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LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

ENGINEERING DIVISION
PO BOX 373
HONOLULU, HAWAII 96809

MAY 11 2005

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

FROM: Peter T. Young, Chairperson
Board of Land and Natural Resources

SUBJECT: **Final Environmental Assessment for the Proposed Maalaea Small Boat Harbor Improvements**

The Department of Land and Natural Resources (DLNR) has reviewed the Final Environmental Assessment (EA) prepared for the subject project. The DLNR has determined that this project will not have significant environmental effects and has issued a Finding of No Significant Impact determination. Please publish this notice in your next scheduled publication of the Environmental Notice.

A completed OEQC Bulletin Publication Form, four (4) copies of the Final EA, the project summary and an electronic file of the project summary will be forwarded to your office under separate cover by the project consultant, Munekiyo & Hiraga, Inc.

Should you have any questions, please contact Mr. Eric Hirano, Chief Engineer at 587-0230.

c: M. Hirano, Munekiyo & Hiraga, Inc.

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Final Environmental Assessment

PROPOSED MAALAEA SMALL BOAT HARBOR IMPROVEMENTS

Prepared for:

State of Hawaii, Department
of Land and Natural Resources

May 2005

MUNEKIYO & HIRAGA, INC.

Final

Environmental Assessment

PROPOSED MAALAEA SMALL BOAT HARBOR IMPROVEMENTS

Prepared for:

State of Hawaii, Department of Land and Natural Resources

May 2005

MUNEKIYO & HIRAGA, INC.

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Preface

The State of Hawaii, Department of Land and Natural Resources, proposes repairs, upgrades and related landside improvements at the Maalaea Small Boat Harbor in Maalaea, Maui, Hawaii. The proposed improvements include the reconstruction of the existing inter-island ferry terminal building, resurfacing of an access road, paving of a parking area, upgrading of water, sewer and electrical utilities, new comfort station, site landscaping and renovations at existing comfort station and barrier removal to comply with Americans with Disabilities Act requirements.

Since the proposed project is proposed to use State and Federal funds, as well as State lands and work in the shoreline area, this Environmental Assessment (EA) has been prepared in accordance with the provisions of Chapter 343, Hawaii Revised Statutes. As Federal funds are proposed to be used for the proposed project, Federal EA requirements of the National Environmental Policy Act (NEPA) of 1969 will be triggered. A separate Categorical Exclusion will be prepared for improvements related to ferry operations to meet NEPA requirements.

Chapter I

Project Overview

I. PROJECT OVERVIEW

A. PROJECT LOCATION, EXISTING USE AND LAND OWNERSHIP

The State of Hawaii, Department of Land and Natural Resources (DLNR) proposes repairs and upgrading to existing inter-island commuter ferry terminal facilities at the Maalaea Small Boat Harbor (MSBH) in Maalaea, Maui, Hawaii. See Figure 1. The MSBH is located on the western shoreline of Maui approximately nine (9) miles southwest of Maui's main airport in Kahului.

The MSBH project area is identified by TMK Nos. (2) 3-6-01:02, 49, 49 por. and 50 (referred to as Parcel A, collectively). An adjoining parcel located in the eastern portion of the MSBH, identified by TMKs (2) 3-8-14:27, 28 and 30 (referred to as Parcel B), is presently leased by DLNR and is also included in the proposed project. See Figure 2. The harbor property covers approximately 29.51 acres and Parcel B covers 1.137 acres. The MSBH was constructed in 1952 for use by commercial vessels. The area of the proposed improvements is designated for light industrial use in the Kihei-Makena Community Plan. The present configuration of MSBH is defined by a south revetted mole approximately 1,100 feet long and 90 feet wide and an eastern rubble-mound breakwater approximately 850 feet long and 8 feet wide. A 90-foot wide, 13-foot deep entrance channel provides access to the harbor. The interior dredged harbor basin covers an area of approximately 11.3 acres and provides a total berthing capacity of 96 vessels. The South Mole provides parking for about 151 automobiles and buses, berths for about 30 of the larger commercial vessels, an existing ferry loading dock and a 2-story building (former ferry terminal) with a comfort station on the ground level and offices for the Maalaea Harbor Agents on the second level, as well as a sewage pump station. Additional harbor facilities include a one-lane concrete launch ramp, 277 marked parking spaces (of which 151 stalls

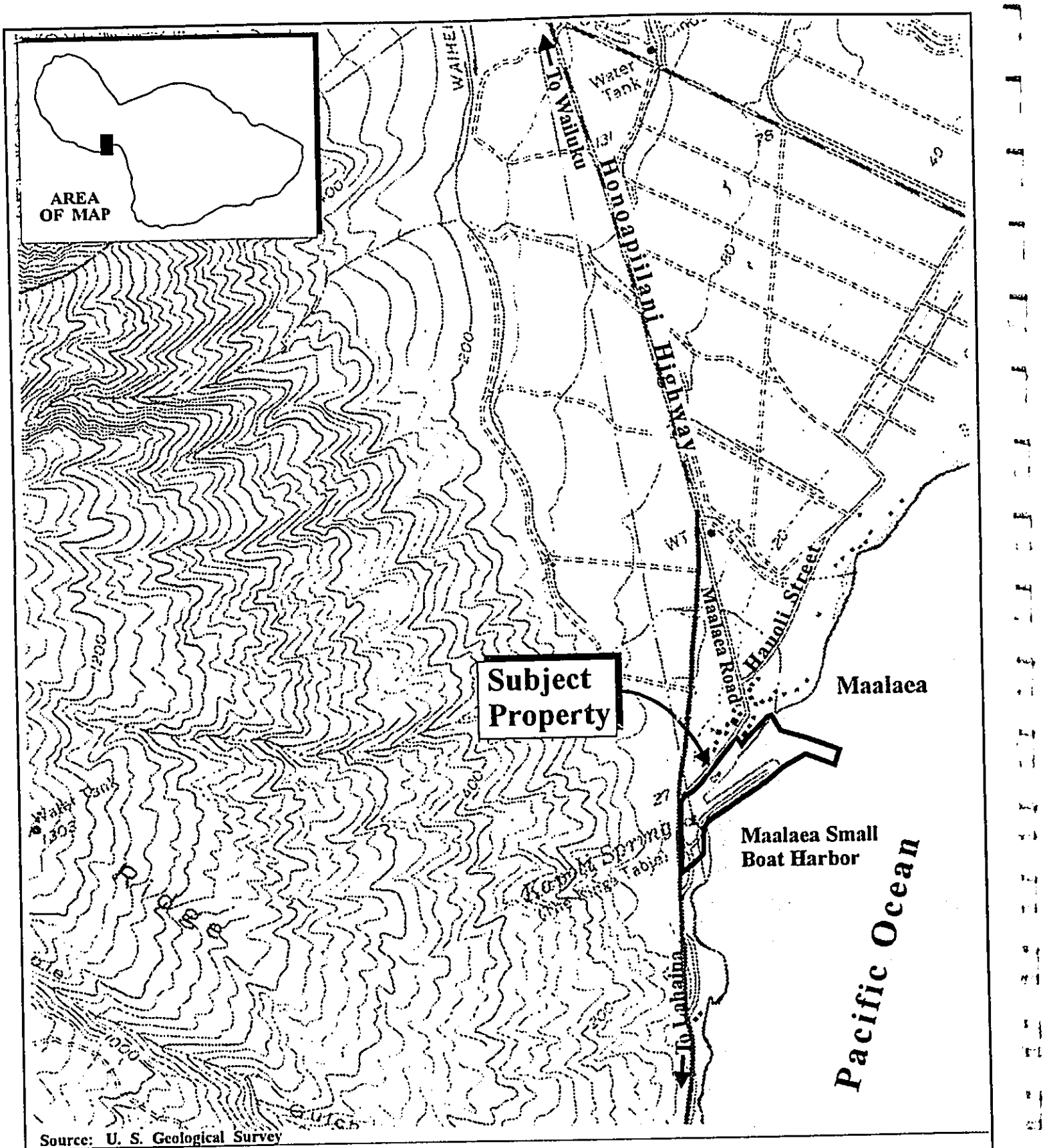

Figure 1 Proposed Maalaea Small Boat Harbor Improvements
Regional Location Map

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Prepared for: State of Hawaii, Department of Land and Natural Resources

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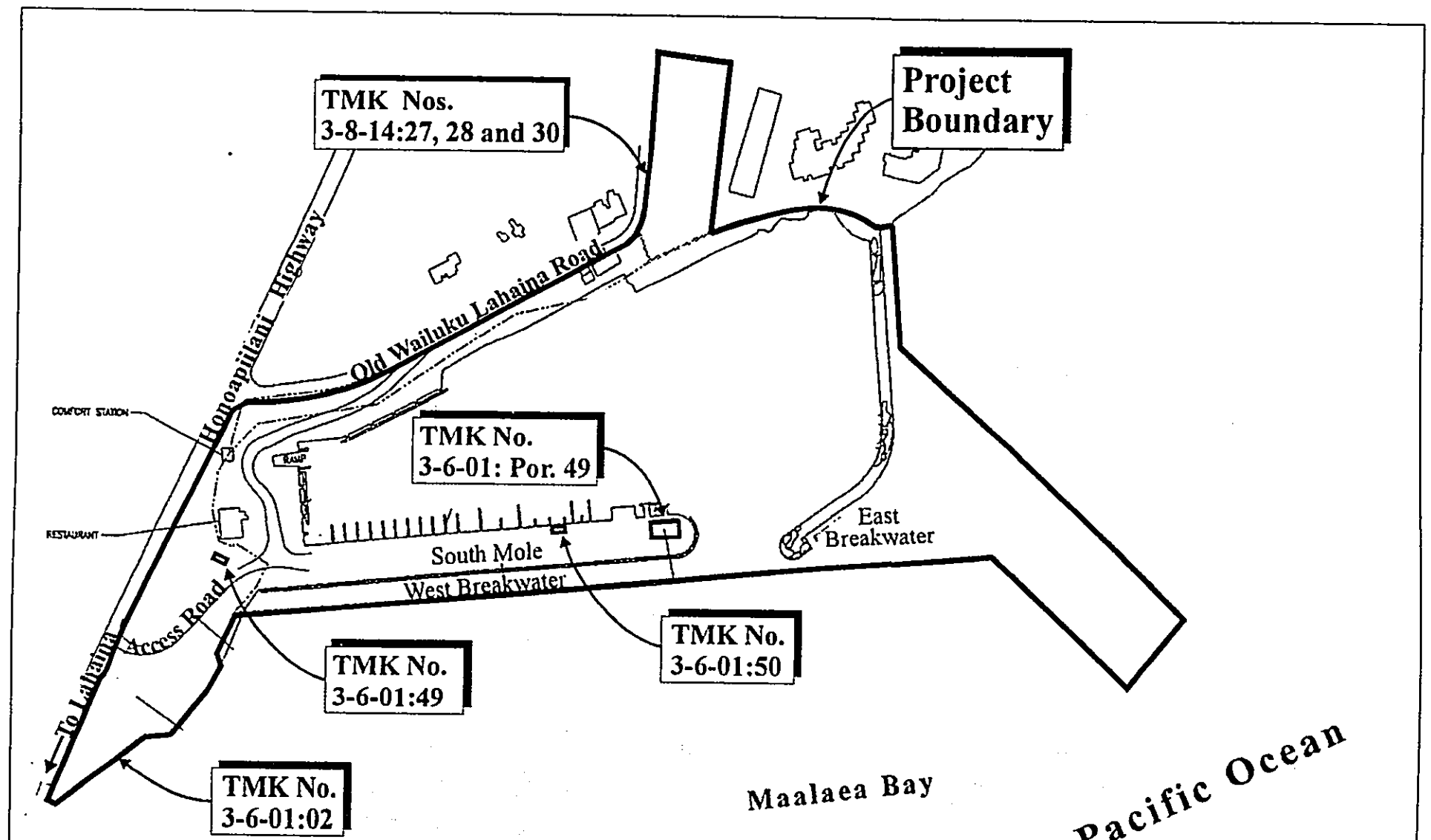

Source: Fukunaga & Associates, Inc.

Figure 2 Proposed Maalaea Small Boat Harbor Improvements
Project Site Map

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are those previously mentioned on the South Mole), a haul-out facility, a small comfort station and two (2) storage buildings. Parcel B is currently used for overflow parking. Additional parking is also provided along roadways and a graded, but unpaved parking lot near the Honoapiilani Highway access. Other onsite facilities include Buzz's Wharf Restaurant and a U. S. Coast Guard station. See Figure 3.

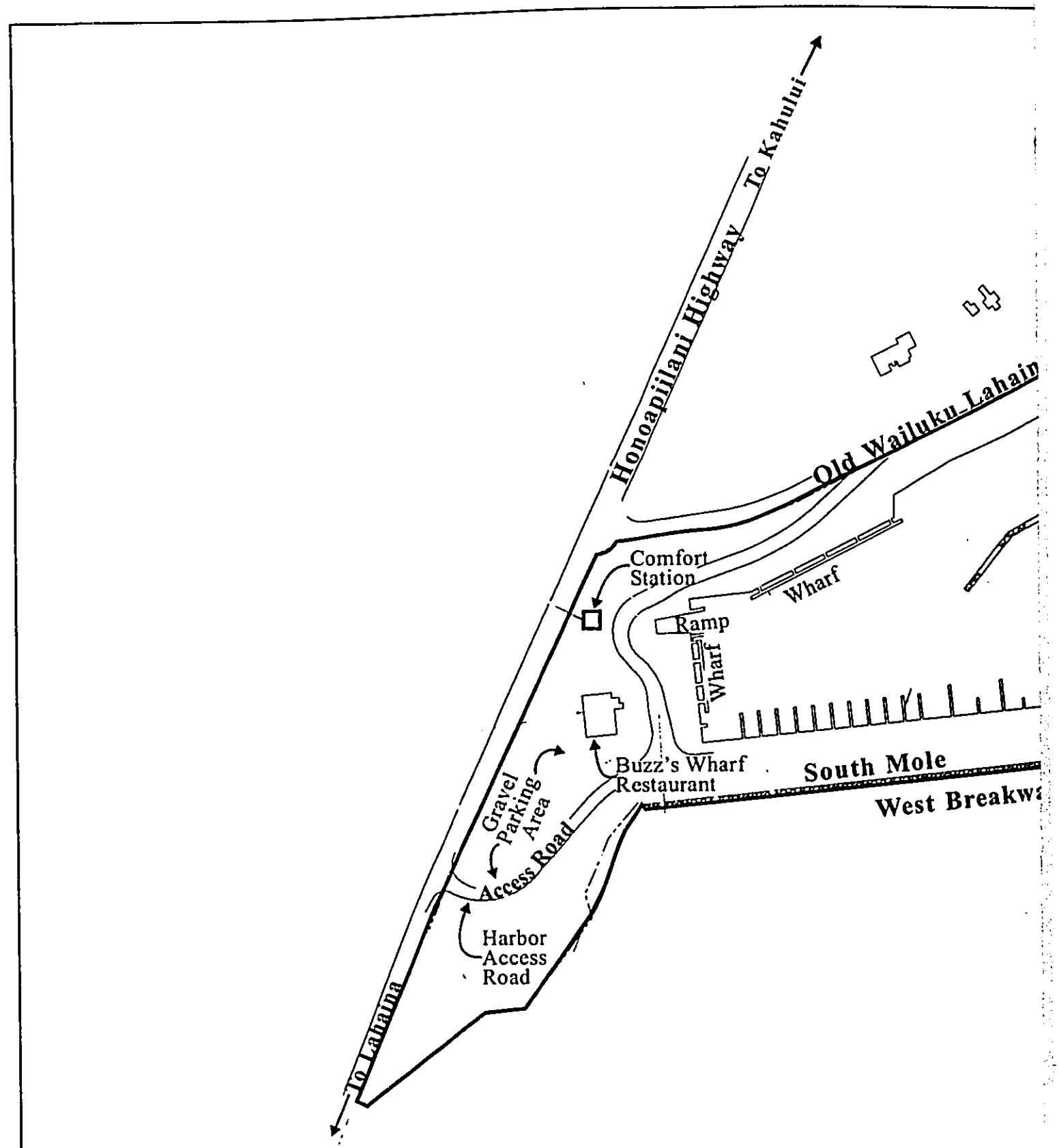
Access to the MSBH is provided off of Honoapiilani Highway via a harbor access road and via Old Wailuku Lahaina Road which turns into Maalaea Road and reconnects with Honoapiilani Highway approximately 0.5 mile to the north.

The harbor and its surrounding area accommodate a variety of uses catering predominantly to tourism. The Maalaea Triangle adjacent to the MSBH includes restaurants, an ocean center, a miniature golf course, souvenir shops and parking. A number of residential condominiums (both owner/renter occupied and transient vacation rentals) are located along Hauoli Road to the northeast of the harbor.

Beyond the Maalaea Triangle to the north and northeast, is a large area of agricultural land, predominantly used for sugarcane cultivation.

The ownership of the MSBH (Parcel A) rests with the DLNR. The DLNR leases Parcel B from Don Williams and currently uses the site for overflow parking. The lease is for a 30-year term and expires on August 31, 2024.

The project area is located within the limits of the Special Management Area for the island of Maui.



Source: Fukunaga & Associates, Inc.

Figure 3 Proposed Maalaea Small Boat Harbo
Existing Conditions

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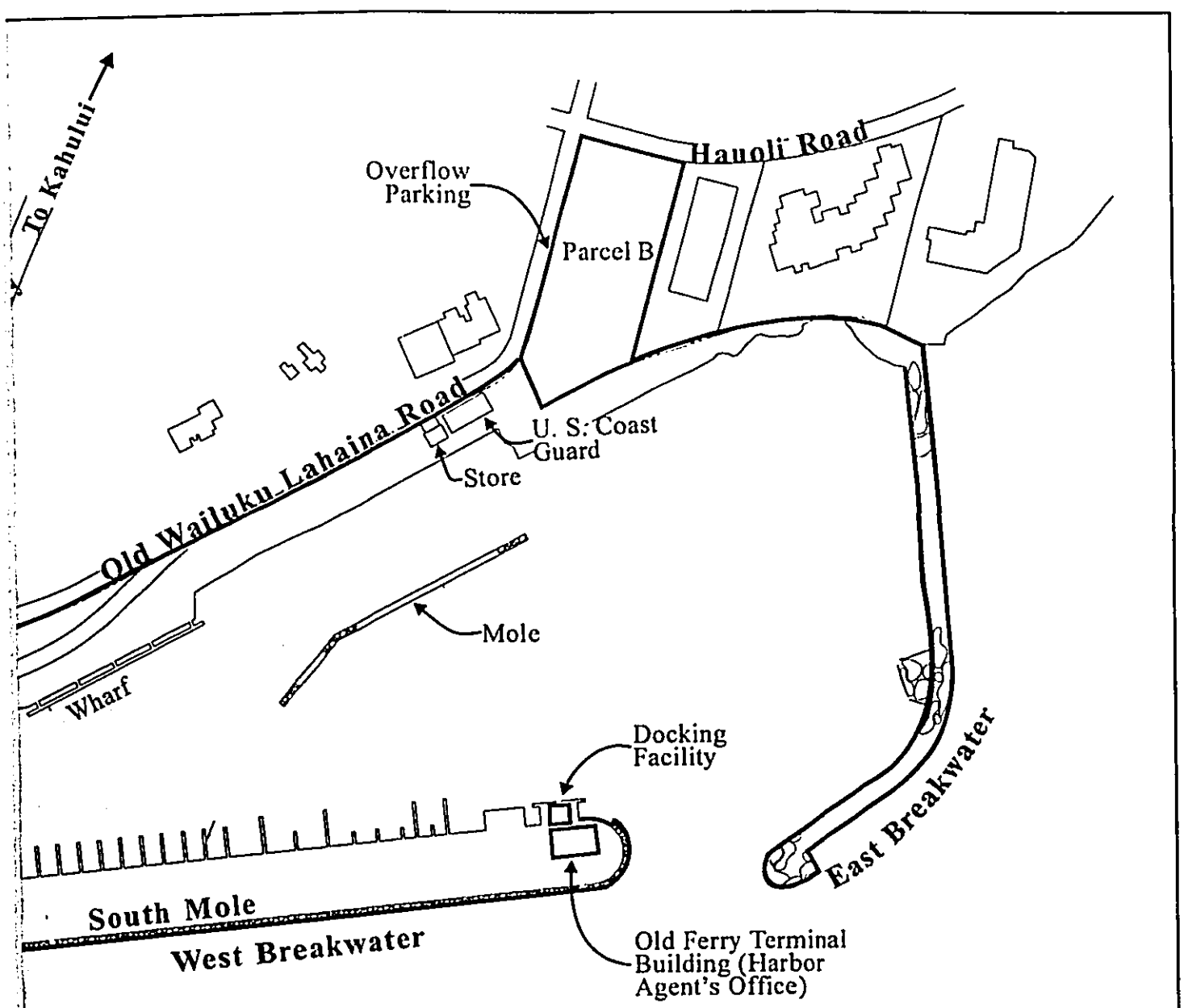

Small Boat Harbor Improvements
Existing Conditions

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B. PROJECT NEED

1. Inter-island Ferry Service

Since the late 1980s, two (2) private companies have provided daily commuter ferryboat service between the islands of Maui and Lanai, and between the islands of Maui and Molokai. Both companies are permitted by the DLNR, Division of Boating and Ocean Recreation to operate their ferryboat services out of DLNR facilities: Lahaina Small Boat Harbor on the island of Maui; Manele Small Boat Harbor on the island of Lanai; and the Kaunakakai Commercial/Small Boat Harbor on the island of Molokai. The Kaunakakai Commercial/Small Boat Harbor is owned and managed by DLNR and the State Department of Transportation (DOT).

The Expedition ferry, owned by Hone Heke Corporation, operates five (5) daily round trips between Manele and the Lahaina Small Boat Harbors with a new 65-foot, 149-passenger ferry vessel.

Sea Link of Hawaii provides ferry service between the Kaunakakai and the Lahaina Small Boat Harbors with two (2) ferry vessels, the 100-foot Molokai Princess (Molokai Ferry) and the 118-foot Maui Princess, each providing a capacity of 149 passengers. Mondays through Saturdays, the Molokai Princess and the Maui Princess both make one daily round trip between Kaunakakai and the Lahaina Small Boat Harbors, while on Sundays the Molokai Princess makes one round trip.

The State of Hawaii recognizes that the existing commuter ferry operations between the islands of Lanai, Molokai and Maui are vital to the economic and social well being of the County of Maui, as

well as to the State of Hawaii. The State also recognizes that these ferry operations could be significantly enhanced through improvements to the existing ferry system, to include the MSBH on the island of Maui.

Enhancing commuter ferry operations to include a second ferry port on the island of Maui at the MSBH would increase overall system capacity and reduce congestion at the Lahaina Small Boat Harbor. Such enhancements would aid in ensuring more reliable commuter ferry system operation during extreme weather conditions by providing a ferry terminal in a protected harbor on the island of Maui. The second ferry port on the island of Maui would also encourage greater patronage by providing more direct access to government services, employment and recreational opportunities, and major population centers in Central and South Maui.

2. ***Inter-island Ferry Service Request***

Expeditions has requested approval from the DLNR to expand their Maui to Lanai commuter ferry service to include a second stop on the island of Maui, at the MSBH. Expeditions has expressed their intentions to seek Public Utilities Commission (PUC) approval to amend their tariff to address this proposed triangle route serving commuter travel between the islands of Maui and Lanai with ports of call at the Lahaina, Maalaea, and Manele Small Boat Harbors.

DLNR has also received inquiries from Sea Link of Hawaii, the operator of the Molokai Ferry, to offer commuter ferry service between MSBH on the island of Maui and Kaumalapau Commercial Harbor on the island of Lanai.

3. ***Existing Ferry Facilities at MSBH***

The loading dock facilities and adjacent ferry terminal building (Harbor Agent's office) were used for the inter-island ferry service provided by Sea Flight in the 1970's and early 1980's. The loading dock is currently used by commercial tour vessels to load and unload passengers and by the inter-island ferry service operating out of Lahaina Small Boat Harbor in emergency situations when the latter facility is closed due to high surf. Although the docking facilities are currently used, the facilities are in need of repairs and upgrading to accommodate a resumption of ferry service operation at MSBH.

4. ***Wastewater System***

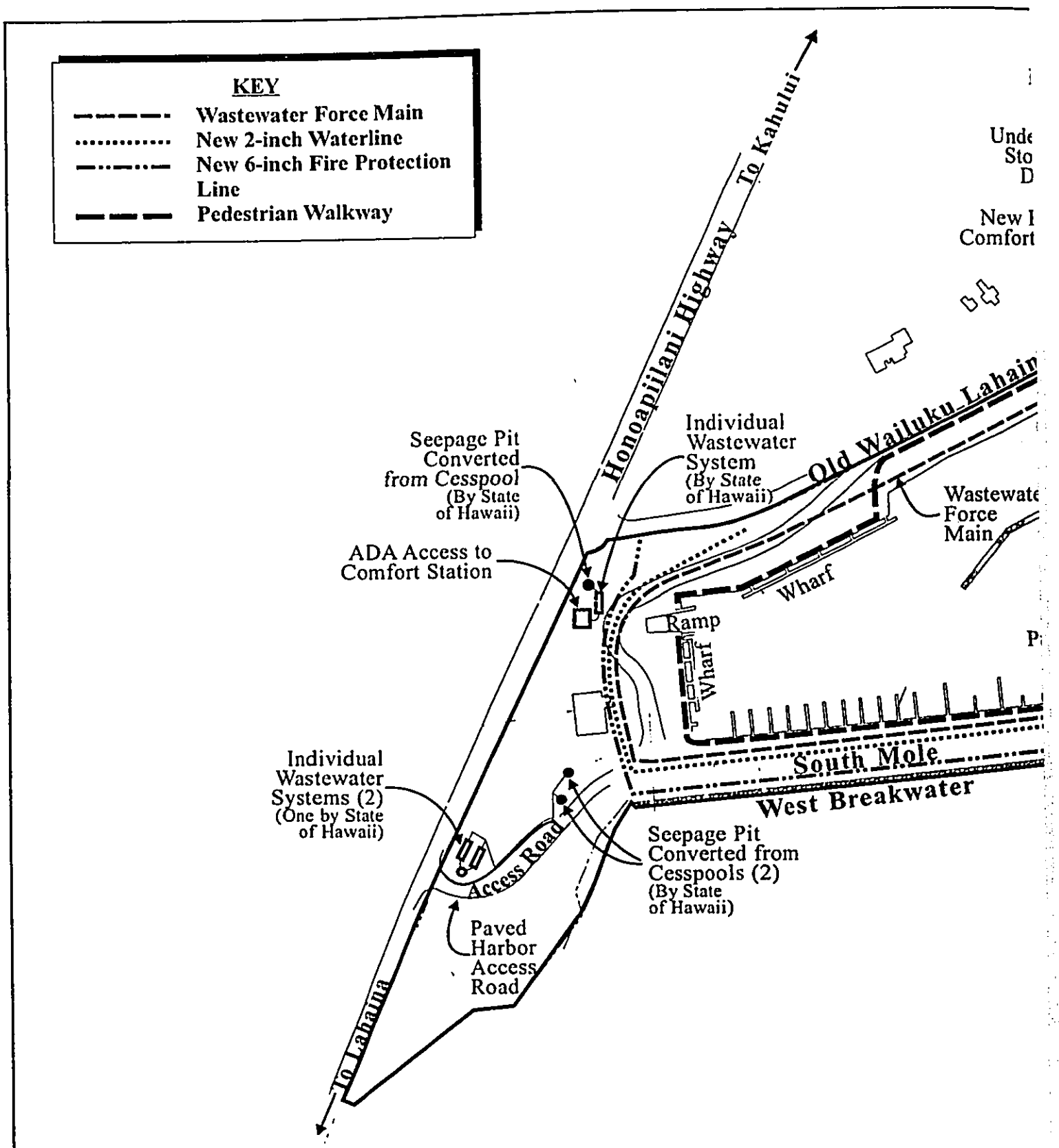
The existing large capacity cesspools need to be replaced or closed by May 31, 2009 to meet U.S. Environmental Protection Agency (EPA) and State Department of Health regulations.

5. ***Americans with Disabilities Act (ADA) Requirements***

Accessibility improvements and barrier removal will be carried out within MSBH to comply with ADA regulations.

C. *PROPOSED ACTION*

Proposed improvements at the MSBH address needs for upgrading site utilities, parking and building structures. Proposed improvements to key harbor facilities are depicted in Figure 4. More detailed plans covering specific utilities and site improvements are identified by schematic engineering plans presented in Appendix "A". To facilitate presentation of proposed improvements, the description of the proposed action is divided into two (2) parts: (1) site infrastructure improvements; and (2) building improvements. Site infrastructure improvements cover

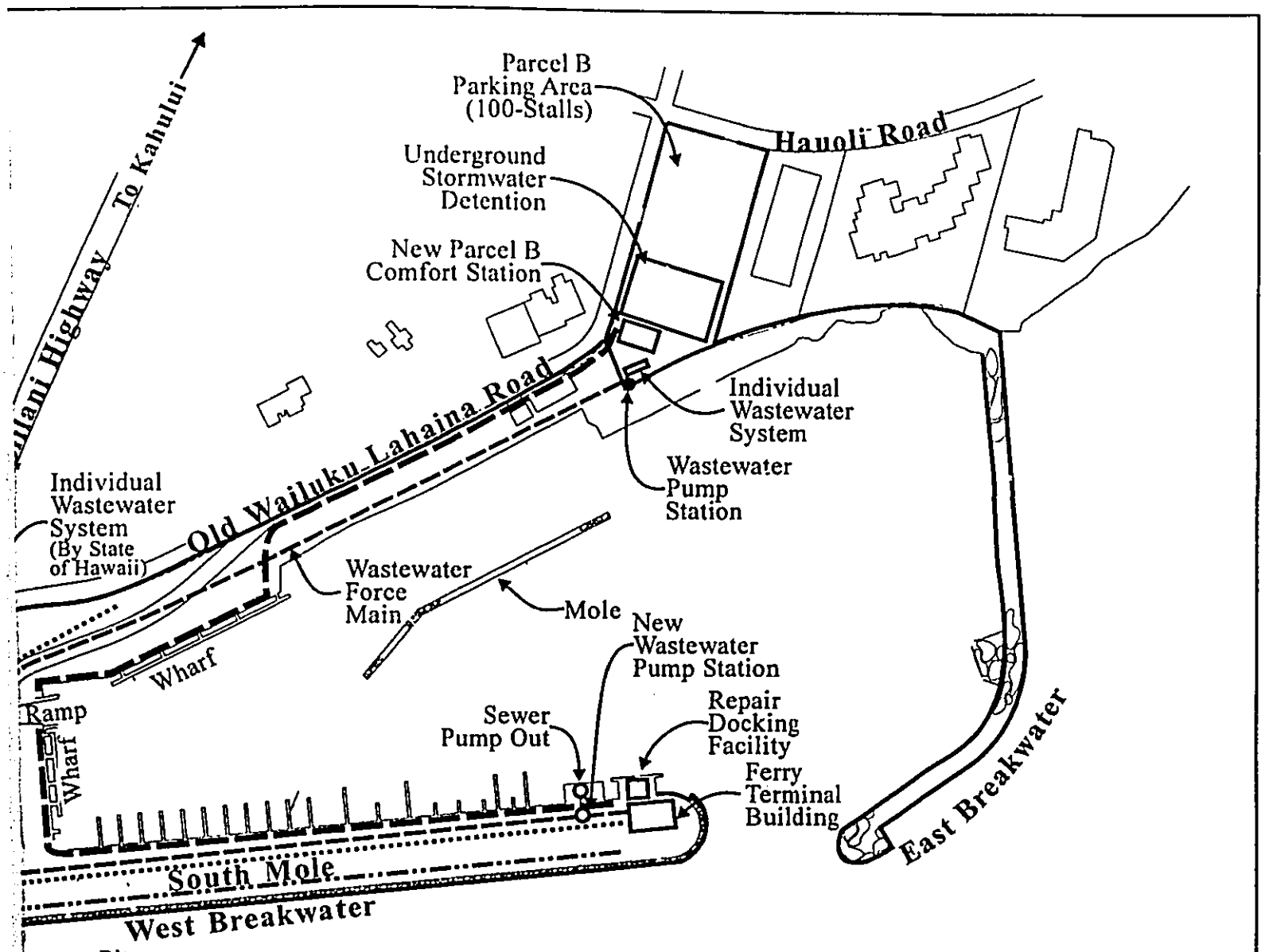


Source: Fukunaga & Associates, Inc.

Figure 4

Proposed Maalaea Small Boat Harbo
Proposed Improvements to Key Harbo

Prepared for: State of Hawaii, Department of Land and Natural Resources



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provements to Key Harbor Facilities

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wastewater, water, electrical and parking and access upgrades, while building improvements address work relating to building construction, reconstruction and renovations.

1. ***Site Infrastructure Improvements***

Existing water and sewer lines will be replaced by new underground lines to improve and meet service reliability needs and code requirements. Refer to Appendix "A". In particular the following utility elements are proposed:

- A 2-inch waterline (for domestic purposes) with attendant hose bibs to serve existing berths along the South Mole;
- A 6-inch fire protection line with fire hydrants, along the South Mole to meet current fire protection requirements;
- New wastewater handling facilities involving the replacement of an existing cesspool system with four (4) individual wastewater systems (IWS) and conversion of existing cesspools to attendant seepage pits to meet current U.S. EPA and State Department of Health wastewater treatment and disposal regulations;
- A new sewer force main from a proposed new comfort station to be located on Parcel B (comfort station described under "Building Improvements" section, below);
- A new wastewater pump station (near the existing comfort station) to convey flows from the Parcel B comfort station to the IWS facility;
- A new sewer pump station to be located at the makai (eastern) end of the South Mole;
- A new sewer force main to convey flows from the South Mole pump station to the new IWS facility;
- A sewer pump out to service the inter-island ferry;
- Replacement of the existing underground electrical system with new conduits, as well as new transformers and area

lighting fixtures for safety and security (utilizing 20 ft. to 25 ft. high light poles);

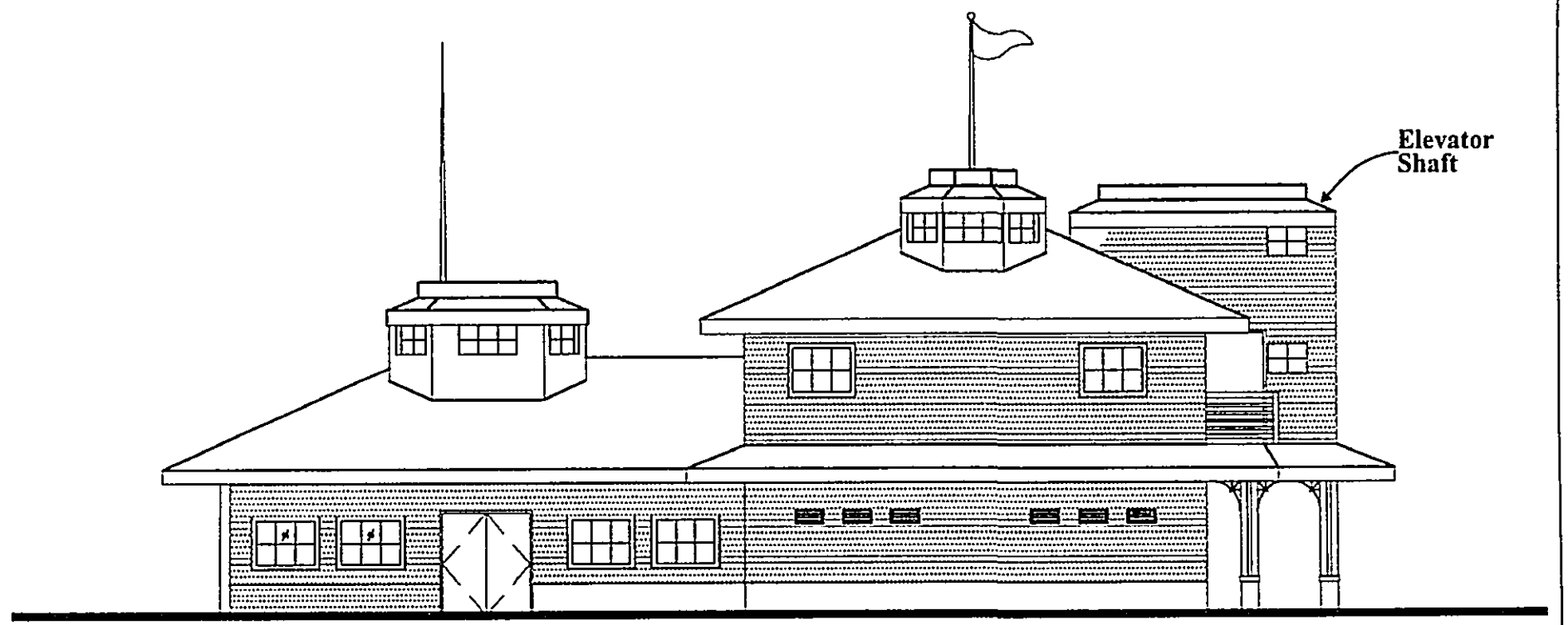
- Re-paving with concrete, the existing access road from Honoapiilani Highway;
- Re-paving with concrete, the existing asphalt pavement on the South Mole;
- Improving the existing overflow parking area on Parcel B, to include asphalt paving and attendant drainage, sidewalk, and landscape improvements, to provide 100 parking stalls; and an underground stormwater detention system to capture increase runoff from parking lot improvements;
- Pedestrian walkway from Parcel B to ferry terminal building; and
- Barrier removal and accessible parking stalls to comply with Americans with Disabilities Act requirements.

2. ***Building Improvments***

Building improvements are comprised of four (4) elements as described below.

Ferry Terminal Building: The existing two (2) story terminal building is proposed to be demolished and reconstructed to accommodate ferry operations. The footprint of the proposed building will remain the same as the existing building. The new building will be a two (2) story concrete and wood structure. See Figure 5 and Figure 6. The building's ground level will encompass a 1,200 square feet passenger holding area, restrooms and a storage room. The 1,200 square feet second floor will provide office space for about eight (8) DLNR employees and restrooms. Access to the second floor will be provided by an elevator and stairway.

Ferry Loading Facility: The passenger loading facility will be upgraded to provide efficient and safe movement of people from the vessels to the terminal building. The damaged concrete pier edge will be repaired and a new gangway will be installed. The existing opening in the dock surface located near the entrance to the terminal building will be covered with metal grating or concrete slab. This improvement will provide a safer area for pedestrian traffic.



NORTH ELEVATION

North Elevation

Source: Fukunaga & Associates, Inc.

Figure 5 Proposed Maalaea Small Boat Harbor Improvements
Ferry Building Elevation

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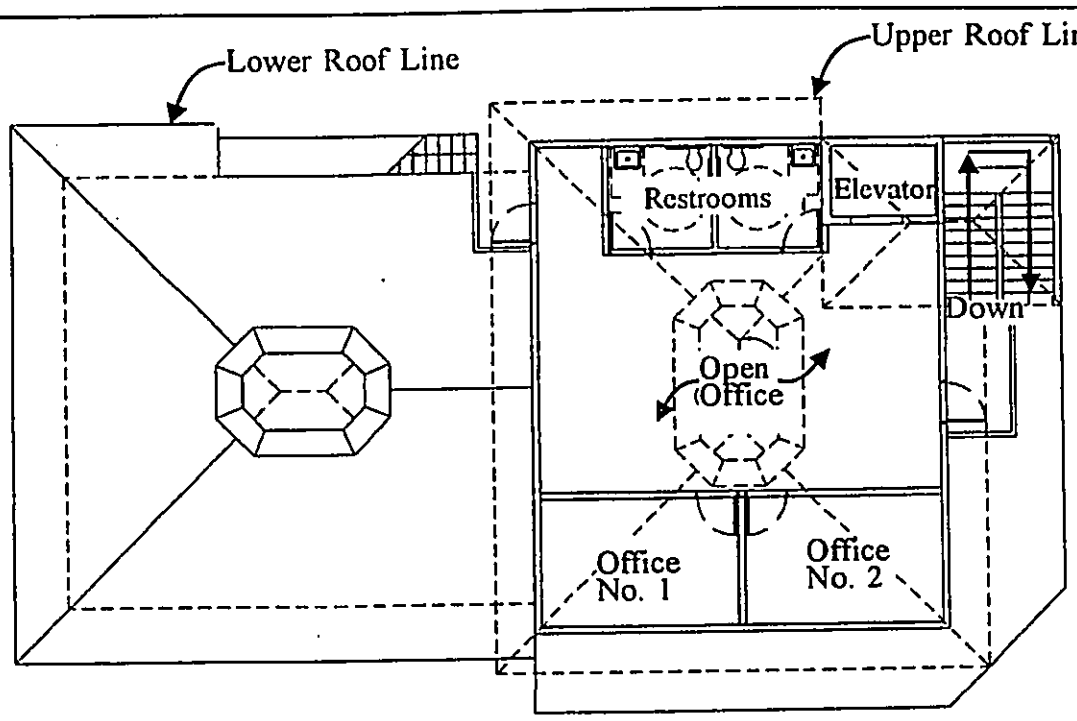
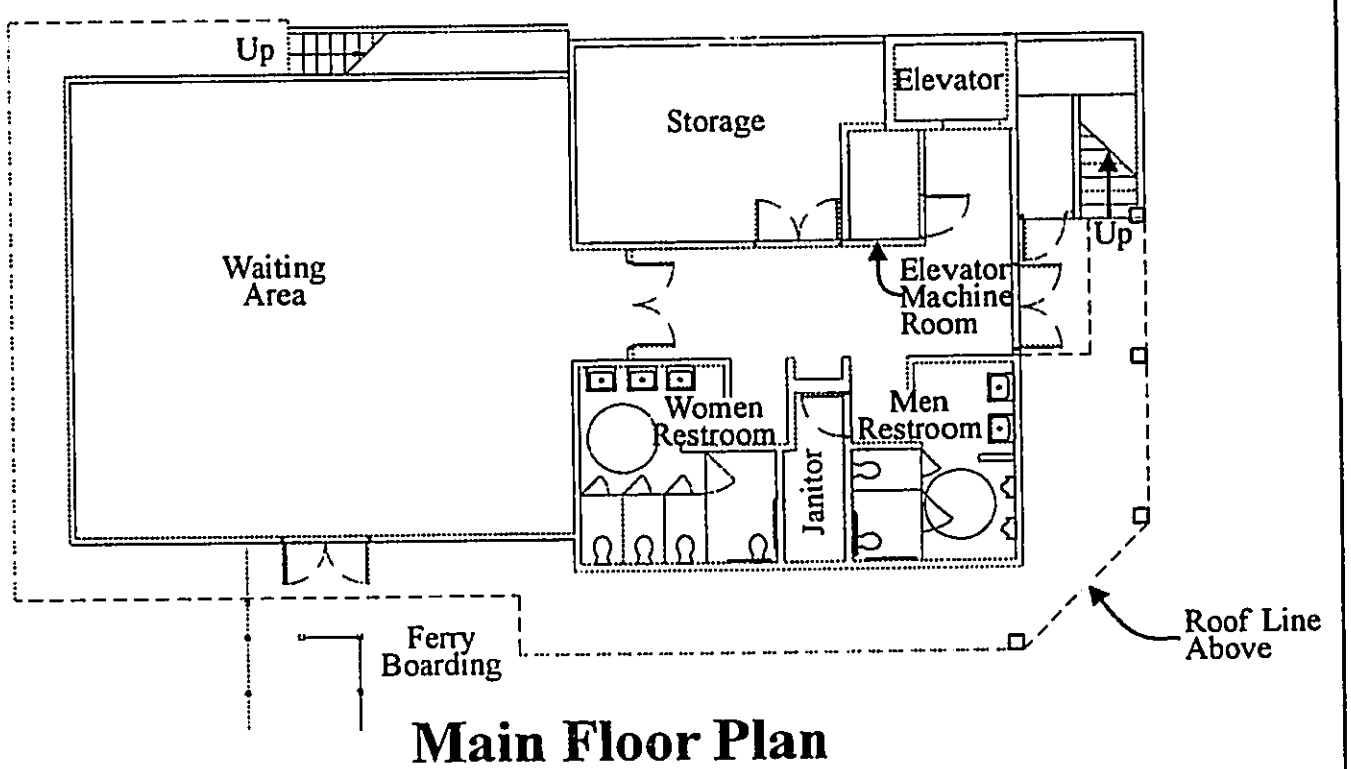


Second Story Floor Plan



Main Floor Plan

Source: Fukunaga & Associates, Inc.

Figure 6 Proposed Maalaea Small Boat Harbor Improvements
Ferry Terminal Building Floor Plans

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New Comfort Station at Parcel B: This new comfort station will be located near the vehicular access entrance to the Parcel B parking area. Restroom areas of 300 square feet each will be provided for men's and women's facilities. See Figure 7. A janitorial closet and storage area of approximately 200 square feet will also be included in the comfort station building.

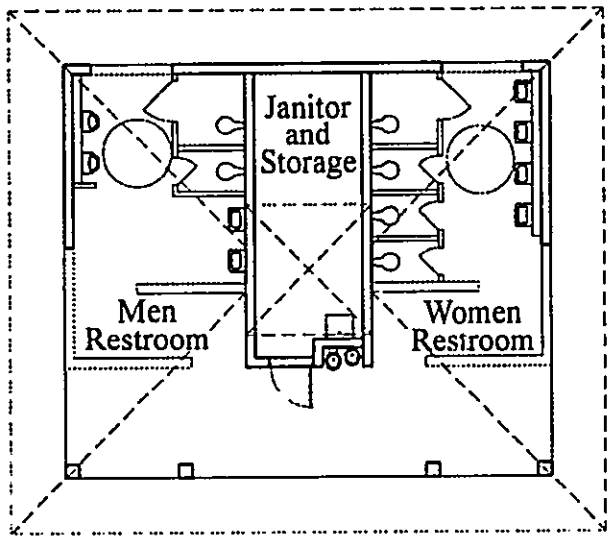
Improvements at Existing Comfort Station: The existing comfort station located to the north of Buzz's Wharf Restaurant will be improved with new electrical and vandal-resistant lighting service. Access ramps will also be upgraded to comply with the Americans with Disabilities Act requirements.

D. *CHAPTER 343, HAWAII REVISED STATUTES (HRS) REQUIREMENTS*

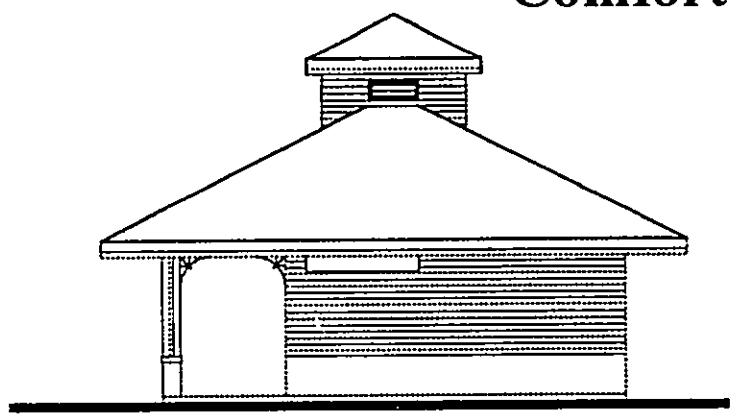
Inasmuch as the proposed action will utilize State funds and work in State lands and the shoreline area, an Environmental Assessment will be prepared in accordance with Chapter 343, Hawaii Revised Statutes (HRS). As the project wil also utilize Federal funds, coordination with the Federal Transit Administration (FTA) will be carried out to ensure requirements pursuant to the Federal National Environmental Policy Act are met.

1. *Chapter 343, HRS Exempt Actions*

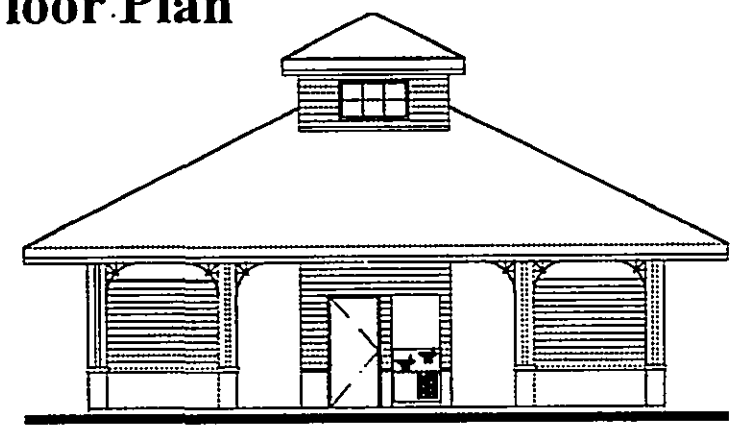
For purposes of the environmental assessment, the scope of proposed improvements include project components that are categorized as either: (1) repair and replacement of existing facilities; or (2) actions that are categorized as expansion or new facilities. Project components categorized as repair and replacement include the loading dock and passenger queuing area improvements, installation of the IWS systems, access road paving and related site grading and drainage system improvements. These project components have been determined by the DLNR to be exempt from the requirements of Chapter 343, Hawaii Revised Statutes, based on the Comprehensive Exemption List for the



Comfort Station Floor Plan



Side Elevation



Front Elevation

Source: Fukunaga & Associates, Inc.

Figure 7 Proposed Maalaea Small Boat Harbor Improvements
Parcel B Comfort Station Plan and Elevations

NOT TO SCALE

Prepared for: State of Hawaii, Department of Land and Natural Resources

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Division of Boating and Ocean Recreation, Department of Land and Natural Resources, as concurred by the Environmental Council, State of Hawaii. See Appendix "B".

2. ***Actions Subject To Chapter 343, HRS***

Project components which are triggers for a Chapter 343, HRS environmental assessment include the following scope of work items.

a. Replacement of the 2-story Harbor Agent's office with public comfort station and terminal facilities on the main floor and administrative offices on the second floor;

b. Upgrading of the sewer pump station facilities on the South Mole;

c. Upgrading of the electrical services on the South Mole; and

d. New comfort station and parking area on Parcel B.

All of the foregoing actions are landside improvements which do not involve any expansion of the breakwater or harbor dredging.

Although the DLNR has categorized project components as exempt or non-exempt actions with respect to Chapter 343, HRS, this environmental assessment document will consider the various project components collectively to ensure that appropriate mitigation measures are identified for the overall project.

E. NATIONAL ENVIRONMENTAL POLICY ACT COORDINATION

Federal funding for the ferry system improvements is proposed to be provided by the U.S. Department of Transportation, Federal Transit Administration (FTA). The DLNR will coordinate with the FTA to prepare

and process a Categorical Exclusion to waive the requirement to prepare a Federal EA in accordance with the National Environmental Policy Act (NEPA) of 1969.

F. *DRAFT SUPPLEMENT II ENVIRONMENTAL IMPACT STATEMENT (EIS) MA'ALAEA HARBOR FOR LIGHT-DRAFT VESSELS, MAUI, HAWAII*

In 1998 the U.S. Army Engineer District, Honolulu in partnership with the State of Hawaii, prepared a Draft Supplement II Environmental Impact Statement for Ma'alaea Harbor for Light-Draft Vessels, Maui, Hawaii. The proposed scope of work covered under the EIS involves realigning the entrance channel and modifying the existing breakwater to protect the new entrance channel. The EIS was prepared pursuant to Chapter 343, HRS and National Environmental Policy Act of 1969 and 40 Code of Federal Regulations (CFR) 1500-1508, 33 CFR 230, ER 1105-2-100. The EIS is still under consideration. The scope of work evaluated in the EIS is separate and independent from the subject environmental assessment prepared for the landside inter-island ferry terminal and related facilities project.

G. *SPECIAL MANAGEMENT AREA PERMIT REQUIREMENTS*

The MSBH is located within the County of Maui's Special Management Area (SMA). Accordingly, an application for a SMA Use Permit will be filed with the Maui Planning Department for review and action by the Maui Planning Commission. In this respect, the proposed action, including all project components as described in Section C, above, will be evaluated with respect to SMA objectives, policies and guidelines, pursuant to Chapter 205A, Hawaii Revised Statutes, and the Rules and Regulations of the Maui Planning Commission.

H. *PROJECT FUNDING AND SCHEDULING*

The Federal Transit Administration (FTA) has earmarked approximately $30.0 million from the following fiscal years (FY) to support ferry operations in Hawaii: $5.0 million for FY 2001, $10.0 million for FY 2002, $10.0 million for FY 2003 and $5.0 million for FY 2004. There is a remaining balance of $12.7 million from these earmarked funds.

Funds from a FTA grant have been provided for the project's planning phase. Upon completion of this phase, the State Department of Transportation, on behalf of DLNR, will file a grant application with the FTA to fund a portion of the design and construction of the project. In addition, DLNR will seek its share of the design and construction cost from the current and/or future Legislative sessions. The Federal to State cost share ratio for both the planning and the design and construction phases is 4:1.

The estimated construction cost for the proposed project is approximately $13.2 million. Construction of the project is expected to commence upon the receipt of State/FTA funding, and all permits and approvals. The project will be constructed in one (1) phase and is anticipated to be completed in 12 months.

Chapter II

Description of Existing Environment

II. DESCRIPTION OF EXISTING ENVIRONMENT

A. PHYSICAL ENVIRONMENT

1. Surrounding Land Use

The project site, the 29.51-acre MSBH and Parcel B, is situated on the southwest coast of the island of Maui, about eight (8) miles from the commercial and business center of Kahului. It lies to the east of the Honoapiilani Highway, which is the principal access-way to areas on the west coast of the island, including Lahaina, Kaanapali and Kapalua. The project site is approximately sixteen (16) miles southeast of Lahaina and nine (9) miles southwest of Maui's main airport in Kahului. The harbor is accessed directly from Honoapiilani Highway (harbor access road) and by the Old Wailuku Lahaina Road which connects with Maalaea Road. The adjacent Maalaea Triangle accommodates a variety of uses catering predominantly to tourism, including restaurants, an ocean center, a miniature golf course, souvenir shops and parking.

A large area of agricultural land, predominantly used for sugarcane cultivation, is located to the north and northeast of the project site. Land uses set forth in the Kihei-Makena Community Plan for the immediate surrounding areas include Project District 11 (Maalaea Village) and Project District 12 (Maalaea Mauka), both of which encompass large-scale master planned residential communities covering 650 acres and 260 acres, respectively.

2. Climate

Maui is characterized by a semi-tropical climate containing a multitude of individual microclimates. The mean annual temperature of the island is about 75 degrees Fahrenheit at all locations near sea level. The coolest months on Maui are

December and January, with August and September representing the hottest months in the calendar year. A high proportion of the rainfall that Maui receives each year falls on the northeast facing shores leaving the south and southwest coastal areas relatively dry. Maalaea Harbor is located within one of these drier areas of the southwest coast, one that is also often affected by strong winds and high waves. Trade winds originating from the northeast average from 10 to 20 miles per hour (mph) and are common throughout the localized area.

3. ***Topography and Soils***

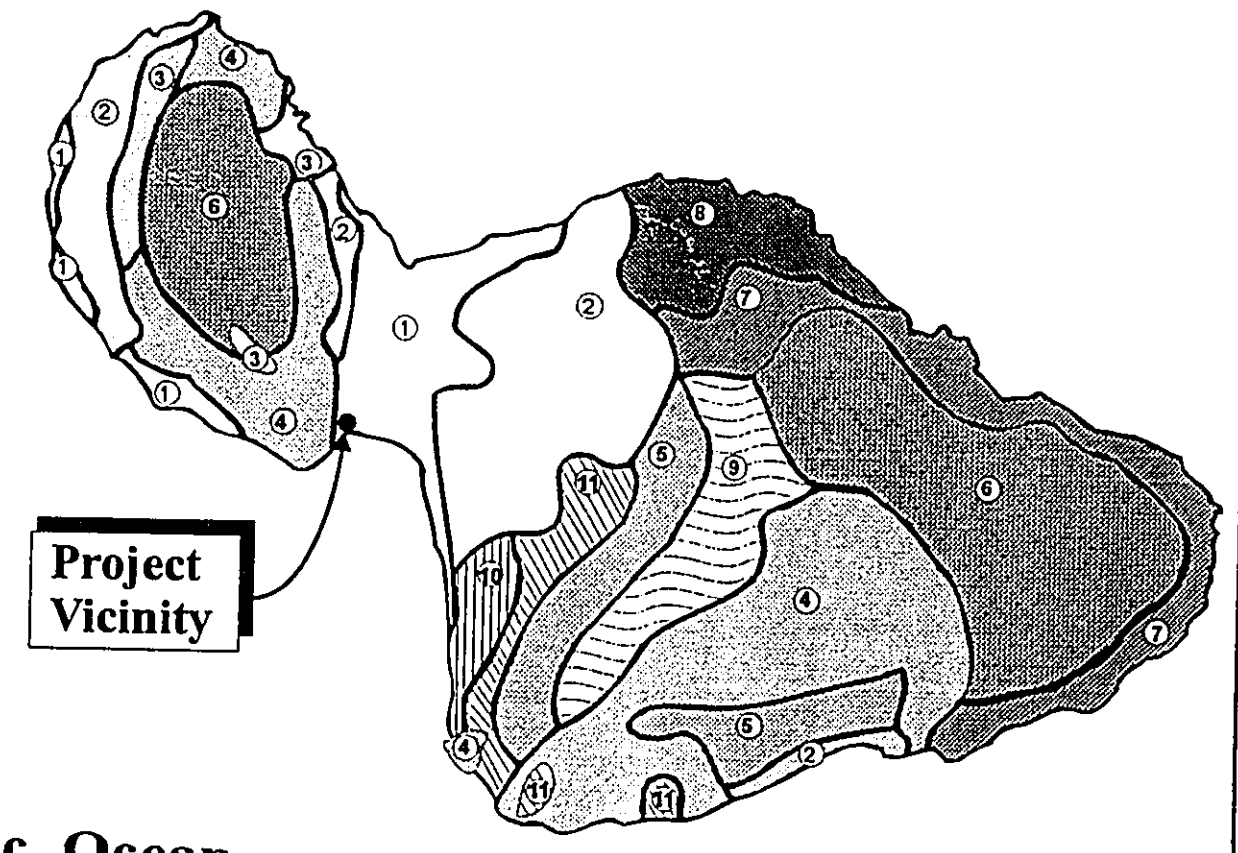
Underlying the property are soils belonging to the Pulehu-Ewa-Jaucus association. See Figure 8. The Soil Survey of the islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii characterizes the soils of this association as deep and well drained and located on alluvial fans and in basins.

Ewa Silty Clay (EsB) and Stony Alluvial Land (rSM) are the two (2) classifications of soil type specific to the site and immediate surrounding area. See Figure 9. Ewa Silty Clay, which is situated on the northeast side of the project site, occurs around alluvial fans and terraces and is generally characterized by a 3 to 7 percent slope, moderate permeability, a slight erosion capacity and slow run-off. This soil classification is predominantly used for sugarcane or pineapple crop cultivation in the Hawaiian Islands.

Stony Alluvial Land, located on the southwest portion of the project site, consists of stones, boulders and soil deposited by streams along the bottoms of gulches and on alluvial fans. This soil classification can be found at elevations ranging from sea level up

LEGEND

- ① Pulehu-Ewa-Jaucas association
- ② Waiakoa-Keahua-Molokai association
- ③ Honolua-Olelo association
- ④ Rock land-Rough mountainous land association
- ⑥ Puu Pa-Kula-Pane association
- ⑥ Hydrandepts-Tropaquods association
- ⑦ Hana-Makaalae-Kailua association
- ⑧ Pauwela-Haiku association
- ⑨ Laumaia-Kaipoipoi-Olinda association
- ⑩ Keawakapu-Makena association
- ⑪ Kamaole-Oanapuka association



Source: USDA Soil Conservation Service

Figure 8

Proposed Maalaea Small Boat Harbor Improvements
Soil Association Map

NOT TO SCALE

Prepared for: State of Hawaii, Department of Land and Natural Resources

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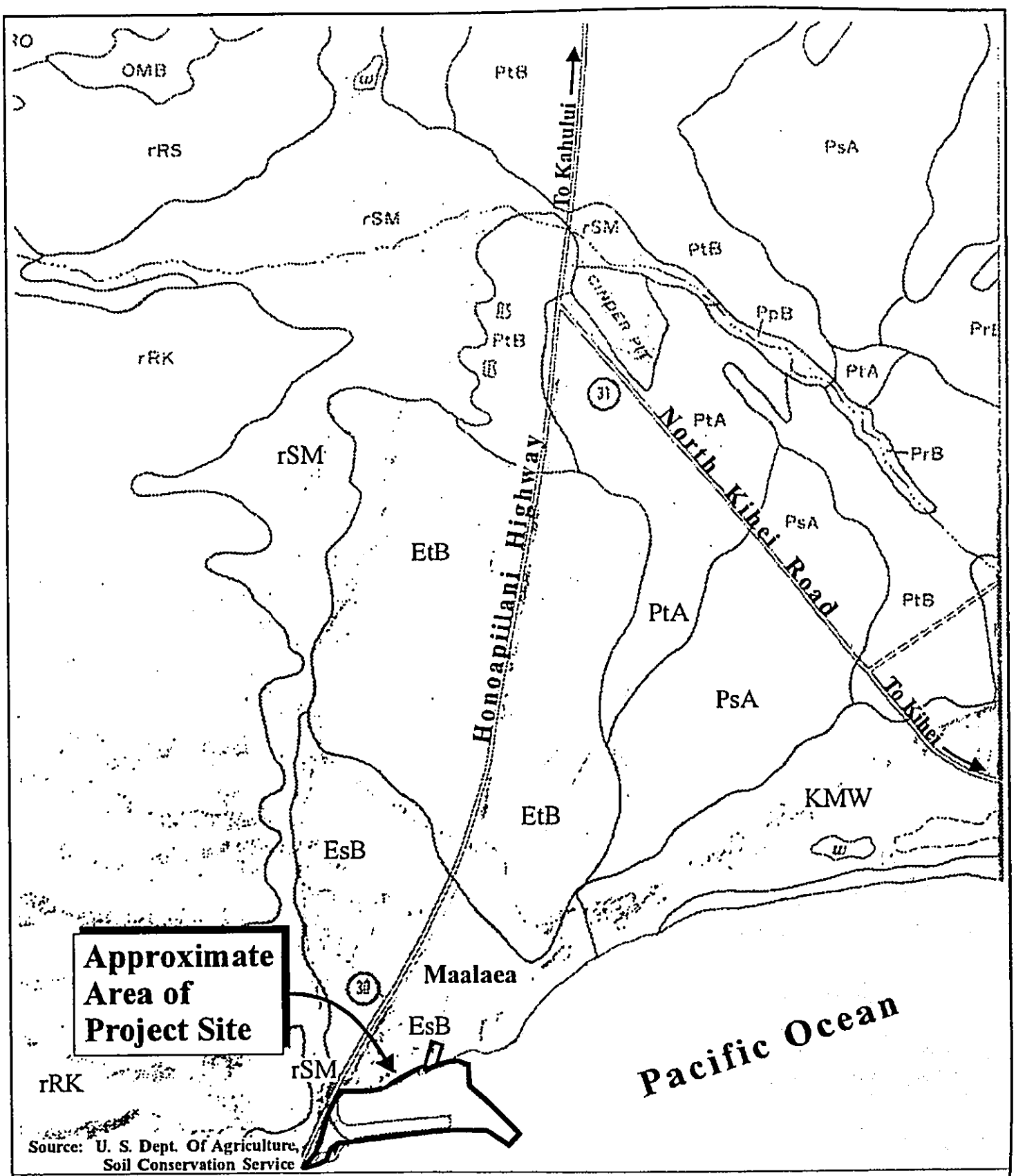


Source: U. S. Dept. Of Agriculture, Soil Conservation Service

Figure 9 Proposed Maalaea Small Boat Harbor Improvements

Soil Classification Map

NOT TO SCALE

Prepared for: State of Hawaii, Department of Land and Natural Resources

MUNEKIYO & HIRAGA, INC.

to around 1,000 feet and is generally characterized by a 3 to 15 percent slope. Improvement of the land in such areas is difficult due to the presence of stones and boulders.

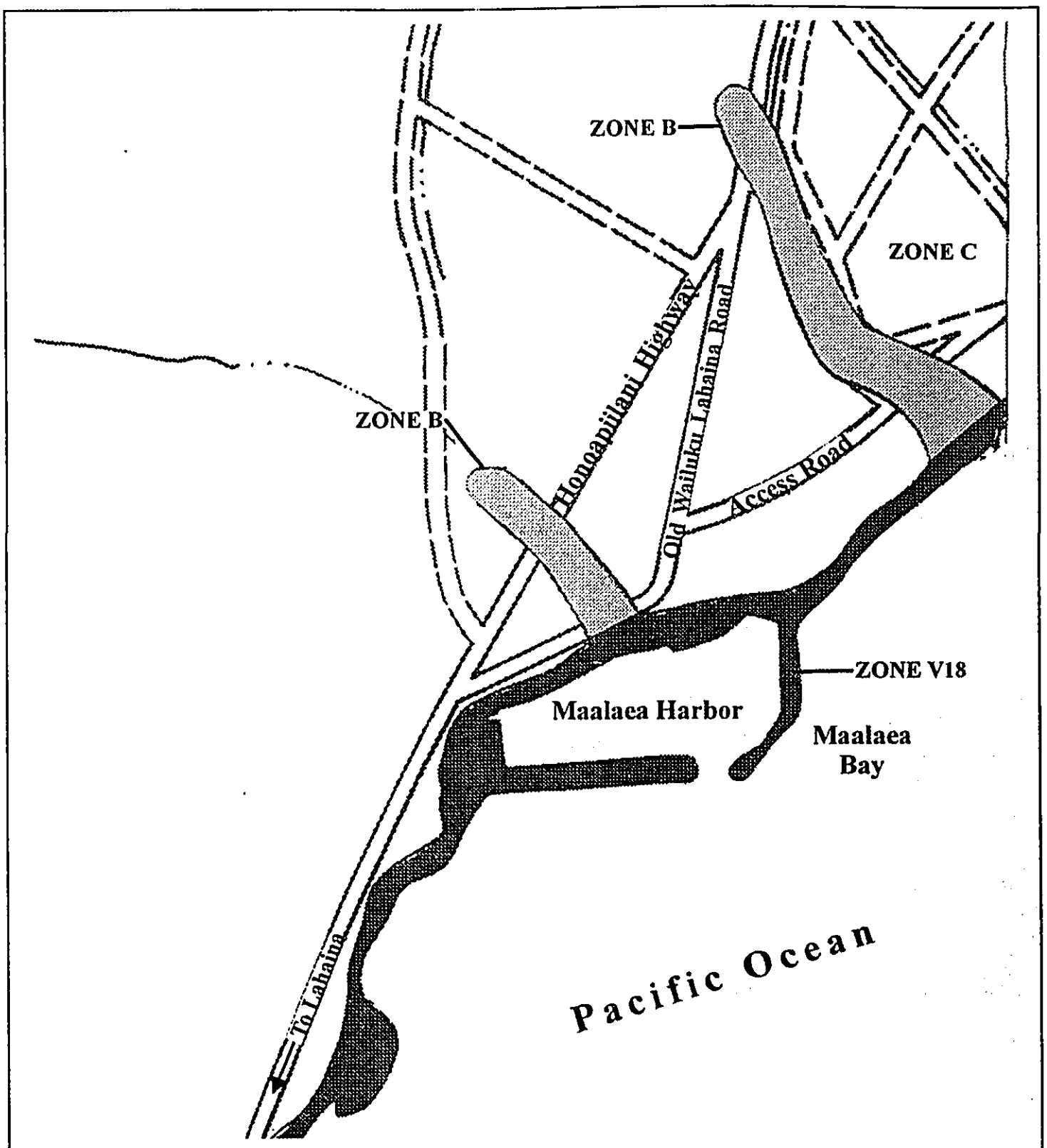
Vegetation normally associated with these soil classifications includes kiawe, ilima, guava, kukui, hilograss and christmas berry.

4. ***Flood and Tsunami Hazards***

The flood insurance maps indicate that the Maalaea Harbor project site falls within Zone V18, areas of the 100-year flood with velocity (wave action), and Zone C, areas of minimal flooding. See Figure 10. The base flood elevation within Zone V18 is 11 feet above the mean sea level. Zone V18 forms a narrow band along the shoreline, encompassing the entire harbor complex south of the access road, while Zone C surrounds the harbor area, except for two (2) areas designated as Zone B. The majority of the proposed MSBH improvements lie within Zone V18 while the existing parking area along Honoapiilani Highway lies in Zone C.

5. ***Flora and Fauna***

A terrestial and marine biological survey was carried out over the project area and surrounding waters of the proposed project by AECOS, Inc. See Appendix "C". The results of the terrestial survey are as follows. The major part of the project area surveyed was previously disturbed during the development of existing harbor improvements. Forty-two plant species were recorded in the harbor area. Approximately 72 percent were not native to the Hawaiian Islands. These plant species include Buffelgrass, Garden spurge, Pigweed, Bermuda grass, Ironwood, Guinea grass, Chinese fan palm and Hibiscus. The native plants were used in



Source: Flood Insurance Rate Map 15003/0235 B

Figure 10 Proposed Maalaea Small Boat Harbor Improvements

Flood Zone Designation Map

NOT TO SCALE

Prepared for: State of Hawaii, Department of Land and Natural Resources

MUNEKIYO & HIRAGA, INC.

the ornamental landscaping. The only endemic species recorded was the lo'ulu palm. Six (6) indigenous species were recorded in the landscape planting areas around the harbor. They were: milo, kou, hala, pohinahina, naupaka kahakai and seaside purslane. The area to the west of the harbor access road contained an area of natural kiawes and naturalized grasses.

A variety of marine biota were recorded. These included rice and lace coral, 'opihi, 'a'awa (thin-shelled rock crab), and various butterfly fish. It is noted that the MSBH is located within the boundaries of the Hawaiian Islands Humpback Whale National Marine Sanctuary.

There are no rare, threatened or endangered species of plant life within the project area. The sites within the MSBH, where the majority of the improvements will take place, have previously been graded and paved.

No wetlands were observed in the project area.

6. ***Air Quality***

The Maalaea Bay area in general does not experience adverse air quality conditions. There is one notable point source of air contaminants in the local area, which is the power generation site owned and operated by Maui Electric Company. This industrial site is located approximately one (1) mile to the northeast of the harbor. However, this source is not considered a major source of pollution due to the regular occurrence of prevailing trade winds along the south coast. Other airborne pollutants that do exist can largely be attributed to ship exhaust from harbor traffic, vehicle exhaust from

Honoapiilani Highway and the occasional burning of sugarcane by Hawaii Commercial & Sugar Company. All of the above sources are relatively intermittent, however, and the prevailing tradewinds generally disperse suspended particulates to maintain a relatively high level of air quality in and around the MSBH.

7. ***Noise***

Existing background noise in the project area is principally attributed to ship traffic in the MSBH and vehicle traffic on the surrounding roadways. The noise from inter-island flight paths of arriving and departing aircraft at Kahului Airport, located nine (9) miles to the northeast of the project area, represents another occasional source of noise to the surrounding area. It should also be noted that intermittent noise from wind adds to the overall ambient noise level from all of the aforementioned human sources.

8. ***Archaeology***

An Archaeological Inventory Survey was prepared for the proposed project by Pacific Legacy, Inc. in February 2005. See Appendix "D". This report notes a number of sites of significance in the vicinity of the harbor area. Previous archaeological work identified a *ko'a* (fishing shrine), several habitation sites, petroglyphs, burials, and a *heiau* (traditional Hawaiian shrine). None of these previously identified sites are in the project site or anticipated to be affected by the proposed action.

The Archaeological Inventory Survey concentrated in three (3) areas using pedestrian surveys, shovel test probes, and backhoe trenching. Areas 1 and 2 are located near the intersection of Honoapiilani Highway and the Harbor Access Road. Area 3 is

located within the existing, overflow parking area of Parcel B.

Area 1 contains a single site (State Site No. 50-50-09-5645) with three (3) features: (1) a remnant of a historic bridge which now spans a dry gully; (2) an alignment of basalt boulders that may represent the curbing of a historic roadway; and (3) a concrete pad with basalt boulders of indeterminate origin and function. A modern, brass memorial plaque was also encountered, cemented to a boulder. Areas 2 and 3 yielded no sites of interest.

9. ***Historical/Cultural Resources***

Maalaea was once a traditional landing site for Hawaiian outrigger canoes, and is a popular reference in the history books as providing a landing point for armies coming to fight Kahekili and their chiefs on their way to Wailuku. It became a commercial landing in the 19th and early 20th century and also holds a place in Hawaiian history as representing the place where the first Westerner to Maui, sea captain George Vancouver (1757-98), landed his ship. A totem pole now stands across from the Maui Lu Hotel to commemorate this historic event. The middle of the 20th century witnessed the coastline along Maalaea being used for amphibious landing exercises during World War II. The modern harbor, itself, however, was not constructed until 1952.

Although, historically a landing place for Hawaii's war fleets, the name Maalaea has more peaceful origins and seems to have originated from the fact that "alaea", commonly known as red dirt iron oxide, was found along the coast. There are two (2) different kinds of alaea: kane and wahine. The first of which, kane is found in the ocean, while the second, wahine is found on land. Maalaea

Bay is a source for both of these types of alaea.

Although once the site of an old Hawaiian village, there is no visible surface presence of cultural resources around the project site today apart from the "Piko" stone and the large sharpening stone known as the "King's Table" or "Adze" that sits in front of Buzz's Wharf restaurant and proudly commemorates the historic roots of the harbor.

Immediately adjacent to the MSBH, a historic Japanese shrine is extant. This shrine, called the Maalaea Ebisu Jinja, is believed to have been constructed in the early twentieth century.

10. Scenic and Open Space Resources

The MSBH is located along the southwest coastline of Maui, an area, like many other areas on the island, that offers beautiful scenic views. Scenic resources in the vicinity of the harbor include the Pacific Ocean, the West Maui Mountains to the west and Haleakala to the east. Open space resources around the project are characterized by the vast expanse of agricultural land in the Central Valley that lies to the north of Maalaea and Kihei.

B. SOCIO-ECONOMIC ENVIRONMENT

1. Regional Setting

Existing and proposed land uses surrounding the MSBH is indicative of growth trends anticipated for the Maalaea area. The Maalaea Triangle, a commercial center with shops, restaurants, and commercial recreational uses, lies to the immediate north. Project District 11 and Project District 12, both proposed as master planned residential communities lie to the north of MSBH. Project

District 11 encompasses 650 acres, while Project District 12 encompasses 260 acres. Lands underlying the Project District 11 and Project District 12 areas are currently in agricultural use. There are a number of condominiums along the coastline to the east of the harbor, most of which are owner occupied and transient vacation rentals. The land bordering the shoreline to the west of the MSBH is currently designated for single-family homes.

2. ***Population***

MSBH is located along the south coast of Maui, within the Kihei-Makena Community Plan region, an area that has experienced a significant population growth over the last three (3) decades. In the year 2000, the population of Maui was 117,644, with 22,870 people (19.4 percent) of the island's population residing in the Kihei-Makena Community Plan region (SMS, June 2002). The growth in population since 1970 has been considerable, with population increasing from 1,636 in 1970, to approximately 7,263 in 1980, and to 15,365 in 1990. Over the past 30 years, the Kihei-Makena Community Plan region has experienced a fourteen-fold (14) increase in resident population, which is expected to rise further over the coming years. The resident population of Maui is projected to increase to 138,665 by the year 2010, with a projected 27,181 people (19.6 percent) resident in the Kihei-Makena area (SMS, June 2002).

3. ***Economy***

The economy of Maui is heavily dependent upon the visitor industry, and the Kihei-Makena area provides a fine illustration of this characteristic. The presence of a high number of vacation condominiums along South Kihei Road, including Kihei Akahi, Kihei

Kai Nani, Maui Banyan and Maui Kamaole to name but a few, reflects the fact that Maui's south coast has grown to be one of the most popular tourist destinations in the State. The Wailea area, north of Makena, further reaffirms the island's economic dependence on tourism, with the presence of a number of major luxury hotels, such as the Fairmont Kea Lani, Grand Wailea, Maui Prince and Diamond Resort, all of which are located amongst internationally renowned golf courses.

The MSBH is an important source of Maui's economic sustenance as it represents one of the focal points for tourism on the island. Many of the commercial boat operators conduct Molokini snorkeling trips, whale-watching tours, deep sea fishing expeditions or sunset cruises on a regular basis. The popularity of the harbor as a tourist gateway can be attributed to its proximity to the airport in Kahului, the hotels in Kihei and Wailea, and Molokini crater, one of the top three (3) sightseeing destinations in Maui County.

As of December 2004, the unemployment rates for Maui County and the island of Maui were 2.6 percent and 2.4 percent, respectively. This shows a significant improvement on the respective 2003 figures, which had unemployment rates at 4.1 percent and 4.0 percent (State of Hawaii, Department of Labor and Industrial Relations).

C. PUBLIC SERVICES

1. Solid Waste Disposal

Single-family residential solid waste collection service is provided by the County of Maui on a once-a-week basis. Residential solid waste collected by County crews is disposed of at the County's 55-

acre Central Maui Landfill facility, located 4.0 miles southeast of the Kahului Airport. In addition to County-collected refuse, the Central Maui Landfill also accepts commercial waste from private collection companies. A new expansion to the Central Maui solid-waste landfill facility is expected to come online in early 2005. Privately owned facilities, such as the Maui Demolition and Construction Landfill and the Pohakulepo Concrete Recycling Facility, accept solid waste and concrete from demolition and construction activities. These facilities are located at Maalaea, near Honoapiilani Highway's junctions with North Kihei Road and the Kuihelani Highway. A privately operated green waste recycling facility, Campaign Recycle Maui, is situated near Waikapu, while a County operated recycling facility is located at the Central Maui Landfill.

Any solid waste generated by the commercial activities in and around the MSBH is collected and disposed of by private contractors.

2. ***Medical Facilities***

The only major medical facility on the island is Maui Memorial Medical Center, which is located in Kahului about eight (8) miles in distance away from the project area. The 196-bed facility provides general, acute, and emergency care services.

Clinics and offices throughout the Kihei and Wailea areas, however, offer medical services on a lesser scale. Such clinics include Kihei Clinic and Wailea Medical Services, Kihei Pediatric Clinic, Kihei Physicians and the Kihei-Wailea Medical Center.

3. ***Police and Fire Protection***

The project area is within the Maui Police Department's (MPD) service area, the headquarters for which are located in Wailuku. The MPD consists of several patrol, investigative and administrative divisions. The project area falls within the Kihei Patrol District IV, the MPD service that covers the Kihei-Makena Community Plan region. The Kihei substation is located at the Kihei Town Center near Star Market about five (5) miles from the harbor.

The Maui County Department of Fire and Public Safety provides fire prevention, suppression, protection and emergency services to the islands of Maui, Lanai, and Molokai from 14 fire stations and a fire prevention office. The department's Kihei station, which services the Maalaea and Kihei areas, is situated on South Kihei Road. The Makena-Wailea area is covered by a separate Wailea Fire Station. Other Central Maui stations are located in Wailuku Town and in Kahului, on Dairy Road.

4. ***Educational Facilities***

The State Department of Education (DOE) operates three (3) schools in the Kihei area. Kihei Elementary School and Kamalii Elementary School covers grades K to 5, each with enrollments of approximately 800 students. Lokelani Intermediate School includes grades 6 to 8, with similar approximate enrollment. The Kihei Charter High School is also located in the region with an approximate enrollment of 150 students (Department of Education). The majority of public school students in grades 9 through 12 attend Maui High School located in Kahului. Maui Community College, a branch of the University of Hawaii system, is the primary

higher education institution serving the County.

5. *Recreational Facilities*

Diverse recreational opportunities are available in the Kihei-Makena Community Plan region. Shoreline activities, such as fishing, surfing, jogging, camping, picnicking, snorkeling, swimming, and windsurfing, are by far the predominant form of recreation in the area. The County's Haycraft Park is located to the south of MSBH at the terminus of Hauoli Street, and provides access to a sandy beach with paved parking and portable restrooms and shower facilities. Other public park facilities within a relatively short driving distance of Maalaea Harbor include Kalama and Kamaole I/II/III Beach Parks, located to the southeast about seven (7) miles away along the Kihei coastline. Additionally, recreational resources available in Kihei and Wailea, include the Kihei Community Center as well as resort-affiliated, world-class golf courses and tennis centers.

D. *INFRASTRUCTURE*

1. *Roadway System*

The harbor is served by the Honoapiilani Highway, the single route of access for vehicles traveling between West Maui and Central Maui. There are two (2) junctions located to the north of the Harbor, which lead onto the Kuihelani Highway and the North Kihei Road. The Kuihelani Highway provides a direct route to Kahului, including the Kahului Airport. The junction at North Kihei Road transitions into South Kihei Road and Piilani Highway which provides access to the residential and commercial areas located further along the south coast of Maui, such as Kihei, Wailea and Makena.

Access to the MSBH is provided directly off of Honoapiilani Highway by a harbor access road and via Old Wailuku Lahaina Road to the north. This road transitions to Maalaea Road and joins Honoapiilani Highway approximately 0.5 mile to the north.

2. ***Water System***

The County of Maui, Department of Water Supply serves five (5) main regions within the County: Central Maui, Upcountry Maui, West Maui, East Maui, and Molokai. The existing water supply system utilized by the harbor is provided by the Department of Water Supply, Central Maui Systems. The water sources for the Central Maui Systems are the designated Iao aquifer, the Waihee aquifer, the Iao tunnel and Iao-Waikapu Ditch. The MSBH is served by an 8-inch waterline and five (5) fire hydrants along Maalaea Road. The MSBH is serviced by three 2-inch meters and one 1.5-inch meter. The present rate of water consumption for the MSBH is about 12,600 gallons per day (Department of Water Supply letter, 2005).

3. ***Wastewater System***

There is currently no sewage collection infrastructure serving the Maalaea area. The existing single-family residences currently use cesspools or septic tanks for sewage disposal. The commercial operations and condominiums in the area utilize a combination of cesspools and small individual wastewater package treatment plants. Existing facilities for the harbor uses are currently comprised of three (3) cesspools located around the dry-dock area near Buzz's Wharf Restaurant. The maximum capacity of the three (3) cesspools has recently been estimated at 32,400 gallons per day (Engineering Solutions, Inc., 2004). The existing wastewater

system does not meet the EPA regulations for large capacity cesspools. Compliance with U.S. EPA Underground Injection Control Regulations require these cesspools be upgraded or closed by May 2009.

4. ***Drainage***

Maui receives varying levels of rainfall in a given year depending on location. The average annual rainfall (1996-2002) for the Kihei area, which is also part of the drier southern coast of Maui, was 10.95 inches (Maui County Data Book, 2003). Annual rainfall in the area of the harbor is relatively low. There is a box drain within Maalaea Road which carries flows from the roadway and up stream sources to the harbor. Stormwater runoff from the upland drainage area also sheetflows in a southerly direction and is collected in three (3) ditches which drain into the ocean. During times of unusually high rainfall, however, the sediment load entering the near shore waters of Maalaea Bay increases substantially as a result of drainage from erosion prone upland areas. Although the harbor acts as a sediment trap, the daily vessel activity causes the finer particles to be resuspended and flushed out into the ocean in the surface water flow.

The proposed improvements includes repaving existing paved areas, replacing aging utilities, upgrading the inter-island commuter ferry terminal facilities, constructing a new comfort station and paving an existing overflow parking area. The paving of the parking lot on Parcel B, is the only area where there will be an increase of stormwater flows. A drainage report was prepared for this particular area. See Appendix "E".

The existing gravel parking area discharges 1.4 cubic feet per second (cfs) for a 1-hour, 10-year storm.

5. ***Electrical and Telephone Systems***

Electrical power and telephone services to the harbor are provided by Maui Electric Company and Verizon Hawaii, respectively.

Chapter III

Potential Impacts and Mitigation Measures

III. POTENTIAL IMPACTS AND MITIGATION MEASURES

A. PHYSICAL ENVIRONMENT

1. Surrounding Land Use

The project site is located within and immediately adjacent to the confines of the MSBH. The Harbor is designed for various ocean-going activities including recreational and commercial boating uses. The Harbor area contains various related resources including a number of commercial establishments catering to the tourists, such as restaurants and retail establishments, the U.S. Coast Guard station, and residential properties, principally condominiums.

The proposed action will involve repairs and maintenance to the existing inter-island commuter ferry facilities and related infrastructure improvements. The proposed improvements will complement existing, established uses of the MSBH. The proposed improvements will not expand harbor uses beyond their present boundaries (which includes the area currently leased by DLNR (Parcel B)). No adverse impacts to surrounding land uses are anticipated as a result of the proposed project.

2. Topography and Landform

The proposed project's land-based improvements are not anticipated to have any adverse impact upon existing, terrestrial conditions. Structural improvements, such as the improved ferry terminal building and new comfort station will not require mass-grading, while the parking area improvement is located on an existing parking area and will not significantly alter grades. Other project components, such as the wastewater systems upgrades, will likewise have no substantial impact upon landform.

3. ***Flood and Tsunami Hazards***

The MSBH improvements are proposed within lands designated as Flood Zone V18, areas of the 100-year flood with velocity, and Flood Zone C, areas of minimal flooding. As such, the proposed project, including the reconstruction of the ferry terminal building, will be constructed in accordance with the provisions of Chapter 19.62 of the Maui County Code, which pertain to Flood Hazard Areas.

4. ***Nearshore Marine Environment***

A Marine and Coastal Survey was prepared for the proposed project by AECOS, Inc. in February, 2005. Refer to Appendix "C".

The marine bottom off-shore of the harbor consists of coral-line and limestone reefs. The bottom of the harbor itself is generally soft, with boulder revetments and the remains of the former reef flat in places where dredging did not occur. The harbor is an artificial basin, designated as a Class II, shallow draft harbor.

Water samples were collected from four (4) stations on November 12, 2004; two (2) of the stations were located within the harbor breakwaters and two (2) were located outside the harbor along the shoreline near the west and east breakwaters. The collected samples were cooled on ice, and taken to a laboratory for measurement. The survey consisted of analyses for various indicators of water quality, including the quantity of dissolved oxygen, pH, chlorophyll, turbidity, and total suspended solids (TSS).

The salinity level of samples taken furthest within the harbor was

lower than that of other samples, which appears to indicate an influx of freshwater. Correlating this data with that of the Archaeological Inventory Survey, it is suggested that this influx may originate in the Kapoli Spring, once thought to have been dry. Refer to Appendix "D". Various other factors indicate potential sources of nutrient influx into the harbor from more than one source.

It is noted that the waters of the MSBH are classified as Class "A" by the Department of Health. The objective for this class of water is to protect their use for recreation and aesthetic qualities.

The report notes that the new comfort station and parking lot within the harbor at Parcel B would increase the area of impervious surface, which will increase the runoff into the harbor. Suitable Best Management Practices will be carried out to minimize construction-related runoff. A subsurface drainage detention system within Parcel B is proposed to capture post-development stormwater, to mitigate adverse impacts to downstream and adjacent of properties.

The improvements to the loading dock are anticipated to have slight impacts to marine fauna and their habitat, none of them rare or endangered. Further, these organisms are anticipated to recolonize. The report urges caution regarding the existing stand of invasive, snowflake coral. This colony should be dispersed as little as possible.

Overall, the AECOS, Inc. study concludes the proposed improvements, notably the conversion of the cesspools to individual

wastewater treatment systems and the drainage retention basin on Parcel B, could lead to improvement rather than degradation of the marine and coastal environment.

5. ***Flora and Fauna***

There are no known rare, threatened, or endangered species or important wildlife habitats within the limits of the project area. The proposed project is not anticipated to have any adverse impact on flora, fauna, or critical habits in the vicinity.

6. ***Air Quality***

Air quality impacts attributable to construction-related activities include short-term generation of dust. Dust control measures, such as regular watering and sprinkling, will be implemented to minimize nuisance impacts to nearby areas.

Once the project is completed and ferry service inaugurated, ferry traffic will generate exhaust emissions. However, the relatively small scale emissions from the vessels are not expected to adversely impact local and regional ambient air quality conditions.

7. ***Noise Quality***

As with air quality, ambient noise conditions will be temporarily impacted by construction-related activities. Construction equipment and machinery will be the dominant sources of noise during the construction process. Proper equipment and maintenance are anticipated to minimize noise levels from these sources. In addition, equipment mufflers or other sound attenuating devices may be utilized as required to mitigate adverse impacts to noise levels. All construction-related activities will be limited to normal,

daylight working hours.

Once the project is completed and ferry service inaugurated, ferry vessel traffic will generate noise. However, the incremental increase in noise associated with ferry traffic is not anticipated to adversely impact local and regional ambient noise quality conditions.

8. ***Archaeological and Historic Resources***

An Archaeological Survey was prepared for the proposed project in February 2005, by Pacific Legacy, Inc. Refer to Appendix "D".

The following significance evaluations are broad criteria established for the State and National Register of Historic Places. These criteria are as follows:

Criterion A: *Site is associated with events that have made a significant contribution to the broad patterns of our history.*

Criterion B: *Site is associated with the lives of persons significant to our past.*

Criterion C: *Site embodies the distinctive characteristics of a type, period, or method of construction; or represents the work of a master; or possesses high artistic value; or represents a significant and distinguishable entity whose components may lack individual construction.*

Criterion D: *Site has yielded or has the potential to yield information important in prehistory or history.*

Criterion E: *Site has an important traditional cultural value to the native Hawaiian people or to another ethnic group of the state due to associations with traditional cultural practices once carried out, or*

still carried out, at the property or due to associations with traditional beliefs, events, or oral accounts (State of Hawaii criterion only).

During the survey, three (3) features, constituting a single site, Site 50-50-09-5645, were located during the pedestrian survey of the area west of the harbor access road. Site 50-50-09-5645 would appear to be significant under Criteria A and D. However, the report notes that their potential has been realized by their recordation and that they can be deemed no longer significant. Nevertheless, the proposed project will not adversely impact this site since no improvements will be carried out in this area of the MSBH.

9. ***Cultural Impact Assessment***

a. ***Historic Overview***

Maalaea Bay was well-known as a canoe-landing point, stretching back to pre-contact times. There was a well-developed, though small, native Hawaiian settlement there, at Kapoli, where Buzz's Wharf restaurant is now located. In the mid-19th century, much of the land of Waikapu *ahupua'a*, in which Maalaea is located, was converted to agricultural use. Those lands surrounding the Maalaea Bay were primarily directed toward sugarcane cultivation.

The harbor was built in 1952, by the then-Territory of Hawaii as a preferred, small boat harbor. In the next year, dredging was completed and the breakwater constructed. Oral tradition and physical evidence suggest that a *heiau*, located mauka of the harbor, was torn down and the stone reused for the breakwater. A second breakwater was completed in

1958.

b. ***Interviews***

Oral interviews were performed by Pacific Legacy, Inc. as part of a Cultural Impact Assessment performed for the proposed project. Refer to Appendix "D". All of the interviewees mentioned that Kapoli Spring still flows, although it was formerly thought to have dried up. They also discussed the local surf spots, which are all well-known to the surfing community. More details from those interviews are summarized below.

(1) ***Robert K. Lu'uwai, Jr.***

Mr. Lu'uwai is the Commodore of the Maalaea Fish and Boat Club and involved with the Japanese shrine located in the harbor. The Lu'uwai family has been fishing in the area for three (3) decades. Mr. Lu'uwai noted that people seldomly fish in the harbor itself because the adjacent cesspools have deteriorated the water quality. He also discussed the history and function of the Japanese shrine dedicated to Ebisu-sama, mentioning that most of the local, Japanese families have moved out of the area. According to Mr. Lu'uwai, the harbor has become a common place for people to have their ashes spread. Mr. Lu'uwai approved of the proposed project plans.

(2) ***Kahu Charles Kauluwehi Maxwell, Sr.***

Mr. Maxwell is a well-known elder and expert on traditional, Hawaiian practices. He traces his family lineage back to the Maalaea area. Mr. Maxwell discussed the *heiau* that was used as building material for the harbor. He also discussed the two (2) stones now located in front of the Buzz's Wharf. Mr. Maxwell stated that one of them was a *piko* (navel) stone, associated with traditional practices, while the other was used to grind adzes. The interviewee also mentioned a nearby salt-cave and

the *limu* (seaweed) gatherings that took place along the shore, south of the harbor.

Finally, Mr. Maxwell expanded upon his family's connections to the area, including the disposition of his great-grandmother. Mr. Maxwell expressed approval of the proposed project plans, as long as the two (2) stones in front of the restaurant were not impacted.

(3) ***Ann Kaleilokelani Tsuha***

Ms. Tsuha is a cultural practitioner on Maui and works for the Kaho'olawe Island Restoration Commission. She discussed traditional stories about the area, including Hana'ula, located immediately mauka of Maalaea.

c. ***Cultural Impact Analysis***

Based upon archival research and oral interviews for the proposed project, there are no anticipated impacts to cultural practices or deposits. One of the interviewees stressed that the stones fronting Buzz's Wharf should be untouched. The project plans do not involve any impacts to those stones.

The replacement of the cesspools with four (4) individual wastewater systems are anticipated to improve water quality in and around the MSBH. This improvement in water quality is anticipated to have a positive impact on cultural food gathering practices.

10. Scenic and Open Space Resources

The views to and along the ocean are the principal visual resources of the project area. The proposed action calls for improvements to existing harbor facilities and, therefore, is not anticipated to adversely impact view planes or scenic view

corridors. Improved structures, such the reconstructed ferry terminal building, will be on approximately the same scale as the existing structure. The new comfort station proposed on Parcel B will be designed in scale and mass compatible with surrounding harbor infrastructure and facilities. The ferry terminal building replaces an existing structure and will not impact view planes or scenic view corridors.

B. IMPACTS TO COMMUNITY SETTING

1. Population and Local Economy

On a short-term basis, the proposed project should not significantly affect population parameters. The project will provide a positive impact to the local economy during construction.

The proposed project is not considered a direct population generator from a long-term perspective. Improved inter-island ferry service may also provide increased employment opportunities for residents of all islands in Maui County, thereby benefitting the local economy on a long term basis.

2. Agriculture

There are no impacts anticipated to agriculture resulting from the proposed project. The MSBH is designated for Urban uses by the State Land Use Commission and zoned M-1, Light Industrial by the County of Maui. There are agricultural fields in the near vicinity to the harbor, but these will not be impacted by the proposed action.

3. Emergency Services

The proposed improvements are not expected to affect the service capabilities of police, fire, and emergency operations. The project

is not considered a population generator and will not extend the existing service area limits for emergency services.

4. ***Educational Services***

The proposed project is not considered a population generator and will not place additional demand upon the educational resources of the area.

5. ***Recreational Services***

The proposed project will improve the functionality of the MSBH, a major recreational, as well as commercial, resource. The wastewater and parking improvements will allow for more efficient use of the harbor and its facilities, in keeping with current needs and standards.

6. ***Solid Waste***

A solid waste management plan will be developed, as appropriate, for the disposal of materials resulting from demolition and construction activities. Once completed, solid waste collection services will continue to be provided by a private contractor and disposed at the County of Maui's Central Maui Landfill.

According to the County of Maui, Department of Public Works and Environmental Management, the County's Central Maui landfill receives an average of approximately 450 tons of solid waste per day. Approximately 125 tons of that is attributable to the County's residential refuse collection service and the remaining 325 tons attributable to non-residential solid waste, including hotel, condominium, retail, commercial, and industrial uses. The Central Maui Landfill has six (6) planned phases for expansion and is

projected to accommodate waste disposal until the year 2065 (R.M. Towill Corporation, 2002). The proposed project is not anticipated to adversely impact solid waste capacity.

C. IMPACTS TO INFRASTRUCTURE

1. Roadway System

A traffic evaluation report was prepared for the proposed project in January, 2005. See Appendix "F".

The traffic evaluation analyzes the impacts of the proposed ferry facility improvements. Projected traffic impacts are assessed using Level of Service (LOS) ratings, as determined by the 2000 Highway Capacity Manual (HCM) methodology. This is a qualitative measurement "A" through "F" in which LOS A represents ideal or free-flowing traffic operating conditions, and LOS F represents unacceptable or potentially congested traffic operating conditions. The LOS for the analyzed intersections was then determined for both the AM and PM peak periods, which were determined to be 6:15 AM to 7:15 AM and 4:45 PM to 5:45 PM, respectively.

a. Existing Conditions

The following intersections, all unsignalized, were analyzed for current conditions:

(1) Honoapiilani Highway and Maalaea Harbor Access Road

Left- and right-turning traffic onto Honoapiilani Highway operates at LOS D during the AM peak and LOS F during the PM peak. The high traffic volume on the highway, coupled with the speed of traffic makes finding a turning gap difficult for left-turning vehicles. Right-turning vehicles have relatively less difficulty finding a gap, but as this road is only one

lane, these vehicles are frequently delayed behind left-turning traffic.

Northbound, right-turning movements from Hana Highway are unrestrained and not evaluated in the report. Southbound, left-turning and through traffic on Honoapiilani Highway operates at LOS A during the AM peak and LOS B during the PM peak. This is more than acceptable traffic movement, however, the report notes that left-turning vehicles are sometimes forced to come to a complete stop while waiting for a turning gap in the oncoming traffic. As there is no turning lane, they are stopped in the middle of a busy highway. The report suggests that this is a potential safety hazard.

(2) ***Honoapiilani Highway and Old Wailuku Lahaina Road (Maalaea Road) (South End)***

This intersection only allows right-turns in and out of the Harbor area. Right-turning movements from the highway into the MSBH are unrestrained and not evaluated in this report.

The right-turn out of Old Wailuku Lahaina Road feeds directly into an auxiliary lane that extends the length of the Maalaea Triangle area. This movement operated at LOS B during the AM peak hour and LOS C during the PM peak hour.

(3) ***Old Wailuku Lahaina Road (Maalaea Road) and Hauoli Street***

North- and southbound, left-turning movements from Maalaea Road operate at LOS A during both peak periods, as do all westbound movements from Hauoli Street. Eastbound movements from Hauoli Street operate at LOS B during both peak periods.

(4) ***Old Wailuku Lahaina Road (Maalaea Road) and the Internal Harbor Access Road***

All turning movements at this intersection operate at LOS A during both peak periods.

With the notable exception of the first intersection (Honoapiilani Highway and Maalaea Harbor Access Road), turning movements were more than acceptable. The report notes that lack of parking and internal traffic confusion due to lack of signs are significant elements in adding to traffic movements in the harbor area.

b. ***Projected Year 2008 without Project***

Background traffic on Honoapiilani Highway has been assumed at one (1) percent annually for this projection. Traffic movements in the Year 2008 without the proposed project are anticipated to operate at similar levels to those currently existing.

c. ***Projected Year 2008 with Project***

The traffic report used the number of trips generated by the existing inter-island ferry service to Lahaina, in order to make a worst case projection for the trips that would be generated at the MSBH with the project and anticipated ferry service expansion. A total of 144 ferry-generated trips are projected at MSBH for the AM and PM peak periods, split roughly evenly between tourists and commuters, and between trips north- and southbound on Honoapiilani Highway. This worst-case scenario assumes that ferry passengers arrive at the harbor during the AM peak period and leave the harbor during the PM peak. This would lead to greater traffic impacts than a gradual return of passengers, which scenario is also feasible. The report also assumes that a shuttle-

system would be implemented to run between the ferry loading dock and the parking area located at Parcel B. This would also add to traffic congestion.

(1) ***Honoapiilani Highway and Maalaea Harbor Access Road***

The proposed project is not anticipated to result in substantive impacts to traffic operations at this intersection. LOS for all movements remain the same for "without" and "with" project.

(2) ***Honoapiilani Highway and Old Wailuku Lahaina Road (Maalaea Road) (South End)***

The proposed project is also not anticipated to result in substantive impacts to traffic operations at this intersection. LOS for all movements are projected to be LOS B and LOS C for the AM peak and PM peak hours, respectively.

(3) ***Old Wailuku Lahaina Road (Maalaea Road) and Hauoli Street***

Traffic operations at this intersection would operate at similar levels to those currently existing. Westbound movements from Hauoli Road would go from LOS A to LOS B during both peak periods.

(4) ***Old Wailuku Lahaina Road (Maalaea Road) and the Internal Harbor Access Road***

Traffic operations are anticipated to be minimally affected by the proposed project and would continue at LOS A during both peak periods.

(5) ***New Parking Lot (Parcel B) Access***

The report anticipates that access to the new parking lot at Parcel B, whether intersecting with Hauoli Street or Maalaea Road, would operate at LOS A during both peak periods.

The traffic evaluation concludes that there would be extremely minimal impacts to traffic operations resulting from the proposed ferry pier improvements.

d. Recommendations

The traffic report includes a number of recommendations. The recommendation to alter the intersection geometrics at Honoapiilani Highway and the provision of a shuttle service from the ferry terminal to the new parking lot are not part of the proposed improvements since they are not directly related to inter-island ferry terminal facilities. The following recommendations will be carried out as part of the proposed improvements.

(1) Provision of an offsite parking area; and

(2) Pedestrian improvements such as extending the sidewalk near the Coast Guard Station and pedestrian crosswalk across the Old Wailuku Lahaina Road.

2. Water System

The proposed project is not anticipated to place any substantial, new demands on water system resources. The expansion of ferry services to the MSBH will require some additional water. Domestic

and irrigation calculations will be submitted to the Department of Water Supply for review during the building permit application process.

3. ***Wastewater System***

The proposed project includes upgrades and improvements to the existing wastewater system of the Harbor. The new wastewater transmission lines will carry wastewater to four (4) individual wasterwater systems as follows. The anticipated wastewater flows from the public restrooms/administrative office are 4,192 gallons per day (gpd) and 5,000 gpd from the boat pump out system. The improved wastewater system will involve retrofitting the existing pump station and rerouting the existing 4-inch sewer forcemain to a new aerobic treatment system located in the unpaved parking lot at the entrance of the harbor. The treatment system will include a 1,000 gallon pre-loader, two (2) 5,000 gpd aerobic and disinfection units. Effluent from this system will be discharged into a series of 6-inch sewer pipes and manholes, and ultimately into one of two (2) seepage pits (converted cesspools) adjacent to the Buzz's Wharf Restaurant. Refer to Figure 4.

Wastewater flow from the existing comfort station was estimated to be 2,880 gpd (shower flows not considered because shower head and controls have been removed). Currently, wastewater flow from the existing comfort station is chlorinated and disposed into an existing cesspool adjacent to the existing comfort station. Improvements include installing a 750 gallon pre-loader, 3,000 gpd aerobic unit, and disinfection. Effluent from this system will be disposed into the existing seepage pit (converted from cesspool) adjacent to the existing comfort station. Refer to Figure 4.

Wastewater flows from the new comfort station (4,032 gpd), at the new overflow parking lot comfort station will also be discharged in this cesspool. The new comfort station will have its own pre-loader, aerobic unit and disinfection unit, and pump station to pump the effluent to the converted seepage pit (adjacent to existing comfort station) for disposal. The improvement to the wastewater systems will meet regulatory requirements and have less environmental impact than that currently existing. Total wastewater flows are projected to be 16,105 gpd. The projected flow volumes are within the existing wastewater capacity at the MSBH. The existing cesspools are evaluated to handle a maximum wastewater flow capacity of approximately 32,400 gpd.

4. ***Drainage and Erosion Control***

The existing stormwater flow patterns will not be significantly changed due to the proposed ferry terminal facility improvements. Increase in stormwater flows due to the paving of the overflow parking area on Parcel B is estimated to be 3.0 cfs. This increase in flow will be collected in drain inlets and directed to an underground stormwater detention system. The detention system will have a storage capacity of 4,400 cubic feet. The proposed project will not adversely affect downstream or adjacent properties.

5. ***Electrical and Telephone Systems***

There are no impacts to telephone or electrical services anticipated to result from the proposed project. Electrical services will be upgraded and coordinated with Maui Electric Company to ensure that service delivery and capacity requirements are adequately addressed.

D. CUMULATIVE AND SECONDARY IMPACTS

Cumulative impacts are defined as the impact on the environment which results from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. The proposed project is not part of a larger action, nor would it occur within the context of such actions. There are no direct community growth impacts resulting from or occurring with the project.

Secondary impacts are those which have the potential to occur later in time or farther in distance, but are still reasonably foreseeable. They can be viewed as actions of others that are taken because of the presence of the project. Secondary impacts from highway projects, for example, can occur because they can induce development by removing one of the impediments to growth-transportation access.

The provision of ferry services to the project site is an anticipated result of the proposed improvements. Enhancing commuter ferry operations to include a second ferry port on the island of Maui at the MSBH would increase overall system capacity and reduce congestion at the Lahaina Small Boat Harbor. Such enhancements would aid in ensuring more reliable commuter ferry system operation during extreme weather conditions by providing a ferry terminal in a protected harbor on the island of Maui. The second ferry port on the island of Maui would also encourage greater patronage by providing more direct access to government services, employment and recreational opportunities, and major population centers in Central and South Maui.

There are minimal traffic impacts associated with the project. In all, the proposed action is not anticipated to result in any substantive, adverse cumulative or secondary impacts.

Chapter IV

Relationship to Land Use Plans, Policies and Controls

IV. RELATIONSHIP TO LAND USE PLANS, POLICIES AND CONTROLS

A. STATE LAND USE DISTRICTS

Chapter 205, Hawaii Revised Statutes (HRS), relating to the Land Use Commission, establishes four (4) major land use districts in which all lands in the state are placed. These districts are designated as "Urban", "Rural", "Agricultural", and "Conservation". The subject property is located within the "Urban" district. See Figure 11. The proposed improvements at the MSBH are permitted within this district.

B. CONFORMITY WITH CHAPTER 226, HAWAII STATE PLAN

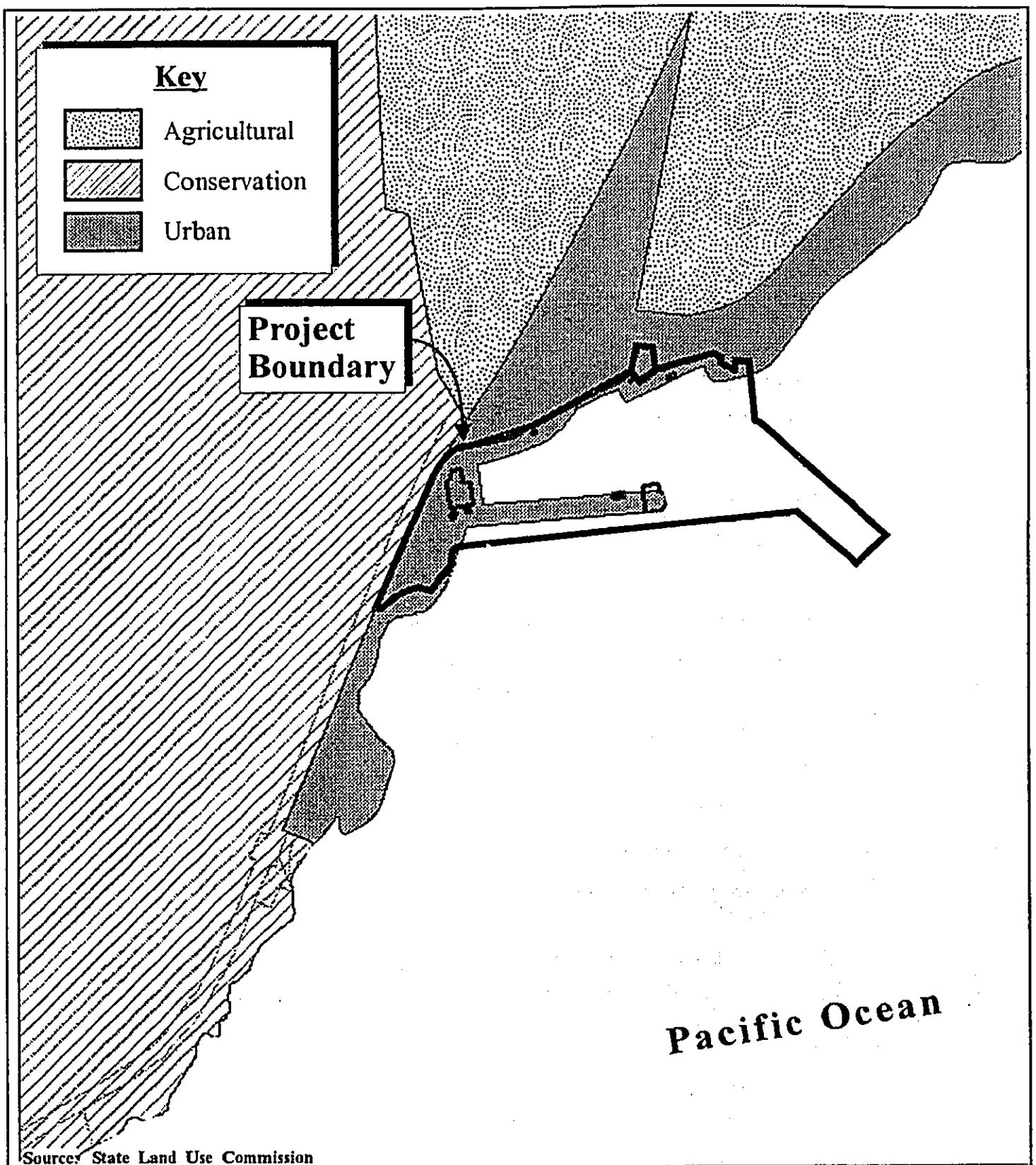
Chapter 226, HRS, also known as the Hawaii State Plan, is a long-range comprehensive plan which serves as a guide for the future long-term development of the State by identifying goals, objectives, policies and priorities, as well as implementation mechanisms.

The proposed improvements to the inter-island passenger ferry terminal at the MSBH and related facilities is in consonance with the overall theme, goals and objectives and policies of Chapter 226, HRS, relating to the Hawaii State Planning Act. The proposed project is in concert with the following goals of the Hawaii State Plan:

- A strong, viable economy, characterized by stability, diversity, and growth, that enables the fulfillment of the needs and expectations of Hawaii's present and future generations.

- A desired physical environment, characterized by beauty, cleanliness, quiet, stable natural systems, and uniqueness, that enhances the mental and physical well-being of the people.

- Physical, social and economic well-being for individuals and families in Hawaii that nourishes a sense of community responsibility, of caring and of participation in community life.



Source: State Land Use Commission

Figure 11 Proposed Maalaea Small Boat Harbor Improvements
State Land Use Designations

NOT TO SCALE

Prepared for: State of Hawaii, Department of Land and Natural Resources

MUNEKIYO & HIRAGA, INC.

1. ***Objectives and Policies of the Hawaii State Plan***

The proposed action is in conformance with the following objectives and policies of the Hawaii State Plan:

Chapter 226-5, HRS, Objectives and Policies for Population

226-5(a), HRS: It shall be the objective in planning for the State's population to guide population growth to be consistent with the achievement of physical, economic, and social objectives contained in this chapter.

226-5(b)(1), HRS: Manage population growth statewide in a manner that provides increased opportunities for Hawaii's people to pursue their physical, social, and economic aspirations while recognizing the unique needs of each county.

226-5(b)(3), HRS: Promote increased opportunities for Hawaii's *people to pursue their socio-economic aspirations throughout the* islands.

Chapter 226-6, HRS, Objective and Policies for the Economy - in General

226-6(a)(1), HRS: Increased and diversified employment opportunities to achieve full employment, increased income and job choice, and improved living standards for Hawaii's people.

226-6(b)(9), HRS: Foster greater cooperation and coordination between government and private sectors in developing Hawaii's employment and economic growth opportunities.

Chapter 226-8, Objective and Policies for the Economy - Visitor Industry

226-8(b)(1), HRS: Support and assist in the promotion of Hawaii's visitor attractions and facilities.

226-8(b)(3), HRS: Improve the quality of existing visitor destination areas.

226-8(b)(4), HRS: Encourage cooperation and coordination between the government and private sectors in developing and maintaining well-designed, adequately serviced visitor industry and related developments which are sensitive to neighboring

communities and activities.

Chapter 226-11, HRS, Objectives and Policies for the Physical Environment - Land-Based, Shoreline, and Marine Resources

226-11(a)(1), HRS: Prudent use of Hawaii's land-based, shoreline, and marine resources.

226-11(a)(2), HRS: Effective protection of Hawaii's unique and fragile environmental resources.

226-11(b)(3), HRS: Take into account the physical attributes of areas when planning and designing activities and facilities.

226-11(b)(8), HRS: Pursue compatible relationships among activities, facilities, and natural resources.

Chapter 226-12, HRS, Objective and Policies for the Physical Environment - Scenic, Natural Beauty, and Historic Resources

226-12(b)(5), HRS: Encourage the design of developments and activities that complement the natural beauty of the islands.

