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DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF BOATING AND OCEAN RECREATION
333 QUEEN STREET, SUITE 300
HONOLULU, HAWAII 96813

BOR-E-062.13

November 27, 2012

Mr. Gary Gill, Director
Office of Environmental Quality Control
Department of Health, State of Hawai'i
235 S. Beretania Street, Room 702
Honolulu, Hawai'i 96813

RECEIVED
12 NOV 28 AM 1:00
OFFICE OF ENVIRONMENTAL
QUALITY CONTROL

Dear Director:

With this letter, the State of Hawaii, Department of Land and Natural Resources, Division of Boating and Ocean Recreation hereby transmits the draft environmental assessment and anticipated finding of no significant impact (DEA-AFONSI) for the New Administrative Office at Ke'ehi Small Boat Harbor situated at TMK: 1-2-025:024 in the Kalihi District on the island of Oahu for publication in the next available edition of the Environmental Notice.

Enclosed is a completed OEQC Publication Form, two copies of the DEA-AFONSI, an Adobe Acrobat PDF file of the same, and an electronic copy of the publication form in MS Word. Simultaneous with this letter, we have submitted the summary of the action in a text file by electronic mail to your office.

If there are any questions, please contact Mr. Eric Yuasa of the Engineering Branch at (808) 587-0122.

Sincerely,

Edward R. Underwood
Administrator

Attach.

**APPLICANT ACTIONS
SECTION 343-5(C), HRS
PUBLICATION FORM (JULY 2012 REVISION)**

Project Name: New Administrative Office at Ke'ehi Small Boat Harbor

Island: Oahu

District: Honolulu / Kalihi

TMK: 1-2-025:024 (por.)

Permits: SMA

Approving Agency: Board of Land and Natural Resources, 1151 Punchbowl Street, Room 130, Honolulu, Hawaii, 96813, Mr. William J. Aila, Jr., Chairperson, 808-587-0401

Applicant: Division of Boating and Ocean Recreation, 333 Queen Street, Suite 300, Honolulu, Hawaii, 96813, Mr. Eric Yuasa, Engineering Branch Head, 808-587-0122

Consultant: None

Status (check one only):

DEA-AFNSI

Submit the approving agency notice of determination/transmittal on agency letterhead, a hard copy of DEA, a completed OEQC publication form, along with an electronic word processing summary and a PDF copy (you may send both summary and PDF to oeqc@doh.hawaii.gov); a 30-day comment period ensues upon publication in the periodic bulletin.

FEA-FONSI

Submit the approving agency notice of determination/transmittal on agency letterhead, a hard copy of the FEA, an OEQC publication form, along with an electronic word processing summary and a PDF copy (send both summary and PDF to oeqc@doh.hawaii.gov); no comment period ensues upon publication in the periodic bulletin.

FEA-EISPN

Submit the approving agency notice of determination/transmittal on agency letterhead, a hard copy of the FEA, an OEQC publication form, along with an electronic word processing summary and PDF copy (you may send both summary and PDF to oeqc@doh.hawaii.gov); a 30-day consultation period ensues upon publication in the periodic bulletin.

Act 172-12 EISPN

Submit the approving agency notice of determination on agency letterhead, an OEQC publication form, and an electronic word processing summary (you may send the summary to oeqc@doh.hawaii.gov). NO environmental assessment is required and a 30-day consultation period upon publication in the periodic bulletin.

DEIS

The applicant simultaneously transmits to both the OEQC and the approving agency, a hard copy of the DEIS, a completed OEQC publication form, a distribution list, along with an electronic word processing summary and PDF copy of the DEIS (you may send both the summary and PDF to oeqc@doh.hawaii.gov); a 45-day comment period ensues upon publication in the periodic bulletin.

FEIS

The applicant simultaneously transmits to both the OEQC and the approving agency, a hard copy of the FEIS, a completed OEQC publication form, a distribution list, along with an electronic word processing summary and PDF copy of the FEIS (you may send both the summary and PDF to oeqc@doh.hawaii.gov); no comment period ensues upon publication in the periodic bulletin.

