	316.90	.08

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