Chapter 226-13, HRS, Objectives and Policies for the Physical Environment - Land, Air, and Water Quality

226-13(b)(2), HRS: Promote the proper management of Hawaii's land and water resources.

226-13(b)(6), HRS: Encourage design and construction practices that enhance the physical qualities of Hawaii's communities.

226-13(b)(7), HRS: Encourage urban developments in close proximity to existing services and facilities.

Chapter 226-14, Objective and Policies for Facility Systems - in General

226-14(b)(1), HRS: Accommodate the needs of Hawaii's people through coordination of facility systems and capital improvement priorities in consonance with state and county plans.

Chapter 226-15, Objectives and Policies for Facility System - Solid and Liquid Wastes

226-15(a)(1), HRS: Maintenance of basic public health and sanitation standards relating to treatment and disposal of solid and liquid wastes.

Chapter 226-17, Objectives and Policies for Facility Systems - Transportation

226-17(a)(1), HRS: An integrated multi-modal transportation system that services statewide needs and promotes the efficient, economical, safe, and convenient movement of people and goods.

226-17(b)(4), HRS: Provide for improved accessibility to shipping, docking, and storage facilities.

226-17(b)(6), HRS: Encourage transportation systems that serve to accommodate present and future development needs of communities.

226-17(b)(7), HRS: Encourage a variety of carriers to offer increased opportunities and advantages to inter-island movement of people and goods.

226-17(b)(8), HRS: Increase the capacities of airport and harbor systems and support facilities to effectively accommodate trans-shipment and storage needs.

Chapter 226-23, HRS, Objective and Policies for Socio-Cultural Advancement - Leisure.

226-23(b)(4), HRS: Promote the recreational and educational potential of natural resources having scenic, open space, cultural, historical, geological, or biological values while ensuring that their inherent values are preserved.

Chapter 226-26, Objectives and Policies for Socio-Cultural Advancement - Public Safety

226-26(a)(1), HRS: Assurance of public safety and adequate protection of life and property for all people.

2. ***Priority Guidelines of the Hawaii State Plan***

The proposed action is in keeping with the following priority guidelines of the Hawaii State Plan.

Chapter 226-103, HRS, Economic Priority Guidelines:

226-103(1): Seek a variety of means to increase the availability of investment capital for new and expanding enterprises.

a. Encourage investments which:

(i) Reflect long term commitments to the State;

(ii) Rely on economic linkages within the local economy;

(iii) Diversify the economy;

(iv) Reinvest in the local economy; and

(v) Are sensitive to community needs and priorities.

Chapter 226-104, HRS, Population Growth and Land Resources Priority Guidelines

226-104(a)(1), HRS: Encourage planning and resource management to insure that population growth rates throughout the State are consistent with available and planned resource capacities and reflect the needs and desires of Hawaii's people.

226-104(a)(3), HRS: Ensure that adequate support services and facilities are provided to accommodate the desired distribution of future growth throughout the State.

226-104(a)(4), HRS: Encourage major state and federal investments and services to promote economic development and private investment to the neighbor islands, as appropriate.

226-104(b)(12), HRS: Utilize Hawaii's limited land resources wisely, providing adequate land to accommodate projected population and economic growth needs while ensuring the protection of the environment and the availability of the shoreline conservation lands, and other limited resources for future generations.

226-104(b)(12), HRS: Protect and enhance Hawaii's shoreline, open spaces, and scenic resources.

3. ***Conformity with State Functional Plans***

Comment: The State Functional Plans implement the Hawaii State Plan by identifying needs, problems and issues, and by recommending policies and priority actions which address the identified areas of concern. The proposed improvements to the MSBH are consistent with the following State Functional Plans:

a. ***State Recreational Functional Plan***

Outdoor recreation is recognized by the Hawaii State Plan as an important part of life for Hawaii's residents and visitors.

The capacity of beach parks and nearshore areas is rapidly being exceeded because of the significant numbers of resident and visitor users. High volume use is taxing the capacity of related support facilities, such as restrooms and vehicular parking. The MSBH is a popular facility for both residents and visitors and provides a point of access for a wide array of ocean recreational opportunities. The proposed improvements to the MSBH will provide comfort station improvements and increase the vehicular parking.

b. ***State Transportation Functional Plan***

The Hawaii State Plan addresses the vital role of transportation, particularly in light of the important relationship between transportation facilities and economic development. The State Functional Plan for Transportation

calls for a combination of strategies to reduce the congestion of transportation facilities. These include increasing the transportation capacity, expanding and modernizing the transportation infrastructure, addressing decentralization policies, and reduce the demand for travel, managing our existing transportation system effectively, and seeking and implementing new transportation alternatives.

C. ***MAUI COUNTY GENERAL PLAN***

The Maui County General Plan (1990 Update) sets forth broad objectives and policies to help guide the long-range development of the County. As stated in the Maui County Charter:

> *The purpose of the General Plan is to recognize and state the major problems and opportunities concerning the needs and the development of the County and the social, economic, and environmental effects of such development and set forth the desired sequence, patterns, and characteristics of future development.*

The proposed action is in keeping with the following General Plan objectives and policies:

LAND USE

Objective:

- To preserve for present and future generations existing geographic, cultural and traditional community lifestyles by limiting and managing growth through environmentally sensitive and effective use of land in accordance with the individual character of the various communities and regions of the County.

- To use the land within the County for the social and economic benefit of all the County's residents.

Policies:

- Identify and preserve significant historic and cultural sites.

- Mitigate environmental conflicts and enhance scenic amenities, without having a negative impact on natural resources.

ENVIRONMENT

Objective:

To use the County's land-based physical and ocean-related coastal resources in a manner consistent with sound environmental planning practice.

Policies:

- Preserve, enhance and establish traditional and new environmentally sensitive access opportunities for mountain and ocean resources.

- Evaluate all land based development relative to its impact on the County's land and ocean ecological resources.

CULTURAL RESOURCES

Objective:

To preserve for present and future generations the opportunity to know and experience the arts, culture and history of Maui County.

Policy:

Identify and maintain an inventory of significant and unique cultural resources for special protection.

ECONOMIC ACTIVITY

Objective:

To provide a balance between visitor industry employment and non-visitor employment for a broader range of employment choices for the County's residents.

Policy:

Encourage industries that will utilize the human resources available from within Maui County rather than having to import workers.

TRANSPORTATION

Objective:

To support an advanced and environmentally sensitive transportation system which will enable people and goods to move safely, efficiently and economically.

Policies:

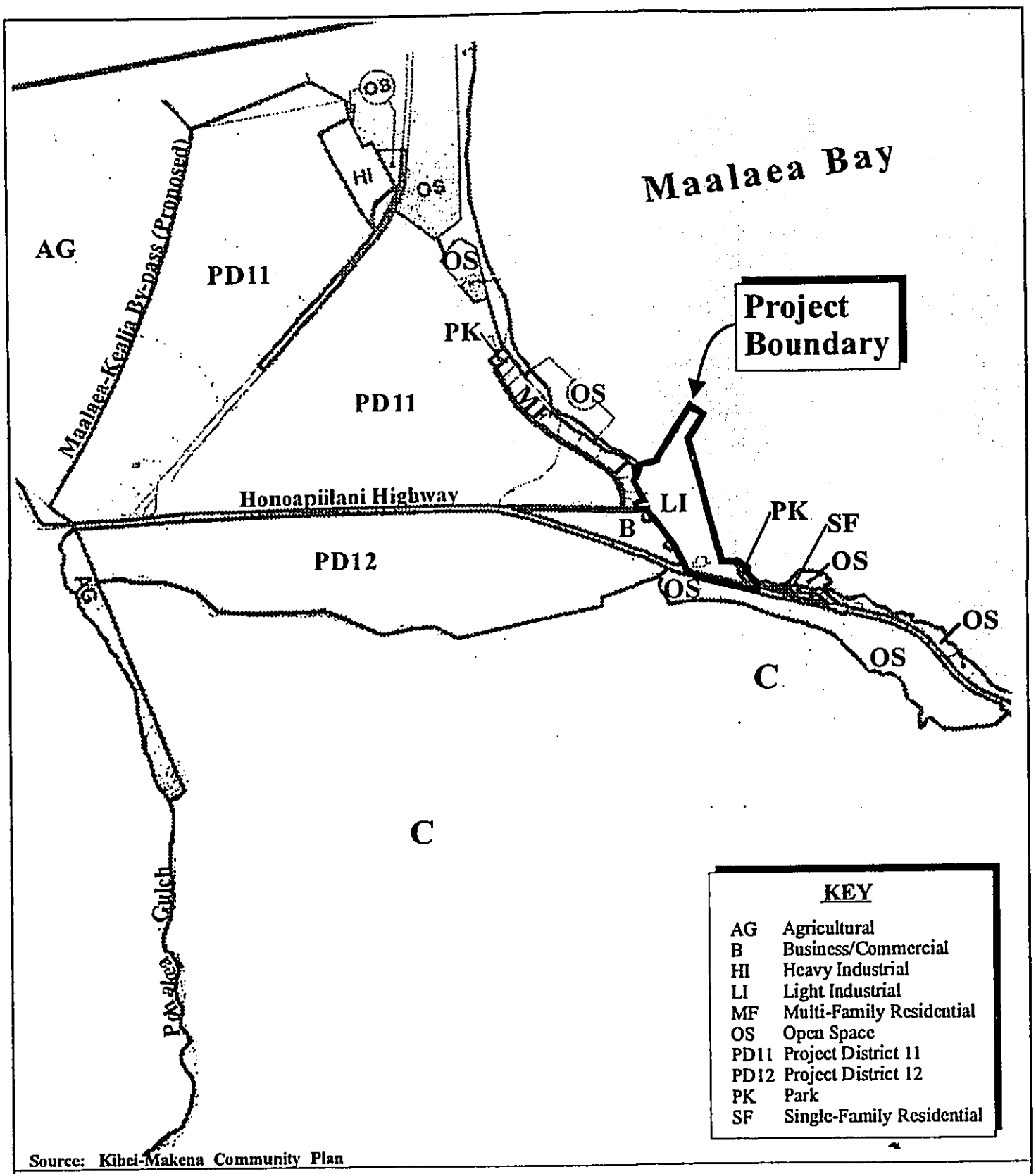
- Encourage the development of more efficient water and air transportation systems.
- Support environmentally sensitive developments or modernization of major transportation facilities such as new harbors and airports when they are needed by our residents.
- Explore alternative inter-island modes of freight transportation and ongoing modernization and improvement of our harbor facilities.

D. *KIHEI-MAKENA COMMUNITY PLAN*

Within Maui County, there are nine (9) community plan regions. From a General Plan implementation standpoint, each region is governed by a community plan which sets forth desired land use patterns, as well as goals, objectives, policies, and implementing actions for a number of functional areas including infrastructure-related parameters.

The subject property is located within the Kihei-Makena region. It is designated for Light Industrial and Park uses. See Figure 12.

The proposed action is in keeping with the following Community Plan goals, objectives, and policies:



Source: Kihei-Makena Community Plan

Figure 12 Proposed Maalaea Small Boat Harbor Improvements

NOT TO SCALE

Kihei-Makena Community Plan
Land Use Designations

Prepared for: State of Hawaii, Department of Land and Natural Resources

MUNEKIYO & HIRAGA, INC.

ENVIRONMENT

Goal:

Preservation, protection, and enhancement of Kihei-Makena's unique and fragile environmental resources.

Objectives and Policies:

- Maintain and enhance the long-term availability of shoreline resources for public enjoyment through adequate access, space, and facility provisions, and through on-going resource management programs.

- Permit recreational activities in the shoreline zone which respond to shoreline characteristics and principles of sound resource management. Activities which damage or deplete shoreline resources, or are incompatible with ecological systems, shall not be permitted.

- Protect the quality of nearshore waters by ensuring that land-based discharges meet water quality standards. Continued monitoring of existing and future waste disposal systems is necessary to ensure their efficient operation. Programs should be implemented to reduce the reliance on injection wells for wastewater disposal.

CULTURAL RESOURCES

Goal:

Identification, preservation, enhancement, and appropriate use of cultural resources, cultural practice, and historic sites that:

a. Provides a sense of history and defines a sense of place for the Kihei-Makena region; and

b. Preserves and protects native Hawaiian rights customarily and traditionally exercised for subsistence, cultural, and religious purposes in accordance with Article XII, Section 7, of the Hawaii State Constitution, and the Hawaii Supreme Court's PASH opinion, 79 Haw. 425 (1995).

Objectives and Policies:

Identify, preserve, protect and restore significant historical and cultural sites.

E. *COUNTY ZONING*

TMK (2) 3-6-01:49 (por.) is currently zoned P-1, Public/Quasi-Public district, while Parcel B is zoned M-1, Light Industrial district by the Maui County Code. TMKs (2) 3-6-01:02, 49 and 50 are currently zoned M-1, Light Industrial; B-R, Resort Commercial; and P-1, Public/Quasi; as well as PK, Park in the westerly portion of Parcel 02, west of the access road. Harbor uses which will be improved by the proposed action are appropriate for lands in the M-1, Light Industrial district, and P-1, Public/Quasi-Public district. It is noted that no improvements are proposed in the area zoned PK, Park district and B-R, Resort Commercial district.

F. *HAWAII COASTAL ZONE MANAGEMENT OBJECTIVES AND POLICIES AND COUNTY OF MAUI SPECIAL MANAGEMENT AREA (SMA)*

The proposed project falls entirely within the County of Maui's Special Management Area (SMA). The Hawaii Coastal Zone Management Program (HCZMP), as formalized in Chapter 205A, HRS, as well as the Maui Planning Commission's SMA rules, establish objectives and policies for the preservation, protection, and restoration of natural resources of Hawaii's coastal zone.

As set forth in Chapter 205A, HRS, and Sections 12-202-10 and 11, Rules of Practice and Procedures for the Maui Planning Commission, Special Management Area, this section addresses the project's relationship to applicable coastal zone management considerations.

1. ***Recreational Resources***

Objective: Provide coastal recreational opportunities accessible to the public.

Policies:

a. Improve coordination and funding of coastal recreational planning and management; and

b. Provide adequate, accessible, and diverse recreational opportunities in the coastal zone management area by:

(i) Protecting coastal resources uniquely suited for recreational activities that cannot be provided in other areas;

(ii) Requiring replacement of coastal resources having significant recreational value including, but not limited to, surfing sites, fishponds, and sand beaches, when such resources will be unavoidably damaged by development; or requiring reasonable monetary compensation to the State for recreation when replacement is not feasible or desirable;

(iii) Providing and managing adequate public access, consistent with conservation of natural resources, to and along shorelines with recreational value;

(iv) Providing an adequate supply of shoreline parks and other recreational facilities suitable for public recreation;

(v) Ensuring public recreational uses of county, state, and federally owned or controlled shoreline lands and waters having recreational value consistent with public safety standards and conservation of natural resources;

(vi) Adopting water quality standards and regulating point and non-point sources of pollution to protect, and where feasible, restore the recreational value of coastal waters;

(vii) Developing new shoreline recreational opportunities, where appropriate, such as artificial lagoons, artificial beaches, and artificial reefs for surfing and fishing; and

(viii) Encouraging reasonable dedication of shoreline areas with recreational value for public use as part of discretionary approvals or permits by the

Land Use Commission, Board of Land and Natural Resources, and county authorities; and crediting such dedication against the requirements of Section 46-6, HRS.

Response: The proposed project is expected to improve existing harbor operations and service for recreational and commercial boaters, with an emphasis of improving inter-island ferry operations. The proposed improvements will better provide services for harbor users, without adversely impacting coastal resources or impacting access.

2. ***Historic Resources***

Objective: Protect, preserve and, where desirable, restore those natural and manmade historic and prehistoric resources in the coastal zone management area that are significant in Hawaiian and American history and culture.

Policies:

a. Identify and analyze significant archeological resources;
b. Maximize information retention through preservation of remains and artifacts or salvage operations; and
c. Support state goals for protection, restoration, interpretation, and display of historic resources.

Response: An Archaeological Assessment was carried out for the proposed project by Pacific Legacy, Inc. Refer to Appendix "D". No adverse impacts to historic or cultural deposits are anticipated from the proposed project. Should human remains be inadvertently discovered during land-based, ground-altering activities, work will promptly cease in the immediate area of the find, and the find will be protected from further damage. The State Historic Preservation Division will be immediately notified and procedures for the

treatment of inadvertently discovered human remains will be followed pursuant to Chapter 6E, HRS.

3. ***Scenic and Open Space Resources***

Objectives: Protect, preserve, and, where desirable, restore or improve the quality of coastal scenic and open space resources.

Policies:

a. Identify valued scenic resources in the coastal zone management area;
b. Ensure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural landforms and existing public views to and along the shoreline;
c. Preserve, maintain, and, where desirable, improve and restore shoreline open space and scenic resources; and
d. Encourage those developments that are not coastal dependent to locate in inland areas.

Response: The proposed action is not anticipated to impact scenic resources. The harbor improvements will have minimal visual impact and follow the same general design of the existing harbor facilities so as to leave view corridors unaffected.

4. ***Coastal Ecosystem***

Objective: Protect valuable coastal ecosystems, including reefs, from disruption and minimize adverse impacts on all coastal ecosystems.

Policies:

a. Exercise an overall conservation ethic, and practice stewardship in the protection, use, and development of marine and coastal resources;
b. Improve the technical basis for natural resource management;
c. Preserve valuable coastal ecosystems, including reefs, of

significant biological or economic importance;

d. Minimize disruption or degradation of coastal water ecosystems by effective regulation of stream diversions, channelization, and similar land and water uses, recognizing competing water needs; and

e. Promote water quantity and quality planning and management practices that reflect the tolerance of fresh water and marine ecosystems and maintain and enhance water quality through the development and implementation of point and nonpoint source water pollution control measures.

Response: A Marine and Coastal Survey was prepared for the project by AECOS, Inc. in February 2005. Refer to Appendix "C". Appropriate Best Management Practices and erosion-control measures will be implemented to minimize the effects of stormwater runoff resulting from the implementation of the project and to ensure that coastal ecosystems are not adversely impacted by construction activities. The improved harbor is not anticipated to substantially increase impacts to the coastal environment over existing levels.

5. ***Economic Use***

Objective: Provide public or private facilities and improvements important to the State's economy in suitable locations.

Policies:

a. Concentrate coastal dependent development in appropriate areas;

b. Ensure that coastal dependent development such as harbors and ports, and coastal related development such as visitor industry facilities and energy generating facilities, are located, designed, and constructed to minimize adverse social, visual, and environmental impacts in the coastal zone management area; and

c. Direct the location and expansion of coastal dependent developments to areas presently designated and used for

such developments and permit reasonable long-term growth at such areas, and permit coastal dependent development outside of presently designated areas when:

(i) Use of presently designated locations is not feasible;
(ii) Adverse environmental effects are minimized; and
(iii) The development is important to the State's economy.

Response: The proposed project is consistent with the goals of the Kihei-Makena Community Plan, which guides growth and development in the region. The project involves repairs, maintenance, reconstruction and upgrades to existing facilities and is appropriately located to serve the inter-island commuter ferry needs for the County of Maui.

6. ***Coastal Hazards***

Objective: Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence, and pollution.

Policies:

a. Develop and communicate adequate information about storm wave, tsunami, flood, erosion, subsidence, and point and nonpoint source pollution hazards;
b. Control development in areas subject to storm wave, tsunami, flood, erosion, hurricane, wind, subsidence, and point and nonpoint source pollution hazards;
c. Ensure that developments comply with requirements of the Federal Flood Insurance Program; and
d. Prevent coastal flooding from inland projects.

Response: The proposed harbor improvements lie within Zone V18 and Zone C. Zone V18 designates an area within the 100-year flood with velocity, while Zone C designates an area of minimal flooding. The proposed improvements will be constructed in accordance with County requirements for developments within

flood hazard areas. In addition, the proposed improvements will be designed in accordance with the Drainage Standards of the County of Maui, as applicable, to ensure that the project will not adversely affect downstream and adjoining properties from the effects of flooding and erosion.

7. ***Managing Development***

Objective: Improve the development review process, communication, and public participation in the management of coastal resources and hazards.

Policies:

a. Use, implement, and enforce existing law effectively to the maximum extent possible in managing present and future coastal zone development;
b. Facilitate timely processing of applications for development permits and resolve overlapping of conflicting permit requirements; and
c. Communicate the potential short and long-term impacts of proposed significant coastal developments early in their life cycle and in terms understandable to the public to facilitate public participation in the planning and review process.

Response: Public input will be solicited in coordination with the processing of the Draft EA, pursuant to the Chapter 343, HRS, environmental assessment review process. All aspects of development will be conducted in accordance with applicable Federal, State, and County standards. Opportunities for review of the proposed action are offered through the regulatory review process for construction and development permits.

8. ***Public Participation***

Objective: Stimulate public awareness, education, and participation in coastal management.

Policies:

a. Promote public involvement in coastal zone management processes;
b. Disseminate information on coastal management issues by means of educational materials, published reports, staff contact, and public workshops for persons and organizations concerned with coastal issues, developments, and government activities; and
c. Organize workshops, policy dialogues, and site-specific mediations to respond to coastal issues and conflicts.

Response: The proposed improvements are subject to the County of Maui's SMA and shoreline setback review proceedings. Opportunities for public awareness, education, and participation in coastal management are provided through these entitlement processes, as well as through Federal and Sate regulatory processes. As noted above, public input is being received through the EA process.

9. ***Beach Protection***

Objective: Protect beaches for public use and recreation.

Policies:

a. Locate new structures inland from the shoreline setback to conserve open space, minimize interference with natural shoreline processes, and minimize loss of improvements due to erosion;
b. Prohibit construction of private erosion-protection structures seaward of the shoreline, except when they result in improved aesthetic and engineering solutions to erosion at the sites and do not interfere with existing recreational and waterline activities; and
c. Minimize the construction of public erosion-protection structures seaward of the shoreline.

Response: The Marine and Coastal Survey assessed shoreline impacts resulting from the proposed project. Refer to Appendix

"C". No substantial, long term adverse effects are anticipated.

10. Marine Resources

Objective:

Promote the protection, use, and development of marine and coastal resources to assure their sustainability.

Policies:

a. Ensure that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial;
b. Coordinate the management of marine and coastal resources and activities to improve effectiveness and efficiency;
c. Assert and articulate the interests of the State as a partner with federal agencies in the sound management of ocean resources within the United States exclusive economic zone;
d. Promote research, study, and understanding of ocean processes, marine life, and other ocean resources in order to acquire and inventory information necessary to understand how ocean development activities relate to and impact upon ocean and coastal resources; and
e. Encourage research and development of new, innovative technologies for exploring, using, or protecting marine and coastal resources.

Response: The Marine and Coastal Survey assessed existing marine resources and anticipated impacts resulting from the proposed project. Refer to Appendix "C". No substantial, adverse effects are anticipated from the improvements.

In addition, Best Management practices will be implemented during construction-related activities to support the policies of effective management of marine resources.

G. *SHORELINE SETBACK VARIANCE*

As applicable, a County of Maui shoreline setback approval or variance will be secured for the proposed improvements within the shoreline setback area. An application for such a variance will be undertaken and submitted to the Maui Planning Commission.

A shoreline survey carried out in 1973 shows the certified shoreline following the wharf along the Coast Guard facilities in the eastern portion of the MSBH. The shoreline Boundary then follows along the top of the bank seaward of the Old Wailuku Lahaina Road. See Appendix "G". From the west, a certified shoreline survey dated December 17, 1973 shows the shoreline boundary seaward of the MSBH west breakwater.

An assessment of the County's shoreline setback criteria relative to the project components within the setback area follows:

1. *Analysis of Shoreline Setback Criteria*

The following components of the project are located within the shoreline setback, as set forth in Chapter 203, Shoreline Rules for the Maui Planning Commission: re-paving of the existing road surfaces with concrete, repair ferry loading facility, installation of underground utilities, replacement of the former ferry terminal building and offices, and barrier removal and accessibility improvements to comply with ADA requirements.

Accordingly, the proposed actions have been evaluated with respect to applicable criteria and considerations advanced by the subject rules.

It is noted that Section 12-203-12(4) provides that the following

structures activities are permitted within the shoreline area:

(4) A structure or activity that consists of maintenance, repair, reconstruction, and minor additions or alterations of legal boating maritime, or water sports recreational facilities, which are publically owned, and which result in no interference with natural beach processes, provided that permitted structures may be repaired, but shall not be enlarged within the shoreline area without a variance.

The shoreline rules (Section 12-203-15) also provide criteria for approval of a variance action within the shoreline setback, as follows:

(1) To maintain and require access to and along the shoreline or adequately compensate for its loss;

Response: The existing lateral access in the vicinity of the proposed improvements will not be adversely impacted by the proposed action.

(2) To minimize risk of adverse impacts on beach processes;

Response: The proposed improvements will not adversely impact beach processes as the improvments will be made to the existing harbor facility.

(3) To minimize risk of structures falling and becoming loose rocks or rubble on public property;

Response: Given the design of the proposed improvements, repairs to existing facilities have been deemed necessary to minimize risk of structures falling and becoming loose rocks or rubble on public property.

(4) To minimize adverse impacts on public views to, from and along the shoreline.

Response: The proposed action is not anticipated to have an adverse impact on scenic and open space resources. The proposed improvements are either repairs to, or replacement of existing facilities, or underground installation of utilities, which will not affect public views to, from and along the shoreline.

H. NATIONAL ENVIRONMENTAL POLICY ACT COORDINATION

While the proposed action is subject to the National Environmental Policy Act (NEPA), preliminary consultation with the Federal Transit Administration (FTA) indicates that the proposed action may meet the FTA's criteria for a Categorical Exclusion. The DLNR will coordinate with the FTA to prepare and process a Categorical Exclusion to waive the requirement to prepare a Federal EA in accordance with the National Environmental Policy Act of 1969.

Chapter V

Summary of Adverse Environmental Effects Which Cannot Be Avoided

V. SUMMARY OF ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED

The proposed improvements at MSBH will result in unavoidable construction-related environmental impacts as outlined in Chapter III, Potential Impacts and Mitigation Measures.

Potential effects include noise-generated impacts occurring during the site preparation and construction phases of the proposed development. It is acknowledged that the popularity of Maalaea Harbor as a tourism destination and its relatively close proximity to residential condominiums are extremely important considerations, in regards to impacts on ambient noise levels.

Air quality impacts will also arise as a direct result of construction activities, such as the generation of dust and other airborne pollutants. As was discussed in Chapter II, Description of Existing Environment, Maalaea is an area subject to regular prevailing winds originating from the northeast. It should be noted that the influence and effectiveness of these winds in regards to pollutant dispersal will depend on two (2) factors, speed and direction.

Although unavoidable in nature, it should be noted that the aforementioned impacts will be minimized to reasonable levels through the implementation of a Best Management Practices (BMP) plan during the construction phase of development. Mitigation techniques, such as limiting construction to the daylight hours, regular watering and sprinkling, and the use of machinery mufflers or other sound attenuating devices, will be adopted in order to reduce nuisance impacts. In addition, project activities will comply with Administrative Rules of the Department of Health, Chapter 11-46, Community Noise Control.

The improvements to the loading dock are anticipated to have slight impacts to marine fauna and their habitat, none of them rare or endangered. Further, these

organisms are anticipated to recolonize.

The proposed project is not anticipated to create any significant long-term, adverse environmental effects.

Chapter VI

Alternatives to the Proposed Action

VI. ALTERNATIVES TO THE PROPOSED ACTION

A. NO ACTION ALTERNATIVE

In addition to maintaining present physical conditions, the "No Action" alternative would retain existing facilities in the present state of disrepair, while public needs and demand on the harbor's services and facilities continues. The "No Action" alternative results in no ferry terminal improvements, no FTA funding, and no improvements to the South Mole of the MSBH.

Furthermore, were harbor facilities to be utilized for the accommodation of inter-island ferry services, the scenario of a "No-Action" alternative would pose two (2) important safety issues:

1. Overall passenger use associated with the inter-island ferry terminal building would be greater than is presently the case with just the commercial boat operators.

2. The majority of passengers traveling inter-island between Maui, Lanai would carry some amount of personal luggage.

The combination of these two (2) aforementioned factors, therefore, needs to be accounted for through the provision of a safer loading dock facility. The majority of commercial boat operators currently onload and offload passengers using extendable temporary walkway facilities that are either stored on the harbor's edge or on board the vessel.

Taking the continued public demand at the harbor and inter-island passenger safety requirements into account, the "No Action" alternative is not deemed a viable alternative. Accordingly, the "No Action" alternative was not considered.

B. *PROPOSED ACTION ALTERNATIVE*

The "Proposed Action" alternative would involve the development of a terminal facility for the inter-island commuter ferry between the islands of Maui and Lanai in accordance with the aforementioned plans. The project would also incorporate an upgrade of existing harbor facilities, provision of onsite parking in order to support the ferry service, as well as meet EPA and ADA regulations. The "Proposed Action" alternative is deemed the most viable to meet project objectives and has been comprehensively addressed through the preparation of this Environmental Assessment in accordance with Chapter 343, Hawaii Revised Statutes (HRS).

C. *SITE SELECTION ALTERNATIVE*

The "Site Selection" alternative would involve undertaking the proposed project at a different site in Central Maui in order to develop a terminal facility for the inter-island commuter ferry service. Maalaea has been identified as the most appropriate location in the Central Maui area in regard to available land, existing infrastructure and capital costs. The Kahului Harbor is not a viable option due to greater travel time and exposure to North Shore winds and swells. Moreover, the MSBH has been historically used for ferry operations. Selection of an alternative site would incur greater capital costs and environmental impacts than upgrading and enhancing the existing facilities at the MSBH. The "Site Selection" alternative is, therefore, not deemed an economically and environmentally viable option, due to the lack of alternative sites in Central Maui. Accordingly, this alternative was not considered during the planning stages of the project.

D. *DEVELOPMENT SCOPE ALTERNATIVES*

During the project concept development process, a variety of alternative engineering elements were evaluated.

The ongoing need for a sewage pump out facility at Maalaea Harbor was specifically addressed and reviewed. Raw sewage from Maalaea vessel toilet facilities is currently disposed of out to sea. In order to ensure sufficient pollutant dispersal, the Clean Water Act 1972 prohibits the disposal of raw sewage within three (3) nautical miles of the shoreline. A facility enabling boat operators to pump out raw sewage from their vessels currently does not exist. The need for such a facility was addressed during an initial project meeting with the Maalaea Harbor Boat Owners' Association (September 1, 2004), whereby the construction of a shared pump out station to be used by all boat owners was discussed as part of the agenda. Following detailed analysis and dialogue with boat owners, this option will be limited in the present scope of the inter-island ferry project, due to funding criteria of the Federal Transit Administration funding program. One (1) sewer pump out and a sewer pump station will be provided to service the proposed inter-island ferry terminal. The expansion of the sewer pump out facilities will be undertaken by separate funding sources and is beyond the scope of the proposed project funding.

As there is a particular shortage of paved parking in the direct vicinity of the harbor area, alternative options regarding the location of functional parking areas were also considered during the planning process. Limited space is currently available for parking next to the harbor's edge and is predominantly utilized by boat owners who want their vehicle and equipment to be in close proximity to their boat. Condominium owners frequently complain about harbor users parking their vehicles along the narrow access road to the northwest of the site. One option that was

addressed during the planning process involved the possible provision of a "park and ride" shuttle service from the currently under-utilized triangle of parking north of the shopping center near the Maui Ocean Center. This parking area is, however, owned by a third-party and would require an agreement regarding use of parking facilities and provision of the shuttle service. This alternative, although deemed viable, was not included in the proposed improvement plan due to the availability of Parcel B for parking use which will provide more convenient access for both harbor visitors and boat operators.

Chapter VII

Irreversible and Irretrievable Commitments of Resources

VII. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The development of the proposed project is anticipated to result in the irreversible and irretrievable commitment of land and fiscal resources. Other resource commitments include energy, labor, and material resources. The commitment of these resources, however, is considered appropriate when evaluating the benefits to be derived from the proposed action versus the consequences of taking no action.

Chapter VIII

Findings and Conclusions

VIII. FINDINGS AND CONCLUSIONS

Every phase of the proposed action, expected consequences, both primary and secondary, and the cumulative as well as the short-term and long-term effects of the action have been evaluated in accordance with the Significance Criteria of Section 11-200-12 of the Administrative Rules. Discussion of project conformance to the criteria is noted as follows:

1. ***No Irrevocable Commitment to Loss or Destruction of any Natural or Cultural Resource Would Occur as a Result of the Proposed Project***

   The proposed action is not anticipated to adversely impact known habitats of rare, endangered, or threatened species of flora or fauna. An archaeological inventory survey was carried out by Pacific Legacy, Inc. Refer to Appendix "B". There are no significant archaeological or historic resources which will be impacted by the proposed parking lot and new comfort station on Parcel B. No further archaeological work was recommended. Should any historic and cultural features, including human burials be found during ground altering activities, work in the area of the find shall be promptly halted and the find protected from further disturbances. The SHPD will be immediately contacted to determine the significance of the find and establish appropriate mitigating measures, if necessary.

2. ***The Proposed Action Would Not Curtail the Range of Beneficial Uses of the Environment***

   The proposed action will improve the functionality of the MSBH by providing improved parking, wastewater, ferry terminal and related infrastructure facilities. The proposed action will not curtain the range of beneficial uses of the environment.

3. ***The Proposed Action Does Not Conflict With the State's Long-Term Environmental Policies or Goals or Guidelines as Expressed in Chapter 344, HRS***

The State Environmental Policy and Guidelines are set forth in Chapter 344, HRS. The proposed action is in consonance with those policies and guidelines.

4. ***The Economic or Social Welfare of the Community or State Would Not Be Substantially Affected***

The project will directly benefit the local economy by providing construction and construction-related employment. In the long term, the proposed project is anticipated to have a beneficial effect upon the welfare of the community, not only by providing upgraded harbor facilities, but by allowing the expansion of the inter-island ferry service in Maui County to include a second port on the island of Maui.

5. ***The Proposed Action Does Not Affect Public Health***

No adverse impacts to the public health are anticipated. The wastewater improvements are carried out to meet U.S. EPA Underground Injection Control Regulations and State DOH Wastewater System Rules and will allow the treatment of effluent with less environmental impact than the current facilities allow.

6. ***No Substantial Secondary Impacts, Such as Population Changes or Effects on Public Facilities, are Anticipated***

The proposed project is not a direct source of new population to the region. In this regard, the proposed project is not anticipated to adversely affect public services in the region, such as schools, police, and fire protection.

7. ***No Substantial Degradation of Environmental Quality is Anticipated***

During the construction phase of the project, there will be short-term air and noise quality impacts. In the long term, there are no anticipated impacts upon air quality and ambient noise levels. The proposed harbor improvements are not expected to significantly affect the open space and scenic character of the area. No substantial degradation of environmental quality resulting from the action is anticipated.

8. ***The Proposed Action Does Not Involve a Commitment to Larger Actions, Nor Would Cumulative Impacts Result in Considerable Effects On The Environment***

The proposed action is a stand-alone project which can be funded, designed and constructed independently of other projects affecting the MSBH. The proposed action is not anticipated to have significant adverse effects, either primary or secondary.

9. ***No Rare, Threatened or Endangered Species or Their Habitats Would be Adversely Affected By The Proposed Action***

There are no known rare, threatened, or endangered species of flora and fauna, nor habitats of such within the project area.

10. ***Air Quality, Water Quality or Ambient Noise Levels Would Not Be Detrimentally Affected By The Proposed Project***

Construction activities will result in short-term air quality and noise impacts. Dust control measures, such as regular watering and sprinkling, and installation of dust screens will be implemented to minimize wind-blown emissions. Noise impacts will occur primarily from construction equipment. Equipment mufflers or other noise attenuating equipment, as well as proper equipment and vehicle maintenance, will be used during construction activities. Water quality of harbor and nearby coastal waters

will be maintained through implementation of appropriate BMPs and drainage improvements. The proposed improvements will affect landside facilities only.

In the long term, the proposed project is not anticipated to have a significant impact on air quality, water quality or ambient noise conditions.

11. The Proposed Project Would Not Affect Environmentally Sensitive Areas, Such As Flood Plains, Tsunami Zones, Erosion-prone Areas, Geologically Hazardous Lands, Estuaries, Fresh Waters or Coastal Waters

The project site is located within Flood Zones C, areas of minimal flooding, and V18, areas of coastal flooding with velocity wave action. The proposed project will be developed in accordance with Special Flood Hazard Area requirements of the Maui County Code. The project is not anticipated to affect any erosion-prone areas or geologically hazardous lands, estuaries or fresh waters. Appropriate permitting and mitigation measures will be applied to minimize any impact on coastal water.

12. The Proposed Project Will Not Substantially Affect Scenic Vistas and Viewplanes Identified in County or State Plans or Studies

The views to and along the ocean are the principle visual resources of the project area. The proposed action calls for improvements to existing, harbor facilities and is, therefore, not anticipated to adversely impact viewplanes or scenic corridors. Improved structures, such the reconstructed ferry terminal building and new comfort station, will be on the same scale as the existing structures.

13. The Proposed Project Will Not Require Substantial Energy Consumption

The subject project will involve the commitment of fuel for construction

equipment, vehicles, and machinery during construction and maintenance activities.

In the context of the region's overall energy consumption, the harbor improvements are not anticipated to create excessive or substantially increased demand for energy.

Based on the foregoing findings, it is anticipated that this environmental assessment will be filed as a Finding of No Significant Impacts or FONSI.

Chapter IX

List of Permits and Approvals

IX. LIST OF PERMITS AND APPROVALS

The following Federal, State and County permits and approvals are anticipated to be required for project implementation:

County of Maui

1. Special Management Area Use Permit (Maui Planning Commission)
2. Shoreline Setback Approval or Variance (Maui Planning Department/Maui Commission)
3. Demolition and Building Permits (Department of Public Works and Environmental Management)
4. Special Flood Hazard Area Development Permit (Department of Planning)
5. Grading permit (Department of Public Works and Environmental Management)

State of Hawaii

1. Noise Permit as applicable (Department of Health)
2. Disability and Communication Access Board (DCAB)
3. National Pollutant Discharge Elimination System Permit (NPDES) (Department of Health)

Chapter X

Parties Consulted During the Preparation of the Draft Environmental Assessment; Letters Received and Responses to Substantive Comments

X. PARTIES CONSULTED DURING THE PREPARATION OF THE DRAFT ENVIRONMENTAL ASSESSMENT; LETTERS RECEIVED AND RESPONSES TO SUBSTANTIVE COMMENTS

The following parties were consulted during the preparation of the Draft EA. Consultation with the listed Native Hawaiian organizations will take place during the Draft EA process in compliance with Section 106 of the National Historic Preservation Act. These organizations will receive copies of the Draft EA. Agency comments and responses to substantive comments are also included in this section.

1. Ranae Ganske-Cerizo, Acting District Conservationist
Natural Resources Conservation Service
U.S. Department of Agriculture
210 Imi Kala Street, Suite 209
Wailuku, Hawaii 96793-2100

2. George Young, P.E.
Chief, Regulatory Branch
U.S. Department of the Army
U.S. Army Engineer District, Hnl.
Attn: CEPOH-EC-R
Bldg. 230, Room 201
Fort Shafter, Hawaii 96858-5440

3. Robert P. Smith
Pacific Islands Manager
U. S. Fish and Wildlife Service
300 Ala Moana Blvd., #3-122, Box 50088
Honolulu, Hawaii 96813

4. Micah Kane, Chairman
State of Hawaii
Department of Hawaiian Home Lands
P.O. Box 1879
Honolulu, Hawaii 96805

5. Chiyome L. Fukino, M.D., Director
State of Hawaii
Department of Health
P.O. Box 3378
Honolulu, Hawaii 96801

6. Herbert Matsubayashi
District Environmental Health Program Chief
State of Hawaii
Department of Health
54 High Street
Wailuku, Hawaii 96793

7. Peter T. Young, Director
State of Hawaii
Department of Land and Natural Resources
P. O. Box 621
Honolulu, Hawaii 96809

8. Jason Koga, District Land Agent
Maui District Land Office
State of Hawaii
Department of Land and Natural Resources
54 South High Street, Room 101
Wailuku, Hawaii 96793

9. Melissa Kirkendall, Ph.D.
State Historic Preservation Division
Department of Land and Natural Resources
Maui District Office
130 Mahalani Street
Wailuku, Hawaii 96793

10. Nathan Napoka, Chief
State Historic Preservation Division
Department of Land and Natural Resources
History and Culture Branch
Kakuhihewa Building, Room 555
601 Kamokila Boulevard
Kapolei, Hawaii 96707

11. Skippy Hau, Aquatic Biologist
State of Hawaii
Division of Aquatic Resources
Department of Land and Natural Resources
130 Mahalani Street
Wailuku, Hawaii 96793

12. Melanie Chinen, Administrator
State Historic Preservation Division
Department of Land and Natural Resources
601 Kamokila Blvd., Room 555
Kapolei, Hawaii 96707

13. Rodney K. Haraga, Director
State of Hawaii
Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813

14. Fred Cajigal, Maui District Engineer
State of Hawaii
Department of Transportation
Highways Division
650 Palapala Drive
Kahului, Hawaii 96732

15. Clyde Namu'o, Administrator
Office of Hawaiian Affairs
711 Kapiolani Boulevard, Suite 500
Honolulu, Hawaii 96813

16. Carl Kaupalolo, Chief
County of Maui
Department of Fire and Public Safety
200 Dairy Road
Kahului, Hawaii 96732

17. Michael W. Foley, Director
County of Maui
Department of Planning
250 South High Street
Wailuku, Hawaii 96793

18. Glenn Correa, Director
County of Maui
Department of Parks and Recreation
700 Hali'a Nakoa Street
Wailuku, Hawaii 96793

19. Tom Phillips, Chief
County of Maui
Police Department
55 Mahalani Street
Wailuku, Hawaii 96793

20. Gilbert Coloma-Agaran, Director
County of Maui
Department of Public Works and Environmental Management
200 South High Street
Wailuku, Hawaii 96793

21. Kyle Ginoza, Director
County of Maui
Department of Transportation
200 South High Street
Wailuku, Hawaii 96793

22. George Tengan, Director
County of Maui
Department of Water Supply
200 South High Street
Wailuku, Hawaii 96793

23. Patty Nishiyama, Executive Director
Na Kupuna O Maui
320 Kaeo Place
Lahaina, Hawaii 96761

24. Thelma Shimaoka, Community Resource Coordinator
Office of Hawaiian Affairs
140 Ho'ohana Street, Suite 206
Kahului, Hawaii 96732

25. Vanessa Medeiros, District Supervisor
Department of Hawaiian Home Lands
Maui District Office
655 Kaumualii Street
Wailuku, Hawaii 96793

26. Kim Ball, President
Hi-Tech Surf & Sports
425 Koloa Street
Kahului, Hawaii 96732

27. David Jung
Island Marine Activities
Molokai Ferry
658 Front Street, Suite 101
Lahaina, Hawaii 96761

28. Don Couch, Executive Assistant
Office of the Mayor
County of Maui
200 South High Street
Wailuku, Hawaii 96793

29. Steve Knight
Expeditions
Lahaina/Lanai Passenger Ferry
658 Front Street, Suite 127
Lahaina, Hawaii 96761

30. Betty Morris
20 Hauoli Street, Apt. 211
Wailuku, Hawaii 96793

31. Christopher Shiebler
30 Hauoli Street, #412
Wailuku, Hawaii 96793

32. Tony Parrinella
30 Hauoli Street, #406
Wailuku, Hawaii 96793

33. Donald Perry
15 Laie Iki Place
Makawao, Hawaii 96768

34. Irene Bowie, PWF
300 Maalaea Road, #21
Wailuku, Hawaii 96793

35. George N. Kaya
Governor's Liaison, Maui
2264 Aupuni Street, #1
Wailuku, Hawaii 96793

36. Marsha Wienert
Tourism Liaison
250 South Hotel Street, 5th Floor
Honolulu, Hawaii 96813

37. Tim Lyons
The Legislative Center
677 Ala Moana Boulevard, Suite 815
Honolulu, Hawaii 96813

38. Dr. Ted Fox
Maalaea Community Association
1819 South Kihei Road, Suite #D103
Kihei, Hawaii 96753

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

JAN 11 2005

REPLY TO
ATTENTION OF

January 6, 2005

Regulatory Branch

Mr. Mich Hirano
Project Planner
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, HI 96793

Dear Mr. Hirano:

This responds to your request for written comments for a draft Environmental Assessment (dEA) which will address activities and impacts of the proposed Repairs and Upgrading to Existing Ferry Terminal Facilities, Maalaea Small Boat Harbor, Maui Island (on 29.51 acres on TMKs (2) 3-6-01: pors. 2, 49 and (2) 3-8-14: 28).

The present scope of the dEA excludes proposed work considered repair and replacement, such as the existing loading dock. The omission of information regarding the proposed work to this particular structure does not enable us to determine that there will, or will be no potential for waters of the U.S. to be impacted by the proposed activities within the improvement area. Upon our receipt of additional information that work associated with the loading dock will, or will not involve the discharge of dredged or fill material into Maalaea Harbor, or that structural work in, under, or above Maalaea Harbor will or will not occur, it may be determined whether a Department of Army (DA) permit for Section 404 activities of the Clean Water Act and Section 10 activities of the Rivers and Harbors Act may, or may not be, required for the proposed Maalaea Small Boat Harbor.

Thank you for your consideration of potential impacts to the aquatic environment of Maalaea Bay. Please contact Mr. Farley Watanabe of my staff at 438-7701, or facsimile 438-4060, if you have any questions or need additional information. Please refer to File Number POH-2004-1130 in any future correspondence with us.

Sincerely,

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

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO

February 24, 2005

George Young, Chief
Department of the Army
Regulatory Branch
U. S. Army Engineer District, Honolulu
Building 230
Honolulu, Hawaii 96858

SUBJECT: Early Consultation Comments on Proposed Upgrades and Improvements to Maalaea Small Boat Harbor, Maalaea, Maui, Hawaii, TMK Nos. (2) 3-6-01:02, 49 (por.) and 3-8-14:28

Dear Chief Young:

Thank you for your letter of January 6, 2005, responding to our request for early consultation comments for the proposed upgrades and improvements at the Maalaea Small Boat Harbor. In response to your comments, we note that the Department of Land and Natural Resources will coordinate with your office to determine whether waters of the U. S. have the potential to be impacted by the proposed project and whether or not a Department of the Army permit will be required.

Thank you again for your comments on the proposed action. A copy of the Draft Environmental Assessment will be provided to your office for review and comment.

Very truly yours,

Mich Hirano, AICP
Project Manager

MH:yp
cc: Eric Hirano, Department of Land and Natural Resources
fukunagalmaalaearmy.res

environment
planning
305 High Street, Suite 104 Wailuku, Hawaii 96793 ph: (808)244-2015 fax: (808)244-8729 planning@mhinconline.com

LINDA LINGLE
GOVERNOR
STATE OF HAWAII

DEC 17 2004

MICAH A. KANE
CHAIRMAN
HAWAIIAN HOMES COMMISSION

BEN HENDERSON
DEPUTY TO THE CHAIRMAN

KAULANA H. PARK
EXECUTIVE ASSISTANT

STATE OF HAWAII

DEPARTMENT OF HAWAIIAN HOME LANDS

P.O. BOX 1879

HONOLULU, HAWAII 96805

December 15, 2004

Mr. Micah Hirano, Planner
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Mr. Hirano:

Thank you for the opportunity to review the proposed repairs and upgrading project for the existing Interisland Ferry Terminal Facilities and Maalaea Small Boat Harbor improvements on Maui. The Department of Hawaiian Home Lands has no comments to offer.

Should you have any questions, please call the Planning Office at (808) 586-3836.

Aloha and mahalo,

for Micah A. Kane, Chairman
Hawaiian Homes Commission

LINDA LINGLE
GOVERNOR OF HAWAII

DEC 3 0 2004

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

LORRIN W. PANG, M. D., M. P. H.
DISTRICT HEALTH OFFICER

STATE OF HAWAII
DEPARTMENT OF HEALTH
MAUI DISTRICT HEALTH OFFICE
54 HIGH STREET
WAILUKU, MAUI, HAWAII 96793-2102

December 28, 2004

Mr. Mich Hirano, AICP
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawai`i 96793

Dear Mr. Hirano:

Subject: **Maalaea Small Boat Harbor Upgrade and Improvements**
TMK: (2) 3-6-01: 02 & por. 49; (2) 3-8-14: 28

Thank you for the opportunity to participate in the early consultation process for the environmental assessment. The following comments are offered:

1. National Pollutant Discharge Elimination System (NPDES) permit coverage is required for this project. The Clean Water Branch should be contacted at 808 586-4309.

2. The noise created during the construction phase of the project may exceed the maximum allowable levels as set forth in Hawaii Administrative Rules (HAR), Chapter 11-46, "Community Noise Control". A noise permit may be required and should be obtained before the commencement of work.

In reference to HRS 343 Exempt Project Component 3, "two (2) wastewater treatment systems to replace the existing three (3) cesspools . . .", it is recommended that the applicant consult with the Wastewater Branch of the Department of Health. Wastewater systems in this area are prone to failure. Careful planning should be employed so the best type of systems are installed and placed in the best locations to ensure that these systems can be operated and maintained as efficiently as possible.

Although it is not a requirement, it is recommended that the applicant look into the feasibility of installing sewage pumpout facilities for recreational and commercial vessels.

Should you have any questions, please call me at 984-8230.

Sincerely,

Herbert S. Matsubayashi
District Environmental Health Program Chief

c: WWB

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO

February 24, 2005

Herbert Matsubayashi,
District Environmental Health
Program Chief
State of Hawaii
Department of Health
Maui District Health Office
54 High Street
Wailuku, Hawaii 96793

SUBJECT: Early Consultation Comments on Proposed Upgrades and Improvements to Maalaea Small Boat Harbor, Maalaea, Maui, Hawaii, TMK Nos. (2) 3-6-01:02, 49 (por.) and 3-8-14:28

Dear Mr. Matsubayashi:

Thank you for your letter of December 28, 2004, responding to our request for early consultation comments for the proposed upgrades and improvements at the Maalaea Small Boat Harbor. In response to your comments, we note the following:

1. The applicant acknowledges that the proposed project will require a National Pollutant Discharge Elimination System permit coverage. The applicant will coordinate with the Clean Water Branch, as appropriate.

2. The applicant acknowledges that a noise permit may be required for the construction phase of the proposed project and will coordinate with your office, as appropriate.

3. The applicant acknowledges the need for careful planning regarding the proposed, new wastewater systems in the proposed action. Coordination will be undertaken with the Wastewater Branch, as appropriate, to ensure the operational stability and efficiency of the new wastewater systems.

4. A sewer pump out will be provided to service the inter-island ferry.

planning environment

305 High Street, Suite 104 Wailuku, Hawaii 96793 ph: (808)244-2015 fax: (808)244-8729 planning@mhinconline.com

Thank you again for your comments on the proposed action. A copy of the Draft Environmental Assessment will be provided to your office for review and comment.

Very truly yours,

Mich Hirano, AICP
Project Manager

MH:yp
cc: Eric Hirano, Department of Land and Natural Resources
fukunaga\maalaea\mauidoh.res

DEC 3 0 2004

LINDA LINGLE
GOVERNOR OF HAWAII

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

DAN DAVIDSON
DEPUTY DIRECTOR - LAND

YVONNE Y. IZU
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
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CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

December 29, 2004

LD-NAV
FERRYTERMINALDLNR.RCM

Munekiyo and Hiraga, Inc.
Mich Hirano, Planner
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Mr. Hirano:

SUBJECT: Proposed Repairs and Upgrading to Existing Interisland Ferry Terminal Facilities and Related Improvements at the Maalaea Small Boat Harbor, Island of Maui, Hawaii

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

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

- Division of Aquatic Resources
- Division of Forestry and Wildlife
- Engineering Division
- Division of Boating and Ocean Recreation
- Commission on Water Resource Management
- Office of Conservation and Coastal Lands
- Land-Maui District Land Office
- Land-Planning and Development

Enclosed please find a copy of the Engineering Division and the Division of Aquatic Resources' comment.

Based on the attached responses the Department of Land and Natural Resources has no other comment to offer on the subject matter.

If you have any questions, please feel free to contact Nicholas A. Vaccaro of the Land Division Support Services Branch at 1-808-587-0384.

Very truly yours,

DIERDRE S. MAMIYA
Administrator

C: MDLO

LINDA LINGLE
GOVERNOR OF HAWAII

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

DAN DAVIDSON
DEPUTY DIRECTOR - LAND

YVONNE Y. IZU
DEPUTY DIRECTOR - WATER

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COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
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STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

December 14, 2004
MUNEKIYO/HIRAGA

LD-NAV
FERRYTERMINALDLNR.CMT
Suspense Date: 12/22/04

'04 DEC 15 AM 10:07 ENGINEERING

MEMORANDUM:

TO: XXX Division of Forestry and Wildlife
XXX Division of Aquatic Resources
✓XXX Engineering Division
XXX Division of Boating and Oce3an Recreation
XXX Land-Maui District Land Office
XXX Land-Planning and Development
XXX Office of Conservation and Coastal Lands
XXX Commission on Water Resource Management

FROM: Dierdre S. Mamiya, Administrator
Land Division

SUBJECT: Proposed Repairs and Upgrading to Existing Interisland Ferry Terminal Facilities and Related Improvements at the Maalaea Small Boat Harbor, Island of Maui (DLNR Project)

Please review the attached letter dated December 8, 2004 and maps (Proposed project summary) pertaining to the subject matter and submit your comment (if any) on Division letterhead signed and dated by the suspense date.

Should you have any questions, please contact Nicholas A. Vaccaro at 587-0384. If this office does not receive your comments by the suspense date, we will assume there are no comments.

( ) We have no comments.

(X) Comments attached.

Division: Engineering

Signed:

Date: 12/28/04

Print Name: ERIC T. HIRANO, CHIEF ENGINEER

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LA/NAV

Ref.: FERRYTERMINALDLNR.CMT
Maui.385

COMMENTS

( ) We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone ___.

(X) **Please take note that the project site according to the Flood Insurance Rate Map (FIRM), is located in Zones C and V18. V18 is an area of 100-year coastal flood with velocity (wave action); base flood elevation (EL 11) and flood hazard factors determined. National Flood Insurance Program (NFIP) does not regulate development within Zone C; however, it does regulate development within Zone V18 as indicated in bold letters below.**

( ) Please note that the correct Flood Zone Designation for the project site according to the Flood Insurance Rate Map (FIRM) is ___.

(X) **Please note that the project *must comply with the* rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal Regulations (44CFR), whenever development within a Special Flood Hazard Area is undertaken. If there are any questions, please contact the State NFIP Coordinator, Ms. Carol Tyau-Beam, of the Department of Land and Natural Resources, Engineering Division at (808) 587-0267.**

Please be advised that 44CFR indicates the minimum standards set forth by the NFIP. Your Community's local flood ordinance may prove to be more restrictive and thus take precedence over the minimum NFIP standards. If there are questions regarding the local flood ordinances, please contact the applicable County NFIP Coordinators below:

( ) Mr. Robert Sumimoto at (808) 523-4254 or Mr. Mario Siu Li at (808) 523-4247 of the City and County of Honolulu, Department of Planning and Permitting.

( ) Mr. Kelly Gomes at (808) 961-8327 (Hilo) or Mr. Kiran Emler at (808) 327-3530 (Kona) of the County of Hawaii, Department of Public Works.

(X) Mr. Francis Cerizo at (808) 270-7771 of the County of Maui, Department of Planning.

( ) Mr. Mario Antonio at (808) 241-6620 of the County of Kauai, Department of Public Works.

( ) The applicant should include project water demands and infrastructure required to meet water demands. Please note that the implementation of any State-sponsored projects requiring water service from the Honolulu Board of Water Supply system must first obtain water allocation credits from the Engineering Division before it can receive a building permit and/or water meter.

( ) The applicant should provide the water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update.

( ) Additional Comments: _____

_____

( ) Other: _____

_____

Should you have any questions, please call Mr. Andrew Monden of the Planning Branch at 587-0229.

Signed: _____
ERIC T. HIRANO, CHIEF ENGINEER

Date: 12/28/04

LINDA LINGLE
GOVERNOR OF HAWAII

DIVISION OF AQUATIC RESOURCES
DIRECTOR
COM FISHERIES
AQ PROGRAM
AQ PROGRAM
STAT WILD
FP
DAR
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CWRM
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STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
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HONOLULU, HAWAII 96809

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LAND DIVISION
2004 DEC 28 P 4:05

DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

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

DAN DAVIDSON
DEPUTY DIRECTOR - LAND

YVONNE Y. IZU
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
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CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
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HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

December 14, 2004
MUNEKIYO/HIRAGA

LD-NAV
FERRYTERMINALDLNR.CMT
Suspense Date: 12/22/04

MEMORANDUM:

RECEIVED
DEC 21 2004
AQUATIC RESOURCES

TO: XXX Division of Forestry and Wildlife
✓XXX Division of Aquatic Resources
XXX Engineering Division
XXX Division of Boating and Oce3an Recreation
XXX Land-Maui District Land Office
XXX Land-Planning and Development
XXX Office of Conservation and Coastal Lands
XXX Commission on Water Resource Management

FROM: Dierdre S. Mamiya, Administrator
Land Division

SUBJECT: Proposed Repairs and Upgrading to Existing Interisland Ferry Terminal Facilities and Related Improvements at the Maalaea Small Boat Harbor, Island of Maui (DLNR Project)

Please review the attached letter dated December 8, 2004 and maps (Proposed project summary) pertaining to the subject matter and submit your comment (if any) on Division letterhead signed and dated by the suspense date.

Should you have any questions, please contact Nicholas A. Vaccaro at 587-0384. If this office does not receive your comments by the suspense date, we will assume there are no comments.

( ) We have no comments. (X) Comments attached.

Division: Aquatic Resources Signed: [signature]

Date: 12/27/04 Print Name: WILLIAM DEVICK

SUSPENSE DATE: December 22, 2004

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

MEMORANDUM

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

Comments Requested By: Dede Mamiya - Land Division

Date of Request: 12/14/04 Date Received: 12/21/04

Summary of Project

Title: Harbor Repair, Upgrading and Improvements

Proj. By: DLNR

Location: Maalaea Small Boat Harbor, Maui

Brief Description:

The DLNR plans to repair, upgrade and related landside improvements of the interisland commuter ferry terminal facilities at the Maalaea Small Boat Harbor, Maui

Comments:

The activity proposed is not likely to diminish further, aquatic resource values in Maalaea Harbor which is in a highly developed and modified area. Significant long-term impacts adverse to aquatic resource values are not expected from the activities proposed. However we suggest the following mitigation measures to insure minimum impact to the aquatic environment.

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

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

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

D. Extreme care must be taken to ensure that no debris, petroleum products, or deleterious materials or wastes be allowed to fall, flow, leach, or otherwise enter the Maalaea Small Boat Harbor

cc: Jeff Newman, USFWS

LINDA LINGLE
GOVERNOR OF HAWAII

04 DEC 15 P2:15

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

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

DAN DAVIDSON
DEPUTY DIRECTOR - LAND

YVONNE Y. IZU
DEPUTY DIRECTOR - WATER

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KAHOOLAWE ISLAND RESERVE COMMISSION
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Suspense Date: 12/22/04

December 14, 2004
MUNEKIYO/HIRAGA

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LAND DIVISION
2004 DEC 16 P 3:21

MEMORANDUM:

Fr: To: TO:
XXX Division of Forestry and Wildlife
XXX Division of Aquatic Resources
XXX Engineering Division
XXX Division of Boating and Oce3an Recreation
XXX Land-Maui District Land Office
XXX Land-Planning and Development
XXX Office of Conservation and Coastal Lands
✓ XXX Commission on Water Resource Management

To: FROM: Dierdre S. Mamiya, Administrator
Land Division

SUBJECT: Proposed Repairs and Upgrading to Existing Interisland Ferry Terminal Facilities and Related Improvements at the Maalaea Small Boat Harbor, Island of Maui (DLNR Project)

Please review the attached letter dated December 8, 2004 and maps (Proposed project summary) pertaining to the subject matter and submit your comment (if any) on Division letterhead signed and dated by the suspense date.

Should you have any questions, please contact Nicholas A. Vaccaro at 587-0384. If this office does not receive your comments by the suspense date, we will assume there are no comments.

(✓) We have no comments.

( ) Comments attached.

Division: CWRM

Signed: Edwin T. Sakoda

Date: 12/15/04

Print Name: Edwin T. Sakoda

LINDA LINGLE
GOVERNOR OF HAWAII

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

DAN DAVIDSON
DEPUTY DIRECTOR - LAND

YVONNE Y. IZU
DEPUTY DIRECTOR - WATER

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STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

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LAND DIVISION

December 14, 2004
MUNEKIYO/HIRAGA

FERRYTERMINAL.DLNR.CMT
Suspense Date: 12/22/04

MEMORANDUM:

TO: XXX Division of Forestry and Wildlife
XXX Division of Aquatic Resources
XXX Engineering Division
✓XXX Division of Boating and Oce3an Recreation
XXX Land-Maui District Land Office
XXX Land-Planning and Development
XXX Office of Conservation and Coastal Lands
XXX Commission on Water Resource Management

FROM: Dierdre S. Mamiya, Administrator
Land Division

SUBJECT: Proposed Repairs and Upgrading to Existing Interisland Ferry Terminal Facilities and Related Improvements at the Maalaea Small Boat Harbor, Island of Maui (DLNR Project)

Please review the attached letter dated December 8, 2004 and maps (Proposed project summary) pertaining to the subject matter and submit your comment (if any) on Division letterhead signed and dated by the suspense date.

Should you have any questions, please contact Nicholas A. Vaccaro at 587-0384. If this office does not receive your comments by the suspense date, we will assume there are no comments.

(X) We have no comments. ( ) Comments attached.

Division: DOBOR Signed: R Rice

Date: 12/18/04 Print Name: R Rice

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO

February 24, 2005

Warren Wegesend, Jr., Administrator
State of Hawaii
Department of Land and Natural Resources
P. O. Box 621
Honolulu, Hawaii 96809

SUBJECT: Early Consultation Comments on Proposed Upgrades and Improvements to Maalaea Small Boat Harbor, Maalaea, Maui, Hawaii, TMK Nos. (2) 3-6-01:02, 49 (por.) and 3-8-14:28

Dear Mr. Wegesend:

Thank you for your letter of December 29, 2004, responding to our request for early consultation comments for the proposed upgrades and improvements at the Maalaea Small Boat Harbor. In response to your comments, we note the following:

1. The applicant acknowledges that the proposed project site is located in Flood Zones C and V18 and that Zone V18 has developmental regulations. The project will comply with the rules and regulations of the national Flood Insurance Program, as presented in Title 44 of the Code of Federal Regulations, as applicable, and the Maui County Code, Chapter 19.62, *"Flood Hazard Areas"*.

2. Best Management Practices will be implemented to minimize impacts to water quality and marine resources.

3. Construction-related materials will be stored so as to minimize impacts to the aquatic environment.

4. Construction-related materials will be free of pollutants.

5. The applicant will exercise extreme caution that no hazardous or potentially hazardous materials be allowed to enter the waters of the Maalaea Small Boat Harbor.

planning environment

305 High Street, Suite 104 Wailuku, Hawaii 96793 ph: (808)244-2015 fax: (808)244-8729 planning@mhinconline.com

Thank you again for your comments on the proposed action. A copy of the Draft Environmental Assessment will be provided to your office for review and comment.

Very truly yours,

Mich Hirano, AICP
Project Manager

MH:yp
cc: Eric Hirano, Department of Land and Natural Resources
fukunaga\maalaea\dlnr.res

JAN 0 5 2005

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

January 3, 2005

Mr. Mich Hirano
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Log No: 2004.3653
Doc No: 0412SC30

Dear Mr. Hirano:

SUBJECT: National Historic Preservation Act, Section 106 Compliance – Proposed Repairs and Upgrades to Existing Interisland Ferry Terminal Facilities and Related Landside Improvements at the Maalaea Small Boat Harbor
Ukumehame, Wailuku, Maui
TMK: (2) 3-6-001:002 and Por. 049

Thank you for the opportunity to comment on a pre-Environmental Assessment (EA) scoping letter on work proposed for the Maalaea Small Boat Harbor on Maui. We received your request for comments on December 9, 2004, and provide the following response. Our review is based on historic maps, aerial photographs, records, and reports maintained at the State Historic Preservation Division (SHPD). In addition, Thomas Lim and Susan Tasaki of our Architecture Branch and Melissa Kirkendall of our Archaeology Branch have conducted a site inspection.

The proposed undertaking will include the following actions:

- Replacement of the two-story Harbor Agent's office with a public comfort station and terminal facilities on the main floor and administrative offices on the second floor;
- Upgrade of the sewer pump station facilities on the West Breakwater;
- Upgrade of the electrical services on the West Breakwater; and
- New comfort station and parking area on the eastern portion of the project site

A portion of the work will be funded through the Federal Transit Administration.

Staff of our Architecture Branch believe that "no historic properties will be affected" by the proposed undertaking.

Our Archaeology Branch has recommended that an archaeological inventory survey with subsurface testing be conducted on portions of the Area of Potential Effect since it is possible that significant historic sites, including buried cultural layers, may be present. Once we receive and review a report of findings made from the survey, we shall be better able to recommend to you and your client any needed additional steps.

Should you have any questions about archaeological matters, please contact Melissa Kirkendall on Maui at 243-5169. Should you have any questions about architectural matters, please contact Thomas Lim on O`ahu at 692-8030. Should you have any questions about cultural matters please contact Nathan Napoka on O`ahu at 587-0192.

Sincerely,

Melanie A. Chinen
Deputy State Historic Preservation Officer

SC: slc

C: Carol Braegelmann, Environmental Protection Specialist, Office of Human & Natural Environment, Federal Transit Administration, 400 Seventh Street, SW, Washington, DC 20590
Gilbert Coloma-Agaran, Director, Dept of Public Works & Environmental Management, 250 S. High Street, Wailuku, HI 96793
Michael Foley, Director, Dept of Planning, 250 S. High Street, Wailuku, HI 96793
Eric Hirano, Administrator, Engineering Division, DLNR
Lee Keatinge, The President's Advisory Council on Historic Preservation
Thomas Lim, Branch Chief, Architecture Branch
Maui Section, Archaeology Branch
Maui Cultural Resources Commission, Dept of Planning, 250 S. High Street, Wailuku, HI 96793
Nathan Napoka, Branch Chief, History and Culture Branch
Richard Rice, Administrator, DOBOR, DLNR

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO

February 24, 2005

Melanie Chinen
State of Hawaii
Department of Land and Natural Resources
State Historic Preservation Division
Kakuhihewa Building, Room 555
601 Kamokila Boulevard
Kapolei, Hawaii 96707

SUBJECT: Early Consultation Comments on Proposed Upgrades and Improvements to Maalaea Small Boat Harbor, Maalaea, Maui, Hawaii, TMK Nos. (2) 3-6-01:02, 49 (por.) and 3-8-14:28

Dear Ms. Chinen:

Thank you for your letter of January 3, 2005, responding to our request for early consultation comments for the proposed upgrades and improvements at the Maalaea Small Boat Harbor. In response to your comments, we note the following:

1. We acknowledge that the Architecture Branch anticipates no historic properties to be impacted by the proposed project.

2. An archaeological inventory survey with subsurface testing has been conducted for the proposed project and will be submitted for review. We anticipate your review of that report and any recommendations that your Division may have.

305 High Street, Suite 104 Wailuku, Hawaii 96793 ph: (808)244-2015 fax: (808)244-8729 planning@mhinconline.com

Thank you again for your comments on the proposed action. A copy of the Draft Environmental Assessment will be provided to your office for review and comment.

Very truly yours,

Mich Hirano, AICP
Project Manager

MH:yp
cc: Eric Hirano, Department of Land and Natural Resources
fukunaga\maalaea\shpd.res

JAN 19 2005

LINDA LINGLE
GOVERNOR

RODNEY K. HARAGA
DIRECTOR

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

IN REPLY REFER TO:

STP 8.1524

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

January 4, 2005

Mr. Mich Hirano, AICP
Planner
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Mr. Hirano:

Subject: Maalaea Small Boat Harbor, Inter-Island Ferry Terminal Repairs and Upgrades, and Related Landside Improvements Project – Environmental Assessment Early Consultation

In reply to your request for our review of the subject project, we are providing the following comments:

1. The proposed upgrades, repairs and improvements indicate that there may be a need to meet higher current demand from users and activities including future demand and growth at the harbor. The rise in activity may result in increased traffic and may require roadway/intersection improvements and/or other mitigation measures. An assessment of the traffic impacts from the subject project, should be completed and provided for our review. In particular, the assessment should cover impacts to Honoapiilani Highway, North Kihei Road, and any roads connecting to Honoapiilani Highway or North Kihei Road in the area of the project, and any relevant intersections.

2. Plans for construction work within and/or adjoining our highway right-of-ways must be submitted for our review and approval, along with appropriate construction and environmental permits. Preparation and submittal of construction plans should be coordinated with our Highways Division Maui District Office.

We appreciate the opportunity to provide our comments.

Very truly yours,

for RODNEY K. HARAGA
Director of Transportation

c: DLNR, Boating & Ocean Recreation Division

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO

February 24, 2005

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

SUBJECT: Early Consultation Comments on Proposed Upgrades and Improvements to Maalaea Small Boat Harbor, Maalaea, Maui, Hawaii, TMK Nos. (2) 3-6-01:02, 49 (por.) and 3-8-14:28

Dear Mr. Haraga:

Thank you for your letter of January 4, 2005, responding to our request for early consultation comments for the proposed upgrades and improvements at the Maalaea Small Boat Harbor. In response to your comments, we note the following:

1. A traffic evaluation study is being prepared for the proposed project and will be included in the Draft Environmental Assessment (EA).

2. Construction plans will be made available for your review. Coordination in this regard will be undertaken with the Maui District Office. A list of required environmental and construction permits for the proposed project will be included in the Draft EA

Thank you again for your comments on the proposed action. A copy of the Draft EA will be provided to your office for review and comment.

Very truly yours,

Mich Hirano, AICP
Project Manager

MH:yp
cc: Eric Hirano, Department of Land and Natural Resources
fukunaga\maalaealdot.res

environment
planning

305 High Street, Suite 104 Wailuku, Hawaii 96793 ph: (808)244-2015 fax: (808)244-8729 planning@mhinconline.com

DEC 16 2004

ALAN M. ARAKAWA
MAYOR

CARL M. KAUPALOLO
CHIEF

NEAL A. BAL
DEPUTY CHIEF

COUNTY OF MAUI
DEPARTMENT OF FIRE AND PUBLIC SAFETY

200 DAIRY ROAD
KAHULUI, MAUI, HAWAII 96732
(808) 270-7561
FAX (808) 270-7919

December 15, 2004

Munekiyo & Hiraga, Inc.
Attention: Mich Hirano, Planner
305 High Street, Suite 104
Wailuku, HI 96793

Subject: Proposed Repairs & Upgrading Existing Interisland Ferry Terminal Facilities & Related Landslide Improvements at the Maalaea Small Boat Harbor, Maui

Dear Mich Hirano,

I have had the opportunity to review the above subject. A detailed review will be conducted in the future when permits and plans are forwarded to our office. Topics that will be covered consist of water for fire protection and roadway widths for emergency vehicles. Please feel free to contact Lt. Scott English at 270-7122 if there are any questions.

Sincerely,

Valeriano F. Martin
Captain
Fire Prevention Bureau

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO

February 24, 2005

Valeriano F. Martin, Captain
Fire Prevention Bureau
County of Maui
Department of Fire and Public Safety
200 Dairy Road
Kahului, Hawaii 96732

SUBJECT: Early Consultation Comments on Proposed Upgrades and Improvements to Maalaea Small Boat Harbor, Maalaea, Maui, Hawaii
TMK Nos. (2) 3-6-01: 02, 49 (por.) and 3-8-14:28

Dear Captain Martin:

Thank you for your letter of December 15, 2004, responding to our request for early consultation comments for the proposed upgrades and improvements at the Maasaea Small Boat Harbor. We would like to provide the following information in response to your comments.

We confirm the proposed improvements will conform to the Maui County Code requirements and detailed plans for the water for fire protection and roadway widths will be submitted for your review and approval during the building permit application process.

Again thank you for your comments and participation in the early consultation process.

Very truly yours,

Mich Hirano, AICP
Project Manager

MH:yp
cc: Eric Hirano, Department of Land and Natural Resources
fukunaga\maalaea\mtd.res

planning environment

305 High Street, Suite 104 Wailuku, Hawaii 96793 ph: (808)244-2015 fax: (808)244-8729 planning@mhinconline.com

ALAN M. ARAKAWA
Mayor

MICHAEL W. FOLEY
Director

WAYNE A. BOTEILHO
Deputy Director

COUNTY OF MAUI
DEPARTMENT OF PLANNING

December 23, 2004

Mr. Mich Hirano, AICP
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Mr. Hirano:

RE: Preconsultation - Proposed Repairs and Upgrades to the Existing Interisland Ferry Terminal Facilities and Related Landside Improvements at the Maalaea Small Boat Harbor, TMK: 3-6-001: 002 and 049 (portion), Maalaea, Island of Maui, Hawaii (LTR 2004/4517)

The Maui Planning Department (Department) received your request for preconsultation comments in preparation of an Environmental Assessment (EA) as required by Chapter 343, HRS, and the National Environmental Policy Act (NEPA). The Department's comments are as follows:

1. The land use designations are as follows:

   a. State Land Use

      Parcels 2, 49, and 28 – Urban District

   b. Kihei-Makena Community Plan

      Parcel 2 – Light Industrial and Park
      Parcel 49 – Light Industrial
      Parcel 28 – Light Industrial

   c. County Zoning, Title 19, MCC:

      Parcel 2 – Light Industrial, Business Resort Community, Public Use, and Park
      Parcel 49 – Public Use
      Parcel 28 – Light Industrial

d. Other Designations

The project area is located within the Special Management Area and requires review in accordance with Chapter 205A, HRS, Coastal Zone Management, SMA Rules of the Maui Planning Commission, and the Shoreline Setback Rules of the Maui Planning Commission.

2. Your letter indicates multiple actions within the project area have been declared exempt by the Department of Land and Natural Resources (DLNR) from the Chapter 343, HRS, environmental review process. However, pursuant to §11-200-7, HAR, a group of actions proposed shall be treated as a single action when the component actions are phases or increments of a larger total undertaking. As such, the Department recommends including all actions within the scope of the environmental assessment.

3. Specifically, DLNR exempted the construction of two (2) new paved parking lots on both sides of the Access Road to Honoapiilani Highway under Exemption Class 2, "Replacement or reconstruction of existing structures and facilities where the new structure will be located generally on the same site and will have substantially the same purpose, capacity, density, height, and dimensions as the structure replaced." However, these parking areas are currently undeveloped and are not existing structures.

The Department is concerned with impacts of increased runoff and drainage from the newly hardened surfaces to the nearby coastal waters and recommends including the action within the scope of the environmental assessment.

4. Provide landscape planting and irrigation plans for parking areas.

Thank you for the opportunity to comment. Should you require additional clarification, please contact Ms. Kivette A. Caigoy, Environmental Planner, at 270-7735.

Sincerely,

MICHAEL W. FOLEY
Planning Director

MWF:KAC:lar
c: Wayne Boteilho, Deputy Planning Director
Kivette A. Caigoy, Environmental Planner
DLNR, Division of Boating and Ocean Recreation
OEQC
Project File
General File
K:\WP_DOCS\PLANNING\EA\PreConComments\2004\4517_MaalaeaHarborImprvmts.wpd

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO

February 24, 2005

Michael Foley, Director
County of Maui
Department of Planning
250 South High Street
Wailuku, Hawaii 96793

SUBJECT: Early Consultation Comments on Proposed Upgrades and Improvements to Maalaea Small Boat Harbor, Maalaea, Maui, Hawaii, TMK Nos. (2) 3-6-01:02, 49 (por.) and 3-8-14:28

Dear Mr. Foley:

Thank you for your letter of December 23, 2004, responding to our request for early consultation comments for the proposed upgrades and improvements at the Maalaea Small Boat Harbor. Our responses have been numbered to correspond to those of your comments.

1. We acknowledge the land use designations for the subject property. For clarification, we would like to confirm that "Business Resort Community" is in reference to "Business Resort Commercial" (B-R) and "Public Use" is in reference to the Public/Quasi-Public" district.

2. The Draft Environmental Assessment (EA) will discuss all components of the proposed project and their potential impacts.

3. The Department of Land and Natural Resources concurs that the development of a parking area at Parcel 28 is not an exempted action and is subject to the requirements of Chapter 343, HRS. It is noted that the project has been revised so that only the parking area on Parcel 28 will be developed.

4. Landscaping and irrigation plans are still at the conceptual level at this stage of the development process. Such plans will be provided at the appropriate point in the County land entitlement permitting process.

planning environment

305 High Street, Suite 104 Wailuku, Hawaii 96793 ph: (808)244-2015 fax: (808)244-8729 planning@mhinconline.com

Thank you again for your comments on the proposed action. A copy of the Draft EA will be provided to your office for review and comment.

Very truly yours,

Mich Hirano, AICP
Project Manager

MH:yp
cc: Eric Hirano, Department of Land and Natural Resources
fukunaga\msaalaea\planning.res

JAN 0 3 2005

ALAN M. ARAKAWA
Mayor

GLENN T. CORREA
Director

JOHN L. BUCK III
Deputy Director

(808) 270-7230
Fax (808) 270-7934

DEPARTMENT OF PARKS & RECREATION

700 Hali'a Nakoa Street, Unit 2, Wailuku, Hawaii 96793

December 28, 2004

Mich Hirano, AICP
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Mr. Hirano:

SUBJECT: Proposed Repairs and Upgrading to Existing Interisland Ferry Terminal Facilities and Related Landside Improvements at the Maalaea Small Boat Harbor, Maui

We have reviewed the Project Summary for the subject project and have no comments to the proposed action.

Thank you for the opportunity to review and comment. Should there be any questions, please contact Mr. Patrick Matsui, Chief of Parks Planning and Development, at 270-7387.

Sincerely,

GLENN T. CORREA
Director

c: Patrick Matsui, Chief of Parks Planning and Development

JAN 10 2005

POLICE DEPARTMENT
COUNTY OF MAUI

ALAN M. ARAKAWA
MAYOR

OUR REFERENCE
YOUR REFERENCE

55 MAHALANI STREET
WAILUKU, HAWAII 96793
(808) 244-6400
FAX (808) 244-6411

THOMAS M. PHILLIPS
CHIEF OF POLICE

KEKUHAUPIO R. AKANA
DEPUTY CHIEF OF POLICE

December 28, 2004

Mr. Mich Hirano, AICP
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, HI 96793

Dear Mr. Hirano:

SUBJECT: Proposed Repairs and Upgrading to Existing Interisland Ferry Terminal Facilities and Related Landside Improvements at the Maalaea Small Boat Harbor, Maui

Thank you for your letter of December 8, 2004, requesting comments on the above subject.

We have reviewed the information submitted for this project and have enclosed a copy of our comments. As always, thank you for giving us the opportunity to comment on this project.

Very truly yours,

Assistant Chief Sydney Kikuchi
for: Thomas M. Phillips
Chief of Police

c: Michael Foley, Planning Department

Enclosure

TO : THOMAS PHILLIPS, CHIEF OF POLICE, COUNTY OF MAUI

VIA : CHANNELS

COPY

FROM : BRAD HICKLE, POLICE OFFICER III, DISTRICT VI KIHEI

SUBJECT : PROPOSED REPAIRS AND UPGRADING TO EXISTING INTERISLAND FERRY TERMINAL FACILITIES AND RELATED LANDSIDE IMPROVEMENTS AT THE MAALAEA SMALL BOAT HARBOR, MAUI

On 12/16/04 this Officer received a copy of the request for early review and comments on the proposed Repairs and Upgrading to Existing Inter-Island Ferry Terminal Facilities and Related Landside Improvements at the Maalaea Small Boat Harbor.

The information was provided by Munekiyo & Hiraga, Inc. for the State of Hawaii, Department of Land and Natural Resources (DLNR).

CONTACT VIA PHONE:

Upon contacting the DLNR Office on Maui at about 1540 hours on 12/16/04, I spoke with Cherish ALMEIDA who related, "currently the enforcement at Maalaea Harbor is handled by DLNR Enforcement Division which is headed up by Randy AWO". ALMEIDA further related, "Richard RICE of the Honolulu Office would be the person to contact for additional information regarding the proposed harbor improvements," and she provided this Officer with the number 1-808-587-1966.

I spoke with Richard RICE via phone on 12/16/04 at about 1700 hours. Mr. RICE related the proposed Repairs and Upgrading to the Existing Inter-Island Ferry Terminal Facilities at Maalaea Harbor are primarily office building and needed infrastructure upgrades.

The proposed upgrades being submitted will facilitate watercraft currently using the harbor access area by providing upgraded sewage facilities, berthing areas and parking at the harbor. It is not being upgraded to assist larger crafts such as the new Super Ferry or Oceanliners.

COMMENTS/RECOMMENDATIONS:

I do not believe the proposed repairs and upgrades will affect police operations. I do not have any recommendations at this time.

Respectfully Submitted,

Officer Brad Hickle
12/16/04 1820 hours

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO

February 24, 2005

Thomas Philips, Chief
County of Maui
Police Department
55 Mahalani Street
Wailuku, Hawaii 96793

SUBJECT: Early Consultation Comments on Proposed Upgrades and Improvements to Maalaea Small Boat Harbor, Maalaea, Maui, Hawaii, TMK Nos. (2) 3-6-01:02, 49 (por.) and 3-8-14:28

Dear Chief Philips:

Thank you for your letter of December 28, 2004, responding to our request for early consultation comments for the proposed upgrades and improvements at the Maalaea Small Boat Harbor. We acknowledge that your Department will monitor the project as it progresses for any security or other concerns.

Thank you again for your comments on the proposed action. A copy of the Draft Environmental Assessment will be provided to your office for review and comment.

Very truly yours,

Mich Hirano, AICP
Project Manager

MH:yp
cc: Eric Hirano, Department of Land and Natural Resources
fukunaga\maalaea\mpd.res

environment
planning
305 High Street, Suite 104 Wailuku, Hawaii 96793 ph: (808)244-2015 fax: (808)244-8729 planning@mhinconline.com

ALAN M. ARAKAWA
Mayor

MILTON M. ARAKAWA, A.I.C.P.
Director

MICHAEL M. MIYAMOTO
Deputy Director

Telephone: (808) 270-7845
Fax: (808) 270-7955

COUNTY OF MAUI
DEPARTMENT OF PUBLIC WORKS AND ENVIRONMENTAL MANAGEMENT
200 SOUTH HIGH STREET
WAILUKU, MAUI, HAWAII 96793

JAN 25 2005

RALPH NAGAMINE, L.S., P.E.
Development Services Administration

TRACY TAKAMINE, P.E.
Wastewater Reclamation Division

CARY YAMASHITA, P.E.
Engineering Division

BRIAN HASHIRO, P.E.
Highways Division

Solid Waste Division

January 19, 2005

Mr. Mich Hirano, Planner
MUNEKIYO & HIRAGA, INC.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Mr. Hirano:

SUBJECT: PROPOSED REPAIRS AND UPGRADING TO EXISTING INTERISLAND FERRY TERMINAL FACILITIES AND LANDSLIDE IMPROVEMENTS
MAALAEA SMALL BOAT HARBOR
TMK: (2) 3-6-001:002

We reviewed the subject application and have the following comments:

1. All grading/grubbing work for the subject project shall comply with Chapter 20.08 (Soil Erosion and Sedimentation Control) of the Maui County Code. Best Management Practices shall be implemented to the maximum extent practicable to prevent pollutants including dust and sediment from discharging off the project site.

2. The subject project shall comply with the "Rules for the Design of Storm Drainage Facilities in the County of Maui".

3. Submit plan for disposal/recycling of demolition and construction waste.

If you have any questions regarding this letter, please call Michael M. Miyamoto at (808) 270-7845.

Sincerely,

for MILTON M. ARAKAWA, A.I.C.P.
Director

MMA:MMM:da
S:\LUCA\CZM\Maa_Sm_Boat_Harb_Ferry_Termr_Imp_36001002_da.wpd

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO

February 24, 2005

Milton Arakawa, Director
County of Maui
Department of Public Works
and Environmental Management
200 South High Street
Wailuku, Hawaii 96793

SUBJECT: Early Consultation Comments on Proposed Upgrades and Improvements to Maalaea Small Boat Harbor, Maalaea, Maui, Hawaii, TMK Nos. (2) 3-6-01:02, 49 (por.) and 3-8-14:28

Dear Mr. Arakawa:

Thank you for your letter of January 19, 2005, responding to our request for early consultation comments for the proposed upgrades and improvements at the Maalaea Small Boat Harbor. In response to your comments, we note the following:

1. All grading and grubbing work will comply with the relevant provisions of Chapter 20.08 of the Maui County Code. Best Management Practices will also be implemented to the maximum extent practicable.

2. The proposed inter-island commuter ferry pier improvements will comply with the "Rules for the Design of Storm Drainage Facilities in the County of Maui", as applicable.

3. Waste management plans will be submitted to your Department during the construction permitting phase of the proposed process.

305 High Street, Suite 104 Wailuku, Hawaii 96793 ph: (808)244-2015 fax: (808)244-8729 planning@mhinconline.com

Thank you again for your comments on the proposed action. A copy of the Draft Environmental Assessment will be provided to your office for review and comment.

Very truly yours,

Mich Hirano, AICP
Project Manager

MH:yp
cc: Eric Hirano, Department of Land and Natural Resources
fukunaga\maalaea\dpwem.res

ALAN M. ARAKAWA
MAYOR

GEORGE Y. TENGAN
DIRECTOR
JEFFREY T. PEARSON,
P.E.

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109
Telephone (808) 270-7816 • Fax (808) 270-7833

January 6, 2005

Mr. Mich Hirano, Planner
Munekiyo & Hiraga, Inc.
305 High Street Suite 104
Wailuku HI 96793

Subject: Proposed Repairs and Upgrading to Existing Interisland Ferry Terminal Facilities and Related *Landside Improvements at the Maalaea Small Boat Harbor, Maui*

Dear Mr. Hirano:

Thank you for the opportunity to provide comments on the preparation of this Environmental Assessment (EA). The Department of Water Supply provides the following information:

Source Availability and Consumption
The project area is served by the Central Maui System. The main sources of water for this system are the designated Iao aquifer, the Waihee aquifer, the Iao tunnel and the Iao-Waikapu Ditch. DWS will not issue reservations for future meters until new sources are brought on-line. Although the Department continues to issue meters for those ready to receive service at this time, it may also become necessary to stop issuing new meters altogether. The EA should address sources and anticipated potable and non-potable water use. The Maalaea Harbor is serviced by two 2-inch meters, one 1 ½-inch meter and one 2-inch meter. Average daily consumption for these meters total about 12,600 gallons. Additional water for this project beyond these meters, if needed, may not be available until new sources are on-line. Domestic and irrigation calculations should be submitted to the Department to verify meter capacity.

System Infrastructure
The Maalaea Harbor is serviced by an 8-inch water line and five fire hydrants along Maalaea Road. A section of the fire protection map is attached for your reference. Fire flow calculations will be required in the building permit process. Actual fire demand for structures is determined by fire flow calculations prepared, signed and stamped by a certified engineer or architect. The approved fire flow calculation methods for use include Guidance for Determination of Fire Flow- Insurance Service Office, 1974 and Fire Flow- Hawaii Insurance Bureau, 1991. Installation of a reduced pressure back-flow preventer approved by the Department is also required.

Pollution Prevention
The project overlies the Waikapu aquifer. The Department of Water Supply strives to protect the integrity of surface and groundwater resources by encouraging the applicant to adopt best management practices (BMPs) designed to minimize infiltration and runoff from all construction and vehicle operations. We have attached sample BMPs for principle operations for reference. Additional information can be obtained from the State Department of Health.

Conservation
We recommend that the following water conservation measures be included in the EA and implemented in project design and construction:
Eliminate Single-Pass Cooling: Single-pass, water-cooled system should be eliminated per Maui County Code Subsection 14.21.20. Although prohibited by code, single-pass water cooling is still manufactured into some models of air-conditioners, freezers, and commercial refrigerators.
Utilize Low-Flow Fixtures and Devices: Maui County Code Subsection 16.20A.680 requires the use of low-flow water fixtures and devices in faucets, showerheads, urinals, water closets and hose bibs. Water conserving washing machines, ice-makers and other units are also available.

Maintain Fixtures to Prevent Leaks: A simple, regular program of repair and maintenance can prevent the loss of hundreds or even thousands of gallons a day. Refer to the attached handout, "The Costly Drip". The applicant should establish a regular maintenance program.
Use Climate-adapted Plants: The project is located in the "Maui County Planting Plan" - Plant Zone 5. Native plants adapted to the area conserve water and protect the watershed from degradation due to invasive alien species. Please refer to the attached brochure: "Saving Water In The Yard - What and How to Plant In Your Area" for all landscaping purposes.
Prevent Over-Watering By Automated Systems: Provide rain-sensors on all automated irrigation controllers in common areas. Check and reset controllers at least once a month to reflect the monthly changes in evapo-transpiration rates at the site. As an alternative, provide the more automated, soil-moisture sensors on controllers.

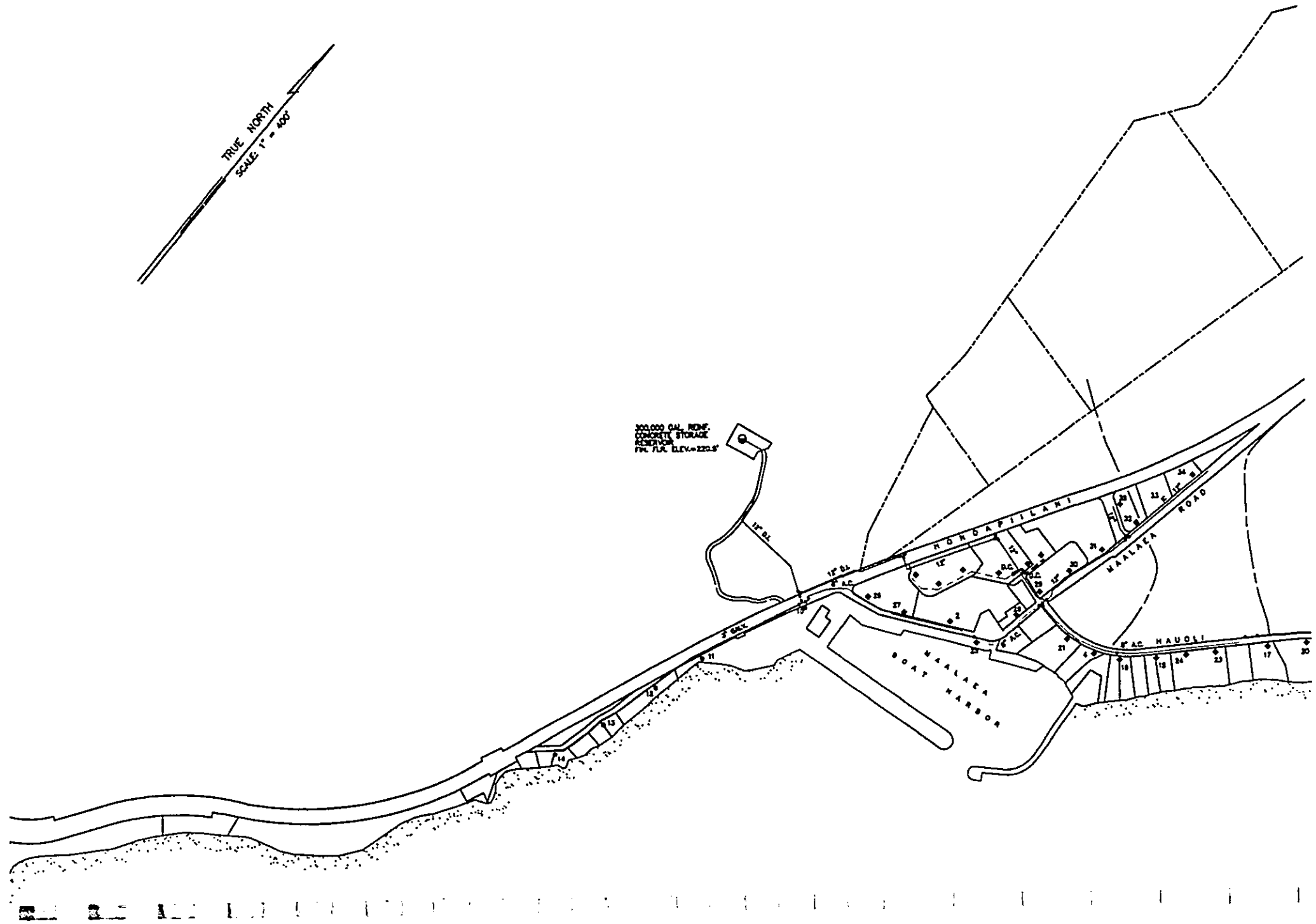
Should you have any questions, please contact our Water Resources and Planning Division at 270-7199.

Sincerely,

George Y. Tengan
Director
emb

c: engineering division
attachments:
Section of fire protection map
Maui County Planting Plan -Saving Water in the Yard-What and How to Plant in your Area
Ordinance No. 2108 - A Bill for an Ordinance Amending Chapter 16.20 of the Maui County Code, Pertaining to the Plumbing Code
A Checklist of Water Conservation Ideas For Commercial Buildings
Selected BMP's from "Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters"-EPA

C:\WPdocs\EAs EISs\Maalaea Small Boat Harbor repairs early.wpd


TRUE NORTH
SCALE: 1" = 400'
300,000 GAL. REINF. CONCRETE STORAGE RESERVOIR
FIN. FLR. ELEV.=220.5'
12" DI.
8" A.C.
HONOAPIILANI
MAALAEA ROAD
MAALAEA BOAT HARBOR
8" A.C. HAUOLI

A Checklist of Water Conservation Ideas For

Commercial Buildings

This checklist provides water conservation tips successfully implemented by industrial and commercial users. This list has been revised from the original copy first published and distributed by the Los Angeles Department of Water and Power.

☐ General suggestions

Increase employee awareness of water conservation.

Install signs encouraging water conservation in employee and customer restrooms.

When cleaning with water is necessary, use budgeted amounts.

Determine the quantity and purpose of water being used.

Read water meter weekly to monitor success of water conservation efforts.

Assign an employee to monitor water use and waste.

Seek employee suggestions on water conservation; put suggestion boxes in prominent areas.

Determine other methods of water conservation.

☐ Building maintenance

Check water supply for leaks.

Turn off any unnecessary flows.

Repair dripping faucets and showers and continuously running or leaking toilets.

Install faucet aerators where possible.

Reduce toilet water use by adjusting flush valves or installing dams and flapper mechanisms.

As appliances or fixtures wear out, replace them with water-saving models.

Shut off water supply to equipment rooms not in use.

Minimize the water used in cooling equipment in accordance with manufacturers recommendations. Shut off cooling units when not needed.

☐ Cafeteria area

Turn off continuous flow used to clean the drain trays.

Turn off dishwasher when not in use. Wash full loads only.

Use water from steam tables to wash down cooking area.

Do not use running water to melt ice or frozen foods.

Use water-conserving ice makers.

ORDINANCE NO. 2108

BILL NO. 6 (1992)

Draft 1

A BILL FOR AN ORDINANCE AMENDING CHAPTER 16.20 OF THE MAUI COUNTY CODE, PERTAINING TO THE PLUMBING CODE

BE IT ORDAINED BY THE PEOPLE OF THE COUNTY OF MAUI:

SECTION 1. Title 16 of the Maui County Code is amended by adding a new section to Chapter 10 of the Uniform Plumbing Code to be designated and to read as follows:

"16.20.675 Section 1050 added. Chapter 10 of the Uniform Plumbing Code is amended by adding a new section, pertaining to low-flow water fixtures and devices, to be designated and to read as follows:

Sec. 1050 Low-flow water fixtures and devices. (a) This section establishes maximum rates of water flow or discharge for plumbing fixtures and devices in order to promote water conservation.

(b) For the plumbing fixtures and devices covered in this section, manufacturers or their local distributors shall provide proof of compliance with the performance requirements established by the American National Standards Institute (ANSI) and such other proof as may be required by the director of public works. There shall be no charge for this registration process.

(c) Effective December 31, 1992, only plumbing fixtures and devices specified in this section shall be offered for sale or installed in the County of Maui, unless otherwise indicated in this section. All plumbing fixtures and devices which were installed before December 31, 1992, shall be allowed to be used, repaired or replaced after December 31, 1992.

(1) Faucets (kitchen): All kitchen and bar sink faucets shall be designed, manufactured, installed or equipped with a flow control device or aerator which will prevent a water flow rate in excess of two and two-tenths gallons per minute at sixty pounds per square inch of water pressure.

(2) Faucets (lavatory): All lavatory faucets shall be designed, manufactured, installed or equipped with a flow control device or aerator which will prevent a water flow rate in excess of two and two tenths gallons per minute at sixty pounds per square inch of water

pressure.

(3) Faucets (public rest rooms): In addition to the lavatory requirements set forth in paragraph (2), lavatory faucets located in rest rooms intended for use by the general public shall be of the metering or self-closing types.

(4) Hose bibbs: Water supply faucets or valves shall be provided with approved flow control devices which limit flow to a maximum three gallons per minute.

EXCEPTIONS: (A) Hose bibbs or valves not used for fixtures or equipment designated by the director of public works.

(B) Hose bibbs, faucets, or valves serving fixed demand, timing, or water level control appliances, and equipment or holding structures such as water closets, pools, automatic washers, and other similar equipment.

(5) Showerheads: Showerheads, except where provided for safety or emergency reasons, shall be designed, manufactured, or installed with a flow limitation device which will prevent a water flow rate in excess of two and one-half gallons per minute at eighty pounds per square inch of water pressure. The flow limitation device must be a permanent and integral part of the showerhead and must not be removable to allow flow rates in excess of two and one-half gallons per minute or must be mechanically retained requiring force in excess of eight pounds to remove.

(6) Urinals: Urinals shall be designed, manufactured, or installed so that the maximum flush will not exceed one gallon of water. Adjustable type flushometer valves may be used provided they are adjusted so the maximum flush will not exceed one and six tenths gallons of water.

(7) Water closets (toilets): Water closets shall be designed, manufactured, or installed so that the maximum flush will not exceed one and six tenths gallons of water.

(d) Beginning December 31, 1992, it is unlawful to sell or install any plumbing fixtures or devices not specified in this section, except as permitted under this section.

(e) The director of public works may exempt the use of low-flow water fixtures and devices if there is a finding that the use of such fixtures and devices would not be consistent with accepted engineering practices and would be detrimental to the public health, safety and welfare.

(f) Any person violating this section shall be fined $250 for each violation and shall correct all instances of non-compliance for which a citation is issued. Violation of this section shall constitute a violation as defined in section 701-107 Hawaii Revised Statutes and shall be enforceable by employees of the department of public works. The foregoing fine may also be imposed in a civil, administrative proceeding pursuant to Rules and Regulations adopted by the department of public works in accordance with chapter 91 Hawaii Revised Statutes."

SECTION 2. New material is underscored. In printing this bill, the County Clerk need not include the underscoring.

SECTION 3. This ordinance shall take effect upon its approval.

APPROVED AS TO FORM
AND LEGALITY:

HOWARD M. FUKUSHIMA
Deputy Corporation Counsel
County of Maui
c:\wp51\ords\flows4\pk

E HEREBY CERTIFY that the foregoing BILL NO. 6 (19 92), Draft 1

1. Passed FINAL READING at the meeting of the Council of the County of Maui, State of awaii, held on the 1st day of May , 1992 , by the following votes:

Howard S. KIHUNE Chair	Patrick S. KAWANO Vice-Chair	Vince G. BAGOYO, Jr.	Goro HOKAMA	Alice L. LEE	Ricardo MEDINA	Wayne K. NISHIKI	Joe S. TANAKA	Lelnaala TERUYA DRUMMOND
Aye	Aye	Excused	Excused	Aye	Aye	Aye	Aye	Aye

2. Was transmitted to the Mayor of the County of Maui, State of Hawaii, on the 1st day of May , 1992 .

DATED AT WAILUKU, MAUI, HAWAII, this 1st day of May , 19 92 .

HOWARD S. KIHUNE, CHAIR
Council of the County of Maui

DARYL T. YAMAMOTO, COUNTY CLERK
County of Maui

THE FOREGOING BILL IS HEREBY APPROVED THIS 5th DAY OF MAY , 1992 .

LINDA CROCKETT LINGLE, MAYOR
County of Maui

I HEREBY CERTIFY that upon approval of the foregoing BILL by the Mayor of the County of Maui, the said BILL was designated as ORDINANCE NO. 2108 of the County of Maui, State of Hawaii.

DARYL T. YAMAMOTO, COUNTY CLERK
County of Maui

Passed First Reading on January 17, 1992.
Effective date of Ordinance May 5, 1992.

I HEREBY CERTIFY that the foregoing is a true and correct copy of Ordinance No. 2108 , the original of which is on file in the Office of the County Clerk, County of Maui, State of Hawaii.

Dated at Wailuku, Hawaii, on

County Clerk, County of Maui

United States
Environmental Protection
Agency

Office of Water
Washington, DC 20460

840-B-92-002
January 1993

EPA

Guidance Specifying Management Measures For Sources Of Nonpoint Pollution In Coastal Waters

Issued Under the Authority of
Section 6217(g) of the Coastal Zone Act
Reauthorization Amendments of 1990

III. CONSTRUCTION ACTIVITIES

A. Construction Site Erosion and Sediment Control Management Measure

(1) Reduce erosion and, to the extent practicable, retain sediment onsite during and after construction, and

(2) Prior to land disturbance, prepare and implement an approved erosion and sediment control plan or similar administrative document that contains erosion and sediment control provisions.

1. Applicability

This management measure is intended to be applied by States to all construction activities on sites less than 5 acres in areas that do not have an NPDES permit[3] in order to control erosion and sediment loss from those sites. This management measure does not apply to: (1) construction of a detached single family home on a site of 1/2 acre or more or (2) construction that does not disturb over 5,000 square feet of land on a site. (NOTE: All construction activities, including clearing, grading, and excavation, that result in the disturbance of areas greater than or equal to 5 acres or are a part of a larger development plan are covered by the NPDES regulations and are thus excluded from these requirements.) Under the Coastal Zone Act Reauthorization Amendments of 1990, States are subject to a number of requirements as they develop coastal NPS programs in conformity with this management measure and will have flexibility in doing so. The application of management measures by States is described more fully in *Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance*, published jointly by the U.S. Environmental Protection Agency (EPA) and the National Oceanic and Atmospheric Administration (NOAA) of the U.S. Department of Commerce.

2. Description

The goal of this management measure is to reduce the sediment loadings from construction sites in coastal areas that enter surface waterbodies. This measure requires that coastal States establish new or enhance existing State erosion and sediment control (ESC) programs and/or require ESC programs at the local level. It is intended to be part of a comprehensive land use or watershed management program, as previously detailed in the Watershed and Site Development Management Measures. It is expected that State and local programs will establish criteria determined by local conditions (e.g., soil types, climate, meteorology) that reduce erosion and sediment transport from construction sites.

Runoff from construction sites is by far the largest source of sediment in urban areas under development (York County Soil and Water Conservation District, 1990). Soil erosion removes over 90 percent of sediment by tonnage in urbanizing areas where most construction activities occur (Canning, 1988). Table 4-14 illustrates some of the

[3] On May 27, 1992, the United States Court of Appeals for the Ninth Circuit invalidated EPA's exemption of construction sites smaller than 5 acres from the storm water permit program in *Natural Resources Defense Council* v. *EPA*, 965 F.2d 759 (9th Cir. 1992). EPA is conducting further rulemaking proceedings on this issue and will not require permit applications for construction activities under 5 acres until further rulemaking has been completed.

measured sediment loading rates associated with construction activities found across the United States. As seen in Table 4-14, erosion rates from natural areas such as undisturbed forested lands are typically less than one ton/acre/year, while erosion from construction sites ranges from 7.2 to over 1,000 tons/acre/year.

Table 4-14. Erosion and Sediment Problems Associated With Construction

Location	Problem	Reference
United States	Sediment loading rates vary from 36.5 to 1,000 ton/ac/yr. These are 5 to 500 times greater than those from undeveloped land. Approximately 600 million tons of soil erodes from developed sites each year. Construction site sediment in runoff can be 10 to 20 times greater than that from agricultural lands.	York County Soil and Water Conservation District, 1990
Franklin County, FL	Sediment yield (ton/ac/yr): forest < 0.5 rangeland < 0.5 tilled 1.4 construction site 30 established urban < 0.5	Franklin County, FL
Wisconsin	Erosion rates range from 30 to 200 ton/ac/yr (10 to 20 times those of cropland).	Wisconsin Legislative Council, 1991
Washington, DC	Erosion rates range from 35 to 45 ton/ac/yr (10 to 100 times greater than agriculture and stabilized urban land uses).	MWCOG, 1987
Anacostia River Basin, VA, MD, DC	Sediment yields from portions of the Anacostia Basin have been estimated at 75,000 to 132,000 ton/yr.	U.S. Army Corps of Engineers, 1990
Washington	Erosion rates range from 50 to 500 ton/ac/yr. Natural erosion rates from forests or well-sodded prairies are 0.01 to 1.0 ton/ac/yr.	Washington Department of Ecology, 1989
Anacostia River Basin, VA, MD, DC	Erosion rates range from 7.2 to 100.8 ton/ac/yr.	USGS, 1978
Alabama	1.4 million tons eroded per year.	Woodward-Clyde, 1991
North Carolina	6.7 million tons eroded per year.	
Louisiana	5.1 million tons eroded per year.	
Oklahoma	4.2 million tons eroded per year.	
Georgia	3.8 million tons eroded per year.	
Texas	3.5 million tons eroded per year.	
Tennessee	3.3 million tons eroded per year.	
Pennsylvania	3.1 million tons eroded per year.	
Ohio	3.0 million tons eroded per year.	
Kentucky	3.0 million tons eroded per year.	

Eroded sediment from construction sites creates many problems in coastal areas including adverse impacts on water quality, critical habitats, submerged aquatic vegetation (SAV) beds, recreational activities, and navigation (APWA, 1991). For example, the Miami River in Florida has been severely affected by pollution associated with upland erosion. This watershed has undergone extensive urbanization, which has included the construction of many commercial and residential buildings over the past 50 years. Sediment deposited in the Miami River channel contributes to the severe water quality and navigation problems of this once-thriving waterway, as well as Biscayne Bay (SFWMD, 1988).

ESC plans are important for controlling the adverse impacts of construction and land development and have been required by many State and local governments, as shown in Table 4-13 (in the Site Development section of this chapter). An ESC plan is a document that explains and illustrates the measures to be taken to control erosion and sediment problems on construction sites (Connecticut Council on Soil and Water Conservation, 1988). It is intended that existing State and local erosion and sediment control plans may be used to fulfill the requirements of this management measure. Where existing ESC plans do not meet the management measure criteria, inadequate plans may be enhanced to meet the management measure guidelines.

Typically, an ESC plan is part of a larger site plan and includes the following elements:

- Description of predominant soil types;
- Details of site grading including existing and proposed contours;
- Design details and locations for structural controls;
- Provisions to preserve topsoil and limit disturbance;
- Details of temporary and permanent stabilization measures; and
- Description of the sequence of construction.

ESC plans ensure that provisions for control measures are incorporated into the site planning stage of development and provide for the reduction of erosion and sediment problems and accountability if a problem occurs (York County Soil and Water Conservation District, 1990). An effective plan for urban runoff management on construction sites will control erosion, retain sediments on site, to the extent practicable, and reduce the adverse effects of runoff. Climate, topography, soils, drainage patterns, and vegetation will affect how erosion and sediment should be controlled on a site (Washington State Department of Ecology, 1989). An effective ESC plan includes both structural and nonstructural controls. Nonstructural controls address erosion control by decreasing erosion potential, whereas structural controls are both preventive and mitigative because they control both erosion and sediment movement.

Typical nonstructural erosion controls include (APWA, 1991; York County Soil and Water Conservation District, 1990):

- Planning and designing the development within the natural constraints of the site;
- Minimizing the area of bare soil exposed at one time (phased grading);
- Providing for stream crossing areas for natural and man-made areas; and
- Stabilizing cut-and-fill slopes caused by construction activities.

Structural controls include:

- Perimeter controls;
- Mulching and seeding exposed areas;
- Sediment basins and traps; and
- Filter fabric, or silt fences.

Some erosion and soil loss are unavoidable during land-disturbing activities. While proper siting and design will help prevent areas prone to erosion from being developed, construction activities will invariably produce conditions where erosion may occur. To reduce the adverse impacts associated with construction, the construction management measure suggests a system of nonstructural and structural erosion and sediment controls for incorporation into an

ESC plan. Erosion controls have distinct advantages over sediment controls. Erosion controls reduce the amount of sediment transported off-site, thereby reducing the need for sediment controls. When erosion controls are used in conjunction with sediment controls, the size of the sediment control structures and associated maintenance may be reduced, decreasing the overall treatment costs (SWRPC, 1991).

3. Management Measure Selection

This management measure was selected to minimize sediment being transported outside the perimeter of a construction site through two broad performance goals: (1) reduce erosion and (2) retain sediment onsite, to the extent practicable. These performance goals were chosen to allow States and local governments flexibility in specifying practices appropriate for local conditions.

While several commentors responding to the draft (May 1991) guidance expressed the need to define "more measurable, enforceable ways" to control sediment loadings, other commentors stressed the need to draft management measures that do not conflict with existing State programs and allow States and local governments to determine appropriate practices and design standards for their communities. These management measures were selected because virtually all coastal States control construction activities to prevent erosion and sediment loss.

The measures were specifically written for the following reasons:

(1) Predevelopment loadings may vary greatly, and some sediment loss is usually inevitable;

(2) Current practice is built on the use of systems of practices selected based on site-specific conditions; and

(3) The combined effectiveness of erosion and sediment controls in systems is not easily quantified.

4. Erosion Control Practices

As discussed more fully at the beginning of this chapter and in Chapter 1, the following practices are described for illustrative purposes only. State programs need not require implementation of these practices. However, as a practical matter, EPA anticipates that the management measure set forth above generally will be implemented by applying one or more management practices appropriate to the source, location, and climate. The practices set forth below have been found by EPA to be representative of the types of practices that can be applied successfully to achieve the management measure described above.

Erosion controls are used to reduce the amount of sediment that is detached during construction and to prevent sediment from entering runoff. Erosion control is based on two main concepts: (1) disturb the smallest area of land possible for the shortest period of time, and (2) stabilize disturbed soils to prevent erosion from occurring.

a. *Schedule projects so clearing and grading are done during the time of minimum erosion potential.*

Often a project can be scheduled during the time of year that the erosion potential of the site is relatively low. In many parts of the country, there is a certain period of the year when erosion potential is relatively low and construction scheduling could be very effective. For example, in the Pacific region if construction can be completed during the 6-month dry season (May 1 - October 31), temporary erosion and sediment controls may not be needed. In addition, in some parts of the country erosion potential is very high during certain parts of the year such as the spring thaw in northern areas. During this time of year, melting snowfall generates a constant runoff that can erode soil. In addition, construction vehicles can easily turn the soft, wet ground into mud, which is more easily washed offsite. Therefore, in the north, limitations should be placed on grading during the spring thaw (Goldman et al., 1986).

b. *Stage construction.*

Avoid areawide clearance of construction sites. Plan and stage land disturbance activities so that only the area currently under construction is exposed. As soon as the grading and construction in an area are complete, the area should be stabilized.