Section 11-200-23
Determination

The approving agency simultaneously transmits its determination of acceptance or nonacceptance (pursuant to Section 11-200-23, HAR) of the FEIS to both OEQC and the applicant. No comment period ensues upon publication in the periodic bulletin.

Statutory hammer
Acceptance

The approving agency simultaneously transmits its notice to both the applicant and the OEQC that it failed to timely make a determination on the acceptance or nonacceptance of the applicant's FEIS under Section 343-5(c), HRS, and that the applicant's FEIS is deemed accepted as a matter of law.

Section 11-200-27
Determination

The approving agency simultaneously transmits its notice to both the applicant and the OEQC that it has reviewed (pursuant to Section 11-200-27, HAR) the previously accepted FEIS and determines that a supplemental EIS is not required. No EA is required and no comment period ensues upon publication in the periodic bulletin.

Withdrawal (explain)

Summary:

Draft Environmental Assessment
New Administrative Office
at Ke`ehi Small Boat Harbor
Honolulu, O`ahu, Hawai`i
TMKs: 1-2-025:024 (por.)

PROJECT NEED:

The State DLNR, Division of Boating and Ocean Recreation (DOBOR) currently rents space on the third floor (Suite 300) in the Melim Building located in Downtown Honolulu at 333 Queen Street, Honolulu, Hawai`i, 96813. Parking for DOBOR employees working in the Melim Building is limited and very costly. Parking for visitors conducting business or attending meetings at the Administrative Office is limited to 8 parking meters on Richards Street and 30 minute parking stalls at the Post Office Parking lot.

The new Administrative Office will save DOBOR approximately \$170,000 per year in lease rent, provide more office space and parking for its employees and be more accessible for people conducting business or attending meetings at the Administrative Office.

PROJECT LOCATION

The project site is located in the Ke`ehi Small Boat Harbor at 4 Sand Island Access Road, Honolulu, Hawai`i. The proposed activity will take place on an unpaved parking area, which is approximately 15,000 S.F. or 0.344 Acres and an existing maintenance facility, which is approximately 3,000 S.F. or 0.068 Acres.

PROPOSED ACTIVITIES

The proposed improvements, includes a new 50' X 80' two-story building with an open deck and covered lanai; and an accessible ramp/walkway to the building; a new 24' X 36' single story building. Site improvements will include minor grading; installation of asphalt paving, utilities and chain-link fence along the perimeter of the parking area to address security requirements. Most of the existing 6' tall chain-link fencing will remain in place and be incorporated into the final site improvements. New 6' tall chain-link fencing will be connected to the existing fence along the Makai and Ewa ends of the project site. Approximately 20 parking stalls will be provided for DOBOR employees and visitors. Two of the parking stalls will comply with ADAAG. All outdoor lighting will be full cutoff fixtures to minimize impacts to nocturnal wildlife and light pollution.

Draft Environmental Assessment
**New Administrative Office
at Ke`ehi Small Boat Harbor**
Honolulu, O`ahu, Hawai`i
TMK: 1-2-025:024 (por.)

December 2012

Prepared Pursuant to
Hawai`i Revised Statutes, Chapter 343

Prepared by:
Division of Boating and Ocean Recreation
Engineering Branch
333 Queen Street, Suite 300
Honolulu, Hawai`i 96813

**New Administrative Office
at Ke`ehi Small Boat Harbor
Honolulu, O`ahu, Hawai`i**

TABLE OF CONTENTS

	Page No.
Cover Page	1
Table of Contents	2
Project Summary	3
Section 1 - Introduction	4
Section 2 – Project Description	6
Section 3 - Alternatives	8
Section 4 – Description of the Affected Environment, Impacts and Mitigation	10
Section 5 – Relationship to State and County Land Use Plans and Policies	16
Section 6 – Necessary Permits and Approvals	18
Section 7 – Cultural Impact Assessment	19
Section 8 – Agencies, Organizations, and Individuals Consulted	20
Section 9 – Summary of Impacts and Significance Determination	21
Section 10 – Findings	24