By clearing only those areas immediately essential for completing site construction, buffer zones are preserved and soil remains undisturbed until construction begins. Physical markers, such as tape, signs, or barriers, indicating the limits of land disturbance, can ensure that equipment operators know the proposed limits of clearing. The area of the watershed that is exposed to construction is important for determining the net amount of erosion. Reducing the extent of the disturbed area will ultimately reduce sediment loads to surface waters. Existing or newly planted vegetation that has been planted to stabilize disturbed areas should be protected by routing construction traffic around and protecting natural vegetation with fencing, tree armoring, retaining walls, or tree wells.

c. *Clear only areas essential for construction.*

Often areas of a construction site are unnecessarily cleared. Only those areas essential for completing construction activities should be cleared, and other areas should remain undisturbed. Additionally, the proposed limits of land disturbance should be physically marked off to ensure that only the required land area is cleared. Avoid disturbing vegetation on steep slopes or other critical areas.

d. *Locate potential nonpoint pollutant sources away from steep slopes, waterbodies, and critical areas.*

Material stockpiles, borrow areas, access roads, and other land-disturbing activities can often be located away from critical areas such as steep slopes, highly erodible soils, and areas that drain directly into sensitive waterbodies.

e. *Route construction traffic to avoid existing or newly planted vegetation.*

Where possible, construction traffic should travel over areas that must be disturbed for other construction activity. This practice will reduce the area that is cleared and susceptible to erosion.

f. *Protect natural vegetation with fencing, tree armoring, and retaining walls or tree wells.*

Tree armoring protects tree trunks from being damaged by construction equipment. Fencing can also protect tree trunks, but should be placed at the tree's drip line so that construction equipment is kept away from the tree. The tree drip line is the minimum area around a tree in which the tree's root system should not be disturbed by cut, fill, or soil compaction caused by heavy equipment. When cutting or filling must be done near a tree, a retaining wall or tree well should be used to minimize the cutting of the tree's roots or the quantity of fill placed over the tree's roots.

g. *Stockpile topsoil and reapply to revegetate site.*

Because of the high organic content of topsoil, it cannot be used as fill material or under pavement. After a site is cleared, the topsoil is typically removed. Since topsoil is essential to establish new vegetation, it should be stockpiled and then reapplied to the site for revegetation, if appropriate. Although topsoil salvaged from the existing site can often be used, it must meet certain standards and topsoil may need to be imported onto the site if the existing topsoil is not adequate for establishing new vegetation.

h. Cover or stabilize topsoil stockpiles.

Unprotected stockpiles are very prone to erosion and therefore stockpiles must be protected. Small stockpiles can be covered with a tarp to prevent erosion. Large stockpiles should be stabilized by erosion blankets, seeding, and/or mulching.

i. Use wind erosion controls.

Wind erosion controls limit the movement of dust from disturbed soil surfaces and include many different practices. Wind barriers block air currents and are effective in controlling soil blowing. Many different materials can be used as wind barriers, including solid board fence, snow fences, and bales of hay. Sprinkling moistens the soil surface with water and must be repeated as needed to be effective for preventing wind erosion (Delaware DNREC, 1989); however, applications must be monitored to prevent excessive runoff and erosion.

j. Intercept runoff above disturbed slopes and convey it to a permanent channel or storm drain.

Earth dikes, perimeter dikes or swales, or diversions can be used to intercept and convey runoff above disturbed areas. An earth dike is a temporary berm or ridge of compacted soil that channels water to a desired location. A perimeter dike/swale or diversion is a swale with a supporting ridge on the lower side that is constructed from the soil excavated from the adjoining swale (Delaware DNREC, 1989). These practices should be used to intercept flow from denuded areas or newly seeded areas to keep the disturbed areas from being eroded from the uphill runoff. The structures should be stabilized within 14 days of installation. A pipe slope drain, also known as a pipe drop structure, is a temporary pipe placed from the top of a slope to the bottom of the slope to convey concentrated runoff down the slope without causing erosion (Delaware DNREC, 1989).

k. On long or steep, disturbed, or man-made slopes, construct benches, terraces, or ditches at regular intervals to intercept runoff.

Benches, terraces, or ditches break up a slope by providing areas of low slope in the reverse direction. This keeps water from proceeding down the slope at increasing volume and velocity. Instead, the flow is directed to a suitable outlet, such as a sediment basin or trap. The frequency of benches, terraces, or ditches will depend on the erodibility of the soils, steepness and length of the slope, and rock outcrops. This practice should be used if there is a potential for erosion along the slope.

l. Use retaining walls.

Often retaining walls can be used to decrease the steepness of a slope. If the steepness of a slope is reduced, the runoff velocity is decreased and, therefore, the erosion potential is decreased.

m. Provide linings for urban runoff conveyance channels.

Often construction increases the velocity and volume of runoff, which causes erosion in newly constructed or existing urban runoff conveyance channels. If the runoff during or after construction will cause erosion in a channel, the channel should be lined or flow control BMPs installed. The first choice of lining should be grass or sod since this reduces runoff velocities and provides water quality benefits through filtration and infiltration. If the velocity in the channel would erode the grass or sod, then riprap, concrete, or gabions can be used.

n. Use check dams.

Check dams are small, temporary dams constructed across a swale or channel. They can be constructed using gravel or straw bales. They are used to reduce the velocity of concentrated flow and, therefore, to reduce the erosion in

a swale or channel. Check dams should be used when a swale or channel will be used for a short time and therefore it is not feasible or practical to line the channel or implement flow control BMPs (Delaware DNREC, 1989).

o. *Seed and fertilize.*

Seeding establishes a vegetative cover on disturbed areas. Seeding is very effective in controlling soil erosion once a dense vegetative cover has been established. However, often seeding and fertilizing do not produce as thick a vegetative cover as do seed and mulch or netting. Newly established vegetation does not have as extensive a root system as existing vegetation and therefore is more prone to erosion, especially on steep slopes. Care should be taken when fertilizing to avoid untimely or excessive application. Since the practice of seeding and fertilizing does not provide any protection during the time of vegetative establishment, it should be used only on favorable soils in very flat areas and not in sensitive areas.

p. *Use seeding and mulch/mats.*

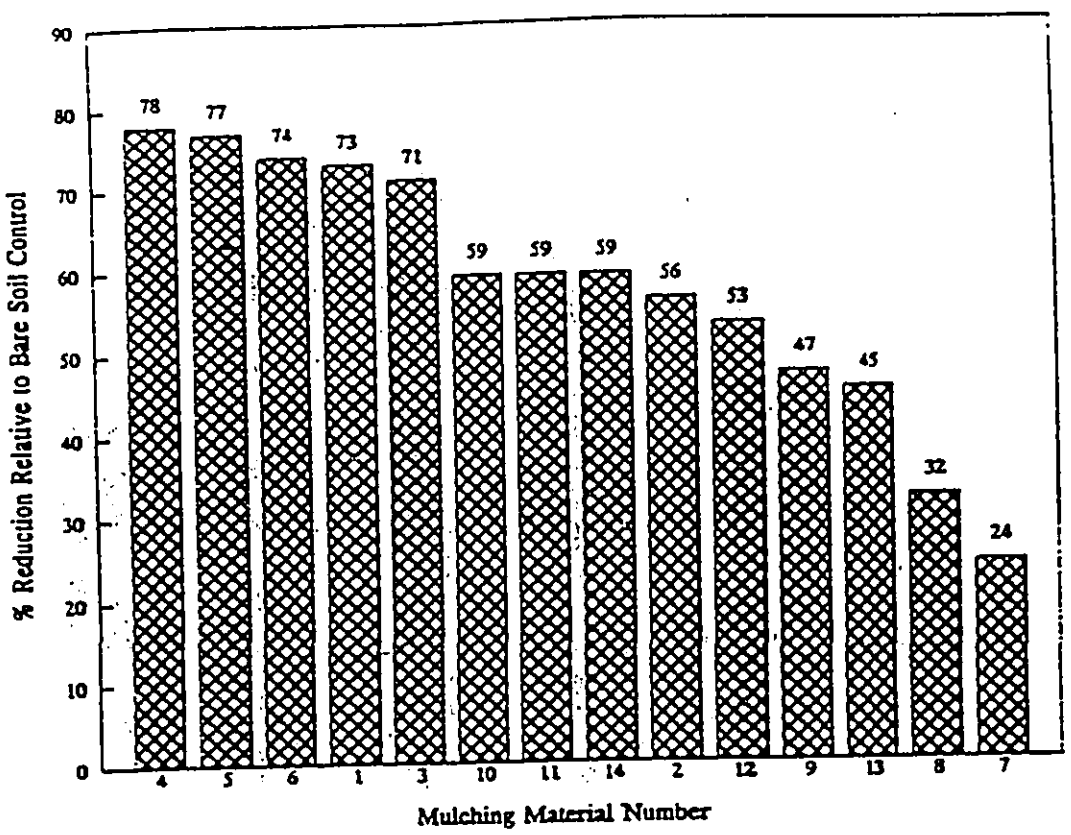
Seeding establishes a vegetative cover on disturbed areas. Seeding is very effective in controlling soil erosion once the vegetative cover has been established. The mulching/mats protect the disturbed area while the vegetation becomes established.

The management of land by using ground cover reduces erosion by reducing the flow rate of runoff and the raindrop impact. Bare soils should be seeded or otherwise stabilized within 15 calendar days after final grading. Denuded areas that are inactive and will be exposed to rain for 30 days or more should also be temporarily stabilized, usually by planting seeds and establishing vegetation during favorable seasons in areas where vegetation can be established. In very flat, non-sensitive areas with favorable soils, stabilization may involve simply seeding and fertilizing. Mulching and/or sodding may be necessary as slopes become moderate to steep, as soils become more erosive, and as areas become more sensitive.

q. *Use mulch/mats.*

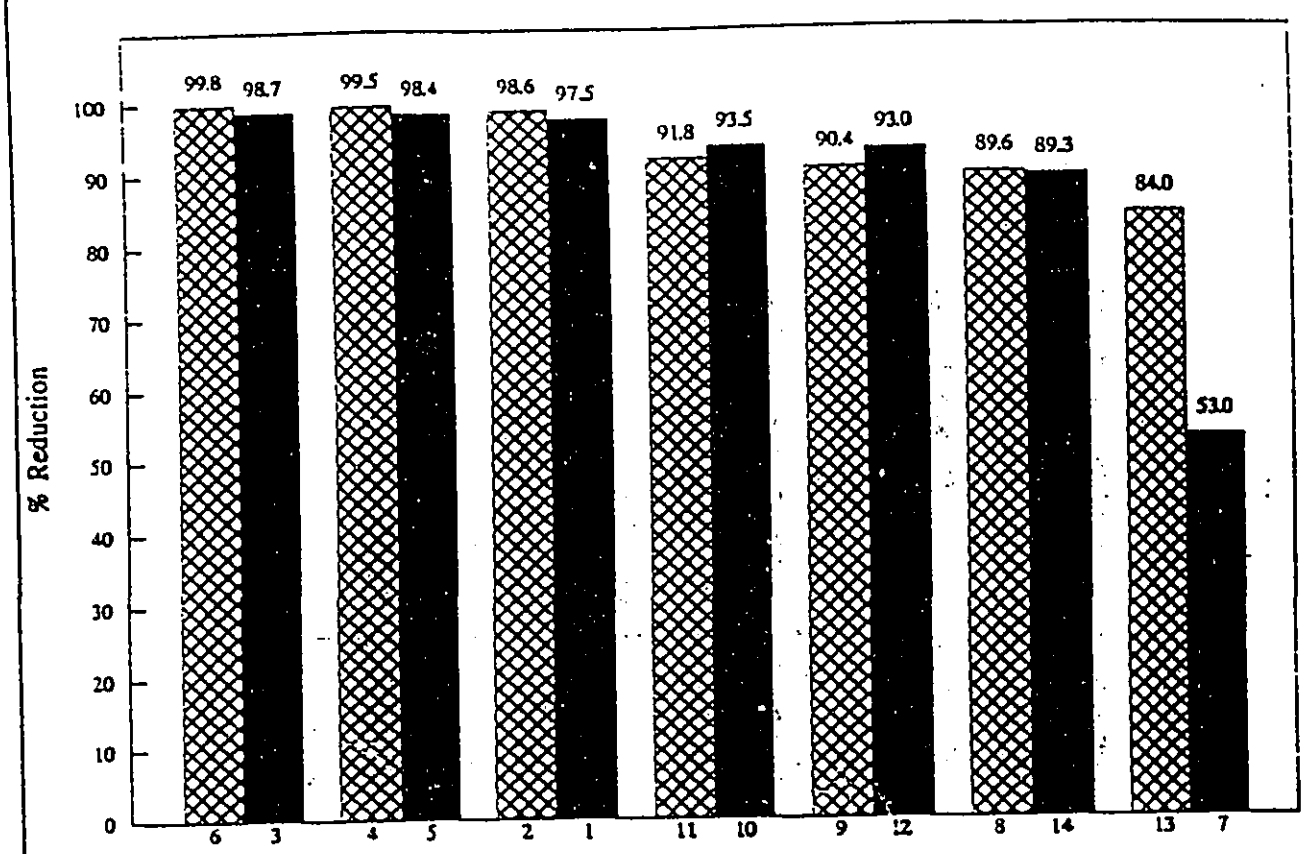
Mulching involves applying plant residues or other suitable materials on disturbed soil surfaces. Mulchs/mats used include tacked straw, wood chips, and jute netting and are often covered by blankets or netting. Mulching alone should be used only for temporary protection of the soil surface or when permanent seeding is not feasible. The useful life of mulch varies with the material used and the amount of precipitation, but is approximately 2 to 6 months. Figure 4-5 shows water velocity reductions that could be expected using various mulching techniques. Similarly, Figure 4-6 shows reductions in soil loss achievable using various mulching techniques. During times of year when vegetation cannot be established, soil mulching should be applied to moderate slopes and soils that are not highly erodible. On steep slopes or highly erodible soils, multiple mulching treatments should be used. On a high-elevation or desert site where grasses cannot survive the harsh environment, native shrubs may be planted. Interlocking ceramic materials, filter fabric, and netting are available for this purpose. Before stabilizing an area, it is important to have installed all sediment controls and diverted runoff away from the area to be planted. Runoff may be diverted away from denuded areas or newly planted areas using dikes, swales, or pipe slope drains to intercept runoff and convey it to a permanent channel or storm drain. Reserved topsoil may be used to revegetate a site if the stockpile has been covered and stabilized.

Consideration should be given to maintenance when designing mulching and matting schemes. Plastic nets are often used to cover the mulch or mats; however, they can foul lawn mower blades if the area requires mowing.



Mulch Material	Characteristics
1	100% wheat straw/top net
2	100% wheat straw/two nets
3	70% wheat straw/30% coconut fiber
4	70% wheat straw/30% coconut fiber
5	100% coconut fiber
6	Nylon monofilament/two nets
7	Nylon monofilament/rigid/bonded
8	Vinyl monofilament/flexible/bonded
9	Curled wood fibers/top net
10	Curled wood fibers/two nets
11	Antiwash netting (jute)
12	Interwoven paper and thread
13	Uncrimped wheat straw – 2,242 kg/ha
14	Uncrimped wheat straw – 4,484 kg/ha

Figure 4-5. Water velocity reductions for different mulch treatments (adapted from Harding, 1990).



Mulch Material	Characteristics
1	100% wheat straw/top net
2	100% wheat straw/two nets
3	70% wheat straw/30% coconut fiber
4	70% wheat straw/30% coconut fiber
5	100% coconut fiber
6	Nylon monofilament/two nets
7	Nylon monofilament/rigid/bonded
8	Vinyl monofilament/flexible/bonded
9	Curled wood fibers/top net
10	Curled wood fibers/two nets
11	Antiwash netting (jute)
12	Interwoven paper and thread
13	Uncrimped wheat straw — 2,242 kg/ha
14	Uncrimped wheat straw — 4,484 kg/ha

Figure 4-6. Actual soil loss reductions for different mulch treatments (adapted from Harding, 1990).

r. *Use sodding.*

Sodding permanently stabilizes an area. Sodding provides immediate stabilization of an area and should be used in critical areas or where establishment of permanent vegetation by seeding and mulching would be difficult. Sodding is also a preferred option when there is a high erosion potential during the period of vegetative establishment from seeding.

s. *Use wildflower cover.*

Because of the hardy drought-resistant nature of wildflowers, they may be more beneficial as an erosion control practice than turf grass. While not as dense as turfgrass, wildflower thatches and associated grasses are expected to be as effective in erosion control and contaminant absorption. Because thatches of wildflowers do not need fertilizers, pesticides, or herbicides, and watering is minimal, implementation of this practice may result in a cost savings (Brash et al., undated). In 1987, Howard County, Maryland, spent $690.00 per acre to maintain turfgrass areas, compared to only $31.00 per acre for wildflower meadows (Wilson, 1990).

A wildflower stand requires several years to become established; maintenance requirements are minimal once the area is established (Brash et al., undated).

5. Sediment Control Practices[4]

As discussed more fully at the beginning of this chapter and in Chapter 1, the following practices are described for illustrative purposes only. State programs need not require implementation of these practices. However, as a practical matter, EPA anticipates that the management measure set forth above generally will be implemented by applying one or more management practices appropriate to the source, location, and climate. The practices set forth below have been found by EPA to be representative of the types of practices that can be applied successfully to achieve the management measure described above.

Sediment controls capture sediment that is transported in runoff. Filtration and detention (gravitational settling) are the main processes used to remove sediment from urban runoff.

a. *Sediment Basins*

Sediment basins, also known as silt basins, are engineered impoundment structures that allow sediment to settle out of the urban runoff. They are installed prior to full-scale grading and remain in place until the disturbed portions of the drainage area are fully stabilized. They are generally located at the low point of sites, away from construction traffic, where they will be able to trap sediment-laden runoff.

Sediment basins are typically used for drainage areas between 5 and 100 acres. They can be classified as either temporary or permanent structures, depending on the length of service of the structure. If they are designed to function for less than 36 months, they are classified as "temporary"; otherwise, they are considered permanent structures. Temporary sediment basins can also be converted into permanent urban runoff management ponds. When sediment basins are designed as permanent structures, they must meet all standards for wet ponds.

b. *Sediment Trap*

Sediment traps are small impoundments that allow sediment to settle out of runoff water. Sediment traps are typically installed in a drainageway or other point of discharge from a disturbed area. Temporary diversions can be

[4]Adapted from Goldman (1986).

used to direct runoff to the sediment trap. Sediment traps should not be used for drainage areas greater than 5 acres and typically have a useful life of approximately 18 to 24 months.

c. Filter Fabric Fence

Filter fabric fence is available from many manufacturers and in several mesh sizes. Sediment is filtered out as urban runoff flows through the fabric. Such fences should be used only where there is sheet flow (i.e., no concentrated flow), and the maximum drainage area to the fence should be 0.5 acre or less per 100 feet of fence. Filter fabric fences have a useful life of approximately 6 to 12 months.

d. Straw Bale Barrier

A straw bale barrier is a row of anchored straw bales that detain and filter urban runoff. Straw bales are less effective than filter fabric, which can usually be used in place of straw bales. However, straw bales have been effectively used as temporary check dams in channels. As with filter fabric fences, straw bale barriers should be used only where there is sheet flow. The maximum drainage area to the barrier should be 0.25 acre or less per 100 feet of barrier. The useful life of straw bales is approximately 3 months.

e. Inlet Protection

Inlet protection consists of a barrier placed around a storm drain drop inlet, which traps sediment before it enters the storm sewer system. Filter fabric, straw bales, gravel, or sand bags are often used for inlet protection.

f. Construction Entrance

A construction entrance is a pad of gravel over filter cloth located where traffic leaves a construction site. As vehicles drive over the gravel, mud, and sediment are collected from the vehicles' wheels and offsite transport of sediment is reduced.

g. Vegetated Filter Strips

Vegetated filter strips are low-gradient vegetated areas that filter overland sheet flow. Runoff must be evenly distributed across the filter strip. Channelized flows decrease the effectiveness of filter strips. Level spreading devices are often used to distribute the runoff evenly across the strip (Dillaha et al., 1989).

Vegetated filter strips should have relatively low slopes and adequate length and should be planted with erosion-resistant plant species. The main factors that influence the removal efficiency are the vegetation type, soil infiltration rate, and flow depth and travel time. These factors are dependent on the contributing drainage area, slope of strip, degree and type of vegetative cover, and strip length. Maintenance requirements for vegetated filter strips include sediment removal and inspections to ensure that dense, vigorous vegetation is established and concentrated flows do not occur. Maintenance of these structures is discussed in Section II.A of this chapter.

6. Effectiveness and Cost Information

a. Erosion Control Practices

The effectiveness of erosion control practices can vary based on land slope, the size of the disturbed area, rainfall frequency and intensity, wind conditions, soil type, use of heavy machinery, length of time soils are exposed and unprotected, and other factors. In general, a system of erosion and sediment control practices can more effectively reduce offsite sediment transport than can a single system. Numerous nonstructural measures such as protecting natural or newly planted vegetation, minimizing the disturbance of vegetation on steep slopes and other highly

erodible areas, maximizing the distance eroded material must travel before reaching the drainage system, and locating roads away from sensitive areas may be used to reduce erosion.

Table 4-15 contains the available cost and effectiveness data for some of the erosion controls listed above. Information on the effectiveness of individual nonstructural controls was not available. All reported effectiveness data assume that controls are properly designed, constructed, and maintained. Costs have been broken down into annual capital costs, annual maintenance costs, and total annual costs (including annualization of the capital costs).

b. Sediment Control Practices

Regular inspection and maintenance are needed for most erosion control practices to remain effective. The effectiveness of sediment controls will depend on the size of the construction site and the nature of the runoff flows. Sediment basins are most appropriate for drainage areas of 5 acres or greater. In smaller areas with concentrated flows, silt traps may suffice. Where concentrated flow leaves the site and the drainage area is less than 0.5 ac/100 ft of flow, filter fabric fences may be effective. In areas where sheet flow leaves the site and the drainage area is greater than 0.5 acre/100 ft of flow, perimeter dikes may be used to divert the flow to a sediment trap or sediment basin. Urban runoff inlets may be protected using straw bales or diversions to filter or route runoff away from the inlets.

Table 4-16 describes the general cost and effectiveness of some common sediment control practices.

c. Comparisons

Figure 4-7 illustrates the estimated TSS loading reductions from Maryland construction sites possible using a combination of erosion and sediment controls in contrast to using only sediment controls. Figure 4-8 shows a comparison of the cost and effectiveness of various erosion control practices. As can be seen in Figure 4-8, seeding or seeding and mulching provide the highest levels of control at the lowest cost.

Table 4-15. ESC Quantitative Effectiveness and Cost Summary

Practice	Design Constraints or Purpose	Percent Removal of TSS	Useful Life (years)[a]	Construction Cost	Annual Maintenance Cost (as % construction cost)	Total Annual Cost
Sod	Immediate erosion protection where there is high erosion potential during vegetative establishment.	Average: 99% Observed range: 98% - 99% References: Minnesota Pollution Control Agency, 1989; Pennsylvania, 1983 cited in USEPA, 1991	2	Average: $0.2 per ft^2 ($11,300 per acre) Range: $0.1 - $1.1 References: SWRPC, 1991; Schueler, 1987; Virginia, 1980	Average: 5% Range: 5% Reference: SWRPC, 1991	$0.20 per ft^2 $7,500 per acre
Seed	Establish vegetation on disturbed area.	After vegetation established- Average: 90% Observed range: 50% - 100% References: SCS, 1985 cited in EPA, 1991; Minnesota Pollution Control Agency, 1989; Oberts, 1984 cited in City of Austin, 1988; Delaware Department of Natural Resources, 1989	2	Average: $400 per acre Range: $200 - $1000 per acre References: Wisconsin DOT cited in SWRPC, 1991; SWRPC, 1991; Goldman, 1986; Virginia, 1980	Average: 20% Range: 15% - 25% References: Wisconsin DOT cited in SWRPC, 1991; SWRPC, 1991	$300 per acre
Seed and Mulch	Establish vegetation on disturbed area.	After vegetation established- Average: 90% Observed range: 50% - 100% References: SCS, 1985 cited in EPA, 1991; Minnesota Pollution Control Agency, 1989; Oberts, 1984 cited in City of Austin, 1988; Delaware Department of Natural Resources, 1989	2	Average: $1,500 per acre Range: $800 - $3,500 per acre References: Goldman, 1986; Washington DOT, 1990; NC State, 1990; Schueler, 1987; Virginia, 1980; SWRPC, 1991	Average: NA[b] Range: NA References: None	$1,100 per acre

Table 4-15. (Continued)

Practice	Design Constraints or Purpose	Percent Removal of TSS	Useful Life (years)[a]	Construction Cost	Annual Maintenance Cost (as % construction cost)	Total Annual Cost
Mulch	Temporary stabilization of disturbed area.	Observed range: sand: 20% slope / 50% slope wood fiber @ 1500 lb/ac: 50-60% / 0-20% wood fiber @ 3000 lb/ac: 50-85% / 50-70% straw @ 3000 lb/ac: 90-100% / 95% Silt-loam: 20% slope / 50% slope wood fiber @ 1500 lb/ac: 20-60% / 40-60% wood fiber @ 3000 lb/ac: 60-90% / 60-70% straw @ 3000 lb/ac: 80-95% / 70-90% Silt-clay-loam: 10-30% slope / 30-50% slope wood fiber @ 1500 lb/ac: 5% / -- wood fiber @ 3000 lb/ac: 40% / -- jute netting: 30-60% / 30% straw @ 3000 lb/ac: 40-70% / 20-40% wood chips @ 10,000 lb/ac: 60-80% / 50-60% mulch blanket: 60-80% / 50-60% excelsior blanket: 60-80% / 50-60% multiple treatment (straw and jute): 90% / 90% References: Minnesota Pollution Control Agency, 1989; Kay, 1983 cited in Goldman, 1986	Straw mulch: 0.25 Wood fiber mulch: 0.33 Jute netting: 0.33 Straw and jute: 0.33	Straw mulch: Average: $1,700 per acre Range: $500 - $5,000 per acre References: Wisconsin DOT cited in SWRPC, 1991; Washington DOT, 1990; Virginia, 1980 Wood fiber mulch: Average: $1,000 per acre Range: $100 - $2,300 per acre References: Washington DOT, 1990; Virginia, 1980 Jute netting: Average: $3,700 per acre Range: $3,500-$4,100 per acre References: Washington DOT, 1990; Virginia, 1980 Straw and jute: Average: $5,400 per acre Range: $4,000-$9,100 per acre References: Washington DOT, 1990; Virginia, 1980	Average: NA[b] Range: NA References: None	Straw mulch: $7,500 per acre Wood fiber mulch: $3,500 per acre Jute netting: $12,500 per acre Straw and jute: $18,000 per acre

Table 4-15. (Continued)

Practice	Design Constraints or Purpose	Percent Removal of TSS	Useful Life (years)[a]	Construction Cost	Annual Maintenance Cost (as % construction cost)	Total Annual Cost
Terraces	Break up long or steep slopes.	Observed range: Land Slope / Reduction in Erosion 1-12% 70% 12-18% 60% 18-24% 55% Additionally, if the slope steepness is halved, while other factors are held constant, the soil loss potential decreases 2-1/2 times. If both the slope and length are halved, the soil loss potential is decreased 4 times. References: Goldman, 1986; Beasley, 1972	2	Average: $5 per lin ft Range: $1 - $12 References: SWRPC, 1991; Goldman, 1986; Virginia, 1991	Average: 20% Range: 20% Reference: SWRPC, 1991	$4 per lin ft
All Erosion Controls	Reduce amount of sediment entering runoff.	Average: 85% Observed range: 85% Reference: Schueler, 1990	--	Varies but typically low	Varies but typically low	Varies but typically low

NA - Not available.
[a] Useful life estimated as length of construction project (assumed to be 2 years).
[b] For Total Annual Cost, assume Annual Maintenance Cost = 2% of construction cost.

Table 4-16. ESC Quantitative Effectiveness and Cost Summary for Sediment Control Practices

Practice	Design Constraints or Purpose	Percent Removal of TSS	Useful Life (years)[a]	Construction Cost	Annual Maintenance Cost (as % construction cost)	Total Annual Cost
Sediment basin	Minimum drainage area = 5 acres, maximum drainage area = 100 acres	Average: 70% Observed range: 55% - 100% References: Schueler, 1990; Engle, BW and Jarrett, AR, 1990; Baumann, 1990	2	Less than 50,000 ft^3 storage Average: \$0.60 per ft^3 storage (\$1,100 per drainage acre[c]) Range: \$0.20 - \$1.30 per ft^3 Greater than 50,000 ft^3 storage Average: \$0.3 per ft^3 storage (\$550 per drainage acre[c]) Range: \$0.10 - \$0.40 per ft^3 References: SWRPC, 1991	Average: 25% Range: 25% References: Denver COG cited in SWRPC, 1991; SWRPC, 1991	Less than 50,000 ft^3 storage \$0.40 per ft^3 storage \$700 per drainage acre[b] Greater than 50,000 ft^3 storage \$0.20 per ft^3 storage \$900 per drainage acre[c]
Sediment trap	Maximum drainage area = 5 acres	Average: 60% Observed range: (-7%) - 100% References: Schueler, et al., 1990; Tahoe Regional Planning Agency, 1989; Baumann, 1990	1.5	Average: \$0.60 per ft^3 storage (\$1,100 per drainage acre[c]) Range: \$0.20 - \$2.00 per ft^3 References: Denver COG cited in SWRPC, 1991; SWRPC, 1991; Goldman, 1986	Average: 20% Range: 20% References: Denver COG cited in SWRPC, 1991; SWRPC, 1991	\$0.70 per ft^3 storage \$1,300 per drainage acre[c]
Filter Fabric Fence	Maximum drainage area = 0.5 acre per 100 feet of fence. Not to be used in concentrated flow areas.	Average: 70% Observed range: 0% - 100% sand: 80% - 99% silt-loam: 50% - 80% silt-clay-loam: 0% - 20% References: Munson, 1991; Fisher et al., 1984; Minnesota Pollution Control Agency, 1989	0.5	Average: \$3 per lin ft (\$700 per drainage acre[c] Range: \$1 - \$8 per lin ft References: Wisconsin DOT cited in SWRPC, 1991; SWRPC, 1991; Goldman, 1986; Virginia, 1991; NC State, 1990	Average: 100% Range: 100% References: SWRPC, 1991	\$7 per lin ft \$850 per drainage acre[c]

Table 4-16. (Continued)

Practice	Design Constraints or Purpose	Percent Removal of TSS	Useful Life (years)[a]	Construction Cost	Annual Maintenance Cost (as % construction cost)	Total Annual Cost
Straw Bale Barrier	Maximum drainage area = 0.25 acre per 100 feet of barrier. Not to be used in concentrated flow areas.	Average: 70% Observed Range: 70% References: Virginia, 1980 cited in EPA, 1991	0.25	Average: $4 per lin ft ($1,600 per drainage acre[d] Range: $2 - $6 per lin ft References: Goldman, 1986; Virginia, 1991	Average: 100% Range: 100% References: SWRPC, 1991	$17 per lin ft $6,800 per drainage acre[d]
Inlet Protection	Protect storm drain inlet.	Average: NA Observed Range: NA References: None	1	Average: $100 per inlet Range: $50 - $150 References: SWRPC, 1991; Denver COG cited in SWRPC, 1991; Virginia, 1991; EPA cited in SWRPC, 1991	Average: 60% Range: 20% - 100% References: SWRPC, 1991; Denver COG cited in SWRPC, 1991	$150 per inlet
Construction Entrance	Removes sediment from vehicles wheels.	Average: NA Observed Range: NA References: None	2	Average: $2,000 each Range: $1,000 - $4,000 References: Goldman, 1986; NC State, 1990	Average: NA[e] Range: NA References: None	$1,500 each
				With washrack: Average: $3,000 each Range: $1,000 - $5,000 References: Virginia, 1991		$2,200 each

Table 4-16. (Continued)

Practice	Design Constraints or Purpose	Percent Removal of TSS	Useful Life (years)[a]	Construction Cost	Annual Maintenance Cost (as % construction cost)	Total Annual Cost
Vegetative Filter Strip	Must have sheet flow.	Average: 70% Observed Range: 20% - 80% References: Hayes and Hairston, 1983 cited in Casman, 1990; Dillaha et al., 1989, cited in Glick et al., 1991; Virginia Department of Conservation, 1987; Nonpoint Source Control Task Force, 1983 cited in Minnesota PCA, 1989; Schueler, 1987	2	Established from existing vegetation- Average: $0 Range: $0 References: Schueler, 1987 Established from sod- Average: $11,300 per acre Range: $4,500 - $48,000 per acre References: Schueler, 1987; SWRPC, 1991	Average: NA Range: NA References: None	NA

NA - Not available.
[a] Useful life estimated as length of construction project (assumed to be 2 years)
[a] For Total Annual Cost, assume Annual Maintenance Cost=20% of construction cost.
[b] Assumes trap volume = 1800 cf/ac (0.5 inches runoff per acre).
[c] Assumes drainage area of 0.5 acre per 100 feet of fence (maximum allowed).
[d] Assumes drainage area of 0.25 acre per 100 feet of barrier (maximum allowed).

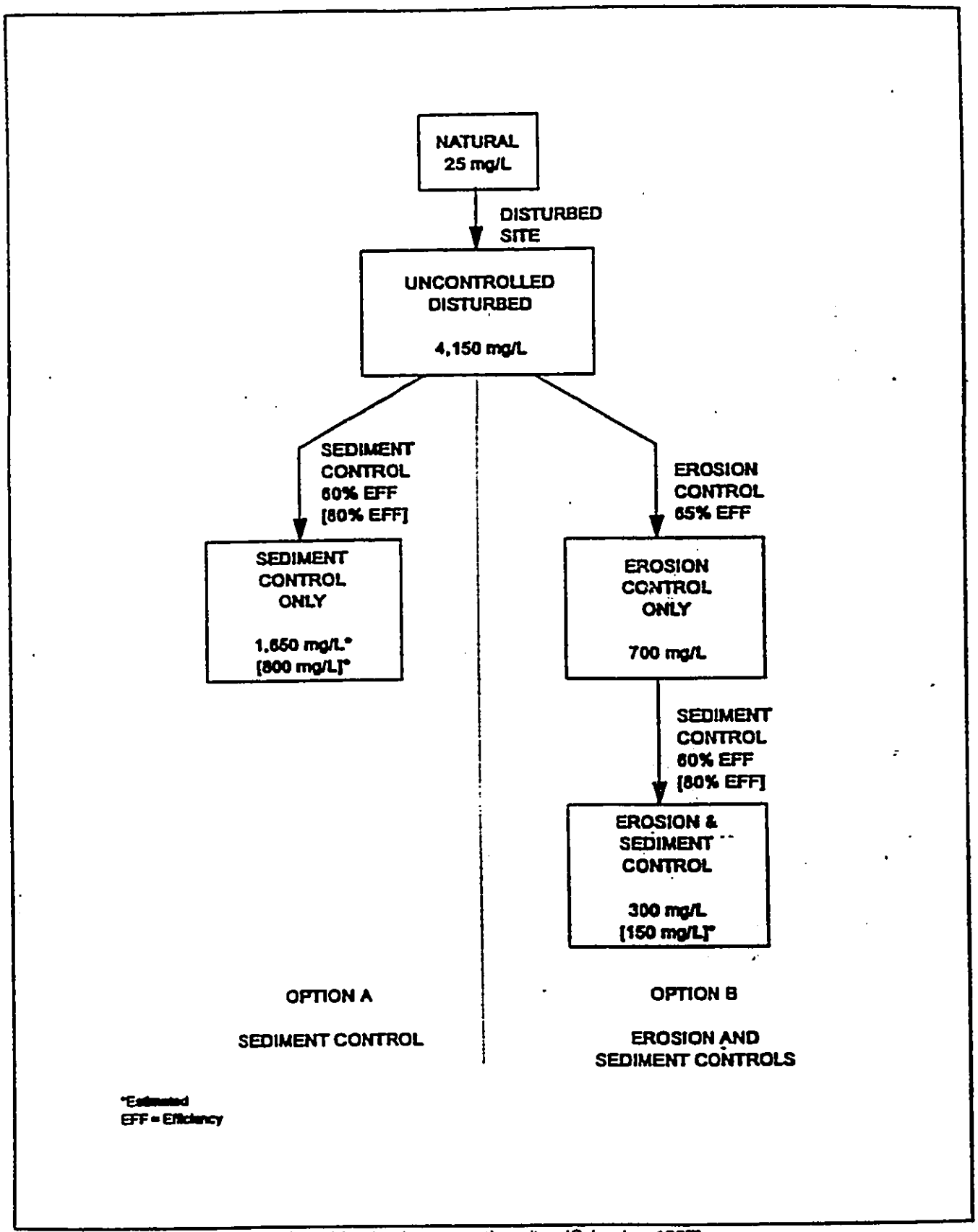


Figure 4-7. TSS concentrations from Maryland construction sites (Schueler, 1987).

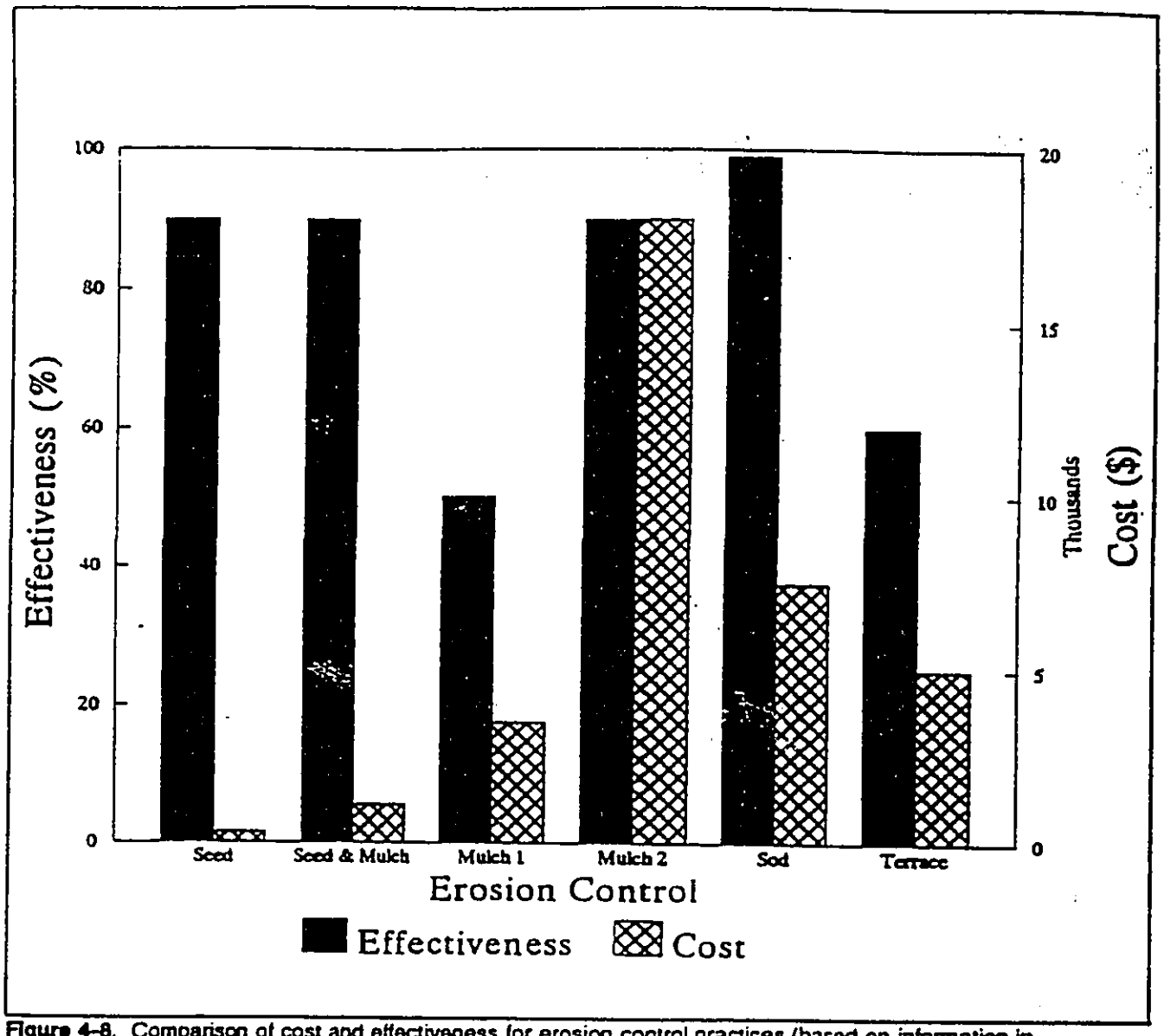


Figure 4-8. Comparison of cost and effectiveness for erosion control practices (based on information in Tables 4-15 and 4-16).

B. Construction Site Chemical Control Management Measure

(1) Limit application, generation, and migration of toxic substances;

(2) Ensure the proper storage and disposal of toxic materials; and

(3) Apply nutrients at rates necessary to establish and maintain vegetation without causing significant nutrient runoff to surface waters.

1. Applicability

This management measure is intended to be applied by States to all construction sites less than 5 acres in area and to new, resurfaced, restored, and reconstructed road, highway, and bridge construction projects. This management measure does not apply to: (1) construction of a detached single family home on a site of 1/2 acre or more or (2) construction that does not disturb over 5,000 square feet of land on a site. (NOTE: All construction activities, including clearing, grading, and excavation, that result in the disturbance of areas greater than or equal to 5 acres or are a part of a larger development plan are covered by the NPDES regulations and are thus excluded from these requirements.) Under the Coastal Zone Act Reauthorization Amendments of 1990, States are subject to a number of requirements as they develop coastal NPS programs in conformance with this management measure and will have flexibility in doing so. The application of management measures by States is described more fully in *Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance*, published jointly by the U.S. Environmental Protection Agency (EPA) and the National Oceanic and Atmospheric Administration (NOAA) of the U.S. Department of Commerce.

2. Description

The purpose of this management measure is to prevent the generation of nonpoint source pollution from construction sites due to improper handling and usage of nutrients and toxic substances, and to prevent the movement of toxic substances from the construction site.

Many potential pollutants other than sediment are associated with construction activities. These pollutants include pesticides (insecticides, fungicides, herbicides, and rodenticides); fertilizers used for vegetative stabilization; petrochemicals (oils, gasoline, and asphalt degreasers); construction chemicals such as concrete products, sealers, and paints; wash water associated with these products; paper; wood; garbage; and sanitary wastes (Washington State Department of Ecology, 1991).

The variety of pollutants present and the severity of their effects are dependent on a number of factors:

(1) **The nature of the construction activity.** For example, potential pollution associated with fertilizer usage may be greater along a highway or at a housing development than it would be at a shopping center development because highways and housing developments usually have greater landscaping requirements.

(2) **The physical characteristics of the construction site.** The majority of all pollutants generated at construction sites are carried to surface waters via runoff. Therefore, the factors affecting runoff volume,

such as the amount, intensity, and frequency of rainfall; soil infiltration rates; surface roughness; slope length and steepness; and area denuded, all contribute to pollutant loadings.

(3) **The proximity of surface waters to the nonpoint pollutant source.** As the distance separating pollutant-generating activities from surface waters decreases, the likelihood of water quality impacts increases.

a. Pesticides

Insecticides, rodenticides, and herbicides are used on construction sites to provide safe and healthy conditions, reduce maintenance and fire hazards, and curb weeds and woody plants. Rodenticides are also used to control rodents attracted to construction sites. Common insecticides employed include synthetic, relatively water-insoluble chlorinated hydrocarbons, organophosphates, carbamates, and pyrethrins.

b. Petroleum Products

Petroleum products used during construction include fuels and lubricants for vehicles, for power tools, and for general equipment maintenance. Specific petroleum pollutants include gasoline, diesel oil, kerosene, lubricating oils, and grease. Asphalt paving also can be particularly harmful since it releases various oils for a considerable time period after application. Asphalt overloads might be dumped and covered without inspection. However, many of these pollutants adhere to soil particles and other surfaces and can therefore be more easily controlled.

c. Nutrients

Fertilizers are used on construction sites when revegetating graded or disturbed areas. Fertilizers contain nitrogen and phosphorus, which in large doses can adversely affect surface waters, causing eutrophication.

d. Solid Wastes

Solid wastes on construction sites are generated from trees and shrubs removed during land clearing and structure installation. Other wastes include wood and paper from packaging and building materials, scrap metals, sanitary wastes, rubber, plastic and glass, and masonry and asphalt products. Food containers, cigarette packages, leftover food, and aluminum foil also contribute solid wastes to the construction site.

e. Construction Chemicals

Chemical pollutants, such as paints, acids for cleaning masonry surfaces, cleaning solvents, asphalt products, soil additives used for stabilization, and concrete-curing compounds, may also be used on construction sites and carried in runoff.

f. Other Pollutants

Other pollutants, such as wash water from concrete mixers, acid and alkaline solutions from exposed soil or rock, and alkaline-forming natural elements, may also be present and contribute to nonpoint source pollution.

Revegetation of disturbed areas may require the use of fertilizers and pesticides, which, if not applied properly, may become nonpoint source pollutants. Many pesticides are restricted by Federal and/or State regulations.

Hydroseeding operations, in which seed, fertilizers, and lime are applied to the ground surface in a one-step operation, are more conducive to nutrient pollution than are the conventional seedbed-preparation operations, in which fertilizers and lime are tilled into the soil. Use of fertilizers containing little or no phosphorus may be required by

local authorities if the development is near sensitive waterbodies. The addition of lime can also affect the pH of sensitive waters, making them more alkaline.

Improper fueling and servicing of vehicles can lead to significant quantities of petroleum products being dumped onto the ground. These pollutants can then be washed off site in urban runoff, even when proper erosion and sediment controls are in place. Pollutants carried in solution in runoff water, or fixed with sediment crystalline structures, may not be adequately controlled by erosion and sediment control practices (Washington Department of Ecology, 1991). Oils, waxes, and water-insoluble pesticides can form surface films on water and solid particles. Oil films can also concentrate water-soluble insecticides. These pollutants can be nearly impossible to control once present in runoff other than by the use of very costly water-treatment facilities (Washington Department of Ecology, 1991).

After spill prevention, one of the best methods to control petroleum pollutants is to retain sediments containing oil on the construction site through use of erosion and sediment control practices. Improved maintenance and safe storage facilities will reduce the chance of contaminating a construction site. One of the greatest concerns related to use of petroleum products is the method for waste disposal. The dumping of petroleum product wastes into sewers and other drainage channels is illegal and could result in fines or job shutdown.

The primary control method for solid wastes is to provide adequate disposal facilities. Erosion and sediment control structures usually capture much of the solid waste from construction sites. Periodic removal of litter from these structures will reduce solid waste accumulations. Collected solid waste should be removed and disposed of at authorized disposal areas.

Improperly stored construction materials, such as pressure-treated lumber or solvents, may lead to leaching of toxics to surface water and ground water. Disposal of construction chemicals should follow all applicable State and local laws that may require disposal by a licensed waste management firm.

3. Management Measure Selection

This management measure was selected based on the potential for many construction activities to contribute to nutrient and toxic NPS pollution.

This management measure was selected because (1) construction activities have the potential to contribute to increased loadings of toxic substances and nutrients to waterbodies; (2) various States and local governments regulate the control of chemicals on construction sites through spill prevention plans, erosion and sediment control plans, or other administrative devices; (3) the practices described are commonly used and presented in a number of best management practice handbooks and guidance manuals for construction sites; and (4) the practices selected are the most economical and effective.

4. Practices

As discussed more fully at the beginning of this chapter and in Chapter 1, the following practices are described for illustrative purposes only. State programs need not require implementation of these practices. However, as a practical matter, EPA anticipates that the management measure set forth above generally will be implemented by applying one or more management practices appropriate to the source, location, and climate. The practices set forth below have been found by EPA to be representative of the types of practices that can be applied successfully to achieve the management measure described above.

a. Properly store, handle, apply, and dispose of pesticides.

Pesticide storage areas on construction sites should be protected from the elements. Warning signs should be placed in areas recently sprayed or treated. Persons mixing and applying these chemicals should wear suitable protective clothing, in accordance with the law.

Application rates should conform to registered label directions. Disposal of excess pesticides and pesticide-related wastes should conform to registered label directions for the disposal and storage of pesticides and pesticide containers set forth in applicable Federal, State, and local regulations that govern their usage, handling, storage, and disposal. Pesticides and herbicides should be used only in conjunction with Integrated Pest Management (IPM) (see Chapter 2). Pesticides should be the tool of last resort; methods that are the least disruptive to the environment and human health should be used first.

Pesticides should be disposed of through either a licensed waste management firm or a treatment, storage, and disposal (TSD) facility. Containers should be triple-rinsed before disposal, and rinse waters should be reused as product.

Other practices include setting aside a locked storage area, tightly closing lids, storing in a cool, dry place, checking containers periodically for leaks or deterioration, maintaining a list of products in storage, using plastic sheeting to line the storage area, and notifying neighboring property owners prior to spraying.

b. Properly store, handle, use, and dispose of petroleum products.

When storing petroleum products, follow these guidelines:

- Create a shelter around the area with cover and wind protection;
- Line the storage area with a double layer of plastic sheeting or similar material;
- Create an impervious berm around the perimeter with a capacity 110 percent greater than that of the largest container;
- Clearly label all products;
- Keep tanks off the ground; and
- Keep lids securely fastened.

Oil and oily wastes such as crankcase oil, cans, rags, and paper dropped into oils and lubricants should be disposed of in proper receptacles or recycled. Waste oil for recycling should not be mixed with degreasers, solvents, antifreeze, or brake fluid.

c. Establish fuel and vehicle maintenance staging areas located away from all drainage courses, and design these areas to control runoff.

Proper maintenance of equipment and installation of proper stream crossings will further reduce pollution of water by these sources. Stream crossings should be minimized through proper planning of access roads. Refer to Chapter 3 for additional information on stream crossings.

d. Provide sanitary facilities for constructions workers.

e. Store, cover, and isolate construction materials, including topsoil and chemicals, to prevent runoff of pollutants and contamination of ground water.

f. Develop and implement a spill prevention and control plan. Agencies, contractors, and other commercial entities that store, handle, or transport fuel, oil, or hazardous materials should develop a spill response plan.

Post spill procedure information and have persons trained in spill handling on site or on call at all times. Materials for cleaning up spills should be kept on site and easily available. Spills should be cleaned up immediately and the contaminated material properly disposed of. Spill control plan components should include:

- Stop the source of the spill.
- Contain any liquid.
- Cover the spill with absorbent material such as kitty litter or sawdust, but do not use straw. Dispose of the used absorbent properly.

g. Maintain and wash equipment and machinery in confined areas specifically designed to control runoff.

Thinners or solvents should not be discharged into sanitary or storm sewer systems when cleaning machinery. Use alternative methods for cleaning larger equipment parts, such as high-pressure, high-temperature water washes, or steam cleaning. Equipment-washing detergents can be used, and wash water may be discharged into sanitary sewers if solids are removed from the solution first. (This practice should be verified with the local sewer authority.) Small parts can be cleaned with degreasing solvents, which can then be reused or recycled. Do not discharge any solvents into sewers.

Washout from concrete trucks should be disposed of into:

- A designated area that will later be backfilled;
- An area where the concrete wash can harden, can be broken up, and then can be placed in a dumpster; or
- A location not subject to urban runoff and more than 50 feet away from a storm drain, open ditch, or surface water.

Never dump washout into a sanitary sewer or storm drain, or onto soil or pavement that carries urban runoff.

h. Develop and implement nutrient management plans.

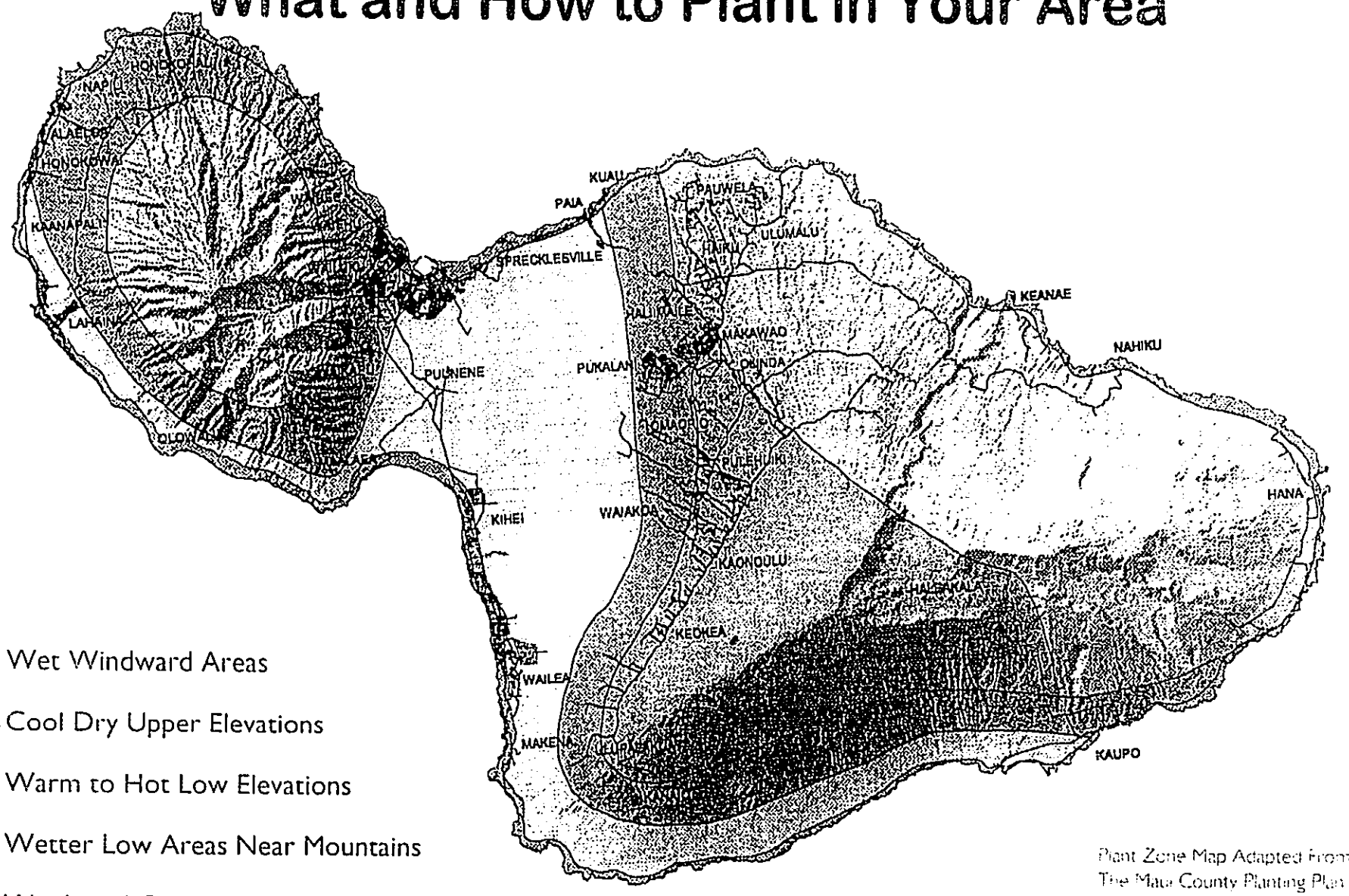
Properly time applications, and work fertilizers and liming materials into the soil to depths of 4 to 6 inches. Using soil tests to determine specific nutrient needs at the site can greatly decrease the amount of nutrients applied.

i. Provide adequate disposal facilities for solid waste, including excess asphalt, produced during construction.

j. Educate construction workers about proper materials handling and spill response procedures. Distribute or post informational material regarding chemical control.

Saving Water in The Yard

What and How to Plant in Your Area



Plant Zone Map Adapted From
The Maui County Planting Plan

1 Wet Windward Areas

2 Cool Dry Upper Elevations

3 Warm to Hot Low Elevations

4 Wetter Low Areas Near Mountains

5 Windward Coastal Salt Spray Zones

Tips From The Maui County Department of Water Supply

By Water All Things Find Life

Zone-specific Native and Polynesian plants for Maui County

Zone 1

TYPE: F Fern G Grass Gr Ground Cover Sh Shrub P Palm S Sedge Tr Tree V Vine

Type	Scientific Name	Common Name	Height	Spread	Elevation	Water req.
F	Psilotum nudum	moa, moa kula	1'	1'	sea to 3,000'	Dry to Wet
F	Sadleria cyatheoides	'ama'u, ama'uma'u				
Gr - Sh	Lipochaeta succulenta	nehe	2'	5'	sea to 1,000'	Dry to Wet
P	Cocos nucifera	coconut, niu	100'	30'	sea to 1,000'	Dry to Wet
P	Pritchardia arecina	lo'ulu, hawane	40'	10'	1,000' to 3,000'	Dry to Wet
P	Pritchardia forbesiana	lo'ulu	15'			
P	Pritchardia hillebrandii	lo'ulu, fan palm	25'	15'	sea to 1,000'	Dry to Wet
S	Mariscus javanicus	marsh cypress, 'ahu'awa	0.5'	0.5'	sea to 1,000'	Dry to Medium
Sh	Bidens hillebrandiana ssp. hillebrandiana	ko'oko'olau	1'	2'	sea to 1,000'	Dry to Wet
Sh	Cordyline fruticosa	ti, ki	6			
Sh	Hedyotis spp.	au, pilo	3'	2'	1,000' to 3,000'	Dry to Wet
Sh - Tr	Broussonetia papyrifera	wauke, paper mulberry	8'	6'	sea to 1,000'	Dry to Medium
Tr	Acacia koa	koa	50' - 100'	40' - 80'	1,500' to 4,000'	Dry to Medium
Tr	Aleurites moluccana	candlenut, kukui	50'	50'	sea to 3,000'	Medium to Wet
Tr	Calophyllum inophyllum	kamani, alexandrian laurel	60'	40'	sea to 3,000'	Medium to Wet
Tr	Charpentiera obovata		15'			
Tr	Cordia subcordata	kou	30'	25'	sea to 1,000'	Dry to Wet
Tr	Hibiscus furcellatus	'aklohala, hau-hele	8'			
Tr	Metrosideros polymorpha var. macrophylla	ohi'a lehua	25'	25'	sea to 1,000'	Dry to Wet
Tr	Morinda citrifolia	indian mulberry, noni	20'	15'	sea to 1,000'	Dry to Wet
Tr	Pandanus tectorius	hala, puhala (HALELIST)	35'	25'	sea to 1,000'	Dry to Wet
V	Alyxia oliviformis	maile	Vine		sea to 6,000'	Medium to Wet

Zone-specific Native and Polynesian plants for Maui County

Zone 2

TYPE: **F** Fern **G** Grass **Gr** Ground Cover **Sh** Shrub **P** Palm **S** Sedge **Tr** Tree **V** Vine

Type	Scientific Name	Common Name	Height	Spread	Elevation	Water req.
F	Psilotum nudum	moa, moa kula	1'	1'	sea to 3,000'	Dry to Wet
F	Sadleria cyatheoides	'ama'u, ama'uma'u				
G	Eragrostis monticola	kalamalo	1'	2'	sea to 3,000'	Dry to Medium
Gr	Ipomoea tuboides	Hawaiian moon flower, 'uala	1'	10'	sea to 3,000'	Dry to Medium
Gr	Peperomia leptostachya	'ala'ala-wai-nui	1'	1'	sea to 3,000'	Dry to Medium
Gr	Plumbago zeylanica	'ilie'e	1'			
Gr - Sh	Hibiscus calyphyllus	ma'o hau hele, Rock's hibiscus	3'	2'	sea to 3,000'	Dry to Medium
Gr - Sh	Lipochaeta rockii	nehe	2'	2'	sea to 3,000'	Dry to Medium
Sh	Argemone glauca var. decipiens	pua kala	3'	2'	sea to 3,000'	Dry to Medium
Sh	Artemisia mauiensis var. diffusa	Maui wormwood, 'ahinahina	2'	3'	1,000' to higher	Dry to Medium
Sh	Chenopodium oahuense	'aheahea, 'aweoweo	6'		sea to higher	Dry to Medium
Sh	Dianella sandwicensis	'uki	2'	2'	1,000' to higher	Dry to Medium
Sh	Lipochaeta lavarum	nehe	3'	3'	sea to 3,000'	Dry to Medium
Sh	Osteomeles anthyllidifolia	'ulei, eluehe	4'	6'	sea to 3,000'	Dry to Medium
Sh	Senna gaudichaudii	kolomana	5'	5'	sea to 3,000'	Dry to Medium
Sh	Styphelia tamelamelae	pukiawe	6'	6'	1,000' to higher	Dry to Medium
Sh	Vitex rotundifolia	pohinahina	3'	4'	sea to 1,000'	Dry to Medium
Sh - Tr	Myoporum sandwicense	naio, false sandalwood	10'	10'	sea to higher	Dry to Medium
Sh - Tr	Nototrichium sandwicense	kulu'i	8'	8'	sea to 3,000'	Dry to Medium
Sh-Tr	Dodonaea viscosa	'a'ali'i	6'	8'	sea to higher	Dry to Medium
Tr	Acacia koa	koa	50' - 100'	40' - 80'	1,500' to 4,000'	Dry to Medium
Tr	Charpentiera obovata		15'			
Tr	Erythrina sandwicensis	wiliwili	20'	20'	sea to 1,000'	Dry
Tr	Metrosideros polymorpha var. macrophylla	ohi'a lehua	25'	25'	sea to 1,000'	Dry to Wet

Zone-specific Native and Polynesian plants for Maui County

Zone 2

Type	Scientific Name	Common Name	Height	Spread	Elevation	Water req.
Tr	Nestegis sandwicensis	olopua	15'	15'	1,000' to 3,000'	Dry to Medium
Tr	Pleomele auwahiensis	halapepe	20'			
Tr	Rauvolfia sandwicensis	hao	20'	15'	sea to 3,000'	Dry to Medium
Tr	Santalum ellipticum	coastal sandalwood, 'iii-ahi	8'	8'	sea to 3,000'	Dry to Medium
Tr	Sophora chrysophylla	mamane	15'	15'	1,000' to 3,000'	Medium
V	Alyxia oliviformis	maile	Vine		sea to 6,000'	Medium to Wet

Zone-specific Native and Polynesian plants for Maui County

Zone 3

TYPE: **F** Fern **G** Grass **Gr** Ground Cover **Sh** Shrub **P** Palm **S** Sedge **Tr** Tree **V** Vine

Type	Scientific Name	Common Name	Height	Spread	Elevation	Water req.
F	Psilotum nudum	moa, moa kula	1'	1'	sea to 3,000'	Dry to Wet
G	Colubrina asiatica	'anapanapa	3'	10'	sea to 1,000'	Dry to Wet
G	Eragrostis monticola	kalamalo	1'	2'	sea to 3,000'	Dry to Medium
G	Eragrostis variabilis	'emo-loa	1'	2'	sea to 3,000'	Dry to Medium
G	Fimbristylis cymosa ssp. spathacea	mau'u'aki'aki fimbristylis	0.5'	1'	sea to 1,000'	Dry to Medium
Gr	Boerhavia repens	alena	0.5'	4'	sea to 1,000'	Dry to Medium
Gr	Chamaesyce celastroides var. laehiensis	'akoko	2'	3'	sea to 1,000'	Dry to Medium
Gr	Cressa truxillensis	cressa	0.5'	1'	sea to 1,000'	Dry to Medium
Gr	Heliotropium anomalum var. argenteum	hinahina ku kahakai	1'	2'	sea to 1,000'	Dry to Medium
Gr	Ipomoea tuboides	Hawaiian moon flower, 'uala	1'	10'	sea to 3,000'	Dry to Medium
Gr	Jacquemontia ovalifolia ssp. sandwicensis	pa'u o hi'iaka	0.5'	6'	sea to 1,000'	Dry to Medium
Gr	Lipochaeta integrifolia	nehe	1'	5'	sea to 1,00'	Dry to Medium
Gr	Peperomia leptostachya	'ala'ala-wai-nui	1'	1'	sea to 3,000'	Dry to Medium
Gr	Plumbago zeylanica	'ilie'e	1'			
Gr	Sesuvium portulacastrum	'akulikuli, sea-purslane	0.5'	2'	sea to 1,000'	Dry to Wet
Gr	Sida fallax	'ilima	0.5'	3'	sea to 1,000'	Dry to Medium
Gr	Tephrosia purpurea var. purpurea	'auhuhu	2'	2'	sea to 1,000'	Dry to Medium
Gr - Sh	Hibiscus calyphyllus	ma'o hau hele, Rock's hibiscus	3'	2'	sea to 3,000'	Dry to Medium
Gr - Sh	Lipochaeta rockii	nehe	2'	2'	sea to 3,000'	Dry to Medium
Gr - Sh	Lipochaeta succulenta	nehe	2'	5'	sea to 1,000'	Dry to Wet
Gr - Sh	Lycium sandwicense	'ohelo-kai, 'ae'ae	2'	2'	sea to 1,000'	Dry to Medium
P	Cocos nucifera	coconut, niu	100'	30'	sea to 1,000'	Dry to Wet
P	Pritchardia hillebrandii	lo'ulu, fan palm	25'	15'	sea to 1,000'	Dry to Wet
S	Mariscus javanicus	marsh cypress, 'ahu'awa	0.5'	0.5'	sea to 1,000'	Dry to Medium

Zone-specific Native and Polynesian plants for Maui County

Zone 3

Type	Scientific Name	Common Name	Height	Spread	Elevation	Water req.
Sh	Argemone glauca var. deciplens	pua kala	3'	2'	sea to 3,000'	Dry to Medium
Sh	Bidens mauiensis	ko'oko'olau	1'	3'	sea to 1,000'	Dry to Medium
Sh	Bidens menziesii ssp. menziesii	ko'oko'olau	1'	3'		
Sh	Bidens micrantha ssp. micrantha	ko'oko'olau	1'	3'		
Sh	Chenopodium oahuense	'aheahea, 'aweoweo	6'		sea to higher	Dry to Medium
Sh	Dianella sandwicensis	'uki	2'	2'	1,000' to higher	Dry to Medium
Sh	Gossypium tomentosum	mao, Hawaiian cotton	5'	8'	sea to 1,000'	Dry to Medium
Sh	Hedyotis spp.	au, pilo	3'	2'	1,000' to 3,000'	Dry to Wet
Sh	Lipochaeta lavarum	nehe	3'	3'	sea to 3,000'	Dry to Medium
Sh	Osteomeles anthyllidifolia	'ulei, eluehe	4'	6'	sea to 3,000'	Dry to Medium
Sh	Scaevola sericea	naupaka, naupaka-kahakai	6'	8'	sea to 1,000'	Dry to Medium
Sh	Senna gaudichaudii	kolomana	5'	5'	sea to 3,000'	Dry to Medium
Sh	Solanum nelsonii	'akia, beach solanum	3'	3'	sea to 1,00'	Dry to Medium
Sh	Styphelia tamelameiae	pukiawe	6'	6'	1,000' to higher	Dry to Medium
Sh	Vitex rotundifolia	pohinahina	3'	4'	sea to 1,000'	Dry to Medium
Sh	Wikstroemia uva-ursi kaualensis kaualensis	'akia, Molokai osmanthus				
Sh - Tr	Broussonetia papyrifera	wauke, paper mulberry	8'	6'	sea to 1,000'	Dry to Medium
Sh - Tr	Myoporum sandwicense	naio, false sandalwood	10'	10'	sea to higher	Dry to Medium
Sh - Tr	Nototrichium sandwicense	kulu'i	8'	8'	sea to 3,000'	Dry to Medium
Sh-Tr	Dodonaea viscosa	'a'ali'i	6'	8'	sea to higher	Dry to Medium
Tr	Aleurites moluccana	candlenut, kukui	50'	50'	sea to 3,000'	Medium to Wet
Tr	Calophyllum inophyllum	kamani, alexandrian laurel	60'	40'	sea to 3,000'	Medium to Wet
Tr	Canthium odoratum	Alahe'e, 'ohe'e, walahe'e	12'	8'	sea to 3,000'	Dry to Medium
Tr	Cordia subcordata	kou	30'	25'	sea to 1,000'	Dry to Wet
Tr	Diospyros sandwicensis	lama	12'	15'	sea to 3,000'	Dry to Medium
Tr	Erythrina sandwicensis	wiliwili	20'	20'	sea to 1,000'	Dry
Tr	Metrosideros polymorpha var. macrophylla	ohi'a lehua	25'	25'	sea to 1,000'	Dry to Wet

Zone-specific Native and Polynesian plants for Maui County

Zone 3

Type	Scientific Name	Common Name	Height	Spread	Elevation	Water req.
Tr	Morinda citrifolia	Indian mulberry, noni	20'	15'	sea to 1,000'	Dry to Wet
Tr	Nesoluma polynesicum	keahi	15'	15'	sea to 3,00'	Dry
Tr	Nestegis sandwicensis	olopua	15'	15'	1,000' to 3,000'	Dry to Medium
Tr	Pandanus tectorius	hala, puhala (HALELIST)	35'	25'	sea to 1,000'	Dry to Wet
Tr	Pleomele auwahiensis	halapepe	20'			
Tr	Rauvollia sandwicensis	hao	20'	15'	sea to 3,000'	Dry to Medium
Tr	Reynoldsia sandwicensis	'ohe makai	20'	20'	1,000' to 3,000'	Dry
Tr	Santalum ellipticum	coastal sandalwood, 'iii-ahi	8'	8'	sea to 3,000'	Dry to Medium
Tr	Thespesia populnea	milo	30'	30'	sea to 3,000'	Dry to Wet

Zone-specific Native and Polynesian plants for Maui County

Zone 4

TYPE: F Fern G Grass Gr Ground Cover Sh Shrub P Palm S Sedge Tr Tree V Vine

Type	Scientific Name	Common Name	Height	Spread	Elevation	Water req.
F	Psilotum nudum	moa, moa kula	1'	1'	sea to 3,000'	Dry to Wet
F	Sadleria cyatheoides	'ama'u, ama'uma'u				
G	Colubrina asiatica	'anapanapa	3'	10'	sea to 1,000'	Dry to Wet
G	Eragrostis monticola	kalamalo	1'	2'	sea to 3,000'	Dry to Medium
G	Eragrostis variabilis	'emo-loa	1'	2'	sea to 3,000'	Dry to Medium
G	Fimbristylis cymosa ssp. spathacea	mau'u'aki'aki fimbristylis	0.5'	1'	sea to 1,000'	Dry to Medium
Gr	Chamaesyce celastroides var. laehlensis	'akoko	2'	3'	sea to 1,000'	Dry to Medium
Gr	Ipomoea tuboides	Hawaiian moon flower, 'uala	1'	10'	sea to 3,000'	Dry to Medium
Gr	Jacquemontia ovalifolia ssp. sandwicensis	pa'u o hi'iaka	0.5'	6'	sea to 1,000'	Dry to Medium
Gr	Lipochaeta integrifolia	nehe	1'	5'	sea to 1,00'	Dry to Medium
Gr	Peperomia leptostachya	'ala'ala-wai-nui	1'	1'	sea to 3,000'	Dry to Medium
Gr	Plumbago zeylanica	'ilie'e	1'			
Gr	Sida fallax	'ilima	0.5'	3'	sea to 1,000'	Dry to Medium
Gr	Tephrosia purpurea var..purpurea	'auhuhu	2'	2'	sea to 1,000'	Dry to Medium
Gr - Sh	Hibiscus calyphyllus	ma'o hau hele, Rock's hibiscus	3'	2'	sea to 3,000'	Dry to Medium
Gr - Sh	Lipochaeta rockii	nehe	2'	2'	sea to 3,000'	Dry to Medium
Gr - Sh	Lipochaeta succulenta	nehe	2'	5'	sea to 1,000'	Dry to Wet
P	Cocos nucifera	coconut, niu	100'	30'	sea to 1,000'	Dry to Wet
P	Pritchardia arecina	lo'ulu, hawane	40'	10'	1,000' to 3,000'	Dry to Wet
P	Pritchardia forbesiana	lo'ulu	15'			
P	Pritchardia hillebrandii	lo'ulu, fan palm	25'	15'	sea to 1,000'	Dry to Wet
S	Mariscus javanicus	marsh cypress, 'ahu'awa	0.5'	0.5'	sea to 1,000'	Dry to Medium
Sh	Argemone glauca var. decipiens	pua kala	3'	2'	sea to 3,000'	Dry to Medium
Sh	Artemisia australis	'ahinahina	2'	3'	sea to 3,000'	Dry to Medium

Zone-specific Native and Polynesian plants for Maui County

Zone 4

Type	Scientific Name	Common Name	Height	Spread	Elevation	Water req.
Sh	Artemisia mauiensis var. diffusa	Maui wormwood, 'ahinahina	2'	3'	1,000' to higher	Dry to Medium
Sh	Bidens hillebrandiana ssp. hillebrandiana	ko'oko'olau	1'	2'	sea to 1,000'	Dry to Wet
Sh	Bidens menziesii ssp. menziesii	ko'oko'olau	1'	3'		
Sh	Bidens micrantha ssp. micrantha	ko'oko'olau	1'	3'		
Sh	Cordyline fruticosa	ti, ki	6			
Sh	Dianella sandwicensis	'uki	2'	2'	1,000' to higher	Dry to Medium
Sh	Lipochaeta lavarum	nehe	3'	3'	sea to 3,000'	Dry to Medium
Sh	Osteomeles anthyllidifolia	'ulei, eluehe	4'	6'	sea to 3,000'	Dry to Medium
Sh	Scaevola sericea	naupaka, naupaka-kahakai	6'	8'	sea to 1,000'	Dry to Medium
Sh	Solanum nelsonii	'akia, beach solanum	3'	3'	sea to 1,00'	Dry to Medium
Sh	Styphelia tameiameiae	pukiawe	6'	6'	1,000' to higher	Dry to Medium
Sh	Vitex rotundifolia	pohinahina	3'	4'	sea to 1,000'	Dry to Medium
Sh	Wikstroemia uva-ursi kauaiensis kauaiensis	'akia, Molokai osmanthus				
Sh - Tr	Broussonetia papyrifera	wauke, paper mulberry	8'	6'	sea to 1,000'	Dry to Medium
Sh - Tr	Myoporum sandwicense	naio, false sandalwood	10'	10'	sea to higher	Dry to Medium
Sh - Tr	Nototrichium sandwicense	kulu'i	8'	8'	sea to 3,000'	Dry to Medium
Sh-Tr	Dodonaea viscosa	'a'ali'i	6'	8'	sea to higher	Dry to Medium
Tr	Acacia koa	koa	50' - 100'	40' - 80'	1,500' to 4,000'	Dry to Medium
Tr	Aleurites moluccana	candlenut, kukui	50'	50'	sea to 3,000'	Medium to Wet
Tr	Calophyllum inophyllum	kamani, alexandrian laurel	60'	40'	sea to 3,000'	Medium to Wet
Tr	Canthium odoratum	Alahe'e, 'ohe'e, walahe'e	12'	8'	sea to 3,000'	Dry to Medium
Tr	Charpentiera obovata		15'			
Tr	Cordia subcordata	kou	30'	25'	sea to 1,000'	Dry to Wet
Tr	Diospyros sandwicensis	lama	12'	15'	sea to 3,000'	Dry to Medium
Tr	Hibiscus furcellatus	'akiohala, hau-hele	8'			
Tr	Metrosideros polymorpha var. macrophylla	ohi'a lehua	25'	25'	sea to 1,000'	Dry to Wet
Tr	Morinda citrifolia	indian mulberry, noni	20'	15'	sea to 1,000'	Dry to Wet

Zone-specific Native and Polynesian plants for Maui County

Zone 4

Type	Scientific Name	Common Name	Height	Spread	Elevation	Water req.
Tr	Nestegis sandwicensis	olopua	15'	15'	1,000' to 3,000'	Dry to Medium
Tr	Pandanus tectorius	hala, puhala (HALELIST)	35'	25'	sea to 1,000'	Dry to Wet
Tr	Pleomele auwahlensis	halapepe	20'			
Tr	Rauvolfia sandwicensis	hao	20'	15'	sea to 3,000'	Dry to Medium
Tr	Santalum ellipticum	coastal sandalwood, 'ili-ahi	8'	8'	sea to 3,000'	Dry to Medium
Tr	Sophora chrysophylla	mamane	15'	15'	1,000' to 3,000'	Medium
Tr	Thespesia populnea	milo	30'	30'	sea to 3,000'	Dry to Wet
V	Alyxia oliviformis	maile	Vine		sea to 6,000'	Medium to Wet

Zone-specific Native and Polynesian plants for Maui County

Zone 5

TYPE: F Fern G Grass Gr Ground Cover Sh Shrub P Palm S Sedge Tr Tree V Vine

Type	Scientific Name	Common Name	Height	Spread	Elevation	Water req.
G	Colubrina asiatica	'anapanapa	3'	10'	sea to 1,000'	Dry to Wet
G	Eragrostis variabilis	'emo-loa	1'	2'	sea to 3,000'	Dry to Medium
G	Fimbristylis cymosa ssp. spathacea	mau'u'aki'aki fimbristylis	0.5'	1'	sea to 1,000'	Dry to Medium
Gr	Boerhavia repens	alena	0.5'	4'	sea to 1,000'	Dry to Medium
Gr	Chamaesyce celastroides var. laehlensis	'akoko	2'	3'	sea to 1,000'	Dry to Medium
Gr	Cressa truxillensis	cressa	0.5'	1'	sea to 1,000'	Dry to Medium
Gr	Heliotropium anomalum var. argenteum	hinahina ku kahakai	1'	2'	sea to 1,000'	Dry to Medium
Gr	Jacquemontia ovalifolia ssp. sandwicensis	pa'u o hi'iaka	0.5'	6'	sea to 1,000'	Dry to Medium
Gr	Lipochaeta integrifolia	nehe	1'	5'	sea to 1,00'	Dry to Medium
Gr	Sesuvium portulacastrum	'akulikuli, sea-purslane	0.5'	2'	sea to 1,000'	Dry to Wet
Gr	Sida fallax	'ilima	0.5'	3'	sea to 1,000'	Dry to Medium
Gr	Tephrosia purpurea var. purpurea	'auhuhu	2'	2'	sea to 1,000'	Dry to Medium
Gr - Sh	Hibiscus calyphyllus	ma'o hau hele, Rock's hibiscus	3'	2'	sea to 3,000'	Dry to Medium
Gr - Sh	Lycium sandwicense	'ohelo-kai, 'ae'ae	2'	2'	sea to 1,000'	Dry to Medium
P	Cocos nucifera	coconut, niu	100'	30'	sea to 1,000'	Dry to Wet
P	Pritchardia hillebrandii	lo'ulu, fan palm	25'	15'	sea to 1,000'	Dry to Wet
S	Mariscus javanicus	marsh cypress, 'ahu'awa	0.5'	0.5'	sea to 1,000'	Dry to Medium
Sh	Argemone glauca var. deciplens	pua kala	3'	2'	sea to 3,000'	Dry to Medium
Sh	Artemisia australis	'ahinahina	2'	3'	sea to 3,000'	Dry to Medium
Sh	Bidens hillebrandiana ssp. hillebrandiana	ko'oko'olau	1'	2'	sea to 1,000'	Dry to Wet
Sh	Bidens mauiensis	ko'oko'olau	1'	3'	sea to 1,000'	Dry to Medium
Sh	Chenopodium oahuense	'aheahea, 'aweoweo	6'		sea to higher	Dry to Medium
Sh	Dianella sandwicensis	'uki	2'	2'	1,000' to higher	Dry to Medium
Sh	Gossypium tomentosum	mao, Hawaiian cotton	5'	8'	sea to 1,000'	Dry to Medium

Zone-specific Native and Polynesian plants for Maui County

Zone 5

Type	Scientific Name	Common Name	Height	Spread	Elevation	Water req.
Sh	Hedyotis spp.	au, pilo	3'	2'	1,000' to 3,000'	Dry to Wet
Sh	Lipochaeta lavarum	nehe	3'	3'	sea to 3,000'	Dry to Medium
Sh	Osteomeles anthyllidifolia	'ulei, eluehe	4'	6'	sea to 3,000'	Dry to Medium
Sh	Scaevola sericea	naupaka, naupaka-kahakai	6'	8'	sea to 1,000'	Dry to Medium
Sh	Senna gaudichaudii	kolomana	5'	5'	sea to 3,000'	Dry to Medium
Sh	Solanum nelsonii	'akia, beach solanum	3'	3'	sea to 1,00'	Dry to Medium
Sh	Vitex rotundifolia	pohinahina	3'	4'	sea to 1,000'	Dry to Medium
Sh	Wikstroemia uva-ursi kaualensis kaualensis	'akia, Molokai osmanthus				
Sh - Tr	Myoporum sandwicense	naio, false sandalwood	10'	10'	sea to higher	Dry to Medium
Sh-Tr	Dodonaea viscosa	'a'ali'i	6'	8'	sea to higher.	Dry to Medium
Tr	Aleurites moluccana	candlenut, kukui	50'	50'	sea to 3,000'	Medium to Wet
Tr	Calophyllum inophyllum	kamani, alexandrian laurel	60'	40'	sea to 3,000'	Medium to Wet
Tr	Cordia subcordata	kou	30'	25'	sea to 1,000'	Dry to Wet
Tr	Hibiscus furcellatus	'akiohala, hau-hele	8'			
Tr	Morinda citrifolia	indian mulberry, noni	20'	15'	sea to 1,000'	Dry to Wet
Tr	Pandanus tectorius	hala, puhala (HALELIST)	35'	25'	sea to 1,000'	Dry to Wet
Tr	Thespesia populnea	milo	30'	30'	sea to 3,000'	Dry to Wet
V	Ipomoea pes-caprae	beach morning glory, pohuehue	1			

DO NOT PLANT THESE PLANTS !!!

Common name	Scientific name	Plant family
black wattle	Acacia mearnsii	Mimosaceae
blackberry	Rubus argutus	Rosaceae
blue gum	Eucalyptus globulus	Myrtaceae
bocconia	Bocconia frutescens	Papaveraceae
broad-leaved cordia	Cordia glabra	Boraginaceae
broomsedge, yellow bluestem	Andropogon virginicus	Poaceae
buffelgrass	Cenchrus ciliaris	Poaceae
butterfly bush, smoke bush	Buddleja madagascariensis	Buddlejaceae
cats claw, Mysore thorn, wait-a-bit	Caesalpinia decapetala	Caesalpiniaceae
common ironwood	Casuarina equisetifolia	Casuarinaceae
common velvet grass, Yorkshire fog	Holcus lanatus	Poaceae
fiddlewood	Citharexylum spinosum	Verbenaceae
fire tree, faya tree	Myrica faya	Myricaceae
glorybower	Clerodendrum laponicum	Verbenaceae
hairy cat's ear, gosmore	Hypochoeris radicata	Asteraceae
haole koa	Leucaena leucocephala	Fabaceae
ivy gourd, scarlet-fruited gourd	Coccinia grandis	Cucurbitaceae
juniper berry	Citharexylum caudatum	Verbenaceae
kahili flower	Grevillea banksii	Proteaceae
klu, popinac	Acacia farnesiana	Mimosaceae
logwood, bloodwood tree	Haematoxylon campechianum	Caesalpiniaceae
loquat	Eriobotrya japonica	Rosaceae
meadow ricegrass	Ehrharta stipoides	Poaceae
melaleuca	Melaleuca quinquenervia	Myrtaceae
miconia, velvet leaf	Miconia calvescens	Melastomataceae
narrow-leaved carpetgrass	Axonopus fissifolius	Poaceae
oleaster	Elaeagnus umbellata	Elaeagnaceae
oriental mangrove	Bruguiera gymnorrhiza	Rhizophoraceae
padang cassia	Cinnamomum burmanii	Lauraceae
palmgrass	Setaria palmifolia	Poaceae
pearl flower	Heterocentron subtriplinervium	Melastomataceae
quinine tree	Cinchona pubesens	Rubiaceae
satin leaf, caimitillo	Chrysophyllum oliviforme	Sapotaceae
silkwood, Queensland maple	Flindersia brayleyana	Rutaceae
silky oak, silver oak	Grevillea robusta	Proteaceae
strawberry guava	Psidium cattleianum	Myrtaceae
swamp oak, saltmarsh, longleaf ironwood	Casuarina glauca	Casuarinaceae
sweet vernalgrass	Anthoxanthum odoratum	Poaceae
tree of heaven	Ailanthus altissima	Simaroubaceae
trumpet tree, guarumo	Cecropia obtusifolia	Cecropiaceae
white ginger	Hedychium coronarium	Zingiberaceae
white moho	Heliocarpus popayanensis	Tiliaceae
yellow ginger	Hedychium flavescens	Zingiberaceae

DO NOT PLANT THESE PLANTS !!!

Common name	Scientific name	Plant family
	Jasminum fluminense	Oleaceae
	Arthrostema ciliatum	Melastomataceae
	Dissotis rotundifolia	Melastomataceae
	Erigeron karvinskianus	Asteraceae
	Eucalyptus robusta	Myrtaceae
	Hedychium gardnerianum	Zingiberaceae
	Juncus planifolius	Juncaceae
	Lophostemon confertus	Myrtaceae
	Medinilla cumingii	Melastomataceae
	Medinilla magnifica	Melastomataceae
	Medinilla venosa	Melastomataceae
	Melastoma candidum	Melastomataceae
	Melinis minutiflora	Poaceae
	Olea europaea	
	Oxyspora paniculata	Melastomataceae
	Panicum maximum	Poaceae
	Paspalum urvillei	Poaceae
	Passiflora edulis	Passifloraceae
	Phormium tenax	Agavaceae
	Pinus taeda	Pinaceae
	Prosopis pallida	Fabaceae
	Pterolepis glomerata	Melastomataceae
	Rhodomyrtus tomentosa	Myrtaceae
	Schefflera actinophylla	Araliaceae
	Syzygium jambos	Myrtaceae
Australian blackwood	Acacia melanoxylon	Mimosaceae
Australian tree fern	Cyathea cooperi	Cyatheaceae
Australian tree fern	Sphaeropteris cooperi	Cyatheaceae
Beggar's tick, Spanish needle	Bidens pilosa	Asteraceae
California grass	Brachiaria mutica	Poaceae
Chinese banyon, Maylayan banyon	Ficus microcarpa	Moraceae
Chinese violet	Asystasia gangetica	Acanthaceae
Christmasberry, Brazilian pepper	Schinus terebinthifolius	Anacardiaceae
Formosan koa	Acacia confusa	Mimosaceae
German ivy	Senecio mikanioides	Asteraceae
Japanese honeysuckle	Lonicera japonica	Caprifoliaceae
Koster's curse	Clidemia hirta	Melastomataceae
Lantana	Lantana camara	Verbenaceae
Mauritius hemp	Furcraea foetida	Agavaceae
Mexican ash, tropical ash	Fraxinus uhdei	Oleaceae
Mexican tulip poppy	Hunnemannia fumariifolia	Papaveraceae
Mules foot, Madagascar tree fern	Angiopteris evecta	Marattiaceae
New Zealand laurel, karakaranut	Corynocarpus laevigatus	Corynocarpaceae
New Zealand tea	Leptospermum scoparium	Myrtaceae
Pampas grass	Cortaderia jubata	Poaceae
Panama rubber tree, Mexican rubber tree	Castilloa elastica	Moraceae
Shoebutton ardisia	Ardisia elliptica	Myrsinaceae
banana poka	Passiflora mollissima	Passifloraceae

Selection

As a general rule, it is best to select the largest and healthiest specimens. However, be sure to note that they are not pot-bound. Smaller, younger plants may result in a low rate of plant survival.[1] When selecting native species, consider the site they are to be planted in, and the space that you have to plant. For example: Mountain species such as koa and maile will not grow well in hot coastal areas exposed to strong ocean breezes. Lowland and coastal species such as wiliwili and Kou require abundant sunshine and porus soil. They will not grow well with frequent cloud cover, high rainfall and heavy soil.

Consider too, the size that the species will grow to be. It is not wise to plant trees that will grow too large.[2] Overplanting tends to be a big problem in the landscape due to the underestimation of a species' height, width or spread.

A large, dense canopied tree such as the kukui is a good shade tree for a lawn. However, it's canopy size and density of shade will limit what can be planted in the surrounding area. Shade cast by a koa and ohia lehua is relatively light and will not inhibit growth beneath it.

Keep seasons in mind when you are selecting your plants. Not all plants look good year round, some plants such as ilima will look scraggly after they have flowered and formed seeds. Avoid planting large areas with only one native plant. Mixing plants which naturally grow together will ensure the garden will look good all year round.[3] Looking at natural habitats helps to show how plants grow naturally in the landscape.

When planting an area with a mixed-ecosystem, keep in mind the size and ecological requirements of each plant. Start with the hardiest and most easily grown species, but allow space for fragile ones in subsequent plantings.

Acquiring natives

Plants in their wild habitat must be protected and maintained. It is best and easiest to get your plants from nurseries (see list), or friend's gardens. Obtain proper permits from landowners and make sure you follow a few common sense rules:

- collect sparingly from each plant or area.
- some plants are on the state or Federal Endangered Species list. Make sure you get permits (see app. A,B)

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[1] K. Nagata, P.6

[2] K. Nagata, P.9

[3] Nagata, P.9

Soil

Once you have selected your site and the plants you wish to establish there, you must look at the soil conditions on the site. Proper soil is necessary for the successful growth of most native plants, which preform poorly in hard pan, clay or adobe soils. If natives are to be planted in these types of soil, it would be wise to dig planting holes several times the size of the rootball and backfill with 50-75% compost.[4] A large planting hole ensures the development of a strong root system. The plant will have a headstart before the roots penetrate the surrounding poor soil.[5]

It is recommended that native plants not be planted in ground that is more dense than potting soil. If there is no alternative, dig a hole in a mound of soil mixed with volcanic cinder which encourages maximum root development. Fill the hole with water, if the water tends to puddle or drain too slowly, dig a deeper hole until the water does not puddle longer than 1 or 2 minutes.[6] Well-drained soil is one of the most important things when planting natives as you will see in the next section.

Irrigation

Most natives do very poorly in waterlogged conditions. Do not water if the soil is damp. Water when the soil is dry and the plants are wilting. Once established, a good soaking twice a week should suffice. Deep soaking encourages the development of stronger, and deeper root systems. This is better than frequent and shallow watering which encourage weaker, more shallow root systems.

The following is a watering schedule from Kenneth Nagata's Booklet, *How To Plant A Native Hawaiian Garden*:

WATER REQUIREMENT	WATERING FREQUENCY
Heavy	3x / week
Moderate	2x / week
Light	1x / week

Red clay soils hold more water for a longer period of time than sandy soils do. If your area is very sunny or near a beach, things will dry out faster. Even in the area of one garden, there are parts that will need more or less water. Soils can vary and amount of shade and wind differ. After plants are established (a month or two for most plants, up to a year for some trees), you can back off watering.

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[4] Nagata, p. 6

[5] Nagata, p. 8

[6] Nagata, p. 8

Automatic sprinkler systems are expensive to install and must be checked and adjusted regularly. Above-ground systems allow you to monitor how much water is being put out, but you lose a lot due to malfunctioning of sprinkler heads and wind. The most efficient way to save water and make sure your plants get enough water, is to hand-water. This way you are getting our precious water to the right places in the right amounts.[7]

Fertilizer

An all-purpose fertilizer 10-10-10 is adequate for most species. They should be applied at planting time, 3 months later, and 6 months thereafter. Use half the dosage recommended for ornamentals and pay special attention to native ferns which are sensitive to strong fertilizers. Use of organic composts and aged animal manures is suggested instead of chemical fertilizers. In addition, use of cinders for providing trace minerals is strongly recommended.[8]

Natives are plants which were here hundreds of years before the polynesians inhabited the Hawaiian Islands. They were brought here by birds, or survived the harsh ocean conditions to float here. They are well-adapted to Hawaii's varying soil and environmental conditions. This is why they make prime specimens for a xeriscape garden. However, natives will not thrive on their own, especially under harsh conditions. On the other hand, like any other plant, if you over-water and over-fertilize them, they will die. Follow the instructions given to you by the nursery you buy the plant from, or from this booklet. Better yet, buy a book (suggested readings can be found in the bibliography in the back of this pamphlet), read it, and learn more about native plants. I guarantee that you will be pleased with the results.

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[7] Bornhorst, p. 19-20

[8] Nagata, p. 6

Propagation

There are many ways to propagate and plant-out native Hawaiian species. One of the most thourough and helpful book is Heidi Bornhorst's book, *Growing Native Hawaiian Plants.* The easiest, and best way to obtain natives for the novice gardener is to get them from a reputable nursery (see appendix c). That way all you will have to do is know how to transplant (if necessary) and plant-out when you are ready. These are the two methods I have listed here.

Transplanting

1. Use pots that are one size bigger than the potted plant is in
2. Get your potting medium ready

Good potting medium is a ½, ½ mixture of peat moss and perlite. If the plant is from a dry or coastal area, add chunks of cinder or extra perlite. If it is a wet forest species, add more peat moss or compost. Be aware that peat moss is very acidic and certain plants react severely to acidity.

If the plant is to eventually be planted into the ground, make a mix of equal parts peat moss, perlite, and soil from the area in which the plant is to be planted. Slow-release fertilizer can be mixed into the potting medium.

3. Once pots, potting medium, fertilizer and water are ready, you can begin re-potting. Keep the plant stem at the same depth it was in the originai pot. Avoid putting the plant in too large a pot, as the plant may not be able to soak up all the water in the soil and the roots may drown and rot.

Mix potting medium and add slow-release fertilizer at this time. Pre-wet the medium to keep dust down and lessen shock to the plant. Put medium in bottom of pot. Measure for the correct depth in the new pot. Make sure there is from ½ to 2 inches from the top of the pot so the plant can get adequate water. Try to stand the plant upright and center the stem in the middle of the pot.

Water the plant thoroughly after transplanting. A vitamin B-1 transplanting solution can help to lessen the transplant shock. Keep the plant in the same type of environment as it was before, sun or shade. If roots were broken, trimm off some of the leaves to compensate for the loss.[9]

Planting out

1. Plant most native Hawaiian plants in a sunny location in soil that is well-drained.
2. Make the planting hole twice as wide as the root ball or present pot, and just as deep.

If the soil is clay-like, and drains slowly, mix in some coarse red or bland cinder, coarse perlite or

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[9] Bornhorst, p.20-21

coarse compost. Place some slow-release fertilizer at the bottom of the hole.

3. Carefully remove the plant from the container and place it in the hole.

The top of the soil should be at the same level as the top of the hole, if it is too high or too low, adjust the soil level so that the plant is at the right depth.

4. Water thoroughly after you transplant.

Mulch

Most natives cannot compete with weeds, and therefore must be weeded around constantly in order to thrive. Mulch is a practical alternative, which discourages and prevents weeds from growing.

Hawaii's hot, humid climate leads to the breaking down of organic mulches. Thick organic mulches such as wood chips and leaves, may also be hiding places for pests.

Stone mulches are attractive, permanent and can help to improve soil quality. Red or black cinder, blue rock chips, smooth river rocks and coral chips are some natural choices.[10] Macadamia nut hulls are also easy to find and can make a nice mulch.[11]

Never pile up mulch right next to the stem or trunk of a plant, keep it a few inches away.

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[10] Bornhorst, p. 24

[11] Nagata, p. 7

PLACES TO SEE NATIVES ON:

The following places propagate native Hawaiian plants from seeds and/or cuttings. Their purpose is to protect and preserve these native plants. Please contact them before going to view the sites, they can provide valuable information and referral to other sources.

Maui:

1. Hoolawa Farms, P.O. Box 731, Haiku, Hawaii, 96708	572-4835
2. The Hawaiian Collection, 1127 Manu St., Kula, Hawaii, 96790	878-1701
3. Kula Botanical Gardens, RR 4, Box 228, Kula, Hawaii, 96790	878-1715
4. Maui Botanical Gardens, Kanaloa Avenue across from stadium	243-7337
5. Kula Forest Reserve, access road at the end of Waipouli Rd. Call the Maui District Forester	984-8100
6. Wailea Point, Private Condominium residence, 4000 Wailea Alanui, public access points at Four Seasons Resort or Polo Beach	875-9557
7. Kahanu Gardens, National Tropical Botanical Garden, Alau Pl, Hana, Hawaii, 96713	248-8912
9. Kahului Library Courtyard, 20 School Street, Kahului, Hawaii	873-3097

ZONES

The Maui County Planting Plan has compiled a system of 5 zones of plant growth for Maui County. The descriptions of zones and maps for these zones are as follows:

Zone 1:
Wet areas on the windward side of the island. More than 40 inches of rain per year. Higher than 3,000 feet.

Zone 2:
Cool, dry areas in higher elevations (above 1,000 feet). 20 to 40 inches of rain per year.

Zone 3:
Low, drier areas, warm to hot. Less than 20 inches of rain per year. Sea level to 1,000 feet.

Zone 4:
Lower elevations which are wetter due to proximity of mountains. 1,000 to 3,000 feet.

Zone 5:
Salt spray zones in coastal areas on the windward side.

These zones are to be used as a general guide to planting for Maui County. In addition to looking at the maps, read the descriptions of the zones and decide which zone best fits your area. Plants can be listed in more than one zone and can be planted in a variety of conditions. For best results, take notes on the rainfall, wind, sun and salt conditions of your site. Use the zones as a general guide for selection and read about the plants to decide which best fits your needs as far as care and or function.

PLACES TO BUY NATIVES ON:

Maui:

1. **Hoolawa Farms** — 575-5099
   P O Box 731
   Haiku HI 96708
   The largest and best collection of natives in the state. They will deliver, but it's worth the drive to go and see!
   Will propagate upon request

2. **Kula True Value Nursery** — 878-2551
   Many natives in stock
   Get most of their plants from Hoolawa Farms
   They take special requests

3. **Kihei Garden and Landscape** — 244-3804

4. **Kihana Nursery, Kihei** — 879-1165

5. **The Hawaiian Collection** — 878-1701
   Specialize in Sandalwood propagation
   Will propagate special requests

MUNEKIYO HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO

February 24, 2005

George Tengan, Director
County of Maui
Department of Water Supply
200 South High Street
Wailuku, Hawaii 96793

SUBJECT: Early Consultation Comments on Proposed Upgrades and Improvements to Maalaea Small Boat Harbor, Maalaea, Maui, Hawaii, TMK Nos. (2) 3-6-01:02, 49 (por.) and 3-8-14:28

Dear Mr. Tengan:

Thank for your letter of January 6, 2005, responding to our request for early consultation comments for the proposed upgrades and improvements at the Maalaea Small Boat Harbor (MSBH). In response to your comments, we note the following:

1. We acknowledge the Department's policy regarding the issuance of water meter reservations. The existing water meters that serve the MSBH are anticipated to be adequate for the proposed harbor improvements.

2. The Draft Environmental Assessment (EA) will discuss sources of water for the MSBH.

3. Domestic and irrigation calculations will be submitted to the Department to verify meter capacity during the building permit application process.

4. Fire flow calculations determined by an approved method will be provided during the building permit application process.

5. We acknowledge the receipt of sample Best Management Practices.

6. We acknowledge the recommendations concerning water conservation measures.

planning environment

305 High Street, Suite 104 Wailuku, Hawaii 96793 ph: (808)244-2015 fax (808)244-8729 planning@mhinconline.com

Thank you for your comments on the proposed action. A copy of the Draft Environmental Assessment will be provided to your office for review and comment.

Very truly yours,

Mich Hirano, AICP
Project Manager

MH:yp
cc: Eric Hirano, Department of Land and Natural Resources
fukunagavmaalaealdws.res

Ma'alaea Community Association

50 Hauoli Street
Ma'alaea, Maui 96793

December 16, 2004

Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, HI 96793

Attention: Mich Hirano, Planner

Dear Mr. Hirano:

This is in response to your letter to our Dr. Ted Fox regarding proposed repairs and upgrading to the MSBH, etc. dated December 9, 2004. We thank you for the opportunity to comment.

A major concern in our community is the current practice of dumping human waste from tour boats in Ma'alaea Bay by the Pacific Whale Foundation and other operators of tour boats. All concerned agree that a pumpout facility for these vessels somewhere at the MSBH is needed.

In reviewing your letter and appended drawings, especially Figure 4, we cannot find mention or callouts for a tour boat human waste pumpout station. The proposed new wastewater treatment units appear to be too far removed from the water to serve this purpose.

Perhaps we have missed the pumpout facility in our careful reading of your proposal. If so, please advise where it is to be located. Our input is that, while there *must* be one at the MSBH, it should not be anywhere near the residential apartment buildings to the east of Parcel 28.

Should you have any additional questions, please call me at 249-0939.

Sincerely,

Robert W. Riebling

Robert W. Riebling
President

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO

February 24, 2005

Robert Riebling, President
Ma'alaea Community Association
50 Hauoli Street
Maalaea, Hawaii 96793

SUBJECT: Early Consultation Comments on Proposed Upgrades and Improvements to Maalaea Small Boat Harbor, Maalaea, Maui, Hawaii, TMK Nos. (2) 3-6-01:02, 49 (por.) and 3-8-14:28

Dear Mr. Riebling:

Thank you for your letter of December 16, 2004, responding to our request for early consultation comments for the proposed upgrades and improvements at the Maalaea Small Boat Harbor (MSBH). In response to your comments, we note your concerns over the absence of a waste pump out station at the Maalaea Small Boat Harbor. The project proposed at present is focused upon upgrades and renovations corollary to the extension of interisland ferry service to the MSBH. This project will be funded by Federal funds earmarked for the improvement of the interisland commuter ferry service.

A sewage pump out will be provided at the Southern Mole near the proposed ferry terminal building to service the inter-island ferry. The proposed wastewater improvements will be designed to allow for an additional future sewer pump out facility, mid-way along the Southern Mole to service tour and commercial vessels. Installation of the additional pump out facility improvements will be carried out under a separate action by the DLNR. In this regard, it should be noted that overall sewage capacity is limited to the existing capacity which is currently approximately 32,400 gallons of wastewater per day.

Thank you again for your comments on the proposed action. A copy of the Draft Environmental Assessment will be provided to your office for review and comment.

Very truly yours,

Mich Hirano, AICP
Project Manager

MH:yp
cc: Eric Hirano, Department of Land and Natural Resources
fukunaga\maalaea\mca.res

Chapter XI

Public Informational Meeting to Review Draft Environmental Assessment

XI. PUBLIC INFORMATIONAL MEETING TO REVIEW DRAFT ENVIRONMENTAL ASSESSMENT

Prior to the conclusion of the 30-day public comment period, a public informational meeting to review the Draft EA for the proposed improvements to the inter-island passenger ferry facilities at MSBH was held on March 22, 2005. Generally, the public was in support of the proposed improvements for the inter-island ferry facilities. During the meeting the following comments were received:

1. ***Comment on Insufficient Parking:*** The lack of harbor parking was identified as a problem for many harbor users. It was suggested that the additional parking lot located on Parcel B be clearly designated for ferry users in order to avoid additional parking demand on existing parking facilities.

   Response: Traffic management and parking lot administration will be addressed through operational policies of the DLNR and the Harbor Agent prior to the project implementation.

2. ***Pedestrian Traffic and Congestion on the South Mole:*** A comment was made regarding the need to have clearly marked pedestrian walkways within the harbor. It was suggested that the sidewalk improvements need to be expanded to link the new ferry parking lot with the ferry terminal. This would help reduce conflicts between pedestrian and vehicular traffic within the harbor.

   Response: Extension of sidewalks to improve safety will be reviewed during the design phase.

3. ***Need for More Sewer Pump Outs:*** Many harbor users felt that the one sewer pump out was not enough. More sewer pump out stations along the South Mole need to be provided for existing commercial tour boat operators.

   Response: The proposed improvements to the Maalaea Small Boat Harbor are related to the inter-island ferry facilities. Additional sewer pump outs are beyond the scope of proposed improvements. However, the DLNR will be investigating the need and requirements to provide additional sewer pump outs along the South Mole through

additional funding sources. The consultants will be carrying out further studies for additional sewer pump outs. This would involve a revised environmental assessment pursuant to Chapter 343, Hawaii Revised Statutes, due to change in project scope.

4. ***Need for Traffic Calming:*** It was suggested that traffic calming measures need to be incorporated into the proposed improvements, such as speed bumps or speed tables along the inner harbor roadways to reduce speeding.

   Response: The provision of traffic calming features will be reviewed during the design phase.

5. ***Coordination with the County on the Sidewalk Improvements Along Hauoli Street:*** It was brought to the attention of the Department of Land and Natural Resources that the County of Maui will be installing a sidewalk along Hauoli Street. It was therefore, suggested that the Department of Land and Natural Resources coordinate the sidewalk improvements along Hauoli Street portion of Parcel B, with the County of Maui.

   Response: Coordination with the County on the design of the sidewalk along Hauoli Street will be carried out during the design phase.

6. ***Reduce Glare and Reflection From Street Lighting and Parking Lot Lighting:*** It was suggested that all street lighting and parking lot lighting be shielded and down cast in order to reduce impact to neighboring residential areas and to be in compliance with night sky lighting guidelines.

   Response: All lighting will be shielded and directed downward to avoid glare and impact on neighboring properties.

7. ***Move Ferry Terminal and Loading to the Dock Adjacent to the Coast Guard Office:*** One harbor user suggested that traffic congestion on the South Mole could be reduced if the ferry terminal was located on the northern side of the harbor next to the Coast Guard Office.

   Response: Location of the ferry terminal building next to the Coast Guard Office was reviewed under earlier development alternatives.

However, this alternative was rejected due to the concerns raised by neighboring condominium owners with regard to the proximity of the ferry operations to the condominiums at this location.

8. ***Provide Buffer Area Between Parking Lot and Condominiums:*** It was suggested that a greenbelt be provided between the new parking area and the adjacent condominiums to provide a noise barrier.

Response: The provision of a landscape buffer for the new parking area will be provided to buffer the parking lot from the adjacent condominiums.

Chapter XII

Parties Consulted During the Preparation of the Final Environmental Assessment; Letters Received and Responses to Substantive Comments

XII. PARTIES CONSULTED DURING THE PREPARATION OF THE FINAL ENVIRONMENTAL ASSESSMENT; LETTERS RECEIVED AND RESPONSES TO SUBSTANTIVE COMMENTS

A Draft Environmental Assessment (EA) for the subject project was filed and published in the Office of Environmental Quality Control's, The Environmental Notice on March 8, 2005. The following parties were consulted during the 30-day public comment period. The State Historic Preservation Officer, in compliance with Section 106 of the National Historic Preservation Act, also received a copy of the Draft EA. Agency comments and responses to substantive comments are also included in this section.

1. Ranae Ganske-Cerizo, Acting District Conservationist
Natural Resources Conservation Service
U.S. Department of Agriculture
210 Imi Kala Street, Suite 209
Wailuku, Hawaii 96793-2100

2. George Young, P.E.
Chief, Regulatory Branch
U.S. Department of the Army
U.S. Army Engineer District, Hnl.
Attn: CEPOH-EC-R
Bldg. 230, Room 201
Fort Shafter, Hawaii 96858-5440

3. Robert P. Smith
Pacific Islands Manager
U. S. Fish and Wildlife Service
300 Ala Moana Blvd., #3-122, Box 50088
Honolulu, Hawaii 96813

4. Micah Kane, Chairman
State of Hawaii
Department of Hawaiian Home Lands
P.O. Box 1879
Honolulu, Hawaii 96805

5. Chiyome L. Fukino, M.D., Director
State of Hawaii
Department of Health
P.O. Box 3378
Honolulu, Hawaii 96801

6. Herbert Matsubayashi
District Environmental Health Program Chief
State of Hawaii
Department of Health
54 High Street
Wailuku, Hawaii 96793

7. Peter T. Young, Director
State of Hawaii
Department of Land and Natural Resources
P. O. Box 621
Honolulu, Hawaii 96809

8. Jason Koga, District Land Agent
Maui District Land Office
State of Hawaii
Department of Land and Natural Resources
54 South High Street, Room 101
Wailuku, Hawaii 96793

9. Melissa Kirkendall, Ph.D.
State Historic Preservation Division
Department of Land and Natural Resources
Maui District Office
130 Mahalani Street
Wailuku, Hawaii 96793

10. Nathan Napoka, Chief
State Historic Preservation Division
Department of Land and Natural Resources
History and Culture Branch
Kakuhihewa Building, Room 555
601 Kamokila Boulevard
Kapolei, Hawaii 96707

11. Skippy Hau, Aquatic Biologist
State of Hawaii
Division of Aquatic Resources
Department of Land and Natural Resources
130 Mahalani Street
Wailuku, Hawaii 96793

12. Melanie Chinen, Administrator
State Historic Preservation Division
Department of Land and Natural Resources
601 Kamokila Blvd., Room 555
Kapolei, Hawaii 96707

13. Rodney K. Haraga, Director
State of Hawaii
Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813

14. Fred Cajigal, Maui District Engineer
State of Hawaii
Department of Transportation
Highways Division
650 Palapala Drive
Kahului, Hawaii 96732

15. Clyde Namu'o, Administrator
Office of Hawaiian Affairs
711 Kapiolani Boulevard, Suite 500
Honolulu, Hawaii 96813

16. Carl Kaupalolo, Chief
County of Maui
Department of Fire and Public Safety
200 Dairy Road
Kahului, Hawaii 96732

17. Michael W. Foley, Director
County of Maui
Department of Planning
250 South High Street
Wailuku, Hawaii 96793

18. Glenn Correa, Director
County of Maui
Department of Parks and Recreation
700 Hali'a Nakoa Street
Wailuku, Hawaii 96793

19. Tom Phillips, Chief
County of Maui
Police Department
55 Mahalani Street
Wailuku, Hawaii 96793

20. Milton Arakawa, Director
County of Maui
Department of Public Works
and Environmental Management
200 South High Street
Wailuku, Hawaii 96793

21. Kyle Ginoza, Director
County of Maui
Department of Transportation
200 South High Street
Wailuku, Hawaii 96793

22. George Tengan, Director
County of Maui
Department of Water Supply
200 South High Street
Wailuku, Hawaii 96793

23. Patty Nishiyama, Executive Director
Na Kupuna O Maui
320 Kaeo Place
Lahaina, Hawaii 96761

24. Thelma Shimaoka, Community Resource Coordinator
Office of Hawaiian Affairs
140 Ho'ohana Street, Suite 206
Kahului, Hawaii 96732

25. Vanessa Medeiros, District Supervisor
Department of Hawaiian Home Lands
Maui District Office
655 Kaumualii Street
Wailuku, Hawaii 96793

26. Kim Ball, President
Hi-Tech Surf & Sports
425 Koloa Street
Kahului, Hawaii 96732

27. David Jung
Island Marine Activities
Molokai Ferry
658 Front Street, Suite 101
Lahaina, Hawaii 96761

28. Don Couch, Executive Assistant
Office of the Mayor
County of Maui
200 South High Street
Wailuku, Hawaii 96793

29. Steve Knight
Expeditions
Lahaina/Lanai Passenger Ferry
658 Front Street, Suite 127
Lahaina, Hawaii 96761

30. Betty Morris
20 Hauoli Street, Apt. 211
Wailuku, Hawaii 96793

31. Christopher Shiebler
30 Hauoli Street, #412
Wailuku, Hawaii 96793

32. Tony Parrinella
30 Hauoli Street, #406
Wailuku, Hawaii 96793

33. Donald Perry
15 Laie Iki Place
Makawao, Hawaii 96768

34. Irene Bowie, PWF
300 Maalaea Road, #21
Wailuku, Hawaii 96793

35. George N. Kaya
Governor's Liaison, Maui
2264 Aupuni Street, #1
Wailuku, Hawaii 96793

36. Marsha Wienert
Tourism Liaison
250 South Hotel Street, 5th Floor
Honolulu, Hawaii 96813

37. Tim Lyons
The Legislative Center
677 Ala Moana Boulevard, Suite 815
Honolulu, Hawaii 96813

38. Robert Riebling
Maalaea Community Association
50 Hauoli Street
Kihei, Hawaii 96753

39. Jan Roberson
Surfrider Maui Chapter
P.O. Box 374
Haiku, Hawaii 96708

APR 0 1 2005

LINDA LINGLE
GOVERNOR OF HAWAII

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

LORRIN W. PANG, M. D., M. P. H.
DISTRICT HEALTH OFFICER

STATE OF HAWAII
DEPARTMENT OF HEALTH
MAUI DISTRICT HEALTH OFFICE
54 HIGH STREET
WAILUKU, MAUI, HAWAII 96793-2102

March 31, 2005

Mr. Mich Hirano, AICP
Munekiyo & Hiraga, Inc.
305 South High Street, Suite 104
Wailuku, Hawai'i 96793

Dear Mr. Hirano:

Subject: **Draft Environmental Assessment, Maalaea Small Boat Harbor**
TMK: (2) 3-6-01: 02, 49, por. of 50

Thank you for the opportunity to comment on the proposed improvements to the Maalaea Small Boat Harbor. The following comments are offered:

Improvements to the wastewater disposal systems include the conversion of existing cesspools to seepage pits. The resulting seepage pits may be considered injection wells and may fall under the permitting requirements of the Underground Pollution Control Section of the Safe Drinking Water Branch of the Department of Health. The Safe Drinking Water Branch should be consulted about this matter.

Should you have any questions, please call me at 984-8230.

Sincerely,

Herbert S. Matsubayashi
District Environmental Health Program Chief

c: SDWB

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO

May 9, 2005

Herbert Matsubayashi
District Environmental
Health Program Chief
State of Hawaii
Department of Health
Maui District Health Office
54 High Street
Wailuku, Hawaii 96793

SUBJECT: Draft Environmental Assessment for Proposed Upgrades and Improvements to Maalaea Small Boat Harbor, Maalaea, Maui, Hawaii

Dear Mr. Matsubayashi:

Thank you for your letter of March 31, 2005, providing comments on the Draft Environmental Assessment (EA) for the proposed upgrades and improvements at the Maalaea Small Boat Harbor (MSBH). In response to your comments we note that the three (3) existing cesspools will be converted to seepage pits for disposal of the effluent from the aerobic treatment units. The cesspool conversion will be bound by the requirements of the Hawaii Administrative Rules (HAR), Chapter 23, Title 11, Underground Injection Control (UIC). Construction drawings and the appropriate forms will be filed and submitted during the design phase to the State Department of Health including:

1. Engineer's Certification Conversion of Existing Cesspool to Seepage Pit; and

2. Existing Injection Well Application for a UIC Permit to Operate.

Thank you again for providing your input to the proposed action.

Very truly yours,

Mich Hirano, AICP
Project Manager

MH:yp
cc: Eric Hirano, Department of Land and Natural Resources
Fukunaga\Maalaea\dohmaui.deares

305 High Street, Suite 104 Wailuku, Hawaii 96793 ph: (808)244-2015 fax: (808)244-8729 planning@mhinconline.com

APR 07 2005

LINDA LINGLE
GOVERNOR OF HAWAII

GENEVIEVE SALMONSON
DIRECTOR

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

April 6, 2005

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

Dear Mr. Young:

Subject: Draft EA for the Maalaea Small Boat Harbor Improvements

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

1. Please describe where the treated wastewater will be disposed and the impacts associated with the disposal.

2. Please consult with the Department of Health regarding the need for a wastewater permit.

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

Sincerely,

for Genevieve Salmonson
Director

C: Munekiyo & Hiraga

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO

May 9, 2005

Genevieve Salmonson, Director
State of Hawaii
Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

SUBJECT: Draft Environmental Assessment for Proposed Upgrades and Improvements to Maalaea Small Boat Harbor, Maalaea, Maui, Hawaii

Dear Ms. Salmonson:

Thank you for your letter of April 6, 2005, providing comments on the Draft Environmental Assessment (EA) for the proposed upgrades and improvements at the Maalaea Small Boat Harbor (MSBH). In response to your comments we note the following:

1. The three (3) existing cesspools will be converted to seepage pits for disposal of the effluent from the aerobic treatment units. The wastewater system will involve an aerobic and disinfection treatment units. The cesspool conversion will be bound by the requirements of the Hawaii Administrative Rules (HAR), Chapter 23, Title 11, Underground Injection Control (UIC). No adverse impacts associated with the disposal are anticipated.

2. Construction drawings of the proposed wastewater system and appropriate forms will be filed and submitted to the State Department of Health during the design phase. These will include:

   A. Engineer's Certification Conversion of Existing Cesspool to Seepage Pit; and

   B. Existing Injection Well Application for a UIC Permit to Operate.

305 High Street, Suite 104 Wailuku, Hawaii 96793 ph: (808)244-2015 fax: (808)244-8729 planning@mhinconline.com

Thank you again for providing your input to the proposed action.

Very truly yours,

Mich Hirano, AICP
Project Manager

MH:yp
cc: Eric Hirano, Department of Land and Natural Resources
FukunagaMaalaea\oeqc.deares

MAR 14 2005

LINDA LINGLE
GOVERNOR
STATE OF HAWAII

MICAH A. KANE
CHAIRMAN
HAWAIIAN HOMES COMMISSION

BEN HENDERSON
DEPUTY TO THE CHAIRMAN

KAULANA H. PARK
EXECUTIVE ASSISTANT

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

March 11, 2005

Mr. Mich Hirano, AICP
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Mr. Hirano:

Thank you for the opportunity to review the draft environmental assessment report for the "Proposed Maalaea Small Boat Harbor Improvements" project on Maui. The Department of Hawaiian Home Lands has no comments to offer.

Should you have any questions, please call the Planning Office at (808) 586-3836.

Aloha and mahalo,

for Micah A. Kane, Chairman
Hawaiian Homes Commission

MUNEKIYO & HIRAGA, INC.

MAR 14 2005

RECEIVED
LAND DIVISION OF
LAND MANAGEMENT

2005 MAR -8 PM 2:33

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO

March 6, 2005

Jason Koga, District Land Agent
State of Hawaii
Department of Land and Natural Resources
Maui District Land Office
54 South High Street, Room 101
Wailuku, Hawaii 96793

SUBJECT: Draft Environmental Assessment for the Proposed Maalaea Small Boat Harbor Improvements

Dear Mr. Koga:

Pursuant to Chapter 343, HRS and Chapter 200, Title 11, Administrative Rules, Environmental Impact Statement Rules, the notice of availability of the Draft EA will be published in the Environmental Notice on March 8, 2005. The applicant and approving agency for the Draft EA is the State of Hawaii, Department of Land and Natural Resources (DLNR). The 30-day comment deadline is April 6, 2005. Comments received relevant to the Draft EA will be processed for evaluation and response by the applicant, DLNR.

To facilitate processing of the review requirements of the Draft EA, it would be appreciated if you would provide your written comments to the undersigned and a copy to:

Mich Hirano, AICP
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

If you have any questions, please call me at (808) 244-2015.

No comments
Charlene E. Unoki
3/10/05

305 High Street, Suite 104 Wailuku, Hawaii 96793 ph: (808)244-2015 fax: (808)244-8729 planning@mhinconline.com

planning environment government

Thank you for your cooperation in facilitating this concurrent review process.

Very truly yours,

for Mich Hirano, AICP
Project Manager

MH:yp
Enclosure
cc: Eric Hirano, Department of Land and Natural Resources (w/out enclosure)
fukunaga/maalaea/deaagency.ltr

APR 21 2005

LINDA LINGLE
GOVERNOR OF HAWAII

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

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

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

April 19, 2005

Mr. Mich Hirano, AICP
Munekiyo & Hiraga, Inc.
305 South High Street, Suite 104
Wailuku, Hawaii 96793

LOG NO: 2005.0785
DOC NO: 0504CD39

Dear Mr. Hirano:

SUBJECT: **Chapter 6E-42 Historic Preservation Review – Draft Environmental Assessment for the Proposed Maalaea Small Boat Harbor Improvements Waikapu and Ukumehame Ahupua`a, Wailuku District, Island of Maui TMK: (2) 3-6-001:002 and 3-8-014:028**

Thank you for the opportunity to review and comment on the Draft Environmental Assessment for the Proposed Maalaea Small Boat Harbor Improvements, which was received by our staff on March 8, 2005. We understand Pacific Legacy has recently completed an archaeological inventory survey of the proposed project area. However, we have not formally received copies of the report documenting the findings. Please submit copies of the archaeological report to our Maui and O`ahu offices so we may complete the historic preservation review process.

If you have any questions, please call Cathleen A. Dagher at 692-8023.

Aloha,

Melanie Chinen, Administrator
State Historic Preservation Division

CD:jen

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO

May 9, 2005

Melanie Chinen, Administrator
State Historic Preservation Division
Department of Land and Natural Resources
601 Kamokila Boulevard, Room 555
Kapolei, Hawaii 96707

SUBJECT: Draft Environmental Assessment for Proposed Upgrades and Improvements to Maalaea Small Boat Harbor, Maalaea, Maui, Hawaii

Dear Ms. Chinen:

Thank you for your letter of April 19, 2005, providing comments on the Draft Environmental Assessment (EA) for the proposed upgrades and improvements at the Maalaea Small Boat Harbor (MSBH).

Your staff has indicated that the archaeological inventory survey report was received by your office and that State Historic Preservation Division will be providing comments on the archaeological inventory survey by the end of May 2005.

We look forward to receiving your comments on the archaeological inventory survey.

Very truly yours,

Mich Hirano, AICP
Project Manager

MH:yp
cc: Eric Hirano, Department of Land and Natural Resources
Fukunaga\Maalaea\shpd.deares

305 High Street, Suite 104 Wailuku, Hawaii 96793 ph: (808)244-2015 fax: (808)244-8729 planning@mhinconline.com

UNIVERSITY OF HAWAI'I
ENVIRONMENTAL CENTER

A UNIT OF THE WATER RESOURCES RESEARCH CENTER

April 6, 2005
EA : 0315

Mr. Eric Hirano
Department of Land and Natural Resources
P.O. Box 621
Honolulu, Hawai'i 96809

Dear Mr. Eric Hirano:

Draft Environmental Assessment (DEA)
Ma'alaea Small Boat Harbor Improvements
Wailuku, Maui

The State of Hawaii Department of Land and Natural Resources (DLNR), proposes to improve Ma'alaea Small Boat Harbor (MSBH). Improvements to the harbor are needed to supplement two inter-island ferry services (capacity: 149 passengers) from MSBH on Maui to the islands of Lanai and Molokai. These improvements include replacement of the Harbor Agent's office, upgrades to the sewer pump station facilities and electrical services, and development of a new comfort station and parking area. The project is being financed federally and locally to comply with current code requirements. The cost of the project is estimated to be $13.2 million and will require approximately one year for construction.

The Environmental Center conducted this review with the assistance of Hans-Jurgen Krock, Ocean and Resources Engineering; and Kerry Halford, Environmental Center.

General Comments

The potential environmental impacts and mitigation measures for the land aspects that this project entails are addressed adequately in the draft EA. However, our reviewers found several topical areas lacking important information, including oceanographic conditions, descriptions of the wastewater improvements, and demolished material composition and disposal.

Oceanographic Conditions

A discussion about the oceanographic conditions and how they are altered by the proposed construction should be discussed in the final EA. For example, what are limiting wave and/or wind conditions for ferry operations? Under what wave directions and amplitudes will

KRAUSS ANNEX 19 • 2500 DOLE STREET • HONOLULU, HAWAI'I 96822 • (808) 956-7361 • FAX (808) 956-3980

harbor surge conditions affect operations? Are there water level limitations from storm events or tsunamis (or global warming sea level rise)? Are there more extensive or frequent dredging requirements for providing and maintaining an adequate turning basin for ferry operations? In general, the input of an ocean engineer would add substantially to the completeness of the final EA.

Wastewater Facilities

A brief mention of the four individual wastewater systems is given on page 10 of the draft EA. However, our reviewers suggest that a better description of the wastewater facilities to be constructed should be provided in the final EA. What is the size of the four systems? Are primary clarifiers to be supplemented? A detailed image of these systems should be included with the figures listed in appendix A of the draft EA.

Demolished Material

The composition of the demolished materials was not mentioned in the draft EA. A bore log of the material should be completed. If the results show no toxic substances (arsenic, asbestos, lead, etc...), the DLNR should consult the U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency regarding possible use of these materials for artificial reef or fish aggregation structures. Further, the draft EA does not mention as to where these materials will be deposited and how they will be handled. These topics should be covered in the final EA.

Thank you for the opportunity to review this Draft EA.

Sincerely,

John T. Harrison, Ph.D.
Environmental Coordinator

cc: OEQC
Munekiyo & Hiraga, Inc.
James Moncur, WRRC
Hans-Jurgen Krock
Kerry Halford

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO

May 9, 2005

John Harrsion, Environmental Coordinator
University of Hawaii
Environmental Center
2500 Dole Street, Kruass Annex 19
Honolulu, Hawaii 96822

SUBJECT: Draft Environmental Assessment for Proposed Upgrades and Improvements to Maalaea Small Boat Harbor, Maalaea, Maui, Hawaii

Dear Mr. Harrison:

Thank you for your letter of April 6, 2005, providing comments on the Draft Environmental Assessment (EA) for the proposed upgrades and improvements at the Maalaea Small Boat Harbor (MSBH). In response to your comments we note the following:

1. ***Response to Oceanographic Conditions:***

   A. The proposed improvements to the MSBH are landside improvements and impacts to nearshore marine environment, and alteration to oceanographic conditions are not anticipated.

   B. During storm events and high wave conditions, scheduled service of the inter-island ferry service will be canceled. Decisions will be based on Small Craft Advisory warnings and judgement of the ferry vessel captain. The harbor entrance channel depth is -13 feet and -8 feet in the vicinity of the ferry terminal docking facility. The Expeditions ferry draws about 4 feet of water. Therefore, dredging of the harbor will not be required for the proposed inter-island ferry service.

2. ***Response to Wastewater Facilities:***

   The three (3) existing cesspools will be converted to seepage pits for disposal of the effluent from the aerobic treatment units. The cesspool conversation will be bound by the requirements of of the Hawaii Administrative Rules (HAR), Title 11, Underground Injection Control (UIC). Construction drawings of the proposed wastewater system and appropriate forms will be filed and submitted to the State Department of Health during the design phase. These will include:

planning environment

305 High Street, Suite 104 Wailuku, Hawaii 96793 ph: (808)244-2015 fax: (808)244-8729 planning@mhinconline.com

A. Engineer's Certification Conversion of Existing Cesspool to Seepage Pit; and
B. Existing Injection Well Application for a UIC Permit to Operate.

Wastewater sources on the pier include the Small Boat Harbor Office (40 gallons per day (gpd)) and U.S. Coast Guard Auxiliary (400 gpd). Existing wastewater flows are collected and pumped to the existing cesspools adjacent to the Buzz's Wharf restaurant. These existing facilities will be replaced with Ferry facilities which include public restrooms/administrative office and boat pump out system. The anticipated wastewater flows from the public restrooms/administrative office are 4,192 gpd and 5,000 gpd from the boat pump out system. The improved wastewater system will involve retrofitting the existing pump station and rerouting the existing 4-inch sewer forcemain to a new aerobic treatment system located in the unpaved parking lot at the entrance of the harbor park. The treatment system will include a 1,000 gallon pre-loader, two (2) 5,000 gpd aerobic and disinfection units. Effluent from this system will be discharged into a series of 6-inch sewer pipes and manholes, and ultimately into one of two (2) seepage pits (converted cesspools) adjacent to the Buzz's Wharf Restaurant.

Wastewater flow from the existing comfort station was estimated to be 2,880 gpd (shower flows not considered because shower head and controls have been removed). Currently, wastewater flow from the existing comfort station is chlorinated and disposed into an existing cesspool adjacent to the existing comfort station. Improvements include installing a 750 gallon pre-loader, 3,000 gpd aerobic unit, and disinfection. Effluent from this system will be disposed into the existing seepage pit (converted from cesspool) adjacent to the existing comfort station.

Wastewater flows from the new comfort station (4,032 gpd) at the new overflow parking lot comfort station will also be discharged in this cesspool. The new comfort station will have its own pre-loader, aerobic unit and disinfection unit, and pump station to pump the effluent to the converted seepage pit (adjacent to existing comfort station) for disposal.

3. ***Response to Demolished Materials:***

A solid waste management plan will be submitted to the Department of Public Works and Environmental Management (DPWEM), Solid Waste Division, for approval. All non-recyclable construction debris shall be disposed at an approved construction waste receiving facility. No recyclable materials from demolition or construction are anticipated. Should any be encountered, these materials shall be properly separated and delivered to the appropriate recycling center (e.g. Aloha Plastic Recycling, Maui Recycling Service and Best Disposal). Organic materials

from grubbing shall be removed from the site, and disposed at the Maui Demolition and Construction Landfill in Ma`alaea.

Thank you again for providing your input to the proposed action.

Very truly yours,

Mich Hirano, AICP
Project Manager

MH:yp
cc: Eric Hirano, Department of Land and Natural Resources
Fukunaga\Maalaealuoh.deares

MAR 21 2005

ALAN M. ARAKAWA
Mayor

GLENN T. CORREA
Director

JOHN L. BUCK III
Deputy Director

(808) 270-7230
Fax (808) 270-7934

DEPARTMENT OF PARKS & RECREATION

700 Hali'a Nakoa Street, Unit 2 , Wailuku, Hawaii 96793

March 17, 2005

Mr. Mich Hirano, AICP
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Mr. Hirano:

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED MAALAEA SMALL BOAT HARBOR IMPROVEMENTS

We have reviewed the Draft Environmental Assessment for the proposed Maalaea Small Boat Harbor improvements and have no comments to submit at this time.

Thank you for the opportunity to review and comment. Please call me or Patrick Matsui, Chief of Planning and Development at 270-7387, should you have any questions.

Sincerely,

GLENN T. CORREA
Director

c: Patrick Matsui, Chief of Planning and Development
Eric Hirano, Department of Land and Natural Resources

APR 2 5 2005

ALAN M. ARAKAWA
Mayor

MICHAEL W. FOLEY
Director

WAYNE A. BOTEILHO
Deputy Director

COUNTY OF MAUI
DEPARTMENT OF PLANNING

April 22, 2005

Mr. Mich Hirano, AICP
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Mr. Hirano:

RE: Draft Environmental Assessment for the Proposed Maalaea Small Boat Harbor Improvements located at TMK: 3-6-001: 002, 049, 50

The Maui Planning Department (Department) has reviewed the above referenced document and provides the following comments:

1. Provide a discussion of designing the sewer pump out to service other commercial operations and not limit to the inter-island ferry.

2. Consider an alternative design to the proposed drainage plan to manage more than the net increase in storm-water runoff.

3. The Department recommends exploring the possibility of using alternative technologies, such as pervious paving systems, to further reduce the storm-water runoff generated by the proposed improvements.

4. The proposed drainage plan should consider using oil/water separators to reduce the potential for petroleum contamination to near-shore coastal waters.

Thank you for your cooperation. Should you require further clarification, please contact Ms. Kivette Caigoy, Environmental Planner, at 270-7735.

Sincerely,

MICHAEL W. FOLEY
Planning Director

MWF:KAC:lar
c: Wayne Boteilho, Deputy Planning Director
Clayton Yoshida, Planning Program Administrator
Kivette Caigoy, Environmental Planner
TMK File
General File
K:\WP_DOCS\PLANNING\EA\DEAComments\2005\0542_MaalaeaHarborImprvmt.wpd

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO

May 9, 2005

Michael Foley, Director
County of Maui
Department of Planning
250 South High Street
Wailuku, Hawaii 96793

SUBJECT: Draft Environmental Assessment for Proposed Upgrades and Improvements to Maalaea Small Boat Harbor, Maalaea, Maui, Hawaii

Dear Mr. Foley:

Thank you for your letter of April 22, 2005, providing comments on the Draft Environmental Assessment (EA) for the proposed upgrades and improvements at the Maalaea Small Boat Harbor (MSBH). In response to your comments, we note the following:

1. The proposed improvements for the MSBH are limited to inter-island ferry facilities, actions required to comply with the Americans With Disabilities Act, and elimination of large capacity cesspools as required by the Federal regulations of the Environmental Protection Agency. Electrical upgrades are also being carried out to comply with County code requirements. The proposed sewer pump out is provided for the ferry service operations. This pump out may also be used by other vessel operators. A public informational meeting was held on March 22, 2005, to review the Draft EA and receive public comments. The future provision of additional sewer pump outs at the MSBH was discussed at this meeting in response to public comments. It was noted that the Department of Land and Natural Resources (DLNR) will be investigating the requirements for additional sewer pump outs. The design of the existing system will allow future sewer pump outs to be accommodated along the South Mole. The implementation of additional sewer pump outs will be carried out under a separate source of funds. The Final EA will reflect this discussion.

2. The proposed drainage for the project will be designed to comply with provisions of the *"Rules for the Design of Storm Drainage Facilities"* in the County of Maui.

3. The proposed project is still at the conceptual level and final design decisions regarding materials have not been made. The DLNR acknowledges your

recommendations and will consider alternative technologies to further mitigate potential stormwater runoffs associated with the project.

4. In Item No. 3 above, final design decisions have not been made and consideration will be given to all options to mitigate potential runoff contaminations to the greatest extent practicable. As discussed in the EA, it is felt that the cesspool replacements will help to reduce potential contaminants from entering into the waters of the MSBH. Consideration will also be given to using oil/water separators for the proposed drainage system improvements.

Thank you again for providing your input to the proposed action.

Very truly yours,

Mich Hirano, AICP
Project Manager

MH:yp
cc: Eric Hirano, Department of Land and Natural Resources
Fukunaga\Maalaea\planning.deares

COUNTY COUNCIL
COUNTY OF MAUI
200 S. HIGH STREET
WAILUKU, MAUI, HAWAII 96793
www.co.maui.hi.us/council/

April 21, 2005

Mr. Mich Hirano
Munekiyo and Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Mr. Hirano :

SUBJECT: **COMMENTS ON DRAFT ENVIRONMENTAL ASSESSMENT (EA) – MAALAEA SMALL BOAT HARBOR UPGRADE AND IMPROVEMENTS**

Thank you for this opportunity to comment. Many of my constituents have contacted my office to let me know the need for sewage pump out facilities for the commercial ships operating there. Please include us in the future as a consulted party.

South Maui residents deserve a harbor with safe and functional infrastructure. The harbor is a tremendous economic engine for South Maui but it is also an important recreational and cultural resource for all of Maui's citizens. Our office is encouraged to see a number of needed harbor infrastructure improvements addressed by this project including improved restrooms, upgraded sewage treatment and electrical systems. We do have concerns over the lack of specific information about a number of areas addressed in the Draft EA.

Traffic Impacts

The addition of up to 200 ferry passengers departing and arriving at the harbor each day needs more discussion than is found in the traffic studies. Although improvements to the Lot on Parcel "B" will provide some parking for potential ferry passengers, it is not practical to assume that the influx of a large number of cars during a certain time frame to meet ferry schedules will not impact existing levels of service on the narrow harbor roads.

Pumpout Stations

This is a big concern for local residents. Incidents of human wastes floating in shore line areas of South Maui frequented by dive and snorkel tour boats are commonly reported. It is difficult to determine from the Draft EA if it is proposed that commercial boats share the one pumpout station provided for the proposed ferry landing area. We would request that the state include a discussion in the Final EA to clarify this and that placement of several pumpout stations be considered. As you may know, Lahaina harbor has a single pump out station that remains unused by many commercial users because it is economically impractical to "wait in line" for access. A citizen's advisory committee has advocated for pump out stations for the past four years and some committee members are now picketing the harbor to ask for action. As you know, raw sewage in our nearshore waters is a Federal Clean Water Act violation and we must address this problem immediately. Most boat users also support having a system of pumpout stations accessible around the harbor. This option should be discussed and evaluated in the final EA.

Wastewater System Improvements

No details are given about the nature of treatment that will be used for the upgraded sewage treatment facilities. No information is given about where the treated wastewater will be disposed. The Aecos water quality studies revealed several areas within and without the harbor that were experiencing high levels of nitrates and other pollutants. The individual wastewater treatment systems used by the Ma'alaea condos are suspected as a major impact to declining nearshore water quality in the area. My constituents deserve to know what the state is proposing and it appears that the state DOH also has concerns that " wastewater systems in this area are prone to failure." Long term costs associated with the treatment process should also be adequately discussed in the Final EA.

Should you have any questions, please contact my office at 200 South High Street, Wailuku, Hawaii 96793, (808) 270-7108, or michelle.anderson@mauicounty.us.

Sincerely,

MICHELLE ANDERSON
Councilmember

MA:jh

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO

May 9, 2005

Honorable Michelle Anderson
Councilmember
Maui County Council
200 South High Street
Wailuku, Maui 96793

SUBJECT: Draft Environmental Assessment for Proposed Upgrades and Improvements to Maalaea Small Boat Harbor, Maalaea, Maui, Hawaii

Dear Councilmember Anderson:

Thank you for your letter of April 21, 2005, providing comments on the Draft Environmental Assessment (EA) for the proposed upgrades and improvements at the Maalaea Small Boat Harbor (MSBH). In response to your comments, we note the following:

1. A traffic evaluation report was prepared for the proposed project and included in the EA. This report used the number of trips generated by the existing ferry service to Lahaina, which may be greater than the actual number of trips generated if service were provided to both Lahaina and Maalaea. A total of 144 ferry-generated trips were projected for the AM and PM peak periods. The traffic evaluation further assumed a "worst-case" scenario in which all ferry passengers arrive at the MSBH during the AM peak period and all leave the MSBH during the PM peak period. Using these projections, the report estimates minimal traffic impacts from the extension of ferry service to the MSBH when compared with estimated service levels in the Year 2008 "without project" and "with project" scenarios. Except for the westbound harbor access road, left/right turns onto Honoapiilani Highway during the levels of service afternoon peak period, all intersections are anticipated to operate at satisfactory levels of service.

2. The proposed improvements for the MSBH are limited to inter-island ferry facilities, actions required to comply with the Americans With Disabilities Act, and elimination of large capacity cesspools required by the federal regulations of the Environmental Protection Agency. Electrical upgrades are also being carried out to comply with County code requirements. The proposed sewer pump out is provided for the ferry service operations. This pump out may also be used by other vessel operators. A public informational meeting was held on March 22, 2005, to review the Draft EA and receive public comments. The future provision of additional sewer pump outs

305 High Street, Suite 104 Wailuku, Hawaii 96793 ph (808)244-2015 fax (808)244-8729 planning@mhinconline.com

at the MSBH was discussed at this meeting in response to public comments. It was noted that the DLNR will be investigating the requirements for additional sewer pump outs. The design of the existing system will allow future sewer pump outs to be accommodated along the South Mole. The implementation of additional sewer pump outs will be carried out under a separate source of funds. The Final EA will reflect this discussion.

3. The three (3) existing cesspools will be converted to seepage pits for disposal of the effluent from the aerobic treatment and disinfection units. The conversion of the existing cesspools to seepage pits will be bound by the requirements of the Hawaii Administrative Rules (HAR), Chapter 23, Title 11, Underground injection Control (UIC). Construction drawings and the appropriate forms will be files and submitted during the design phase to the State Department of Health. These will include:

   A. Engineer's Certification Conversion of Existing Cesspool to Seepage Pit; and

   B. Existing injection Well Application for a UIC Permit to Operate.

The estimated annual maintenance cost for the new wastewater system is $20,400.00 per annum.

Thank you again for providing your input to the proposed action.

Very truly yours,

Mich Hirano, AICP
Project Manager

MH:yp
cc: Eric Hirano, Department of Land and Natural Resources
Fukunaga\Maalaea\manderson.deares

ALAN M. ARAKAWA
MAYOR

OFFICE OF THE MAYOR
County of Maui

200 South High Street
Wailuku, Hawaii 96793-2155
Telephone (808) 270-7855
Fax (808) 270-7870
e-mail: mayors.office@co.maui.hi.us

February 6, 2005

Mich Hirano, AICP, for transmittal to: Eric Hirano
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Hawaii Department of Land & Natural Resources
P.O. Box # 621
Honolulu, Hawaii 95809

SUBJECT: OFFICIAL COMMENTS ON DRAFT ENVIRONMENTAL ASSESSMENT FOR PROPOSED MAALAEA SMALL BOAT HARBOR IMPROVEMENTS

Thank you for the opportunity to review and comment on the Draft Environmental Assessment for the proposed Ma'alaea Small Boat Harbor Improvements. As Executive Assistant for Environmental Concerns to Mayor Alan Arakawa, I have been involved with discussions and planning for Ma'alaea Harbor, along with Executive Assistant Don Couch. I have reviewed the Draft EA, attended the public meeting on March 22, 2005, and offer the following comments:

OVERVIEW

It is my belief that the proposed improvements, as described, would not constitute any significant adverse impacts, in relation to the criteria of HRS Chapter 343 and HAR Section 11-200-12. The objectives, policies, and goals of Maui County's General Plan and the Kihei-Makena Community Plan, as noted, are consistent with infrastructure improvements in the Ma'alaea Harbor area. Improved facilities for inter-island ferry operations are likely to have positive, rather than negative impacts.

COORDINATION OF PLANNING WITH COUNTY OF MAUI

We believe it is vitally important to coordinate current planning efforts in conjunction with Maui County officials, as well as area residents. The Mayor's Office has met with Division of Boating and Ocean Recreation Administrator, Richard Rice and engineer Carty Chang, and has also communicated with engineer Eric Yuasa. It is our fervent hope that these communication lines will be open as detailed planning moves forward.

Specifically, much community discussion has taken place surrounding the need for wastewater pumpout facilities for boaters at Ma'alaea Harbor. While we understand that a pumpout station is only a minor portion of proposed improvements, it is long overdue and paramount in the mind of many members of our community. We reiterate our belief that an arterial system could be installed to service multiple slips, and that current ferry-related planning needs to consider that future possibility. We believe that

such a system could be installed sooner than the proposed actions of this Draft EA, which appear to have a construction completion date at least three years from now. To this end, we urge the State to coordinate planning with the County of Maui, and vice versa, to ensure that neither entity designs a wastewater pumpout system that would be incompatible with the other. Perhaps the final design for the force main could accommodate stub outs for each harbor slip. This would allow much greater potential for a workable system than the single pumpout station currently planned. Although not directly related to these proposed actions, it should be noted that sewage pumpout facilities are also lacking and needed at the Kihei Boat Ramp.

WALKWAYS

Discussion at the March 22, 2005 public meeting included the need to provide more detailed planning for walkways within the harbor area. Currently, pedestrians and vehicles share much of the same paved areas. Additional striping and designation of non-vehicular areas will facilitate greater pedestrian safety and ease of movement.

SHUTTLE

Apart from the above suggestions regarding pedestrian walkways, safety and traffic congestion could be further mitigated through implementation of a shuttle service from the proposed paved lot on the Williams property, or elsewhere. Should this system be utilized, appropriate signage and parking restrictions would be needed.

PAVING

Page 11 mentions re-paving the South Mole with concrete, to replace the asphalt. With respect to runoff from vehicular fluids, it is advisable to use semi-permeable paving, as a non-permeable surface could quickly convey contaminants (oil, grease, coolant, etc.) to harbor waters. Consideration could also be given to providing irrigation for a planted or grassed strip along the South Mole and in other harbor areas to further filter such substances from reaching the ocean during storm events.

Thank you for the opportunity to provide these comments, and on behalf of the Office of Mayor Alan Arakawa, we look forward to working with you.

Sincerely,

Robert Parsons

Robert Parsons
Executive Assistant for Environmental Concerns
(808) 270-7960

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO

May 9, 2005

Robert Parsons, Executive Assistant
Office of the Mayor
200 South High Street
Wailuku, Hawaii 96793

SUBJECT: Draft Environmental Assessment for Proposed Upgrades and Improvements to Maalaea Small Boat Harbor, Maalaea, Maui, Hawaii

Dear Mr. Parsons:

Thank you for your letter, providing comments on the Draft Environmental Assessment (EA) for the proposed upgrades and improvements at the Maalaea Small Boat Harbor (MSBH). In response your comments we note the following:

1. We acknowledge your comments that the proposed project would have positive impacts for the community.

2. The Department of Land and Natural Resources (DLNR) intends to continue its coordination with the County of Maui in the furtherance of the proposed project.

3. The proposed improvements at the Maalaea Small Boat Harbor are limited to inter-island ferry facilities, actions required to comply with American With Disabilities Act, and elimination of large capacity cesspools, as required by the Federal regulations of the Environmental Protection Agency. Electrical upgrades are also being carried out to comply with County code requirements. The proposed sewer pump out is provided for the ferry service operations. This pump out may also be used by other vessel operators. A public informational meeting was held on March 22, 2005, to review the Draft EA and receive public comments. The future provision of additional sewer pump outs at MSBH was discussed at this meeting in response to public comments. It was noted that the DLNR will be investigating the requirements for additional sewer pump outs. The design of the existing system will allow future sewer pump outs to be accommodated along the South Mole. The implementation of additional sewer pump outs will be carried out under a separate source of funds. It was also noted that a revised environmental assessment, pursuant to Chapter 343, Hawaii Revised Statutes, will need to be carried out to assess the potential impact of expanding the wastewater treatment facilities beyond the current capacity.

4. The DLNR acknowledges your comments regarding the walkways within the Harbor and has revised the conceptual design configuration to include a pedestrian walkway from the overflow parking area to the ferry landing dock.

5. As discussed in the Draft EA, alternatives investigated during the planning phase included the provision of a "park and ride" shuttle service from parking areas located on adjacent commercial lands. However, this alternative was not pursued due to the availability of Parcel B for parking, which provides a more convenient access for ferry passengers and harbor users. The provision of such service from Parcel B to the ferry dock will be examined during the design phase of the proposed project and in coordination with the proposed ferry service provider.

6. The current plan calls for the use of concrete paving for the Southern Mole. This was chosen due to its durability and reduced need for maintenance over asphalt. Your comments regarding impermeable versus semi-permeable materials will be taken into consideration and evaluated during the design phase of the project.

Thank you again for providing your input to the proposed action.

Very truly yours,

Mich Hirano, AICP
Project Manager

MH:yp
cc: Eric Hirano, Department of Land and Natural Resources
Fukunaga\Maalaea\mayor.deares

COMMENT CARD
MAALAEA SMALL BOAT HARBOR
PUBLIC INFORMATION MEETING

Comments are due by April 6, 2005 and may be turned-in at the public information meeting or mailed to:

Mich Hirano, AICP
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793.

PLEASE PRINT

Name: ROBERT RIEBLING

Address: MAALAEA COMMUNITY ASSN, 50 HAUOLI ST., MAALAEA, HI 96793

Phone: Home 249-0939 **Business** _____

Representing: MAALAEA COMMUNITY ASSN.

Comments:

1. Please consider effects of lighting in the new parking area. Avoid light pollution of the night sky.
2. Please be aware of the Hauoli St. sidewalk being planned by Maui County Public Works and coordinate Harbor sidewalk plans for a smooth transition between the State and County funded sidewalks.
3. Please consider a pedestrian sidewalk all the way from the parking area to the harbor during detail design.
4. 10% greenbelt between parking lot and first condominium building ("Maalaea Mermaid") for noise barrier.

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO

May 9, 2005

Robert Riebling
Maalaea Community Association
50 Hauoli Street
Maalaea, Hawaii 96793

SUBJECT: Draft Environmental Assessment for Proposed Upgrades and Improvements to Maalaea Small Boat Harbor, Maalaea, Maui, Hawaii

Dear Mr. Riebling:

Thank you for the comments provided at the public informational meeting held on March 22, 2005, concerning the Draft Environmental Assessment (EA) for the proposed upgrades and improvements at the Maalaea Small Boat Harbor (MSBH). In response to your comments we note the following:

1. The lighting design for the proposed overflow parking area includes light pollution mitigation measures to direct lighting downward into the parking area and reduce glare to adjacent properties.

2. The Department of Land and Natural Resources (DLNR) will coordinate with the County of Maui regarding the Hauoli Street sidewalk.

3. The DLNR acknowledges your comments regarding the provision of a sidewalk from the overflow parking area to the ferry pier. The Final EA will reflect a design revision to include this infrastructural component.

4. The DLNR also acknowledges your comments regarding the provision of a greenbelt to act as a noise barrier between the overflow parking area and the adjacent condominiums. Landscaping mitigation measures will be carried out as required by Maui County Code, Section 19.36.070. In the M-1 district, this includes a four (4) foot wide front and two (2) foot wide side and rear planted areas immediately adjacent and parallel with each respective portion of a property line where a parking area immediately abuts. As well, large crown shade trees will be provided at a minimum regular interval for every five (5) stalls and hedge material and/or earth mounds, and shrubs will be provided in linear masses to function as visual screens.

305 High Street, Suite 104 Wailuku, Hawaii 96793 ph: (808)244-2015 fax: (808)244-8729 planning@mhinconline.com

Thank you again for providing your input to the proposed action.

Very truly yours,

Mich Hirano, AICP
Project Manager

MH:yp
cc: Eric Hirano, Department of Land and Natural Resources
FukunagaMaalaeaYmca.deares

MAR 8 0 2005

COMMENT CARD
MAALAEA SMALL BOAT HARBOR
PUBLIC INFORMATION MEETING

Comments are due by April 6, 2005 and may be turned-in at the public information meeting or mailed to:

Mich Hirano, AICP
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793.

PLEASE PRINT

Name: FRANCIS MICHAEL PATRICK LYDON

Address: 180 HAUOLI ST #311 WAILUKU HI 96793

Phone: Home 242-0735 **Business** —

Representing: MYSELF

Comments:

I AM 100% IN FAVOR OF THE MAALAEA/LANAI FERRY UPGRADE PROJECT I BELIEVE IT IS PRUDENT TO CAPTURE THESE FUNDS NOW & START THE PROJECT IMMEDIATELY. PHASE II, DREDGING OF EACH COMMERCIAL BOAT SLIP SHOULD FOLLOW IMMEDIATELY THEREAFTER.

THIS AMOUNT IS GIVEN WITH THE FOLLOWING UNDERSTANDINGS:

1) THAT THE SEPTIC SYSTEM IN ITS ENTIRETY BE SIZED LARGE ENOUGH FOR FUTURE CONNECTION OF EACH COMMERCIAL BOAT SLIP & IT REASONABLE NUMBER OF ~~[illegible]~~ ADDITIONAL SLIPS.

2) THAT "STUB UPS" BE INCORPORATED SO THAT FUTURE CONNECTIONS CAN BE MADE CONVIENTLY & W/O TEARING UP THE CONCRETE

3) THAT THE SEPTIC SYSTEM TREATMENT PLANT BE OF PROVEN DESIGN FROM PAST PRACTICE SO EFFLUENT AS WELL WITHIN STATE & FEDERAL STANDARDS

THE FOLLOWING IS ALSO OFFERED FOR YOUR CONSIDERATION:

1) I BELIEVE THE LIGHTED PARKING LOT AS PLANNED WILL ELICIT MANY NEGATIVE COMMENTS FROM OWNERS/DWELLINGS OF ADJACENT CONDOMINIUMS; ESPECIALLY THOSE ON 1ST FLOOR

2) RELOCATION OF THE PLANNED PARKING LOT TO THE STATE OWNED LAND AT THE FOLLOWING LOCATIONS:

A) ADJACENT TO HONOPILIANI HWY. & SOUTH EXIT FROM HARBOR

B) SITE CURRENTLY USED AS BOAT REPAIR YARD IMMEDIATELY TO REAR OF BUZZ'S WHARF.

fukunaga/maalaea/card.001

c) PARKING LOT IMMEDIATELY TO REAR OF BUZZ'S WHARF

d) SITE ON WEST SIDE OF SOUTH EXIT ROAD & NORTH OF ROAD UP TO BUT NOT INCLUDING "BILGE AREA"

BY ROUGH CALCS. IT APPEARS THESE FOUR CITES ARE THE EQUIVALENT IN Ø' AS PLANNED LOT

FROM MULTIPLE OBSERVATIONS IT APPEARS THAT ON MOST OCCASIONS BOAT YARD MARINA OF BUZZ'S COULD HANDLE BOATS CURRENTLY IN YARD NORTH OF BUZZ'S

Irene Mitchell Patel

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO

May 9, 2005

Francis Michael Patrick Lydon
190 Hauoli Street, No. 311
Maalaea, Hawaii 96793

SUBJECT: Draft Environmental Assessment for Proposed Upgrades and Improvements to Maalaea Small Boat Harbor, Maalaea, Maui, Hawaii

Dear Mr. Lydon:

Thank you for the comments provided at the public informational meeting held on March 22, 2005, concerning the Draft Environmental Assessment (EA) for the proposed upgrades and improvements at the Maalaea Small Boat Harbor (MSBH). In response to your comments we note the following:

1. The Department of Land and Natural Resources (DLNR) acknowledges your approval of the proposed project.

2. The proposed wastewater system capacity to accommodate future additional pump out stations along the South Mole will be evaluated, under a separate study by DLNR. The scope of the present project and environmental assessment is limited, to improvements related to the inter-island ferry facilities, and improvements needed to meet Environmental Protection Agency regulations prohibiting use of large capacity cesspools, American With Disabilities Act regulations and electrical upgrades to meet County code standards. However, as mentioned by DLNR at the public meeting, design of the sewer force main will take into consideration, future connection to pump out stations along the South Mole.

3. The lighting design for the proposed overflow parking area, includes light pollution mitigation measures to direct lighting downward into the parking area and reduce glare to adjacent properties.

4. As discussed in the Draft EA, various alternative sites for parking uses were considered during the planning phase of the project. However, Parcel B was deemed the most viable option, given its existing use, proximity to the harbor, and minimal infrastructure requirements. The areas to the west and east of the harbor access road and Honoapiilani Highway were considered, but rejected due to high site development costs.

environment
planning

305 High Street, Suite 104 Wailuku, Hawaii 96793 ph: (808)244-2015 fax: (808)244-8729 planning@mhinconline.com

Thank you again for your review and comments to the Draft EA.

Very truly yours,

Mich Hirano, AICP
Project Manager

MH:yp
cc: Eric Hirano, Department of Land and Natural Resources
Fukunaga\Maalaea\lydon.deares

PACIFIC WHALE FOUNDATION
MAUI
900 Ma'alaea Road, Suite 211 Wailuku, Hawaii 96793
Phone: (808) 249-8811 • Fax: (808) 249-8021 • www.pacificwhale.org

March 24, 2005
Mich Hirano, AICP
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, HI 96793

Dear Mr. Hirano:

We wish to provide the following comments on the Draft Environmental Assessment for the Proposed Ma'alaea Small Boat Harbor (MSBH) Improvements.

1. The scope of the project is to improve MSBH for the stated purposes of upgrading the existing inter-island commuter ferry terminal facilities at MSBH. The draft EA also presupposes when such improvements are completed, ferry service operation(s) will commence thereafter.

   Under Impacts to Flora and Fauna, there is no analysis undertaken with respect to the impact of the resulting ferry service(s) on endangered humpback whales found offshore from October to June each year. DLNR should undertake a comprehensive plan to monitor and mitigate disturbance to whales during the winter months. This plan should proceed at four levels:

   a. review of the types of ferry vessels to be serviced by the improved facility; consideration of a variety of special management regulations on seasonal limitations of activity levels, speed zones, noise abatement, protected areas, etc.;

   b. clearly defined priorities and plans for effective enforcement of state and federal regulations with regard to ferry operations;

   c. required whale avoidance policies and mitigation plans by ferry operator(s);

   d. support for systematic, scientific study and ongoing monitoring of abundance, distribution, and behaviors of whales, levels of human activities, and continued assessment of potential impacts.

2. The proposed wastewater pump facility is inadequate. A sewage pump-out facility that services all berths is desired. A better solution would be an arterial system that provides pump-out attachments at each berth, with sewage storage held in above-ground tanks in the area of the proposed comfort station area.
3. While the development of Parcel B as a dedicated (improved) parking area is laudable, it falls well short of providing the required additional 144 parking stalls to service the future ferry operation(s). We suggest the leasing of additional land from A&B (currently in sugar cane production) north of Hauoli Road as a solution to providing adequate future parking. The parking plan also fails to detail how security issues will be addressed with regard to autos left overnight or for prolonged periods.

Thank you for the opportunity to provide comments on the Draft EA for MSBH.

Sincerely,

Gregory D. Kaufman
President and Founder

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO

May 9, 2005

Gregory D. Kaufman, President
Pacific Whale Foundation
900 Maalaea Road, Suite 211
Wailuku, Hawaii 96793

SUBJECT: Proposed Maalaea Small Boat Harbor Improvements
Draft Environmental Assessment

Dear Mr. Kaufman:

Thank you for your letter, received on March 24, 2005, providing comments on the subject Draft Environmental Assessment (EA). The following information is provided in response to your comments.

1. ***Response to Comment No. 1***

It is noted in the Draft EA that the project site is located within the boundaries of the Hawaiian Islands Humpback Whale National Marine Sanctuary. The proposed improvements to the Maalaea Small Boat Harbor (MSBH) are landside improvements and impacts to the nearshore marine environment are not anticipated.

a. As noted in the Draft EA, the Expedition ferry, owned by Hone Heke Corporation, currently operates a inter-island ferry service between Manele Small Boat Harbor on the island of Lanai and Lahaina Small Boat Harbor. Expedition has requested approval from the Department of Land and Natural Resources (DLNR) to expand their Maui to Lanai commuter ferry service to include a second stop on the island of Maui at the MSBH. Expedition anticipates operating two (2) round trips at the MSBH with one trip in the morning and one trip in the afternoon. It is anticipated that the Expedition ferry will be used for this service. This vessel is 65-feet in length and has a capacity of 149 passengers. Sea Link of Hawaii also has interest to carry out a passenger ferry service from Kaumalapau Commercial Harbor on the island of Lanai to MSBH.

Sea Link operates two (2) ferry vessels, the 100-foot, Molokai Princess and the 118-foot, Maui Princess. Each ferry has a capacity of 149 passengers.

There is a "no wake" speed zone at the harbor entrance. The protected area, as defined by the Department of Commerce, National Marine Fisheries Service, National Oceanic and Atomospheric Administration for the protection of humpback whales, is within 200 nautical miles of the Islands of Hawaii.

b. The Ferry operator(s) will be required to comply with Title 50, Code of Federal Regulations (CFS), Section 22.31 which sets out special prohibitions approaching humpback whales in Hawaii. It is unlawful to operate a vessel or other object to approach within 100 yards of any humpback whale. It is also unlawful to disrupt the normal behavior or prior activity of a humpback whale by other act or omission. A copy of this section, in part, is enclosed herewith as Exhibit "A". Title 46, CFS, Shipping, Chapter I, Coast Guard, Department of Transportation, Subpart C., Miscellaneous Operating Requirements, Section 185.304 states, "*the master of a vessel shall operate a vessel with special attention to, among others, current(s) velocity and direction of the transiting area; density of marine traffic; and potential damage caused by own wake.*" A copy of this section, in part is enclosed herewith as Exhibit "B". Enforcement of these regulations is carried out by the U.S. Coast Guard.

c. It should be noted that the inter-island ferry will generally operate on a set course between the destination harbors. Whale avoidance practices by the ferry operators include: visible look out by the captain and crew during ferry operations; slow down, when a whale is spotted and alter course to avoid the whale; and maintain a safe distance of a minimum of 100 yards.

d. The purpose of the environmental assessment is to identify potential impacts of the proposed action and mitigation which may be implemented to avoid potential adverse impacts to the environmental parameters assessed. The environmental assessment for the proposed improvements to the Maalaea Small Boat Harbor indicates a determination of a Finding of No Significant Impact (FONSI) and further assessment of potential impacts are not required.

2. ***Response to Comment No. 2***

The proposed improvements for the Maalaea Small Boat Harbor are limited to inter-island ferry facilities, actions required to comply with American With Disibilities Act and elimination of large capacity cesspools as required by the federal regulations of the Environmental Protection Agency. Electrical upgrades are also being carried out to comply with County code requirements. The proposed sewer pump

out is provided for the ferry service operations. This pump out may also be used by other vessel operators. A public informational meeting was held on March 22, 2005, to review the Draft EA and receive public comments. The future provision of additional sewer pump outs at MSBH was discussed at this meeting in response to public comments. It was noted that the DLNR will be investigating the requirements for additional sewer pump outs. The design of the existing system will allow future sewer pump outs to be accommodated along the South Mole. The implementation of additional sewer pump outs will be carried out under a separate source of funds. It was also noted that a revised environmental assessment, pursuant to Chapter 343, Hawaii Revised Statutes, will need to be carried out to assess the potential impact of expanding the wastewater treatment facilities beyond the current capacity.

3. ***Response to Comment No. 3***

Parking has been identified as a critical need at MSBH. However, it should be noted that the traffic assessment report estimated the proposed ferry operations to generate an additional 144 vehicle trips. A portion of the vehicle trips will involve pick-up and/or drop-off of passengers and does not directly translate to demand on the parking facilities. As discussed in the Draft EA, alternatives investigated during the planning phase, included the provision of a "park and ride" shuttle service from parking areas located on adjacent commercial lands. However, this alternative was not pursued due to the availability of Parcel B for parking which provides a more convenient access for ferry passengers and harbor users. The parking lot will be fenced and lighted for security. Additional security measures will be addressed through operational policies of the DLNR and the Harbor Agent prior to project implementation.

Again, thank you for your comments.

Very truly yours,

Mich Hirano, AICP
Project Manager

MH:yp
Enclosures
cc: Eric Hirano, Department of Land and Natural Resources (w/enclosures)
Fukunaga\Maalaea\pwf.deares

[Code of Federal Regulations]
[Title 50, Volume 2, Parts 200 to 599]
[Revised as of October 1, 1996]
From the U.S. Government Printing Office via GPO Access
[CITE: 50CFR222.31]

TITLE 50--WILDLIFE AND FISHERIES

CHAPTER II--NATIONAL MARINE FISHERIES SERVICE, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, DEPARTMENT OF COMMERCE

PART 222--ENDANGERED FISH OR WILDLIFE--Table of Contents

Subpart D--Special Prohibitions

Except as provided in subpart C (Endangered Fish or Wildlife Permits) of this part it is unlawful for any person subject to the jurisdiction of the United States to commit, to attempt to commit, to solicit another to commit, or to cause to be committed, within 200 nautical miles (370.4 km) of the Islands of Hawaii, any of the following acts with respect to humpback whales (Megaptera novaeangliae):

(a) Operate any aircraft within 1,000 ft (300 m) of any humpback whale; or

(b) Approach by any means, within 100 yd (90 m) of any humpback whale; or

(c) Cause a vessel or other object to approach within 100 yd (90 m) of a humpback whale; or

(d) Disrupt the normal behavior or prior activity of a whale by any other act or omission. A disruption of normal behavior may be manifested by, among other actions on the part of the whale, a rapid change in direction or speed; escape tactics such as prolonged diving, underwater course changes, underwater exhalation, or evasive swimming patterns; interruptions of breeding, nursing, or resting activities, attempts by a whale to shield a calf from a vessel or human observer by tail swishing or by other protective movement; or the abandonment of a previously frequented area.

[60 FR 3775, Jan. 19, 1995]

EXHIBIT "A"

[Code of Federal Regulations]
[Title 46, Volume 7]
[Revised as of October 1, 2001]
From the U.S. Government Printing Office via GPO Access
[CITE: 46CFR185.304]

[Page 296-297]

TITLE 46--SHIPPING

CHAPTER I--COAST GUARD, DEPARTMENT OF TRANSPORTATION--Continued

PART 185--OPERATIONS--Table of Contents

Subpart C--Miscellaneous Operating Requirements

Sec. 185.304 Navigation underway.

(a) The movement of vessel shall be under the direction and control of the master or a licensed mate at all times. The master shall operate the vessel keeping the safety of the passengers and crew foremost in mind by directing the vessel in order to prevent a casualty. Special attention should be paid to:

(1) The current(s) velocity and direction of the transiting area;
(2) Tidal state;
(3) Prevailing visibility and weather conditions;
(4) Density of marine traffic;

[[Page 297]]

(5) Potential damage caused by own wake;
(6) The danger of each closing visual or radar contact;
(7) Vessel's handling characteristics; and
(8) Magnetic variation and deviation errors of the compass.
(b) [Reserved]

[CGD 85-080, 61 FR 1005, Jan. 10, 1996, as amended at 62 FR 51359, Sept. 30, 1997]

EXHIBIT "B"

COMMENT CARD
MAALAEA SMALL BOAT HARBOR
PUBLIC INFORMATION MEETING

Comments are due by April 6, 2005 and may be turned-in at the public information meeting or mailed to:

Mich Hirano, AICP
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793.

PLEASE PRINT

Name: Thomas W. Elliot

Address: 280 Hauoli St A13

Phone: Home 244-1866 **Business** _____

Representing: Self

Comments:

See attached sheet

fukunaga/maalaea/card.001

I was at the meeting in Maalaea in March where the proposed changes to the harbor to accommodate the ferry were discussed. At that time I was puzzled by the location of the ferry terminal at the end of the mole. Much of the concern about the ferry upgrade to the harbor resolved around traffic congestion on the mole, parking and drop off for ferry passengers.

This caused me to remark at the time that the most logical location for the ferry terminal would be at the lower end of the proposed 100 car parking lot, where the existing plan has a comfort station, and the loading area for the ferry to be at the existing seawall by the Coast Guard station.

This suggestion was rejected mostly because of objections over noise from neighboring condominium owners. This seems an inadequate reason to reject a solution that could potentially solve the traffic problems, help the harbor become more efficient and use the money available for the project in a way that reduces congestion and problems in the harbor, not aggravate them.

In addition to my suggestion at the meeting, which I still believe is more viable than the current proposal and not that much of a change, I think it would fit well to move the Coast Guard station out to the end of the mole. This would put it at the entrance to the harbor, provide docking space for the larger boat I understand they will be deploying, and increase the security of the harbor by giving the Coast Guard direct control over the harbor entrance. It would also reduce traffic on the mole and still allow for the necessary sewer line extensions and upgrades on the mole to service that station.

The objections of the condominium owners do not make much sense to me. Their main complaint is about the noise of one or two boats. There are three condo complexes that are impacted by activities at the harbor, two of them most directly, but those condos were built after the harbor was constructed and it has always been a working harbor, with the attendant noise and activity. Just moving those two boats away from the seawall won't solve their noise problem, the harbor is too small for that and those boats will be just as noisy coming and going as they are now.

I too am a property owner and resident on Hauoli Street and I want to let you know that I am not only in favor of the improvements to the Harbor I believe changing the design to more centrally locate the ferry terminal on the existing seawall will be an even more effective investment in the future of the harbor and the functionality of the ferry. It will also make the ferry more usable to potential patrons and do more to ensure its success.

Investing $15 million in improvements to the harbor to accommodate a ferry and then doing so in a way that makes it difficult to use is not a wise investment. Don't let a few disgruntled neighbors with noise issues derail this project. The harbor is far from the only noise in our environment on this street and directing all their anger towards that facility is not of benefit to our community. For that matter, the individual condo daily maintenance projects produce far more noise that is more constantly objectionable than does the harbor and I don't see them offering to change that behavior.

Thomas W Elliot 244-1864
280 Hauoli st A 13
Wailuku HI 96793

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO

May 9, 2005

Thomas Elliot
280 Hauoli Street, A 13
Maalaea, Hawaii 96793

SUBJECT: Draft Environmental Assessment for Proposed Upgrades and Improvements to Maalaea Small Boat Harbor, Maalaea, Maui, Hawaii

Dear Mr. Elliot:

Thank you for the comments provided at the public informational meeting held on March 22, 2005, concerning the Draft Environmental Assessment (EA) for the proposed upgrades and improvements at the Maalaea Small Boat Harbor (MSBH). In response to your comments we note the following:

1. ***Response to Locating Ferry Terminal at the Northern Portion of the Harbor:***

The Department of Land and Natural Resources (DLNR) acknowledges the complexities of moving passengers to and from the existing loading dock at the MSBH. The location of the ferry terminal at the northern end of the harbor adjacent to the U.S. Coast Guard station was reviewed during the development of alternatives. This alternative was rejected due to the concerns raised by the neighboring condominium owners who objected to having the ferry operations close to their residences.

2. ***Response to Relocating the U.S. Coast Guard Station to the South Mole:***

Discussion of the relocation of the U.S. Coast Guard Station to the South Mole would require some indication from the U.S. Coast Guard that the South Mole would be a suitable location for their operations. Comments made by the U.S. Coast Guard at the public informational meeting, held on March 22, 2005, indicated the South Mole is not a suitable location for their operations. The U.S. Coast Guard station was previously located at the South Mole, before they moved to their current facilities at the northern end of the harbor. They experienced operational difficulties with moving their boat trailer at the South Mole.

planning environment

305 High Street, Suite 104 Wailuku, Hawaii 96793 ph: (808)244-2015 fax: (808)244-8729 planning@mhinconline.com

Thank you again for providing your input to the proposed action.

Very truly yours,

Mich Hirano, AICP
Project Manager

MH:yp
cc: Eric Hirano, Department of Land and Natural Resources
Fukunaga\Maalaea\elliot.deares

References

References

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County of Maui, West Maui Community Plan, February 1996.

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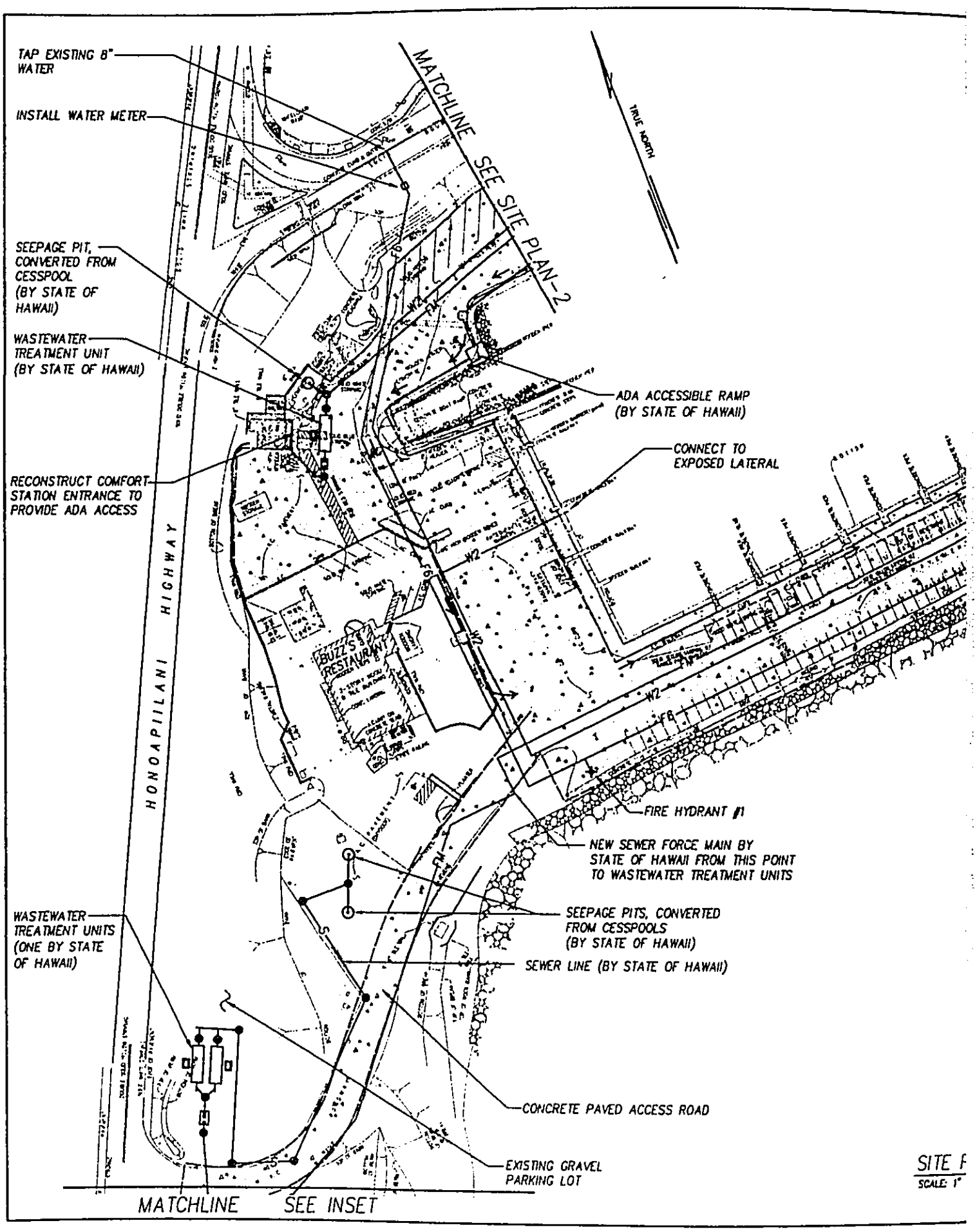
Appendices

Appendix A

Proposed Maalaea Small Boat Harbor Site Improvements


TAP EXISTING 8" WATER
INSTALL WATER METER
SEEPAGE PIT, CONVERTED FROM CESSPOOL (BY STATE OF HAWAII)
WASTEWATER TREATMENT UNIT (BY STATE OF HAWAII)
RECONSTRUCT COMFORT STATION ENTRANCE TO PROVIDE ADA ACCESS
MATCHLINE SEE SITE PLAN-2
TRUE NORTH
ADA ACCESSIBLE RAMP (BY STATE OF HAWAII)
CONNECT TO EXPOSED LATERAL
HONOAPIILANI HIGHWAY
BUZZ'S RESTAURANT
FIRE HYDRANT #1
NEW SEWER FORCE MAIN BY STATE OF HAWAII FROM THIS POINT TO WASTEWATER TREATMENT UNITS
SEEPAGE PITS, CONVERTED FROM CESSPOOLS (BY STATE OF HAWAII)
SEWER LINE (BY STATE OF HAWAII)
WASTEWATER TREATMENT UNITS (ONE BY STATE OF HAWAII)
CONCRETE PAVED ACCESS ROAD
EXISTING GRAVEL PARKING LOT
MATCHLINE SEE INSET
SITE F
SCALE: 1"

COVER OPENING W/ GRATE, IMPROVE/REPAIR DOCKING AREA

RECONSTRUCT TERMINAL BUILDING, SEE ARCH. DWGS.

SEWER PUMPOUT

2" WATERLINE, INSTALL HOSE BIB AT EACH PIER

FIRE HYDRANT #4

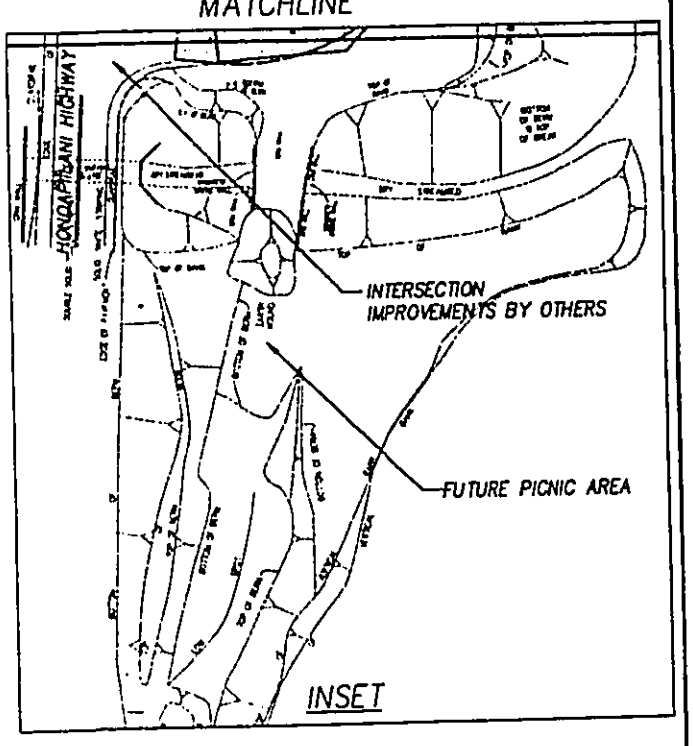
NEW WASTEWATER PUMP STATION

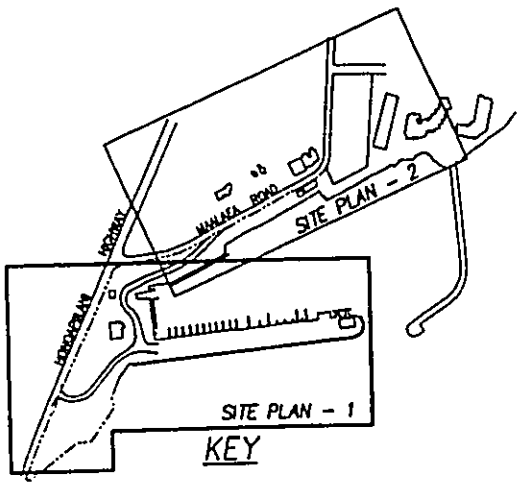
FIRE HYDRANT #3

REMOVE EXISTING AC PAVEMENT, REPLACE W/ CONCRETE PAVEMENT, REINSTALL STRIPING AND WHEEL STOPS

FIRE HYDRANT #2

MATCHLINE





LEGEND:

CONCRETE PAVEMENT

FM — SEWER FORCE MAIN

S4 — SEWER LINE

W2 — WATER LINE

EW8 — EXISTING 8" WATER LINE

F6 — 6" FIRE PROTECTION LINE

→ → PEDESTRIAN WALKWAY

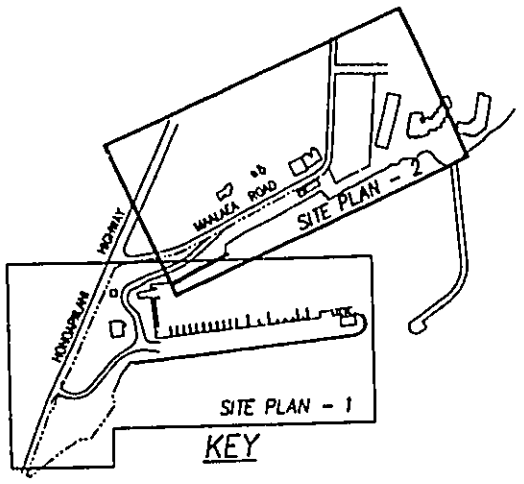
SITE PLAN - 1

SCALE: 1" = 40'

MAALAEA HARBOR
FERRY SYSTEM IMPROVEMENTS
MAALAEA, MAUI

SITE PLAN - 1

April 2005



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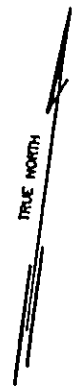
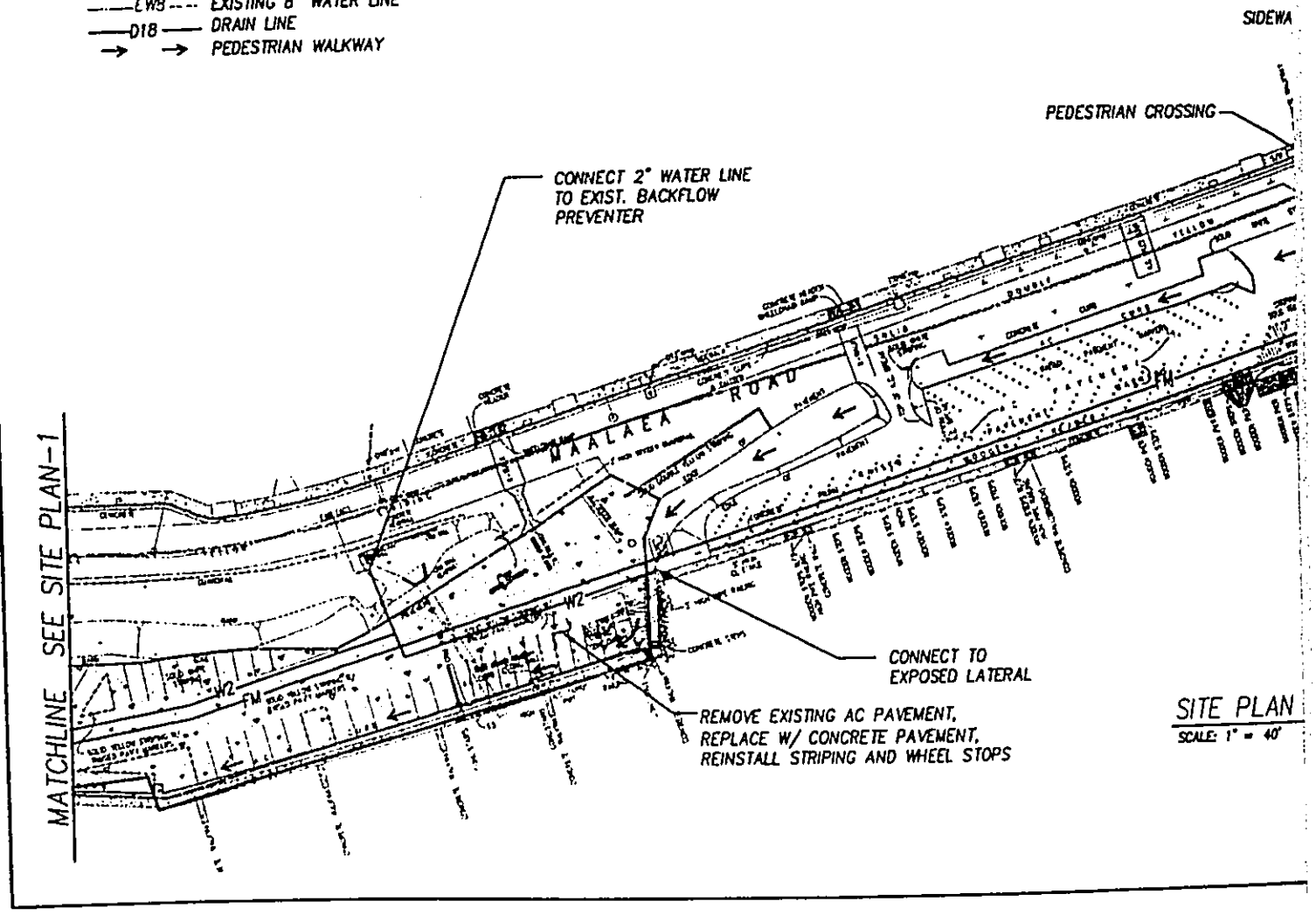


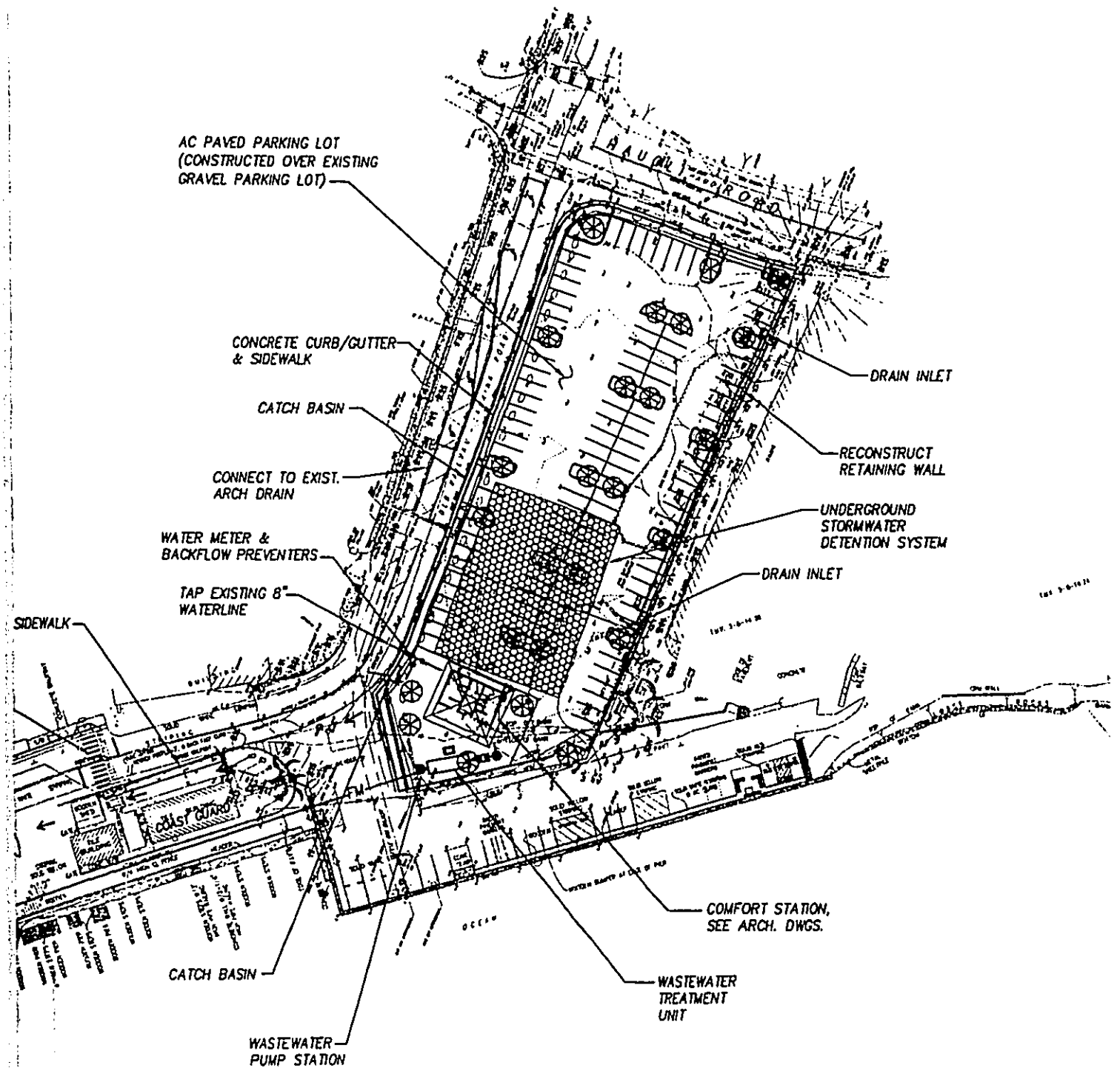
LEGEND:

- CONCRETE PAVEMENT
- FM — SEWER FORCE MAIN
- S4 — SEWER LINE
- W2 — WATER LINE
- EW8 --- EXISTING 8" WATER LINE
- D18 — DRAIN LINE
- → → PEDESTRIAN WALKWAY



SITE PLAN

SCALE: 1" = 40'



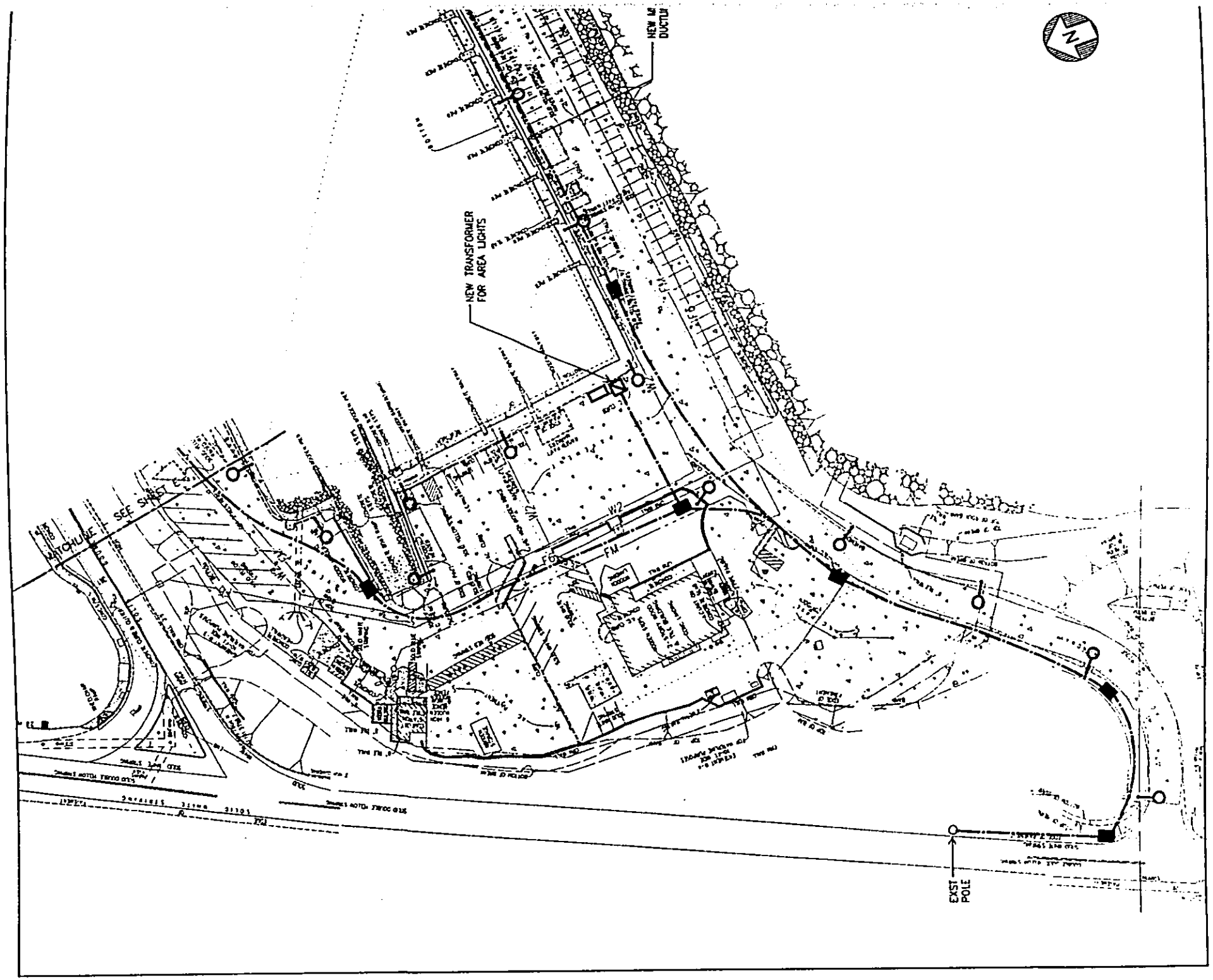
AN - 2

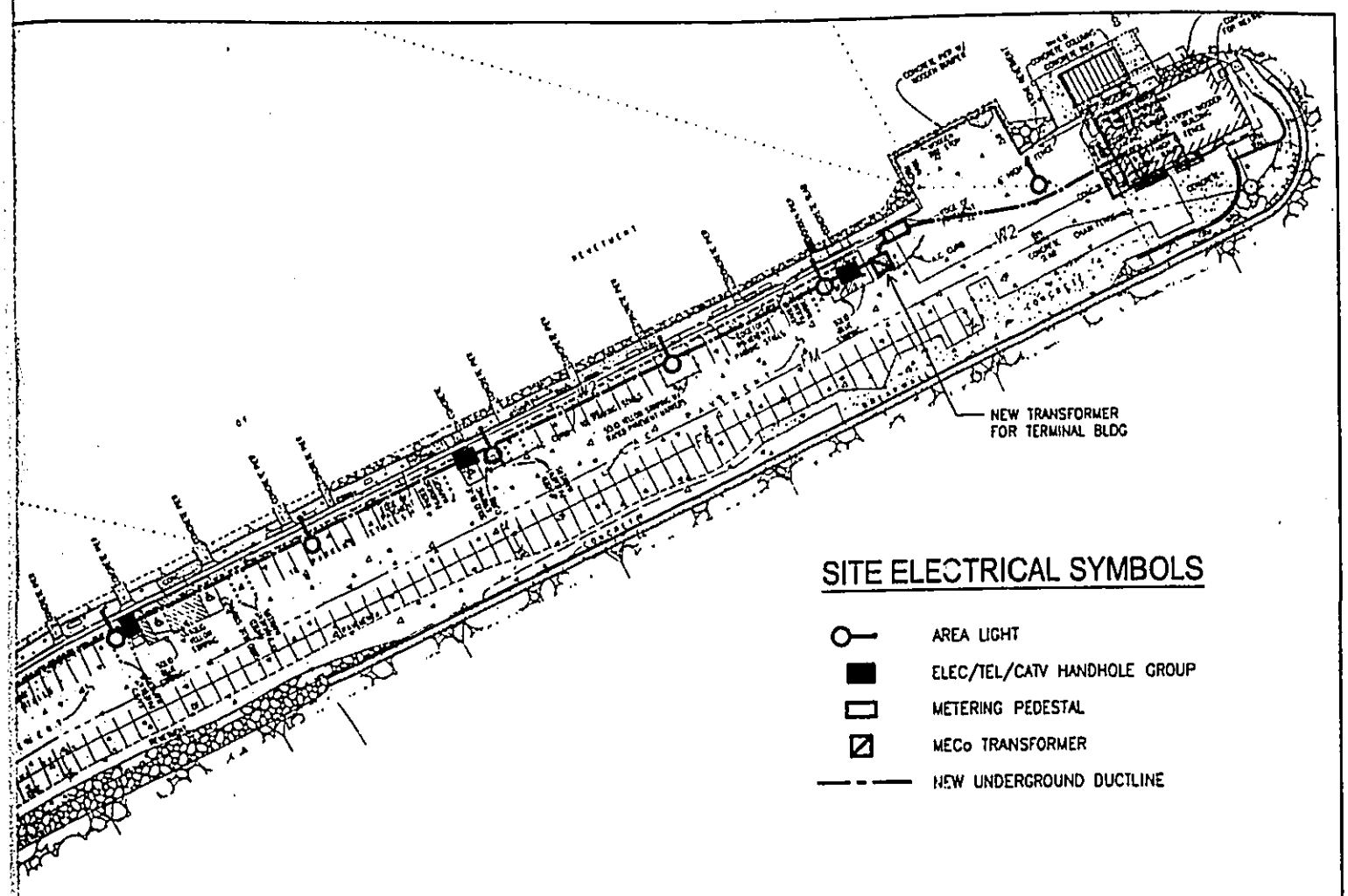
40'

MAALAEA HARBOR
FERRY SYSTEM IMPROVEMENTS
MAALAEA, MAUI

SITE PLAN - 2

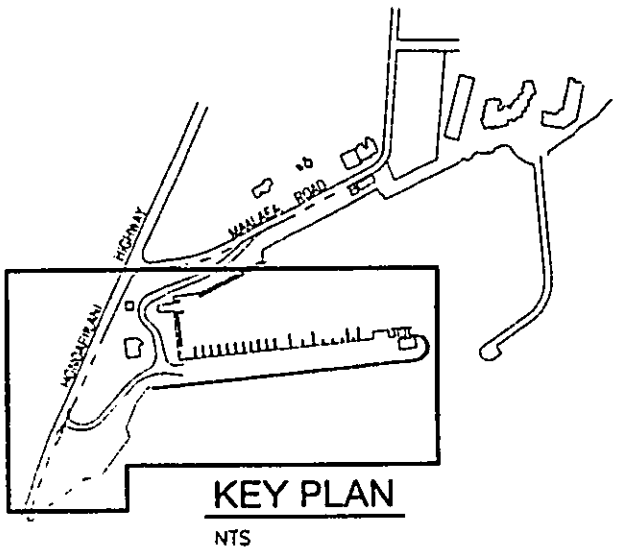
April 2005


NEW TRANSFORMER FOR AREA LIGHTS
EXIST POLE
SEE SHT



SITE ELECTRICAL SYMBOLS

- AREA LIGHT
- ELEC/TEL/CATV HANDHOLE GROUP
- METERING PEDESTAL
- MECo TRANSFORMER
- NEW UNDERGROUND DUCTLINE



KEY PLAN

NTS

SITE ELECTRICAL PLAN 1

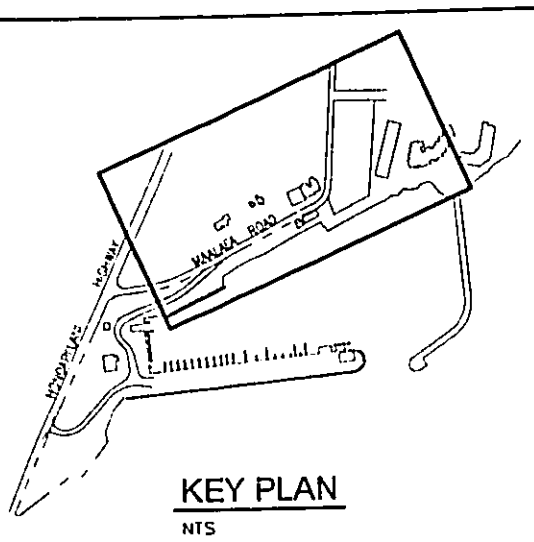
SCALE: 1" = 40'-0"

MAALAEA HARBOR
FERRY SYSTEM IMPROVEMENTS

SITE ELECTRICAL PLAN 1

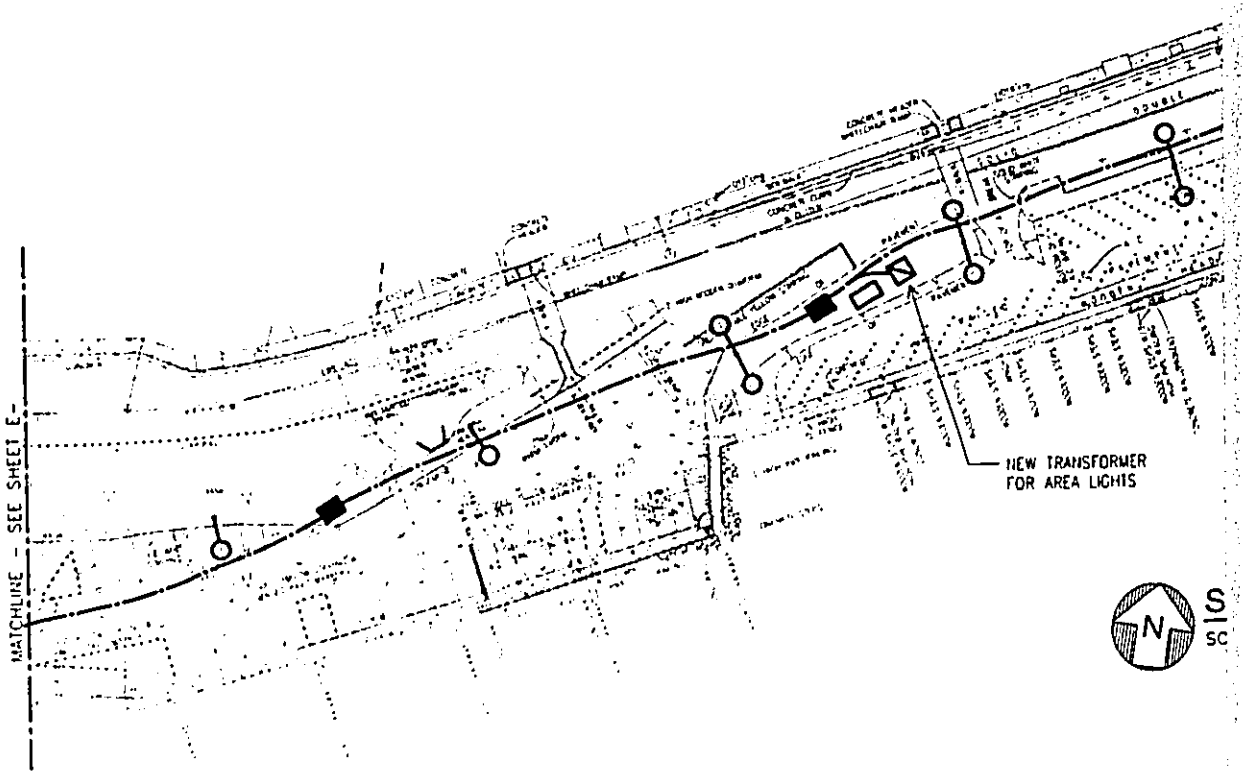
MAALAEA, MAUI

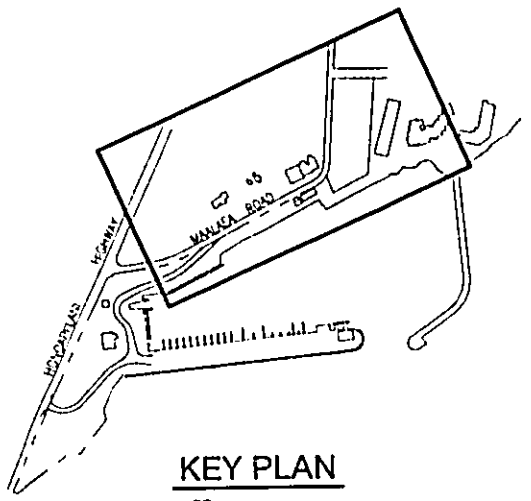
January 2005



KEY PLAN
NTS

SITE

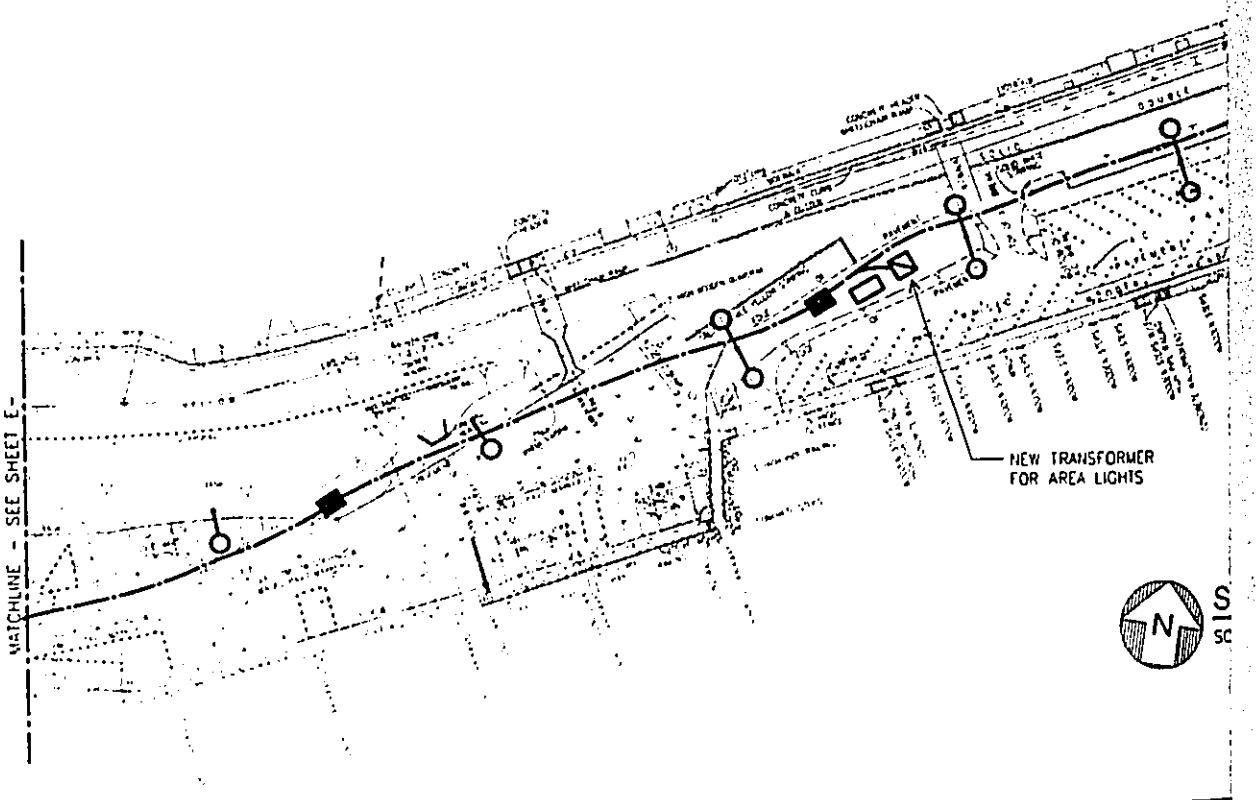




KEY PLAN

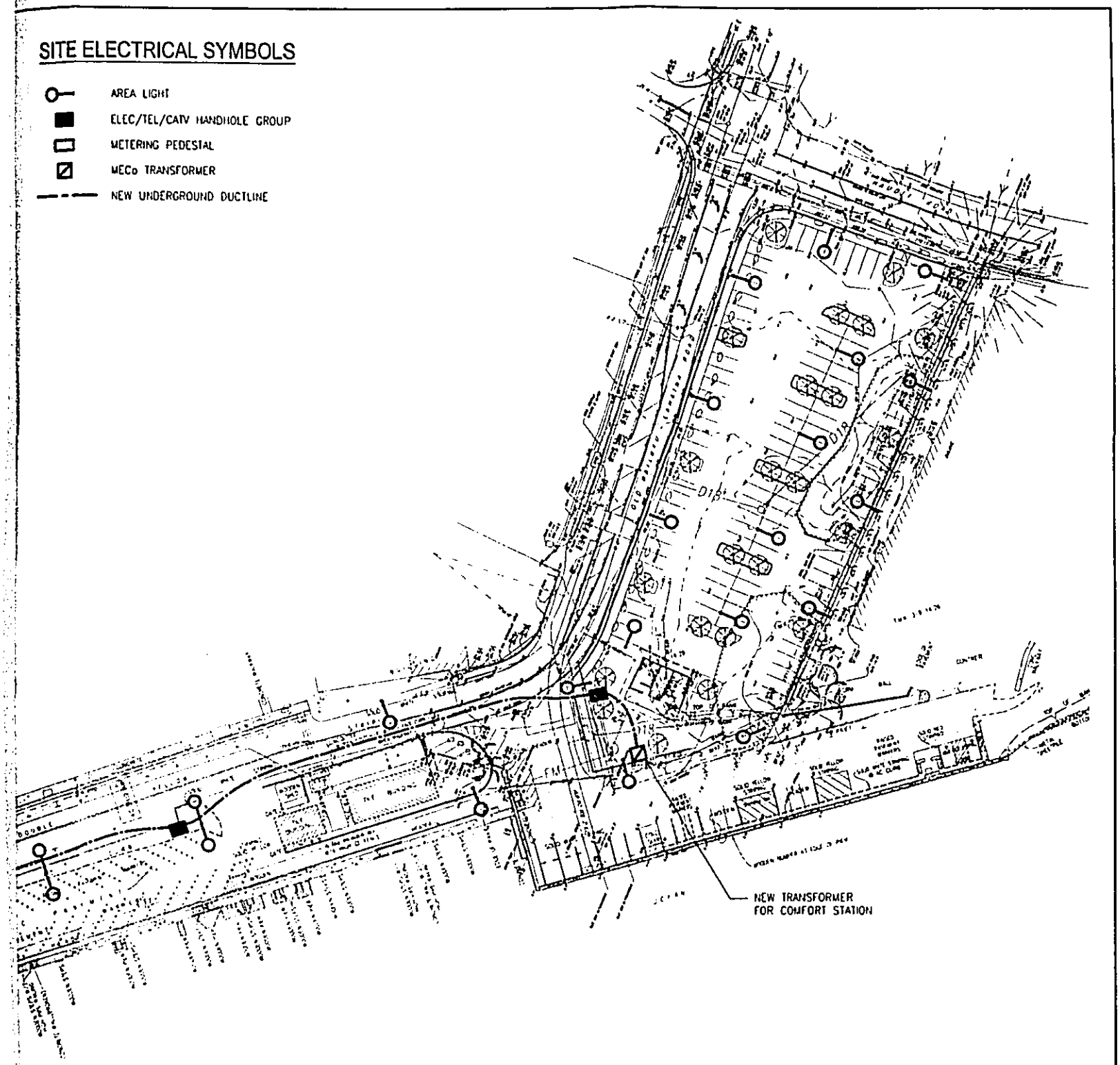
NTS

SITE



SITE ELECTRICAL SYMBOLS

- AREA LIGHT
- ELEC/TEL/CATV HANDHOLE GROUP
- METERING PEDESTAL
- MECo TRANSFORMER
- NEW UNDERGROUND DUCTLINE



N

SITE ELECTRICAL PLAN 2

SCALE 1" = 40'-0"

MAALAEA HARBOR
FERRY SYSTEM IMPROVEMENTS

SITE ELECTRICAL PLAN 2

MAALAEA, MAUI

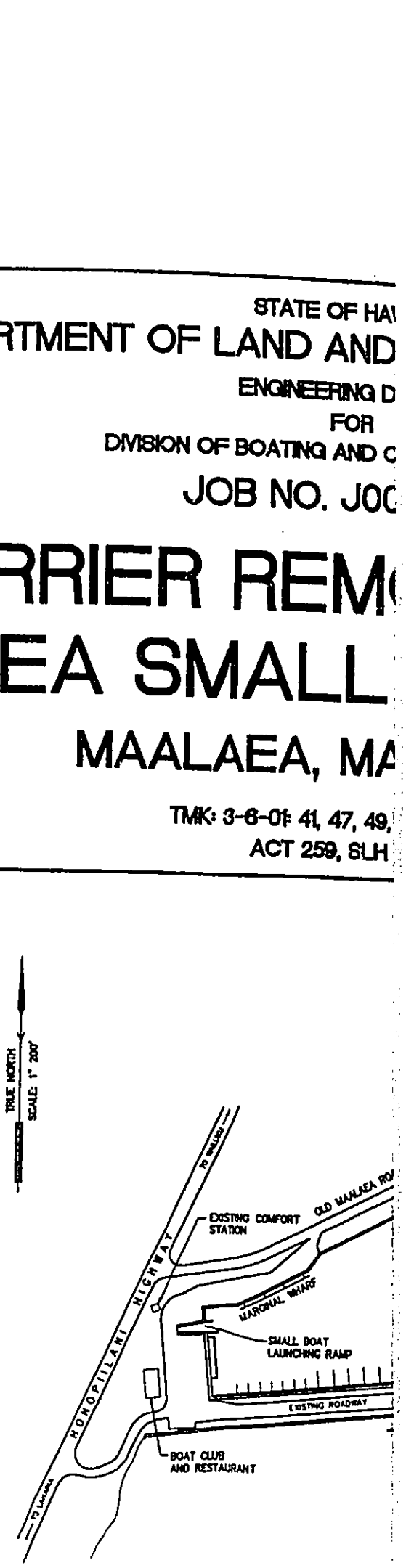
January 2005

STATE OF HA
DEPARTMENT OF LAND AND
ENGINEERING D
FOR
DIVISION OF BOATING AND C
JOB NO. J0C

ADA BARRIER REM
MAALAEA SMALL
MAALAEA, MA

TMK: 3-6-01: 41, 47, 49,
ACT 259, SLH

INDEX

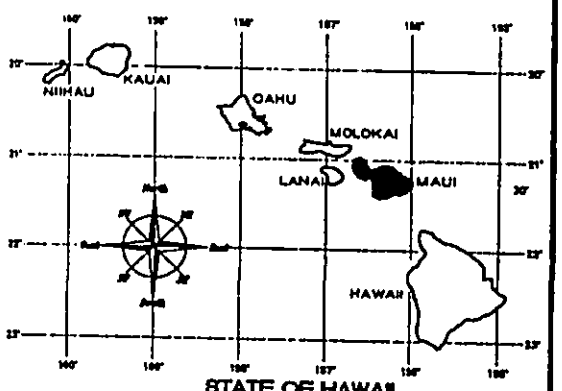


LOCATION MAP
SCALE: 1" = 200'

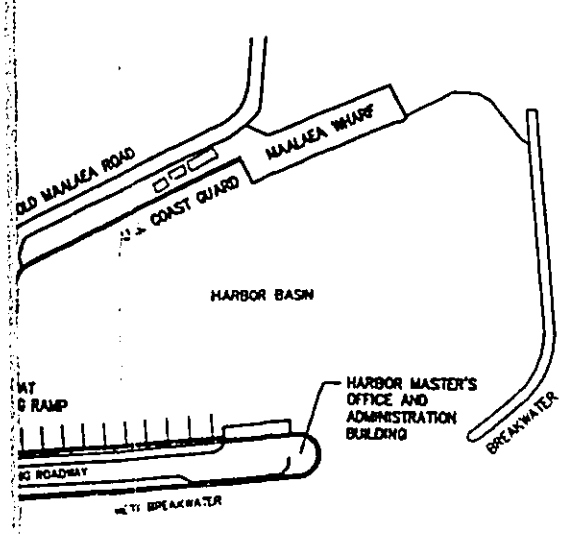
E OF HAWAII
AND NATURAL RESOURCES
ERING DIVISION
FOR
G AND OCEAN RECREATION
). J00CB45A

EMOVAL PROJECT
LL BOAT HARBOR
, MAUI, HAWAII

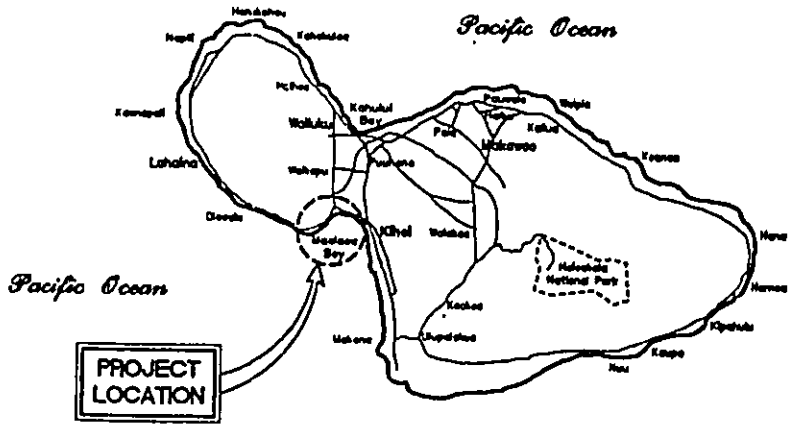
, 47, 49, 50, 51, DIV. 2
59, SLH 2001



STATE OF HAWAII
ISLAND MAP



ON MAP
1" = 200'



ISLAND OF MAUI

VICINITY MAP
NOT TO SCALE

APPROVED :

ES 1

Stephen Thompson 5/3/04
STEPHEN THOMPSON
ACTING ADMINISTRATOR
DIVISION OF BOATING AND OCEAN RECREATION
DEPARTMENT OF LAND AND NATURAL RESOURCES
DATE

Eric T. Hirano 5/4/04
ERIC T. HIRANO
CHIEF ENGINEER
ENGINEERING DIVISION
DEPARTMENT OF LAND AND NATURAL RESOURCES
DATE

4 BARRIER REMOVAL PROJECT, MAALAEA SMALL BOAT HARBOR, JOB NO. J00CB45A

NOTES

..PLICABLE CONSTRUCTION WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, SEPTEMBER 1986, AND STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION, SEPTEMBER 1984, AS AMENDED, OF DEPARTMENT OF PUBLIC WORKS, CITY AND COUNTY OF HONOLULU AND THE COUNTIES OF MAUI AND HAWAII.

..NTRACTOR SHALL BE RESPONSIBLE FOR CONFORMANCE WITH THE APPLICABLE PROVISIONS OF THE WATER QUALITY AND WATER POLLUTION CONTROL STANDARDS CONTAINED IN HAWAII ADMINISTRATIVE RULES, TITLE 11, CHAPTER 54, "WATER QUALITY STANDARDS" AND ..01, CHAPTER 55, "WATER POLLUTION CONTROL." BEST MANAGEMENT PRACTICES SHALL BE ..YED AT ALL TIMES DURING CONSTRUCTION.

..E CONTRACTOR SHALL COORDINATE AND SCHEDULE ALL HIS WORK WITH THE DLNR DIVISION OF ..BOATING AND OCEAN RECREATION SO AS NOT TO DISRUPT THE OPERATIONS OF THE EXISTING ..FACILITIES.

..NTRACTOR SHALL PROTECT ALL EXISTING UTILITIES THAT ARE TO REMAIN IN USE, WHETHER ..ON THE CONTRACT PLANS OR NOT. BEFORE DISRUPTING SERVICE OF ANY UTILITY, THE ..CTOR SHALL CONTACT THE DLNR DIVISION AND APPROPRIATE RESPONSIBLE UTILITY AUTHORITY. ..AGE TO THE UTILITIES AS A RESULT OF HIS CONSTRUCTION ACTIVITIES SHALL BE REPAIRED BY ..E CONTRACTOR AT NO ADDITIONAL COST TO THE STATE.

..RELOCATION IS CALLED FOR, EXISTING UTILITIES SHALL REMAIN IN SERVICE ..PLACE. IF RELOCATION OF EXISTING UTILITIES IS REQUIRED BY THE ..CTOR, INTERRUPTION OF SERVICE SHALL BE KEPT TO A MINIMUM AND SHALL BE ..T THE CONTRACTOR'S EXPENSE AND ONLY WITH THE ACCEPTANCE OF THE OWNER. ..E CONTRACTOR SHALL MAINTAIN POTABLE WATER, SEWER AND ELECTRICAL SERVICES TO ..L EXISTING BUILDINGS AND FACILITIES AT ALL TIMES.

..CONTRACTOR'S ACCESS TO AND MOVEMENT WITHIN THE AREAS OF WORK SHALL BE ..NATED WITH THE DLNR DIVISION OF BOATING AND OCEAN RECREATION.

..NTRACTOR WILL BE REQUIRED TO ARRANGE HIS WORK SO AS TO MINIMIZE INTERFERENCES ..H PUBLIC, LOCAL TRAFFIC AND WORKING OPERATIONS OF THE BUSINESSES WITHIN THE AREA.

..NOT STORE MATERIALS OR EQUIPMENT, OR OPERATE OR PARK EQUIPMENT NEAR OR ..THE BRANCHES OF EXISTING PLANTS AND TREES THAT ARE TO REMAIN, EXCEPT AS ..ED FOR CONSTRUCTION IN THOSE AREAS. THE CONTRACTOR SHALL PROTECT ..ISTING TREES TO REMAIN.

..EN EXCAVATIONS ARE ADJACENT TO OR UNDER EXISTING STRUCTURES OR FACILITIES, ..E CONTRACTOR SHALL BE RESPONSIBLE FOR PROPERLY SHEETING AND BRACING THE ..VATION AND STABILIZING THE EXISTING GROUND TO RENDER IT SAFE AND SECURE ..POSSIBLE SLIDES, CAVE INS AND SETTLEMENT, AND FOR PROPERLY SUPPORTING EXISTING ..TURES AND FACILITIES WITH BEAMS, STRUTS OR UNDERPINNING TO FULLY PROTECT IT ..DAMAGE. DAMAGES SHALL BE REPAIRED OR REPLACED AT NO COST AND TO THE ..ISFACTION OF THE DLNR DIVISION OF BOATING AND OCEAN RECREATION. REPAIRS TO ..MMODATE NEW CONSTRUCTION SHALL BE CONSIDERED INCIDENTAL TO THE NEW WORK.

..NTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE RESULTING FROM HIS ..TIONS AND REPAIR OR REPLACE SUCH DAMAGE AT CONTRACTOR'S EXPENSE. REPAIR ..E IN A MANNER SATISFACTORY TO THE OWNER.

..FETY BARRIERS AND APPROPRIATE WARNING SIGNS AND DEVICES SHALL BE PROVIDED ..L TIMES FOR THE SAFETY OF PEDESTRIANS AND/OR VEHICLES. THE CONTRACTOR ..PROVIDE SAFE ACCESS TO AND FROM ALL DRIVEWAYS AND ROADWAYS.

..AND CHECK ALL DIMENSIONS AND DETAILS PRIOR TO THE START OF ..TRUCTION. DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER.

..ACTOR WILL FOLLOW APPLICABLE RULES AND REGULATIONS REGARDING NOISE, ..CONTROL, VEHICULAR EQUIPMENT AND PROJECT RELATED ACTIONS. IN THE EVENT ..TIFACTS OR HUMAN REMAINS ARE UNCOVERED DURING CONSTRUCTION OPERATIONS, ..CONTRACTOR SHALL IMMEDIATELY SUSPEND WORK AND NOTIFY THE MAUI POLICE ..RTMENT AND THE STATE LAND AND NATURAL RESOURCES -- HISTORIC PRESERVATION DIVISION.

..ED AREAS SHALL BE BACKFILLED WITH A MINIMUM OF 6 INCHES OF TOPSOIL AND ..ED. EXPOSED AREAS SHALL BE DEFINED AS THOSE AREAS WHERE DISTURBANCE OCCURS ..TO DEMOLITION, REMOVAL, OR TRENCHING AND WHERE NO STRUCTURES OR PAVEMENTS ..TO BE CONSTRUCTED.

..ACTOR SHALL ALLOW FOR CONSTRUCTION TOLERANCE IN ORDER TO MEET THE ..M AND MAXIMUM REQUIREMENTS AS INDICATED IN THE CONSTRUCTION DRAWINGS AND ..CATIONS.

..RACTOR SHALL PROVIDE PORTABLE TOILETS FOR THE DURATION OF THE ..ROOM CLOSURE FOR RENOVATIONS. TOILETS SHALL BE SERVICED A MINIMUM OF ..(3) TIMES A WEEK AND SHALL BE MAINTAINED IN ACCORDANCE WITH THE PUBLIC ..H REGULATIONS OF THE DEPARTMENT OF HEALTH. LOCATION OF THE PORTABLE ..S SHALL BE DETERMINED BY THE ENGINEER.

..E SAFEGUARDS AND EXERCISE CAUTION AGAINST INJURY OR DEFACEMENT OF ..ING SITE IMPROVEMENTS. VEHICLES SHALL NOT PASS OVER WALKWAYS AND CURBS, ..S PROTECTION HAS BEEN PROVIDED.

..CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR HIS CONSTRUCTION METHODS, ..OR JOBSITE SAFETY REQUIREMENTS AND PRECAUTIONS.

..BOATING FACILITY SHALL REMAIN OPEN DURING THE CONSTRUCTION PERIOD. THE ..RACTOR SHALL INSTALL ADEQUATE TEMPORARY BARRICADES AND WARNING SIGNS TO ..CT THE PUBLIC DURING THE CONSTRUCTION PERIOD. PROVIDE AND MAINTAIN A SAFE ..TRIAN ACCESS FROM THE PARKING AREA AND TO THE BOATING FACILITY THROUGHOUT ..CONSTRUCTION PERIOD.

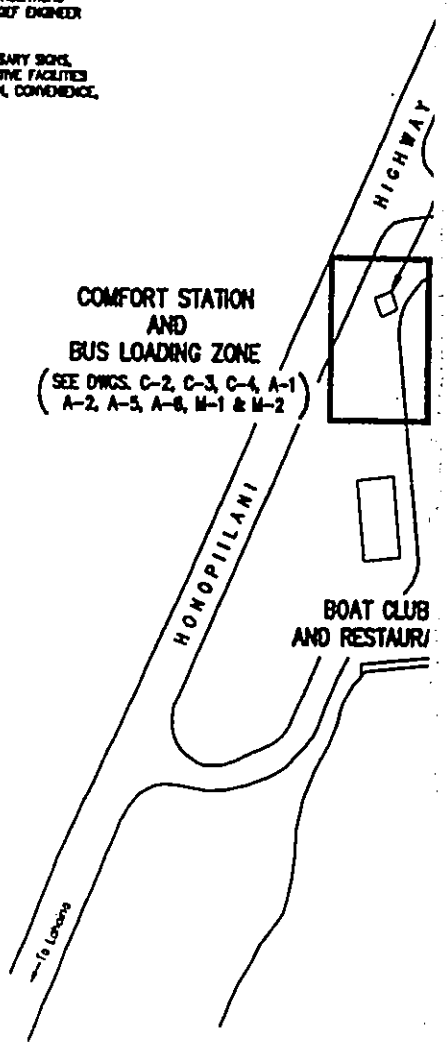
..BENCH MARKS, SEE DRAWING C-5, C-6, C-7 & C-8.

TRAFFIC NOTES

1. THE CONTRACTOR SHALL PROVIDE TRAFFIC CONTROL ALONG ROADWAY AREAS DURING ALL PHASES OF CONSTRUCTION.
2. THE CONTRACTOR SHALL PROVIDE, INSTALL, AND MAINTAIN ALL NECESSARY SIGNS AND OTHER PROTECTIVE FACILITIES, WHICH SHALL CONFORM WITH THE "HAWAII ADMINISTRATION RULES GOVERNING THE USE OF TRAFFIC CONTROL DEVICES AT WORK SITES ON OR ADJACENT TO PUBLIC STREETS AND HIGHWAYS" ADOPTED BY THE DIRECTOR OF TRANSPORTATION, AND THE CURRENT U.S. FEDERAL HIGHWAY ADMINISTRATION'S "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, PART VI - TRAFFIC CONTROLS FOR STREETS AND HIGHWAY CONSTRUCTION AND MAINTENANCE OPERATIONS."
3. ALL CONSTRUCTION WARNING SIGNS SHALL BE PROMPTLY REMOVED OR COVERED WHENEVER THE MESSAGE IS NOT APPLICABLE OR NOT IN USE. THE BACKS OF ALL SIGNS USED FOR TRAFFIC CONTROL SHALL BE APPROPRIATELY COVERED TO PRECLUDE THE DISPLAY OF INAPPLICABLE SIGN MESSAGES (i.e., WHEN SIGNS HAVE MESSAGES ON BOTH FACES).
4. THE CONTRACTOR SHALL PROVIDE FLAGMEN OR OFF-DUTY POLICE OFFICERS TO CONTROL THE FLOW OF TRAFFIC.
5. WHERE PEDESTRIAN WALKWAYS EXIST, THEY SHALL BE MAINTAINED IN PASSABLE CONDITION OR OTHER FACILITIES FOR PEDESTRIANS SHALL BE PROVIDED. PASSAGE BETWEEN WALKWAYS AT INTERSECTIONS SHALL LIKEWISE BE PROVIDED.
6. THE CONTRACTOR SHALL REPLACE OR REPAIR ALL TRAFFIC SIGNS, POSTS AND PAVEMENT MARKINGS DISTURBED BY HIS ACTIVITIES.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES TO EXISTING STREET LIGHTING AND DAMAGES SHALL BE REPAIRED BY THE CONTRACTOR.