LIST OF FIGURES

Figure 1 – Project Location	25
Figure 2 – Site Plan	26
Figure 3 – Office Floor Plan	27
Figure 4 – Sand Island Ocean Recreation Park Preliminary Master Plan	28

APPENDICES

Appendix A – Office Space Requirements	
Appendix B – Project Site Photos and Aerial View	
Appendix C – Cultural Impact Evaluation, Archaeological Literature Review and Field Inspection for the Development of a Small Shipyard at Ke`ehi Small Boat Harbor, Kalihi Kai, Kona, O`ahu	

**New Administrative Office
at Ke`ehi Small Boat Harbor
Honolulu, O`ahu, Hawai`i**

PROJECT SUMMARY

Project:	New Administrative Office at Ke`ehi Small Boat Harbor, Honolulu, O`ahu, Hawai`i
Landowner/Applicant	State of Hawai`i, Department of Land and Natural Resources, Division of Boating and Ocean Recreation
Approving Agency	State of Hawai`i, Board of Land and Natural Resources
Agent	State of Hawai`i, Department of Land and Natural Resources, Division of Boating and Ocean Recreation
Location	4 Sand Island Access Road, Honolulu, Hawai`i, 96819
Tax Map Key	1-2-025:024 (por.)
Proposed Action	Construction of a new two-story, 8,000 S.F. Administrative Office; single story, 864 S.F. Maintenance Building; A.C. Paving (10,000 S.F.); fencing and utilities.
Land Area	Ke`ehi Small Boat Harbor unpaved parking area: 15,000 S.F./0.344 Acres and Existing maintenance facility: 3,000 S.F. / 0.068 Acres.
Present Use	Vehicle parking
State Land Use District	Urban
Zoning	I-3, Waterfront Industrial
Primary Urban Center Development Plan Land Use Designation	Major Parks and Open Space
Special Management Area	Yes, exempt by HRS
Permits Required	City and County of Honolulu Building Permit
Anticipated Determination	Finding of No Significant Impact (FONSI)

SECTION 1 INTRODUCTION

1.1 INTRODUCTION

State of Hawai`i, Department of Land and Natural Resources, Division of Boating and Ocean Recreation, herein referred to as DOBOR currently rents space on the third floor (Suite 300) in the Melim Building located in Downtown Honolulu at 333 Queen Street, Honolulu, Hawai`i, 96813. The O`ahu District, herein referred to as BOR-O currently occupies the conference room at the Ke`ehi Small Boat Harbor Harbor Master's Office located at 4 Sand Island Access Road, Honolulu, Hawai`i. The O`ahu District maintenance personnel, whose office is located adjacent to the Harbor Master's Office do not have a maintenance building. Parking for DOBOR employees working in the Melim Building is limited and very costly. Parking for visitors conducting business or attending meetings at the DOBOR Administrative Office is limited to 8 parking meters on Richards Street and 30 minute parking stalls at the Post Office Parking lot.

DOBOR presently pays approximately \$170,000 in annual lease rent for approximately 5,000 square feet and two parking stalls in the Melim Building. It is likely that this lease rent will increase in the near future. BOR-O pays no rent for the use of the conference room in the Ke`ehi Small Boat Harbor, Harbor Master's Office, however, the conference room is too small for BOR-O. The new Administrative Office Building when completed will save DOBOR approximately \$170,000 per year in lease rent, provide more space and parking for its employees and be more accessible for people conducting business or attending meetings at the DOBOR Administrative Office. The new Maintenance Building will increase the productivity of the maintenance workers.