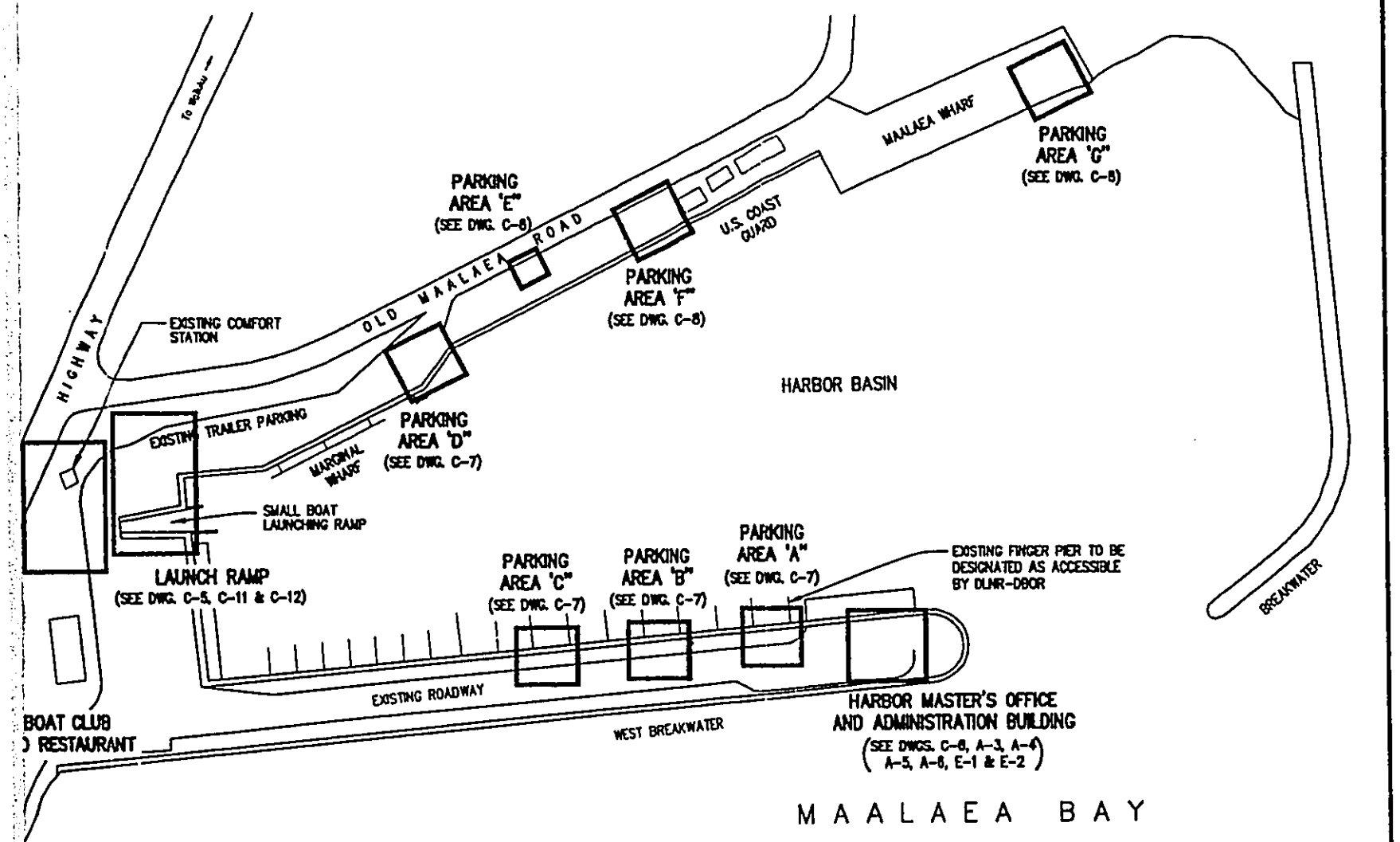
HEALTH, SAFETY AND CONVENIENCE

1. THE CONTRACTOR SHALL OBSERVE AND COMPLY WITH ALL FEDERAL, STATE, AND LOCAL LAWS REQUIRED FOR THE PROTECTION OF PUBLIC HEALTH AND SAFETY AND ENVIRONMENTAL QUALITY.
2. THE CONTRACTOR, AT HIS OWN EXPENSE, SHALL KEEP THE PROJECT AND ITS SURROUNDING AREAS FREE FROM DUST NUISANCE. THE WORK SHALL BE DONE IN CONFORMANCE WITH THE AIR POLLUTION STANDARDS AND REGULATIONS OF THE STATE, DEPARTMENT OF HEALTH. THE CITY SHALL REQUIRE SUPPLEMENTARY MEASURES AS NECESSARY.
3. *NO CONTRACTOR SHALL PERFORM ANY GRADING OPERATION SO AS TO CAUSE FALLING* ROCKS, SOIL OR DEBRIS IN ANY FORM TO FALL, SLIDE OR FLOW ONTO ADJOINING PROPERTIES, STREETS OR NATURAL WATERCOURSES. SHOULD SUCH VIOLATIONS OCCUR, THE COSTS INCURRED FOR ANY REMEDIAL ACTION BY THE DIST ENGINEER SHALL BE PAYABLE BY THE CONTRACTOR.
4. THE CONTRACTOR SHALL PROVIDE, INSTALL AND MAINTAIN ALL NECESSARY SIGNS, LIGHTS, FLARES, BARRICADES, MARKERS, CONES, AND OTHER PROTECTIVE FACILITIES AND SHALL TAKE ALL NECESSARY PRECAUTIONS FOR THE PROTECTION, CONVENIENCE, AND SAFETY OF THE PUBLIC.



PARKING AREA SUMMARY (FOR INFORMATION PURPOSES ONLY)						
PARKING AREA	DESCRIPTION	ACCESSIBLE TRAILER PARKING	ACCESSIBLE PARKING STALL	VAN ACCESSIBLE PARKING STALL	TOTAL ACCESSIBLE PARKING	SEQ. NO.
A	NEAR ACCESSIBLE FINGER PIER		1		1	3,4,5,6
B	NEAR WAILEA KAI (SUP 62)		1		1	14,15
C	NEAR MOTORCYCLE PARKING				0	16,17,18
D	NEAR SUP 47				0	11,12,13
E	NEAR COAST GUARD				0	7,8,9,10
F	NEAR COAST GUARD (LOADING ZONE)			1	1	23
G	MAALAEA WHARF		1	1	2	
HARBOR MASTER'S OFFICE AND ADMIN. BLDG.				1	1	
COMFORT STATION AND BUS LOADING ZONE				1	1	——
LAUNCH RAMP AND TRAILER PARKING		1			1	19,20,21,22
TOTAL		1	3	4	8	

APPROX. NORTH
Scale: 1" = 100'



GENERAL LAYOUT
SCALE: 1" = 100'

REVISION NO.	SYM.	DESCRIPTION	INIT./CK	DATE	APPROVED

RUSSELL M. ARAKAKI LICENSED PROFESSIONAL ENGINEER No. 8217-C HAWAII U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

Russell M. Arakaki

Parsons, Inc. 404 PARK ENGINEERING LICENSE EXPIRES 04-30-06

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

MAALAEA SMALL BOAT HARBOR
ADA BARRIER REMOVAL PROJECT

NOTES & GENERAL LAYOUT

DESIGNED: SH	SUBMITTED:
DRAWN: SM	DATE: APRIL 2004
CHECKED: RMA	SCALE: AS NOTED

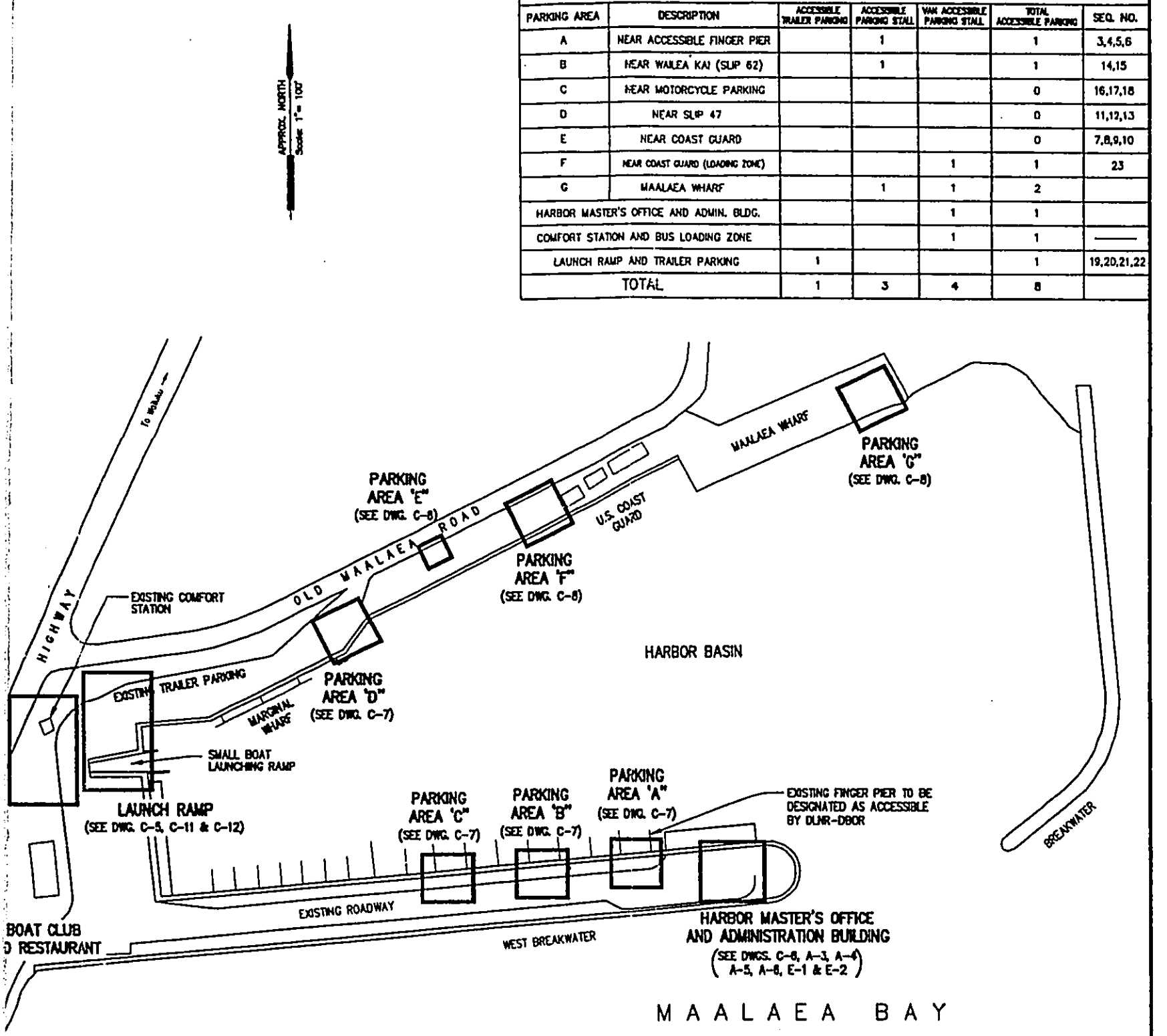
APPROVED:
CHIEF ENGINEER — DATE: NOV 28 2005

DRAWING NO. C-1

JOB NO. J00CB45A

SHEET NO. 2 OF 23 SHEETS

PARKING AREA SUMMARY (FOR INFORMATION PURPOSES ONLY)						
PARKING AREA	DESCRIPTION	ACCESSIBLE TRAILER PARKING	ACCESSIBLE PARKING STALL	VAN ACCESSIBLE PARKING STALL	TOTAL ACCESSIBLE PARKING	SEQ. NO.
A	NEAR ACCESSIBLE FINGER PIER		1		1	3,4,5,6
B	NEAR WAILEA KAI (SLIP 62)		1		1	14,15
C	NEAR MOTORCYCLE PARKING				0	16,17,18
D	NEAR SLIP 47				0	11,12,13
E	NEAR COAST GUARD				0	7,8,9,10
F	NEAR COAST GUARD (LOADING ZONE)			1	1	23
G	MAALAEA WHARF		1	1	2	
HARBOR MASTER'S OFFICE AND ADMIN. BLDG.				1	1	
COMFORT STATION AND BUS LOADING ZONE				1	1	—
LAUNCH RAMP AND TRAILER PARKING		1			1	19,20,21,22
TOTAL		1	3	4	8	



GENERAL LAYOUT
SCALE: 1" = 100'

REVISION NO.	SYM.	DESCRIPTION	INIT./CK	DATE	APPROVED

RUSSELL M. ARAKAKI LICENSED PROFESSIONAL ENGINEER No. 8297-C HAWAII U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

Russell M. Arakaki

Parsons Brinckerhoff dba PARK ENGINEERING LICENSE EXPIRES 04-30-06

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

MAALAEA SMALL BOAT HARBOR
ADA BARRIER REMOVAL PROJECT

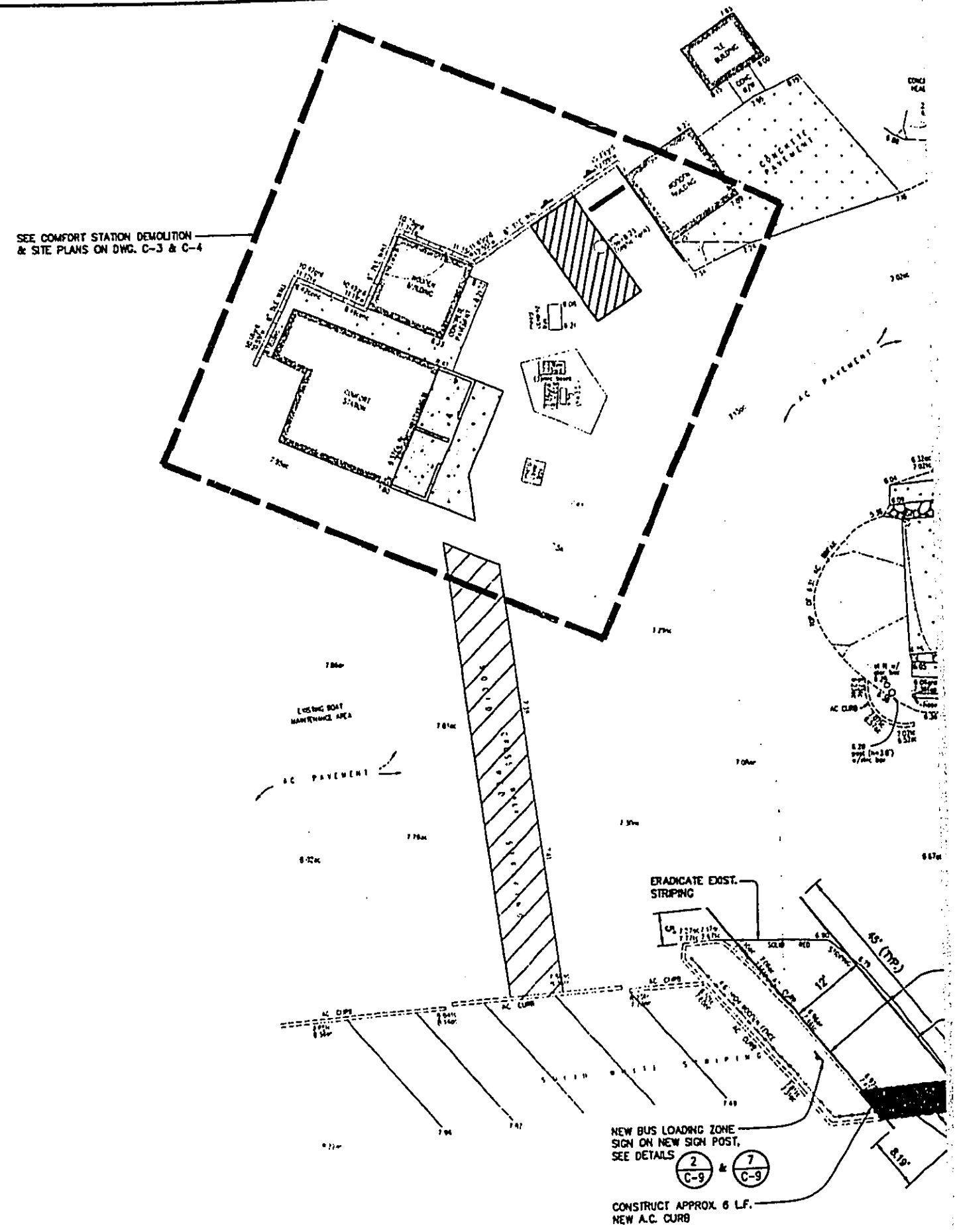
NOTES & GENERAL LAYOUT

DESIGNED: SH	SUBMITTED:
DRAWN: SM	DATE: APRIL 2004
CHECKED: RMA	SCALE: AS NOTED
APPROVED: CHIEF ENGINEER	DATE: APR 28 2004

DRAWING NO. C-1

JOB NO. J00CB45A

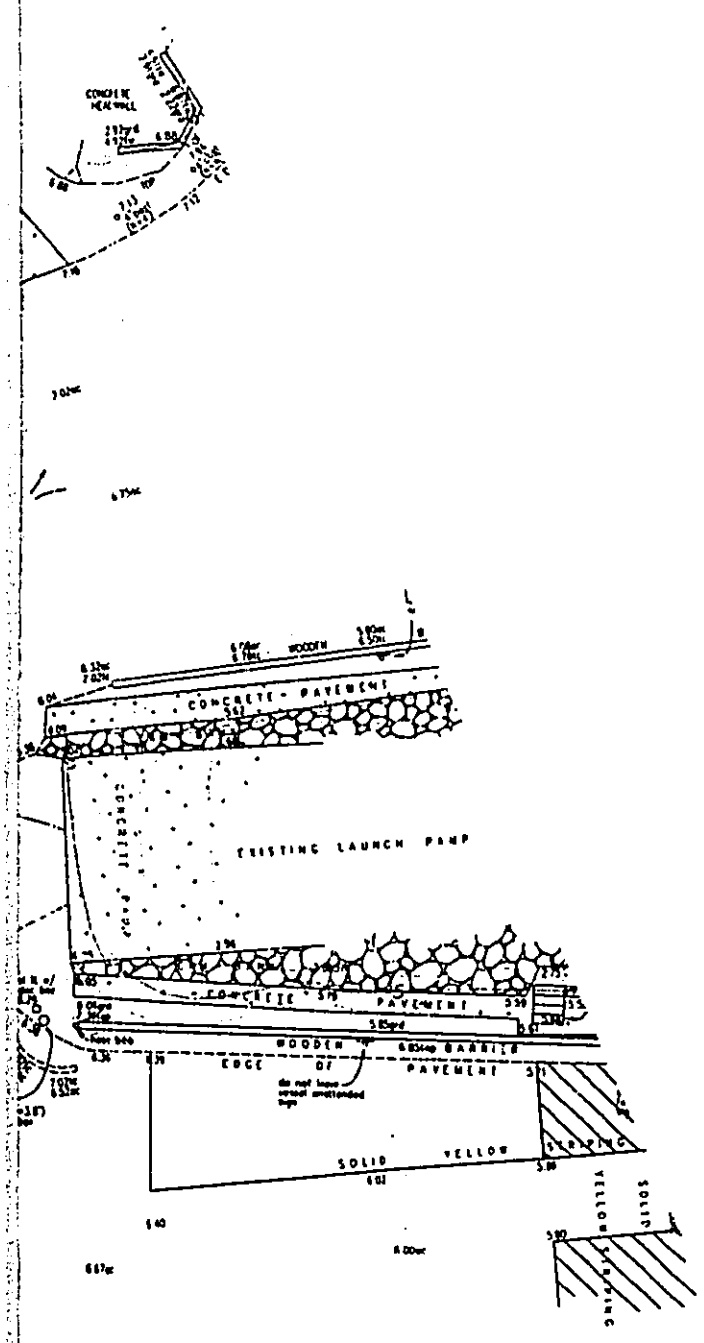
SHEET NO. 2 OF 23 SHEETS



COMFORT STATION & BUS LOADING ZONE—SITE PLA

SCALE: 1" = 10'

ACCESSIBLE STALL SUMMARY (THIS SHEET)	
ACCESSIBLE	0
VAN ACCESSIBLE	0
VAN ACCESSIBLE W/ BOAT TRAILER	0
BUS LOADING	1



APPROX. NORTH
Scale: 1" = 10'

NOTES:

1. ERADICATION OF EXISTING PAINTED STRIPING THROUGH USE OF EITHER
   A) HEAT SOURCE & SCRAPING (FOR BOTH A.C. & CONCRETE SURFACES)
   B) GRINDING METHODS (FOR BOTH A.C. AND CONCRETE SURFACES)
   C) 2 COATS MATTE BLACK ASPHALT EMULSION DRIVEWAY SEALER (FOR A.C. SURFACES ONLY)
2. NON-BIODEGRADEABLE PAINT SOLVENTS SHALL NOT BE PERMITTED.
3. RESTORATION OF A.C. SURFACES SHALL BE COATED W/ TACK COAT, FILLED W/ HOT-MIXED A.C., MIX 4 & PLATE TAMPED TO MATCH ADJOINING A.C.

LEGEND:

- EXISTING SPOT ELEV.
- EXISTING TOP OF A.C. PAVEMENT ELEV.
- EXISTING TOP OF A.C. CURB ELEV.
- EXISTING FINISH FLOOR ELEV.
- EXISTING TOP OF CONC. PAVEMENT ELEV.
- EXISTING GROUND ELEV.
- NEW WHEEL STOP

A.C. PAVEMENT

(TYP.)

4" WIDE WHITE STRIPING. AUGN NEW STALL STRIPING PARALLEL TO EXIST. A.C. CURB

STRIPE NEW BUS LOADING ZONE.

8.16'

DEMOLISH AND REMOVE EXISTING A.C. CURB, APPROX. 7 L.F. OF WOODEN FENCE AND FENCE POST AND LANDSCAPING. CONSTRUCT APPROX. 72 S.F. OF NEW A.C. PAVEMENT. SLOPE 2.0% MAX. IN ALL DIRECTIONS. SEE SIMILAR DETAIL 1/C-4

E PLAN

REVISION NO.	SYM	DESCRIPTION	SHT./OF	DATE	APPROVED

RUSSELL M. ARAKAKI LICENSED PROFESSIONAL ENGINEER No. 8297-C HAWAII U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

Russell M. Arakaki

PRM, Inc. dba PARK ENGINEERING LICENSE EXPIRES 04-30-05

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

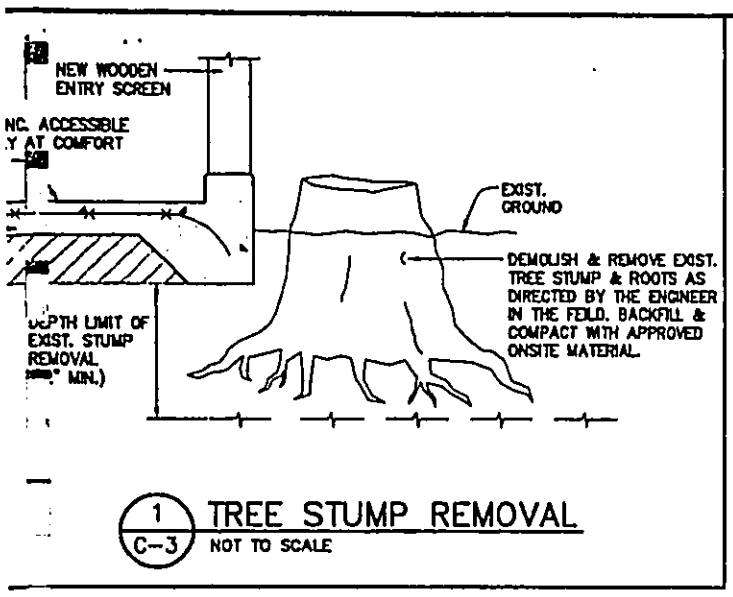
MAALAEA SMALL BOAT HARBOR ADA BARRIER REMOVAL PROJECT

COMFORT STATION & BUS LOADING ZONE-SITE PLAN

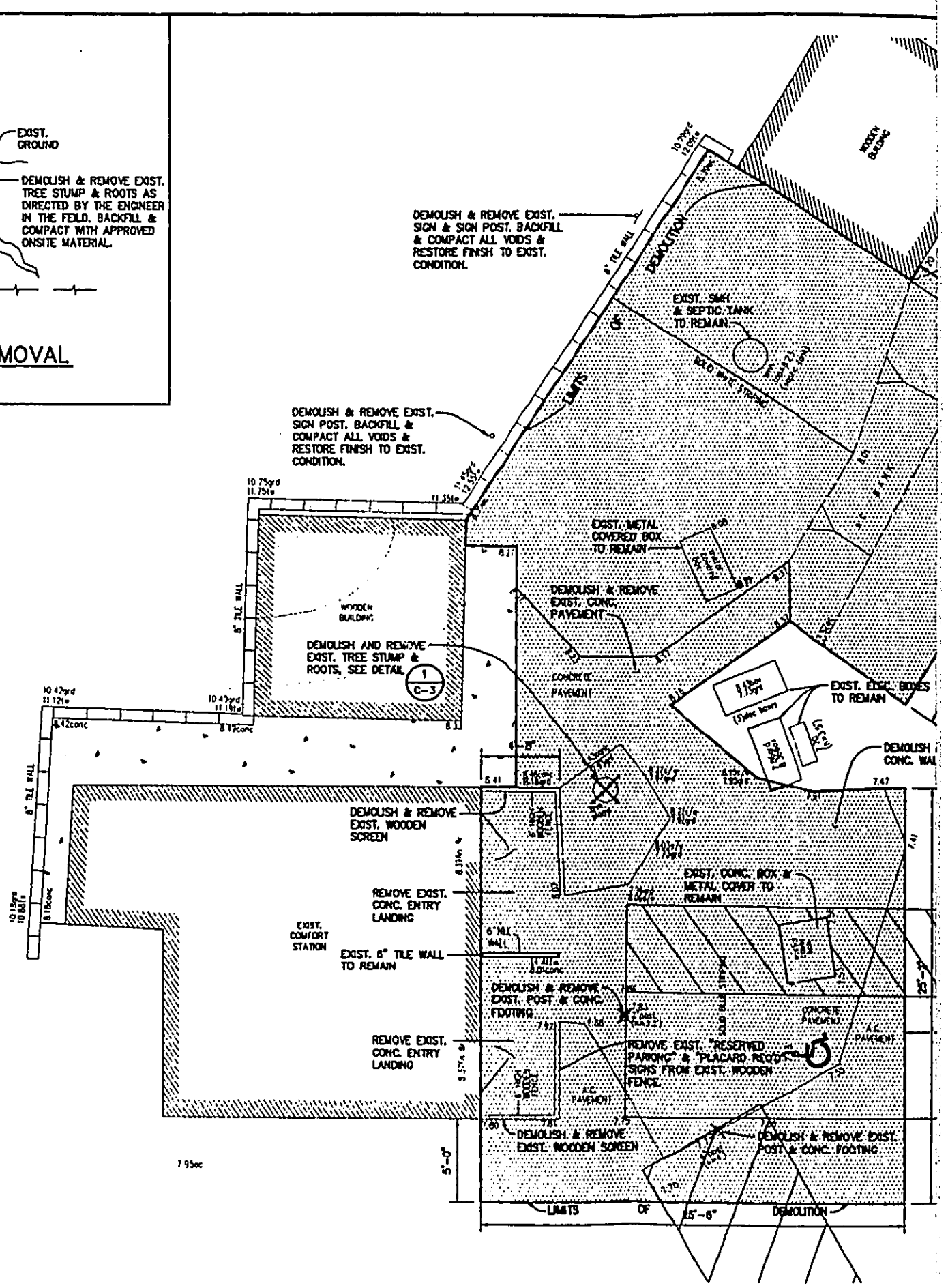
DESIGNED:	SH	SUBMITTED:	
DRAWN:	SM	DATE:	APRIL 2004
CHECKED:	RMA	SCALE:	AS NOTED

APPROVED: _____ APR 28 2004
CHIEF ENGINEER DATE

DRAWING NO. C-2

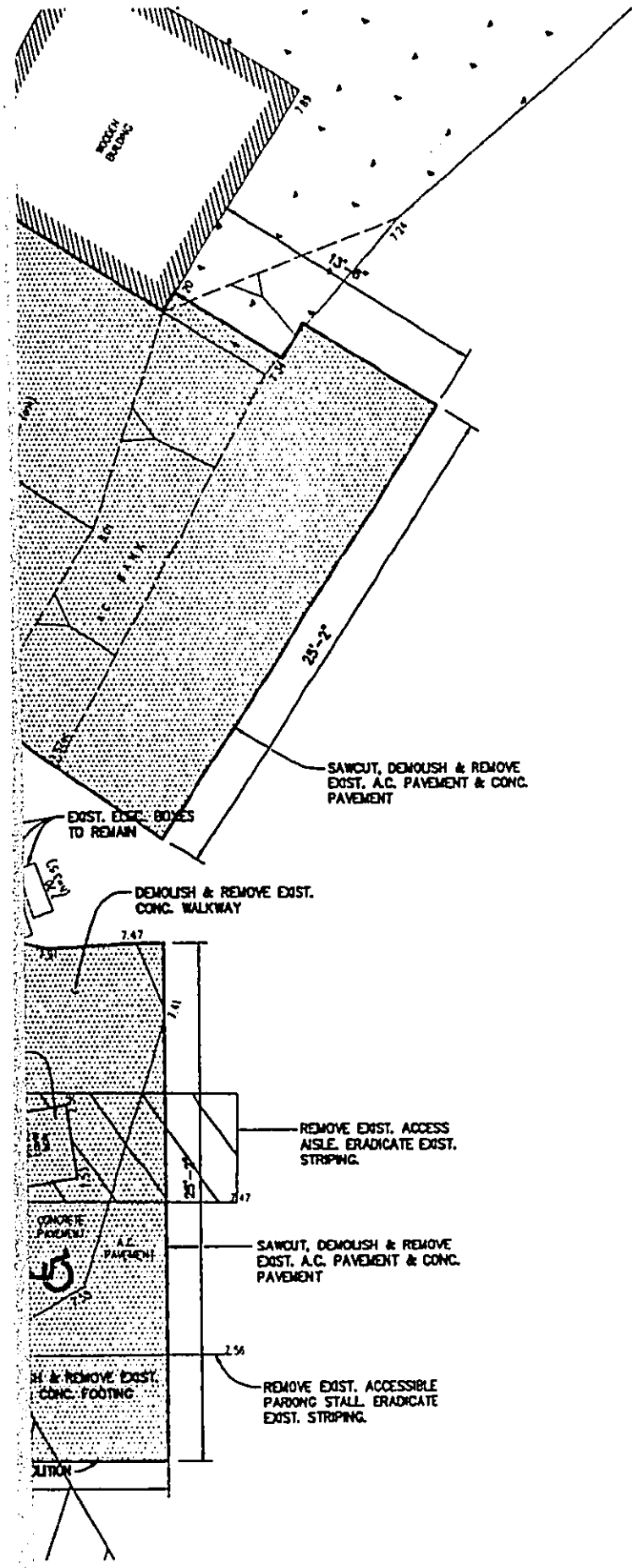


1/C-3 TREE STUMP REMOVAL
NOT TO SCALE



COMFORT STATION–DEMOLITION PLAN

SCALE: 1/4" = 1'-0"



APPROX. NORTH

Scale: 1/4" = 1'-0"

NOTE:

THE CONTRACTOR SHALL EXERCISE CAUTION WHEN DOING WORK NEAR AND OVER THE EXISTING WASTEWATER SYSTEM, INCLUDING SEPTIC TANKS, LEACH FIELD, PIPING, ETC. THE CONTRACTOR SHALL BE RESPONSIBLE TO PROTECT, REPAIR AND PAY FOR ALL DAMAGES TO THE EXISTING WASTEWATER SYSTEM AND OTHER ITEMS DESIGNATED TO REMAIN.

NOTES:

1. ERADICATION OF EXISTING PAINTED STRIPING THROUGH USE OF EITHER
   A) HEAT SOURCE & SCRAPING (FOR BOTH A.C. & CONCRETE SURFACES)
   B) GRINDING METHODS (FOR BOTH A.C. AND CONCRETE SURFACES)
   C) 2 COATS MATTE BLACK ASPHALT EMULSION DRIVEWAY SEALER (FOR A.C. SURFACES ONLY)
2. NON-BIODEGRADEABLE PAINT SOLVENTS SHALL NOT BE PERMITTED.
3. RESTORATION OF A.C. SURFACES SHALL BE COATED W/ TACK COAT, FILLED W/ HOT-MIXED A.C., MIX 4 & PLATE TAMPED TO MATCH ADJOINING A.C.

LEGEND:

8.14	EXIST. SPOT ELEV.
9.51grd	EXIST. GROUND ELEV.
9.51ac	EXIST. A.C. PAVEMENT ELEV.
9.51conc	EXIST. TOP OF CONC. ELEV.
9.51s/w	EXIST. SIDEWALK ELEV.
8.39fin fl	EXIST. FINISH FLOOR ELEV.
11.35tw	EXIST. TOP OF WALL ELEV.

REVISION NO.	BY	DESCRIPTION	SHT./OF	DATE	APPROVED

RUSSELL M. ARAKAKI LICENSED PROFESSIONAL ENGINEER No. 8287-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

Russell M. Arakaki

Inc. dba PARK ENGINEERING

LICENSE EXPIRES 04-30-06

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

MAALAEA SMALL BOAT HARBOR
ADA BARRIER REMOVAL PROJECT

COMFORT STATION-DEMOLITION PLAN

DESIGNED: SH	SUBMITTED:
DRAWN: SM	DATE: APRIL 2004
CHECKED: RMA	SCALE: AS NOTED

APPROVED: Eric T. Hirano APR 26 2004
CHIEF ENGINEER DATE

DRAWING NO. C-3

: STALL SUMMARY (THIS SHEET)

[redacted]	0
	1
IBLE W/ BOAT TRAILER	0
[redacted]	0

INSTALL NEW RESERVED PARKING SIGN FOR VAN ACCESSIBLE STALL ON NEW SIGN POST, SEE DETAILS (2/C-9) & (3/C-9)

INSTALL NEW ACCESS AISLE SIGN ON NEW SIGN POST, SEE DETAILS (2/C-9) & (5/C-9)

APPROX. NORTH
Scale: 1/4" = 1'-0"

INSTALL NEW A.C. PAVEMENT. PROVIDE SMOOTH TRANSITION BETWEEN EXIST. & NEW PAVEMENT. SEE SIMILAR DETAIL (1/C-4)

*ACCESSIBLE PARKING STALLS & ACCESS AISLE SLOPES SHALL NOT EXCEED 2% IN ANY DIRECTION. SEE SIMILAR PARTIAL PARKING PLAN (1/C-9)

ADJUST TOP OF METAL COVER BOX TO BE FLUSH W/ NEW A.C. PAVT. AS REQUIRED

ADD NEW LAYER OF TOP SOIL & GRASS (APPROX. 25 S.F.). GRADE TO MATCH FLUSH W/ NEW CONC. WALKWAY

INSTALL NEW "NO PARKING" SIGN ON NEW WOODEN SCREEN 5'-0" ABOVE FINISHED GRADE. SEE DET. (3/C-4)

CONTRACTOR TO VERIFY & MATCH LENGTH OF EXIST. WOODEN FENCE TO LENGTH OF NEW CONC. CURB

ADJUST TOP OF EXIST. CONC. BOX, METAL FRAME AND COVER TO BE FLUSH WITH NEW CONC. PAVEMENT AS REQUIRED.

INSTALL NEW A.C. PAVEMENT. PROVIDE SMOOTH TRANSITION BETWEEN EXIST. & NEW PAVEMENT. SEE SIMILAR DETAIL (1/C-4)

INSTALL NEW "NO PARKING" SIGN ON NEW WOODEN SCREEN 5'-0" ABOVE FINISHED GRADE. SEE DET. (2/C-4)

NOTE:
FOR BENCHMARK, SEE DWG. C-5

INSTALL NEW WOODEN ENTRY SCREEN ON NEW CONC. CURB. SEE ARCHITECTUAL DRAWINGS.

INSTALL NEW WOODEN ENTRY SCREEN ON NEW CONC. CURB. SEE ARCHITECTUAL DRAWINGS.

NEW 4" WIDE STRIPING TO MATCH EXIST. CROSSWALK. SEE SITE PLAN ON DWG. C-2.

EXIST. COMFORT STATION

WOODEN BUILDING

CONCRETE PAVEMENT

"A"

"A"

COMFORT STATION-SITE PLAN

SCALE: 1/4" = 1'-0"

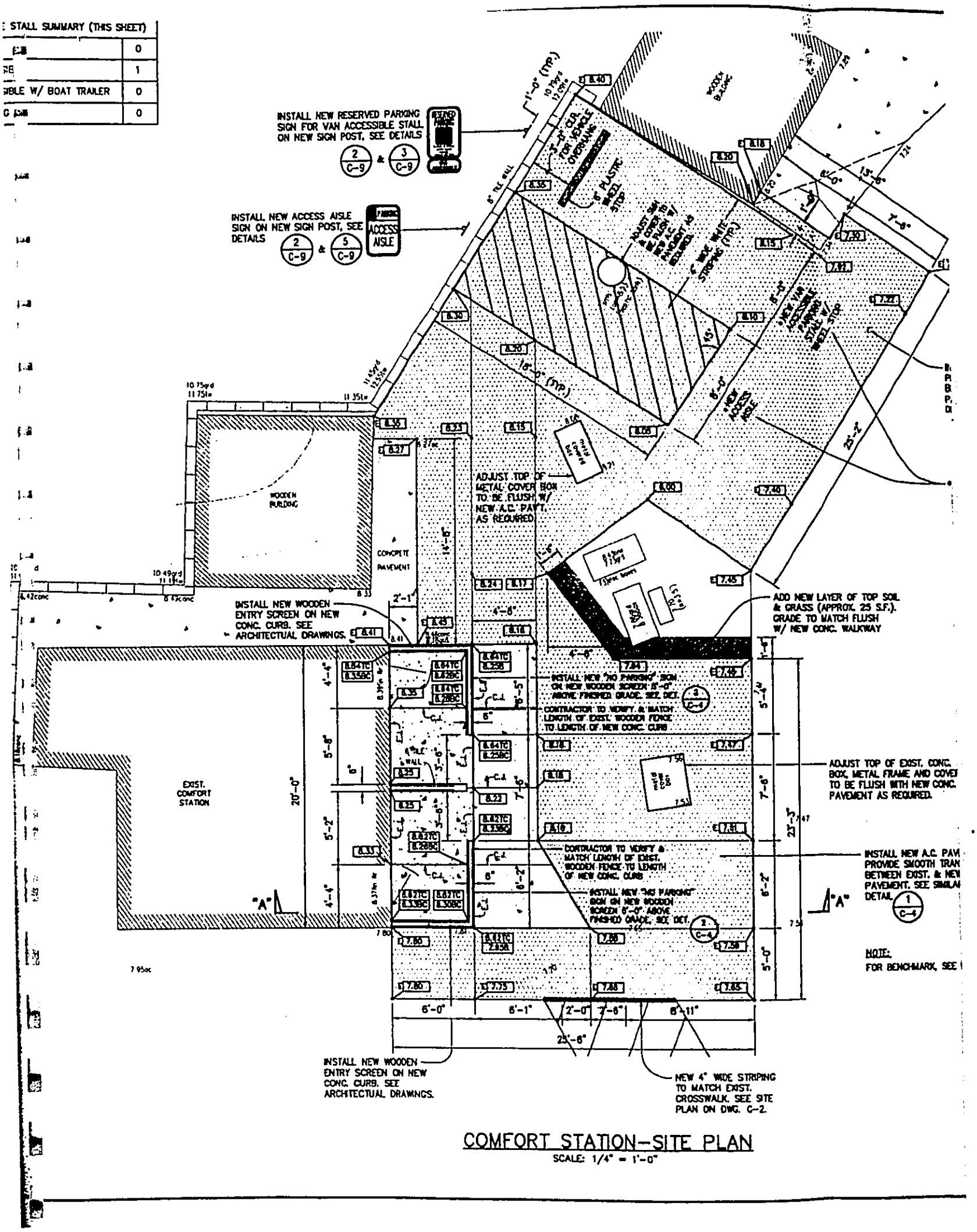
LEGEND:

8.14	EXIST. SPOT ELEV.
9.51g/d	EXIST. GROUND ELEV.
9.51ac	EXIST. A.C. PAVEMENT ELEV.
9.51conc	EXIST. TOP OF CONC. ELEV.
9.51s/w	EXIST. SIDEWALK ELEV.
C.J.	CONTRACTION JOINT
E.J.	EXPANSION JOINT

CORRECTION

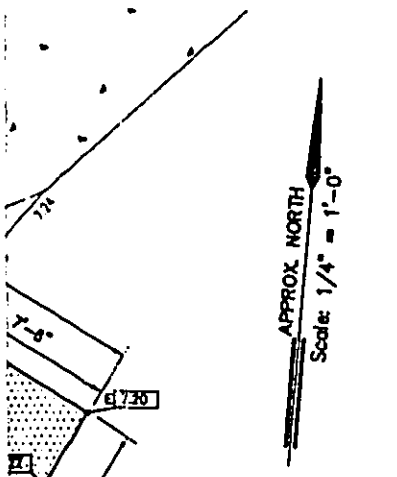
THE PRECEDING DOCUMENT(S) HAS BEEN REPHOTOGRAPHED TO ASSURE LEGIBILITY
SEE FRAME(S)
IMMEDIATELY FOLLOWING

STALL SUMMARY (THIS SHEET)	
[illegible]	0
[illegible]E	1
[illegible]IBLE W/ BOAT TRAILER	0
[illegible]	0



COMFORT STATION–SITE PLAN

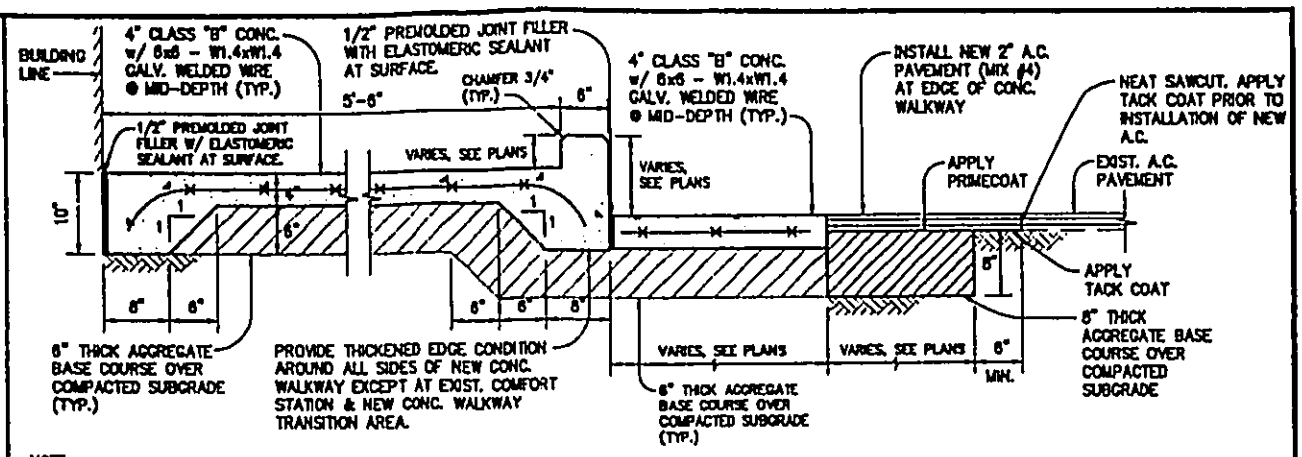
SCALE: 1/4" = 1'-0"



F EXIST. CONC.
AME AND COVER
ITH NEW CONC.
REQUIRED.

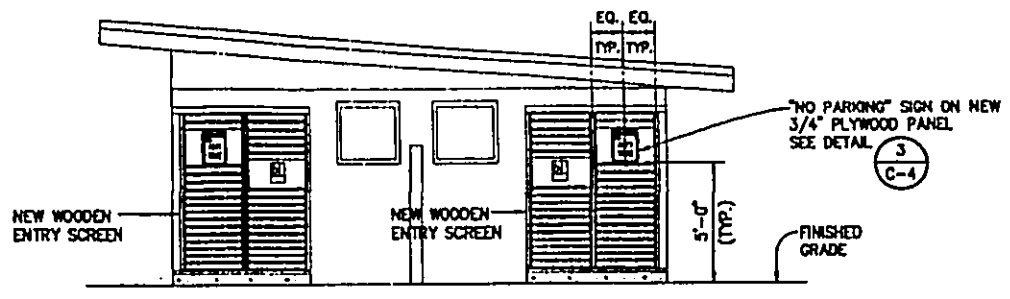
L NEW A.C. PAVEMENT.
E SMOOTH TRANSITION
EN EXIST. & NEW
ENT. SEE SIMILAR
1/C-4

ENCHMARK, SEE DWG. C-5

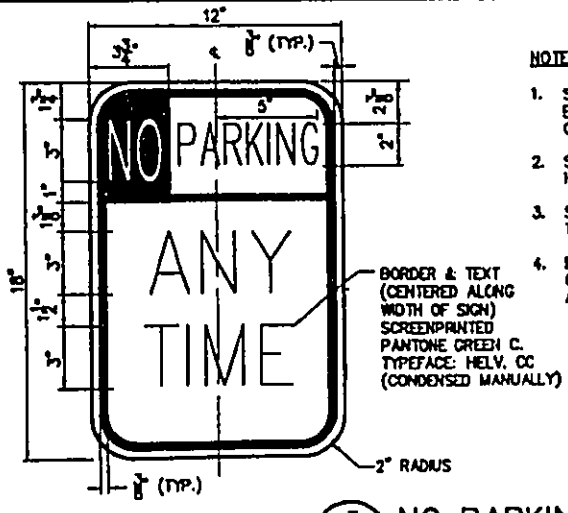


NOTE:
PROVIDE BROOM FINISH IN TRANSVERSE DIRECTION ALL ALONG CONC. WALKWAY SURFACES

1/C-4 SECTION "A"–"A"
SCALE: 1" = 1'-0"



2/C-4 NO PARKING SIGN ON ENTRY WOODEN SCREEN DETAIL
SCALE: 1/4" = 1'-0"



NOTES:
1. SIGN SHALL COMPLY WITH THE UNIFORM STANDARD AS PRESCRIBED BY THE LATEST VERSION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS.
2. SIGNS SHALL BE ALUM. TB061 STREET COVERED W/ HIGH INTENSITY REFLECTIVE SHEETING.
3. SIGN LETTERING SHALL BE UPPERCASE LETTERS OF THE TYPE APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION.
4. ELEMENTS (TEXT & GRAPHIC) REQ'D. ON SIGN MAY BE PLACED ON MORE THAN ONE SIGN. DIMENSIONS OF ELEMENTS ON SIGN ARE MINIMUM REQUIREMENTS.

3/C-4 NO PARKING SIGN DETAIL
NOT TO SCALE

LEGEND:

8.14	EXIST. SPOT ELEV.	8.00	NEW FINISH SPOT GRADE
8.51gd	EXIST. GROUND ELEV.	℄ 8.00	NEW FINISH GRADE TO MATCH EXIST. ELEV.
9.51ac	EXIST. A.C. PAVEMENT ELEV.	8.78TC	NEW TOP OF CURB GRADE
9.51conc	EXIST. TOP OF CONC. ELEV.	8.38BC	NEW BOT. OF CURB GRADE
9.51s/a	EXIST. SIDEWALK ELEV.	7.808	NEW BOTTOM OF CONC. WALKWAY GRADE
C.J.	CONTRACTION JOINT	℄ 7.808	NEW BOTTOM OF CONC. WALKWAY GRADE TO MATCH EXIST. ELEV.
E.J.	EXPANSION JOINT		

REVISION NO.	SYM.	DESCRIPTION	INIT./DT	DATE	APPROVED

RUSSELL M. ARAKAKI LICENSED PROFESSIONAL ENGINEER No. 8287-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
Russell M. Arakaki
Name, title
dba PARK ENGINEERING
LICENSE EXPIRES 04-30-06

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

MAALAEA SMALL BOAT HARBOR
ADA BARRIER REMOVAL PROJECT

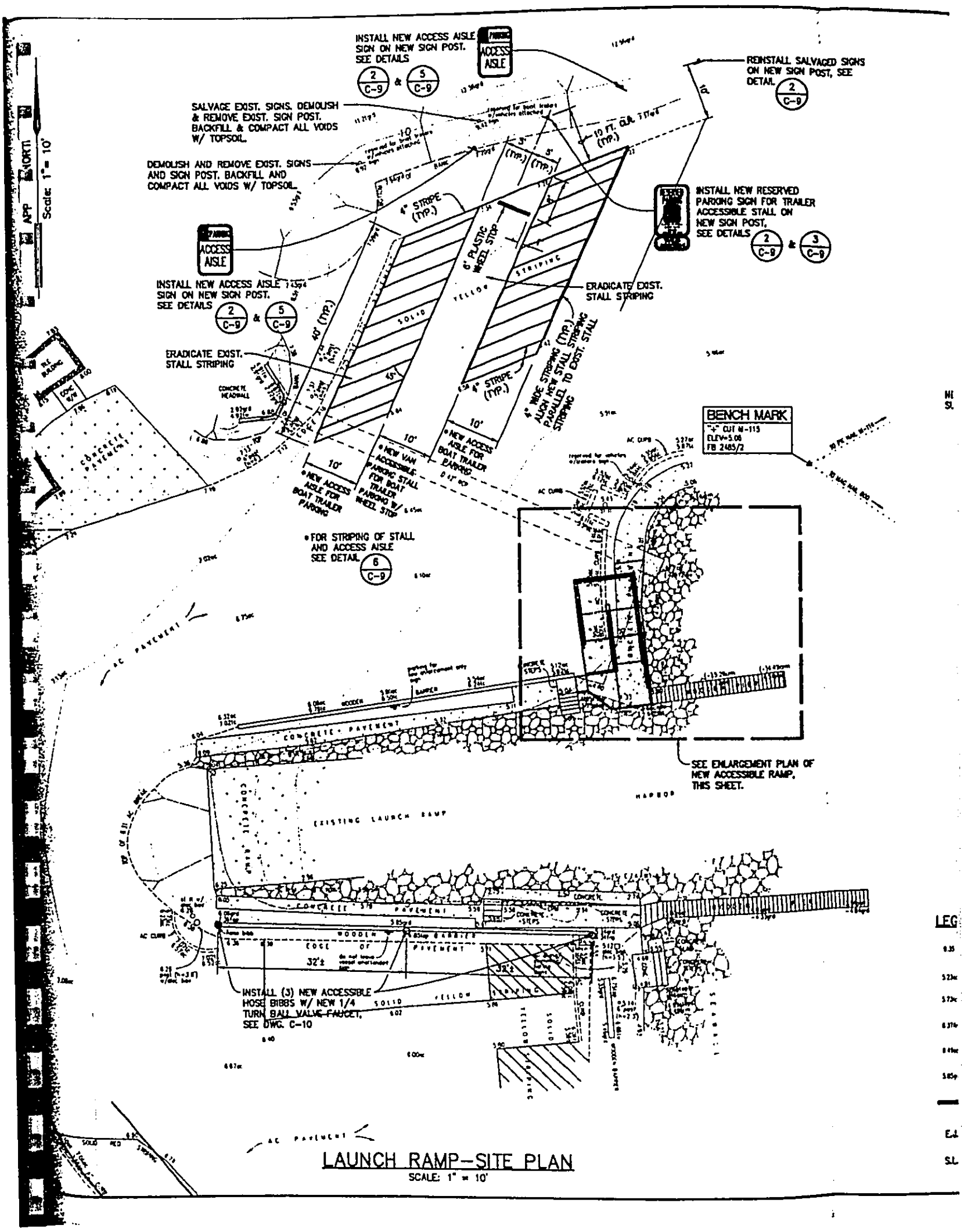
COMFORT STATION–SITE PLAN

DESIGNED:	SH	SUBMITTED:	
DRAWN:	SM	DATE:	APRIL 2004
CHECKED:	RMA	SCALE:	AS NOTED

APPROVED: Eric T. Hirano APR 28 2004
CHIEF ENGINEER — DATE

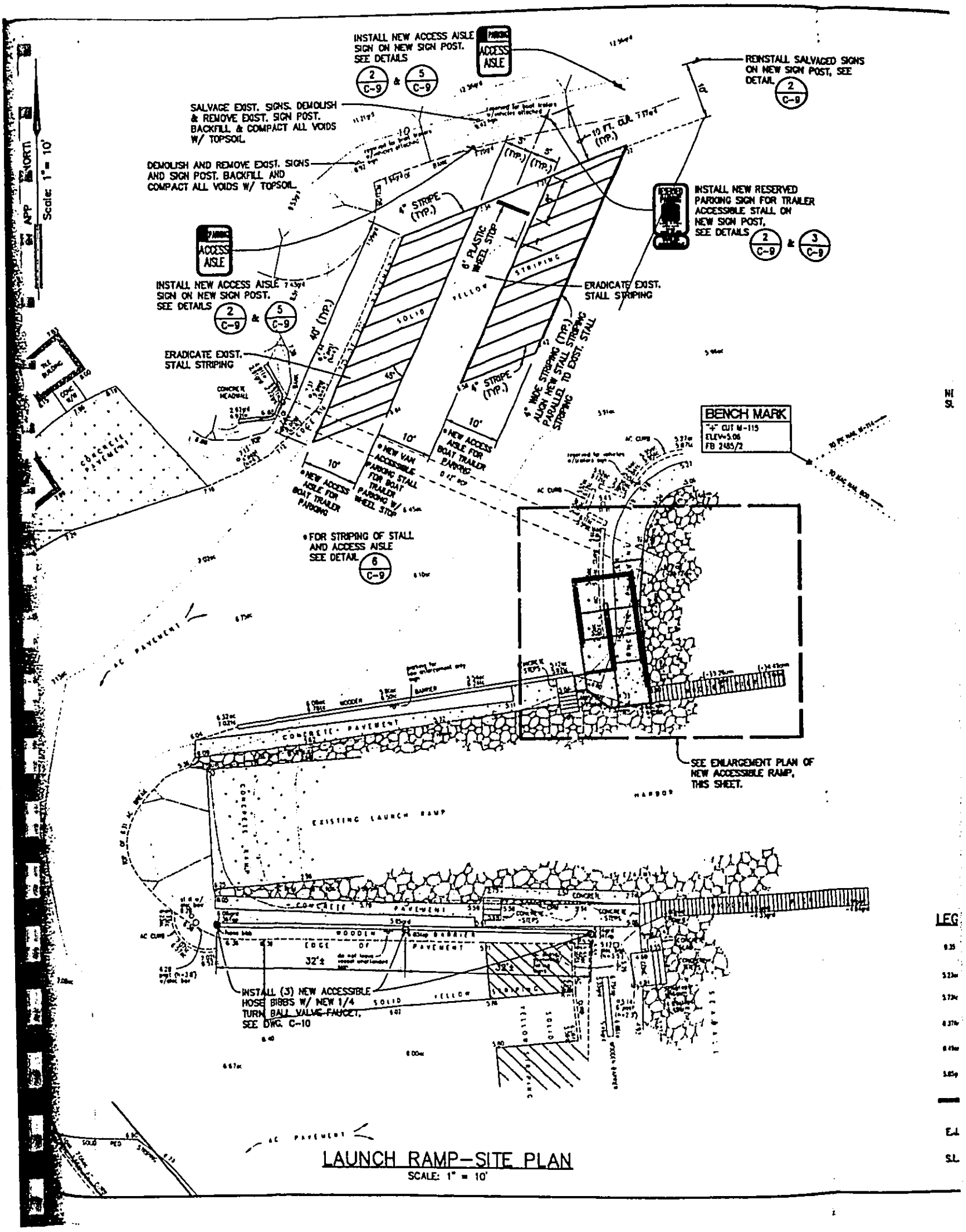
DRAWING NO. C-4

JOB NO. 1000B45A



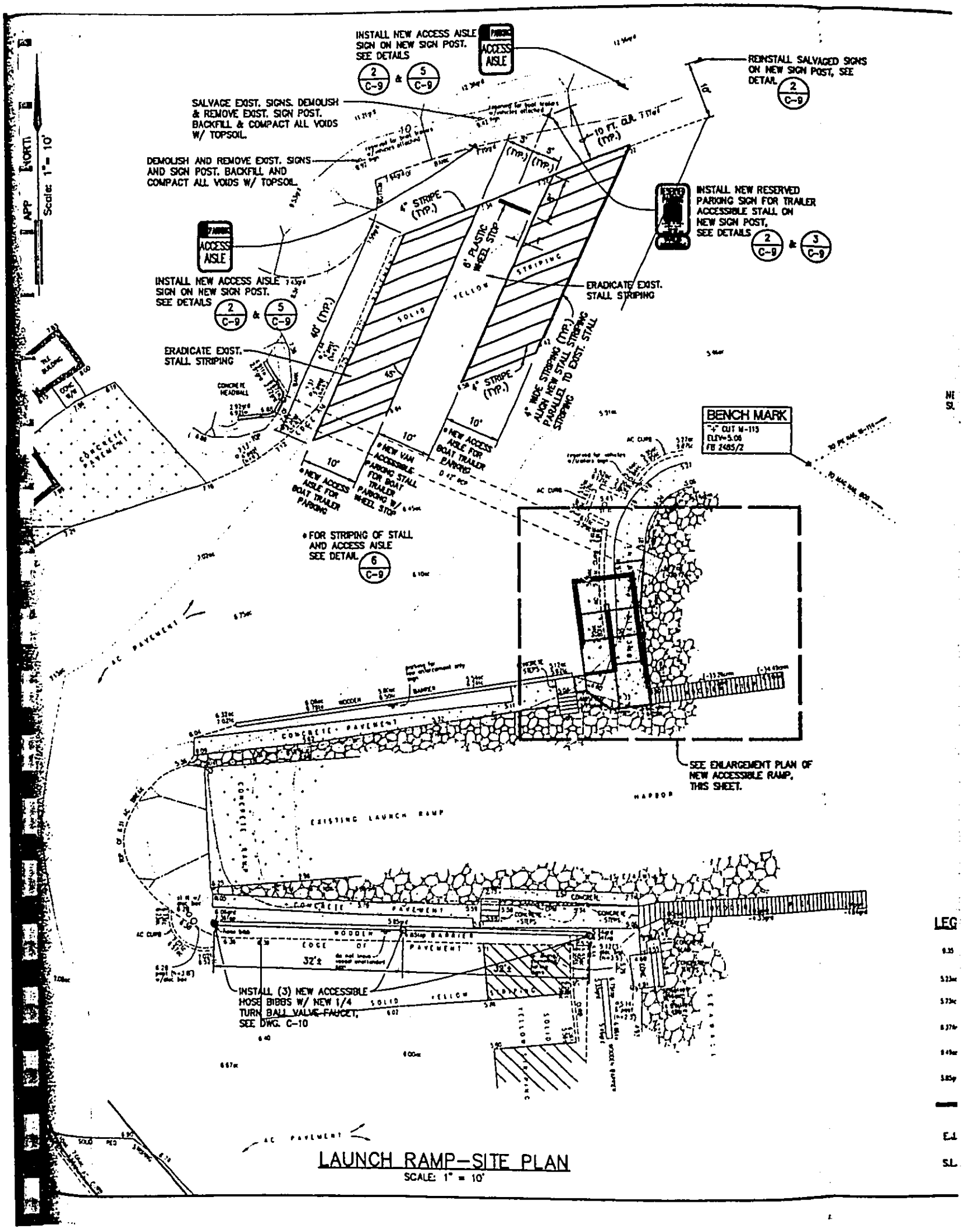
LAUNCH RAMP–SITE PLAN

SCALE: 1" = 10'



LAUNCH RAMP–SITE PLAN

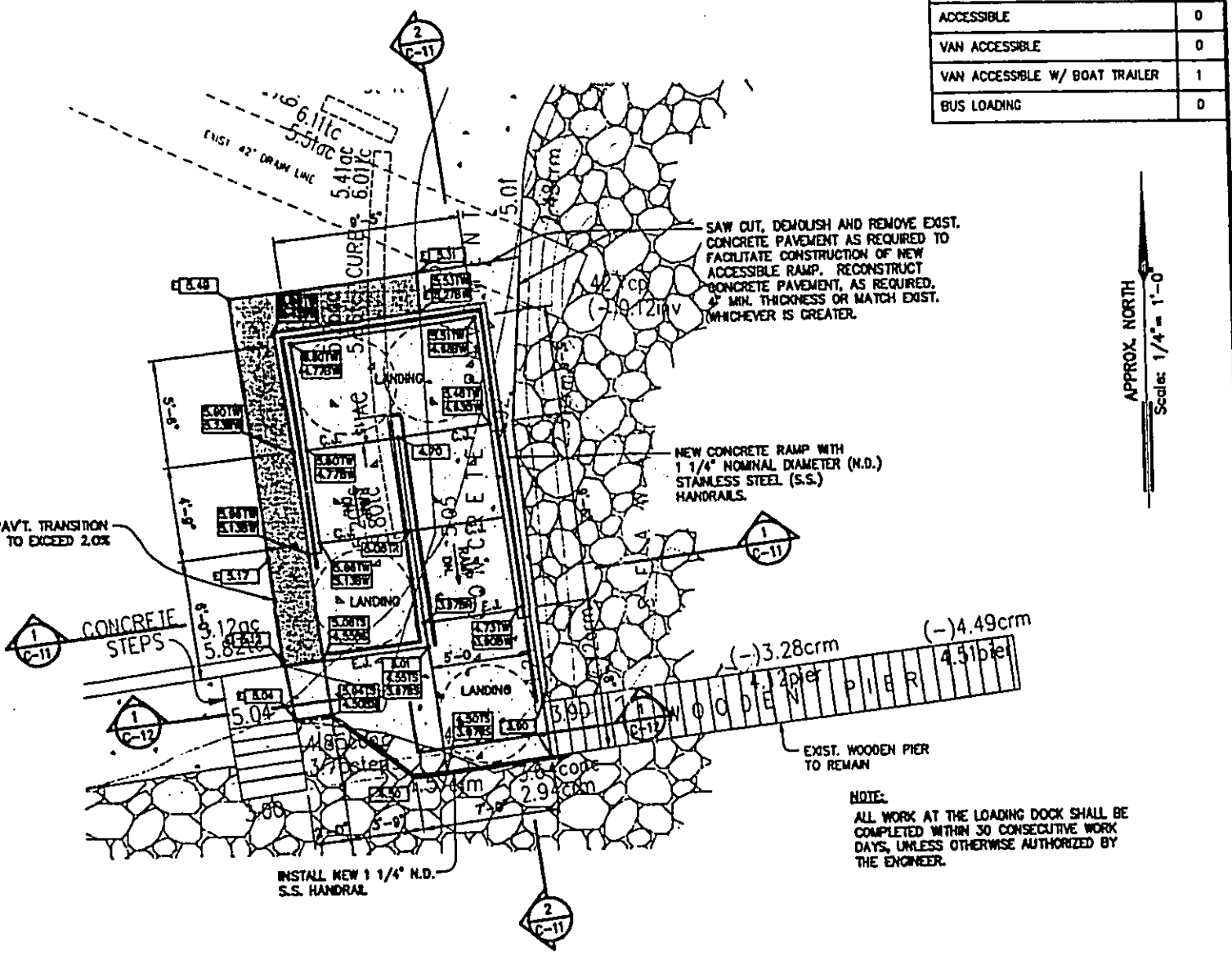
SCALE: 1" = 10'



LAUNCH RAMP—SITE PLAN

SCALE: 1" = 10'

ACCESSIBLE STALL SUMMARY (THIS SHEET)	
ACCESSIBLE	0
VAN ACCESSIBLE	0
VAN ACCESSIBLE W/ BOAT TRAILER	1
BUS LOADING	0



NOTE:
ALL WORK AT THE LOADING DOCK SHALL BE COMPLETED WITHIN 30 CONSECUTIVE WORK DAYS, UNLESS OTHERWISE AUTHORIZED BY THE ENGINEER.

ENLARGEMENT PLAN – NEW ACCESSIBLE RAMP

SCALE: 1/4" = 1'-0"

NOTES:

1. ERADICATION OF EXISTING PAINTED STRIPING THROUGH USE OF EITHER
   A) HEAT SOURCE & SCRAPING (FOR BOTH A.C. & CONCRETE SURFACES)
   B) GRINDING METHODS (FOR BOTH A.C. AND CONCRETE SURFACES)
   C) 2 COATS MATTE BLACK ASPHALT EMULSION DRIVEWAY SEALER (FOR A.C. SURFACES ONLY)
2. NON-BIODEGRADEABLE PAINT SOLVENTS SHALL NOT BE PERMITTED.
3. RESTORATION OF A.C. SURFACES SHALL BE COATED W/ TACK COAT, FILLED W/ HOT-MIXED A.C., MIX 4 & PLATE TAMPED TO MATCH ADJOINING A.C.

LEGEND:

8.35	EXISTING SPOT ELEV.
5.23ac	EXISTING TOP OF A.C. PAVEMENT ELEV.
5.73ac	EXISTING TOP OF A.C. CURB ELEV.
8.37fh ft	EXISTING FINISH FLOOR ELEV.
8.45conc	EXISTING TOP OF CONC. PAVEMENT ELEV.
5.85gl	EXISTING GROUND ELEV.
	NEW WHEEL STOP
E.J.	EXPANSION JOINT
S.L.	SCORE LINE
5.01	NEW FINISH SPOT GRADE
5.17	NEW FINISH SPOT GRADE TO MATCH EXIST. ELEV.
5.06TR	NEW TOP RAMP GRADE
3.87BR	NEW BOTTOM RAMP GRADE
5.58TW / 5.13BW	NEW TOP OF WALL GRADE / NEW BOTTOM OF WALL GRADE
5.04TS / 4.50BS	NEW TOP OF STAIR GRADE / NEW BOTTOM OF STAIR GRADE

REVISION NO	SYM.	DESCRIPTION	BNT./DF	DATE	APPROVED

RUSSELL M. ARAKAKI LICENSED PROFESSIONAL ENGINEER No. 8287-C HAWAII U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

Russell M. Arakaki

RUSSELL M. ARAKAKI, P.E. dba P.MM. ENGINEERING
LICENSE EXPIRES 04-30-06

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

MAALAEA SMALL BOAT HARBOR
ADA BARRIER REMOVAL PROJECT

LAUNCH RAMP–SITE PLAN

DESIGNED: SH	SUBMITTED:
DRAWN: SM	DATE: APRIL 2004
CHECKED: RMA	SCALE: AS NOTED
APPROVED:	DRAWING NO. C-5
CHIEF ENGINEER — DATE: APR 28 2004	

JOB NO. 1006B45A

LE STALL SUMMARY (THIS SHEET)	
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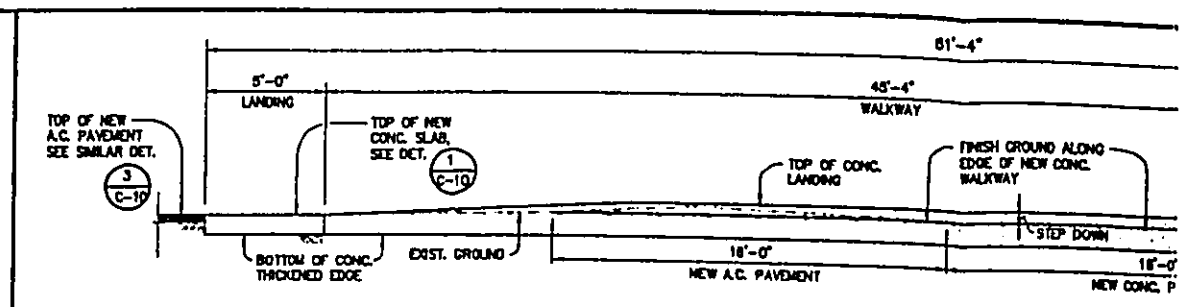
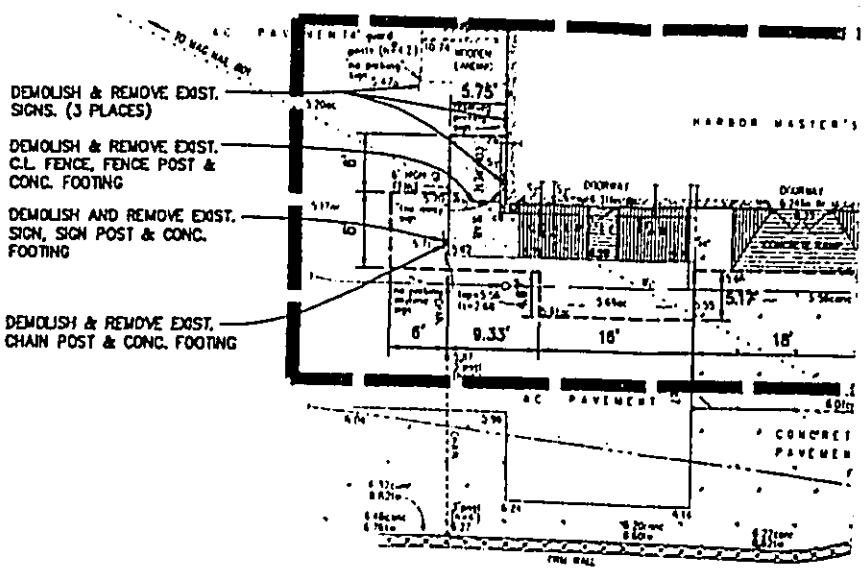
[illegible] LE	1

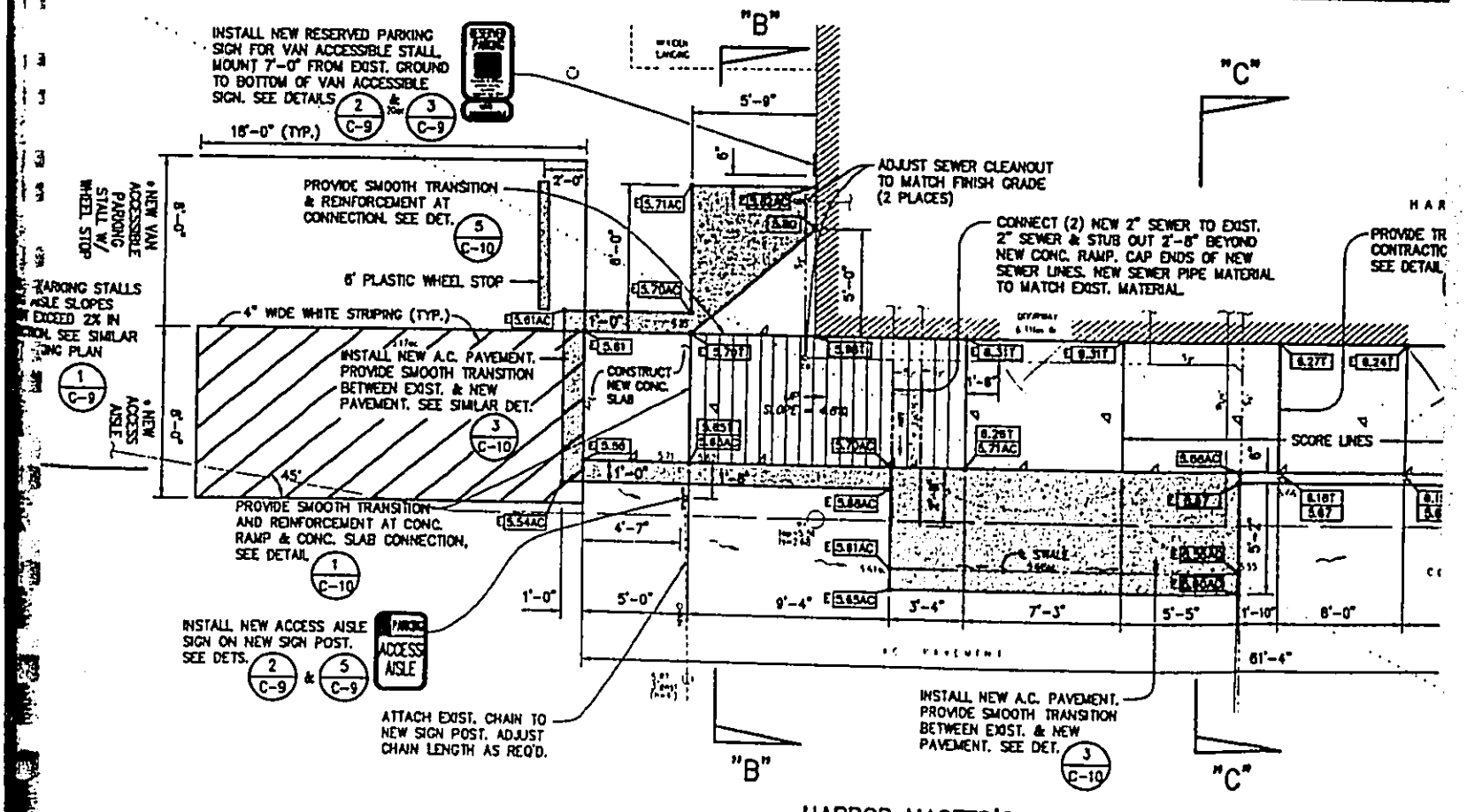


SECTION "A"–"A"
SCALE: 1/4" = 1'-0"

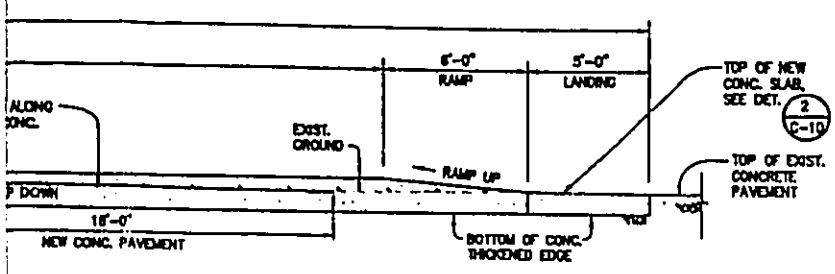


HARBOR MASTER'S OFFICE–DE
SCALE: 1" = 10'

ACCESSIBLE PARKING STALLS & ACCESS AISLE SLOPES SHALL NOT EXCEED 2% IN ANY DIRECTION.
E SIMILAR PARTIAL PARKING
AN 1/C-9

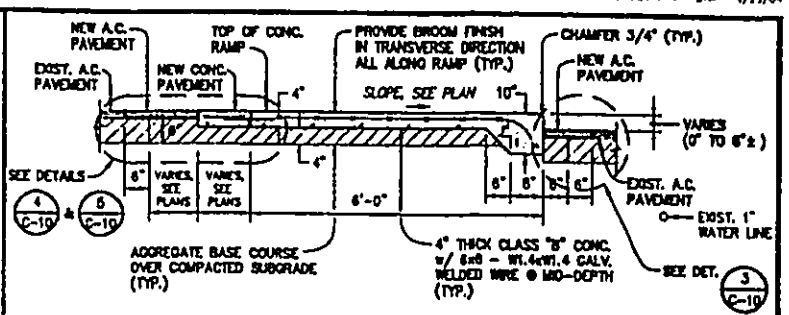


HARBOR MASTER'S OFFICE–SITE PLAN
SCALE: 1/4" = 1'-0"



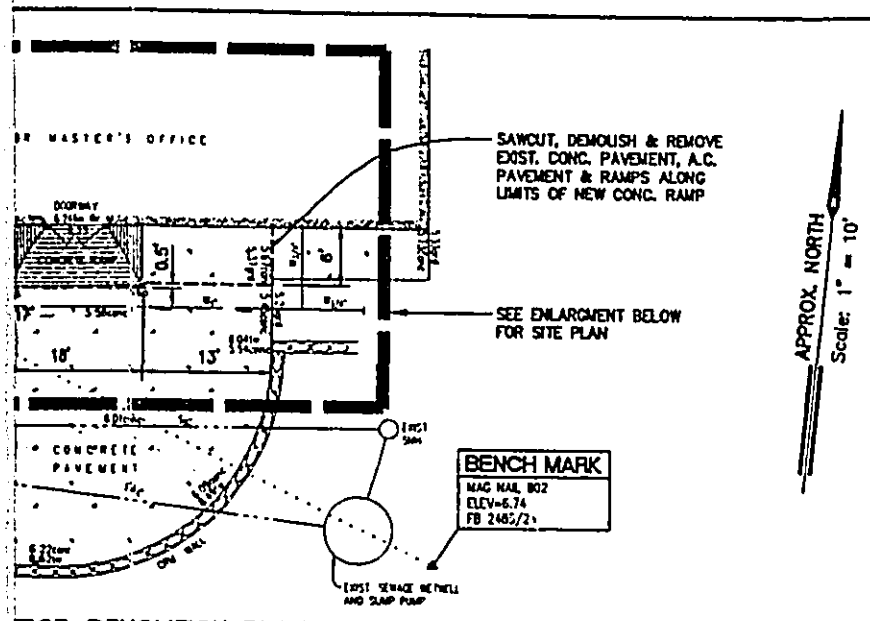
"A"–"A"

1/4" = 1'-0"



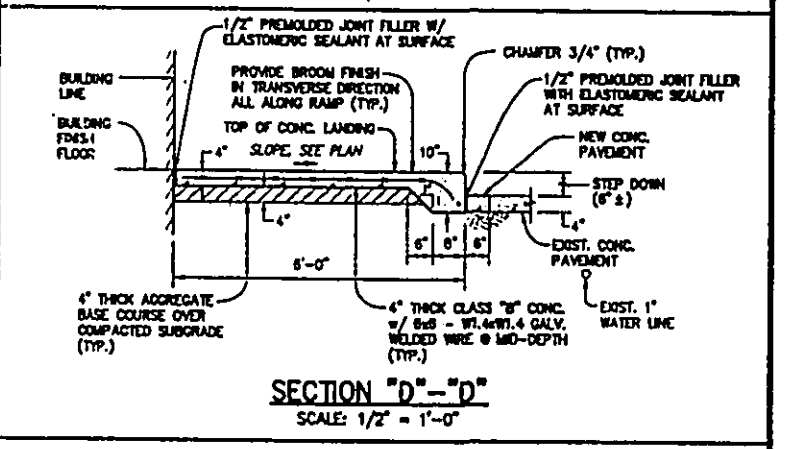
SECTION "B"–"B"

SCALE: 1/2" = 1'-0"



FICE–DEMOLITION PLAN

= 10'

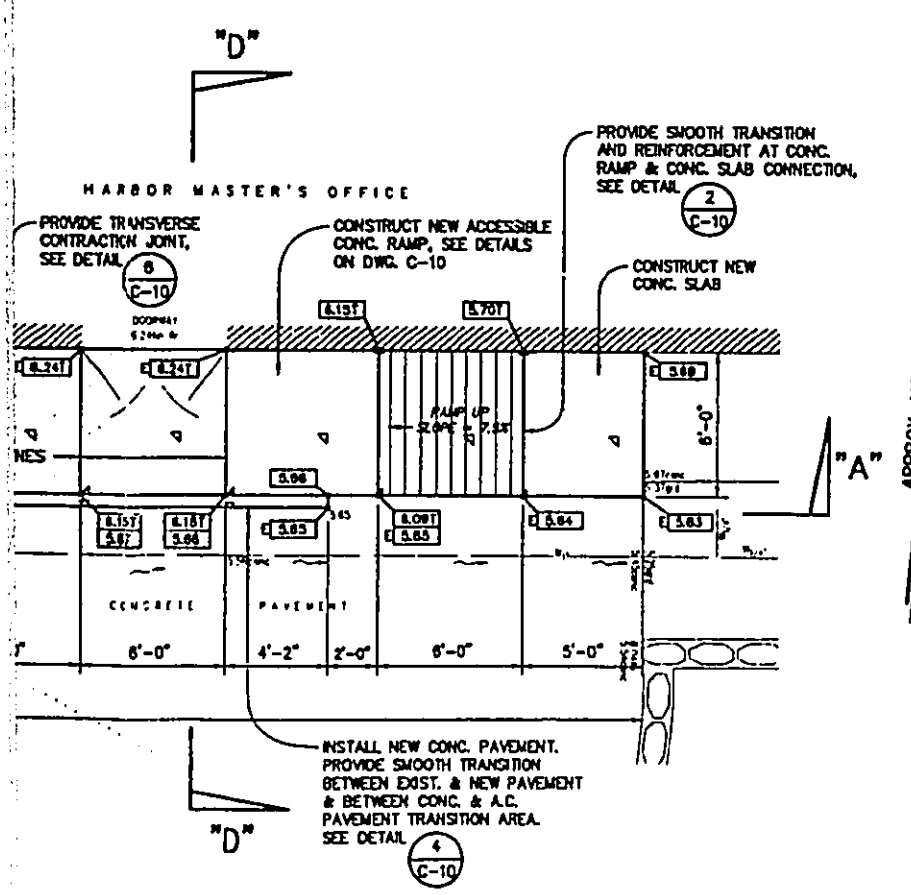


SECTION "C"–"C"

SCALE: 1/2" = 1'-0"

SECTION "D"–"D"

SCALE: 1/2" = 1'-0"



LEGEND:

6.14	EXIST. SPOT ELEV.
5.51TW	EXIST. TOP OF WALL ELEV.
5.51BW	EXIST. GROUND @ BOT. OF WALL ELEV.
5.51AP	EXIST. A.C. PAVEMENT ELEV.
	EXIST. SWALE
6.00	NEW FINISH SPOT GRADE
E 6.00	NEW FINISH GRADE TO MATCH EXIST. ELEV.
6.21T	NEW TOP OF RAMP GRADE
E 6.00T	NEW TOP OF RAMP GRADE TO MATCH EXIST. ELEV.
5.60AC	NEW TOP. OF A.C. PAVEMENT GRADE
E 5.60AC	NEW TOP. OF A.C. PAVEMENT GRADE TO MATCH EXIST. ELEV.

REVISION NO	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED

RUSSELL M. ARAKAKI LICENSED PROFESSIONAL ENGINEER No. 8257-C HAWAII U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

Russell M. Arakaki

ARAKI, INC. dba PARE ENGINEERING

LICENSE EXPIRES 04-30-06

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

MAALAEA SMALL BOAT HARBOR ADA BARRIER REMOVAL PROJECT

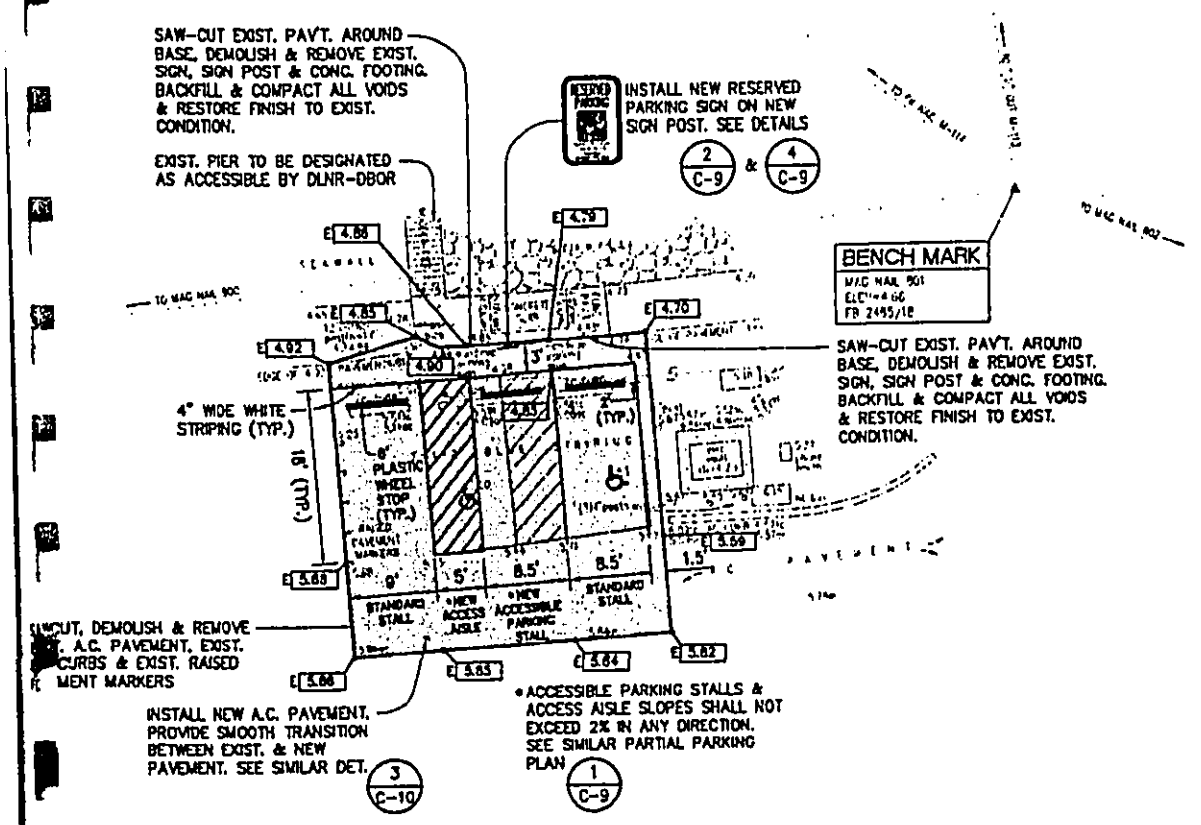
HARBOR MASTER'S OFFICE DEMOLITION & SITE PLAN

DESIGNED:	SH	SUBMITTED:	
DRAWN:	SH	DATE:	APRIL 2004
CHECKED:	RMA	SCALE:	AS NOTED

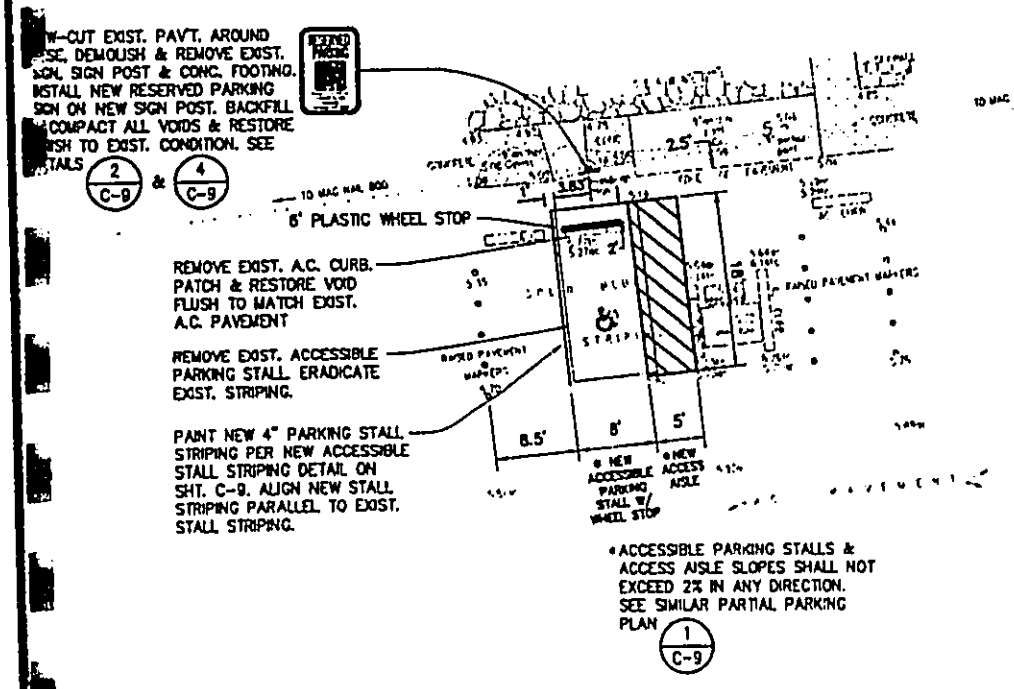
APPROVED: _____ APR 28 2004
CHIEF ENGINEER — DATE

DRAWING NO. C-6

JOB NO. 1000B454



PARKING AREA "A"– ACCESSIBLE & STANDARD PARKING

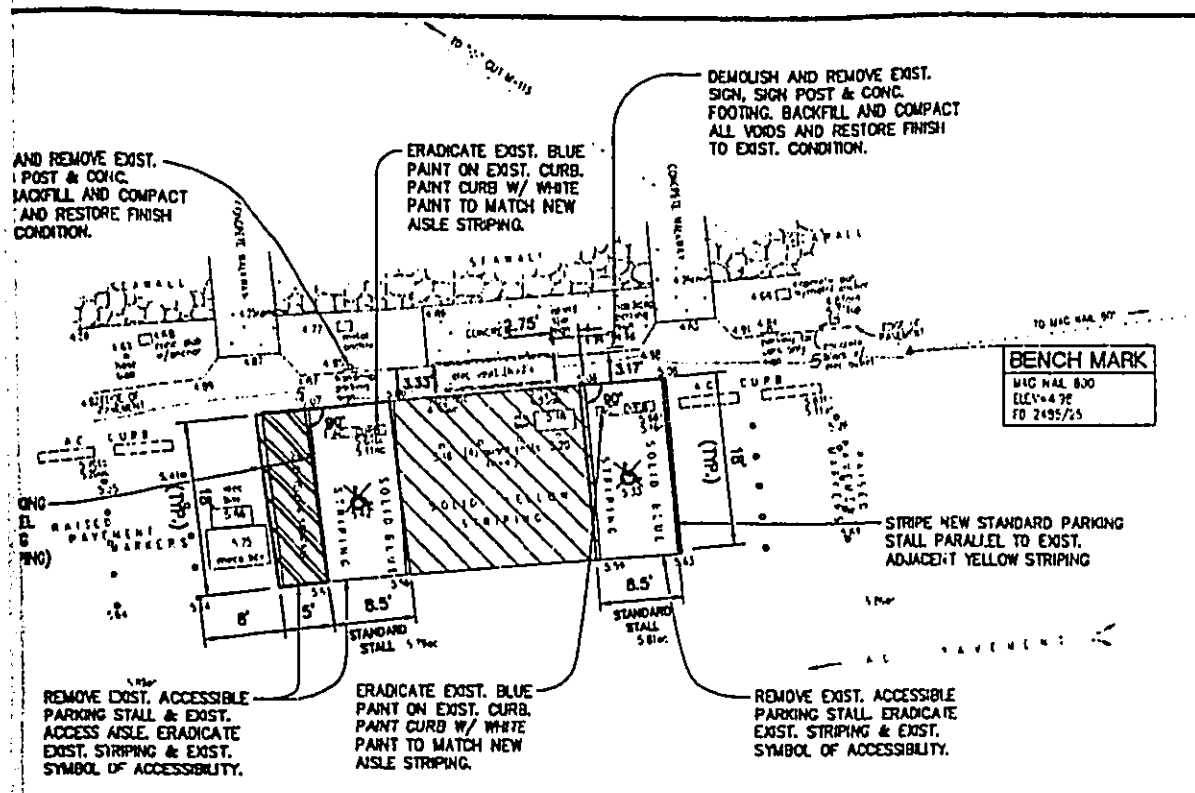


PARKING AREA "B"– ACCESSIBLE PARKING

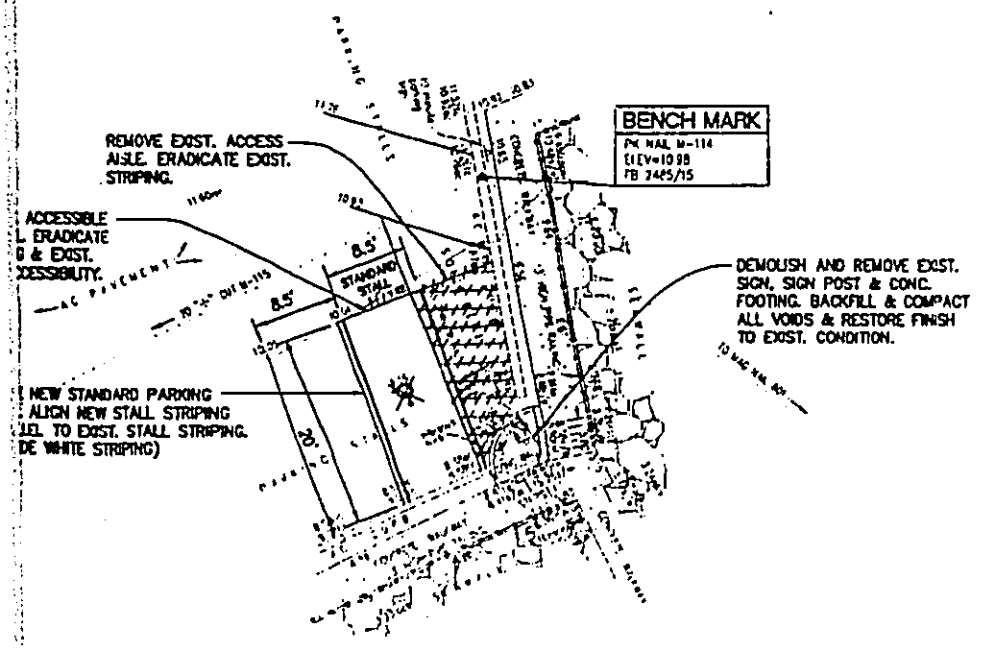
PARKING AREAS A, B, C, D – SITE PL

SCALE: 1" = 10'

ACCESSIBLE STALL SUMMARY (THIS SHEET)		
ACCESSIBLE	2	AREA A & B
VAN ACCESSIBLE	0	———



PARKING AREA "C"– STANDARD PARKING



PARKING AREA "D"– STANDARD PARKING

NOTES:

1. ERADICATION OF EXISTING PAINTED STRIPING THROUGH USE OF EITHER
   A) HEAT SOURCE & SCRAPING (FOR BOTH A.C. & CONCRETE SURFACES)
   B) GRINDING METHODS (FOR BOTH A.C. AND CONCRETE SURFACES)
   C) 2 COATS MATTE BLACK ASPHALT EMULSION DRIVEWAY SEALER (FOR A.C. SURFACES ONLY)
2. NON-BIODEGRADEABLE PAINT SOLVENTS SHALL NOT BE PERMITTED.
3. RESTORATION OF A.C. SURFACES SHALL BE COATED W/ TACK COAT, FILLED W/ HOT-MIXED A.C., MIX 4 & PLATE TAMPED TO MATCH ADJOINING A.C.

LEGEND:

9.35	EXISTING SPOT ELEVATION
9.35AC	EXISTING TOP OF A.C. PAVEMENT
9.35AC	EXISTING TOP OF A.C. CURB
8.00	NEW FINISH SPOT GRADE
8.00	NEW FINISH GRADE TO MATCH EXIST. ELEV.

REVISION NO	SYM	DESCRIPTION	SHT./OF	DATE	APPROVED

RUSSELL M. ARAKAKI LICENSED PROFESSIONAL ENGINEER No. 8297-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

Russell M. Arakaki

RUSSELL M. ARAKAKI
PARK ENGINEER
LICENSE EXPIRES 04-30-06

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

MAALAEA SMALL BOAT HARBOR
ADA BARRIER REMOVAL PROJECT

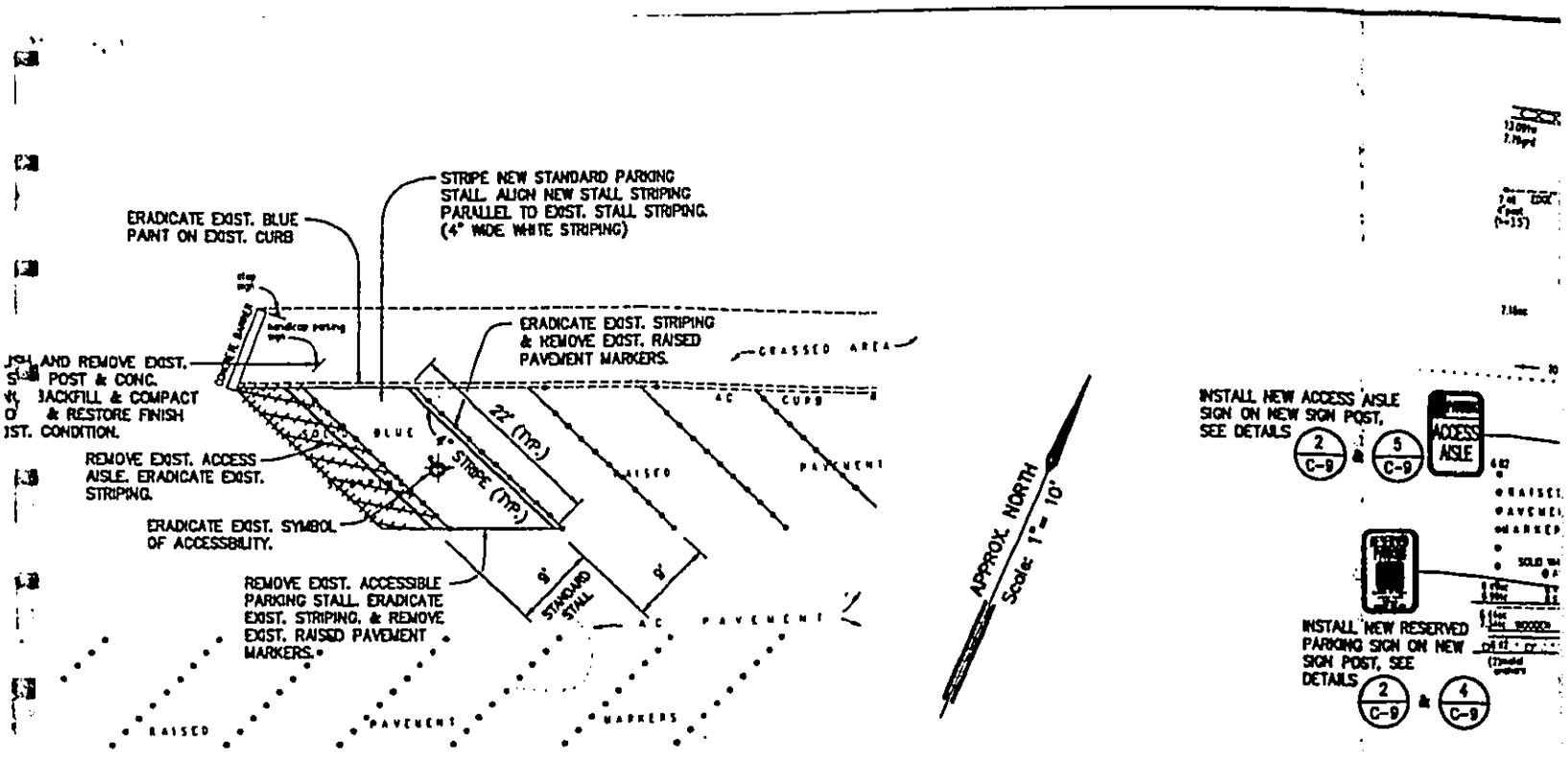
PARKING AREAS A,B,C,D–SITE PLAN

DESIGNED: SH	SUBMITTED:
DRAWN: SM	DATE: APRIL 2004
CHECKED: RMA	SCALE: AS NOTED

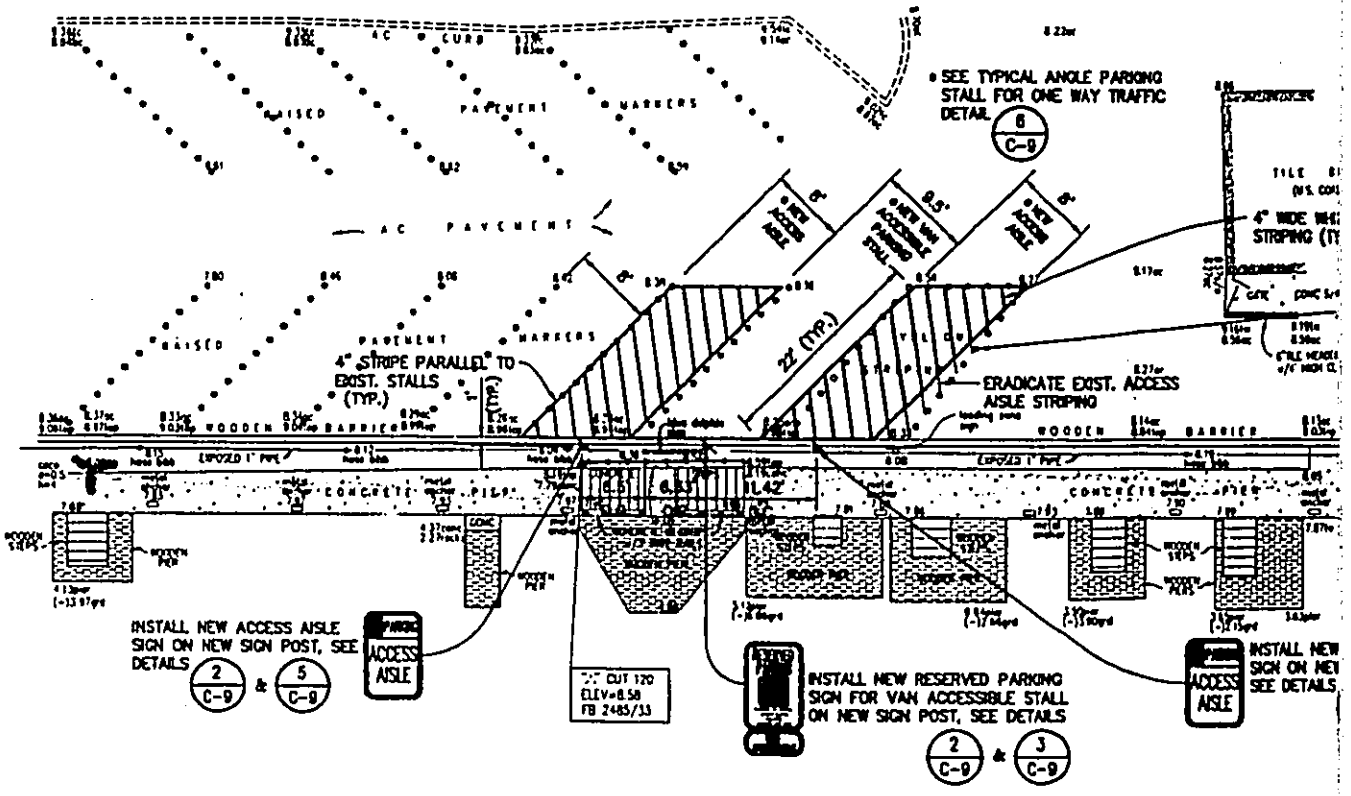
APPROVED: _____ DATE
CHIEF ENGINEER

DRAWING NO. C-7

ITE PLAN



PARKING AREA "E"– STANDARD PARKING

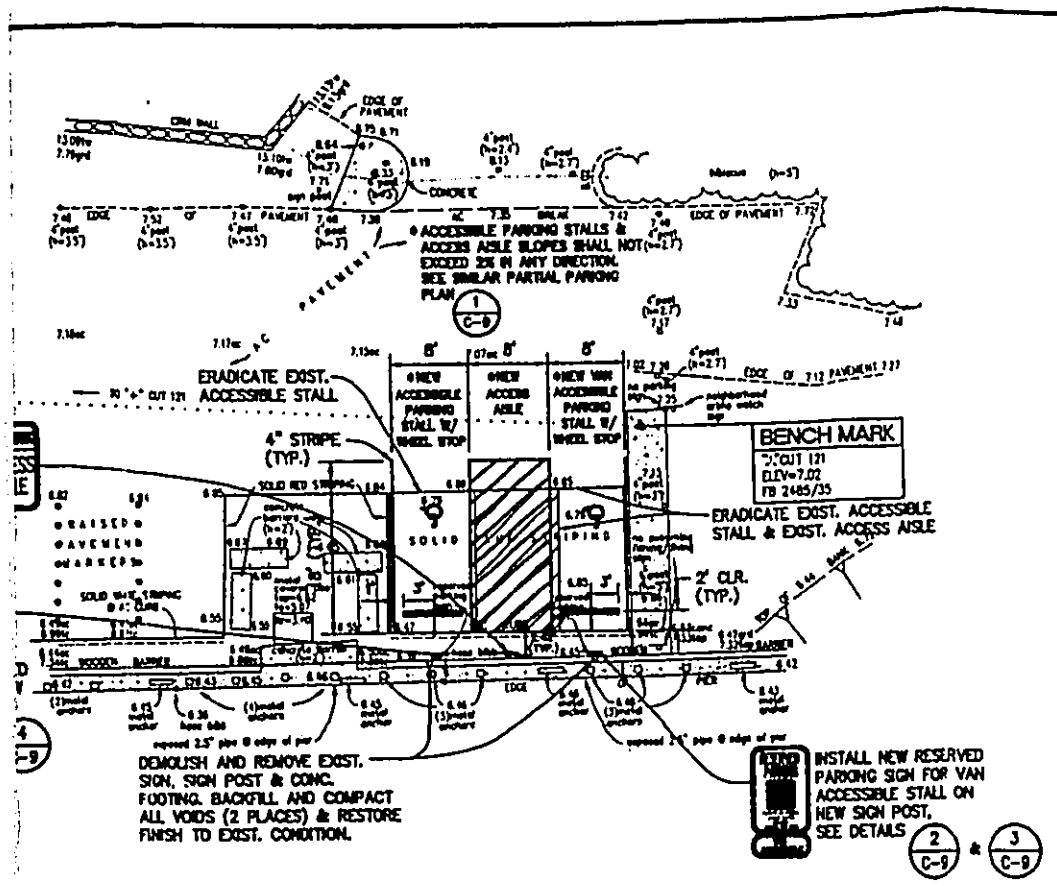


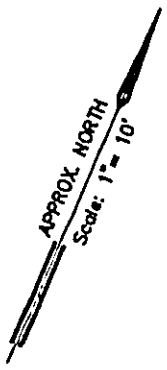
PARKING AREA "F"– ACCESSIBLE PARKING

PARKING AREAS E, F & G – SITE

SCALE: 1" = 10'

ACCESSIBLE STALL SUMMARY (THIS SHEET)		
ACCESSIBLE	1	AREA G
VAN ACCESSIBLE (LOADING ZONE)	1	AREA F
VAN ACCESSIBLE	1	AREA G

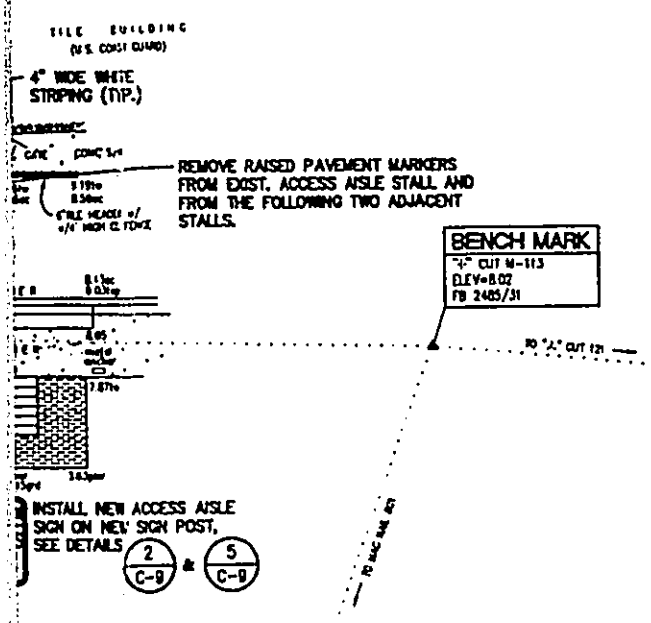


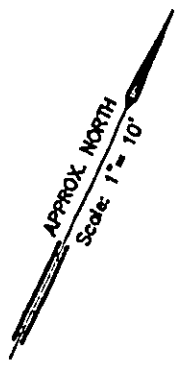


PARKING AREA "G"– ACCESSIBLE PARKING

NOTES:

1. ERADICATION OF EXISTING PAINTED STRIPING THROUGH USE OF EITHER
   A) HEAT SOURCE & SCRAPING (FOR BOTH A.C. & CONCRETE SURFACES)
   B) GRINDING METHODS (FOR BOTH A.C. AND CONCRETE SURFACES)
   C) 2 COATS MATTE BLACK ASPHALT EMULSION DRIVEWAY SEALER (FOR A.C. SURFACES ONLY)
2. NON-BIODEGRADEABLE PAINT SOLVENTS SHALL NOT BE PERMITTED.
3. RESTORATION OF A.C. SURFACES SHALL BE COATED W/ TACK COAT, FILLED W/ HOT-MIXED A.C., MIX 4 & PLATE TAMPED TO MATCH ADJOINING A.C.





– SITE PLAN

LEGEND:

9.35	EXISTING SPOT ELEV.
5.23ac	EXISTING TOP OF A.C. PAVEMENT
5.73ac	EXISTING TOP OF A.C. CURB
5.23w	EXISTING TOP OF WALL
5.73grd	EXISTING GROUND
5.73bw	EXISTING TOP OF BARRIER

REVISION NO.	SYM.	DESCRIPTION	INIT./OF	DATE	APPROVED

RUSSELL M. ARAKAKI LICENSED PROFESSIONAL ENGINEER No. 6217-C HAWAII U.S.A.