The proposed site for the new DOBOR Administrative Office is an unpaved parking area, approximately 15,000 SF or 0.344 Acres adjacent to the Harbor Master's Office and Maintenance facility. The new Maintenance Building will be located in the existing fenced off maintenance yard, which is adjacent to the proposed site for the new DOBOR Administrative Building. See Figure 1, Project Location. The proposed improvements includes a new 50' X 80' two-story office building with office space on the first and second floors; an 8' wide by 50' long covered lanai on the first floor and 8' wide open deck on the second floor on the Makai side of the building. The maintenance building will be a 24' wide by 36' long single story building. Site improvements will include minor grading; installation of asphalt paving, utilities and chain-link fence along the perimeter of the parking area to address security requirements. See Figure 2, Site Plan.

DOBOR proposes to commence construction of the project in Summer 2013 for a period of approximately 9 to 12 months. The cost of the project is approximately \$1.0 million. Funding for the design and construction of the new Administrative Office and Maintenance Building will be provided by State Legislature under Act 213, SLH 2007 (\$650,000) and the Boating Special Fund (\$350,000). DOBOR is investigating the possibility of getting Federal funding support for a portion of the construction costs for the new Administrative Office and Maintenance Building.

1.2 PROJECT LOCATION

The project site is located at the Western end of Honolulu Harbor on the Island of O`ahu. The project site is located in the Ke`ehi Small Boat Harbor at 4 Sand Island Access Road, Honolulu, Hawai`i. The proposed activity will take place on an unpaved parking area, which is approximately 15,000 S.F. or 0.344 Acres and an existing maintenance facility, which is approximately 3,000 S.F. or 0.068 Acres. Both sites are adjacent to each other and located at TMKs: 1-2-025:024 (por.). The Ke`ehi Small Boat Harbor is owned and managed by DOBOR. See Figure 1, Project Location.

Adjacent to the East of the project site is the Tesoro Hawai`i Corporation (Tesoro) fuel storage area. Property to North is used by the Honolulu Fueling Facilities Corporation (HFFC) as a fuel storage area. The project site is bordered to the West by the Ke`ehi Small Boat Harbor, Harbor Master's Office and parking areas for the harbor. The project site is bordered to the South by the access road to the harbor and Piers 100 and 200.

1.3 PURPOSE OF THE ENVIRONMENTAL ASSESSMENT

The purpose of this Draft Environmental Assessment (DEA) is to inform interested parties of the proposed project and to seek public comment on the subject areas that should be addressed prior to the acceptance of the Final Environmental Assessment (FEA). This DEA describes existing conditions at the site and addresses the potential for adverse environmental impacts as a result of the proposed action.

This EA complies with Chapter 343, Section 343-5-1, Hawai`i Revised Statutes, which states an environmental assessment shall be required for actions which, "propose the use of State or County lands or the use of State or County funds. The subject property is owned by DOBOR and State funds will be used to design and construct the proposed DOBOR Administrative Office and Maintenance Building, which necessitates the preparation of this DEA.

SECTION 2 PROJECT DESCRIPTION

2.1 PROPOSED ACTIVITIES

DOBOR proposes to construct a new Administrative Office on an unpaved parking area, approximately 15,000 SF or 0.344 Acres adjacent to the Harbor Master's Office and maintenance facility at the Ke'ehi Small Boat Harbor, Honolulu, O'ahu, Hawai'i. The proposed improvements, includes a new 50' X 80' two-story building with an open deck and covered lanai; and an accessible ramp/walkway to the building; a new 24' X 36' single story building. Site improvements will include minor grading; installation of asphalt paving, utilities and chain-link fence along the perimeter of the parking area to address security requirements. Most of the existing 6' tall chain-link fencing will remain in place and be incorporated into the final site improvements. New 6' tall chain-link fencing will be connected to the existing fence along the Makai and Ewa ends of the project site. Vehicle drive and pedestrian access gates will provide access to the project site and will allow DOBOR to secure the project site after working hours. Approximately 20 parking stalls will be provided for DOBOR employees and visitors. Two of the parking stalls will comply with ADAAG. A bicycle rack will be provided. Outdoor lighting will be attached to the new office building, approximately 18' above the ground. All outdoor lighting will be full cutoff fixtures to minimize impacts to nocturnal wildlife and light pollution. See Figure 2, Site Plan.

Proposed activities will include site preparation, backfilling, and construction of the facility and associated improvements.

Site preparation will involve the following:

- Clear and grade site, prepare for building concrete foundations and asphalt concrete (AC) pavement surface;
- Dispose of debris at an approved landfill facility;
- Establish utilities, including sewer, water, power and telephone;
- Paved access and parking areas approximately 10,000 S.F.;
- Limited landscaping on the Diamond Head side of the project site and Makai side of the new office building.

Facility Construction will involve the following:

- Concrete footings;
- Two-story office building;
- Attached covered lanai on the first floor and open deck on the second floor;
- Accessible ramp/walkway and stairways for access to the first floor;
- External stairways to the second floor;
- Single story maintenance building;
- Security perimeter fencing, drive and pedestrian gates;
- and outdoor lighting.

The proposed two-story office building will provide approximately 8,000 square feet of total floor area of office space, with 4,000 square feet on the first and second floors. There will be an open deck, which is

approximately 1,104 square feet (8' wide X 138' long) on the second floor, and a covered lanai approximately 400 square feet (8' X 50') on the first floor.

The new office space on the first and second floors will provide work space, meeting and storage areas for 27 DOBOR Administrative Office and O'ahu District personnel. Restrooms will be provided on both floors. See Figure 3 – Office Floor Plans and Appendix A – Office Space Requirements, Table 1: Administrative Office and O'ahu District Positions. Partially covered and uncovered paved parking spaces for DOBOR and BOR-O employees will be provided adjacent to the new office building. Visitor parking will be provided adjacent to the new office building, near Pier 100 and on the Ewa side of the Harbor Master's office. In addition, additional parking is available throughout the harbor.

The new 24' X 36' Maintenance Building will provide approximately 864 S.F. of interior space for the four (4) maintenance workers to work on small projects; and to store their tools and materials.

SECTION 3 ALTERNATIVES

3.1 ALTERNATIVES TO THE PROPOSED ACTION

The following site selection criteria were used to investigate potential alternative locations for the relocation of the DOBOR Administrative Office:

- A. The location must be in Honolulu on the island of O`ahu;
- B. The location must be owned by the State of Hawai`i, Department of Land and Natural Resources;
- C. The location must have reasonable access to basic utilities, including water, sewer, power and telephone;
- D. The location must be large enough to accommodate the proposed facility improvements.

3.2 ALTERNATIVE SITES

Potential alternative sites in the Honolulu were evaluated. They include the Sand Island State Recreation Area (near the boat ramp) and Ala Wai Small Boat Harbor.

3.2.1 SAND ISLAND STATE RECREATION AREA

An undeveloped portion of the Sand Island State Recreation Area (SIRA) was considered as an alternative location. This area is owned by the Department of Land and Natural Resources, Division of State Parks. An Ocean Recreation Park was under consideration for a 30-acre portion of the SIRA, but is still in the conceptual phase, and will not go into the planning phase until late 2013, and then only if funding is secured.

This alternative was rejected due to a too great commitment of resources and the lack of sufficient infrastructure for the new building. See Figure 4 – Sand Island Ocean Recreation Park. The proposed facility was included in the proposed Sand Island Ocean Recreation Park located in the undeveloped portion of the Sand Island State Recreation Area.

3.2.2 ALA WAI SMALL BOAT HARBOR

DOBOR investigated a paved parking area behind the Harbor Master's Office in the Ala Wai Small Boat Harbor for the proposed DOBOR Administrative Office. This area is used for trailer parking for the Ala Wai Small Boat Harbor boat ramp. The proposed office and parking area for its employees would eliminate most of the trailer boat parking making the boat ramp unusable to most recreational boaters. It will also preclude a future commercial development at the site which could generate a significant amount of lease rent for DOBOR. This site is located in Waikiki, which makes access difficult during morning and late afternoon rush hour traffic, due to the large volume of vehicles entering and leaving Waikiki on Ala Moana Boulevard.