ALL WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

Russell Arakaki
Prof'l. Eng.
dba PARK ENGINEERING
LICENSE EXPIRES 04-30-06

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

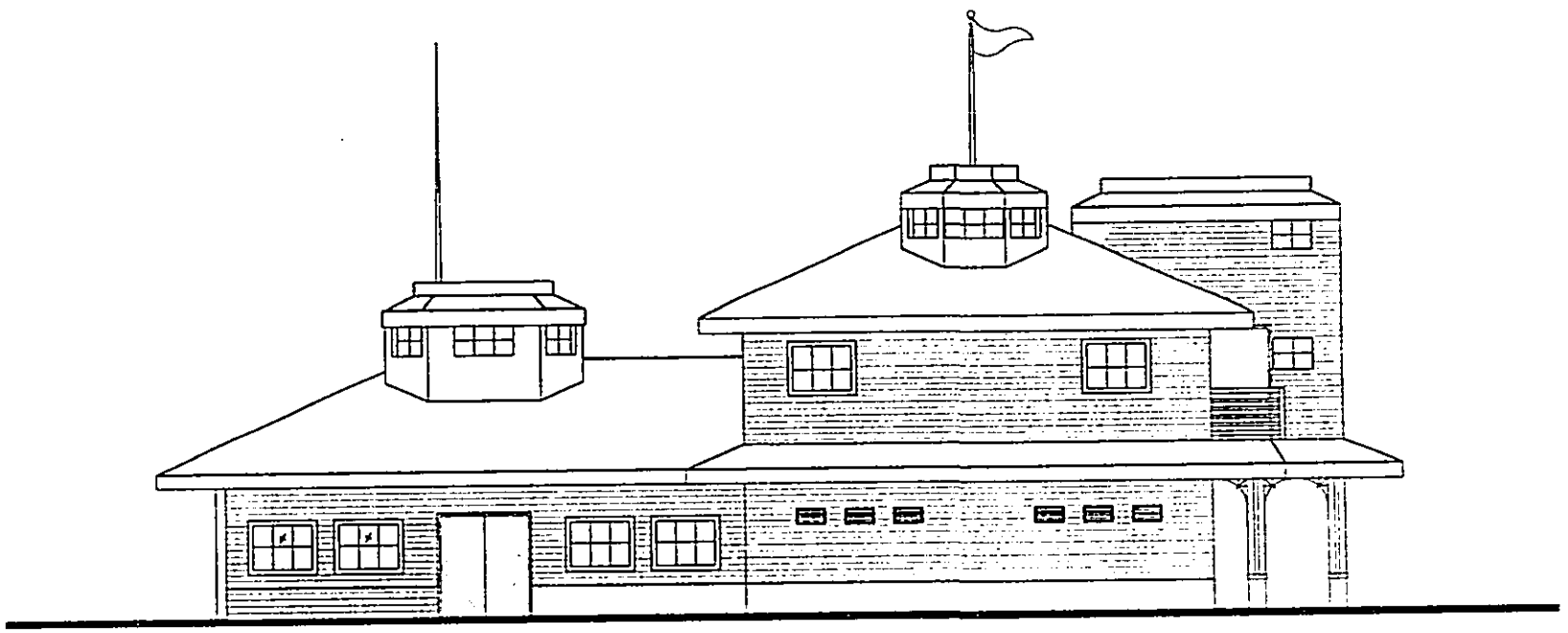
MAALAEA SMALL BOAT HARBOR
ADA BARRIER REMOVAL PROJECT

PARKING AREAS E, F & G–SITE PLAN

DESIGNED:	SH	SUBMITTED:	
DRAWN:	SM	DATE:	APRIL 2004
CHECKED:	RMA	SCALE:	AS NOTED

APPROVED: _____ CHIEF ENGINEER — APR 28 2004 DATE

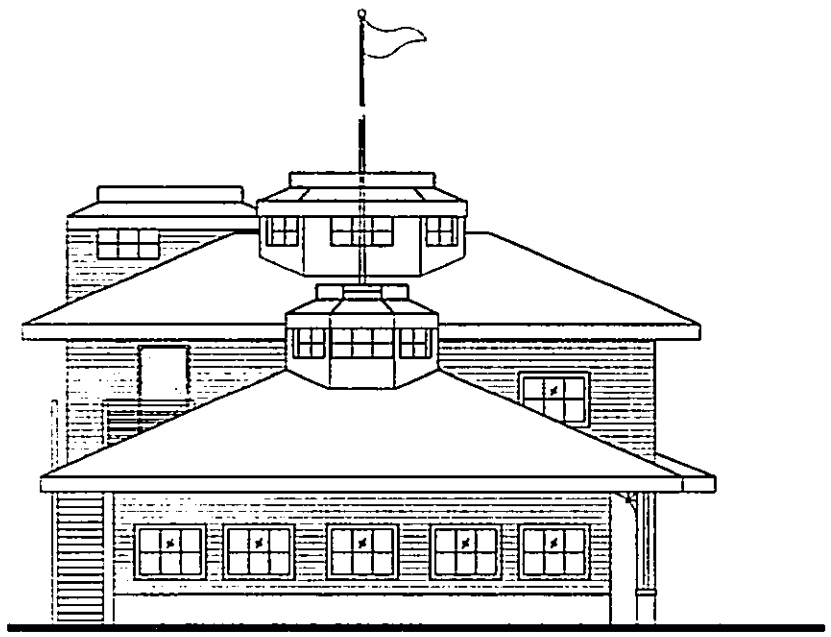
DRAWING NO. C-8



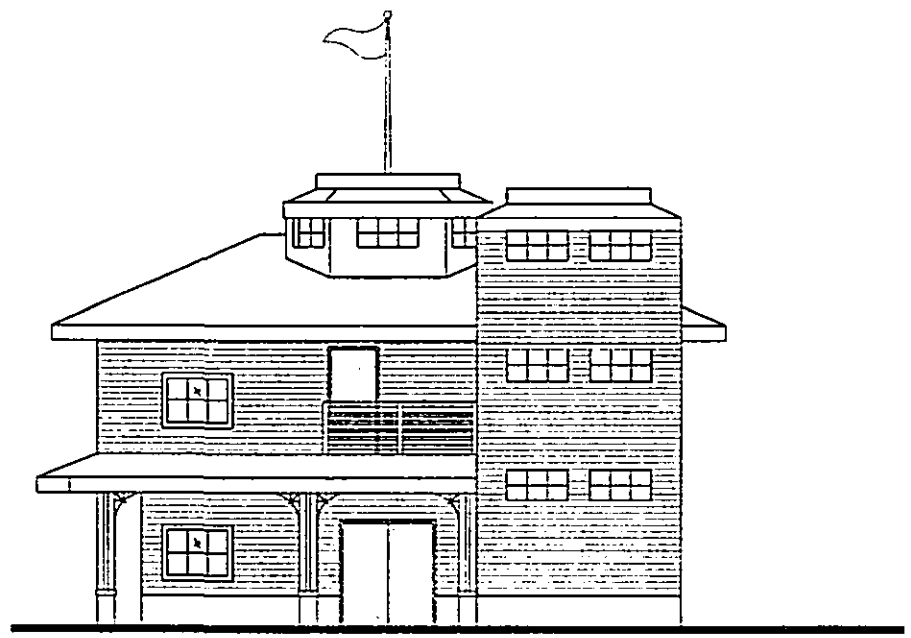
NORTH ELEVATION

ELEVATION

SCALE 1/8" = 1'-0"



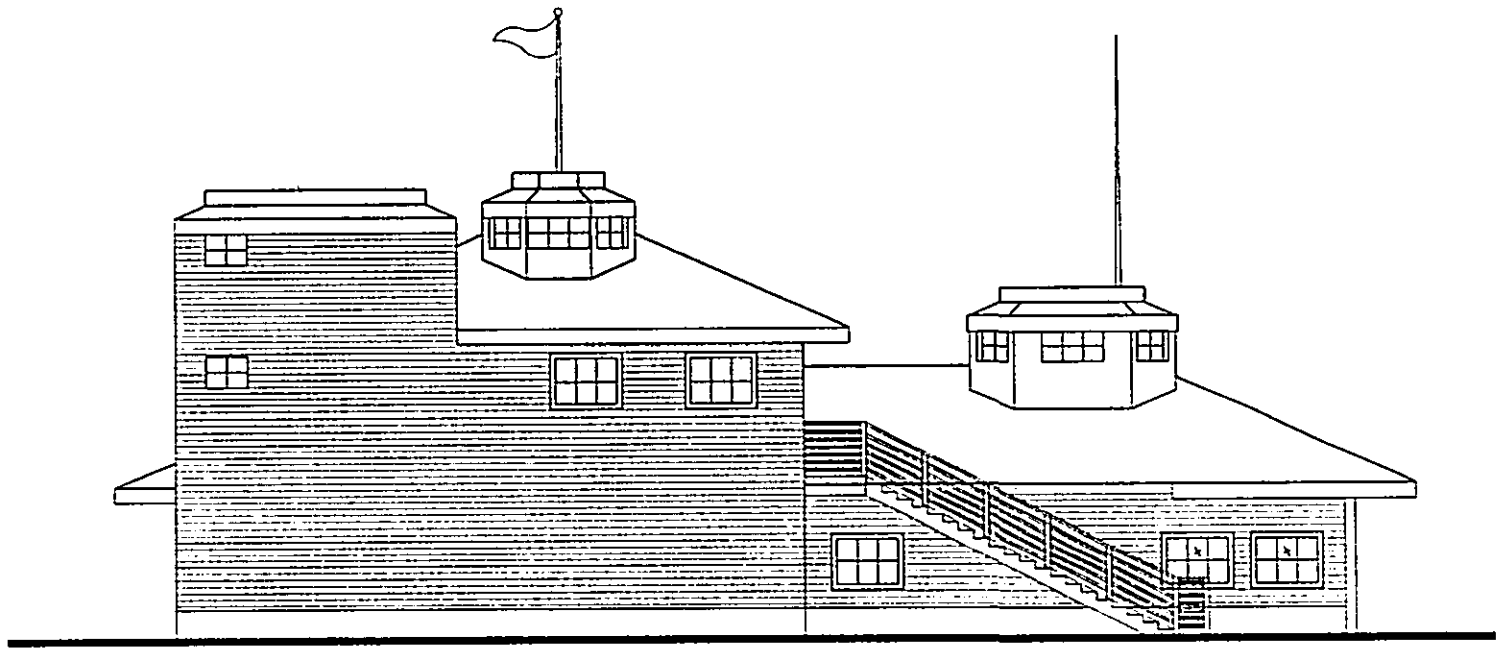
EAST ELEVATION



WEST ELEVATION

ELEVATIONS

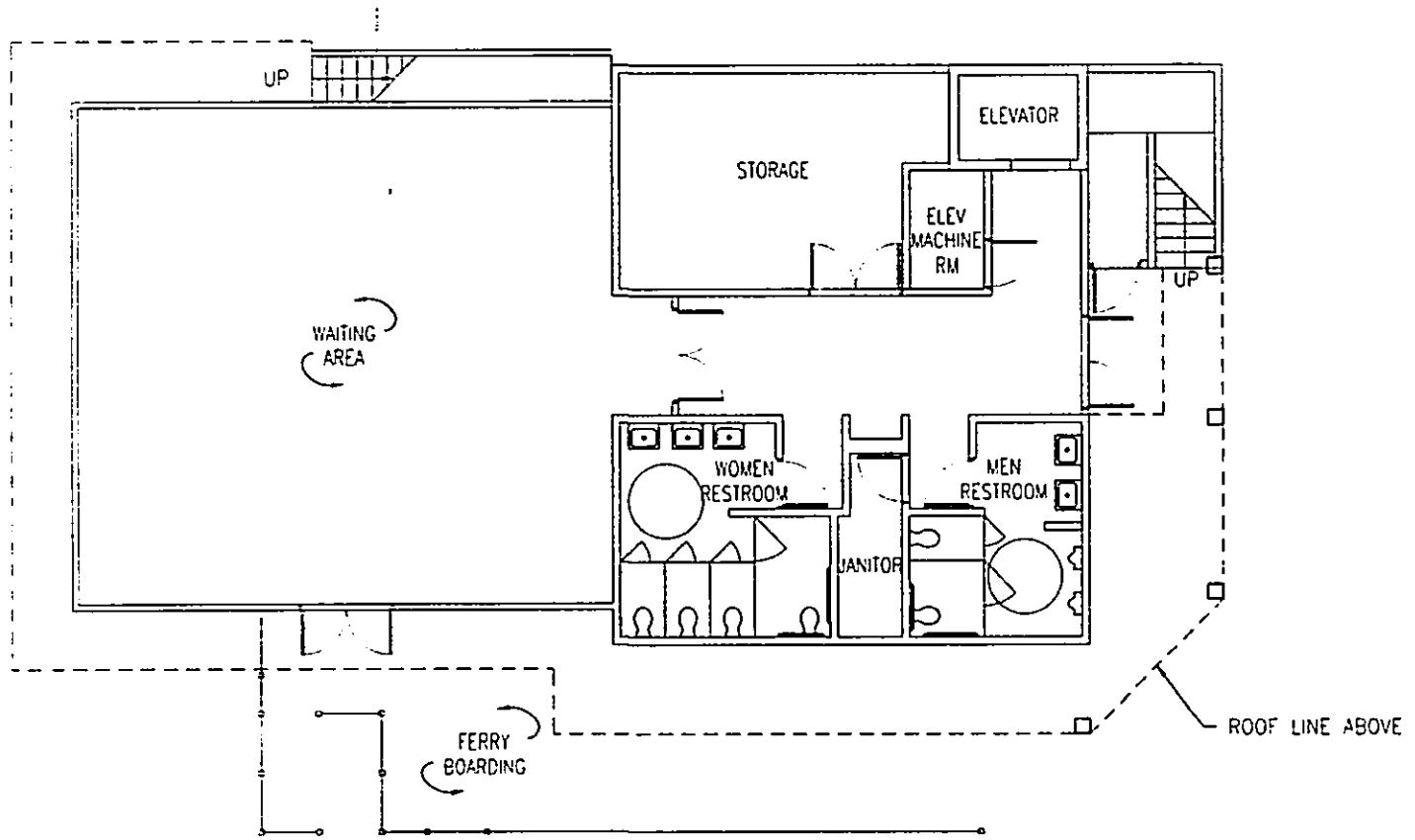
SCALE 1/8" = 1'-0"



SOUTH ELEVATION

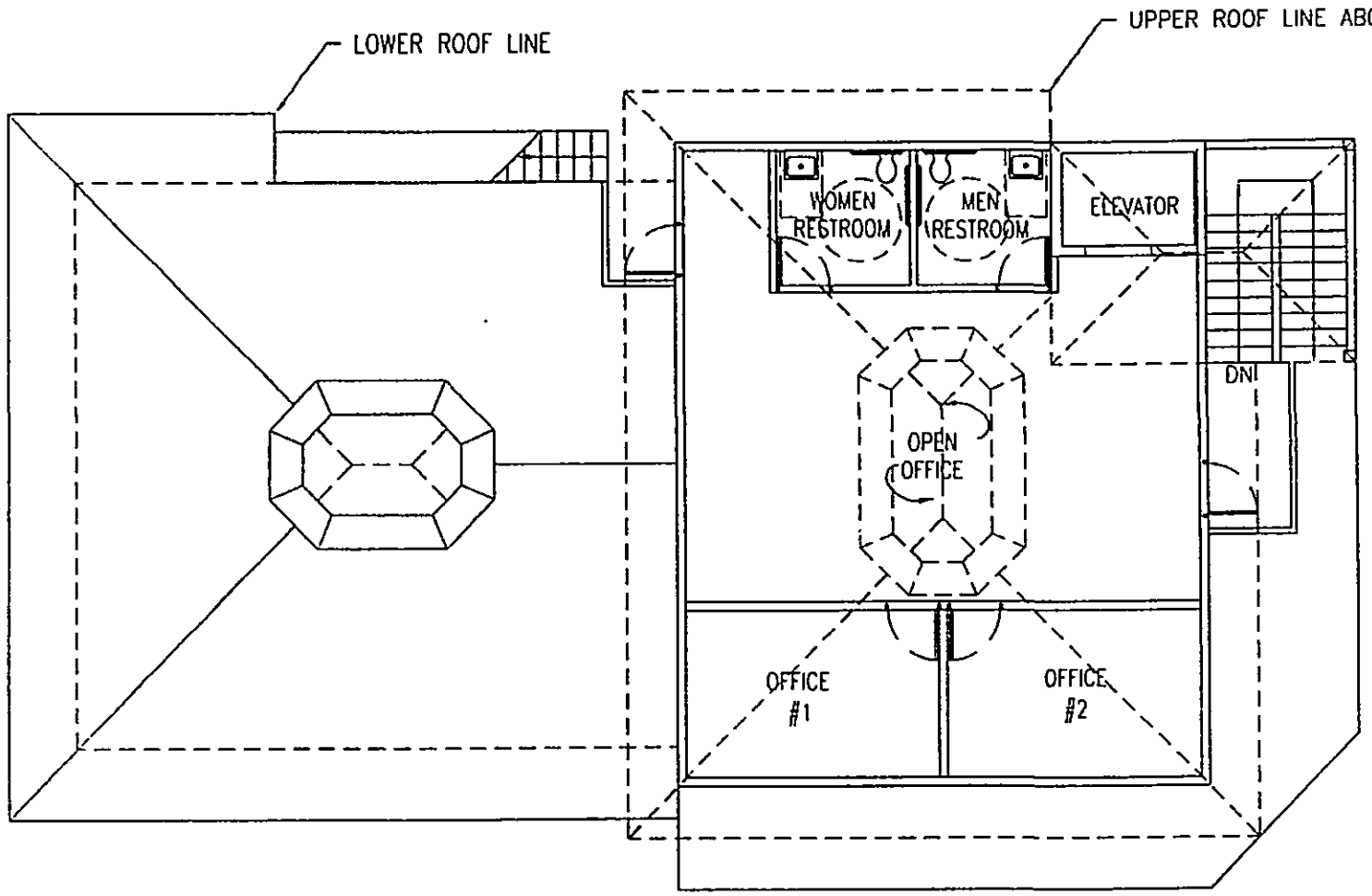
ELEVATION

SCALE 1/8" = 1'-0"



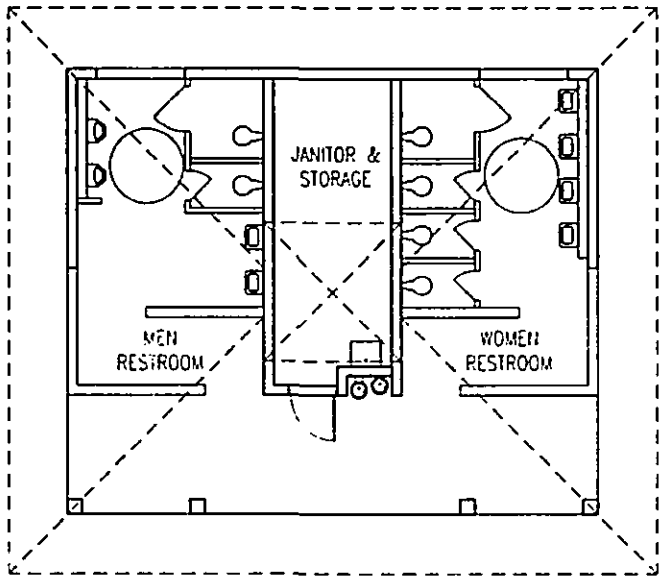
FLOOR PLAN

SCALE 1/8" = 1'-0"



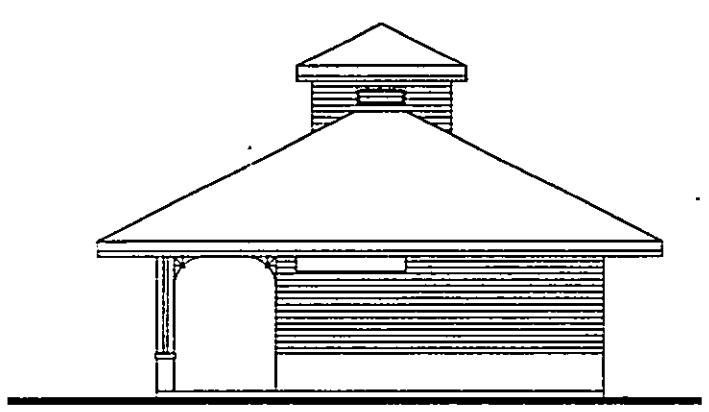
SECOND FLOOR PLAN

SCALE 1/8" = 1'-0"

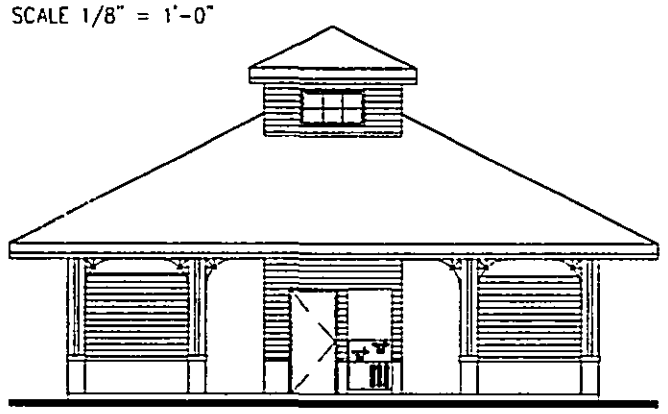


COMFORT STATION FLOOR PLAN

SCALE 1/8" = 1'-0"



SIDE ELEVATION



FRONT ELEVATION

Appendix B

Department of Land and Natural Resources, Chapter 343, HRS, Exemption Determination

LINDA LINGLE
GOVERNOR OF HAWAII

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

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

FEB 22 2005

Mr. Michael T. Munekiyo, A.I.C.P.
President
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Mr. Munekiyo:

Job No. B45XM82A, Maalaea Small Boat Harbor
Ferry System Improvements, Maui

The Department of Land and Natural Resources (Department) has reviewed the scope of the proposed repairs and upgrading to the existing interisland ferry terminal facilities and related landside improvements at the Maalaea Small Boat Harbor, Maui. Based on this review, the Department has determined that some components of the subject project are exempt from the preparation of an Environmental Assessment (EA), as it falls within the Comprehensive Exemption List for the Division of Boating and Ocean Recreation, Department of Land and Natural Resources, State of Hawaii as concurred in by the Environmental Council, State of Hawaii. The Department recognizes that the EA encompasses all project components, including the exempt items.

Exemption Class 1 allows operations, repairs or maintenance of existing structures, facilities, equipment or topographical features, involving negligible or no expansion or change of use beyond that previously existing. Specifically, Item A6 exempts "Repairs and modifications to sewage and water pumping stations and treatment facilities to maintain established codes and standards, provided that modifications that expand the capacity or geographical service area of existing facilities shall not be exempt." The project component exempted under this item is the two (2) wastewater treatment systems to replace the existing three (3) cesspools to handle approximately 19,500 gallons per day of wastewater. The minimum combined capacity of the existing cesspools is approximately 32,400 gallons per day. These cesspools will be replaced with

two wastewater treatment systems to bring the harbor facilities in compliance with Federal regulations. The new wastewater treatment systems will not expand capacity.

Exemption Class 1 items B3 and B4 specifically exempts "Repairs or improvements to catwalks, subsidences, loading docks and mooring facilities" and "Repairs to rock walls, curbings, perimeter seawalls, groins, dikes, breakwaters, boat launching ramps, loading docks, and storm drains". The project components exempted under these items are the repair and maintenance of the existing loading dock and passenger queuing area to accommodate the interisland ferry terminal. The existing loading dock and passenger queuing area will be repaired to meet current Federal, State and County code and safety requirements. No expansion to the facilities is anticipated.

Exemption Class 2 allows replacement or reconstruction of existing structures and facilities where the new structure will be located generally on the same site and will have substantially the same purpose, capacity, density, height and dimensions as the structure replaced. Specifically, items B1 and B2 exempts "Minor upgrades or replacement of existing roadways, road intersections, roadway markings and striping, roadway shoulders and curves, walkways, and navigational aids to meet acceptable safety standards" and "Minor upgrades or replacement of utility and drainage systems to maintain a consistent level of service. Drainage improvements will generally consist of the installation of pipe culverts and construction of gutters where minor flooding occurs". The project components exempted under these items are repair and maintenance to the parking area, access road and comfort station. Proposed improvements to the parking area include fine grading, paving, striping and signage. The parking area will not be expanded. The existing comfort station in the western portion of the harbor will be renovated to meet current code and Federal American with Disabilities Act (ADA) requirements. Improvements to the existing access road from Honoapiilani Highway and internal circulation roads involve paving, restriping and signage to improve traffic circulation.

Should you have any questions, please contact Mr. Eric T. Hirano, Chief Engineer of the Engineering Division, in Honolulu at (808) 587-0230.

Sincerely,

Peter T. Young
Chairperson

c: Mr. Royce Fukunaga,
Fukunaga & Associates, Inc.

Appendix C

Marine and Coastal Survey

Ferry Terminal Improvements at Ma`alaea Small Boat Harbor: Marine and Coastal Survey of Potential Impact Areas[1]

February 4, 2005 *AECOS* No. 1080

Katie Laing, Susan Burr, & Eric Guinther
AECOS, Inc.
45-939 Kamehameha Highway, No. 104
Kaneohe, Hawai'i 96744
Phone: (808) 234-7770 Fax: (808) 234-7775 Email: aecos@aecos.com

Introduction

The State of Hawai`i, Department of Land and Natural Resources is proposing a renovation project involving repairs and upgrades to an existing interisland ferry terminal facility in Ma`alaea Small Boat Harbor at Ma`alaea, Island of Maui, Hawai`i. The proposed improvements include repairs to the loading dock, replacement of the adjacent two-story, Harbor Agent's office building with the addition of public restrooms and improvements to electrical, telephone, water, and sewer facilities to meet current Federal, State, and County requirements. Structural stabilization of the South Mole road and parking lot are proposed as well as the building of a new comfort station at the overflow parking lot, across from the Maui Ocean Center (corner of Ma`alaea Rd. and Hauoli Rd.).

Ma`alaea Small Boat Harbor is located at Ma`alaea on the southern shore of the Maui isthmus in the northwestern corner of Ma`alaea Bay (Figure 1). Original construction of the harbor occurred in phases throughout the 1950's. The 11.9 hectare (29.5 acre) harbor was constructed on a narrow fringing reef flat at the western end of Ma`alaea Bay. The harbor serves as the only public access point along the western side of Ma`alaea Bay and consists of two breakwaters: the West Breakwater (South Mole) extending east from the west shoreline approximately 1100 feet (335 m) with a width of 89 feet (27 m); and the East Breakwater extending south from the north shoreline approximately 850 feet (259 m) with a width of 26 feet (8 m). Currently the harbor accommodates approximately 93 berths/moorings (USFWS, 1993). The south-facing channel between the ends of the breakwaters is approximately 89 feet (27 m) wide and 13 feet (4 m) deep.

[1] This document has been prepared for Munekiyo & Hiraga, Inc. for inclusion in an Environmental Assessment (EA) entitled " " and is therefore part of the public record.

(USFWS, 1993). The south-facing channel between the ends of the breakwaters is approximately 89 feet (27 m) wide and 13 feet (4 m) deep.

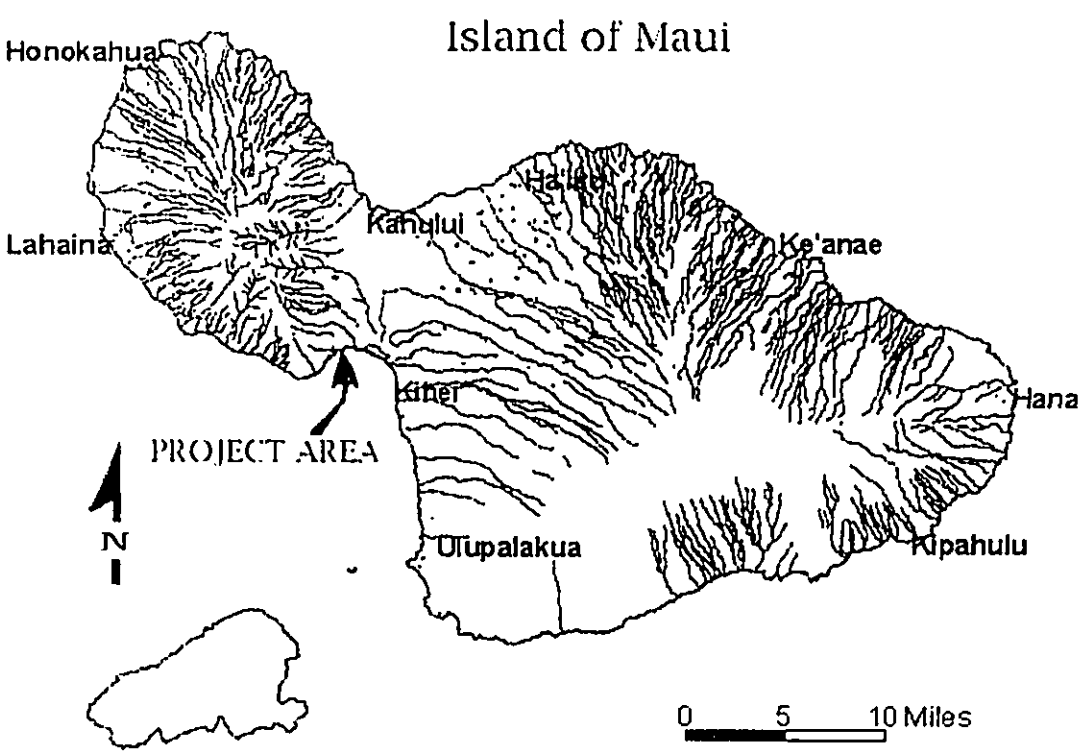


Figure 1. Project location at Ma`alaea on the Island of Maui.

The purpose of this report is to identify any sensitive biological resources that may be present in and around the harbor and potentially affected by the proposed improvements. This report includes results from a marine biological survey, a shoreline biological survey, and water quality sampling of the potential impact area.

The field reconnaissance survey for this project was conducted on November 17, 2004 by three *AECOS* biologists: Susan Burr, Eric Guinther, and Katie Laing. The biologists walked the shoreline to identify coastal plants, collected water samples along the shoreline to measure chemical and physical properties, and snorkeled the area around the old ferry pier and the nearby inner (channel) and outer marine habitats to identify marine flora and fauna. The location of five biological survey areas and four water quality sampling stations are shown in Figure 2.

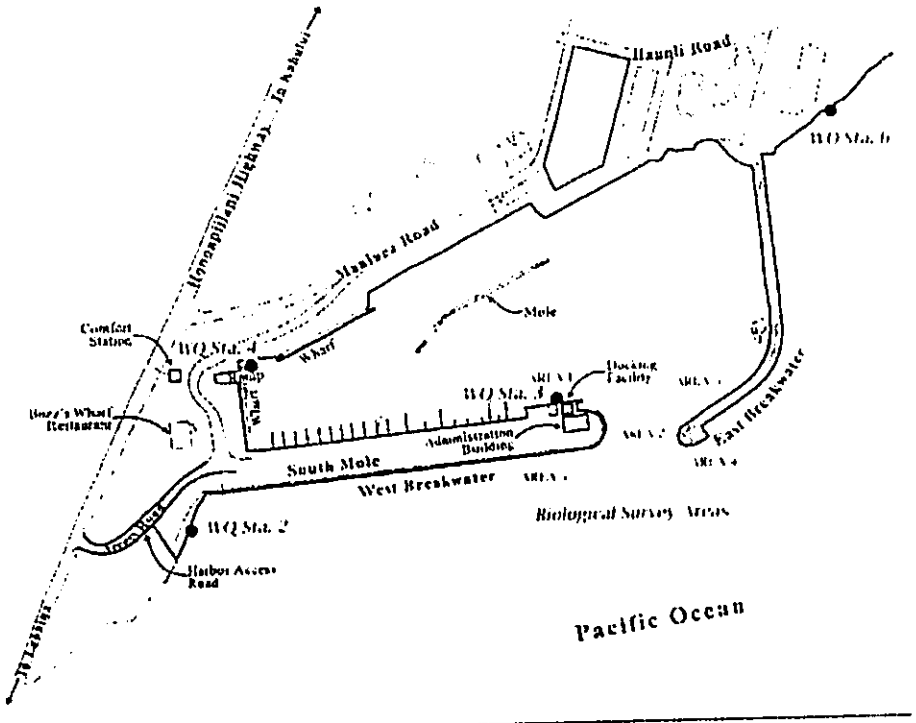


Figure 2. Location of the November 17, 2004 marine biological survey areas and water quality sample stations for the Ma`alaea Small Boat Harbor Ferry Terminal Project.

Environment Description

Ma`alaea Bay — The Ma`alaea Bay area is used extensively for public recreation. Ma'alaea Small Boat Harbor is one of only two berthing areas for small craft on Maui. The harbor is the home port of a sport charter fishing fleet, a small commercial fishing fleet, as well as Maui headquarters of the U. S. Coast Guard. The harbor also has a launch ramp which is heavily used by Maui's trailerboat fishermen (*AECOS*, 1980; 1994).

The long, continuous sand beach east from Kanaio is readily accessible to the public. The small shore break allows easy entry along its entire length. The ocean is relatively calm, and currents are relatively weak, allowing easy access into the water and safe swimming. The nearshore area is seasonally clear, and thus is an area of active snorkeling and diving (Clark, 1980). The shallow waters, less than 30 feet (10 m) deep, between Palalau and Kanaio are considered best for snorkeling and diving because of the highly diverse flora and fauna and seasonally clear waters. The

waters off Kapoli Park (west of the harbor itself) are also utilized by snorkelers. The shallow water fauna of western Ma`alaea Bay is unusual in several respects. A large number of species uncommon elsewhere are relatively common in Ma`alaea Bay. The variety of sponges and bryozoans, and the highly diverse assemblage of gastropod mollusks once made Ma`alaea Bay an area of special interest for nature study, photography, and scientific research (Maciolek, 1971). However, much of the once rich and varied shell life found on the sand bottom occupying the outer bay (Butler, 1975) has declined in recent decades.

Ma`alaea Bay is within the boundaries of the Hawaiian Islands Humpback Whale National Marine Sanctuary. The sanctuary was established in 1992 to protect endangered humpback whales (*Megaptera novaengliae*) and their habitat (HIHWNMSA, 2005).

Outside Harbor Breakwaters — The marine bottom offshore of the harbor generally consists of a hard coralline reef with scattered coral heads and small channels. Directly offshore of the West Breakwater, the bottom grades from smooth rounded rocks and cobbles to a flat limestone reef with scattered patches of coral rubble 200 feet (60 m) out. Water depths are 2 to 4 feet (1 m) in this area, and wave energy is relatively high. Beyond this high energy area, from 200 to 600 feet (60 to 180 m) offshore of the West Breakwater, the water depth ranges from 4 to 12 feet (1 to 4 m), and the bottom consists of a limestone reef with scattered patches of mixed sand and rubble. The bottom relief is relatively flat, with occasional depressions, overhangs, and ledges. The entrance channel is 10 to 15 feet (3 to 5 m) deep, extends approximately 500 feet (150 m) south of the breakwater, and is 150 to 200 feet (45 to 60 m) wide. The channel bottom is relatively flat, with no abrupt slopes marking the sides. The bottom typically consists of a thin covering of calcareous sand and some rubble overlying hard limestone reef materials (AECOS, 1980; 1994). Adjacent to and paralleling the East Breakwater is a scoured zone approximately 100 feet (30 m) wide and 3 feet (1 m) deep. The bottom is flat and composed of burrowed, honeycombed limestone (*AECOS*, 1994).

At least two reef areas near the harbor are popular with *limu* (edible seaweed) gatherers: the shallows off and south of Kapoli Park and the reef flat off Ma`alaea Beach Park. The popular seaweeds, *limu manauea* (*Gracilaria coronopifolia*) and *limu huluhuluwaena* (*Grateloupia filicina*), are sought in these areas (McDermid, 1990).

Harbor Environment — Much of Ma'alaea Small Boat Harbor is soft bottom and supports a variety of borrowing forms typical of this substratum. Boulder revetments line the margin and provide substratum for many intertidal and subtidal forms. There is also a dark sand beach located in the northeast corner of

the harbor. Remnants of the former reef flat also remain within the harbor especially where dredging has not been undertaken.

The intertidal habitat within the harbor is predominantly basalt revetment stones and concrete surfaces which host a wide variety of intertidal creatures. Brewer (1987) lists thin-shelled rock crab or *'a'ama* crab (*Grapsus tenuicrustatus*) and common supratidal snails (*Nerita picea, Littorina pintado* and *L. scabra*) as conspicuous inhabitants by the USCG station. Near the low tide line the fleshy green algae, *Ulva fasciata* and *U. reticulata* were occasionally found along with filamentous blue-green algae. Surveys in May and April 1994 found essentially the same species with some additional forms seen further inside the harbor (AECOS, 1994). Along the shore west from the USCG station a small species of oyster (*Ostrea* sp.) is common, and in the vicinity of the boat ramp, clusters of mussels (*Brachidontes crebristriatus*) are present near the water line. The *'alamihi* crab (*Metopograpsus thukuhar*) is conspicuous everywhere on rocks just above and below the water line, replacing the *'a'ama* crab which is present, but only common in the eastern part of the harbor. Algae are mostly limited to scattered, large growths of *Ulva reticulata* and some *U. lactuca*, but encrusting, pink *Porolithon onkoides* can be found on boulders. The description in USFWS reports (1980, 1993) of *opihi* (*Cellana exarata*) being abundant in the harbor undoubtedly refers to the false limpet (*Siphonaria normalis*), which attains considerable size in this area.

Brewer (1987) noted lace coral (*Pocillopora damicornis*) (reported as *P. cespitosa*) as the "..only significant (and somewhat surprising) benthic organism observed in the harbor ...attached to the concrete sea wall ...west of the Coast Guard station." Observations made in 1994 along the shore west from the USCG station, noted that coral cover declines further into the harbor, with only small, scattered heads of lace coral present (*AECOS*, 1994). The 1980 USFWS survey, although possibly impaired by low visibility (reported at 3 feet), reported no corals and no macroalgae anywhere along the northern edge of the harbor between the boat ramp and the East Breakwater.

In the vicinity of the U.S. Coast Guard station and "sampan wharf" occurred a small area, less than 30 feet^2 (10 m^2) of boulders and undredged reef with growth of at least two coral species, rice coral (*Montipora capitata*) and lace coral (*P. damicornis*) at perhaps 10% coverage (*AECOS*, 1994). Some rice coral colonies were over 10 inches (25 cm) across. Other benthic invertebrates observed were hydroid (?*Halocordyle disticha*), burrowing urchin (*Echinometra mathaei*), and spaghetti worm (*Loimia medusa*). Algal growth was limited to sparse turf with silt and scattered large fronds of *Ulva reticulata*.

A trapezoidal shaped reef remnant in the middle of the harbor was visited by USFWS biologists in 1993. The shoal was covered by sand and silt. The introduced

red alga, hookweed (*Hypnea musciformis*), covered much of the shallow bottom. A few small colonies of the corals, *Porites rus* and *Pocillopora damicornis*, and two species of sea urchins, *Diadema paucispinum* and *Echinometra mathaei*, were observed in this area. A list of eleven species of fishes reported from this reef (most seen around loose boulders of a breakwater set on the reef) by USFWS added only the wrasse, *Thalassoma duperreyi*, to the fishes described above from the vicinity of the USCG Station seen in 1994.

A shallow, reef flat occurs inside the harbor along the East Breakwater. This shallow flat, some 2 acres in extent, was surveyed by Brewer (1987) and USFWS (1993). The biota in 1987 was dominated by "dense, tangled stands of .....*Ulva fasciata, Ulva reticulata, Hypnea chordacea, Amansia glomerata, Gracilaria* cf. *bursapastoris*, and *Grateloupia filicina*, with 100% cover in some patches. USFWS (1993) found the reef flat to be heavily infested by the red alga, *Hypnea musciformis*, but *Bryopsis pinnata, Codium reediae, C. reticulata, Ulva fasciata*, and *Sargassum echinocarpum* occurred as well. Large amounts of hookweed could be seen on the small beach inside the harbor, indicating that this species remained abundant on the reef flat. Between 1999 and 2000, Smith (2000) also found an abundance of hookweed with 80% coverage in northwest Ma'alaea Bay. Two species of fishes, *manini* and *aholehole*, were numerically dominant, but numerous juvenile wrasses and a moray eel were noted by Brewer (1987). No live coral was seen in the area, and was particularly silted over close to the harbor channel, in contrast to that section of the same reef flat which lies outside of the harbor (east of the breakwater) (*AECOS*, 1994).

Fishes are certainly not abundant, but the harbor fauna includes more than the anchovy or *nehu* (*Stolephorus purpureus*) listed by Brewer (1987). *AECOS* (1994) listed the following species near the sampan wharf (roughly in order of abundance observed): Hawaiian flagtail or *aholehole* (*Kuhlia sandvicensis*), convict tank or *manini* (*Acanthurus sandvicensis*), Hawaiian sergeant or *mamo* (*Abudefduf abdominalis*), moorish idol (*Zanclus cornutus*), box fish (*Ostracion meleagris*), belted wrasse (*Stethojulis balteata*), pearl wrasse or *'opule* (*Anampses cuvier*), Hawaiian white-spotted toby (*Canthigaster jactator*), Hawaiian dascyllus or *alo'ilo'i* (*Dascyllus albisella*), raccoon butterflyfish or *lau hau* (*Chaetodon lunula*), lizardfish (*Synodus* cf. *variegatus*), blacktail snapper or *to'au* (*Lutjanus fulvus*), pualu (*Acanthurus* cf. *xanthopterus*), weke (*Mulloidichthyes vanicolensis*), juvenile sidespot goatfish or *malu* (*Parupeneus pleurostigma*), Jenkin's damsel (*Stegastes fasciolatus*), parrotfish (*Scarus* sp.), and cornetfish (*Fistularia commersoni*). Barracuda (*Sphyraena barracuda*), *aholehole*, and schools of mullet (*Mugil cephalus*) and small silverside (?*Spratelloides delicatulus*) occur throughout the inner harbor. The paucity of fishes recorded from the harbor in 1987 may be attributed to the poor underwater visibility at the time of the survey (Brewer, 1987). USFWS (1980) listed *manini* and *nehu* as abundant, and *aholehole* and barracuda as found in "occasional numbers".

The report further mentions that Ma'alaea Harbor supports a "short, but intense seasonal, recreational fishery of bigeye scad or *hahalalu* (*Selar crumenophthalmus*)."

Terrestrial Survey

The Ma'alaea area is extremely dry much of the time. A cursory investigation of plant species in the harbor area was made by USFWS (1980) and in a survey by *AECOS* (1994) of the Ma`alaea Triangle (present location of the Maui Ocean Center - MOC). We conducted a rapid survey of the harbor area vegetation and present those results here (Table 1).

Table 1. List of plants observed in various terrestrial areas around Ma`alaea Small Boat Harbor on November 17, 2004.

Around the USGS building
- Coconut palm (*Cocos nucifera*) pol
- Ornamental hibiscus (*Hibiscus rosa-sinensis* hybrid) orn

Main harbor area near road
- Aloe (*Aloe* sp.) - orn
- *Milo* (*Thespesia populnea*) - ind
- Hibiscus (*Hibiscus rosa-sinensis* hybrid) - orn
- Chinese fan palm (*Livistona chinensis*) - orn
- *Kou* (*Cordia subcordata*) - ind
- *Kiawe* (*Prosopis pallida*) - nat
- Monkeypod (*Samanea saman*) - nat
- Fan palm or *Lo`ulu* (*Pritchardia* sp.) - end
- Panax (*Polyscias guilfoylei*) - orn

Near the Lahaina exit
- Buffelgrass (*Cenchrus ciliaris*) - nat
- Kiawe (*Prosopis pallida*) - nat

On the south mole and parking lot
- Mascarene grass (*Zoysia tenuifolia*) - orn
- *Kiawe* (*Prosopis pallida*) - nat
- *Naupaka kahakai* (*Scaevola sericea*) - ind
- Australian saltbush (*Atriplex semibaccata*) - nat
- Nut grass (*Cyperus rotundus*) - nat
- Garden spurge (*Chamaesyce hirta*) - nat
- Pig weed (*Portulaca oleracea*) - nat
- Seaside purselane/*Akulikuli* (*Sesuvium portulacastrum*) - ind
- False alena (*Boerhavia coccinea*) - nat
- Bermuda grass (*Cynodon dactylor*) - nat
- Plush grass (*Chloris radiata*) - nat
- Wedelia *(Sphagneticola trilobata*) - nat
- Indet. sedge - ?nat.
- Pitted beard grass (*Bothriochloa pertusa*) - nat
- *Koa-haole* (*Leucaena leucocephala*) - nat

Table 1 (continued).

On the south mole and parking lot (continued)
- Chinese violet (*Asystasia gangetica*) - nat
- Ironwood (*Casuarina equisetifolia*) - nat
- Singapore plumeria (*Plumeria obtusa*) - orn

Maalaea Road and shopping area
- Virgate mimosa (*Desmanthus virgatus*) - nat
- Norfolk pine (*Auracaria* sp.) - nat
- Klu (*Acacia farnesiana*) - nat
- Singapore plumeria (*Plumeria obtusa*) - orn
- Guinea grass (*Panicum maximum*) - nat
- Indian fleabane (*Pluchea indica*) - nat
- *Naupaka kahakai* (*Scaevola sericea*) - ind
- Beach vitex or *Pohinahina* (*Vitex rotundifolia*) - ind
- Screw pine or *Hala* (*Pandanus tectorius*) - ind
- Bougainvillea (*Bougainvilea* sp.) - orn
- Croton (*Codiaeum variegatum*) - orn
- Ti (*Cordyline fruticosa*) - pol
- Gardenia (*Gardenia jasminoides*) - orn
- Citrosa plant (*Pelargonium* x *asperum*) - orn
- Plumeria (*Plumeria acutifolia*) - orn

USCG office area
- Areca palm (*Chrysalidocarpus lutescens*) - orn
- Octopus tree (*Schefflera actinophylla*) - nat

KEY TO SYMBOLS USED IN TABLE 1:
Orn = ornamental (planted non-native)
Nat = naturalized (non-native)
Pol = Polynesian introduction (technically non-native)
Ind = indigenous (native)
End = endemic (native), unique to the Hawaiian Islands

The harbor area has been heavily impacted over the years through construction, ornamental plantings and general usage. Of the 42 plant species recorded in the harbor area, 75% are not native to the Hawaiian Islands and essentially all of the native plants are plants being used as ornamentals. The areas surveyed represent entirely either disturbed areas with ruderal weeds or planted areas, the only exceptions being behind the shoreline west of the harbor facilities where an area of naturalized *kiawe* trees and grasses occurs and the swale behind the public restrooms on the north side of the harbor. The only endemic species recorded was *lo'ulu* palm (*Pritchardia* sp.) which here is a decorative planting. Of the six indigenous species recorded two are found on the South Mole: beach *naupaka* or *naupaka kahakai* (*Scaevola sericea*) and the low ground cover, seaside purslane or *akulikuli* (*Sesuvium portulacastrum*). The seaside portion of the South Mole tends to accumulate rubbish and debris both from windblown sources and direct littering and receives inundation during high wave conditions. In the planted areas between

the harbor and the shopping area occur four more indigenous plants: *milo* (*Thespia populnea*), *kou* (*Cordia subcordata*), screw pine or *hala* (*Pandanus tectorius*), and beach vitex or *pohinahina* (*Vitex rotundifolia*), as well as the previously recorded beach *naupaka*. Again, these are all decorative plantings.

Marine Survey

The marine survey was accomplished by snorkeling the perimeter of the two breakwaters and recording the flora and fauna encountered. To survey the site, the three biologists swam along the harbor-side of the South Mole and East Breakwater, as well as the ocean-side of the two breakwaters during bright mid-day light. The species of macroalgae and marine animals were recorded from five areas (Figure 2) and estimates of relative abundance noted (see Table 2). The survey included species of fishes, coral, algae, and other invertebrates.

Table 2. Checklist of aquatic biota observed in nearshore waters of Ma`alaea Small Boat Harbor.

PHYLUM, CLASS, ORDER, FAMILY *Genus species*	Common name	Survey Area 1	2	3	4	5
	ALGAE					
CHLOROPHYTA	GREEN ALGAE					
Bryopsis pennata						O
Cladophora sp.			U			O
Halimeda opuntia				R		R
Ulva fasciata/lactuca	sea lettuce	C		U		A
Ulva reticulata			O			R
PHAEOPHYTA	BROWN ALGAE					
Dictyota bartayresii	*alani*					O
Giffordia breviarticulata	*hulu`ilio*					U
Ralfsia pangoensis		O				
RHODOPHYTA	RED ALGAE					
Acanthophora spicifera	spiny seaweed		A			C
Ahnfeltia concinna	*`aki`aki*					C
Amansia glomerata						C
Hydrolithon reinboldii						U
Hypnea musciformis	hookweed		O			O
Porolithion onkoides					O	A
Pterocladiella capillacea					U	O
HETEROKONTOPHYTA, BACILLIARIOPHYCEAE						
Indet.	pseudofilamentous diatom			A		C
	INVERTEBRATES					
CNIDARIA, HYDROZOA						
HYDROIDA						
Pennaria cf. *disticha*	Christmas tree hydroid	U				
CNIDARIA, ANTHOZOA						

PHYLUM, CLASS, ORDER, FAMILY *Genus species*	Common name	Survey Area 1	2	3	4	5
OCTOCORALLIA						
Carijoa riisei	snowflake coral	C				
CUBOZOA						
Carybdea sp.	box jellyfish					R
ZOANTHINARIA, ZOANTHIDAE SCLERACTINIA,						
Palythoa caesia	blue-gray zoanthid		O	R	O	O
ACROPORIDAE						
Montipora capitata	rice coral	C	C	A	A	O
Montipora patula	spreading coral	R				
Montipora flabellata	blue rice coral		O	O	O	R
FAVIIDAE						
Cyphastrea ocellina			U			
POCILLOPORIDAE						
Pocillopora damicornis	lace coral	U	O			R
Pocillopora meandrina	cauliflower coral	R	U	C	O	O
PORITIDAE						
Porites lobata	lobe coral	R	O	A	A	C
Porites compressa	Finger coral			A	A	R
ANELLIDA, POLYCHAETA	WORMS					
SERPULIDAE						
Sabellastarte sanctijosephi	feather duster worm	U				
Spirobranchus giganteus	Christmas-tree worm	U		R		
TEREBELLIDAE						
Loima medusa	medusa spaghetti worm	R		U		
MOLLUSCA, GASTROPODA	MOLLUSKS					
PATELLIDAE						
Cellana sandwicensis	yellow-foot `opihi					R
Siphonaria normalis	false `opihi	C				C
NERITIDAE						
Nerita picea	black nerite	C				O
LITTORINIDAE						
Littoraria pintado	dotted periwinkle	C				
VERMETIDAE						
Serpulorbis variabilis	variable worm snail		C			
MOLLUSCA, BIVALVIA						
PTERIIDAE						
Pinctada margaritifera	black-lipped pearl oyster					R
OSTREIDAE						
Ostrea sandvicensis	Hawaiian oyster	U				
MOLLUSCA, CEPHALOPODA, OCTOPODA						
OCTOPODIDAE						
Octopus cyanea	day octopus					R
MOLLUSCA, CEPHALOPODA, TEUTHOIDEA						
SEPIOLIDAE						
Sepioteuthis lessoniana	oval squid					R
ARTHOPODA, CRUSTACEA, DECAPODA						
ALPHEIDAE						
Alpheus deuteropus	snapping shrimp			A	A	

PHYLUM, CLASS, ORDER, FAMILY *Genus species*	Common name	Survey Area 1	2	3	4	5
GRAPSIDAE						
Grapsus tenuicrustatus	thin-shelled rock crab	O	C			C
ENOPLOMETOPIDAE						
Enoplometopus occidentalis	red reef lobster †				R	
ECHINODERMATA, ECHINOIDAE	SEA URCHINS					
DIADEMATIDAE						
Diadema paucispinum	long-spined urchin	R		U	O	O
Echinothrix calamaris	banded urchin					R
Echinothrix diadema	blue-black urchin		U			U
ECHINOMETRIDAE						
Colobocentrotus atratus	helmet urchin					R
Echinometra mathaei	rock-boring urchin	O	A	A	A	A
Echinometra oblonga	oblong urchin					A
Heterocentrotus mammillatus	slate-pencil urchin	U	O	O	C	C
TOXOPNEUSTIDAE						
Tripneustes gratilla	collector urchin	O	O	O	C	C
ECHINODERMATA, HOLOTHUROIDAE	SEA CUCUMBERS					
HOLOTHURIIDAE						
Actinopyga mauritiana	white-spotted sea cucumber		R		O	O
Holothuria atra	black sea cucumber					U
	VERTEBRATES					
VERTEBRATA, CHONDRICHTHYES	SHARKS & RAYS					
MYLIOBATIDAE						
Aetobatis narinari	spotted eagle-ray	R				
VERTEBRATA, PICES	FISHES					
MURAENIDAE						
Echidna nebulosa	snowflake moray					R
AULOSTOMIDAE						
Aulostomus chinensis	trumpetfish	U				R
SERRANIDAE						
Indet.	grouper				R	
SYNODONTIDAE						
Saurida sp.	lizardfish		R	R		
FISTULARIIDAE						
Fistularia commersonii	coronetfish		U	U		U
SCORPAENIDAE						
Scorpaenopsis diabolus	devil scropionfish					R
KUHLIIDAE						
Kuhlia sandvicensis (E)	Hawaiian flagtail	R	R			
CARANGIDAE						
Caranx melampygus	bluefin trevally	R		R		R
MULLIDAE						
Mulloidichthys flavolineatus	yellowstripe goatfish		A	A	A	R
Mulloidichthys vanicolensis	yellowfin goatfish		A	C	C	
Parupeneus cyclostomus	blue goatfish			R		
Parupeneus multifasciatus	manybar goatfish		U	R	R	R

PHYLUM, CLASS, ORDER, FAMILY *Genus species*	Common name	Survey Area 1	2	3	4	5
Parupeneus porphyreus (E)	whitesaddle goatfish			U	R	R
KYPHOSIDAE						
Kyphosus bigibbus	brown chub	O	U	U		
CHAETODONTIDAE						
Chaetodon auriga	threadfin butterflyfish	U	O	R	R	
Chaetodon lunula	raccoon butterflyfish	O	R	O		O
Chaetodon miliaris (E)	milletseed butterflyfish	R		R		
Chaetodon quadrimaculatus	four-spot butterflyfish				R	
Chaetodon unimaculatus	one-spot butterflyfish				R	R
POMOCENTRIDAE						
Abudefduf abdominalis (E)	Hawaiian sergeant	O		C	U	C
Chromis vanderbelti	blackfin chromis				U	
Dascyllus albisella (E)	Hawaiian dascyllus	U		O		
Plectroglyphidodon imparipennis	brighteye damselfish				U	
Stegastes fasciolatus	Pacific gregory		O	O		C
LABRIDAE						
Anampses cuvier (E)	pearl wrasse					R
Bodianus bilunulatus (E)	Hawaiian hogfish					R
Cheilio inermis	cigar wrasse			R		R
Coris gaimard	yellowtail wrasse	R		R		R
Gomphosus varius	bird wrasse	R		O	R	U
Labroides phthirophagus (E)	Hawaiian cleaner wrasse			O		U
Macropharyngodon Geoffrey (E)	shortnose wrasse					R
Novaculichthys taeniourus	rockmover wrasse					R
Stethojulis balteata (E)	belted wrasse		O	O	O	
Thalassoma duperrey (E)	saddle wrasse	O	O	C	C	C
Thalassoma trilobatum	Christmas wrasse					O
SCARIDAE						
Scarus psittacus	pale nose parrotfish				O	
ZANCLIDAE						
Zanculus cornutus	Moorish idol	O	U	R		U
ACANTHURIDAE						
Acanthurus blochii	ring-tail surgeonfish	O	U	C		O
Acanthurus dussumieri	eye-stripe surgeonfish	O	C	A		
Acanthurus leucopareius	white-bar surgeonfish	U			C	C
Acanthurus nigrofuscus	lavender tang		C		U	U
Acanthurus triostegus	*manini*	O	C	C	C	A
Ctenochaetus hawaiiensis	chevron tang				R	
Ctenochaetus strigosus	goldring surgeon	U	O		R	U
Naso lituratus	orangespine unicornfish					R
Naso unicornis	unicornfish			R	R	R
Zebrasoma flavescens	yellow tang		R			
BALISTIDAE						
Rhinecanthus rectangulus	reef triggerfish	R		U	R	U

PHYLUM, CLASS, ORDER, FAMILY *Genus species*	Common name	Survey Area 1	2	3	4	5
MONOCANTHIDAE						
Cantherhines dumerilii	barred filefish				U	
OSTRACIIDAE						
Ostracion meleagris	spotted boxfish	O		U	U	C

KEY TO SYMBOLS USED IN TABLE 2:

Location:

1 - Inside harbor near old ferry pier
2 - Channel end of West Breakwater and sand channel
3 - East Breakwater (inside harbor)
4 - East Breakwater (outside harbor)
5 - West Breakwater (outside harbor)

Abundance categories:

R - Rare - Only one or two individuals observed in area.
U - Uncommon - Three to no more than a dozen individuals seen in area.
O- Occasional - Seen irregularly and always in small numbers; more than a dozen individuals in area.

Table 2 (continued).

C - Common - Seen regularly, although generally in small numbers.
A - Abundant - Found in large numbers and widely distributed.

Other symbols and categories:

† - Shell, carapace, or test only (not seen alive).
E - Endemic - Found in Hawaii and nowhere else.

QC:

All listed species were observed in the field by aquatic biologists on November 17, 2004.

Areas 1 and 3 were located inside the harbor, Area 2 was the channel at the harbor mouth, and Areas 4 and 5 were located outside the harbor (Figure 1). Area 1 included the existing ferry terminal wall, the piling area beneath the terminal and the adjacent sand bottom, as well as the surrounding waters out approx. 20 feet (6 m) from the wall. Area 2 included the rock rubble of the east end of the South Mole structure, the adjacent sand bottom and the sandy harbor channel located between the two breakwaters. Area 3 included approx. 60 feet (18 m) of the East Breakwater where it forms the harbor channel and out perpendicularly to approximately 30 feet (10 m). Areas 4 and 5 were outside of the harbor: Area 4 encompassed the first 30 feet (9 m) of boulder revetment at the southwestern end of the East Breakwater, the adjacent reef and waters out 15 feet (5 m). Area 5 included the algal-covered reef platform off the West Breakwater for about 75% of the length of the structure from the channel end, out approximately 30 feet (10 m).

In the areas surveyed, algae are dominated by two invasive algae, hookweed (*Hypnea musciformis*) and spiny seaweed (*Acanthophora spicifera*), and another possibly invasive algae, sea lettuce (*Ulva fasciata*). Another invasive species found is the snowflake coral, a soft coral introduced into Pearl Harbor in the 1970s that

grows in harbors and bays under low light conditions like those found beneath overhanging docks (Coles et al., 1999). The highest coral cover occurs around the west tip of the East Breakwater and the most common corals are rice coral (*Montipora capitata*) and lobe coral (*Porites lobata*). Urchins are some of the most conspicuous members of the marine community. The rock-boring urchin (*Echinometra mathaei*) has the greatest abundance, followed by the slate-pencil urchin (*Heterocentrotus mammillatus*).

The most common fishes are saddle wrasse (*Thallasoma duperrey*) and convict surgeonfish or *manini* (*Acanthurus triostegus*). Butterflyfish were recorded throughout the study area and the raccoon butterflyfish or *lau hau* (*Chaetodon lunula*) is most common. The area of greatest fish diversity is along the surge dominated reef flat of the West Breakwater, but this may be an artifact of the much larger survey area as compared with Areas 1-4. Of the 50 marine fish species recorded 20% are endemic, meaning they are found only in the Hawaiian Islands and no other geographic region. No endangered or threatened species were encountered during our marine survey.

Area 1 (West Breakwater/Ferry terminal) — At the time of the survey, visibility inside the harbor was less than 10 feet (3 m). The ferry dock wall has an array of large tires hung as protective bumpers. Below the existing ferry dock are a number of tires and chain link fence which are strewn amongst the pilings and encrusted with an abundance of an invasive soft coral, snowflake coral (*Carijoa riisei*). The vertical wall substratum hosts five reef-forming coral species, all in low abundance, four species of mollusks, an abundance of thin-shelled rock crab (*Grapsus tenuicrustatus*), and the collector urchin (*Tripneustus gratilla*). The most conspicuous fishes are brown chub or *nenue* (*Kyphosus biggibus*) and trumpetfish (*Aulostomus chinensis*).

Area 2 (East end of South Mole and harbor channel) — The harbor channel consists of a sand bottom channel bordered on the west and east by large boulders that rise to above the surface (the man-made breakwaters). Rice coral (*Montipora* capitata) and lobe coral (*Porites* lobata) are common on the rocky substrate of the south mole, in places comprising 80% of the bottom. On the boulders, near the surface occur thin-shelled rock crab and a number of green and red seaweeds. Herbivorous surgeonfish are well represented here, with the eyestripe surgeonfish (*Acanthurus dussumieri*), lavender tang (*Acanthurus nigrofuscus*), and convict surgeonfish or *manini* (*Acanthurus triostegus*) being most abundant. Two large schools of yellowstripe goatfish (*Mulloidichthys flavolineatus*) were seen at Areas 2, 3, and 4.

Area 3 (Southern part of East Breakwater, inside harbor) — An extensive coral community abutting the breakwater boulders extends shoreward inside the East

Breakwater. Coral coverage approaches 90% in the limited space around the western tip of the East Breakwater with rice coral, cauliflower coral (*Pocillopora meandrina*), lobe coral, and finger coral (*Porites compressa*) predominating. The commensal snapping shrimp (*Alphaeus deuteropus*), are abundant in surface grooves of lobe coral. The most conspicuous fishes are the large and abundant eyestripe surgeonfish (*Acanthurus dussumieri*). The red reef lobster (*Enoplometopus occidentalis*), usually only seen at night, was recorded from the finding of an individual pincer.

Area 4 (West end of East Breakwater, outside harbor) — Small colonies of blue rice coral (*Montipora flabellata*), cauliflower coral, lobe coral, and finger coral are all prevalent along the high wave energy platform beside the breakwater. Urchins and juvenile palenose parrotfish (*Scarus psittacus*) are very common amongst the many small coral colonies of this area.

Area 5 (South revetted mole, outside harbor) — The West Breakwater is fronted by a species-rich algal platform. This area has the greatest algal diversity (15 species) and the greatest fish diversity (30 species) of all areas surveyed, however the greater fish diversity could be an artifact of the greater area surveyed. Several fish species are common here: Hawaiian sergeant (*Abudefduf abdominalis*), Pacific Gregory (*Stegastes fasciolatus*), saddle wrasse (*Thalassoma duperrey*), whitebar surgeonfish (*Acanthurus leucopareius*), convict surgeonfish, and spotted boxfish (*Ostracion meleagris*). Several oval squid (*Sepioteuthis lessoniana*), a single day octopus (*Octopus cyanea*), and the black-lipped pearl oyster (*Pinctada margaritifera*) were also observed in this area, but not in other areas.

Water Quality

The water quality survey involved collection of surface water samples (grab samples) at each of four stations (Figure 2). Samples were collected in appropriate sampling containers and placed on ice until they were transported to the laboratory for analyses (Laboratory Log No. 19516). The following parameters were measured with instruments in the field at the time of sample collection: temperature, dissolved oxygen, pH, and salinity. The parameters measured in the laboratory include: turbidity, total suspended solids, ammonia, nitrate+nitrite, total nitrogen, total phosphorus, and chlorophyll α. All parameters were measured within appropriate hold times. Table 3 lists instrumentation and analytical methods used for field and laboratory water analyses.

The primary purpose of the November 17, 2004 water quality measurements was to characterize the existing marine environment, not to set baseline values or determine compliance with the appropriate Water Quality Standards (HAR, 2000) (Table 4). In fact, the State criteria for all nutrient measurements, chlorophyll α,

and turbidity are based upon geometric mean values and a minimum of three separate samples per station would be required to compute geometric means (HDOH, 2004). Ideally, the multiple samplings would encompass a range of typical conditions for the location, such as high tide and low tide samples, wet and dry season, etc. Nonetheless, our results can be evaluated against the water quality criteria for embayments (Table 4) so long as limitations regarding a possible lack of representativeness are realized.

Table 3. Analytical methods and instruments used for Ma`alaea Small Boat Harbor Ferry Terminal Project water samples.

Analysis	Method	Reference	Instrument
Ammonia	alkaline phenol	Karoleff in Grasshoff et al. (1986)	Technicon AutoAnalyzer II
Chlorophyll α	10200 H	Standard Methods, 18th Edition (1992)	Turner Model 112 fluorometer
Dissolved Oxygen	EPA 360.1	EPA (1979)	YSI Model 85 DO meter
Nitrate + Nitrite	EPA 353.2	EPA (1993)	Technicon AutoAnalyzer II
pH	EPA 150.1	EPA (1979)	Hannah Pocket pH Meter
Salinity	EPA 120.1	EPA (1979)	Handheld Refractometer
Temperature	thermister calibrated to NBS cert. Thermometer (EPA 170.1)	EPA (1979)	YSI Model 85 DO meter
Total Nitrogen	persulfate digestion /EPA 353.2	D'Elia et al. (1977) / EPA (1993)	Technicon AutoAnalyzer II
Total Phosphorus	persulfate digestion /EPA 365.1	Koroleff in Grasshoff et al. (1986) / EPA (1993)	Technicon AutoAnalyzer II
Total Suspended Solids	Method 2540D (EPA 160.2)	Standard Methods 18th Edition (1992); EPA (1979)	Mettler H31 balance
Turbidity	Method 2130B (EPA 180.1)	Standard Methods 18th Edition (1992); EPA (1993)	Hach 2100P Turbidimeter

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Table 4. State of Hawaii water quality criteria for Class A embayments and Class A coastal marine waters (HAR §11-54-06(a)(3) and (b)(3)).

Geometric mean not-to-exceed criteria

Class A Embayment						
Criteria	Ammonia (µg N/l)	Nitrate + nitrite (µg N/l)	Total N (µg N/l)	Total P (µg P/l)	Chl α (µg/l)	Turbidity NTU
Wet *	6.00	8.00	200.00	25.00	1.50	1.5
Dry **	3.50	5.00	150.00	20.00	0.50	0.40

* Wet criteria apply when the open coastal waters receive more than three million gallons per day of fresh water discharge per shoreline mile.
** Dry criteria apply when the open coastal waters receive less than three million gallons per day of fresh water discharge per shoreline mile.

Class A Open Coastal Marine Waters						
Criteria	Ammonia (µg N/l)	Nitrate + nitrite (µg N/l)	Total N (µg N/l)	Total P (µg P/l)	Chl α (µg/l)	Turbidity NTU
Wet *	3.50	5.00	150.0	20.00	0.30	0.50
Dry **	2.00	3.50	110.0	16.00	0.15	0.20

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

The following are applicable to both Embayments and Open Coastal Marine Waters during both "Wet" and Dry" seasons.

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

Sites were selected based partly on the locations of water sampling stations from a previous survey (*AECOS*, 1994), and therefore are not numbered sequentially. Ma`alaea Boat Harbor is designated as a Class A Embayment (HAR, 2000) with water quality criteria pertaining to wet and dry seasons (Table 4). Waters outside of the harbor (Ma`alaea Bay) are Class A marine waters with a separate set of applicable water quality criteria. As stated in the water quality regulations, it is the objective of Class A waters that their use for recreation and aesthetic enjoyment be protected (HDOH, 2004). Ma`alaea Boat Harbor is also an artificial basin which is designated a Class II, shallow draft harbor under the marine bottom standards, with the following specific criterion pertaining: oxidation-reduction potential (EH) in the uppermost ten centimeters (four inches) of sediment shall not be less than -100 millivolts (HAR, 2000; §11-54-07(d)(3)).

For the November 17, 2005 sampling event, the predicted high tide of 2.6 feet (higher high water, HHW) occurred at 8:17 am and the afternoon low tide was predicted at 0.2 feet (lower low water or LLW) occurred at 4:32 pm (NOAA/NOS, 2004; corrected for Ma`alaea Bay). According to this tidal information these samples were collected during a falling tide.

Table 5. Water quality characteristics of Ma`alaea Small Boat Harbor and nearby waters from samples collected on 17 November 2004.

STATION	Time Sampled	Temp. (°C)	Salinity (o/oo)	Dissolved Oxygen (mg/l)	Dissolved Oxygen (% sat.)	Tot. Susp. Solids (mg/L)	pH --
Sta. 4	1135	26.2	26.287	5.35	77	23.4	8.17
Sta. 3	1115	26.2	34.184	7.44	111	19.4	8.14
Sta. 6	1145	26.7	32.762	8.71	131	18.8	8.33
Sta. 2	1127	26.0	34.327	5.89	88	11.0	8.09

STATION	Ammonia (µg N /L)	Nitrate + Nitrite (µg N/L)	Total N (µg N/L)	Total P (µg P/L)	Chl α (µg /L)	Turbidity (NTU)
Sta. 4	<1	415	573	54	2.69	6.88
Sta. 3	<1	26	157	26	0.70	1.60
Sta. 6	<1	128	344	45	2.05	3.42
Sta. 2	<1	54	184	21	0.44	1.14

Water quality station results are arranged in Table 5 (above) from most inside the harbor (Sta. 4) to outside and furthest from the channel mouth (Sta. 2)(See Figure 2). A review of the water quality results (Table 5 above) for November 17, 2004 at and around the project site revealed several marked differences between stations. Stations 2 and 6, located outside the harbor, and station 3, located near the harbor mouth, each had salinities within the expected range for seawater. Station 4 on the other hand, located in the back of the harbor, had a depressed salinity indicative of freshwater input. Total N and total P levels at Stations 4 and 6 greatly exceeded those found at Stations 2 and 3, indicating at least two sources of nutrient inputs: one inside the harbor and the other to the east of the East Breakwater. Chlorophyll α, turbidity, and total suspended solids were all somewhat elevated in these same locations.

Assessment

The proposed improvements at M'alaea Small Boat Harbor include repairs to the ferry loading dock, replacement of the adjacent two-story, Harbor Agent's office building, and structural stabilization of the South Mole road and parking lot. In addition, two comfort stations with public restrooms are proposed, one in the ferry terminal facility the other in a new comfort station at the overflow parking lot, across from the Maui Ocean Center (corner of Ma'alaea Rd. and Hauoli Rd.). Improvements to electrical, telephone, water, and sewer facilities are also proposed.

TERRESTRIAL IMPACTS — Roadway improvements and paving of the South Mole could cause destruction of a small amount of native vegetation and could cause an increase in the amount of pollution (including thermal) in runoff from paved surfaces. On the South Mole there is a strip of gravel between the paved parking area and the rocks of the West Breakwater. Currently this highly altered area hosts two native plants, beach *naupaka* and the low ground cover, seaside purslane. Both species occur naturally on the South Mole without need for watering or maintenance. No rare or endangered species are present. The harsh nearshore environment of the South Mole requires equally tough coastal native plants to withstand conditions. An assortment of salt tolerant native plantings interspersed with footpaths to the rocky breakwater could enhance the aesthetics of the South Mole as well as improve public opinion of construction efforts. Recommended salt tolerant natives include the following; beach naupaka or *naupaka kahakai* (*Scaevola sericea*), *'äkia* (*Wikstroemia uva-ursi*), beach morning glory or *pöhuehue Ipomoea pes-caprae*), beach vitex or *pöhinahina* (*Vitex rotundifolia* var. *ovata*), beach 'ilima or *'ilima papa* (*Sida fallax*), Hawaiian cotton or *ma'o* (*Gossypium tomentosum* var. *argenteum*), Beach heliotrope or *hinahina* (*Heliotropium anomalum*), and *'öhai* (*Sesbania tomentosa*).

The construction of a new comfort station and overflow parking lot would increase impervious surfaces and thereby increase pollutants entering the nearshore waters. Also, there is potential that this construction could impact a stand of tall trees in the proposed parking lot area. The stand of trees acts as a natural windbreak and is an important aid to mariners especially when navigating the confines of the harbor (USFWS, 1993). Care should be taken to preserve the natural windbreak to avoid unnecessary collisions within the harbor and pursuant costly repairs. Upgrading of utilities and installation of a sewage pump should not pose a threat to the existing terrestrial community as long as BMPs are followed.

MARINE IMPACTS —This project only involves repairs and upgrades to an existing facility. Although the project involves an existing concrete pier facility, the work to be performed in the water of the harbor is anticipated to be minimal. Some marine organisms and their habitat will be impacted during reconstruction of the ferry

loading dock, however no rare or endangered species would be lost in this already disturbed environment. Organisms will readily re-colonize on new exposed hard surfaces. Below the existing ferry dock a large stand of the invasive soft coral, known as snowflake coral, exists. Care should be taken to minimize dispersal of this invasive organism.

In-water work is not expected to directly impact the extensive coral community bordering the south end of the East Breakwater inside or outside the harbor; these areas provides considerable habitat for marine life. During reconstruction of the ferry terminal building (Harbor Agent's office) care must be taken to avoid depositing construction materials and related liquids (i.e., paints, solvents, and other noxious chemicals) into the marine environment.

Additional BMPs should be utilized during stabilization repairs to the South Mole to reduce the release of fine sediments or other pollutants into the water. Expansion of parking areas inland from the shore may create run-off problems impacting harbor or ocean water quality. Suitable BMPs need to be implemented during grading and paving work. Design of parking structures and roadways should include directing of run-off into percolation areas rather than directly into the harbor in order to minimize contributions of pollutants such as oil and gasoline spills from vehicles, and prevent thermal additions resulting from moderate rains falling on solar heated, paved surfaces.

Conclusions

Overall, the ferry terminal project could lead to improvement rather than degradation of the marine and coastal environment if BMPs are followed and if special care is given to reduce silt-laden and (after construction) petroleum based chemical and thermal runoff. One recommended method to reduce the amount of polluted runoff is to establish planted percolation areas on the mole to act as a natural buffer.

The installation of a wastewater treatment plant would reduce the amount of nutrients and pathogens entering the harbor. If proper BMPs are employed during construction and direct runoff into the harbor or ocean from paved surfaces minimized, the proposed activities should have minimal long-term adverse effects on the terrestrial plant community or the bordering marine communities.

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Appendix D

Archaeological Inventory Survey and CIA

ARCHAEOLOGICAL SURVEY
AND
CULTURAL IMPACT ASSESSMENT
FOR THE
MĀ`ALAEA SMALL BOAT HARBOR IMPROVEMENTS,
WAIKAPU AND UKUMEHAME AHUPUA`A,
WAILIUKU DISTRICT, ISLAND OF MAUI,
HAWAI`I
(TMK: 3-6-01:02, 3-8-14:28)

Prepared by
Pacific Legacy, Inc.
February 2005

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ABSTRACT

Pacific Legacy, Inc., under contract to Fukunaga and Associates conducted an Archaeological Assessment and Cultural Impact Assessment for proposed improvements for the Mā`alaea Small Boat Harbor from 13 - 23 December 2004. The archaeological assessment included archival research, pedestrian survey, shovel test probes, and backhoe trench excavation. The cultural impact assessment included informal "talk story" interviews about Mā`alaea and the surrounding area. This project is being proposed by the State Department of Land and Natural Resources – Division of Boating and Ocean Recreation to improve the harbor facilities at Mā`alaea, and is being partially funded by the Federal Transit Administration and is thus an "undertaking" as defined in 36 CFR 800.16(y). The current investigations are being conducted to fulfill the federal agency's obligations under Section 106 of the National Historic Preservation Act of 1966, as amended.

Test excavations in the three (3) project areas did not encounter any subsurface cultural deposits. Pedestrian survey encountered three (3) sites which have the potential to yield important information about the history of Mā`alaea and thus are significant under Criterion D.

Oral interviews revealed that Kapoli Spring, once thought to have dried out, is still flowing into the harbor near the boat ramp. The area is still used for gathering *limu* (seaweed), salt and fishing. The two *pōhaku* in front of Buzz's Wharf are culturally significant and measures need to be taken so that they may be protected from further abuse.

The plans for the proposed improvements to the vicinity of Mā`alaea Harbor were reviewed by the interviewees. Kahu Maxwell did not see any problems as long as the two *pōhaku* fronting Buzz's Wharf were not disturbed in any way.

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1.0 INTRODUCTION

Pacific Legacy Inc, at the request of Fukunaga and Associates, conducted an archaeological assessment and Cultural Impact Assessment (CIA) for the proposed Maalaea Small Boat Harbor Improvement project located in the *ahupua`a* of Waikapu and Ukumehame on the island of Maui (TMK:3-6-01:02, 3-8-14;28). This project is being proposed by the State Department of Land and Natural Resources – Division of Boating and Ocean Recreation (DLNR-DOBOR) to improve the harbor facilities at Mā`alaea, and is being partially funded by the Federal Transit Administration (FTA) and is thus an "undertaking" as defined in 36 CFR 800.16(y). The current investigations are being conducted to fulfill the federal agency's (FTA) obligations under Section 106 of the National Historic Preservation Act of 1966, as amended.

The Archaeological Assessment and Cultural Impact Assessment consisted of three separate, but interrelated tasks:

1. archival research,
2. oral interviews with knowledgeable persons; and
3. field survey

These investigations were conducted as part of an Environmental Assessment (EA) being conducted for this project. Juanita Aguerrebere Beck, B.A. conducted the archival research, Solomon H. Kailihiwa, III, B.A. and Jessica A. Ah Sam, B.A. conducted the archaeological survey and test excavations 14-17 December 2004, and Solomon H. Kailihiwa, III, B.A. conducted the oral interviews on Maui from 13 December and 20-23 December 2004. Paul L. Cleghorn, Ph.D. served as principal investigator.

1.2 PROJECT LOCATION AND ENVIRONMENTAL SETTING

Mā`alaea (Figure 1) is located on the southern, leeward coast of the island of Maui and receives, on average, less than 15 inches of rain a year (Juvik and Juvik 1998). The upper temperature ranges from ca. 80° to 90° F (26° to 32° C), while the lower temperature ranges from ca. 60° to 67° F (15° to 19°C) throughout the year (Armstrong 1983).

Vegetation in the project areas includes *kiawe* (*Prosopis pallida*), *koa ha`ole* (*Leucaena leucocephal*), bougainvillea (*Bougainvillea* spp.), and various grasses.

The soils in the project area include stony alluvial land, and Ewa silty clay. Each of these is described below.

> Stony alluvial land (rSM) consists of stones, boulders, and soil deposited by streams along the bottoms of gulches and on alluvial fans. In most places the slope is 3 to 15 percent. Elevations range from nearly sea level to 1,000 feet (Foote et al. 1972: 120).
>
> **Ewa silty clay, 3 to 7 percent slopes** – This soil has a profile like that of Ewa silty clay loam, 3 to 6 percent slopes, except for the texture of the surface layer [See Below] (Foote et al. 1972: 30).

> **Ewa silty clay loam, 3 to 6 percent slopes** (Eab). – This soil occurs on alluvial fans and terraces. Included in mapping were small areas of Honouliuli and Mamala soils. Also included were small areas of soils that have a silt loam surface layer and subsoil.
>
> In a representative profile the surface layer is dark reddish-brown silty clay loam about 18 inches thick. The subsoil, about 42 inches thick, is dark reddish-brown and dark-red silty clay loam that has subangular blocky structure. The substratum is coral limestone, sand, or gravelly alluvium. The soil is neutral in the surface layer and subsoil.
>
> Permeability is moderate. Runoff is slow, and the erosion hazard is slight. (Foote et al 1972:29)

Three project areas (Figure 2) were investigated during this archaeological investigation. Area 1 was the strip of land S of the southernmost intersection of Honoapiilani Highway and the Mā`alaea Harbor access road. The area is bounded by Honoapiialani Highway to the W, the access road to the N, Mā`alaea Bay to the E, and private property to the S.

Across the harbor access road to the N of Area 1, is Area 2. Area 2 consists of a gravel parking lot, and a hill slope to the W of Buzz's Wharf Restaurant.

Area 3 is at the intersection of Mā`alaea Road and Hau`oli Street. Area 3 is a gravel parking lot and *kiawe* scrub area. It is bounded by Hau`oli Street to the N, Mā`alaea Road to the W, condominiums to the E, and private property to the S.

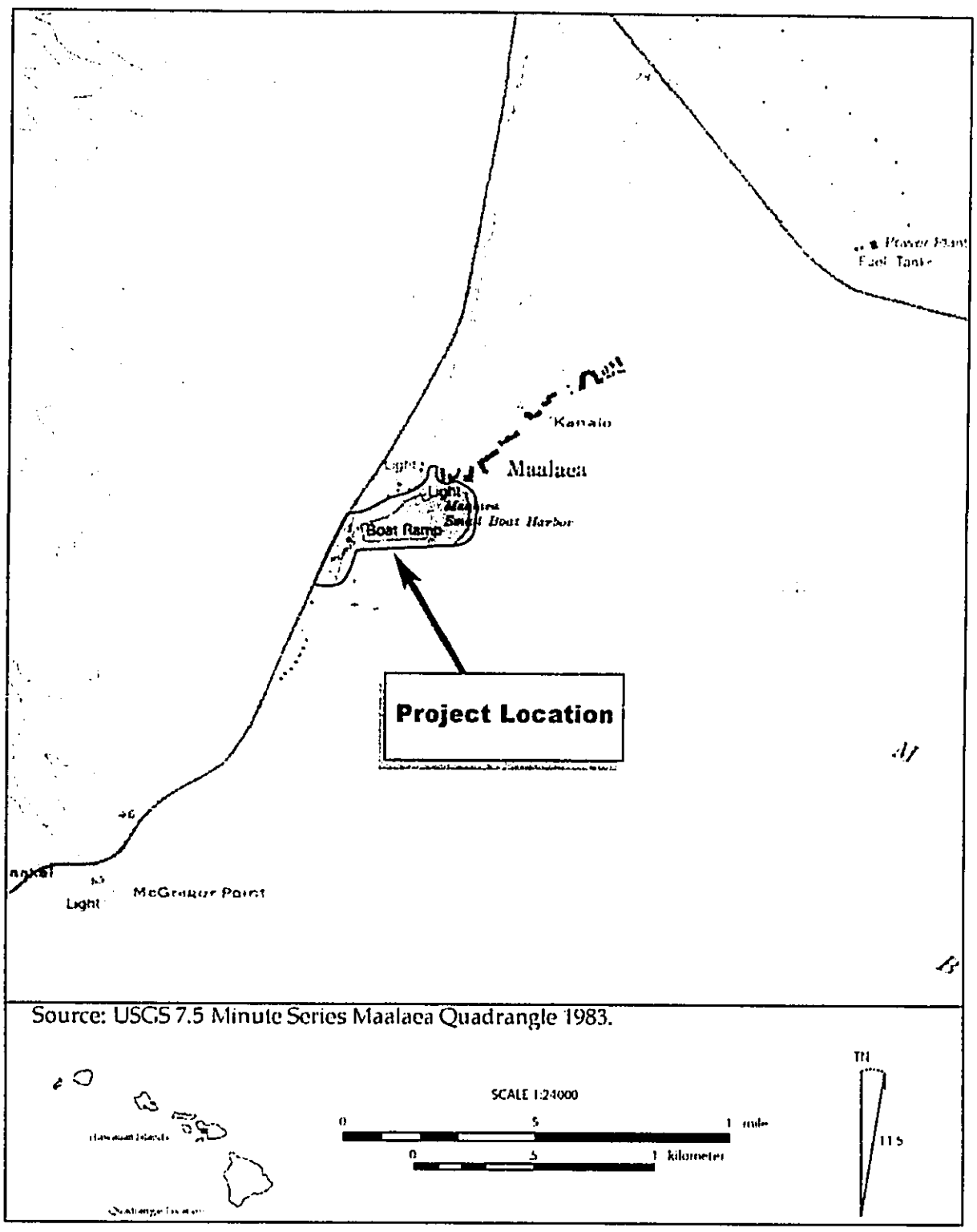

Figure 1. Project location map.

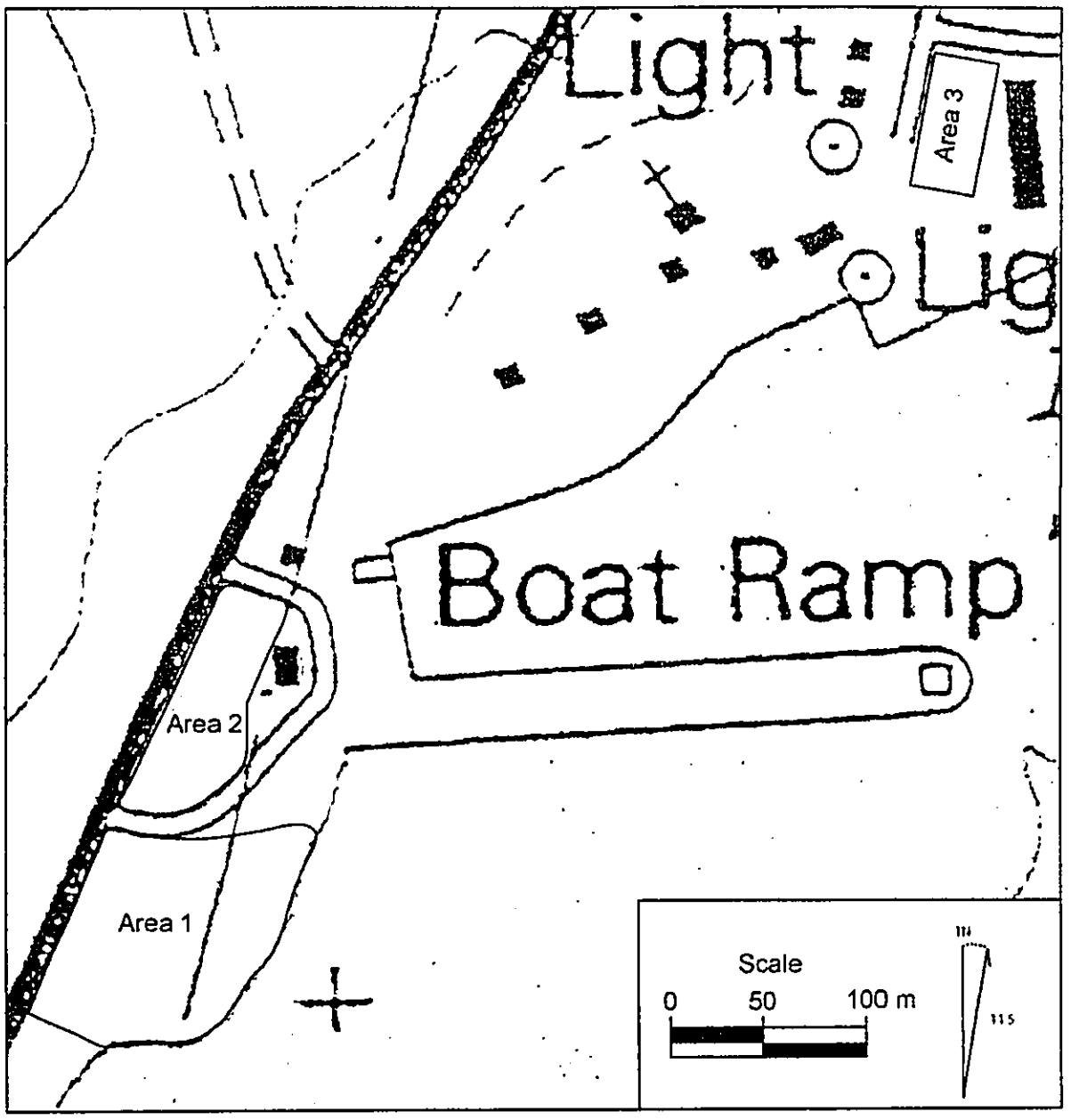

Figure 2. Project area locations (Source: USGS 7.5 Minute Series Maalaea Quadrangle 1983).

2.0 METHODS

2.1 ARCHIVAL RESEARCH

The primary means of collecting background information for the project area was by conducting archival research at the State Historic Preservation Division (SHPD) library, the State Library, and the State Archives. Research consisted of viewing early traveler's accounts, Land Commission Awards testimonies, and reports of previous archaeological investigations.

2.2 ORAL INTERVIEWS

Oral interviews were conducted, so that traditional cultural practices that take place, or have taken place could be identified. These interviews constitute the conducting of a Cultural Impact Assessment (CIA). The methods used follow Office of Environmental Quality Control guidelines for assessing cultural impacts. The purpose of a CIA is to identify traditional cultural practices which could be compromised by proposed development projects, and to comply with the Hawai'i State Department of Health Act 50.

The CIA guidelines state that project properties as well as surrounding property areas, shall be studied to determine the potential for significant and/or adverse effects on cultural practices of the community and State from the proposed construction or development. These guidelines also recommend personal interviews be conducted with knowledgeable informants and traditional cultural practitioners, concerning the cultural practices identified for the area.

On April 26, 2000 Governor Ben Cayetano signed Act 50 into law. The following CIA investigations are intended to satisfy Act 50, which has the stated purpose to:

> (1) Require that environmental impact statements include the disclosure of the effects of a proposed action on the cultural practices of the community and State; and (2) Amend the definition of "significant effect" to include adverse effects on cultural practices.

In order to perform the CIA investigation, attempts were made to contact various people that were knowledgeable of the Mā`alaea area. Many *Kanaka Maoli* (native Hawaiian) terms are used throughout the report. The depth of the Hawaiian language is such that, often, much is lost in translation to English. To hold the ideas from the *Kānaka Maoli* that were interviewed truer to form, terms are left in their Hawaiian form rather than being translated into English. An English explanation of the Hawaiian term is presented at first usage to give the non-native speaker an idea of the word's meaning.

Semiformal interviews were conducted and recorded on audio microcassettes when possible. Information was also gathered via phone conversation and e-mail. The interviews followed a "talk-story" format and the questions led to themes so that the interviewee would be able to tell what he or she thought was most important to them. The interviewees were given a chance to

read over the results of the oral interviews in order to ensure that they were not misrepresented, and that their expressed views were correct.

2.3 ARCHAEOLOGICAL TESTING

Each of the three project areas was surveyed on foot with a 5m spacing between archaeologists. Shovel test probes (STP) were excavated using a shovel, metal *`o`o* (digging stick), and trowel. The excavated soil was screened through .25 inch wire mesh, and cultural material was collected. The cultural material was brought back to the laboratory, analyzed and then discarded. Test Trenches were excavated using a backhoe. One wall of the trench was drawn in profile and the soil layers were described using standard nomenclature and munsell soil color notations.

3.0 BACKGROUND

3.1 TRADITIONAL OVERVIEW

The flat coastal plains of Western Maui, surrounding Mā`alaea Bay supported many fishing settlements and isolated fishermen's houses. Sweet potato grown in sandy soil or red *lepo* (soil) would have been a food staple at these locations (Handy in Sterling 1998:17).

The seas of Mā`alaea had several names: *Kai-o-Hauí* is the name of the sea from Lahaina to Mā`alaea and the *Kai-o-Anehe* is the name of the "sea from Mā`alaea to Keoneoio, between Kahoolawe and Molokini"(Sterling 1998:17).

In 1902, A.D. Kahulelio wrote of the fishing tradition and describes that the Lahaina District had specific boundaries for *`ō`io* (*Albula vulpes*) fishing, which were "from the steamer landing of Maalaea to the cape of Kunounou at Honokapohau, district of Lahaina, Kaanapali, Honolua, and Honokohau" (Sterling 1998:17).

Kapoli Spring is located near the shore at Mā`alaea. Kapoli is mentioned as the landing where Chief Kiha-a-Pi`ilani escaped in order to avoid the wrath of his brother Lono-a-Pi`ilani.

> Kiha-a-Pi`ilani bore his troubles, his poverty, and homeless state patiently. His life was saved by leaping from the fortress of Paku`i and fleeing to Lanai. From Lanai he sailed and landed at Kapoli in Mā`alaea and from thence to the upland of Honua`ula (Kamakau 1992:22-23).

Moses Manu, in the Hawaiian newspaper *Ka Nupepea Kuokoa*, wrote "The Story of Kihapiilani," in which Kapoli Spring is also mentioned.

> When Kihapiilani and his wife were on the road at the site of that rock Unula [Unu`ula], it was there that they began to descend down to Kapoli. They came to the plain of Puhele and just before this place they met with several people who were going to the sea of Kama`alaea carrying bundles on their backs. These two first gave words of greeting as did likewise these people. Kihapiilani asked, "Where are you coming from?" These people answered, From Kalua here. We are going down makai to the shore to trade some food (Sterling 1998: 21).

Kapoli was also the site were the high chiefs landed to take the burial remains of Kekaulike, the ruling Chief of Maui to I`ao in 1736.

> ...fearing the arrival of Alapa`i, bent on war, the chiefs cut the flesh from the bones of Ke-kau-like in order to lighten the load in carrying the body to `Iao [for burial]. Placing the remains on a canoe, they sailed and landed at Kapoli in Ma`alaea and thence went to Pu`uhele... (Kamakau 1992:69)

After landing in Kapoli, the remains of Kekaulike were taken to Kapela, the secret burial cave for the high chiefs in I`ao.

The spring of Kapoli, which means "bosom" is generally considered to have dried up, (see Section 5.1) but is now the site of Pōhaku O Mā`alaea, where two boulders rest in front of Buzz's Wharf Restaurant (James 2001). One is reportedly a *pōhaku piko*, a stone used in the ritual placing of the *piko*, the umbilical cord stump of a newborn child. This was done to gather *mana* for the child. The other *pōhaku* was used for either food preparation or adze grinding and is known as "Kings Table" (James 2001, Moore and Kennedy 1995).

According to James (2001), the stones were originally from an ancient Hawaiian village Manu`ōhule, located west, and upslope of Mā`alaea. Manu`ōhule had many *pōhaku* with various carved petroglyphs near its *heiau*. In 1952 many of the *pōhaku* and stones from the *heiau* were used for the construction the breakwater for the Mā`alaea boat harbor.

> Boulders from this village were used in the construction of the breakwater at Mā`alaea Boat Harbor, but, when it was discovered that the ancient village was being destroyed to provide building materials, two *pōhaku* were saved from the fate of hundreds of others. They stand at the present location as a remainder of all the ancient sites that have disappeared in order that new sites might be established (James 2001).

However, the original locations of these stones remain unknown (Moore and Kennedy 1995).

3.2 Historical Overview

The earliest historical account referring to Mā`alaea Bay is with the re-building of the Lahainaluna School (established in 1831). The lumber for the new school was gathered from the forest of East Maui, and hauled over 35 miles to Mā`alaea Bay, where they were placed in canoes for transportation to Lahaina (Speakman 1978).

During the Great Māhele of 1848, two Land Commission Awards (LCA) were granted with in the project area: LCA 1156 and LCA 2959. LCA 1156 was awarded to Kaili who had lived there since 1829. This LCA consisted of a house lot that was surrounded by government land (Waihona 'aina 2004). The other LCA 2959 was awarded to Hika, which consisted of a house lot at Mā`alaea. This was given to Hika from Kaai in 1846, who "received this from his father Keako in old times" (LCA 2959 Waihona `aina 2004).

The California Gold Rush (1848-1850) proved to be profitable for the people of Hawaii. The people of West Maui started growing Irish potatoes for export to San Francisco (Speakman 1978:161). The Maui Field was called *Nu Caliponi* or New California and Irish potatoes were grown from Kalepolepo to Lahiana. Hawaiians hauled their "gold" to port. David Malo wrote of buying Irish potatoes to be shipped to Honolulu which were grown in this area of Maui (Malo 1853). In addition, sweet potato, onion, pumpkins, oranges, coffee and molasses were other goods exported to the West Coast of the United States.

Much of the land in Waikapu, which Mā`alaea is a part of, was converted for the use of agricultural activities, primarily sugar cane (Moore and Kennedy 1994). The establishment of

the Māhele created a chance for foreigners to buy land fee simple. The entire ahupua`a of Waikapu was sold to Henry Cornwell for the price of $15,050 by King Kalākaua on November 18, 1885. Henry Cornwell was the brother-in-law of James Louzada of Waimea, Hawaii (Speakman 1978). It was James Louzada, who introduced cattle production and sugarcane cultivation to Maui, sometime after 1823 (Moore and Kennedy 1994).

Louzada and Cornwell started Waikapu Plantation, in which a mill was erected at the entrance to Waikapu Valley. The Waikapu Plantation eventually fell into the control of the Wailuku Sugar Company in 1894 (Speakman 1978:120). By 1913, Wailuku Sugar Company cooperated with Maui County in the development of water tunnels in the Waikapu and Wailuku Valley (Wilcox 1996). The lands surrounding Mā`alaea Boat Harbor were also used for sugar cane production (Moore and Kennedy 1994).

Kapoli at Mā`alaea was a notable canoe landing during both prehistoric and historic times. Prior to the 20th Century, it is known that Mā`alaea Bay was used as a shipping point (Moore and Kennedy 1994). Indeed, this portion of Mā`alaea Bay was a fairly well developed maritime settlement which was centered upon its single pier wharf and hotel. Mā`alaea had a wharf with a pier, a boat house, a hotel with a café and was home to several Native Hawaiians (Jackson 1883). By 1902 the pier was in a condition of extreme dilapidation (Joeger and Kaschko 1979).

Much of the land in Waikapu, which Mā`alaea is a part of, was converted for the use of agricultural activities, primarily sugar cane (Moore and Kennedy 1994). The Wailuku Sugar Company was formed in 1862. By 1913 Wailuku Sugar Company cooperated with Maui County in the development of water tunnels in the Waikapu and Wailuku Valley (Wilcox 1996). The lands surrounding Mā`alaea Boat Harbor were used for sugar cane production (Kennedy and Moore 1994).

The Mā`alaea boat harbor was built in 1952 by the Territory of Hawaii as the preferred site for a small boat harbor. By March 1953 a breakwater and dredging were completed (Joeger and Kaschko 1979). It is reported that state workman tore down the remains of a *heiau* upslope from the harbor site in order to use the stones for a massive breakwater (Surfrider Foundation). The incident where the *heiau* was dissembled and incorporated into the harbor walls was recanted during the oral interviews (See Section 5.1).

Another large breakwater, was built in 1958 due to the complaints about the harbor's safety during stormy weather (Joeger and Kaschko 1979). The two breakwaters are known as the West and East Breakwater. Additional harbor modifications followed in the early 1960's, but complaints continued.

In the late 1960's, the U.S. Army Corps of Engineers proposed a plan that would alleviate the concerns and increase the capacity at the harbor to twice its current boat capacity (Townsend 1999). The concerns that the community had with the proposed expansion, were that it would impact the marine environment and the favorite surf breaks (Townsend 1999, Surfrider 2004). Proposed breakwater construction would have involved destruction of 4.8 acres of healthy reef-negatively impacting the marine reefs and ecosystems. The proposed plan also would eliminate a popular surf spot ("Off-the-wall") and the canoe paddler's beach.

3.3 PREVIOUS ARCHAEOLOGY

Several State Sites are located in the vicinity of the project area. Pōhaku O Mā`alaea are two large boulders (as mentioned in Section 3.1) recorded as State Site 50-50-09-1440. However the origin of these boulders are not known.

Walker (As cited in Sterling 1998) describes a *ko`a* (fishing shrine), a series of habitation sites, a *heiau* (temple), and a petroglyph site in the vicinity of Mā`alaea Harbor. The *ko`a* is upslope of the harbor. A semicircular wall encloses a platform. Coral is scattered across the platform, and fishbone and shells were found in one of the corners of the platform (Walker as in Sterling 1998:21).

Walker noted a series of habitation sites between Mā`alaea village and McGregor Point. He notes that there are at least 45 sites, which consist mainly of low-walled enclosures, and cleared spaces, which he calls house platforms. Some of the sites, he claims, may have been *ko`a* or other types of shrines (Walker as in Sterling 1998:21).

Walker describes another *heiau* upslope and to the W of Mā`alaea Harbor. The *heiau* is 60 feet by 90 feet, with walls that are 6 feet thick and 8 feet tall at the corners, built of large, red basalt boulders. The SW corner is paved and two platforms are in the E side, the entrance is located in the S of the structure. Near the entrance are boulders that have petroglyphs on them. To the NE of the *heiau* structure are burial platforms within low-walled enclosures (Walker as in Sterling 1998:21).

Upslope and to the N of the *heiau*, Walker describes boulders that have petroglyphs on them. Sixty (60) boulders are described in Walker's text (Sterling 1998). The petroglyphs include human figures, animal figures, and letters. Walker cites that some of the petroglyphs may be recent as cowboys often come through the area and may create new petroglyphs during their short rest breaks (Walker as in Sterling 1998:22-23).

A petroglyph site is located *mauka* of Mā`alaea Small Boat Harbor. Site 1169 is currently described as including 11 boulders with approximately 60 petroglyphs (Moore and Kennedy 1995). This may be the origin of Site 1440 due to the close proximity of the two sites.

In 1986, Kennedy identified a site adjacent to Mā`alaea Small Boat Harbor. Site 1604 is a historic Japanese shrine named Mā`alaea Ebisu Jinja. The shrine is believed to have been built in the first half of the 20th century and may have been built as early as 1916 (Moore and Kennedy 1994). In 1994, two additional sites were located on the same property (Moore and Kennedy 1994). Site 3553 and 3554 are both burials. Site 3553 was fragmentary burial, and Site 3554 was an intact burial.

In 1991, Tomonari-Tuggle and Tuggle investigated the Lahaina Pali Trail, a 4.5 mile trail along the lower southern slopes of Western Maui. The trail runs along Keaalalola Ridge in Ukumehame Ahupua`a. The western end is situated *mauka* of the Honapiilani Highway, east of Ukumehame Beach Park. The trail's eastern boundary is *mauka* of Mā`alaea Boat Harbor, however, the trail appears to disappear and does not continue to the coast. This may be the result of the impact of modern agricultural activities.

4.0 ARCHAEOLOGICAL FINDINGS

Archaeological pedestrian survey, and testing was conducted at three areas in the vicinity of Mā`alaea Harbor (Figure 2).

4.1 AREA 1

Area 1 (Figure 3) is adjacent to the southern intersection of Honapiilani Highway and Mā`alaea Road. The area is mostly covered with grass and *kiawe* (*Prosopis pallida*). Three features, constituting a single site (State Site No. 50-50-09-5645), were located during the pedestrian survey of Area 1.

Feature 1 (Figures 4, 5, and 6) is the remnant of a concrete bridge that spans the width of a dry gully that is littered with recent garbage (Figure 6). The bridge is ca. 14 m long and 6.5 m wide. The height of the middle of the bridge to the bottom of the middle of the gully is ca. 5 m. The bridge foundation in the gully is rounded basalt boulders cemented together. The S end of the bridge is covered by a mound of dirt and *kiawe* stumps. No date, or name inscriptions were found on the bridge.

Feature 2 (Figures 7, and 8) is a single alignment of basalt boulders that have been cemented together. The alignment is parallel to Honoapiilani Highway and is located 1.5m E of the Highway. Feature 2 appears to be aligned with Feature 1 and may be the curbing of an historic roadway.

Feature 3 (Figures 9, and 10) is a concrete pad that incorporates basalt boulders into its construction. It appears that the W portion of the pad is devoid of the basalt boulder top. Dirt and large pebbles remain in this area. The basalt boulders appear to be on top of a concrete pad. A black, petroleum-based paper has been incorporated into the base of the concrete pad to possibly act as a moisture barrier. This feature is also right next to Honoapiilani Highway.

A total of 13 STPs were excavated in Area 1 (Figure 3). Eight STPs (STP 1,2, 4-12) were excavated along a bearing of 200°E of magnetic north from the edge of Feature 1 to the S property boundary. One STP (STP 3) was excavated adjacent to the E side of Feature 2 in order to see if Feature 2 extended to the E. Three STPs (10-12) were excavated adjacent to the gully and followed the gully from the bridge down to the shore. One more STP (STP 13) was excavated adjacent to the cliff face, E of STP 4.

Excavation depths of the STPs ranged from 20 - 70 cm below the ground surface and averaged ca. 40 cm deep. STP 4 was excavated the deepest. This probe was to see if there was a change in stratigraphy or material culture (if any) at a depth below 50cm below ground surface. The stratigraphy was generally the same, a single layer of brown (7.5YR 4/4) silty clay. The STPs are detailed below in Table 1. The material recovered from the STPs is in Table 2.

A modern memorial was also encountered during the pedestrian survey of Area 1. The memorial consists of a bronze plaque cemented to a large basalt boulder (Figure 11). The plaque has the following inscription:

IN LOVING MEMORY
LESLIE ANN SPARKS
11-15-64 – 7-20-98

Table 1 . Shovel test probes in Area 1.

Test Unit No.	Stratum	Depth Below Ground Surface (centimeters)	Observations
1	I	0-50	Brown (7.5YR 4/4) silty clay
2	I	0-50	Brown (7.5YR 4/4) silty clay
3	I	0-40	Brown (7.5YR 4/4) silty clay
4	I	0-70	Brown (7.5YR 4/4) silty clay
5	I	0-50	Brown (7.5YR 4/4) silty clay
6	I	0-50	Brown (7.5YR 4/4) silty clay
7	I	0-40	Brown (7.5YR 4/4) silty clay
8	I	0-30	Saprolitic Rock
9	I, II	0-30	Brown (7.5YR 4/4) silty clay (0-10 cm) Saprolitic Rock (10-30 cm)
10	I	0-30	Brown (7.5YR 4/4) silty clay
11	I	0-30	Brown (7.5YR 4/4) silty clay
12	I	0-30	Brown (7.5YR 4/4) silty clay
13	I	0-20	Brown (7.5YR 4/4) silty clay

Table 2. Area 1 shovel test probes' contents.

Contents	STP 4	STP 5	STP 6	STP 7	STP 9
Artifacts					
Nylon Rope				x	
Shag Carpet	x	x	x	x	x
Plastic		x	x	x	x
Plastic Mulch Paper		x			
Sugar Cane Slag		x			
Marble		x			
Metal					x
Glass					
Brown			x		x
Clear		x			x
Midden					
Fish Bone			x		
Unidentified Bivalve	x	x	x	x	
Coral		x	x	x	x
Turbo Shell		x	x	x	
Operculum		x			
Opihi		x			
Crab		x			

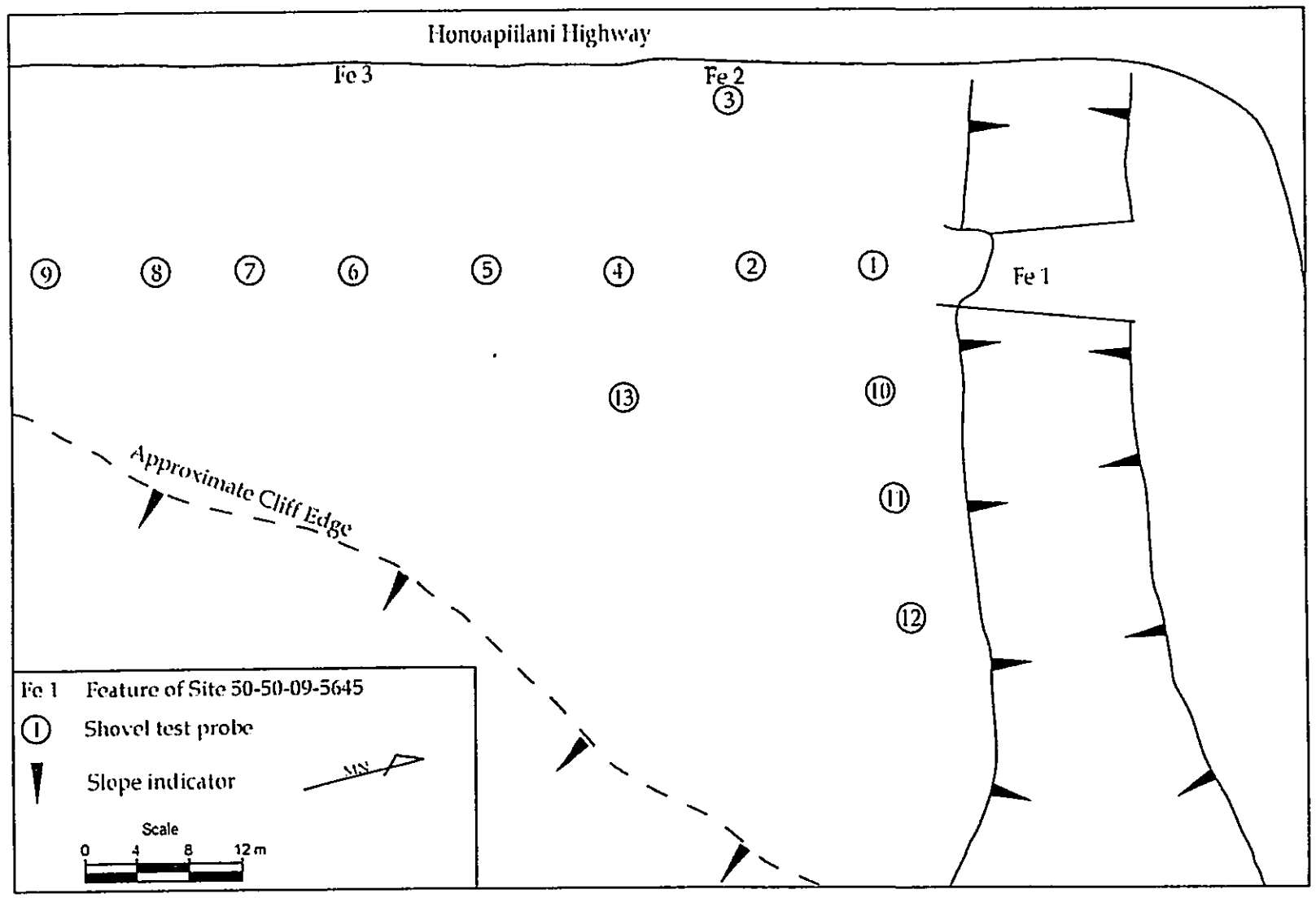

Figure 3. Plan view map of Area 1.

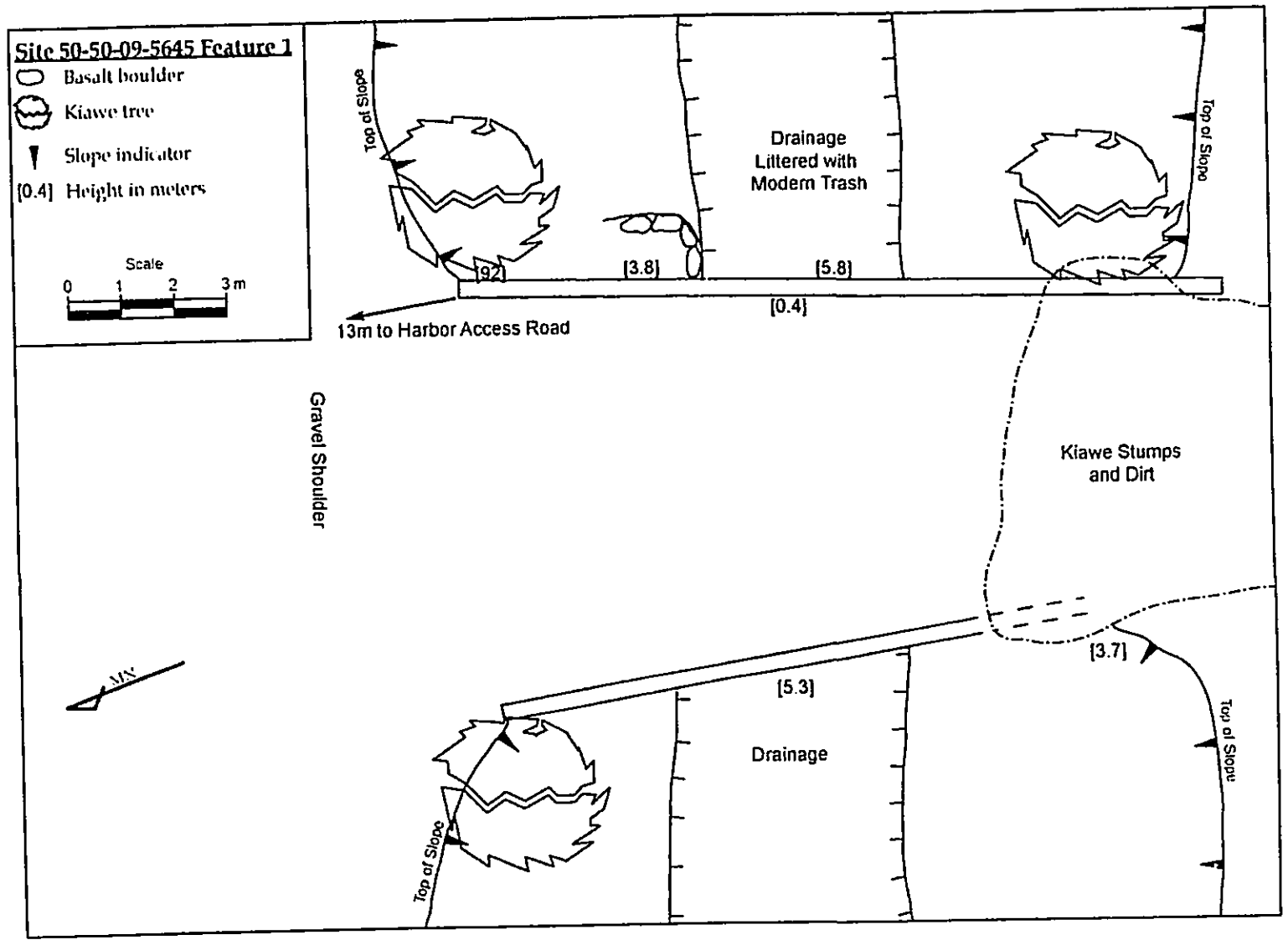

Figure 4. Plan view map of 50-50-09-5645 Feature 1.

Figure 5. 50-50-09-5645 Feature 1, view to S.

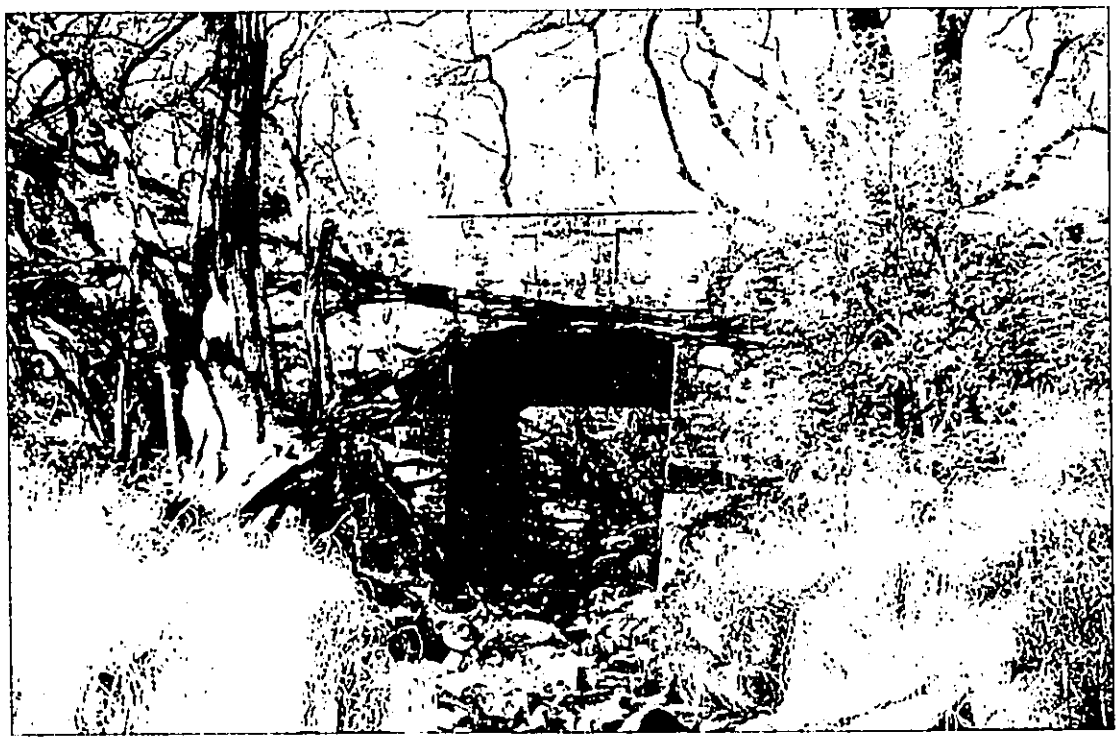

Figure 6. 50-50-09-5645 Feature 1, view to W.

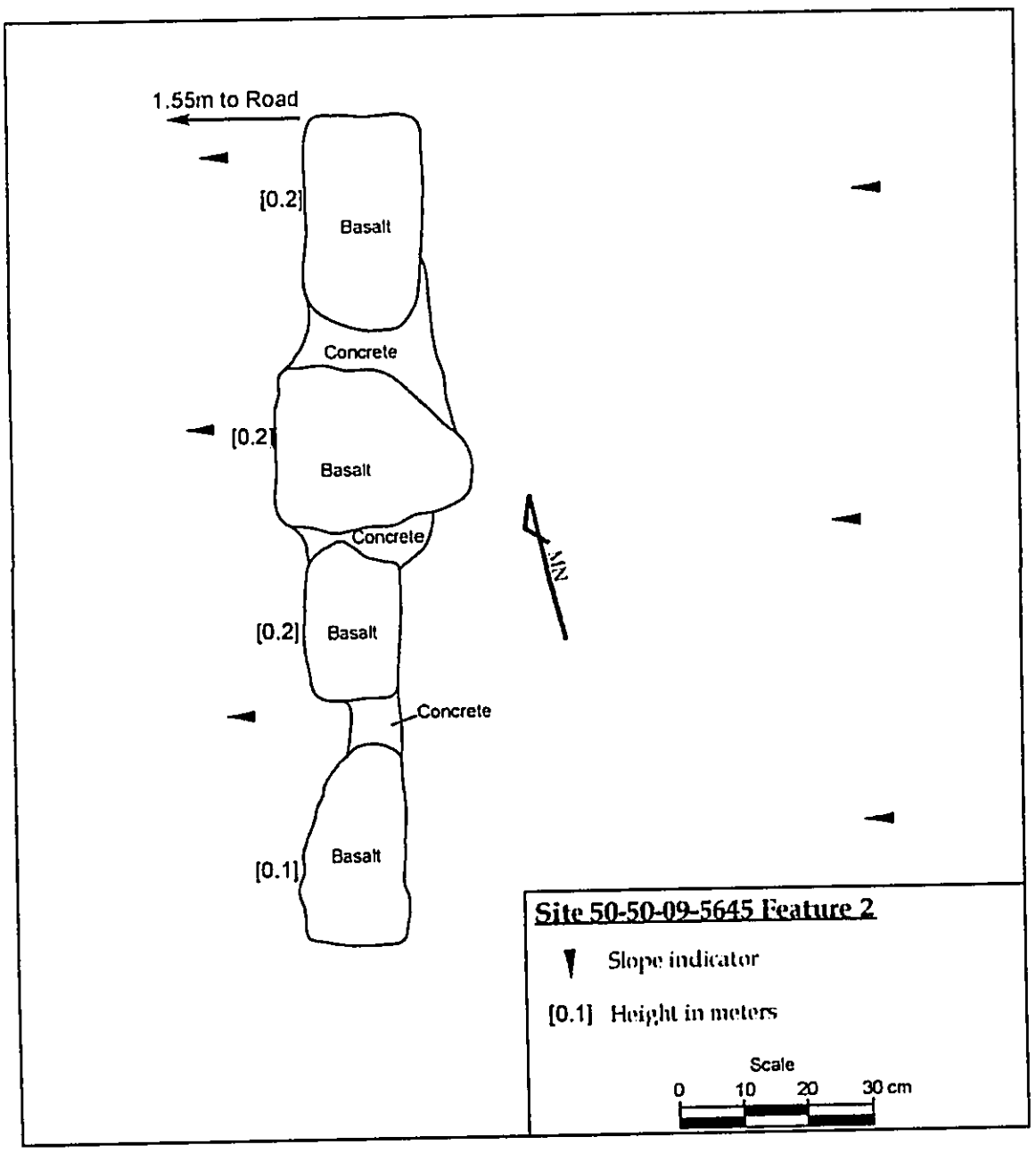

Figure 7. Plan view map of 50-50-09-5645 Feature 2.

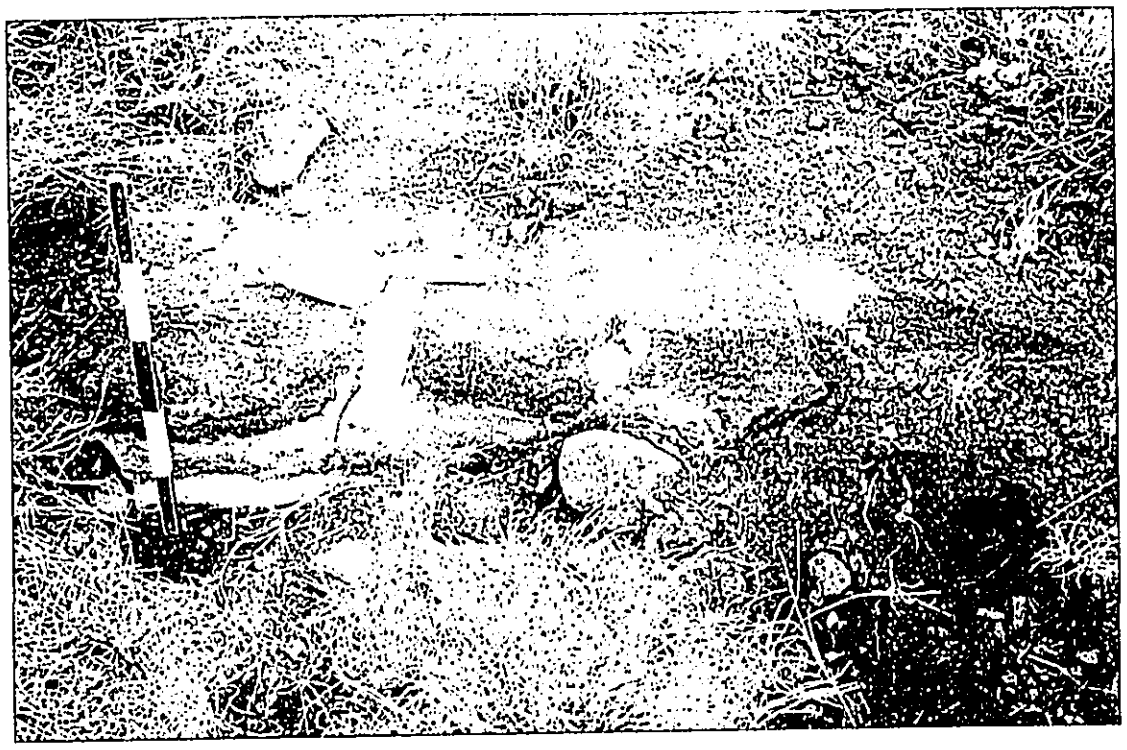

Figure 8. 50-50-09-5645, view to E.

Figure 9. 50-50-09-5645 Feature 3, View to E.

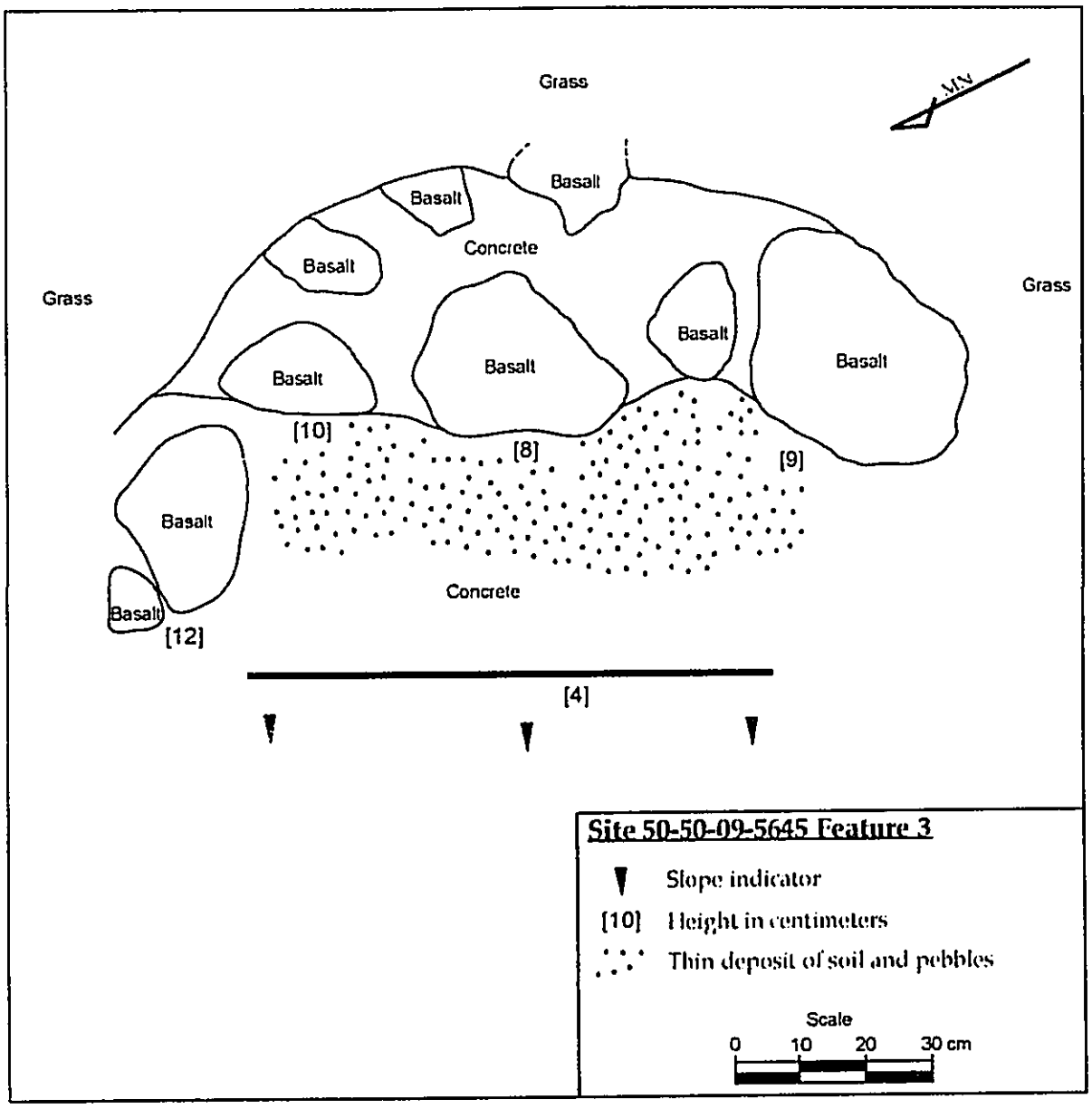

Figure 10. Plan view map of 50-50-09-5645 Feature 3.

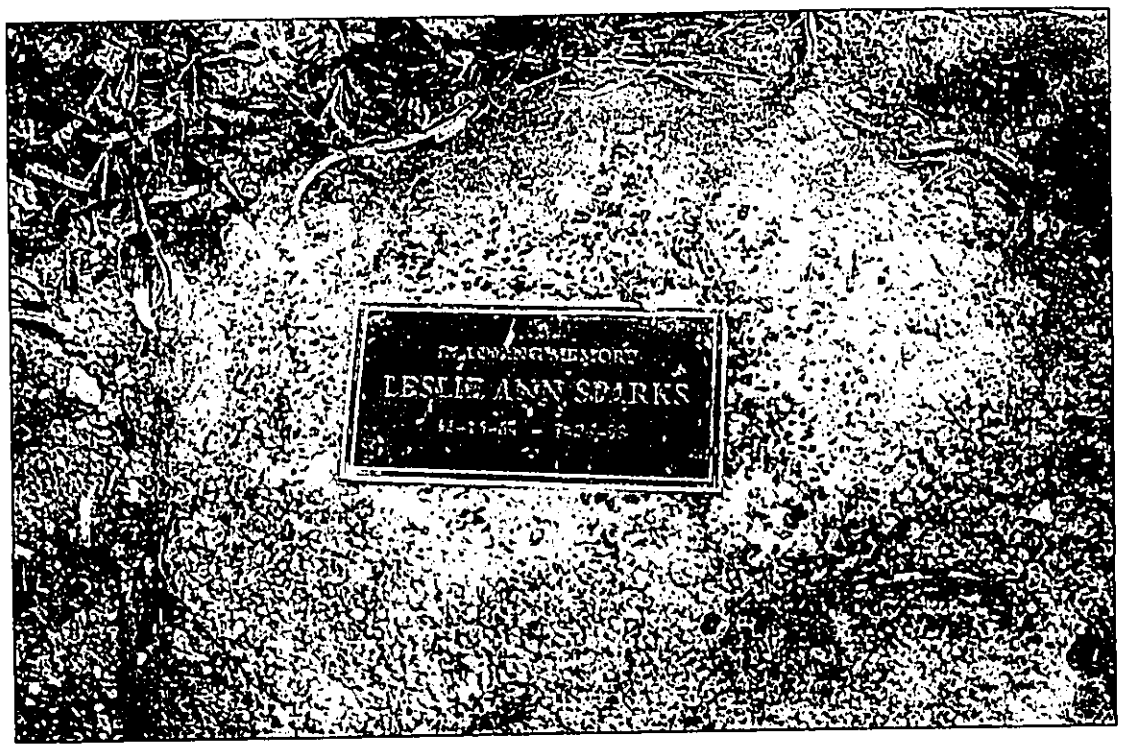

Figure 11. Memorial to Leslie Ann Sparks.

4.2 AREA 2

Area 2 (Figures 12, and 13) is located across an harbor access road to the N of Area 1 (Figure 2). A pedestrian survey was conducted in the area and yielded no visible archaeological sites. Part of Area 2 is currently used as a parking lot, part of it is *kiawe* scrub, and a third part of Area 2 is being landscaped with bougainvillea. Backhoe trench excavation took place in the NW corner of the gravel parking lot (Figure 14).

Trench 1 (Figure 15) was located in the N end of the open gravel area of Area 2 bearing E-W. Caliche was encountered in the trench in a layer of rounded basalt pebbles. The soils for Trench 1 are described below.

Stratigraphic Layer	Depth Below Ground Surface (in centimeters)	Description
Fill	0 - 60	Bands of angular pebbles mixed with red silty clay. Most likely added to level out area.
I	0/60 – 70/85	Dark Reddish Brown (5YR 3/3) silty clay; moist, friable plastic, slightly sticky; wavy abrupt boundary.
II	70/85 - 120+	Rounded basalt pebbles mixed with dark reddish brown silt. Deposits of caliche also present within pebbles.

Figure 12. Area 2 overview, view to NE.

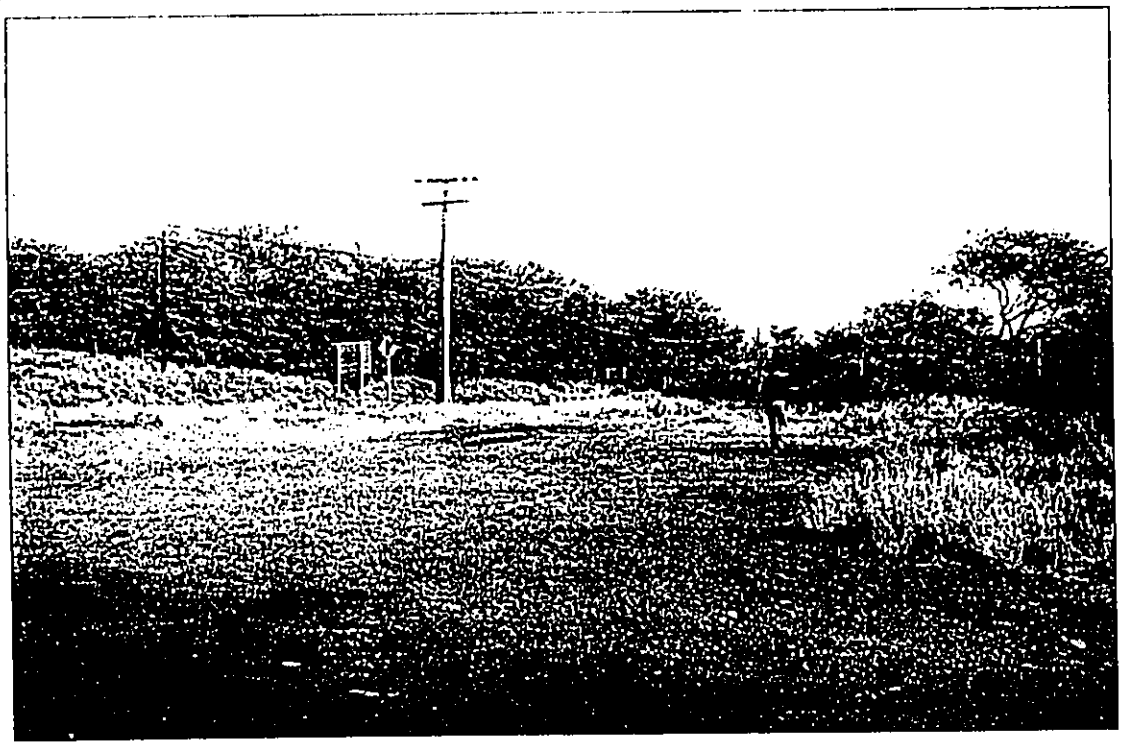

Figure 13. Area 2 overview, view to N.

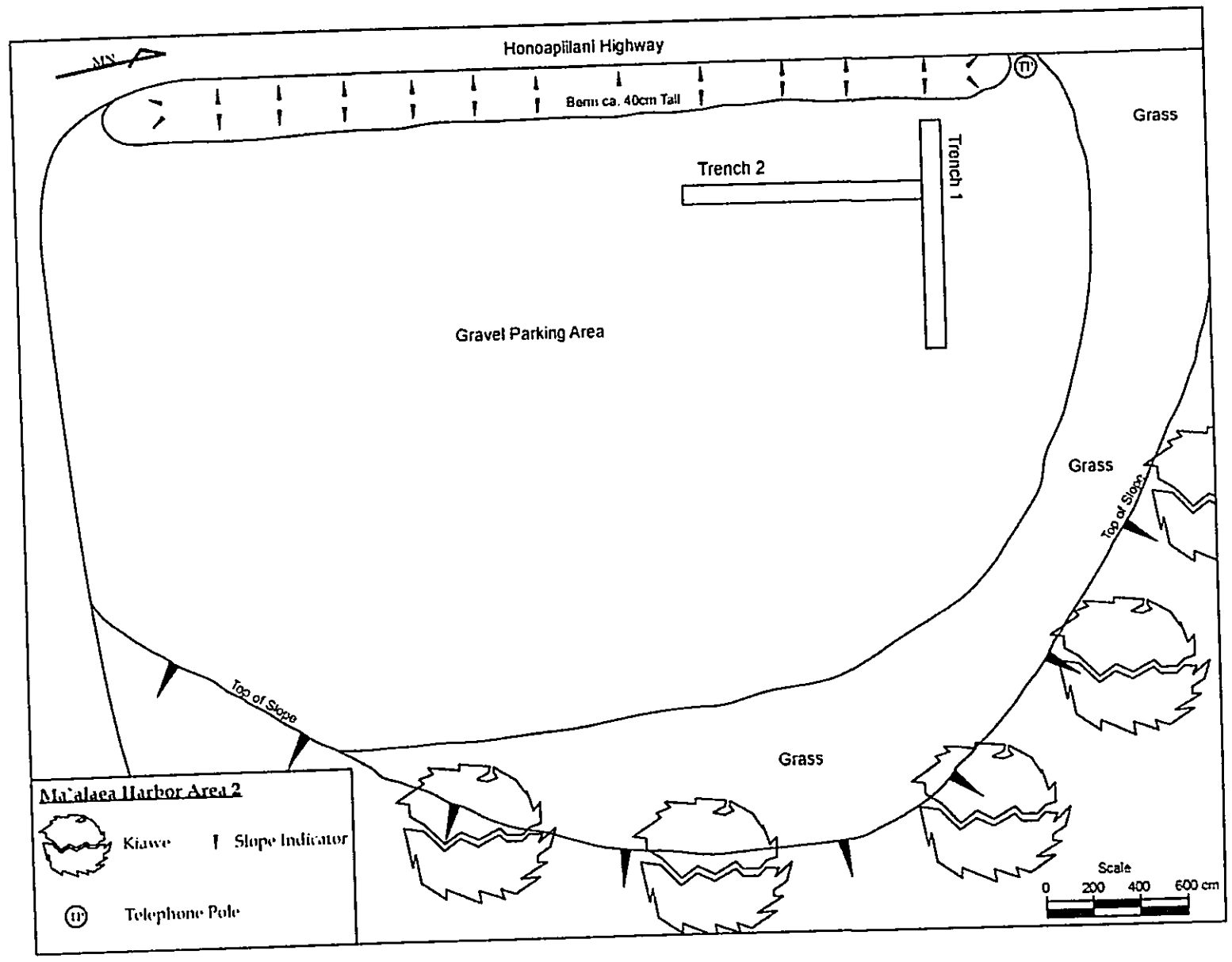

Figure 14. Plan view map of Area 2.

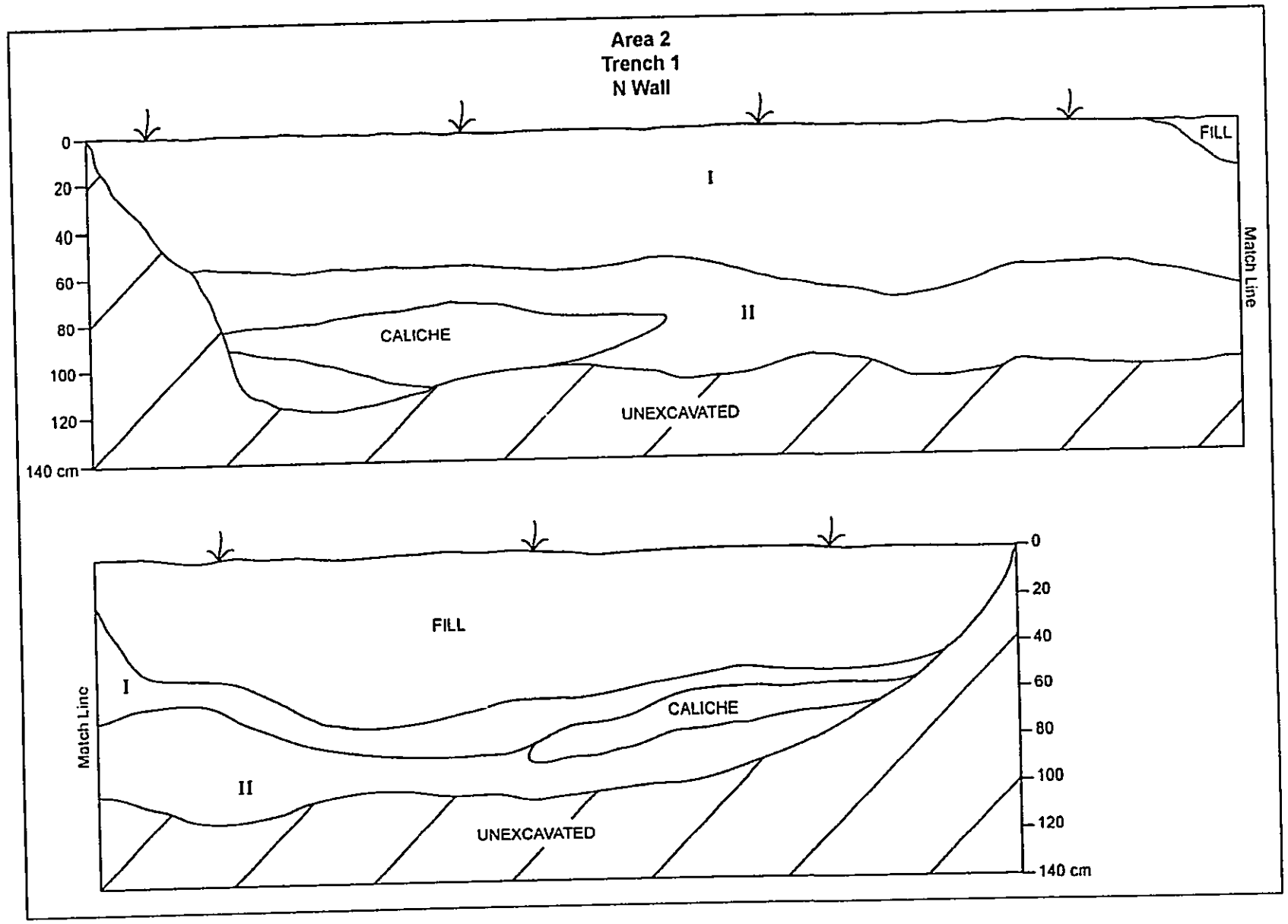

Figure 15. Profile of Area 2 Trench 1.

Area 2 Trench 2 (Figures 16 and 17) was excavated perpendicular to Trench 1 (Figure14) in order to see if Layer II was a natural event (i.e. a result from a flooding episode) rather than a man-made occurrence. The layer of rounded basalt pebbles was present though it started at a shallower depth and proceeded to go deeper towards Trench 1. Bands of caliche were present in the lower stratigraphic layer (Figure 16). The soils from Area 2 Trench 2 are described below.

Stratigraphic Layer	Depth Below Ground Surface (in centimeters)	Description
I	0 – 20/40	Dark Reddish Brown (5YR 3/3) silty clay; moist, friable, plastic, sticky; wavy abrupt boundary.
II	20/40 – 50/70	Rounded basalt pebbles mixed with dark reddish brown silt. Deposits of caliche also present within pebbles. Abrupt, wavy boundary.
III	50/70 - 135+	Dusky Red (2.5YR 3/2) silty clay; moist, friable, plastic slightly sticky; Base of excavation; Bands of caliche present.

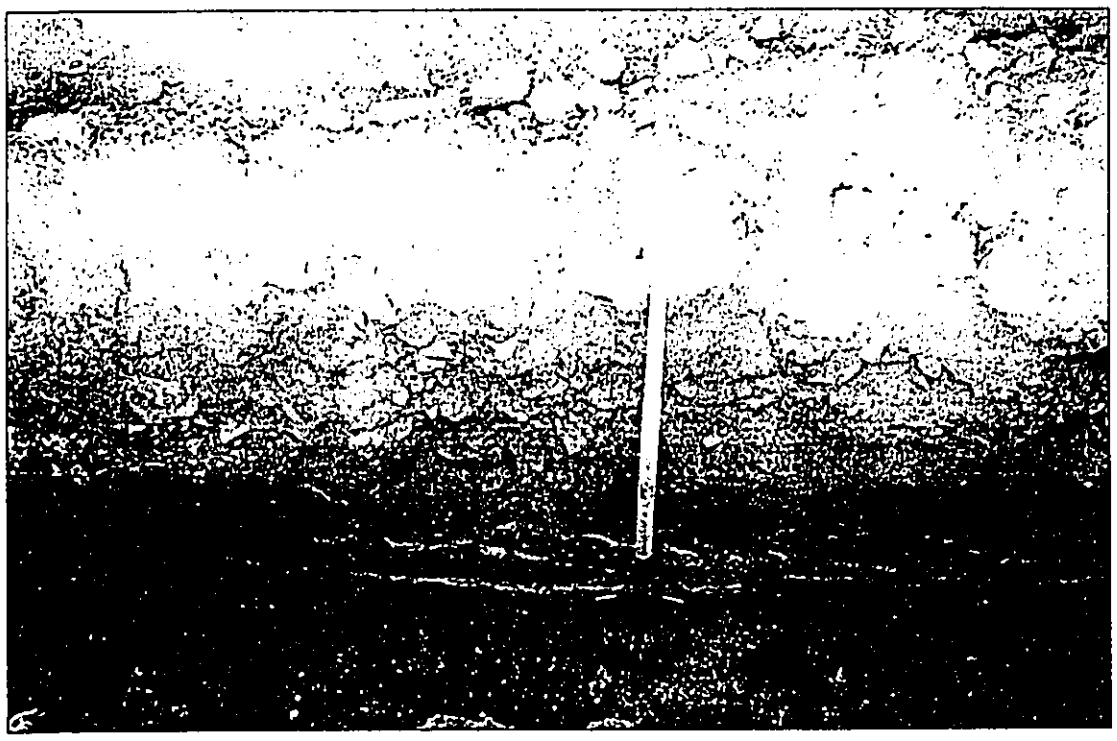

Figure 16. Area 2 Trench 2, W wall (Shovel is 145cm Tall) (Note caliche layers at base of excavation).

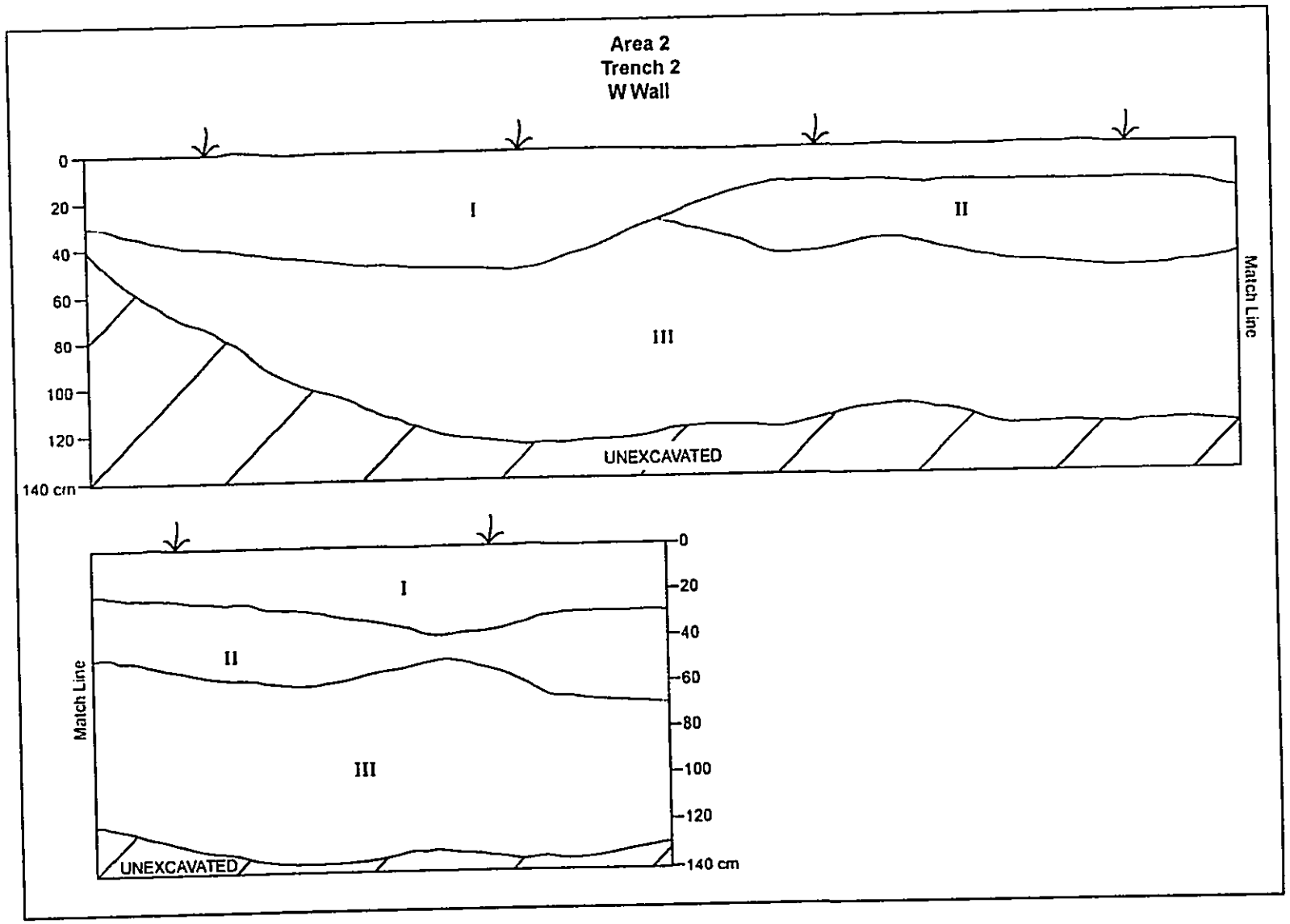

Figure 17. Profile of Area 2 Trench 2..

4.3 AREA 3

Area 3 is located near the NE side of Mā`alaea Harbor (Figure 2). Pedestrian Survey of the area did not encounter any surface archaeological remains. Four trenches were excavated with a backhoe (Figures 18, and 19). One end of each of the trenches was excavated as deep as the arm of the backhoe could reach, which was ca. 4.1m (ca 13 feet), in order to see if there were any type of sand deposits. No sand deposits were encountered. The backhoe operator stated that before the *kiawe* had been cleared from the lot, people used dump their garbage in the trees. He also stated that the elevation of the parking lot area used to be a lot lower and that a lot of fill was brought in to get the lot to its current elevation.

From a depth of 80 cm - 120 cm below ground surface, Trench 1 encountered modern trash in the form of metal cable, plastic bags, nylon rope, and rotted wood. (Figure 20). Three stratigraphic layers were present in Trench 1 (Figure 21) and are described below.

Stratigraphic Layer	Depth Below Ground Surface (in centimeters)	Description
I	0 - 20	Small angular basalt pebbles. Top layer of gravel parking lot, abrupt smooth boundary.
II	20 - 60/410+	Dusky Red (2.5YR 3/2) silty clay; very fine platy structure; moist, hard, slightly sticky, very plastic; Abrupt smooth boundary when present.
III	60 - 150+	Dark Reddish Brown (5YR 3/3) silty clay; blocky; moist, friable, slightly sticky, plastic.

Trenches 2 and 3 also contained Layers I and II. The further inland, the thicker the layer of gravel (Layer I) appeared. In Trench 2, the inland most trench, Layer I is present from the ground surface to 120cm below the ground surface (Figure 22). In Trench 3, located between Trenches 1 and 2, Layer I is present from the ground surface to ca. 100cm below the ground surface (Figure 23).

Trench 4 was not profiled. It was excavated perpendicular to the dry stream bed that is present in the E portion of the property. Only one stratigraphic layer was noted. That layer corresponded with Layer II in the previous three trenches. A black plastic garbage bag was noted in the S sidewall of the trench at 60 cm below surface (Figure 24).

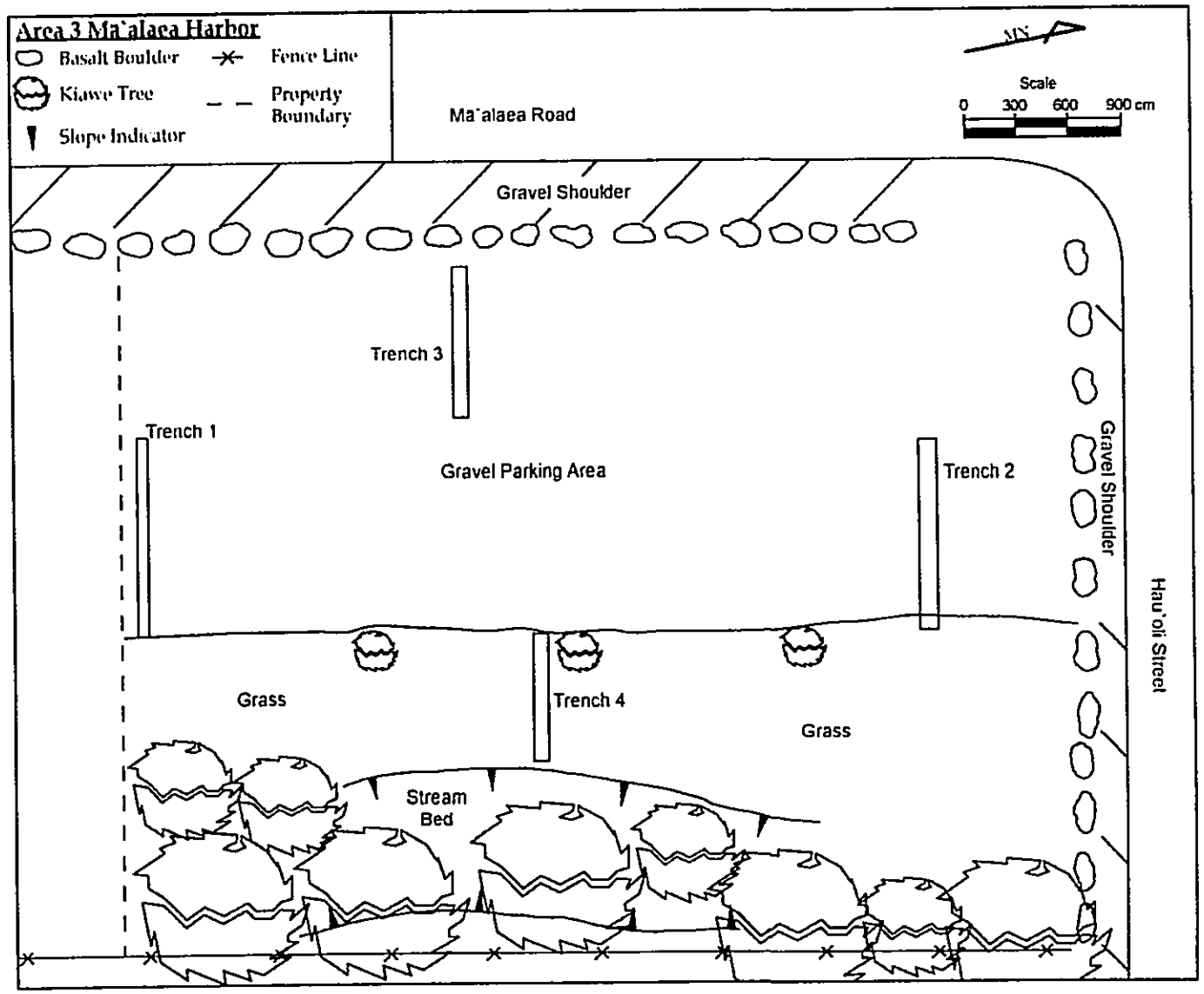

Figure 18. Plan view map of Area 3.

Figure 19. Backhoe excavating Trench 1 in Area 3, view to S.

Figure 20. Modern garbage encountered in Area 3 Trench 1, view to N.

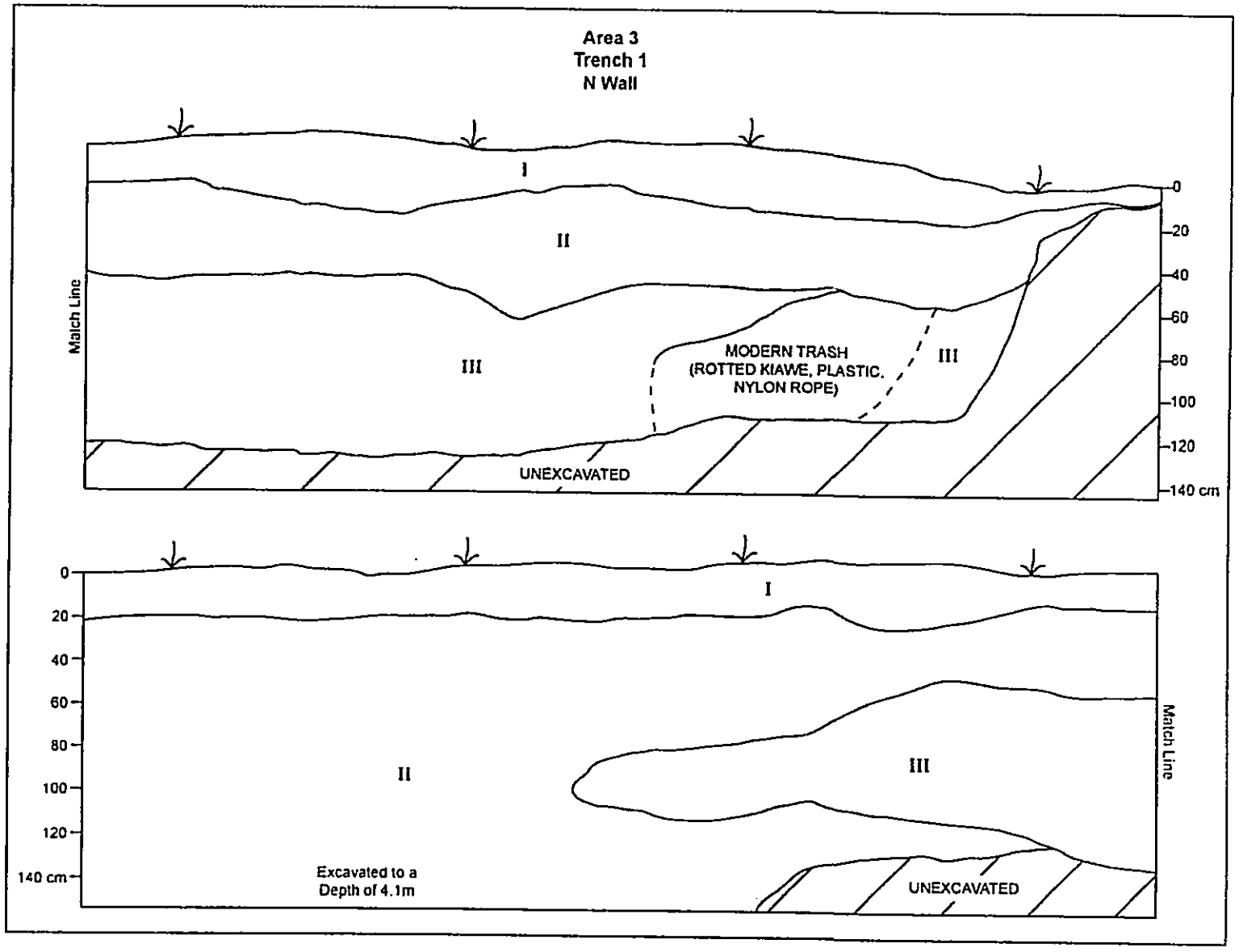

Figure 21. Profile of Area 3 Trench 1.

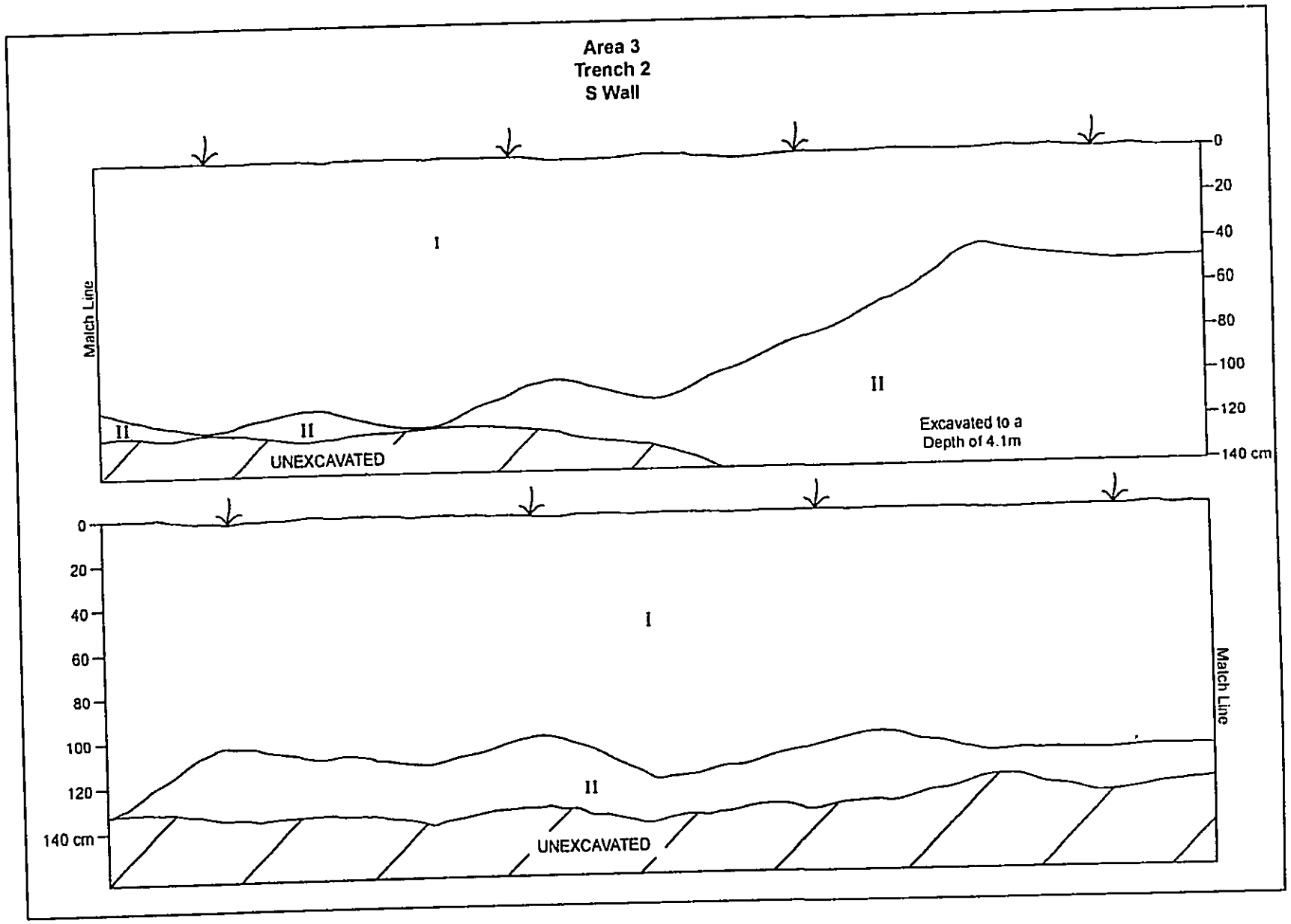

Figure 22. Profile of Area 3 Trench 2.

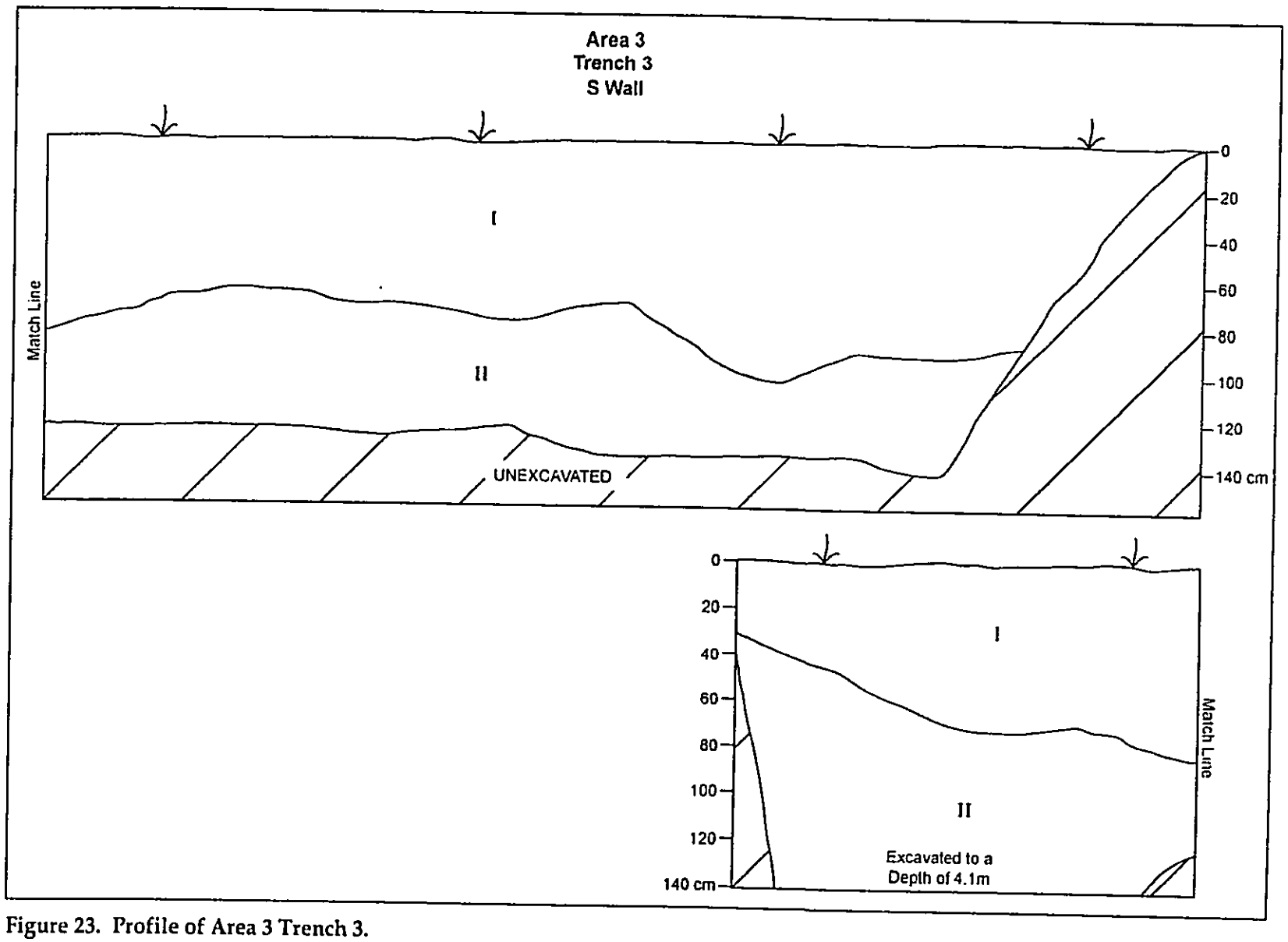

Figure 23. Profile of Area 3 Trench 3.

Figure 24. Plastic bag in S wall of Area 3 Trench 4.

5.0 MĀ`ALAEA: ORAL INTERVIEW RESULTS

Respected members of the community were contacted in order to get an idea of who should be contacted in regards to knowledge of the Mā`alaea area. An attempt was made to contact Dana Hall, but the attempt was unsuccessful.

Hokulani Holt-Padilla is a respected kumu hula, cultural practitioner and the Cultural Programs Director of the Maui Arts and Cultural Center from the island of Maui. When contacted via e-mail she recommended that Robert Lu`uwai, Sr. should be contacted. She also stated that the families that lived in the area were moved out with the expansion of the harbor.

**Robert K. Lu`uwai, Jr.** is the Commodore of the Mā`alaea Fish and Boat Club, and is also the vice president of Mā`alaea Ebisuko, the organization in charge of the shrine to *Ebisu-sama* located at Mā`alaea Harbor. Mr. Lu`uwai agreed to an interview.

Kahu Charles Kauluwehi Maxwell, Sr. is a respected *kupuna* (elder), and priest of the Maui community. He is a cultural consultant to the Maui Ocean Center located at Mā`alaea. Kahu Maxwell's ancestors are from the Mā`alaea area, and he agreed to be interviewed.

Office of Hawaiian Affairs (OHA) on the island of Maui was contacted for a list of possible contacts for Mā`alaea. OHA recommended that we contact Kahu Charles Maxwell, Uncle "Boogie" Lu`uwai, and Dana Hall.

Ann Kaleilokelani Tsuha (Kalei Tsuha) works for the Kaho`olawe Island Restoration Commission (KIRC). She is a chanter, orator, and cultural practitioner from the island of Maui, and is the education/cultural chair for the Hui O Wa`a Kaulua. Kalei agreed to be interviewed, and also recommended that we get in touch with the Lu`uwai family.

5.1 THE INTERVIEWS

The Lu`uwai family keeps their boat moored at Mā`alaea Harbor (Figures 25, and 26), and have been fishing in the area for over 30 years, since the time of Robert Lu`uwai, Jr.'s grandfather. Though currently residing in Mākena, the Lu`uwai family is active in Mā`alaea.

When asked about people fishing in the immediate harbor area, Mr. Lu`uwai replied that not too much fishing takes place near the harbor itself because the water quality is very poor from the cesspools of the nearby condominiums draining near the harbor. People do, however, fish there on occasion, with a pole, diving for *he`e* (octopus), and lobster (Figure 27), and on a rare occasion fishermen will throw net.

Mr. Lu`uwai also spoke of the Japanese families that lived in the immediate area, and of the Shinto shrine dedicated to *Ebisu-sama* located near the waters edge of the harbor (Figure 28). The shrine has been in use from 1914 to the present day. Every year on the second Sunday of January, a ceremony is held at the shrine in order to bless the boats of Mā`alaea Harbor.

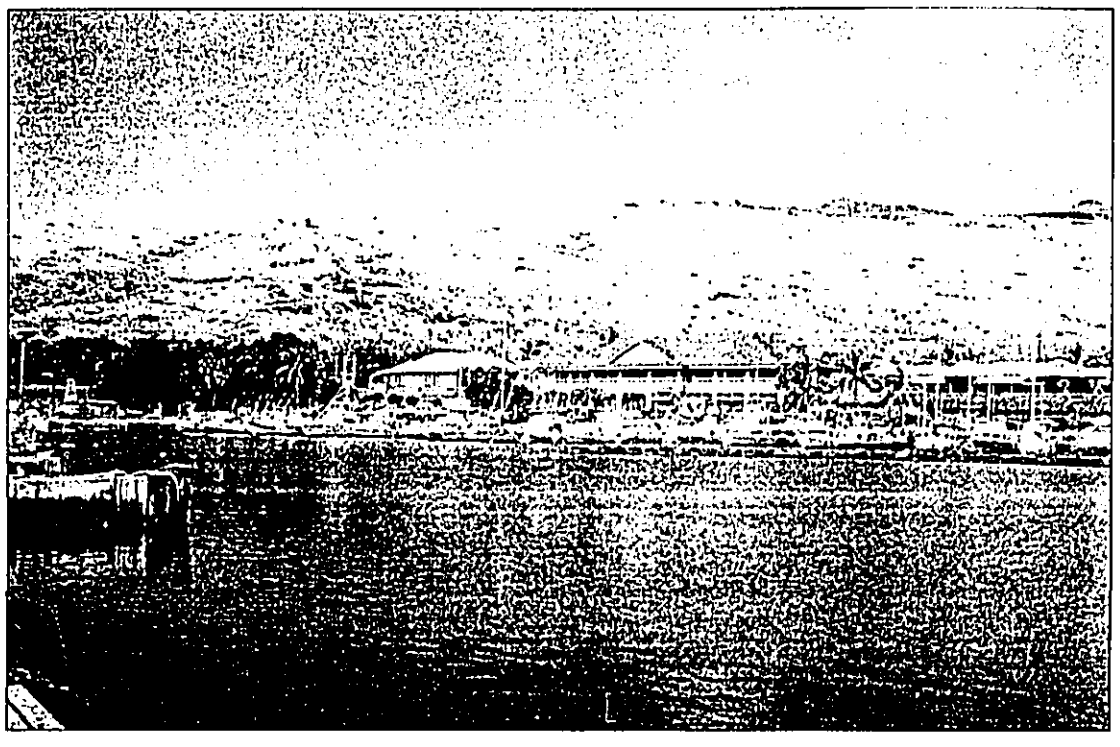

Figure 25. Mā`alaea Harbor, view to NW.

Figure 26. Mā`alaea Harbor, view to N.

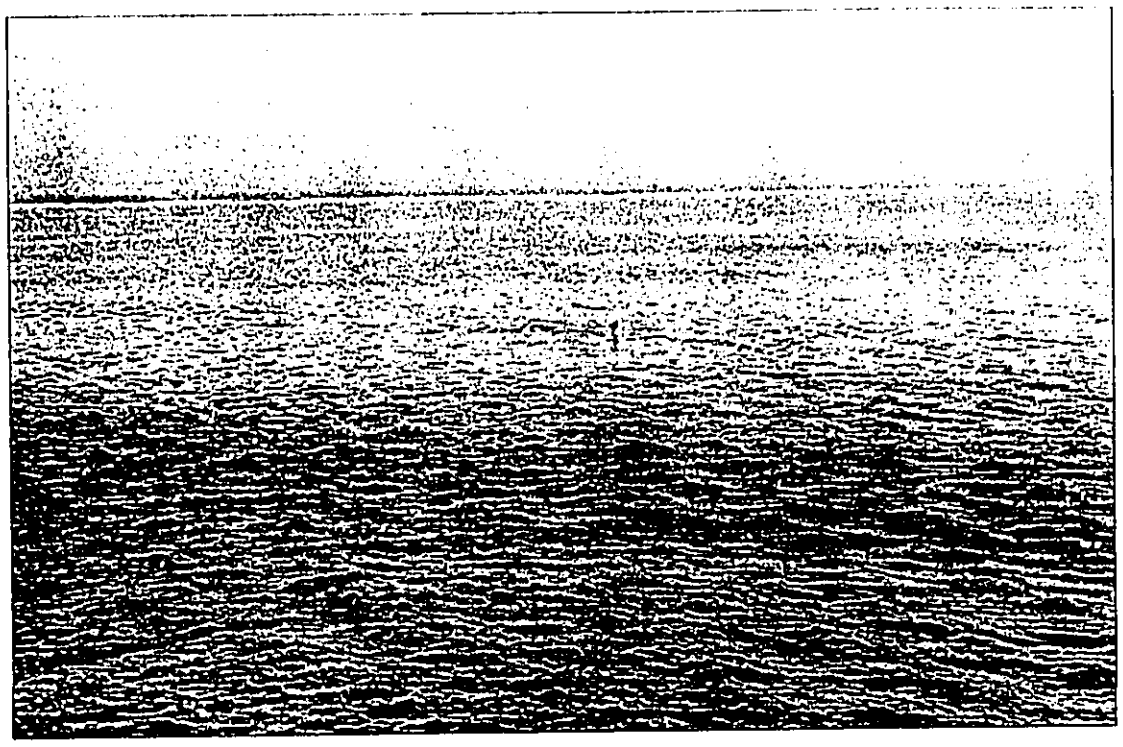

Figure 27. Diver off of the south breakwater.

Figure 28. Shinto shrine dedicated to *Ebisu-sama*.

Previously, the priestess of the shrine would go out to the boats themselves and bless them, but now she is in her 90s and it is not safe for her to be boarding the individual boats. It is said that no one who has been blessed during this event has been lost at sea. *Ebisu-sama* is the god of fishermen, and one of the Seven Deities of Good Fortune. The only Japanese family left living in the area is the Ono family. They own and operate Maalaea Store.

Mr. Lu`uwai also mentioned that it has become very common place for people to have their ashes spread out at sea.

Kahu Maxwell states that Waikapu is his *ku`u one hānau* (The sands of his birth) and that Mā`alaea is the place of his ancestors. The village that they lived in was located at the current site of the Maui Ocean Center. There were actually two heiau, one of which has been destroyed during the construction of the harbor walls, the other one is still intact. The heiau that was destroyed was located near the Mā`alaea water tank (which can be seen in the middle left of Figure 25).

A little further S along the coast, Kahu Maxwell spoke of an *ana o pu`akai* (cave of salt), a place where people would go to gather salt. A special *limu* (seaweed), *huluhulu waena* (*Grateloupia filicina*), was collected along the coast S of the harbor (Figure 29).

Figure 29. View along the coast south of Mā`alaea Harbor.

Kahu Maxwell also spoke of the two *pōhaku* (rocks) fronting Buzz's Wharf (Figure 30). One of them, he states, is a *piko* (navel) stone (Figure 31). *Piko* stones were places where a hole was pecked into the stone so that a child's *piko* could be placed inside and then capped. This was done in order to protect the spiritual and physical well being of the child.

The other *pōhaku* is a remnant of lithic production activities (Figure 32) that took place in the area. The surface of the *pōhaku* contains many grinding surface facets (Figure 33). Kahu Maxwell states that adzes were manufactured in this area.

Kahu Maxwell also spoke of his family's *aumakua* that they tend in the area that would come in at Kalepolepo Bay. His great-grandmother was placed in an *imu* (earthen oven) when she died, her bones were stripped of the flesh, and her remains were placed in a special canoe. The canoe was then sent out to voyage through Kealaikahiki Channel which is S of Mā`alaea Harbor (Figure 34).

Kalei Tsuha spoke about Pu`uhele, a prominent hill fromerly located in the area. She states that "it was said that you haven't been to Maui until you have circled the base of Pu`uhele at least once." She goes on to relate that Pu`uhele is "now a *lua* [pit] used as a construction dump."

Kalei Tsuha also related the story of how Pu`uhele, Pu`uokali, Pu`uonaina, and Kaho`olawe are connected. Pu`uhele and his wife, Pu`uokali, two prominent *pu`u* (hills) near Mā`alaea Harbor, were once actually *mo`o* (gecko). They had a child named Pu`uonaina who was banished to the island of Kaho`olawe. The story, she notes, is in Pukui (1976) and Sterling (1998).

Another story told by Kalei Tsuha, talks about Hana`ula, which is just *mauka* (upland) of Mā`alaea, and a home of Kāne (one of the four major Hawaiian deities) and Kanaloa (another of the four major Hawaiian deities). The story she relates is of the two gods helping a young boy to taunt a whale for its ivory, which makes the young boy an invincible warrior.

Kalei Tsuha also states:

> From Mā`alaea to Kalepolepo is where Kalaniopu`u's canoes landed for the famous battle of Ahulaukapi`iohokakanilua and where Kamehameha received the name Pai`ea for dodging and deflecting spears to save his mentor, Kekuhaupi'o. (This) is (also) where the famous saying by Kamehameha was uttered, "*I nuua na poki`i a inu i ka wai `awa`awa o Wailuku!*"

All of the interviewees spoke of Kapoli Spring, and the fact that it is still active today. Kahu Maxwell and Robert Lu`uwai mentioned that the spring was encountered during the construction of the cesspool for the current comfort station. Kalei Tsuha mentioned that the remnants of Kapoli Spring still seeps out near the Mā`alaea boat ramp. Both Kahu Maxwell and Kalei Tsuha mention Mā`alaea as a place where travelers would rest. Kapoli Spring was the only source of fresh water in any direction from Mā`alaea.

Figure 30. *Pōhaku* fronting Buzz's Wharf Restaurant.

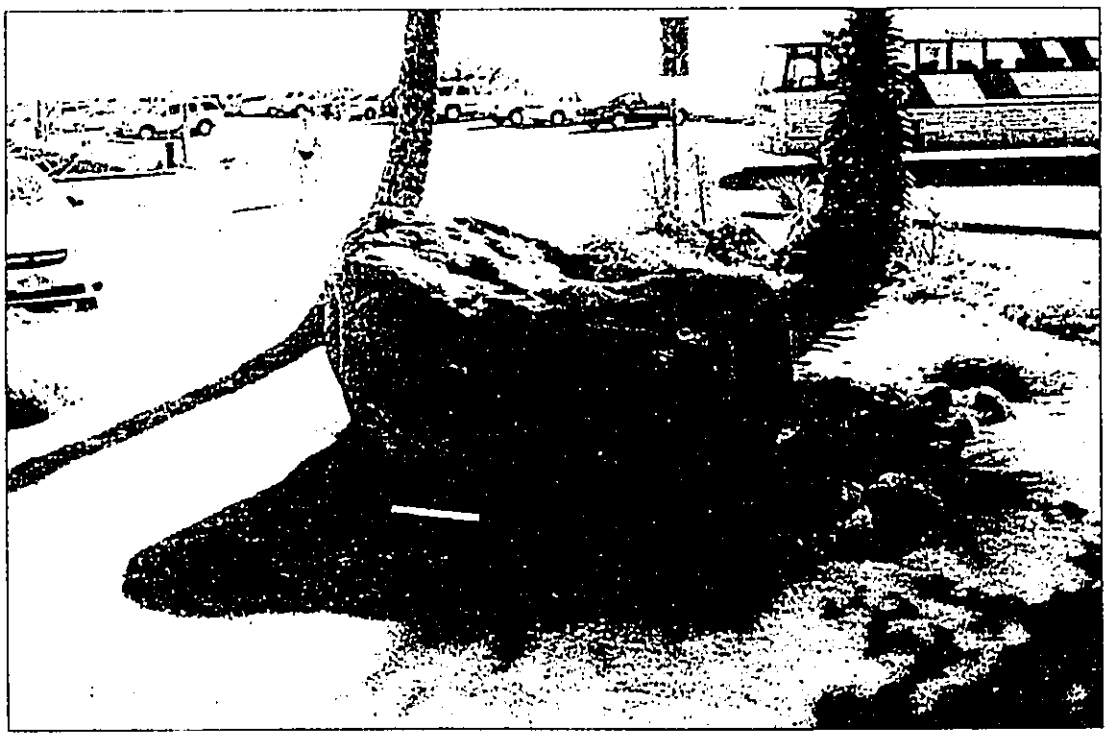

Figure 31. *Piko* stone.

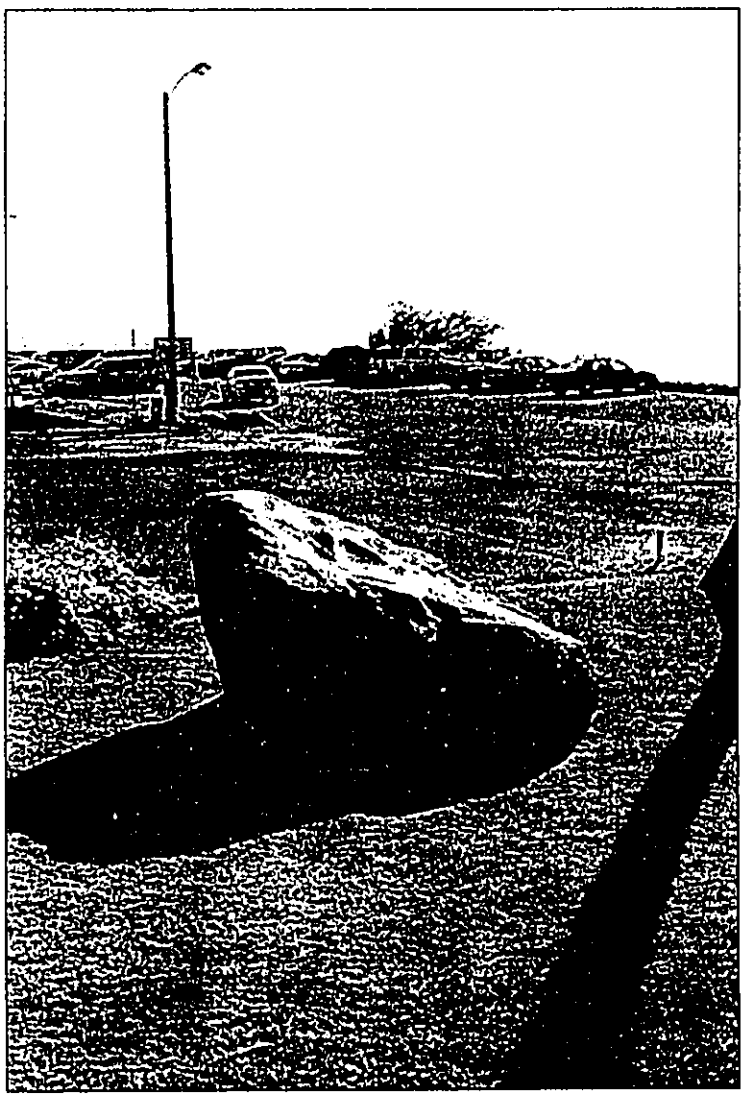

Figure 32. *Pōhaku* with grinding surface facets.

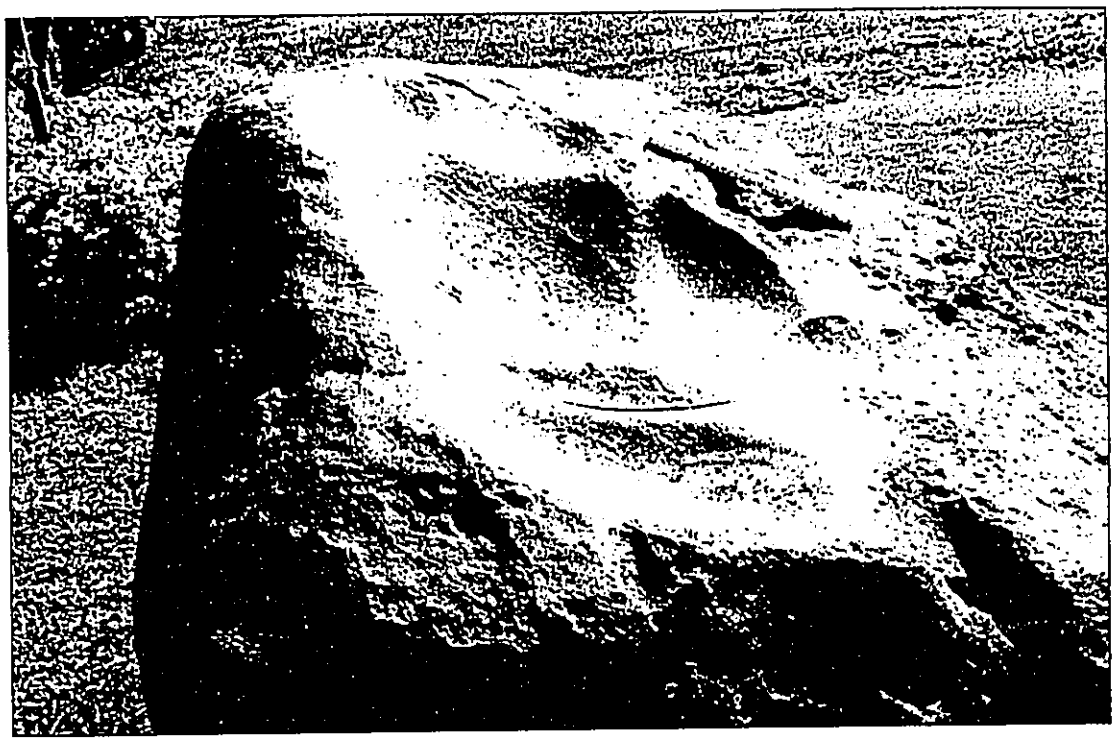

Figure 33. Close-up of grinding surfaces on *pōhaku*.

Figure 34. View to the south from Mā'alaea Harbor to Kaho'olawe.

The surf spots around the harbor were also mentioned by the interviewees. The four breaks, "Buzz's 1", "Buzz's 2", "Off the Wall", and "Freight Trains", are all well known. Kalei Tsuha states that, "Surfing changed to the benefit of the surfers as a fast, long ride after the harbor was built."

Review of the proposed improvement plans (Appendix A) were met with approval by Kahu Maxwell, and Robert Lu`uwai. Kahu Maxwell noted that the plans were fine as long as the two *pōhaku* (Figures 30 - 33) were not touched during construction.

6.0 SIGNIFICANCE

The National Historic Preservation Act of 1966 (as amended) authorizes the Secretary of Interior to expand and maintain a National Register of Historic Places (NRHP) that contains a listing of districts, sites, buildings, structures and objects significant in American history, architecture, archaeology, engineering and culture. A property may be listed in the NRHP if it meets criteria for evaluation defined at 36 CFR §60.4:

> The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and
>
> (a) That are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> (b) That are associated with the lives of persons significant in our past; or
>
> (c) That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
>
> (d) That have yielded, or may be likely to yield, information important in prehistory or history.

The State of Hawaii recognizes the above criteria under HRS §13-275-6, and has also added a fifth significance criterion to the evaluation process:

> (e) That have an important value to the Native Hawaiian people or to another ethnic group of the State due to associations with cultural practices once carried out or still carried out, at the property or due to associations with traditional beliefs, events or oral accounts – these associations being important to the group's history and cultural identity.

The three features of Site 50-50-09-5645 encountered in Area 1 have the potential to yield information about the history of Mā`alaea. Thus, the site appears to be significant under Criterion D. These features also appear to be significant under Criterion A as they are apparently associated with an earlier historic road that cut through the area connecting Central and West Maui. However, the information potential of this site has been realized by the recording conducted during this phase of investigations. Site 50-50-09-5645 is therefore no longer considered significant.

7.0 SUMMARY AND DISCUSSION

Pacific Legacy, Inc., under contract to Fukunaga and Associates conducted an Archaeological Assessment and Cultural Impact Assessment for proposed improvements for the Mā`alaea Small Boat Harbor from 13 - 23 December 2004. The archaeological assessment included archival research, pedestrian survey, shovel test probes, and backhoe trench excavation. The cultural impact assessment included informal "talk story" interviews about Mā`alaea and the surrounding area. This project is being proposed by the State Department of Land and Natural Resources – Division of Boating and Ocean Recreation to improve the harbor facilities at Mā`alaea, and is being partially funded by the Federal Transit Administration and is thus an "undertaking" as defined in 36 CFR 800.16(y). The current investigations are being conducted to fulfill the federal agency's (FTA) obligations under Section 106 of the National Historic Preservation Act of 1966, as amended.

7.1 ARCHAEOLOGICAL INVENTORY SURVEY

Three (3) areas (Figure 2) were evaluated archaeologically in the vicinity of the Mā`alaea Small Boat Harbor. A pedestrian survey was conducted on each of the three areas. STPs were excavated by hand in Area 1, and backhoe excavation was conducted in Areas 1 and 2.

An historic site, comprised of three features, was encountered during the pedestrian survey of Area 1. Feature 1 is an historic bridge that spans the width of a gully. Feature 2 is a single alignment of rounded basalt boulders that have been cemented together with concrete. Feature 2 could possibly be the remnants of curbing for an historic road. Feature 3 is a pad constructed with basalt cobbles and boulders, and concrete and is also associated with the historic road.

A modern site was also encountered during the pedestrian survey. The site is a memorial, which consists of a bronze plaque cemented to a large basalt boulder.

Excavations in Area 2 yielded no cultural resources. A layer of rounded basalt pebbles with caliche deposits was encountered in both Trenches 1 and 2. These deposits could also be seen in the road cut across the highway from the project area (Figure 34) suggesting that these are deposits from a natural flooding episode.

Excavations in Area 3 encountered deposits of modern trash below the ground surface. Excavations also probed down below 4m in depth searching for sand deposits in the area. No sand deposits were encountered. According to the backhoe operator, this area was used as a dumping ground by people before it was cleared and filled in.

7.2 CULTURAL IMPACT ASSESSMENT

Interviews were conducted with members of the Maui community that were recommended as being knowledgeable of the Mā`alaea Area. Kahu Charles K. Maxwell, Sr., Robert K. Lu`uwai, Jr., and Ann Kaleilokelani Tsuha were interviewed for this project.

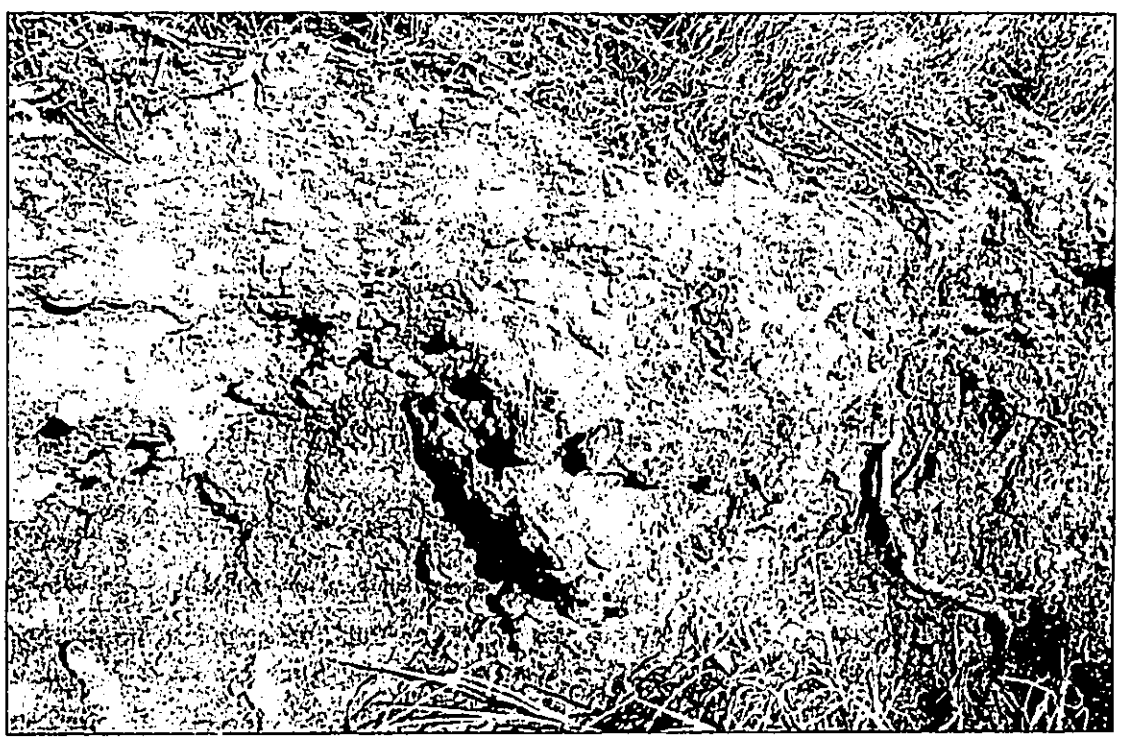

Figure 35. Rounded Basalt Pebbles and Caliche Deposit in Road Cut.

The families that lived in the area were moved out when the harbor was expanded. The Ono family and the shrine to *Ebisu-sama* are all that remain of those families. The shrine is still active and has been since 1914. Every year on the second Sunday of January, a festival and ceremony is held at the shrine to bless all of the fishing boats of the harbor.

Kapoli Spring once flowed clean near the harbor. Mā`alaea was traditionally a rest area for travelers from Lahaina to various parts of Maui, Kapoli Spring was the only source of fresh water in the area. Once thought to have dried up, it was encountered during the construction for the cesspool of the current comfort station. Its flow has been seen near the small boat ramp.

Salt was gathered in a cave that lies to the S of Mā`alaea harbor near the point. *Hululuu waena* is also gathered along the coast S of the small boat harbor.

Some fishing takes place in the vicinity of the harbor, in the form of pole fishing, and diving for *he`e* and lobster. The majority of fishing activities, however, takes place further out to sea on boats that are launched from the harbor.

A *heiau* (temple) and parts of the old village were dismantled to build the boat harbor walls. The dismantled *heiau* was previously recorded by Walker. Two of the *pōhaaku* from those sites were "saved" from being placed in the harbor walls and now front the restaurant, Buzz's Wharf. One of the *pōhaku* was a *piko* stone, and the other one has grinding surface facets on it, from past lithic production activities.

Surf changed to the advantage of the surfers and now Mā`alaea boasts world-renowned surf. Any changes to the Harbor walls may affect these breaks.

7.3 RECOMMENDATIONS

The current archaeological investigations have adequately recorded the resources of the three project areas in the vicinity of the Mā`alaea Small Boat Harbor. No further archaeological work is recommended in these areas.

Past use of Area 1 has left it littered with recent garbage. The garbage ranges from household trash to industrial waste (asphalt concrete, and metal pipe, among other things). Any development in Area 1 should involve the cleanup of the area, especially around Site 50-50-09-5645 Feature 1, where the bulk of the garbage is located.

The construction of the breakwaters for Mā`alaea Small Boat Harbor has had a positive impact for the surf. Two of the breaks, "Off the Wall," and "Freight Trains," are world renowned as surf spots. The breaks are of an age where they may be eligible for the National Register of Historic Places. They are two spots where the traditional cultural practice of surfing is practiced. Additional work needs to be done in order to evaluate the surf in the area as traditional cultural properties as described in National Register Bulletin 38. Such an evaluation is beyond the scope of the present investigation.

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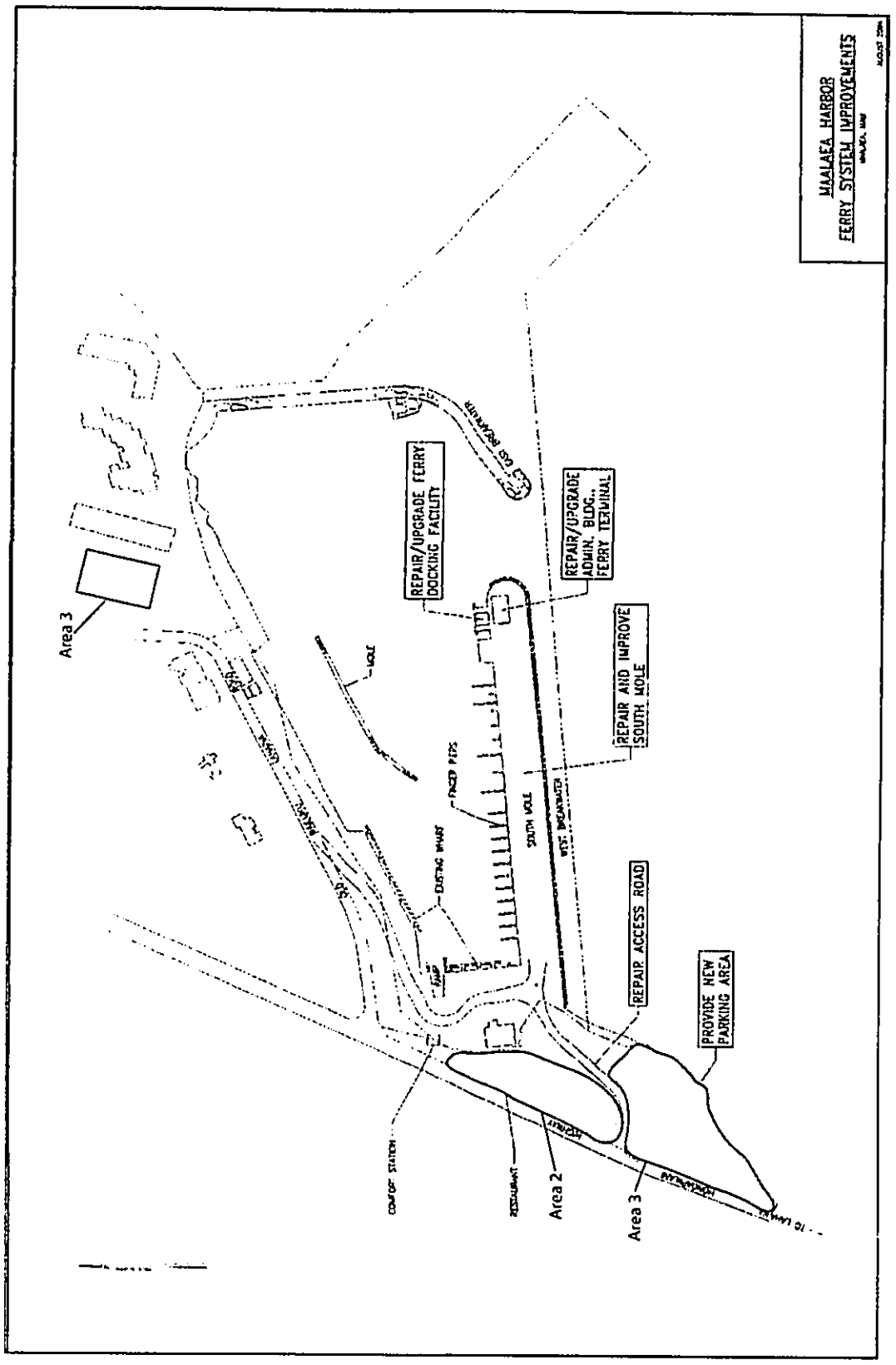
APPENDIX A
Proposed Improvement Plans



Proposed Improvement Plans For Mā`alaea Small Boat Harbor.

Appendix E

Maalaea Harbor Ferry Improvements Project, Drainage Calculations

Drainage Calculations

MAALAEA HARBOR
FERRY IMPROVEMENTS PROJECT
Maalaea, Maui, Hawaii

Prepared for:
State of Hawaii
Department of Land and Natural Resources

Prepared by:
FUKUNAGA & ASSOCIATES, INC.
1388 Kapiolani Boulevard, 2nd Floor
Honolulu, Hawaii 96814

February 2, 2005

DRAINAGE CALCULATIONS

Project: Maalaea Harbor
Ferry Improvements Project
Maalaea, Maui, Hawaii

T.M.K.: 3-8-14, parcels 27, 28, and 30

Owner: State of Hawaii

Consultant: Fukunaga & Associates, Inc.
Prepared by: BEY
Checked by: RSF
Date: 2/2/2005

1.0 INTRODUCTION

1.1 *Project Description:*
Improvements to Maalaea Harbor are proposed to support commuter ferry operations (see Figure 1, Location Map). The project includes repaving, replacing aging utilities, upgrading the terminal building, and constructing a paved parking lot. The proposed parking lot is the only area where there will be an increase of stormwater flows. This report will focus on that area. The design of the improvements is in a conceptual phase, therefore exact sizing and placement of drainage structures will be determined when the final plans are prepared.

1.2 Existing Conditions:
The site is currently a gravel parking lot located at the corner of Maalaea Road and Hauoli Road. The elevation of the lot varies from 8' to 21' above sea level and slopes gradually toward the ocean. Stormwater sheet flows over the lot and into the harbor. There is a box drain within Maalaea Road, which carries flows from the roadway and upstream sources to the harbor. The existing lot (Drainage Area "A") discharges 1.4 cfs for a 1 hour, 10 year storm. (See Figure 2, Existing Drainage Plan.)

1.3 Proposed Conditions:
The proposed parking lot will be paved with asphalt with concrete curbs, gutters, and sidewalks along the adjacent roads. Flows generated within the road right-of-ways will be collected in catch basins along the curb which will then flow into the existing Maalaea Road box culvert. The stormwater generated on-site in excess of the pre-development levels, will be collected in inlets and stored in an underground detention system. Flow from Drainage Area "C" is 1.4 cfs, which is equivalent to the existing flow, will sheet flow over the site. The flow from Drainage Area

"B" of 3.0 cfs will be collected in drain inlets and directed to an underground stormwater detention system. The detention system will have a storage capacity of 4400 cf, assuming an inflow of 3 cfs and an outflow of 0.1 cfs for the underground tanks. The underground detention system will either percolate or be connected to the existing box drain. See Figure 3, Proposed Drainage Plan.

2.0 REFERENCES

2.1 Rules for the Design of Storm Drainage Facilities in the County of Maui, Dept. of Public Works & Waste Management, County of Maui; 1995.

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3.0 CALCULATIONS

3.1 Hydrology

3.1.1 Recurrence Interval (Tm)
Drainage area less than 100 acres, therefore Tm = 10 years, 1 hour
Section 15-04-05, Ref. 2.1.

3.1.2 Runoff Quantity
Drainage area less than 100 acres, therefore use rational method
Q = C i A, where
Q = flow rate, cfs
C = runoff coefficient; Table 1, Ref. 2.1
i = rainfall intensity, in/hr, for a duration equal to the time of concentration; Tm = 10-yr, Plates 4 & 2, Ref. 2.1.
A = drainage area, acres

Drainage Area	Area (acres)	C	I (in/hr)	L (ft)	S (ft/ft)	Tc* (minutes)	adjusted (in/hr) (Plate 2)	Q (cfs)
Existing								
A	1.14	0.30	2	360	0.033	11.5	4.0	1.4
Proposed								
B	0.70	0.95	2	240	0.033	5.0	4.6	3.0
C	0.31	0.95	2	120	0.033	3.0	4.9	1.4

Q = C x i(adj) x A
* Plate 1, Ref. 2.1

3.2 Detention System Sizing

Soil Conservation Service (SCS) Procedure, (Section 8.4.1.3, Ref. 2.3.)

Use 50 yr storm, (Section 15-04-05 e, Ref. 2.1.)

$V_r = K_r Q_d A_m = 0.27$

Where

V_r = inflow volume of runoff, (ac-ft)

K_r = 53.33

Q_d = depth of direct runoff, (in) = 2.5" (50 yr event, plate 7, ref. 2.1)

A_m = area of watershed, (mi^2) = 0.002 mi^2

Q_o = outflow discharge = 0.1 cfs

Q_i = inflow = 3.0 cfs

V_s = storage volume

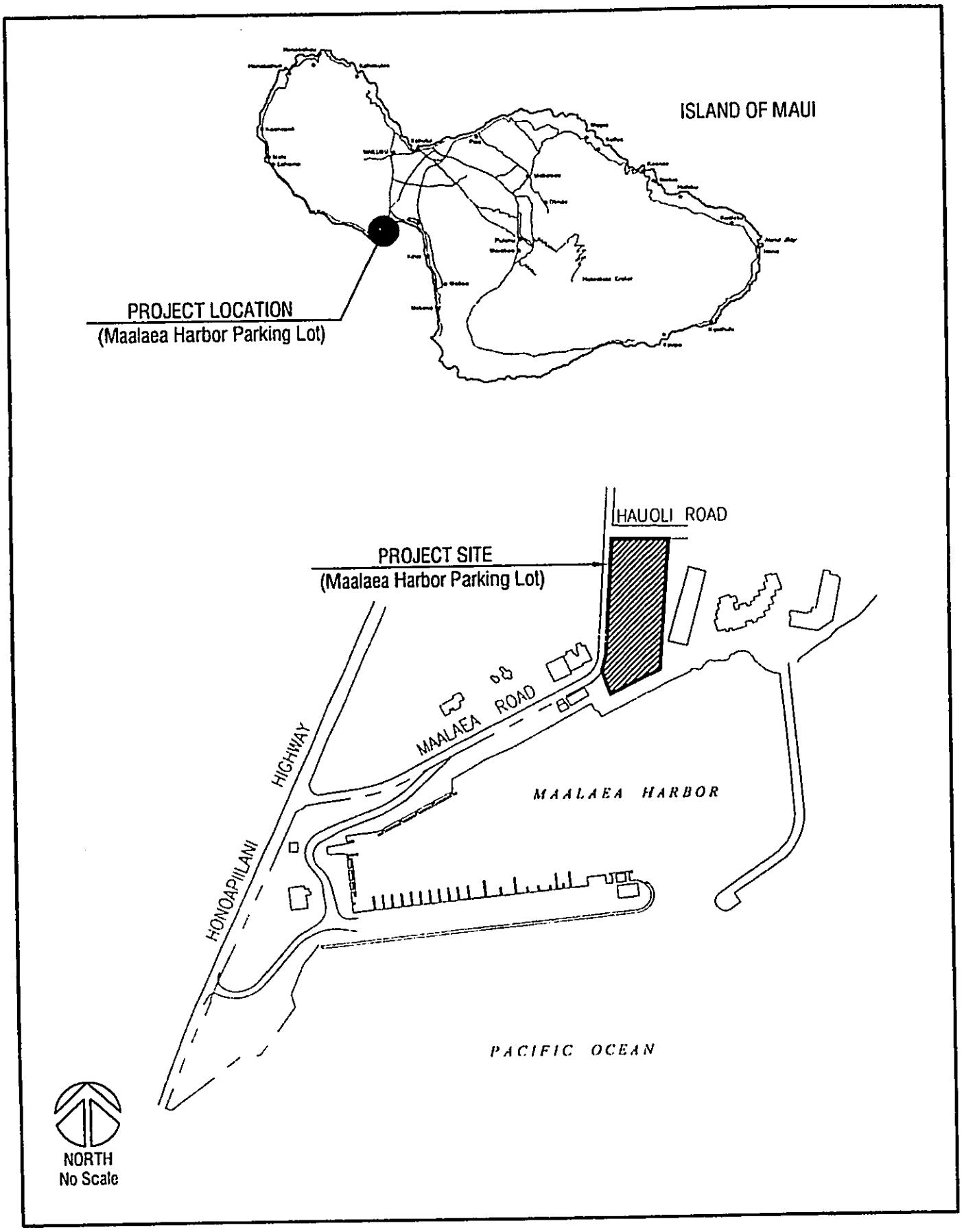
Q_o/Q_i = 0.33

Enter chart (figure 8-5, ref. 2.3), V_s/V_r = 0.36

V_s = 0.36 * 0.27 = 0.1 ac-ft = <u>4400 cf</u>

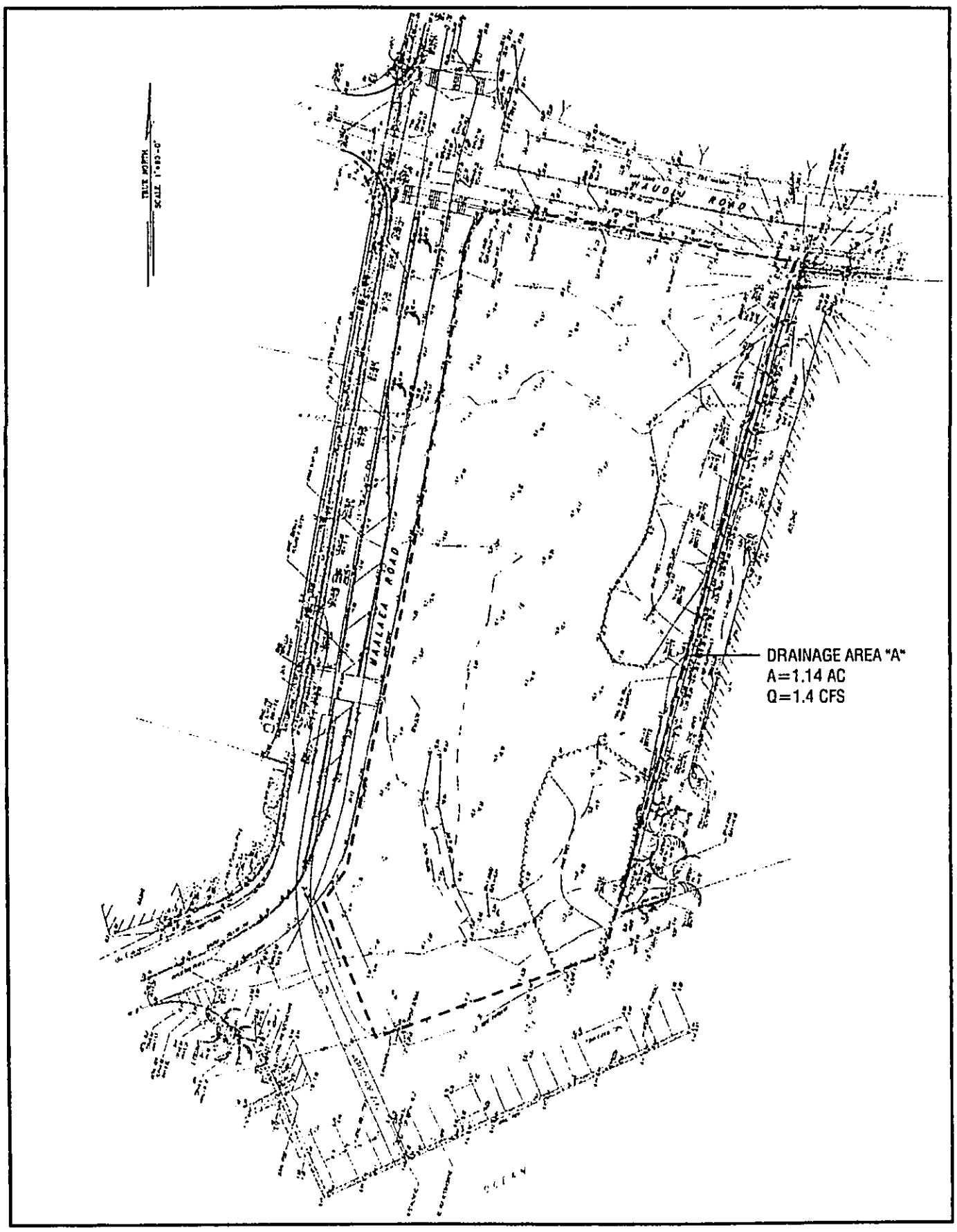
4.0 CONCLUSION

The flow patterns will not be significantly changed with the proposed work. The project will not adversely affect downstream or adjacent properties. Any increase in flow due to paving the lot will be contained on-site in underground detention chambers.



Department of Land and Natural Resources
Maalaea Harbor, Ferry Improvements Project

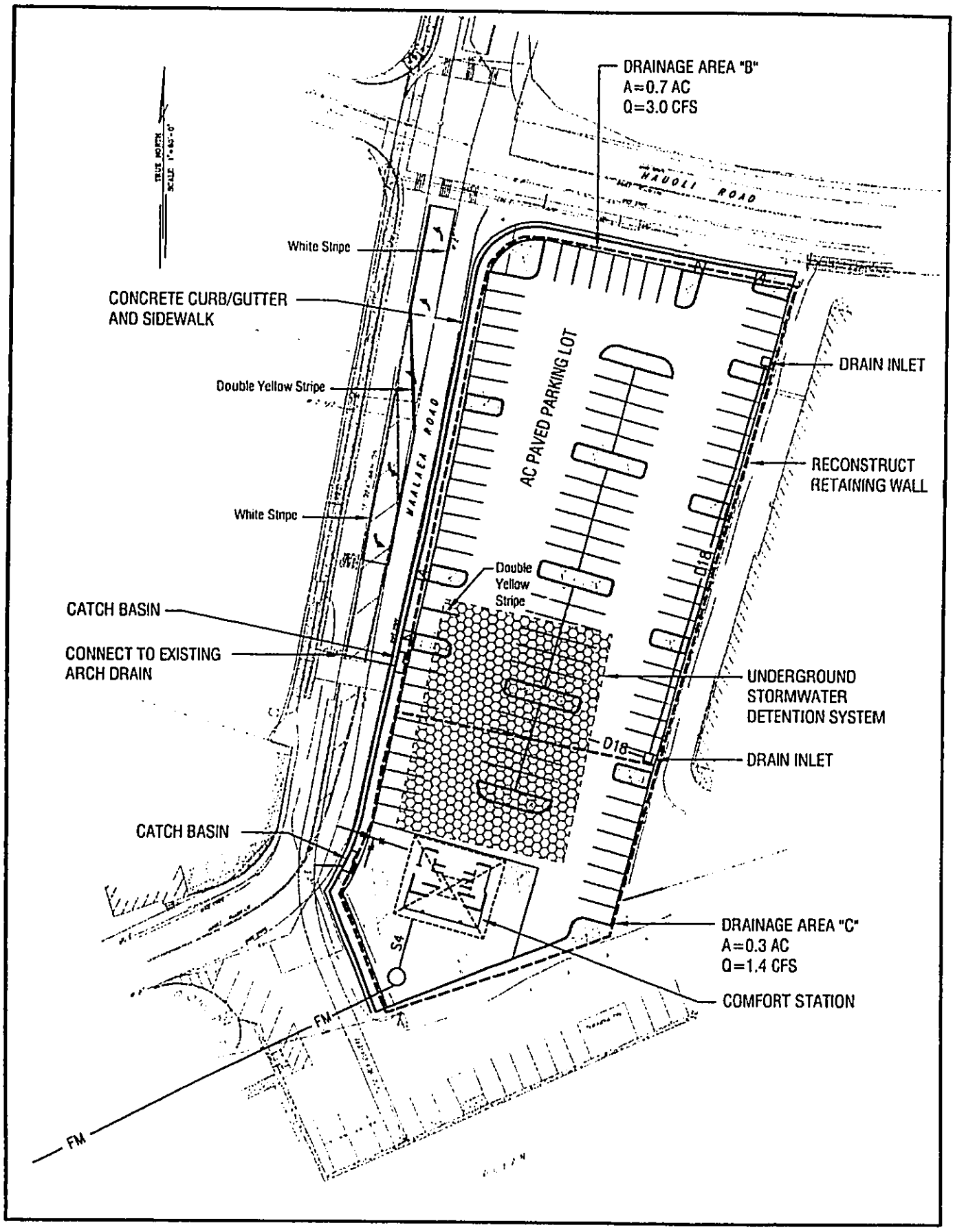
LOCATION MAP
FIGURE 1



Department of Land and Natural Resources
Maalaea Harbor, Ferry Improvements Project

MAALAEA HARBOR PARKING LOT - EXISTING CONDITIONS

FIGURE 2



Department of Land and Natural Resources
Maalaea Harbor, Ferry Improvements Project

MAALAEA HARBOR PARKING LOT - PROPOSED CONDITIONS

FIGURE 3

MAALAEA BOAT HARBOR

I. CIVIL IMPROVEMENTS

The proposed civil site improvements to Maalaea Small Boat Harbor to support ferry operations include the following.

A. PAVING

The existing asphalt paved driveways and parking areas in the harbor property are deteriorating and in need of repair. The asphalt will be removed and replaced with concrete pavement, which will provide a durable driving surface. The parking stall striping, including ADA accessible stalls, and wheel stops will be reinstalled. Where required, ADA accessible ramps will be constructed.

B. UTILITIES

The water and sewer pipelines will be reconstructed to provide reliable service to the harbor and ferry terminal facilities.

Two new sewer pump stations and sewer force mains will be installed to transport sewage from the terminal building and new comfort stations to the waste treatment facilities. The existing cesspools will be replaced by wastewater treatment systems, as required by federal law. (Wastewater treatment and disposal facilities are being designed by Engineering Solutions as a separate project.)

The harbor lacks adequate fire protection, therefore a 6" waterline will be installed in the South Mole to supply fire hydrants and provide fire protection to the terminal building. A 2" domestic water line will replace the existing line and provide water service to the terminal building.

C. PARKING

Parking is in short supply and is the "deficiency" most frequently mentioned by harbor users. A new parking lot is proposed to provide parking for ferry passengers and employees. It will be located at the intersection of Hauoli Road and Maalaea Road and will provide approximately 100 parking spaces with a comfort station (see architectural section) and sidewalks along the adjacent roads. The wastewater from the comfort station will be treated and pumped to the seepage pit near the existing comfort station. Drainage improvements and water supply connections for the comfort station and irrigation will be constructed.

D. PASSENGER LOADING AREA

The passenger loading facilities will be upgraded to provide efficient and safe movement of people from the ship to the terminal building. The damaged concrete pier edge will be repaired and a new gangway system will be installed. The existing opening in the dock surface located near the entrance to the building will be covered with a metal grate or concrete slab. This will provide a safer area for pedestrian traffic.

II. BUILDING IMPROVEMENTS

Appendix F

Traffic Evaluation

TRAFFIC EVALUATION

Maalaea Harbor
Ferry Improvements

MAALAEA, MAUI, HAWAII

January 2005

PARSONS
BRINCKERHOFF

Over a Century of Engineering Excellence

Traffic Evaluation

Maalaea Harbor

Maalaea, Maui, Hawaii

January, 2005

Prepared For:
Fukunaga & Associates
1388 Kapiolani Boulevard, 2nd Floor
Honolulu, Hawaii 96814
Ph. (808) 944-1821

Prepared By:
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ASB Tower - Suite 2400
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Honolulu, HI 96813
Ph. (808) 531-7094

PBQD Reference Number:

16421A

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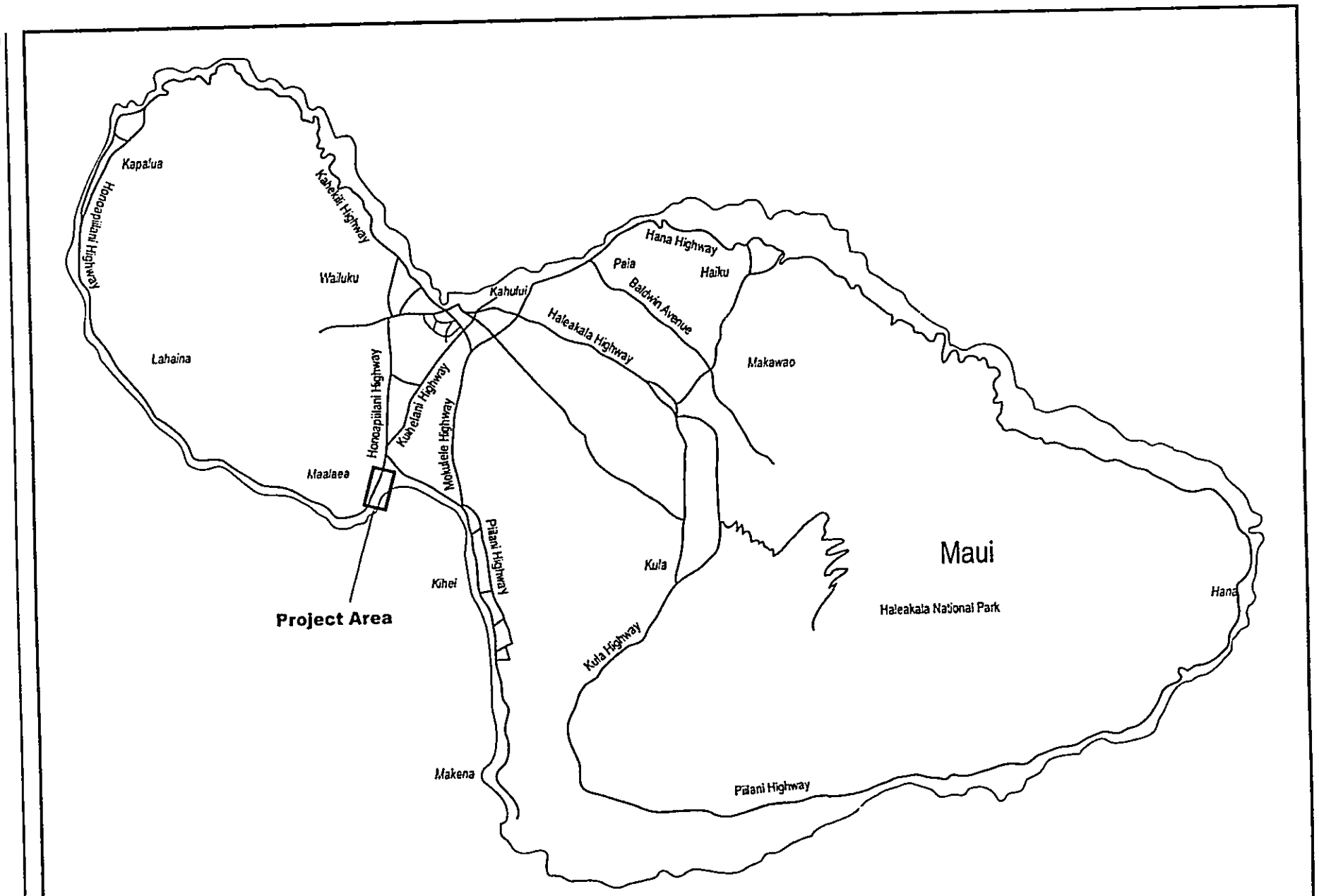
I. INTRODUCTION

This report documents the data collected and methodology used and summarizes the findings and recommendations of a traffic evaluation conducted for the Maalaea Small Boat Harbor.

In an effort to improve and streamline the existing inter-island ferry system, improvements to the Lahaina and Maalaea Small Boat Harbors are being considered. Existing ferry service is available only out of Lahaina with daily trips to and from Kaunakakai, Molokai and Manele Bay, Lanai. In the interest of providing improved ferry service, additional interisland trips to and from Lahaina and new service to and from Maalaea are being proposed. This, in turn, triggers a need for improvements at both harbors.

The traffic evaluation documents existing traffic conditions, identifies traffic impacts associated with the increased activity of the proposed ferry at Maalaea Small Boat Harbor, and identifies potential physical and operational transportation improvements to Maalaea Harbor.

Figure 1 illustrates the approximate location of the project area, and Figure 2 illustrates the layout of the Maalaea Small Boat Harbor.

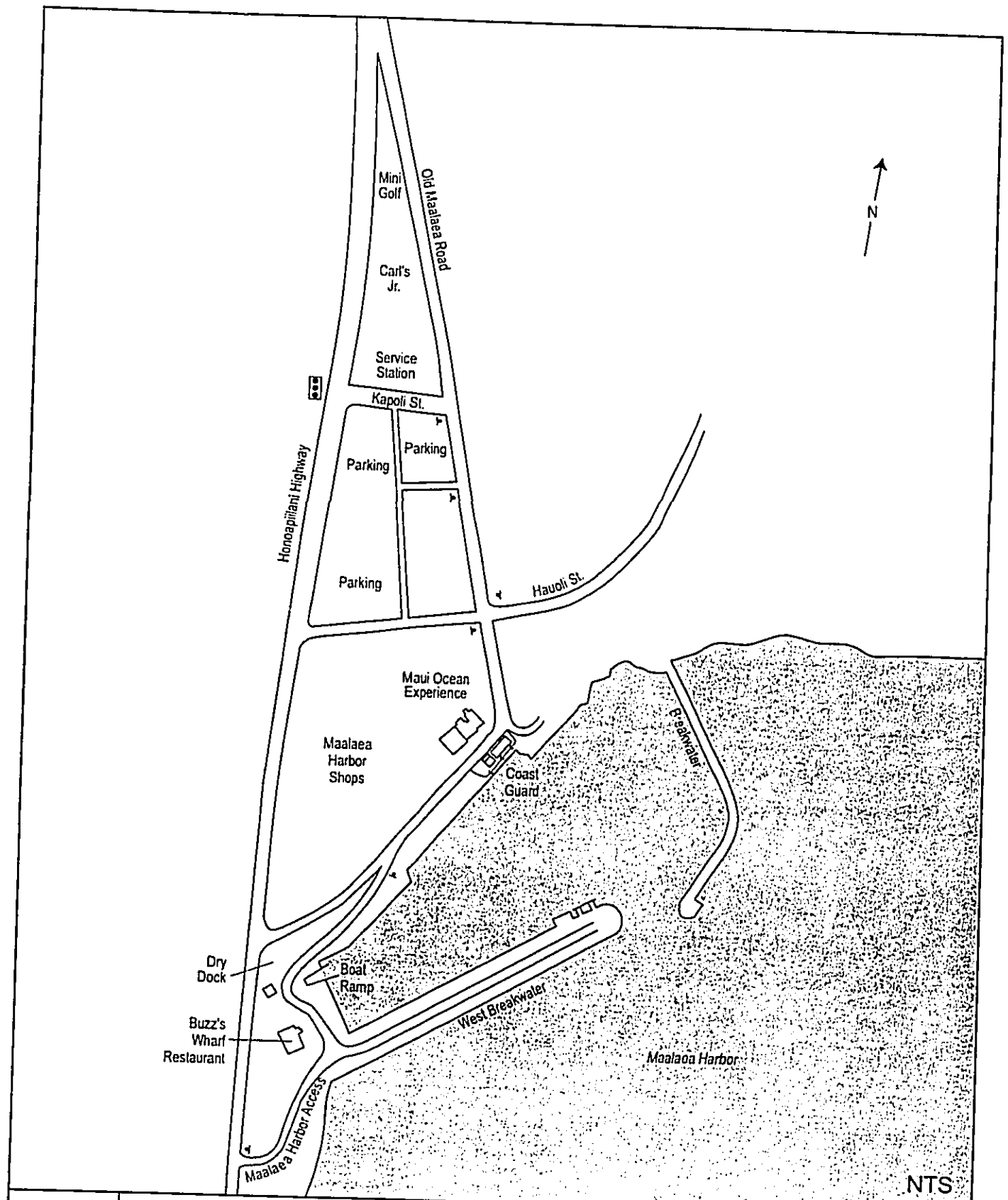


Maalaea Harbor
January 2005

PB 100 YEARS

Project Location Map

Figure
1



Maalaea Small Boat Harbor Site Plan

Figure 2

II. EXISTING TRAFFIC CONDITIONS

A. Existing Roadway System

Maalaea Small Boat Harbor is located on the south side of the isthmus that connects East and West Maui. The Maalaea area is a relatively small pocket of development with internal circulation provided by minor roadways and regional access served by Honoapiilani Highway.

1. Honoapiilani Highway

Honoapiilani Highway provides a regional arterial link between West Maui and Central Maui. Honoapiilani Highway begins just south of Wailuku Town, traveling south to Maalaea and then continuing around the Pali where it provides access and regional mobility to the west coast of Maui.

In the vicinity of Maalaea Small Boat Harbor, Honoapiilani Highway is primarily a 2-lane, undivided roadway. The speed limit along Honoapiilani Highway in this area is 45 mph. Starting at the south end of the existing Maalaea Harbor Shops, there is also an additional northbound lane that continues to North Kihei Road. Between North Kihei Road and Kuihelani Highway, Honoapiilani Highway is a 4-lane, divided roadway. Just north of Kuihelani Highway, Honoapiilani Highway returns to a 2-lane, undivided roadway cross-section.

Within the study area, there are four accesses to Honoapiilani Highway. At the south end of this segment, there is an unsignalized intersection at the Maalaea Small Boat Harbor Access (Harbor Access). At the south end of the existing Maalaea Harbor Shops, there is a right-in/right-out intersection where the south end of Old Maalaea Road intersects Honoapiilani Highway. Within the Maalaea Triangle area, Kapoli Street intersects Honoapiilani Highway at a signalized intersection. At the north end, Old Maalaea Road intersects Honoapiilani Highway at an acute angle intersection. Only traffic movements to and from the north are permitted at this unsignalized intersection.

2. Old Maalaea Road

Old Maalaea Road splits off Honoapiilani Highway at the north end of the Maalaea Triangle area. It proceeds south, providing back access to the Maalaea Harbor Shops and Maui Ocean Center, to the condominiums and park on Hauoli Street, and to Maalaea Small Boat Harbor before curving back to Honoapiilani Highway. Old Maalaea Road is 2-lane, undivided local road with a speed limit of 20 mph. Several crosswalks are in place, some of which have warning signs. Speed humps have been installed along Old Maalaea Road as a traffic calming action.

3. Maalaea Small Boat Harbor Access Road (Harbor Access)

The Harbor Access intersects Honoapiilani Highway at an unsignalized intersection with STOP-sign control on the Harbor Access approach. From there, it winds through the harbor area, providing access and circulation to the boat slips, boat ramp, dry dock, and Buzz's Steak House Restaurant before meeting up with Old Maalaea Road at the Maalaea Harbor Shops.

4. Kapoli Street

Kapoli Street is a short connector roadway located between Honoapiilani Highway and Old Maalaea Road. Its intersection with Honoapiilani Highway is signalized. Kapoli Street provides access to Honoapiilani Highway for Maalaea Harbor Shops, Maui Ocean Center and other development within the Maalaea Triangle area. It also provides alternative access to Old Maalaea Road, which it intersects at an unsignalized intersection with STOP-sign control on the Kapoli Street approach. Kapoli Street is four-lanes wide.