The preclusion of trailer boat parking and potential future commercial development, and traffic congestion makes this site alternative impractical and infeasible.

3.3 NO ACTION ALTERNATIVE

The No Action Alternative would involve the continued rental of office space and two parking stalls in the Melim Building at an annual cost of approximately \$170,000. It would preclude providing additional office space for DOBOR Administrative and O`ahu District personnel, and providing better access for people conducting business at the downtown DOBOR Administrative office.

The No Action Alternative would avoid use of the unpaved parking area at Ke`ehi Small Boat Harbor, precluding environmental impacts disclosed in this document. The parking lot will continue to be used by people visiting the Harbor Master's Office, Piers 100 and 200 to park their vehicles.

3.4 PREFERRED ALTERNATIVE

The Ke`ehi Small Boat Harbor is the preferred alternative site for the reasons listed above.

SECTION 4
DESCRIPTION OF THE AFFECTED ENVIRONMENT, IMPACTS AND MITIGATION

4.1 PHYSICAL ENVIRONMENT

4.1.1 CLIMATE

South O`ahu has a mild semitropical climate which is characterized by abundant sunshine, persistent Northeast trade winds, relatively constant temperatures and moderate humidity. Severe storms are infrequent in this region of O`ahu.

Mean monthly temperatures range from mid-80°F in the summer months, to low-70°F during the winter. Annual average rainfall is less than 30 inches with most of the rainfall occurring between October and March.

The construction and operation of the proposed Administrative Office is not expected to adversely affect the climate of the area therefore no mitigation measures are proposed.

4.1.2 TOPOGRAPHY AND SOILS

The site is located at the western end of Honolulu Harbor, adjacent to Kalihi Channel and the Ke`ehi Small Boat Harbor. The site is relatively flat and has an elevation of approximately 5 feet above MSL.

Information on soil type is obtained from the Soil Survey of Islands of Kauai, O`ahu, Maui, Molokai, and Lanai, State of Hawai`i, as prepared by the U.S. Department of Agriculture, 1972. According to the Soil Survey, the soil association at the project location is classified as "fill land, mixed" (FL) which consists of material dredged from the ocean or hauled from nearby areas.

The existing site has been impacted by prior activities and erosion control measures and Best Management Practices (BMPs) will be installed prior to construction or ground altering activities. The BMPs may include silt fences, gravel bag filters, sediment/equipment wash basins. These BMPs will be developed in the design phase. No further mitigation measures are proposed or anticipated to be required.

The mitigation measures described above are anticipated to be sufficient to ensure against inadvertent or accidental spills of pollutants to state waters. No adverse impacts to surface waters are therefore anticipated.

4.1.3 FLORA/FAUNA

The proposed project site is located within the maritime industrial locale of Honolulu Harbor. The project site area is comprised of introduced fill material and has been used for boating and related maritime industrial activities for several decades. No threatened or endangered flora or fauna are known to inhabit the site.

Terrestrial flora found at the project site include native and introduced species with mostly herbaceous plants including grasses and weedy species typical of disturbed areas. No plant species were observed within the project area that are listed as threatened or endangered, or which are otherwise considered to be rare or special by the State of Hawai'i or federal government.

Introduced terrestrial fauna observed at the site include the Common Indian Mynah (*Acridotheres tristis*), House Sparrow (*Passer domesticus*), Spotted or Lace-necked Dove (*Streptopelia chinensis*), Zebra Dove (*Geopelia striata*), and Cardinal (*Cardinalis cardinalis*). Cats, rats and mice may also inhabit the area based on the nearby use of the Ke'ehi Small Boat Harbor.

Although none were observed, it is possible that foraging seabirds may also be attracted to the area due to the shoreline location and relatively flat surrounding topography. Because of concern for over flights of seabirds to the area, external shielding will be utilized on lighting fixtures to direct the lighting downward.

4.1.4 SCENIC AND VISUAL RESOURCES

The project site is located in an industrial area adjacent to properties with existing fuel storage and shipping container facilities. Major land uses in the area are primarily industrial in nature and include bulk fuel storage facilities, shipping container storage yards, and the Sand Island Wastewater Treatment Plant (SIWWTP), O'ahu's largest wastewater treatment facility serving the majority of the population in urban Honolulu. The Ke'ehi Lagoon Small Boat Harbor is located immediately to the north and west of the site. The Sand Island State Recreational Area is located at the end of the Sand Island Access Road (Sand Island Parkway), approximately 1.6 miles from the project site. Pedestrian and vehicular views of the surrounding area include tall cranes and stacked shipping containers associated with container yard operations and large fuel storage tanks located adjacent to the project site at the Tesoro and the Honolulu Fueling Facilities Corporation facilities.

Existing pedestrian views of the ocean from street level along the Sand Island Access Road are limited by improvements and topography along the road. Existing fuel storage tanks and other improvements on adjacent properties (Tesoro and HFFC), and other elevated structures in and around the Sand Island industrial area already hinder views westward and Mauka from vantage points around the project site, i.e. Ke'ehi Small Boat Harbor. See Appendix B for Project Site Photos.

The City and County of Honolulu, Coastal View Study (1987), indicates "Continuous Coastal Views" from the Sand Island Bridge. Because of the existing land use and nearby structures, and the scale of the facility in relation to adjacent structures (i.e. fuel storage tank yards), the proposed project is not expected to significantly impact or degrade the existing views as identified by the City.

The proposed height of the proposed Administrative Office and Maintenance Building will be below the established 60-foot maximum building height limit.

The proposed Administrative Office and Maintenance Building are expected to have minimal visual impact due to existing industrial uses of the surrounding area including the Tesoro and HFFC fuel storage facilities immediately adjacent and Mauka of the subject property, the Matson shipping facility across

Sand Island Access Road and the UH Marine Education Training Center (METC) facility across Kalihi Channel.

No further mitigation measures are therefore anticipated or proposed.

4.1.5 HISTORIC/ARCHAEOLOGICAL RESOURCES

Cultural Surveys Hawai'i, Inc. conducted a Cultural Impact Assessment, an archaeological literature review, and a field inspection of the proposed Honolulu Marine Shipyard at Ke'ehi Lagoon project site in March 2007. The site is located a short distance to the East of the proposed Administrative Office site. The paved washdown area and trailer boat parking separates both sites. This report was referenced in this EA, as the findings are likely to be similar for both sites. This report is included in Appendix C-Cultural and Archaeological Assessment of this document.

The following is a summary of the investigations:

- A review of the archaeological literature found no archaeological properties in the vicinity of the project area. Several traditional fishponds once existed somewhat inland, but all of these were filled as "reclamation" land beginning in early twentieth century.
- Some human burials have been found in coastline or coastal estuarine environments in Kalihi Kai, however these are scattered and are not near the project area.
- Because the project area is believed to be entirely 20th century fill material, it seems exceedingly unlikely to adversely impact any land resources.
- The proposed construction is within a heavily industrialized area and on land that is composed entirely of fill material. It is therefore highly unlikely that significant historic or archaeological resources are present at the project site. However, should any unidentified deposits be uncovered during construction, work will cease in the immediate area and the State Historic Preservation Office will be contacted.

4.1.6 NOISE

Construction of the Administrative Office will involve some generation of noise. Construction equipment is expected to include, but not be limited to, a compactor, grader, bulldozer, concrete mixer, concrete delivery trucks, cranes, welders and powered hand tools. All combustion powered equipment will be muffled in accordance with industry recognized engine operating practices.