5. Hauoli Street

Hauoli Street is located just north of the Maui Ocean Center and provides access to condominiums and a park located east of Old Maalaea Road. It is a two-lane local roadway that is cul-de-saced at the park. Speed bumps are installed along Hauoli Street as traffic calming measures. Hauoli Street intersects Old Maalaea Road opposite an access from the Maalaea Harbor Shops. It is an unsignalized intersection with STOP-sign control on the Hauoli Street and Harbor Shops Access approaches.

B. Existing Intersections

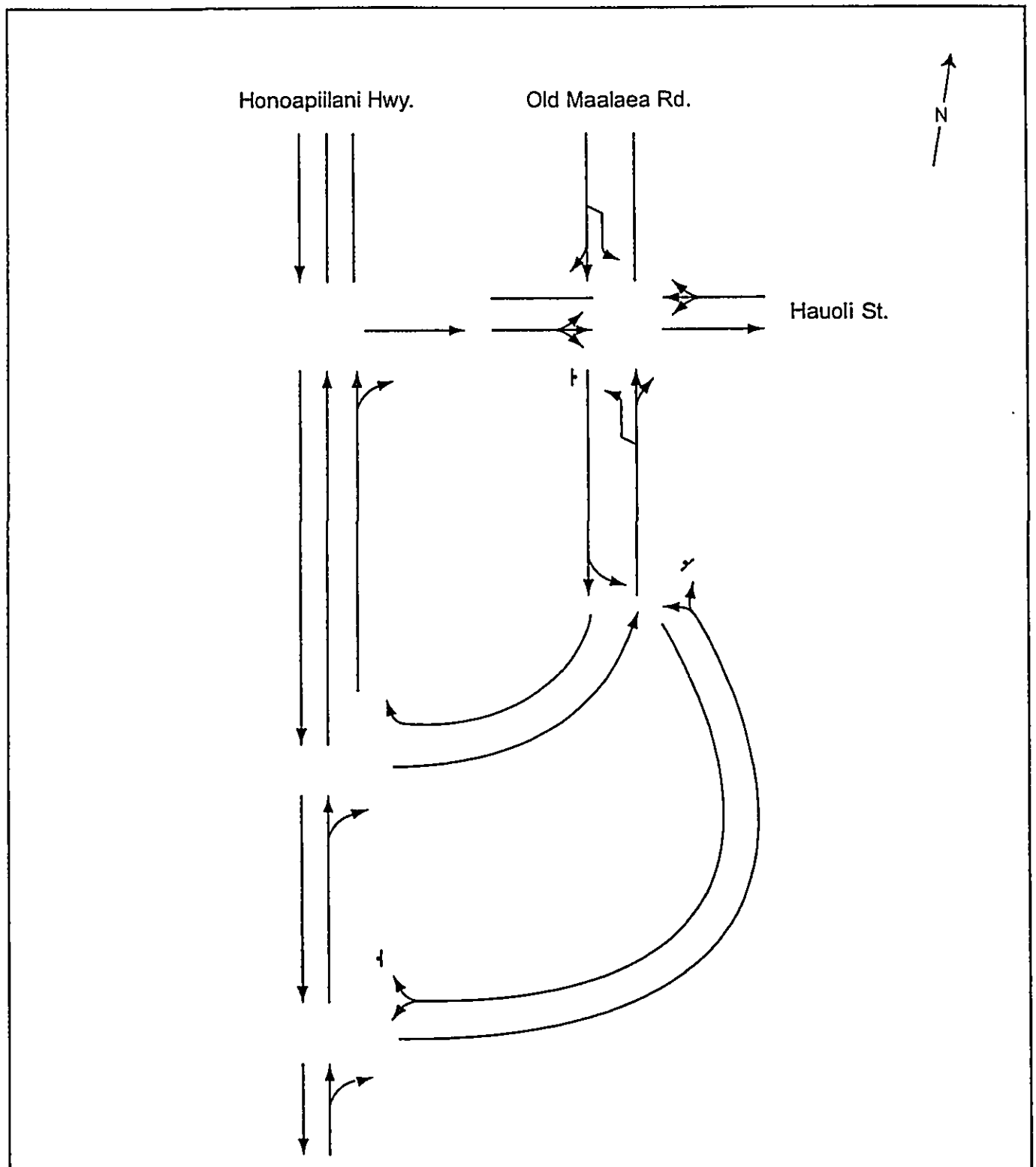
Intersections were inventoried at the boundaries of the Maalaea Small Boat Harbor area. These involved three external intersections and one internal intersection. Two of the external accesses are on Honoapiilani Highway. Figure 3 illustrates the existing lane configurations at these intersections.

1. Maalaea Small Boat Harbor Access (Harbor Access)

The existing Harbor Access is located at the south end of Maalaea Small Boat Harbor. It intersects Honoapiilani Highway at an unsignalized "T-intersection" with STOP-sign control on the Harbor Access approach. This one-lane approach is configured as a shared left/right lane. The northbound Honoapiilani Highway approach consists of a shared through/right-turn lane with no right-turn deceleration lane. The southbound Honoapiilani Highway approach consists of a shared left-turn/through lane. Since there is no separate left-turn storage lane and northbound traffic is fairly heavy, vehicles turning left into the Harbor Entrance must often wait in the southbound through lane. Several instances of unsafe maneuvers such as vehicles passing waiting left-turners on the right shoulder were observed. For traffic turning out of the Harbor Entrance, there is no acceleration lane for right turns and no median refuge area for left turns. Figure 4 is a photograph of the Harbor Access approach, while Figure 5 is a photograph of the Harbor Access/Honoapiilani Highway intersection looking toward the south.

2. Honoapiilani Highway/Old Maalaea Road (South End)

This intersection also provides access for the Maalaea Small Boat Harbor. It is located north of the Harbor Access, and is located between Maalaea Small Boat Harbor and the Maalaea Harbor Shops. It is unsignalized and only right-in and right-out traffic movements are permitted. No right-turn deceleration lane is provided, but the Old Maalaea Road right turn feeds directly into a northbound auxiliary lane on Honoapiilani Highway. Figure 6 is a photograph of the Old Maalaea Road approach to Honoapiilani Highway.



EXISTING LANE CONFIGURATIONS

Figure 3

Figure 4 Harbor Access Approach to Honoapiilani Highway

Figure 5 Harbor Access Intersection on Honoapiilani Highway

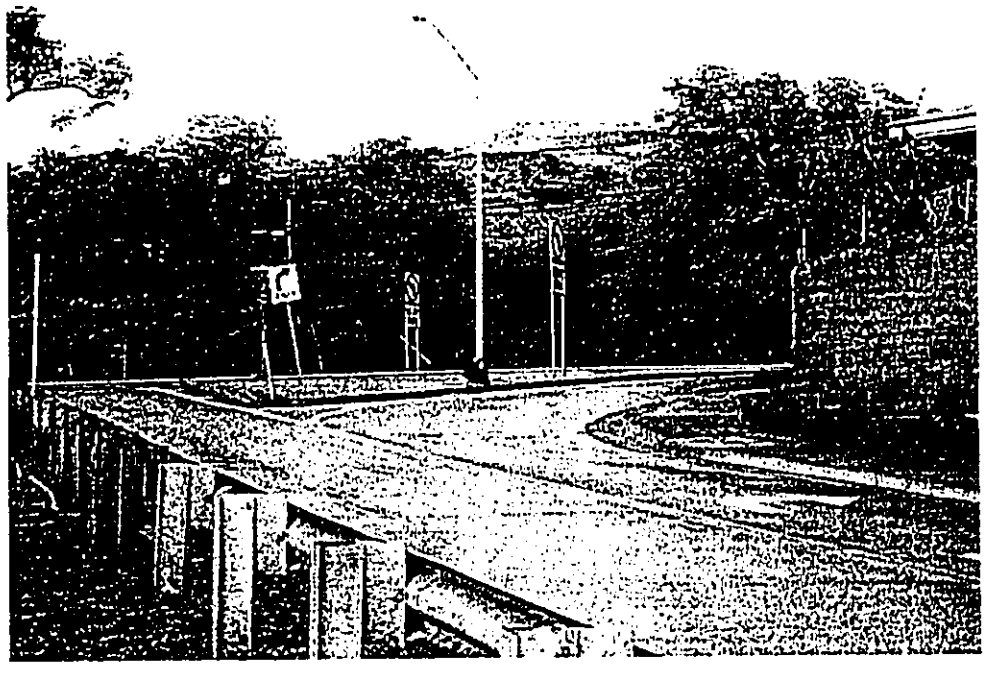


Figure 6 Old Maalaea Road (South End) at Honoapiilani Highway

3. Hauoli Street/Old Maalaea Road

The Hauoli Street/Old Maalaea Road intersection defines the northern access into the Maalaea Small Boat Harbor area. The Old Maalaea approaches both consist of exclusive left turn lanes with shared through/right lanes. Hauoli Street is located opposite a driveway for the existing Maalaea Harbor Shops, and the Hauoli and driveway approaches are STOP-sign controlled with shared left/through/right lanes. Crosswalks are provided across all approaches. Figure 7 is a photo of this intersection looking south along Old Maalaea Road.

Traffic volume to and from the east leg (Hauoli Street) appear to be associated primarily with the condominiums. Traffic to and from the south leg is primarily associated with Maalaea Small Boat Harbor.

Figure 7 Old Maalaea Road/Hauoli Street Intersection

4. Internal Harbor Access Road/Old Maalaea Road

The Internal Harbor Access Road/Old Maalaea Road intersection provides access into the south harbor area from Old Maalaea Road. The intersection is unsignalized with stop sign control for the northbound (Internal Harbor Access) approach. The angle between the two roads is acute, making the eastbound right turns and northbound left turns difficult, and, therefore, the eastbound right turn is currently prohibited. Figure 8 is a photograph of this intersection looking east on Old Maalaea Road.

Figure 8 Internal Harbor Access/Old Maalaea Road Intersection

C. Existing Traffic Volumes

The current Maalaea Small Boat Harbor has three vehicular peak periods: AM peak, midday peak, and PM peak. The AM and PM peaks generally coincide with the commuter traffic peak periods. For current Maalaea Small Boat Harbor traffic, the AM peak is the largest peak, followed by the midday peak. The PM peak is relatively small.

Potential ferry operations are likely to coincide with the AM and PM commuter traffic peak periods, increasing the AM peak and making PM peak larger than the existing midday peak. Therefore, the AM and PM commuter peak hour time periods were used in this analysis.

1. Traffic Volume on Honoapiilani Highway

The State of Hawaii Department of Transportation performed 24-hour traffic approach counts at the intersection of Honoapiilani Highway and Kapoli Street on Monday, May 14, 2001. The 2001 DOT data is shown in Table 1 along with data obtained as part of this

study effort by Parsons Brinckerhoff (PB). The HDOT data shown in Table 1 reflects traffic volume counted at the south leg of the Honoapiilani/Kapoli intersection, while the PB data reflects traffic volume counted on November 14-15, 2004 at the north leg of the Honoapiilani Highway/Harbor Access intersection.

The comparison of traffic counts indicates that annual traffic growth within this segment of Honoapiilani Highway is currently very low.

Table 1

Summary of Honoapiilani Highway Traffic Volumes

Vicinity of Maalaea Small Boat Harbor

Traffic Count	AM Peak Hour		PM Peak Hour	
	Northbound	Southbound	Northbound	Southbound
HDOT (5/01)	419	1127	1133	857
PB (11/04)	380	1003	1051	809

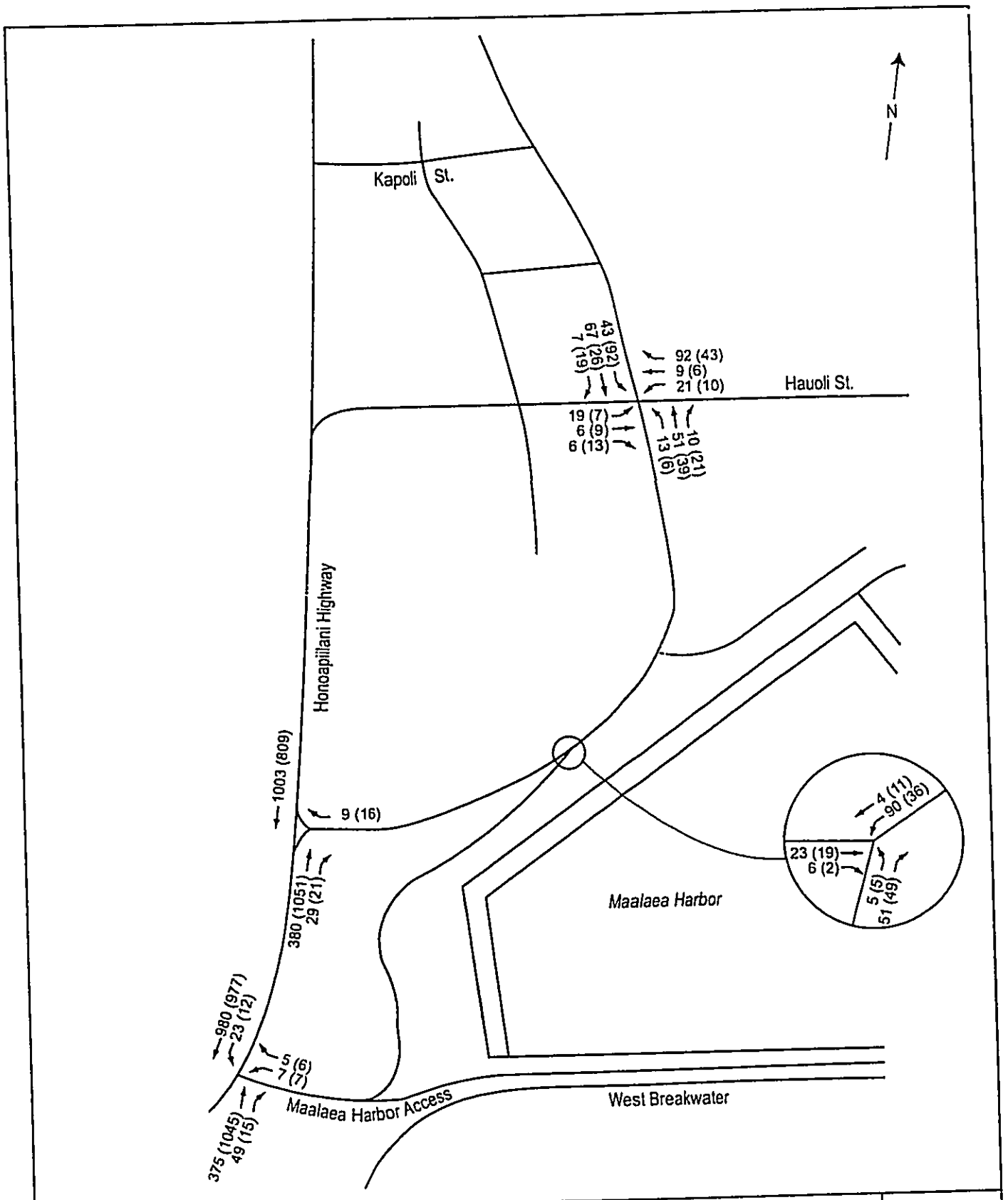
Source: HDOT Traffic Count Station 10-C, 2001; Parsons Brinckerhoff, 2004

2. Peak Hour Intersection Turning Movement Volumes

Traffic turning movements were collected on November 15-16, 2004 at the following locations, also shown in Figure 8:

- Honoapiilani Highway/Maalaea Harbor Access;
- Honoapiilani Highway/Old Maalaea Road (South End);
- Old Maalaea Road/Internal Harbor Access;
- Old Maalaea Road/Hauoli Street.

At the Old Maalaea Road/Hauoli Street intersection, AM data was derived from turning movement counts conducted at the Old Maalaea Road/Internal Harbor Access intersection and through reversal of PM turning movement counts conducted at the Old Maalaea Road/Hauoli Street intersection. The existing turning movement traffic volumes are summarized in Figure 9.



EXISTING TRAFFIC VOLUMES

Figure 9

Parsons Brinckerhoff

Maalaea Harbor
January 2005

The AM and PM peak hours within the harbor area were found to be 6:15 AM to 7:15 AM and 4:45 PM to 5:45 PM, respectively. Peak hours were determined strictly from the traffic internal to the harbor area.

D. Existing Peak Hour Intersection Operation Analysis

The intersections providing primary access to the Maalaea Small Boat Harbor were analyzed using the methodologies for unsignalized intersections outlined in the *2000 Highway Capacity Manual (HCM)*. An intersection's operating conditions can be broken down by approach and expressed as a qualitative measure known as Level of Service (LOS) ranging from A to F. LOS A denotes operations with low delay; conversely, LOS F denotes congested operations with relatively high delay. An intersection's overall LOS is determined by taking a weighted average of the LOS of individual traffic movement groups. Appendix B has more detailed definitions of the intersection LOS. Field observations were performed at these intersections to verify the results of the intersection analysis.

With the exception of the Harbor Access/Honoapiilani Highway intersection, these intersections operate well during the peak hours. Existing intersection LOS is summarized in Table 2.

1. Honoapiilani Highway/Harbor Access

Vehicles can experience difficulty turning into and out of the Harbor Access. The most difficult movement to execute is the left turn from the Harbor Access to southbound Honoapiilani Highway. The relatively high volume and speed of traffic on Honoapiilani Highway during the peak hours make it difficult for left-turning vehicles to find an adequate gap in traffic, and, therefore, often experience long delays during peak traffic periods. The right turns out of the Harbor Access have less difficulty, but because the approach is only one lane wide, right-turning vehicles must sometimes wait for a left-turning vehicle to complete its movement, causing the right-turning vehicle to experience similar delay.

Table 2
Existing Levels of Service

Intersection	AM Peak		PM Peak	
	LOS	Delay	LOS	Delay
Harbor Access/ Honoapiilani Highway	**Unsignalized**			
SB Honoapiilani Left/Through	A	8.3	B	11.1
WB Harbor Access Left/Right	D	26.7	F	52.2
Old Maalaea Road/ Honoapiilani Highway	**Unsignalized**			
WB Right	B	10.6	C	21.0
Old Maalaea Road/ Hauoli Street	**Unsignalized**			
NB Old Maalaea Left	A	7.4	A	7.3
SB Old Maalaea Left	A	7.4	A	7.5
WB Hauoli Left/Through/Right	A	9.8	A	9.6
EB Driveway Left/Through/Right	B	11.2	B	10.3
Internal Harbor Access/ Old Maalaea Road	**Unsignalized**			
WB Old Maalaea Left/Through	A	7.4	A	7.3
NB Internal Harbor Left/Right	A	8.8	A	8.7

Note: NB=northbound, SB=southbound, EB=eastbound, WB=westbound
Delay expressed as seconds per vehicle

Southbound left turns from Honoapiilani Highway into the Harbor Access are calculated to operate at LOS A with little delay. However, it was observed that occasionally these vehicles would have to wait for a gap in the northbound Honoapiilani Highway traffic flow in order to make the southbound left turn. Because there is no median left-turn lane, these vehicles must wait in the southbound through lane. Given the posted speed of 45 miles per hour on Honoapiilani Highway, there is a potential safety issue since these vehicles are at a complete stop in a through traffic lane.

Right turns into the Harbor Access from northbound Honoapiilani Highway constitute the largest turning movement at this intersection. An observation regarding operations is that the absence of a right-turn deceleration lane affects northbound through vehicles as right-turning vehicles slow to make the turn into the Harbor Access. Again this is a potential safety issue, although not as severe as for the southbound left-turn movement.

2. Honoapiilani Highway/Old Maalaea Road

This intersection is configured to only allow right in/right out traffic movements at Old Maalaea Road. Additionally, the right-turn out of Old Maalaea Road feeds directly into an auxiliary lane that extends the length of the Maalaea Triangle area. This traffic must, however, merge back into the northbound Honoapiilani Highway. This maneuver was conservatively evaluated by treating is as a conventional right turn into the main traffic flow. This movement operated well during the AM peak hour, at LOS B. During the PM peak hour, the movement still operates well at LOS C.

3. Hauoli Street/Old Maalaea Road

During the AM peak hour, left turns from Old Maalaea Road into Hauoli Street and the Harbor Shops Driveway both operate at LOS A. Westbound left/through/right movements out of Hauoli Street also operate at LOS A. Eastbound left/through/right movements from the Harbor Shops Driveway operate at LOS B.

During the PM peak the intersection operates at the same LOS at each approach/ movement.

4. Internal Harbor Access/Old Maalaea Road

This internal intersection also currently operates very well. Eastbound right turns from Old Maalaea Road are prohibited, but still occur occasionally. The westbound Old Maalaea Road and northbound Internal Harbor Access approaches both operate at LOS A during both the AM and PM peak hours.

E. Other Issues

During the data collection, it was observed that a key existing issue within the Maalaea Small Boat Harbor is lack of parking for visitors. There also appears to be much confusion on the part of the visitors leading to much unnecessary driving around the harbor parking areas. The Harbor Master and crew members aboard the various boats operating out of the harbor have complained about the lack of parking and internal traffic confusion. There are currently 277 parking stalls in the harbor area, of which 151 are on the west breakwater. As such, much of the parking issues are focused in this area. The issue of

insufficient parking is compounded by difficult maneuvering for tour buses that drop off passengers for the larger boat excursions.

These parking issues need to be considered when planning future ferry operations at the Maalaea Small Boat Harbor.

III. PROJECTED YEAR 2008 TRAFFIC CONDITIONS WITHOUT PROJECT

The planning phase for harbor area improvements is scheduled to be completed in 2005 with construction being completed in late 2007. Thus, 2008 was used as the target completion date and also the horizon year for future projections.

A. Background Traffic

Background traffic on Honoapiilani Highway is assumed to increase at an annual growth rate of 1 percent.

Discussions with management of the Maalaea Harbor Village Shopping Center indicate that no expansion is planned for this time frame. Based on discussions with the Harbor Master for the Maalaea Small Boat Harbor, no new development was assumed for the harbor. As a result, it was assumed that traffic within the Maalaea triangle would remain constant.

The resulting year 2008 peak hour traffic turning movement volumes without the proposed ferry are shown in Figure 10.

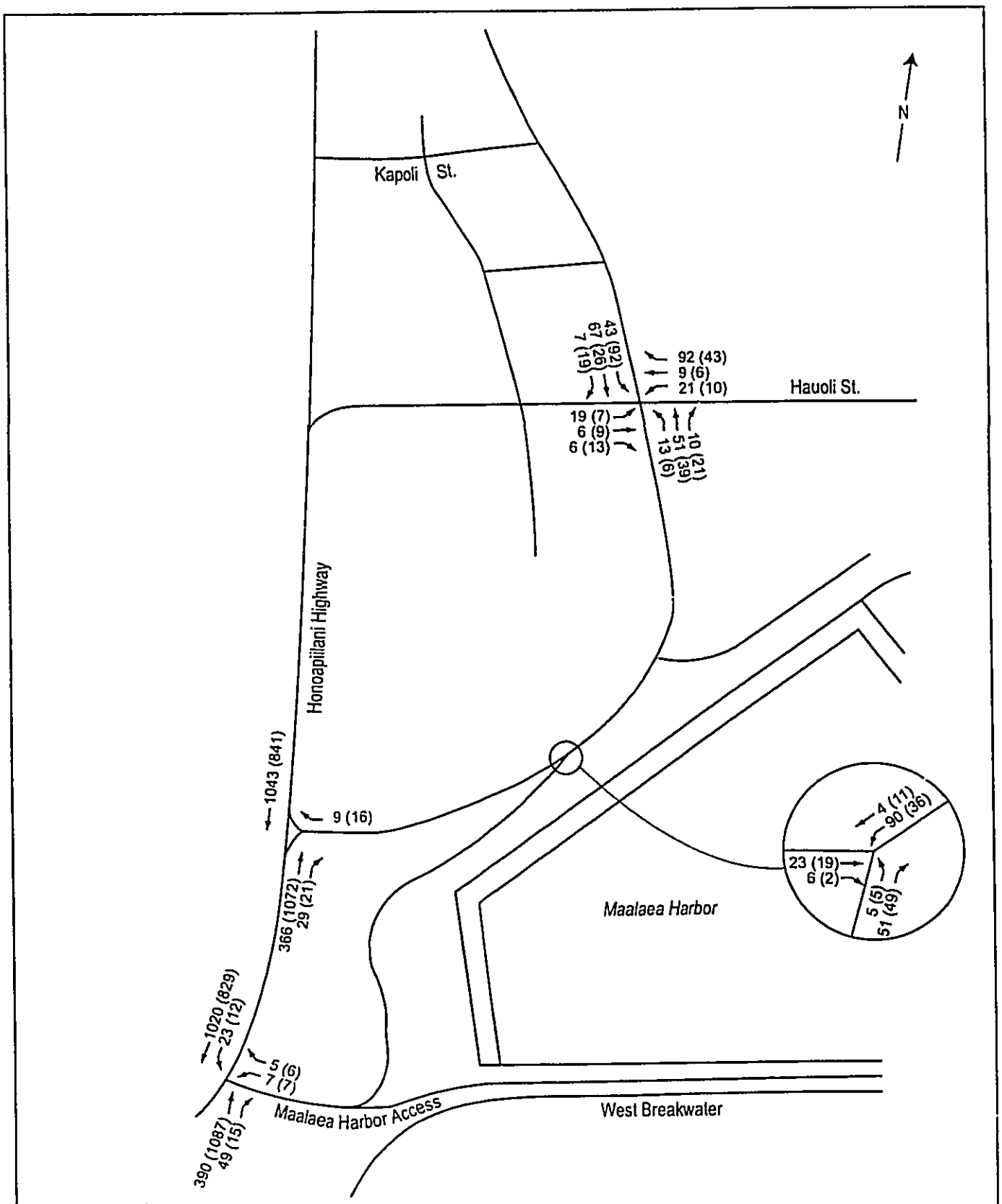
B. Intersection Operations

A summary of 2008 intersection operations without the proposed ferry project is summarized in Table 3.

1. Honoapiilani Highway/Harbor Access

As shown in Figure 10, the expected growth along Honoapiilani Highway is small, and as a result, LOS and delay are very similar to existing levels.

The same issues described for the existing conditions remain. Turning movements out of the Maalaea Harbor Access would still experience long delays. Left-turns into the Maalaea Harbor Access are calculated to have little delay, but pose a potential safety issue because no left-turn storage lane is provided.



YEAR 2008 PEAK HOUR TRAFFIC VOLUMES
WITHOUT PROPOSED FERRY

Figure
10

Table 3
Projected Year 2008 Peak Hour Intersection LOS
Without Proposed Ferry

Intersection	AM Peak		PM Peak	
	LOS	Delay	LOS	Delay
Honoapiilani Highway/ Harbor Access	**Unsignalized**			
SB Honoapiilani Left/Through	A	8.4	B	11.4
WB Harbor Access Left/Right	D	28.7	F	58.5
Honoapiilani Highway/ Old Maalaea Road	**Unsignalized**			
WB Old Maalaea Road Right	B	10.8	C	22.1
Old Maalaea Road/ Hauoli Street	**Unsignalized**			
NB Old Maalaea Road Left	A	7.4	A	7.3
SB Old Maalaea Road Left	A	7.4	A	7.5
WB Hauoli Street Left/Through/Right	A	9.8	A	9.6
EB Harbor Shops Left/Through/Right	B	11.2	B	10.3
Old Maalaea Road/ Internal Harbor Access	**Unsignalized**			
WB Old Maalaea Road Left/Through	A	7.4	A	7.3
NB Internal Harbor Left/Right	A	8.8	A	8.7

Note: NB=northbound, SB=southbound, EB=eastbound, WB=westbound
Delay expressed as seconds per vehicle

2. Honoapiilani Highway/Old Maalaea Road (South End)

As with the Honoapiilani Highway/Harbor Access intersection, LOS at this intersection is projected to be similar to existing conditions.

3. Old Maalaea Road/Hauoli Street

Similarly, intersections operations at this intersection are expected to be similar to those evaluated as part of the existing conditions

4. Old Maalaea Road/Internal Harbor Access

Traffic operations and northbound approaches are both projected to operate at LOS A during both the AM and PM peak hours.

IV. PROJECTED YEAR 2008 TRAFFIC CONDITIONS WITH PROJECT

A. Travel Demand Estimation

1. Trip Generation

It was determined that vehicular trips from potential ferry operations would be estimated using data from the existing Molokai (Sealink) and Lanai (Expedition) ferry operations. These ferries currently operate out of Lahaina and reported the following use by type of users (commuters vs. tourists). This summary is shown in Table 4.

Table 4
Existing Type of Ferry Passengers at Lahaina

Ferry Operation	Commuters	Tourists
Molokai Trips	25%	75%
Lanai Trips	60%	40%

Source: Telephone conversations with Sea Link and Expedition, which operate ferries from Lahaina to Molokai and Lanai, respectively.

Based on conversations with Sea Link and Expedition, it was learned that Expedition could potentially operate a 64-passenger ferry while Sea Link could potentially operate a 149 passenger ferry for a total of 213 ferry passengers at Maalaea. In order to estimate the worst case (peak season) condition, maximum passenger load was assumed. It was also assumed that there would be 2 passengers per vehicle for tourists and 1 passenger per vehicle for commuters. Based on these assumptions, the total numbers of ferry-related vehicle trips were estimated and the resulting traffic volumes are shown in Table 5.

Table 5
Estimated Maalaea Ferry-Generated Vehicular Trips

	Commuters	Tourists	Total
Molokai	37	56	93
Lanai	38	13	51
Total	**75**	**69**	**144**

Source: Based on Interviews with Sea Link and Expedition

The worst-case scenario was assumed for generation of traffic due to ferry operations. That is, ferry passengers arrive during the AM peak, remain in the parking lot all day, and then depart during the PM peak. This is assumed instead of an incremental return by tourists, thereby lessening the PM peak hour generation. Thus, the 144 total trips shown in Table 4 represent the total vehicular inflow during the AM peak hour and the total vehicular outflow during the PM peak hour. The summarized trip generation by direction projected for the potential Maalaea Ferry is shown in Table 6.

Table 6
Maalaea Ferry Trip Generation

	AM Peak Hour		PM Peak Hour	
	In	Out	In	Out
Ferry	144	0	0	144

Note: Volume expressed as vehicles per hour.

2. Trip Distribution

The vehicular trips estimated for the ferry was assumed to utilize a directional trip distribution that is similar to the existing directional A.M. peak hour distribution exhibited at Maalaea Small Boat harbor. This distribution is shown in Table 7.

Table 7
Maalaea Ferry Trip Distribution

Direction	Percent
North on Honoapiilani Highway (Central Maui and Kihei/Wailea)	44
South on Honoapiilani Highway (West Maui)	56

Source: Based on interview with existing ferry operators

Table 5 illustrates directional distribution simply in terms of direction in relation to Maalaea Small Boat Harbor. Thus, south indicates west Maui while north indicates central and south Maui including areas like Kahului, Wailuku, Kihei and Wailea.

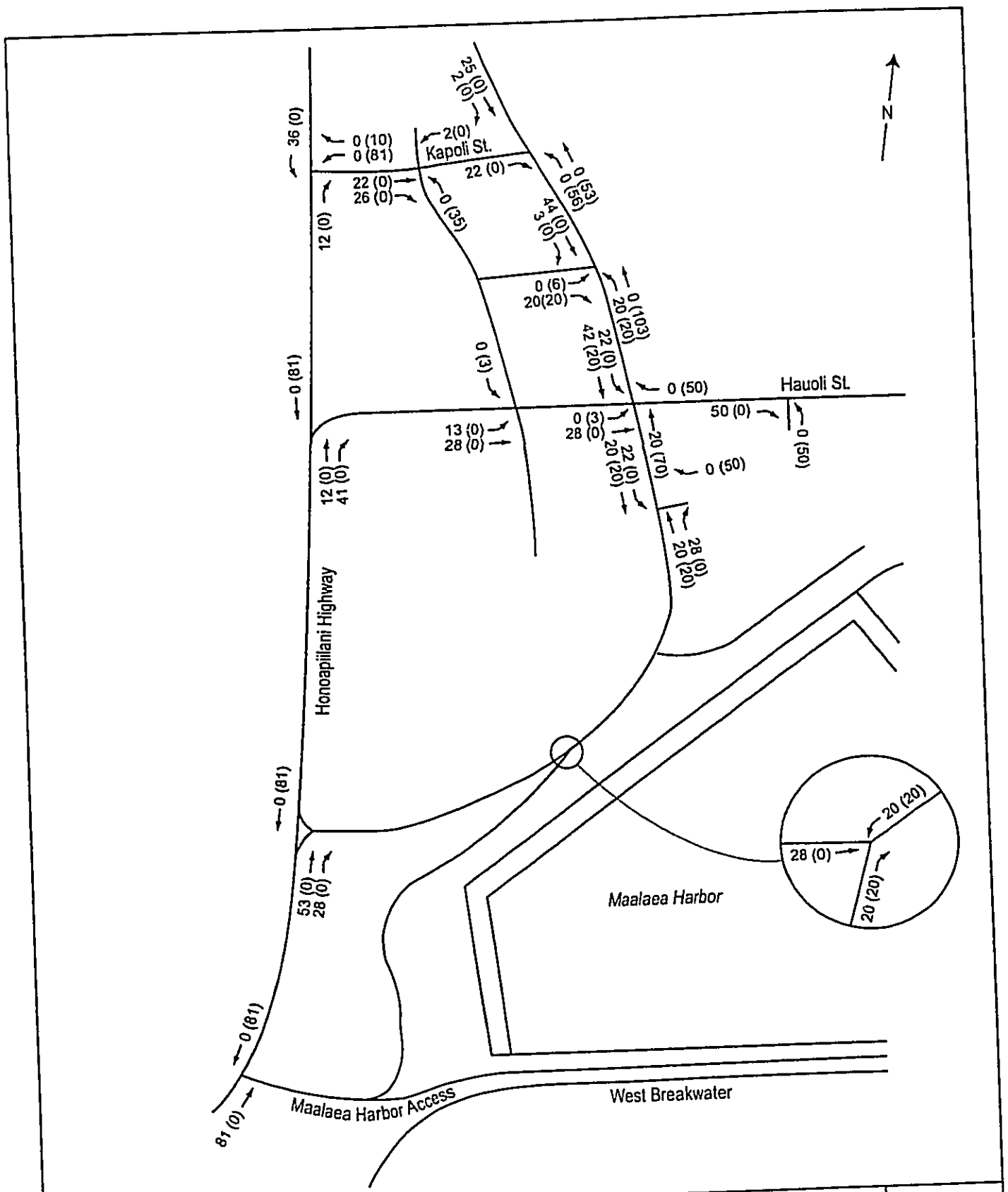
3. Project Generated Traffic Assignment

Using the trip distribution shown in Table 5, the project-generated traffic was assigned to the roadway system assumed to be in place in 2008.

It was assumed that because the existing harbor area is already full parking-wise that any ferry-related traffic would have to be accommodated in an off-site parking lot. There are several options for a an off-site parking lot including the existing underutilized shopping center parking lot just south of Kapoli Street and a vacant lot located east of Old Maalaea Road between Hauoli Street and the harbor. Because the vacant lot is currently being leased by the State of Hawaii as overflow parking for the Maalaea Small Boat Harbor and there are already discussions underway with the land owner to acquire the property, the vacant lot was selected for the off-site parking lot for potential ferry operations. This assumed off-site lot is actually adjacent to the north pier area of the harbor. Access to the parking lot is assumed to be located on Hauoli Street and on Old Maalaea Road, just south of Hauoli Street. Although the proposed parking lot for potential ferry operations is located adjacent to the north pier area, it is possible that ferry operations would operate off of the west breakwater, on the opposite side of the harbor. Therefore, it was assumed that a shuttle would be implemented to carry ferry passengers between the parking lot and the pier on the west breakwater. It was also assumed that about a third of the worst-case (peak season) ferry-generated vehicular volume would park both in the proposed parking lot and within the existing overflow shopping center lot parking. This is reflected in the project generated volumes, shown in Figure 11, which shows the ferry-generated traffic volumes for the AM and PM peak hours.

4. Total Traffic Assignment

Project-generated traffic assignment were combined with the background traffic volumes previously described in Chapter III to produce total projected Year 2008 peak hour traffic volumes assignments with the proposed ferry operations. Figure 12 illustrates these future volumes for the Maalaea Harbor area during the AM and PM peak hours.



YEAR 2008 PROJECT-GENERATED
PEAK HOUR TRAFFIC VOLUMES

Figure
11

B. Traffic Operations Evaluation

The projected year 2008 total peak hour traffic volumes were evaluated assuming the same traffic control as in existing conditions.

A summary of 2008 intersection operations with the project in place is shown in Table 8.

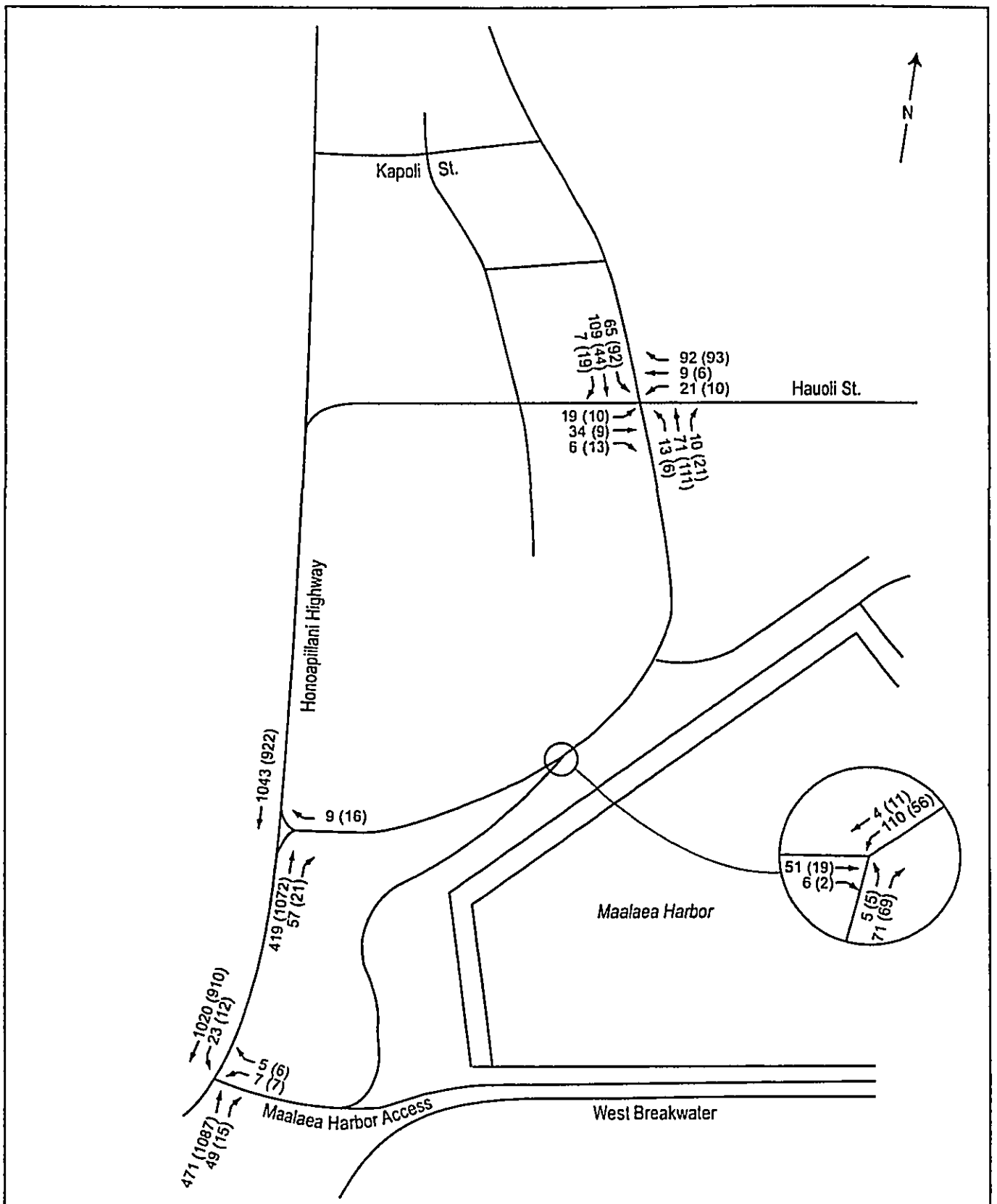
Table 8
Projected Year 2008 Intersection LOS With Project

	AM Peak		PM Peak	
	LOS	Delay	LOS	Delay
Honoapiilani Highway/ Harbor Access	**Unsignalized**			
SB Honoapiilani Left/Through	A	8.7	B	11.4
WB Harbor Access Left/Right	D	31.9	F	66.7
Honoapiilani Highway/ Old Maalaea Road	**Unsignalized**			
WB Old Maalaea Road Right	B	11.3	C	22.1
Old Maalaea Road/ Hauoli Street	**Unsignalized**			
NB Old Maalaea Road Left	A	7.5	A	7.3
SB Old Maalaea Road Left	A	7.5	A	7.7
WB Hauoli Street Left/Through/Right	B	10.4	B	10.1
EB Harbor Shops Left/Through/Right	B	13.0	B	11.6
Old Maalaea Road/ Internal Harbor Access	**Unsignalized**			
WB Old Maalaea Road Left/Through	A	7.5	A	7.3
NB Internal Harbor Left/Right	A	9.0	A	8.7
Hauoli St Parking Access	**Unsignalized**			
WB Hauoli Street Left/Through	A	7.4	A	7.5
NB Parking Lot Access	A	9.2	A	9.9
Maalaea Rd Parking Access	**Unsignalized**			
SB Old Maalaea Road Left	A	7.5	A	7.4
WB Parking Lot Access	A	9.5	A	9.0

Note: NB=northbound, SB=southbound, EB=eastbound, WB=westbound
Delay expressed as seconds per vehicle

1. Honoapiilani Highway/Harbor Access

At this intersection, the traffic volume generated by the potential ferry operation is projected to add to the northbound Honoapiilani Highway through movement during the AM peak hour and the southbound Honoapiilani Highway through movement during the PM peak hour.



PROJECTED YEAR 2008 PEAK HOUR TRAFFIC VOLUMES
WITH PROJECT

Figure
12

This additional volume is projected to have minimal effect on intersection LOS. As an example, when compared with projected year 2008 peak hour intersection operations without the ferry: delays for the Harbor Access approach increase 3.2 seconds per vehicle during the AM peak hour and 8.2 seconds per vehicle during the PM peak hour. The LOS remains the same in both cases.

The ferry operation does not cause major traffic impacts at this intersection. Nor does it cause the potential safety issues identified in the existing conditions portion of this study and restated in the chapter of future traffic conditions without the potential ferry operation. However, it is still important to point out that this intersection does present potential safety issues related to unprotected turning movement in and out of the Harbor Access.

2. Honoapiilani Highway/Old Maalaea Road (South End)

The projected increase in traffic on northbound Honoapiilani Highway is projected to increase delay for the westbound right turn from Old Maalaea Road to northbound Honoapiilani Highway. This increase in delay is small. During the AM peak hour the increase in delay is 0.7 seconds per vehicle and does not change the LOS B forecasted for the movement without the ferry.

3. Old Maalaea Road/Hauoli Street

Based on the assumptions of parking for the proposed ferry operation, internal traffic is expected to be minimally affected. Because shuttles will be used to transport ferry passengers from the remote parking lots to the ferry, the increased activity at this intersection would mainly take the form of four to five bus-sized vehicles or sixteen to twenty van-sized vehicles per hour. Using 20 shuttle vehicles per hour as an assumption, it was found that intersection operations would result in slightly lower LOS projected for this intersection with the potential ferry than without the potential ferry. However, the LOS would be LOS B or better, still very good LOS.

4. Old Maalaea Road/Internal Harbor Access Road

Based on the assumptions of parking for the proposed ferry operation, internal traffic is expected to be minimally affected. Because shuttles will be used to transport ferry passengers from the remote parking lots to the ferry, the increased activity at this

intersection would mainly take the form of four to five bus-sized vehicles or sixteen to twenty van-sized vehicles per hour. Using 20 shuttle vehicles per hour as an assumption, it was found that westbound Old Maalaea Road and northbound Internal Harbor Access approaches are both projected to operate at LOS A during both the Year 2008 AM and PM peak hours.

5. Remote Parking Lot Access Driveways

There are two driveways proposed for the remote parking lot: one on Hauoli Street and one on Old Maalaea Road. Figure 13 in this report show a conceptual plan for this parking lot. Unsignalized intersection analyses project good peak hour operations at these driveways.

V. CONCLUSIONS AND RECOMMENDATIONS

A. Conclusion

Based on the LOS analysis at the study area intersections, it is concluded that the ferry expansion would have a minimal effect on intersection operations for intersections adjacent to the Maalaea Small Boat Harbor during the AM and PM commuter peak periods.

B. Recommendations

The evaluation did reveal several issues with intersection geometry at the Harbor access, with ferry parking needs, and with pedestrian facilities in the Harbor area.

1. Intersection Geometry

There are two harbor accesses which directly access Honoapiilani Highway. One is the Harbor Access; the other is Old Maalaea Road (south end).

The Harbor Access is an unsignalized "T-intersection" with STOP-sign control on the Harbor Access approach. In this area, the posted speed limit for Honoapiilani Highway is 45 miles per hour (mph). There are no acceleration or deceleration lanes at the Harbor Access and no median left-turn lane for vehicles turning left into the Harbor Access. This study has identified this as a potential safety issue, since a southbound vehicle waiting to execute a left-turn into the Harbor Access must do so in the southbound through lane, exposing the vehicle to potential rear-end collision by another vehicle traveling at relatively high speed.

The State of Hawaii Department of Transportation (HDOT) has also identified this intersection as needing geometric improvement. The 2002 Project Assessment Report for Maui District (Belt Collins, March 2002) has identified this intersection as a potential location for safety improvements, most notably a left-turn storage lane for southbound Honoapiilani traffic turning into the Harbor Access. HDOT Maui District has selected a consultant and is working toward design and implementation of this improvement.

Also of concern is the left turn movement out of the harbor. The movement experiences very long delays under existing conditions during the PM peak hour and will continue to

experience very long delays in future scenarios. Median refuge for vehicles turning out of the Harbor access would be a way for these vehicles to complete the movement in two stages, reducing vehicle conflicts and potentially, reducing delay. Additionally, channelizing the Harbor Access approach to provide separate left and right turning lanes would allow right turning vehicles to execute their maneuver without waiting for left-turning vehicles to do so.

Alternatively, some or all left turns could be prohibited at the Harbor Access intersection, thereby eliminating the issue altogether. The access would become a right-in/right-out intersection and vehicles making left turns must do so at other intersections, such as Kapoli Street. The low existing left-turn volume at the Harbor Access indicates that vehicles are already doing this, because of the difficulty of executing left turns at the Harbor Access. The future demand is also projected to be low (7 movements during the AM peak, 7 movements during the PM peak), so it should be possible for these movements to be relocated to Kapoli Street. Motorists trying to enter the harbor coming from the North would have to enter via Kapoli or Old Maalaea.

The selection of which action to implement would be subject to decision by HDOT.

The Old Maalaea Road (South End) intersection is restricted to right in/right out traffic movements. The right-turn movement out of Old Maalaea feeds directly into an existing northbound auxiliary lane, so this movement. Installation of a right-turn deceleration lane would be an enhancement at this intersection, although the relatively low volume currently using and projected to use this access makes this a relatively low priority improvement.

2. Maalaea Small Boat Harbor Parking

Currently, the harbor's parking is inadequate for harbor-related traffic. Existing tour boat operations utilize most of the available parking. Some tour boat operators currently rent parking space from the Maalaea Harbor Village Shopping Center, located north of and adjacent to the harbor.

There are currently 277 parking stalls within the harbor proper according to a 1998 EIS. Of these, a recent field count noted 151 parking stalls on the west breakwater, 90 on the

ocean side and 61 on the harbor side. The breakwater parking constitutes more than half of the total parking in the harbor.

The harbor stalls accommodate parking for boat crew members, boat passengers, people who launch boats at the public boat ramp, workers and customers for the dry dock, and customers for Buzz's Steak House restaurant.

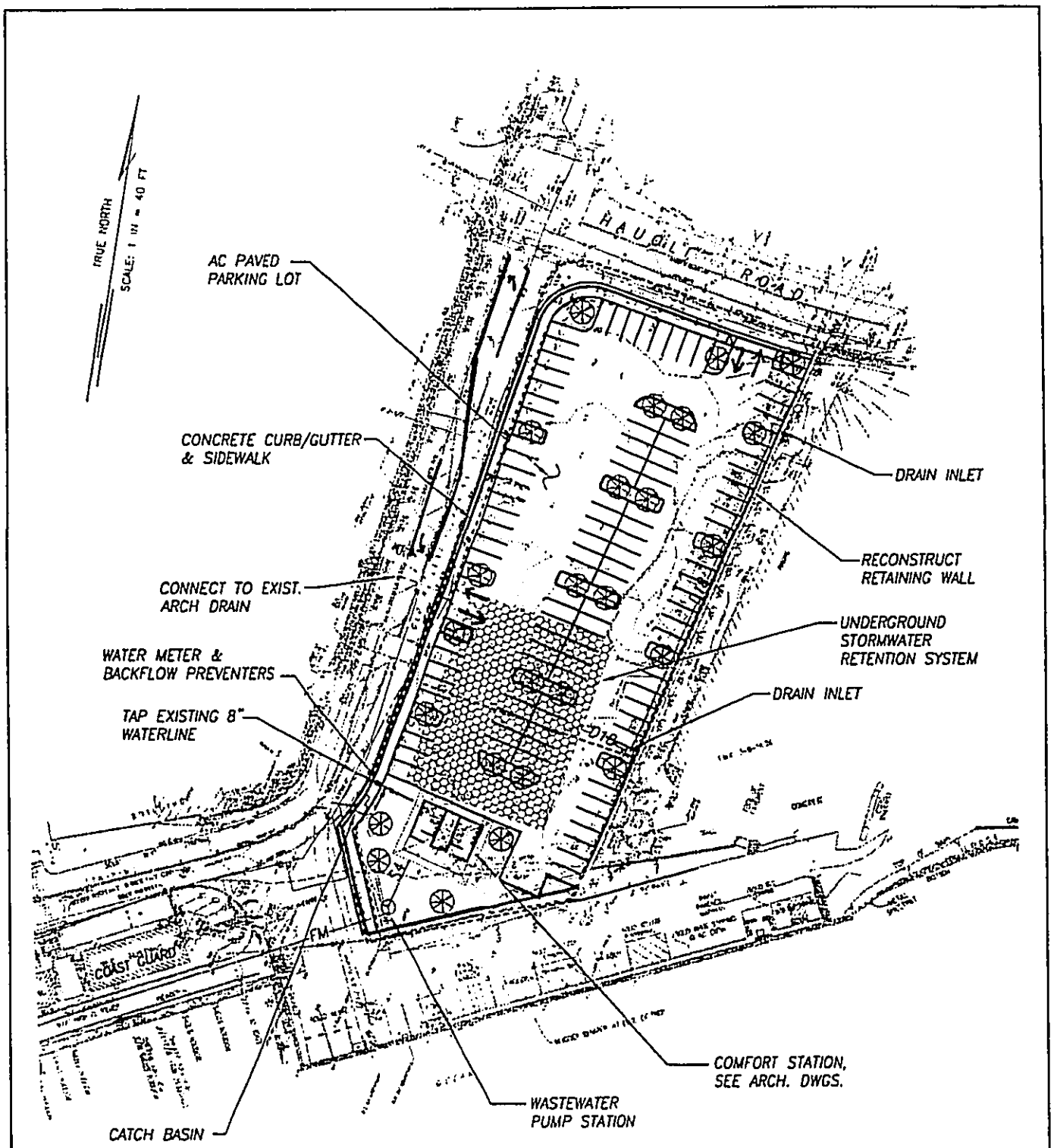
According to information provided by the Maalaea Harbor Master, there are 30 boats that operate out of Maalaea harbor with a total capacity of 2014 passengers, not including crew. Of course, not all ships will be operating at capacity, everyday, during the peak hour. However, this data illustrates the potential demand for parking, especially during peak whale-watching season.

This congested parking situation indicates that new Harbor uses, such as the potential ferry operation would need to find alternative parking to accommodate their patrons.

Estimates of future vehicular parking demand generated by the potential ferry operation indicate a need for approximately 144 (peak season) parking stalls. Any arrangement that would provide this number of parking stalls would accommodate the projected parking demand for the potential ferry operation.

To satisfy the majority of the potential ferry parking demand, a vacant lot currently being leased by the State of Hawaii to provide overflow parking for the Maalaea Small Boat Harbor is identified as a site for the remote parking lot. This site is located east of Old Maalaea Road and south of Hauoli Street and has the advantage of being adjacent to the harbor. This parking lot could contain approximately 100 parking spaces and is currently proposed to have driveway access on Hauoli Street and on Old Maalaea Road, south of Hauoli Street. Figure 13 illustrates a conceptual plan of this parking lot. Overflow vehicular demand in excess of the 100 parking spaces is assumed to park in the currently underutilized north portion of the Maalaea Harbor Village Shopping Center.

Although it is adjacent to the harbor, the off-site parking lot is a good distance away from the west break water pier, which is where the potential ferry is likely to load passengers. Because of this and because overflow ferry parking may utilize some of the shopping center parking, a shuttle service to carry passengers between the harbor and the parking



Conceptual Ferry Remote Parking Lot Plan

Figure 13

lots is recommended. Based on the ferry passenger demand of approximately 213 passengers per hour, it is estimated that four to five tour bus trips or sixteen to twenty-two van round trips would be required to shuttle passengers from their vehicles to the harbor pier. Because of the greater flexibility and ability to provide quicker turnaround time, a van shuttle would probably be preferable to a tour bus shuttle.

3. Pedestrian Facilities

Pedestrian traffic was observed in the Harbor area. Of special note was pedestrian traffic between the Pacific Whale Foundation offices located within the Maalaea Harbor Village Shopping Center and the north pier area, where the Pacific Whale Foundation charter boats dock. According to Pacific Whale Foundation representatives, boat passengers first get briefed at the shopping center offices/classrooms and then walk to the north pier area. Most passengers walk on the sidewalk located adjacent to the shopping center on the north side of Old Maalaea Road. This sidewalk ends, however, when it reaches the parcel where the Old Maalaea Harbor Store and the historic temple is located. Passengers usually cross Old Maalaea Road in the vicinity of the Coast Guard Station and walk along Old Maalaea Road to the north pier area.

It is recommended to implement an appropriate pedestrian crossing of Old Maalaea Road where the shopping center sidewalk ends and to provide a sidewalk or pedestrian path on the south side of Old Maalaea Road between this location and the north pier driveway.

4. Summary of Recommendations

- Make geometric improvements at Honoapiilani Highway/Maalaea Harbor Access intersection to include providing a southbound median left-turn storage lane, a median refuge for left turn out of the Harbor Access, and channelization of the Harbor Access approach to provide separate left and right turning lanes. Alternatively, restrict traffic movements at the Harbor Access to right-in/right-out movements.

- Provide remote parking lot for potential ferry operation patrons. A remote parking lot is currently proposed north of and adjacent to the Maalaea Small Boat Harbor. This parking lot would handle the majority of the potential ferry parking demand. Overflow demand could be accommodated in the underutilized parking areas in

north portion of the Maalaea Harbor Village Shopping Center that currently provide that function for the rest of the harbor operations.

- Provide van shuttle service between the remote parking lot and the pier areas in Maalaea Small Boat Harbor.

- Provide pedestrian crossing of Old Maalaea Road where the existing shopping center sidewalk ends in the vicinity of the Coast Guard Station and provide a sidewalk or pedestrian path between this point and the north pier driveway.

C. Parking Recommendations for Other Maalaea Small Boat Harbor Uses

These parking recommendations are not related to the potential ferry service at Maalaea but are based on observations of existing issues at Maalaea Small Boat Harbor.

It was mentioned previously that there is not sufficient parking for charter boat customers during busy seasons. A primary concern of the Harbor Master is ensuring that boat owners and crew members have enough parking within the Harbor. Ideally, this parking would be right at their respective slips. Often, these parking spaces are occupied by boat passengers and other visitors to the Harbor.

It was also observed that tour buses dropping off passengers for the large charter boat operations had difficulty maneuvering on the west breakwater due to the narrow drive aisle caused by vehicles parking on both sides of the breakwater.

A potential way to address these issues is to relocate visitor parking to remote parking lots and to reserve parking adjacent to the slips for boat owners and crew members. Parking associated with Buzz's Steak House and with boat launching operations would not be included in this relocation.

Removing 90 stalls on the ocean side of the west breakwater would provide a much wider drive path for tour buses dropping passengers at the pier. If visitor parking is relocated to a remote lot, the remaining parking stalls on the harbor side of the breakwater is judged to be sufficient for the boat owners and crew members. The rest of the parking stalls within

Maalaea Small Boat Harbor would be left untouched, but they would be more available to boat owners and crew members since visitors would be using a remote parking lot.

There appear to be available areas for potential remote parking in the northern areas of the Maalaea Harbor Village Shopping Center parking lots if agreements could be worked out with the shopping center owner. Consolidating parking into one area would make it much easier to provide visitors with directions and would reduce the amount of traffic circulating through the harbor area, making it safer for pedestrians.

Shuttles would be needed to transport the visitors from their vehicles to the pier areas. This operation would also help visitors find the appropriate pier area for their arranged excursion.

This recommendation is independent of the potential Maalaea Ferry operation. It is not required to make the ferry operation work but is judged to enhance the internal traffic operation within Maalaea Small Boat Harbor.

Appendix A Data Collection

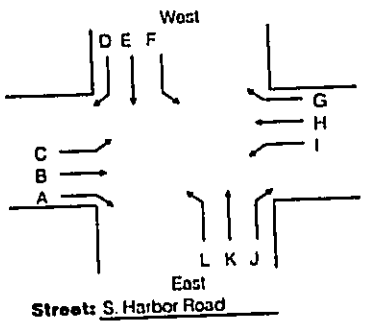
AM COUNT SHEET

Intersection: Maalaea & S. Harbor Road

Date: 11/15/04-11/16/04

By: W. Yoshioka

Weather: Sunny



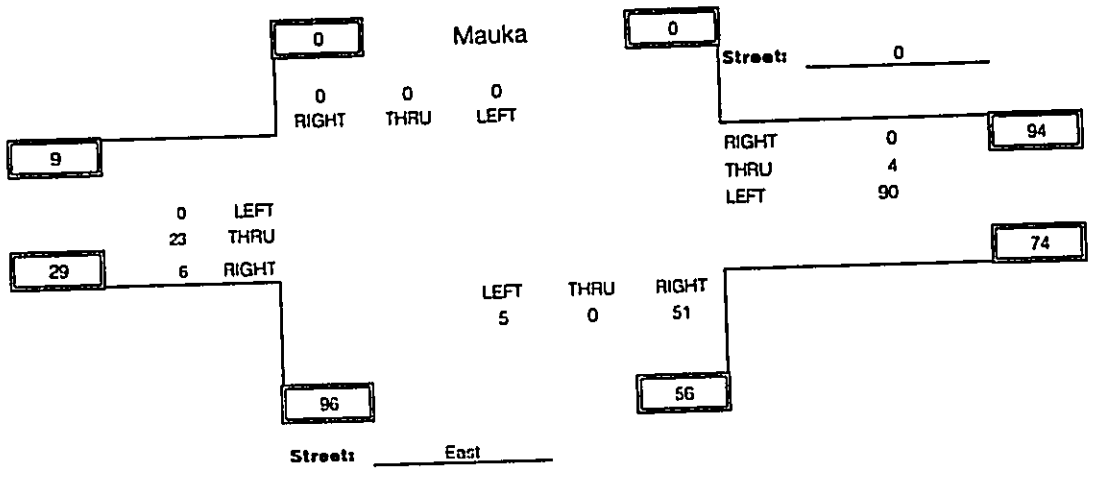
Street: Maalaea Road

Street: S. Harbor Road

TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
6:00 AM - 6:15 AM	7	7	0	0	0	0	0	1	6	8	0	1	30	174
6:15 AM - 6:30 AM	1	7	0	0	0	0	0	0	19	13	0	1	41	179
6:30 AM - 6:45 AM	4	9	0	0	0	0	0	2	30	11	0	1	57	165
6:45 AM - 7:00 AM	0	5	0	0	0	0	0	0	26	13	0	2	46	
7:00 AM - 7:15 AM	1	2	0	0	0	0	0	2	15	14	0	1	35	
7:15 AM - 7:30 AM	2	5	0	0	0	0	0	0	12	5	0	3	27	
7:30 AM - 7:45 AM														
7:45 AM - 8:00 AM														
Phf	0.375	0.639	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.500	0.750	0.911	#DIV/0!	0.625	Peak	Phf
6:15 AM - 7:15 AM	6	23	0	0	0	0	0	4	90	51	0	5	179	0.785

Peak Hour

6:15 AM - 7:15 AM



PARSONS BRINCKERHOFF

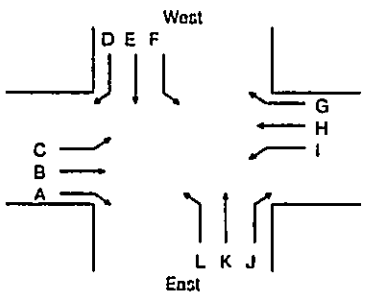
AM COUNT SHEET

Intersection: Maalaea & S. Harbor Road

Date: 11/15/04-11/16/04

By: W. Yoshioka

Weather: Sunny



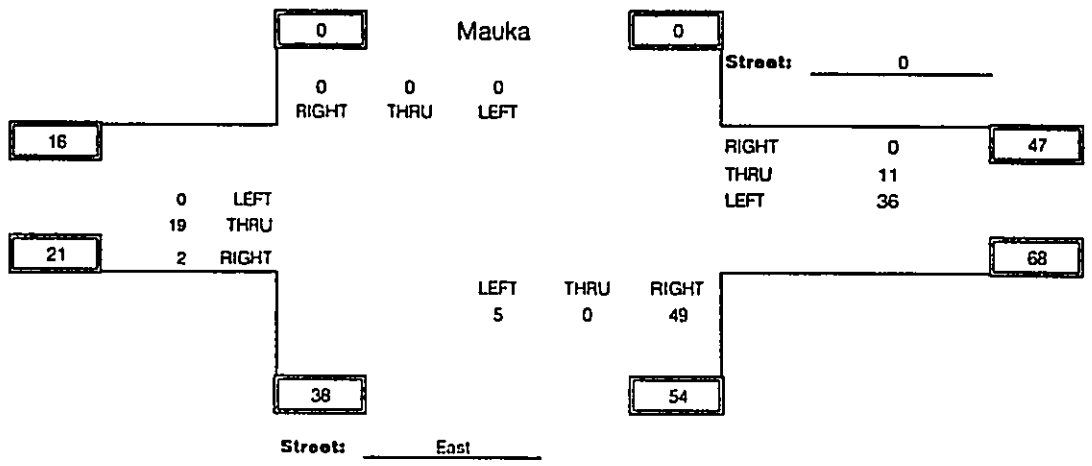
Street: Maalaea Road

Street: S. Harbor Road

TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
4:00 PM - 4:15 PM	0	4	0	0	0	0	0	3	7	22	0	0	36	104
4:15 PM - 4:30 PM	1	5	0	0	0	0	0	2	3	9	0	1	21	104
4:30 PM - 4:45 PM	0	3	0	0	0	0	0	0	6	12	0	2	23	111
4:45 PM - 5:00 PM	0	7	0	0	0	0	0	2	5	10	0	0	24	122
5:00 PM - 5:15 PM	0	5	0	0	0	0	0	2	13	14	0	2	36	118
5:15 PM - 5:30 PM	1	4	0	0	0	0	0	4	9	8	0	2	28	
5:30 PM - 5:45 PM	1	3	0	0	0	0	0	3	9	17	0	1	34	
5:45 PM - 6:00 PM	1	3	0	0	0	0	0	2	7	6	0	1	20	
Phf	0.500	0.679	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.688	0.692	0.721	#DIV/0!	0.625	Peak	Phf
4:45 PM - 5:45 PM	2	19	0	0	0	0	0	11	36	49	0	5	122	0.847

Peak Hour

4:45 PM - 5:45 PM



PARSONS BRINCKERHOFF

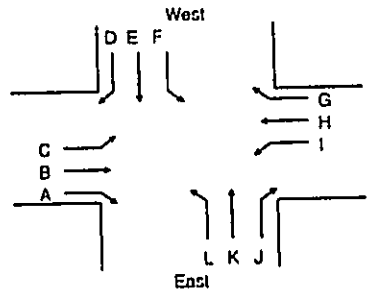
AM COUNT SHEET

Intersection: Maalaea Harbor Entrance

Date: 11/15/04-11/16/04

By: P. Matsunaga

Weather: Sunny



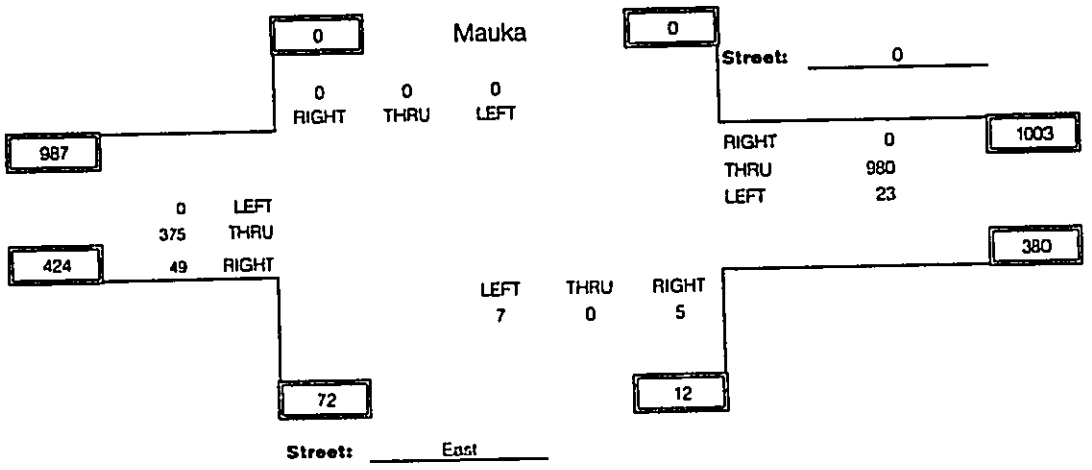
Street: Honoapiilani Highway

Street: Main Harbor Entrance

TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
6:00 AM - 6:15 AM	6	45						152	6	1		0	210	1246
6:15 AM - 6:30 AM	15	69						238	10	2		0	334	1439
6:30 AM - 6:45 AM	20	107						196	4	0		2	329	1517
6:45 AM - 7:00 AM	9	93						262	4	2		3	373	1558
7:00 AM - 7:15 AM	5	106						284	5	1		2	403	
7:15 AM - 7:30 AM	6	120						280	4	2		0	412	
7:30 AM - 7:45 AM	4	165						198	1	0		2	370	
7:45 AM - 8:00 AM														
Phf	0.613	0.876	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.863	0.575	0.625	#DIV/0!	0.583	Peak	Phf
6:15 AM - 7:15 AM	49	375	0	0	0	0	0	980	23	5	0	7	1439	0.893

Peak Hour

6:15 AM - 7:15 AM



PARSONS BRINCKERHOFF

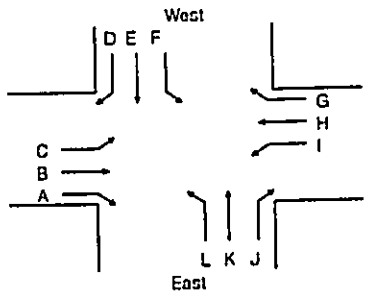
AM COUNT SHEET

Intersection: Maalaea Harbor Entrance

Date: 11/15/04-11/16/04

By: P. Matsunaga

Weather: Sunny



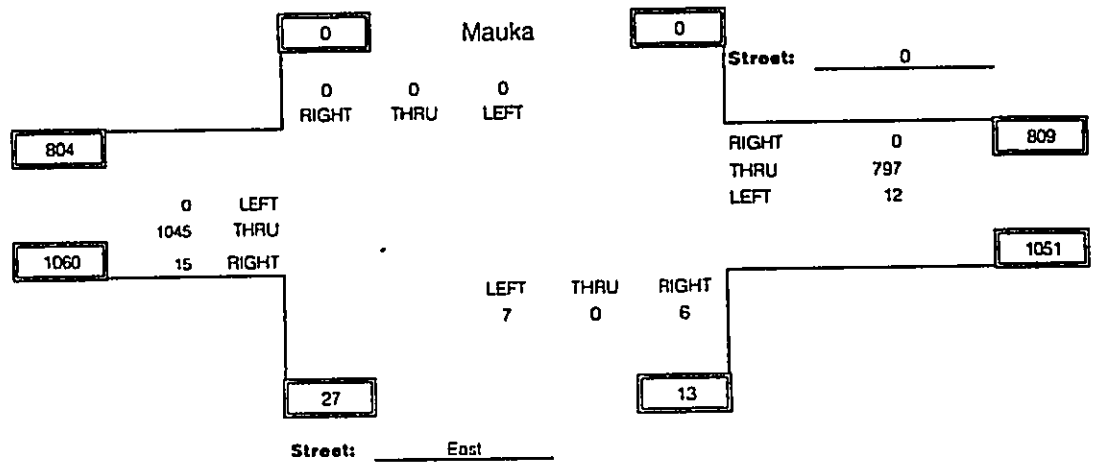
Street: Honoapiilani Highway

Street: Main Harbor Entrance

TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
4:00 PM - 4:15 PM	5	260						281	3	5		0	554	2029
4:15 PM - 4:30 PM	3	245						224	1	2		0	475	1975
4:30 PM - 4:45 PM	1	273						214	2	0		3	493	1968
4:45 PM - 5:00 PM	2	274						222	3	2		4	507	1882
5:00 PM - 5:15 PM	4	283						207	3	0		3	500	1726
5:15 PM - 5:30 PM	6	263						192	4	3		0	468	
5:30 PM - 5:45 PM	3	225						176	2	1		0	407	
5:45 PM - 6:00 PM	5	197						145	2	0		2	351	
Phf	0.625	0.923	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.898	0.750	0.500	#DIV/0!	0.438	Peak	Phf
4:45 PM - 5:45 PM	15	1045	0	0	0	0	0	797	12	6	0	7	1882	0.928

Peak Hour

4:45 PM - 5:45 PM



PARSONS BRINCKERHOFF

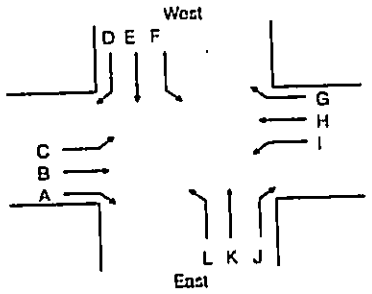
AM COUNT SHEET

Intersection: Honoapiilani S. of Kapoli

Date: 11/15/04-11/16/04

By: P. Matsunaga

Weather: Sunny



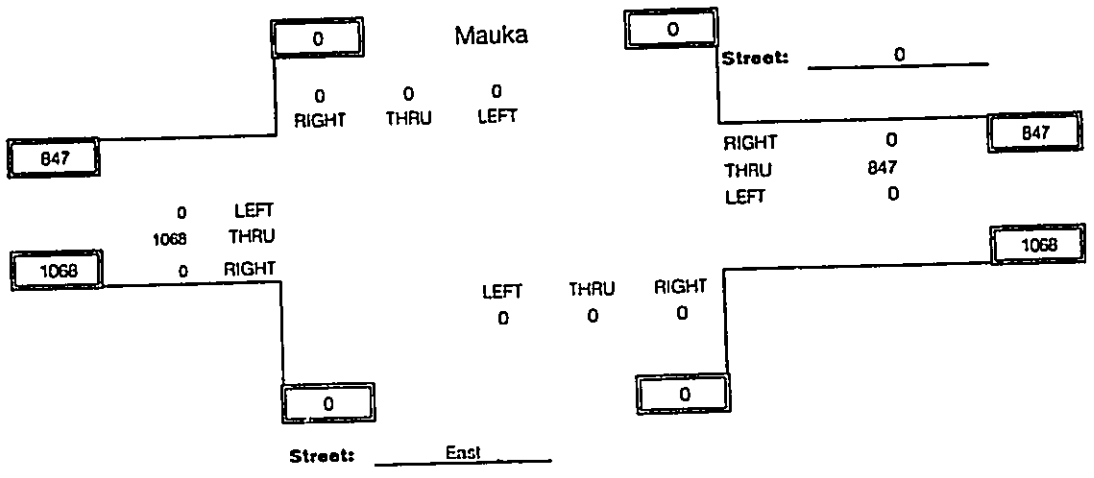
Street: Honoapiilani Highway

Street: Hauoli Street

TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
4:00 PM - 4:15 PM		263						285					548	1995
4:15 PM - 4:30 PM		242						232					474	1956
4:30 PM - 4:45 PM		276						213					489	1954
4:45 PM - 5:00 PM		260						224					484	1915
5:00 PM - 5:15 PM		290						219					509	1809
5:15 PM - 5:30 PM		268						204					472	
5:30 PM - 5:45 PM		250						200					450	
5:45 PM - 6:00 PM		204						174					378	
Phf	#DIV/0!	0.921	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.945	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	Peak	Phf
4:45 PM - 5:45 PM	0	1068	0	0	0	0	0	847	0	0	0	0	1915	0.941

Peak Hour

4:45 PM - 5:45 PM



PARSONS BRINCKERHOFF

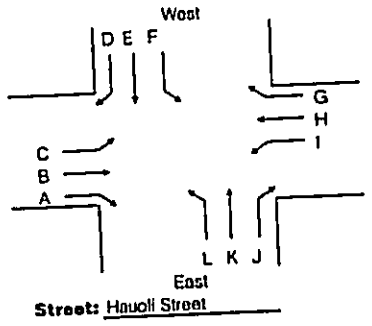
AM COUNT SHEET

Intersection: Maalaea & Hauoli

Date: 11/15/04-11/16/04

By: P. Matsunaga

Weather: Sunny



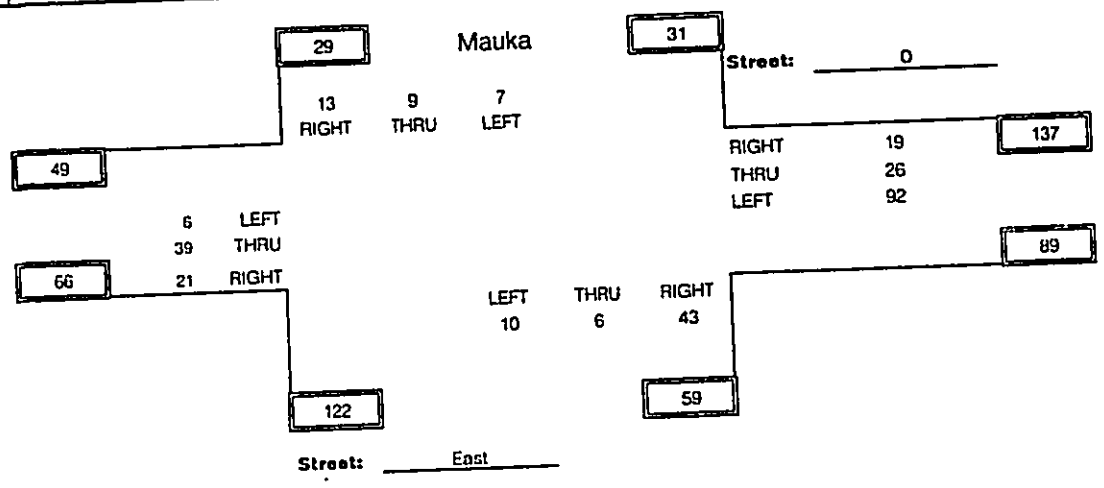
Street: Maalaea Road

Street: Hauoli Street

TIME	A	B	C	D	E	F	G	H	I	J	K	L	Total Mvmt	Total Hour
4:00 PM - 4:15 PM	10	20	2	5	1	2	3	9	10	20	1	0	83	282
4:15 PM - 4:30 PM	3	8	1	2	2	6	5	3	18	24	1	1	74	283
4:30 PM - 4:45 PM	3	10	1	1	2	1	2	4	18	11	1	0	54	271
4:45 PM - 5:00 PM	5	10	2	2	3	2	2	7	24	12	0	2	71	291
5:00 PM - 5:15 PM	5	12	2	4	3	3	6	7	24	13	2	3	84	297
5:15 PM - 5:30 PM	3	7	1	2	2	2	8	1	21	10	1	4	62	
5:30 PM - 5:45 PM	8	10	1	5	1	0	3	11	23	8	3	1	74	
5:45 PM - 6:00 PM	6	5	14	3	6	1	8	7	20	5	0	2	77	
Phf	0.656	0.813	0.750	0.650	0.750	0.583	0.594	0.591	0.958	0.827	0.500	0.625	Peak	Phf
4:45 PM - 5:45 PM	21	39	6	13	9	7	19	26	92	43	6	10	291	0.866

Peak Hour

4:45 PM - 5:45 PM



PARSONS BRINCKERHOFF

Appendix B Level of Service Definitions

The *Highway Capacity Manual* defines six Levels of Service (LOS), labeled A through F, from best to worst conditions. Levels of Service for signalized and unsignalized intersections are defined in terms of average user delays. Delay is a measure of driver discomfort, frustration, fuel consumption, and lost travel time.

For unsignalized intersections, the *Highway Capacity Manual* evaluates gaps in the major street traffic flow and calculates available gaps for left-turns across oncoming traffic and for the left and right-turns onto the major roadway from the minor street.

LEVEL-OF-SERVICE A: Little or no delay.

LEVEL-OF-SERVICE B: Short traffic delays.

LEVEL-OF-SERVICE C: Average traffic delays.

LEVEL-OF-SERVICE D: Long traffic delays.

LEVEL-OF-SERVICE E: Very long traffic delays.

LEVEL-OF-SERVICE F: Demand volume exceeds capacity, resulting in extreme delays with queuing that may cause severe congestion and affect other movements at the intersection.

Appendix C HCS Analysis Worksheets

Two-Way Stop Control

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	P. Matsunaga
Agency/Co.	PBQD
Date Performed	1/3/2005
Analysis Time Period	Existing AM Peak

Site Information

Intersection	Harbor Access/Old Maalaea
Jurisdiction	Maui County
Analysis Year	2004
Project ID	Maalaea Ferry - 16421A - Existing AM Peak

East/West Street: *Old Maalaea Road*
North/South Street: *Harbor Access Road*
Intersection Orientation: *East-West*
Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	0	23	6	90	4	0
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	0	25	6	100	4	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration			TR	LT		
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	5	0	51	0	0	0
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	5	0	56	0	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT		LR				
v (vph)		100		61				
C (m) (vph)		1595		1013				
v/c		0.06		0.06				
95% queue length		0.20		0.19				
Control Delay		7.4		8.8				
LOS		A		A				
Approach Delay	--	--	8.8					
Approach LOS	--	--	A					

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*P. Matsunaga*
Agency/Co.	*PBQD*
Date Performed	*1/3/2005*
Analysis Time Period	*Existing PM Peak*

Site Information

Intersection	*Harbor Access/Old Maalaea*
Jurisdiction	*Maui County*
Analysis Year	*2004*
Project ID	*Maalaea Ferry - 16421A - Existing PM Peak*

East/West Street: *Old Maalaea Road* | North/South Street: *Harbor Access Road*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*19*	*2*	*36*	*11*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*21*	*2*	*40*	*12*	*0*
Percent Heavy Vehicles	*0*	–	–	*0*	–	–
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*5*	*0*	*49*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*5*	*0*	*54*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (vph)		*40*		*59*				
C (m) (vph)		*1605*		*1041*				
v/c		*0.02*		*0.06*				
95% queue length		*0.08*		*0.18*				
Control Delay		*7.3*		*8.7*				
LOS		*A*		*A*				
Approach Delay	–	–		*8.7*				
Approach LOS	–	–		*A*				

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*P. Matsunaga*
Agency/Co.	*PBQD*
Date Performed	*1/3/2005*
Analysis Time Period	*Existing AM Peak*

Site Information

Intersection	*Hauoli/Old Maalaea*
Jurisdiction	*Maui County*
Analysis Year	*2004*
Project ID	*Maalaea Ferry - 16421A - Existing AM Peak*

East/West Street: *Hauoli Street* | North/South Street: *Old Maalaea Road*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*13*	*51*	*10*	*43*	*67*	*7*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*14*	*56*	*11*	*47*	*74*	*7*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*1*	*1*	*0*	*1*	*1*	*0*
Configuration	*L*		*TR*	*L*		*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*21*	*9*	*92*	*19*	*6*	*6*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*23*	*10*	*102*	*21*	*6*	*6*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*	*L*		*LTR*			*LTR*	
v (vph)	*14*	*47*		*135*			*33*	
C (m) (vph)	*1529*	*1547*		*887*			*611*	
v/c	*0.01*	*0.03*		*0.15*			*0.05*	
95% queue length	*0.03*	*0.09*		*0.54*			*0.17*	
Control Delay	*7.4*	*7.4*		*9.8*			*11.2*	
LOS	*A*	*A*		*A*			*B*	
Approach Delay	–	–	*9.8*			*11.2*		
Approach LOS	–	–	*A*			*B*		

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*P. Matsunaga*
Agency/Co.	*PBQD*
Date Performed	*1/3/2005*
Analysis Time Period	*Existing PM Peak*

Site Information

Intersection	*Hauoli/Old Maalaea*
Jurisdiction	*Maui County*
Analysis Year	*2004*
Project ID	*Maalaea Ferry - 16421A - Existing PM Peak*

East/West Street: *Hauoli Street* | North/South Street: *Old Maalaea*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*6*	*39*	*21*	*92*	*26*	*19*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*6*	*43*	*23*	*102*	*28*	*21*
Percent Heavy Vehicles	*0*	–	–	*0*	–	–
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*1*	*1*	*0*	*1*	*1*	*0*
Configuration	*L*		*TR*	*L*		*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*10*	*6*	*43*	*7*	*9*	*13*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*11*	*6*	*47*	*7*	*10*	*14*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*	*L*		*LTR*			*LTR*	
v (vph)	*6*	*102*		*64*			*31*	
C (m) (vph)	*1571*	*1549*		*847*			*705*	
v/c	*0.00*	*0.07*		*0.08*			*0.04*	
95% queue length	*0.01*	*0.21*		*0.24*			*0.14*	
Control Delay	*7.3*	*7.5*		*9.6*			*10.3*	
LOS	*A*	*A*		*A*			*B*	
Approach Delay	–	–	*9.6*			*10.3*		
Approach LOS	–	–	*A*			*B*		

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*P. Matsunaga*
Agency/Co.	*PBQD*
Date Performed	*1/3/2005*
Analysis Time Period	*Existing AM Peak*

Site Information

Intersection	*Honoapiilani/Old Maalaea*
Jurisdiction	*Maui County*
Analysis Year	*2004*
Project ID	*Maalaea Ferry - 16421A - Existing AM Peak*

East/West Street: *Old Maalaea Road*
North/South Street: *Honoapiilani Highway*
Intersection Orientation: *North-South*
Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*351*	*29*	*0*	*1003*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.25*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*390*	*32*	*0*	*1114*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*		*T*	
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*0*	*9*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*0*	*10*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*1*	*0*	*0*	*0*
Configuration			*R*			

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration					*R*			
v (vph)					*10*			
C (m) (vph)					*649*			
v/c					*0.02*			
95% queue length					*0.05*			
Control Delay					*10.6*			
LOS					*B*			
Approach Delay	--	--	*10.6*					
Approach LOS	--	--	*B*					

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*P. Matsunaga*
Agency/Co.	*PBQD*
Date Performed	*1/3/2005*
Analysis Time Period	*Existing PM Peak*

Site Information

Intersection	*Honoapiilani/Old Maalaea*
Jurisdiction	*Maui County*
Analysis Year	*2004*
Project ID	*Maalaea Ferry - 16421A - Existing PM Peak*

East/West Street: *Old Maalaea Road* | North/South Street: *Honoapiilani Highway*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*1030*	*21*	*0*	*809*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.25*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*1144*	*23*	*0*	*898*	*0*
Percent Heavy Vehicles	*0*	–	–	*0*	–	–
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*		*T*	
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*0*	*16*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*0*	*17*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*1*	*0*	*0*	*0*
Configuration			*R*			

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration					*R*			
v (vph)					*17*			
C (m) (vph)					*242*			
v/c					*0.07*			
95% queue length					*0.22*			
Control Delay					*21.0*			
LOS					*C*			
Approach Delay	–	–	*21.0*					
Approach LOS	–	–	*C*					

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*P. Matsunaga*
Agency/Co.	*PBQD*
Date Performed	*1/3/2005*
Analysis Time Period	*Existing AM Peak*

Site Information

Intersection	*Main Harbor Entrance*
Jurisdiction	*Maui County*
Analysis Year	*2004*
Project ID	*Maalaea Ferry - 16421A - Existing AM Peak*

East/West Street: *Harbor Access Road* | North/South Street: *Honoapiilani Highway*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*375*	*49*	*23*	*980*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*416*	*54*	*25*	*1088*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*7*	*0*	*5*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*7*	*0*	*5*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (vph)		*25*		*12*				
C (m) (vph)		*1102*		*178*				
v/c		*0.02*		*0.07*				
95% queue length		*0.07*		*0.21*				
Control Delay		*8.3*		*26.7*				
LOS		*A*		*D*				
Approach Delay	--	--	*26.7*					
Approach LOS	--	--	*D*					

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*P. Matsunaga*
Agency/Co.	*PBQD*
Date Performed	*1/3/2005*
Analysis Time Period	*Existing PM Peak*

Site Information

Intersection	*Main Harbor Entrance*
Jurisdiction	*Maui County*
Analysis Year	*2004*
Project ID	*Maalaea Ferry - 16421A - Existing PM Peak*

East/West Street: *Harbor Access Road* | North/South Street: *Honoapiilani Highway*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*1045*	*15*	*12*	*797*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*1161*	*16*	*13*	*885*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*7*	*0*	*6*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*7*	*0*	*6*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (vph)		*13*		*13*				
C (m) (vph)		*601*		*89*				
v/c		*0.02*		*0.15*				
95% queue length		*0.07*		*0.49*				
Control Delay		*11.1*		*52.2*				
LOS		*B*		*F*				
Approach Delay	--	--		*52.2*				
Approach LOS	--	--		*F*				

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*P. Matsunaga*
Agency/Co.	*PBQD*
Date Performed	*1/3/2005*
Analysis Time Period	*2008 w/o project AM Peak*

Site Information

Intersection	*Harbor Access/Old Maalaea*
Jurisdiction	*Maui County*
Analysis Year	*2008*
Project ID	*Maalaea Ferry - 16421A - 2008 w/o project AM Peak*

East/West Street: *Old Maalaea Road* | North/South Street: *Harbor Access Road*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*23*	*6*	*90*	*4*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*25*	*6*	*100*	*4*	*0*
Percent Heavy Vehicles	*0*	–	–	*0*	–	–
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*5*	*0*	*51*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*5*	*0*	*56*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (vph)		*100*		*61*				
C (m) (vph)		*1595*		*1013*				
v/c		*0.06*		*0.06*				
95% queue length		*0.20*		*0.19*				
Control Delay		*7.4*		*8.8*				
LOS		*A*		*A*				
Approach Delay	–	–		*8.8*				
Approach LOS	–	–		*A*				

Two-Way Stop Control

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*P. Matsunaga*
Agency/Co.	*PBQD*
Date Performed	*1/3/2005*
Analysis Time Period	*2008 w/o project PM Peak*

Site Information

Intersection	*Harbor Access/Old Maalaea*
Jurisdiction	*Maui County*
Analysis Year	*2008*
Project ID	*Maalaea Ferry - 16421A - 2008 w/o project PM Peak*

East/West Street: *Old Maalaea Road* | North/South Street: *Harbor Access Road*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*19*	*2*	*36*	*11*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*21*	*2*	*40*	*12*	*0*
Percent Heavy Vehicles	*0*	–	–	*0*	–	–
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*5*	*0*	*49*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*5*	*0*	*54*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (vph)		*40*		*59*				
C (m) (vph)		*1605*		*1041*				
v/c		*0.02*		*0.06*				
95% queue length		*0.08*		*0.18*				
Control Delay		*7.3*		*8.7*				
LOS		*A*		*A*				
Approach Delay	–	–		*8.7*				
Approach LOS	–	–		*A*				

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*P. Matsunaga*
Agency/Co.	*PBQD*
Date Performed	*1/3/2005*
Analysis Time Period	*2008 w/o project AM Peak*

Site Information

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Intersection	*Hauoli/Old Maalaea*
Jurisdiction	*Maui County*
Analysis Year	*2008*
Project ID	*Maalaea Ferry - 16421A - 2008 w/o project AM Peak*

East/West Street: *Hauoli Street*
North/South Street: *Old Maalaea Road*
Intersection Orientation: *North-South*
Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*13*	*51*	*10*	*43*	*67*	*7*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*14*	*56*	*11*	*47*	*74*	*7*
Percent Heavy Vehicles	*0*	*--*	*--*	*0*	*--*	*--*
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*1*	*1*	*0*	*1*	*1*	*0*
Configuration	*L*		*TR*	*L*		*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*21*	*9*	*92*	*19*	*6*	*6*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*23*	*10*	*102*	*21*	*6*	*6*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*	*L*		*LTR*			*LTR*	
v (vph)	*14*	*47*		*135*			*33*	
C (m) (vph)	*1529*	*1547*		*887*			*611*	
v/c	*0.01*	*0.03*		*0.15*			*0.05*	
95% queue length	*0.03*	*0.09*		*0.54*			*0.17*	
Control Delay	*7.4*	*7.4*		*9.8*			*11.2*	
LOS	*A*	*A*		*A*			*B*	
Approach Delay	*--*	*--*		*9.8*			*11.2*	
Approach LOS	*--*	*--*		*A*			*B*	

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*P. Matsunaga*
Agency/Co.	*PBQD*
Date Performed	*1/3/2005*
Analysis Time Period	*2008 w/o project PM Peak*

Site Information

Intersection	*Hauoli/Old Maalaea*
Jurisdiction	*Maui County*
Analysis Year	*2008*
Project ID	*Maalaea Ferry - 16421A - 2008 w/o project PM Peak*

East/West Street: *Hauoli Street* | North/South Street: *Old Maalaea*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*6*	*39*	*21*	*92*	*26*	*19*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*6*	*43*	*23*	*102*	*28*	*21*
Percent Heavy Vehicles	*0*	–	–	*0*	–	–
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*1*	*1*	*0*	*1*	*1*	*0*
Configuration	*L*		*TR*	*L*		*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*10*	*6*	*43*	*7*	*9*	*13*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*11*	*6*	*47*	*7*	*10*	*14*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*	*L*		*LTR*			*LTR*	
v (vph)	*6*	*102*		*64*			*31*	
C (m) (vph)	*1571*	*1549*		*847*			*705*	
v/c	*0.00*	*0.07*		*0.08*			*0.04*	
95% queue length	*0.01*	*0.21*		*0.24*			*0.14*	
Control Delay	*7.3*	*7.5*		*9.6*			*10.3*	
LOS	*A*	*A*		*A*			*B*	
Approach Delay	–	–	*9.6*			*10.3*		
Approach LOS	–	–	*A*			*B*		

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*P. Matsunaga*
Agency/Co.	*PBQD*
Date Performed	*1/3/2005*
Analysis Time Period	*2008 w/o project AM Peak*

Site Information

Intersection	*Honoapiilani/Old Maalaea*
Jurisdiction	*Maui County*
Analysis Year	*2008*
Project ID	*Maalaea Ferry - 16421A - 2008 w/o project AM Peak*

East/West Street: *Old Maalaea Road*
North/South Street: *Honoapiilani Highway*
Intersection Orientation: *North-South*
Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*366*	*29*	*0*	*1043*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.25*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*406*	*32*	*0*	*1158*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*		*T*	
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*0*	*9*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*0*	*10*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*1*	*0*	*0*	*0*
Configuration			*R*			

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration					*R*			
v (vph)					*10*			
C (m) (vph)					*636*			
v/c					*0.02*			
95% queue length					*0.05*			
Control Delay					*10.8*			
LOS					*B*			
Approach Delay	--	--	*10.8*					
Approach LOS	--	--	*B*					

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*P. Matsunaga*
Agency/Co.	*PBQD*
Date Performed	*1/3/2005*
Analysis Time Period	*2008 w/o project PM Peak*

Site Information

Intersection	*Honoapiilani/Old Maalaea*
Jurisdiction	*Maui County*
Analysis Year	*2008*
Project ID	*Maalaea Ferry - 16421A - 2008 w/o project PM Peak*

East/West Street: *Old Maalaea Road* | North/South Street: *Honoapiilani Highway*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*1072*	*21*	*0*	*841*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.25*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*1191*	*23*	*0*	*934*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*		*T*	
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*0*	*16*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*0*	*17*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*1*	*0*	*0*	*0*
Configuration			*R*			

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration					*R*			
v (vph)					*17*			
C (m) (vph)					*227*			
v/c					*0.07*			
95% queue length					*0.24*			
Control Delay					*22.1*			
LOS					*C*			
Approach Delay	--	--	*22.1*					
Approach LOS	--	--	*C*					

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*P. Matsunaga*
Agency/Co.	*PBQD*
Date Performed	*1/3/2005*
Analysis Time Period	*2008 w/o project AM Peak*

Site Information

Intersection	*Main Harbor Entrance*
Jurisdiction	*Maui County*
Analysis Year	*2008*
Project ID	*Maalaea Ferry - 16421A - 2008 w/o project AM Peak*

East/West Street: *Harbor Access Road* | North/South Street: *Honoapiilani Highway*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*390*	*49*	*23*	*1020*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*433*	*54*	*25*	*1133*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*7*	*0*	*5*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*7*	*0*	*5*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (vph)		*25*		*12*				
C (m) (vph)		*1086*		*164*				
v/c		*0.02*		*0.07*				
95% queue length		*0.07*		*0.23*				
Control Delay		*8.4*		*28.7*				
LOS		*A*		*D*				
Approach Delay	--	--	*28.7*					
Approach LOS	--	--	*D*					

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*P. Matsunaga*
Agency/Co.	*PBQD*
Date Performed	*1/3/2005*
Analysis Time Period	*2008 w/o project PM Peak*

Site Information

Intersection	*Main Harbor Entrance*
Jurisdiction	*Maui County*
Analysis Year	*2008*
Project ID	*Maalaea Ferry - 16421A - 2008 w/o project PM Peak*

East/West Street: *Harbor Access Road* | North/South Street: *Honoapiilani Highway*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*1087*	*15*	*12*	*829*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*1207*	*16*	*13*	*921*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*7*	*0*	*6*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*7*	*0*	*6*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (vph)		*13*		*13*				
C (m) (vph)		*577*		*80*				
v/c		*0.02*		*0.16*				
95% queue length		*0.07*		*0.55*				
Control Delay		*11.4*		*58.5*				
LOS		*B*		*F*				
Approach Delay	--	--	*58.5*					
Approach LOS	--	--	*F*					

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*P. Matsunaga*
Agency/Co.	*PBQD*
Date Performed	*2/2/2005*
Analysis Time Period	*2008 w/project AM Peak*

Site Information

Intersection	*Harbor Access/Old Maalaea*
Jurisdiction	*Maui County*
Analysis Year	*2008*
Project ID	*Maalaea Ferry - 16421A - 2008 w/project AM Peak, w Hauoli*

East/West Street: *Old Maalaea Road* | North/South Street: *Harbor Access Road*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*51*	*6*	*110*	*4*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*56*	*6*	*122*	*4*	*0*
Percent Heavy Vehicles	*0*	–	–	*0*	–	–
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*5*	*0*	*71*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*5*	*0*	*78*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (vph)		*122*		*83*				
C (m) (vph)		*1554*		*977*				
v/c		*0.08*		*0.08*				
95% queue length		*0.26*		*0.28*				
Control Delay		*7.5*		*9.0*				
LOS		*A*		*A*				
Approach Delay	–	–		*9.0*				
Approach LOS	–	–		*A*				

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*P. Matsunaga*
Agency/Co.	*PBQD*
Date Performed	*2/2/2005*
Analysis Time Period	*2008 w/project PM Peak*

Site Information

Intersection	*Harbor Access/Old Maalaea*
Jurisdiction	*Maui County*
Analysis Year	*2008*
Project ID	*Maalaea Ferry - 16421A - 2008 w/project PM Peak w Hauoli*

East/West Street: *Old Maalaea Road* | North/South Street: *Harbor Access Road*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*19*	*2*	*56*	*11*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*21*	*2*	*62*	*12*	*0*
Percent Heavy Vehicles	*0*	–	–	*0*	–	–
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*5*	*0*	*69*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*5*	*0*	*76*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (vph)		*62*		*81*				
C (m) (vph)		*1605*		*1041*				
v/c		*0.04*		*0.08*				
95% queue length		*0.12*		*0.25*				
Control Delay		*7.3*		*8.7*				
LOS		*A*		*A*				
Approach Delay	–	–		*8.7*				
Approach LOS	–	–		*A*				

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*P. Matsunaga*
Agency/Co.	*PBQD*
Date Performed	*2/2/2005*
Analysis Time Period	*2008 w/project AM Peak*

Site Information

Intersection	*Hauoli/Old Maalaea*
Jurisdiction	*Maui County*
Analysis Year	*2008*
Project ID	*Maalaea Ferry - 16421A - 2008 w/project AM Peak w Hauoli*

East/West Street: *Hauoli Street* | North/South Street: *Old Maalaea Road*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*13*	*71*	*10*	*65*	*109*	*7*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*14*	*78*	*11*	*72*	*121*	*7*
Percent Heavy Vehicles	*0*	–	–	*0*	–	–
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*1*	*1*	*0*	*1*	*1*	*0*
Configuration	*L*		*TR*	*L*		*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*21*	*9*	*92*	*19*	*34*	*6*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*23*	*10*	*102*	*21*	*37*	*6*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*	*L*		*LTR*			*LTR*	
v (vph)	*14*	*72*		*135*			*64*	
C (m) (vph)	*1470*	*1519*		*801*			*516*	
v/c	*0.01*	*0.05*		*0.17*			*0.12*	
95% queue length	*0.03*	*0.15*		*0.60*			*0.42*	
Control Delay	*7.5*	*7.5*		*10.4*			*13.0*	
LOS	*A*	*A*		*B*			*B*	
Approach Delay	–	–	*10.4*			*13.0*		
Approach LOS	–	–	*B*			*B*		

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*P. Matsunaga*
Agency/Co.	*PBQD*
Date Performed	*2/2/2005*
Analysis Time Period	*2008 w/project PM Peak*

Site Information

Intersection	*Hauoli/Old Maalaea*
Jurisdiction	*Maui County*
Analysis Year	*2008*
Project ID	*Maalaea Ferry - 16421A - 2008 w/project PM Peak w Hauoli*

East/West Street: *Hauoli Street* | North/South Street: *Old Maalaea*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*6*	*111*	*21*	*92*	*44*	*19*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*6*	*123*	*23*	*102*	*48*	*21*
Percent Heavy Vehicles	*0*	–	–	*0*	--	–
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*1*	*1*	*0*	*1*	*1*	*0*
Configuration	*L*		*TR*	*L*		*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*10*	*6*	*93*	*10*	*9*	*13*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*11*	*6*	*103*	*11*	*10*	*14*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*	*L*		*LTR*			*LTR*	
v (vph)	*6*	*102*		*120*			*35*	
C (m) (vph)	*1545*	*1448*		*821*			*583*	
v/c	*0.00*	*0.07*		*0.15*			*0.06*	
95% queue length	*0.01*	*0.23*		*0.51*			*0.19*	
Control Delay	*7.3*	*7.7*		*10.1*			*11.6*	
LOS	*A*	*A*		*B*			*B*	
Approach Delay	–	--	*10.1*			*11.6*		
Approach LOS	--	--	*B*			*B*		

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*P. Matsunaga*
Agency/Co.	*PBQD*
Date Performed	*2/2/2005*
Analysis Time Period	*2008 w/project AM Peak*

Site Information

Intersection	*Honoapiilani/Old Maalaea*
Jurisdiction	*Maui County*
Analysis Year	*2008*
Project ID	*Maalaea Ferry - 16421A - 2008 w/project AM Peak w Hauoli*

East/West Street: *Old Maalaea Road* | North/South Street: *Honoapiilani Highway*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*419*	*57*	*0*	*1043*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.25*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*465*	*63*	*0*	*1158*	*0*
Percent Heavy Vehicles	*0*	–	–	*0*	–	–
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*		*T*	
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*0*	*9*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*0*	*10*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*1*	*0*	*0*	*0*
Configuration			*R*			

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration					*R*			
v (vph)					*10*			
C (m) (vph)					*578*			
v/c					*0.02*			
95% queue length					*0.05*			
Control Delay					*11.3*			
LOS					*B*			
Approach Delay	–	–	*11.3*					
Approach LOS	–	–	*B*					

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*P. Matsunaga*
Agency/Co.	*PBQD*
Date Performed	*2/2/2005*
Analysis Time Period	*2008 w/project PM Peak*

Site Information

Intersection	*Honoapiilani/Old Maalaea*
Jurisdiction	*Maui County*
Analysis Year	*2008*
Project ID	*Maalaea Ferry - 16421A - 2008 w/project PM Peak w Hauoli*

East/West Street: *Old Maalaea Road*
Intersection Orientation: *North-South*
North/South Street: *Honoapiilani Highway*
Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*1072*	*21*	*0*	*922*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.25*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*1191*	*23*	*0*	*1024*	*0*
Percent Heavy Vehicles	*0*	–	–	*0*	–	–
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*		*T*	
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*0*	*16*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*0*	*17*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*1*	*0*	*0*	*0*
Configuration			*R*			

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration					*R*			
v (vph)					*17*			
C (m) (vph)					*227*			
v/c					*0.07*			
95% queue length					*0.24*			
Control Delay					*22.1*			
LOS					*C*			
Approach Delay	–	–	*22.1*					
Approach LOS	–	–	*C*					

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*P. Matsunaga*
Agency/Co.	*PBQD*
Date Performed	*2/2/2005*
Analysis Time Period	*2008 w/project AM Peak*

Site Information

Intersection	*Main Harbor Entrance*
Jurisdiction	*Maui County*
Analysis Year	*2008*
Project ID	*Maalaea Ferry - 16421A - 2008 w/project AM Peak w Hauoli*

East/West Street: *Harbor Access Road* | North/South Street: *Honoapiilani Highway*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*471*	*49*	*23*	*1020*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*523*	*54*	*25*	*1133*	*0*
Percent Heavy Vehicles	*0*	–	–	*0*	–	–
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*7*	*0*	*5*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*7*	*0*	*5*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (vph)		*25*		*12*				
C (m) (vph)		*1006*		*146*				
v/c		*0.02*		*0.08*				
95% queue length		*0.08*		*0.26*				
Control Delay		*8.7*		*31.9*				
LOS		*A*		*D*				
Approach Delay	--	--	*31.9*					
Approach LOS	–	–	*D*					

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*P. Matsunaga*
Agency/Co.	*PBQD*
Date Performed	*2/2/2005*
Analysis Time Period	*2008 w/project PM Peak*

Site Information

Intersection	*Main Harbor Entrance*
Jurisdiction	*Maui County*
Analysis Year	*2008*
Project ID	*Maalaea Ferry - 16421A - 2008 w/project PM Peak w Hauoli*

East/West Street: *Harbor Access Road* | North/South Street: *Honoapiilani Highway*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*1087*	*15*	*12*	*910*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*1207*	*16*	*13*	*1011*	*0*
Percent Heavy Vehicles	*0*	–	–	*0*	–	–
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*7*	*0*	*6*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*7*	*0*	*6*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (vph)		*13*		*13*				
C (m) (vph)		*577*		*71*				
v/c		*0.02*		*0.18*				
95% queue length		*0.07*		*0.62*				
Control Delay		*11.4*		*66.7*				
LOS		*B*		*F*				
Approach Delay	–	–		*66.7*				
Approach LOS	–	–		*F*				

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*P. Matsunaga*
Agency/Co.	*PBQD*
Date Performed	*2/2/2005*
Analysis Time Period	*2008 w/project AM Peak*

Site Information

Intersection	*Hauoli Parking Access*
Jurisdiction	*Maui County*
Analysis Year	*2008*
Project ID	*Maalaea Ferry - 16421A - 2008 w/project AM Peak w Hauoli*

East/West Street: *Parking Access* | North/South Street: *Old Maalaea Road*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*59*	*50*	*1*	*122*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	
Hourly Flow Rate, HFR	*0*	*65*	*55*	*1*	*135*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*1*	*0*	*1*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*		*0.90*	
Hourly Flow Rate, HFR	*1*	*0*	*1*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (vph)		*1*		*2*				
C (m) (vph)		*1480*		*855*				
v/c		*0.00*		*0.00*				
95% queue length		*0.00*		*0.01*				
Control Delay		*7.4*		*9.2*				
LOS		*A*		*A*				
Approach Delay	--	--		*9.2*				
Approach LOS	--	--		*A*				

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*P. Matsunaga*
Agency/Co.	*PBQD*
Date Performed	*2/2/2005*
Analysis Time Period	*2008 w/project PM Peak*

Site Information

Intersection	*Hauoli Parking Access*
Jurisdiction	*Maui County*
Analysis Year	*2008*
Project ID	*Maalaea Ferry - 16421A - 2008 w/project PM Peak w Hauoli*

East/West Street: *Parking Access* | North/South Street: *Old Maalaea Road*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*122*	*1*	*1*	*59*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*135*	*1*	*1*	*65*	*0*
Percent Heavy Vehicles	*0*	–	–	*0*	–	–
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*50*	*0*	*1*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*55*	*0*	*1*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (vph)		*1*		*56*				
C (m) (vph)		*1461*		*791*				
v/c		*0.00*		*0.07*				
95% queue length		*0.00*		*0.23*				
Control Delay		*7.5*		*9.9*				
LOS		*A*		*A*				
Approach Delay	–	–		*9.9*				
Approach LOS	–	–		*A*				

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*P. Matsunaga*
Agency/Co.	*PBQD*
Date Performed	*2/2/2005*
Analysis Time Period	*2008 w/project AM Peak*

Site Information

Intersection	*Old Maalaea Parking Access*
Jurisdiction	*Maui County*
Analysis Year	*2008*
Project ID	*Maalaea Ferry - 16421A - 2008 w/project AM Peak w Hauoli*

East/West Street: *Parking Access* | North/South Street: *Old Maalaea Road*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*94*	*28*	*22*	*114*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*104*	*31*	*24*	*126*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*1*	*1*	*0*
Configuration			*TR*	*L*	*T*	
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*1*	*0*	*1*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*1*	*0*	*1*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*L*		*LR*				
v (vph)		*24*		*2*				
C (m) (vph)		*1462*		*794*				
v/c		*0.02*		*0.00*				
95% queue length		*0.05*		*0.01*				
Control Delay		*7.5*		*9.5*				
LOS		*A*		*A*				
Approach Delay	--	--	*9.5*					
Approach LOS	--	--	*A*					

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*P. Matsunaga*
Agency/Co.	*PBQD*
Date Performed	*2/2/2005*
Analysis Time Period	*2008 w/project PM Peak*

Site Information

Intersection	*Old Maalaea Parking Access*
Jurisdiction	*Maui County*
Analysis Year	*2008*
Project ID	*Maalaea Ferry - 16421A - 2008 w/project PM Peak w Hauoli*

East/West Street: *Parking Access* | North/South Street: *Old Maalaea Road*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*88*	*1*	*1*	*67*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*97*	*1*	*1*	*74*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*1*	*1*	*0*
Configuration			*TR*	*L*	*T*	
Upstream Signal		*0*			*0*	

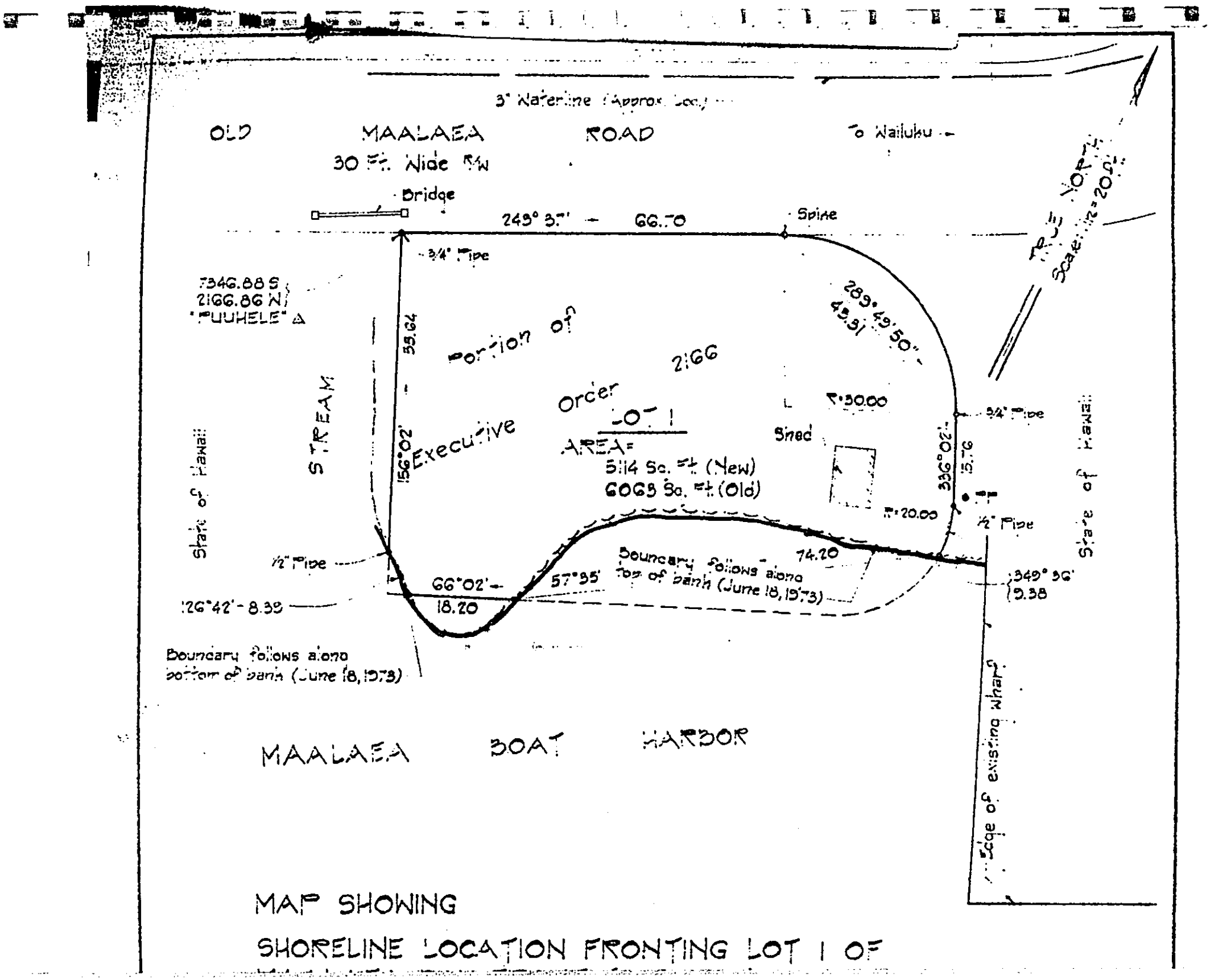
Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*1*	*0*	*50*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*1*	*0*	*55*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*L*		*LR*				
v (vph)		*1*		*56*				
C (m) (vph)		*1508*		*960*				
v/c		*0.00*		*0.06*				
95% queue length		*0.00*		*0.19*				
Control Delay		*7.4*		*9.0*				
LOS		*A*		*A*				
Approach Delay	--	--	*9.0*					
Approach LOS	--	--	*A*					

Appendix G

Shoreline Location Fronting Lot 1 of Maalaea Bay Front



MAP SHOWING

SHORELINE LOCATION FRONTING LOT 1 OF

MAP SHOWING

SHORELINE LOCATION FRONTING LOT 1 OF MAALAEA BAY FRONT (CSF 12,758)

Being a portion of Executive Order 2166

MAALAEA, MAUI, HAWAII

Owner: State of Hawaii
Prepared for: U.S. Coast Guard

Scale: 1 in. = 20 ft.
Date: July 9, 1973

Prepared by: NORMAN SAITO
ENGINEERING CONSULTANTS, INC.
WAILUKU, MAUI, HAWAII

The shoreline as located and certified is hereby confirmed as being the actual shoreline as of JUL 12 1973.

APPROVED: Sunao Kido
Chairman and Member
Board of Land and Natural Resources

NORMAN M. SAITO
REGISTERED PROFESSIONAL LAND SURVEYOR
No. 3035
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Norman M. Saito 11 July 73
Registered Professional