Because the proposed project will be located in an industrial area and is not within proximity to residential areas, the construction of the Administrative Office is not expected to significantly increase nor result in adverse noise levels in the area.

No further mitigation measures are planned or proposed beyond the adherence to regulated safe working practices to prevent adverse noise impacts to the general public and shipyard employees.

4.1.7 AIR QUALITY

No information was collected on air quality. Construction activities are expected to have little or no impact since the project will be of limited duration and where engine exhausts may be a source of potential air pollution, all internal combustion equipment will be governed in accordance with applicable state and county regulations.

During construction, fugitive dust may be generated which can constitute a nuisance to the nearby Tesoro tank site, the Ke`ehi Small Boat Harbor, and the general public transiting the area along the Sand Island Access Road. As required to reduce the potential incidence of fugitive dust, the construction contractor will regularly wet disturbed soil areas.

4.1.8 FLOOD HAZARD

The subject property is located at the outlet of Honolulu Harbor. According to Federal Emergency Management Agency (FEMA), Flood Insurance Rate Map (FIRM), Map No. 15003C0353 E, dated November 20, 2000, the project site is in an area designated as Zone AE (EL 5). The Zone AE (EL 5) designation is the flood insurance rate zone that corresponds to the 1-percent annual chance floodplains that are determined in the Flood Insurance Study by detailed methods of analysis. The Base Flood Elevation determined for this zone at the project location is 5 feet.

Although the proposed facility will be located within Zone AE it is noted that no habitable structures are proposed that would constitute an unreasonable risk to life or property and the first floor elevation will be raised higher than 5 feet MSL. Given that the new office will be located in the same area and ground elevation as the existing Harbor Master's office, the proposed use is considered reasonable and is not anticipated to have a significant impact on, nor be impacted by flood conditions. No further mitigation measures are planned or proposed.

4.2 PUBLIC FACILITIES

4.2.1 TRAFFIC AND ROADWAYS

Vehicular traffic data were collected at the Sand Island Bridge fronting the proposed project site over a 24-hour period in late 2004. Morning traffic volumes to Sand Island peaks between 6:00 a.m. and 7:00 a.m. Approximately twice as many vehicles are traveling to Sand Island than leaving during this 24-hour period. Afternoon traffic volumes from Sand Island peaks between 3:00 p.m. and 4:00 p.m. Approximately 300 more vehicles are traveling from Sand Island than entering during this period.

The volume of traffic during the period between the AM and PM peak is relatively constant at between 400 and 550 vehicles per hour in both directions.

Peak AM (PM) Traffic Volumes
 Sand Island Access Road at Sand Island Bridge
 October 2004

360 (751)	1,005 (491)
Sand Island Access Road (North Bound From Sand Island) AM Peak = 6:00 - 7:00 AM	Sand Island Access Road (South Bound To Sand Island) PM Peak = 3:00 - 4:00 PM

The proposed project is not expected to significantly alter the total volume of traffic on Sand Island Access Road. Construction-related work, including delivery of building supplies, construction vehicles and other related traffic may affect traffic flow on Sand Island Access Road. However, these effects are expected to be short-term and will be experienced primarily during the initial and final stages of the project when construction equipment is moved to and from the project site. Occasional increases in construction traffic may result from the periodic movement of construction materials and when vehicles leave the site to remove debris. Construction activity is planned during the daytime hours with no night work anticipated to be required. Construction activities will not impact pedestrian or vehicle access to the small boat harbor.

In the long-term, the operation of the facility is not expected to significantly add to the existing level of traffic flow along Sand Island Access Road. Normal operational traffic will be limited to the movement of employee and visitors vehicles; and routine delivery of supplies which will occur once daily during non-peak periods.

DOBOR employs approximately 27 employees who typically work in shifts throughout the workday. The early shift begins at 7:00 am and ends at 3:45 pm. The regular shift begins at 7:45 am and ends at 4:30 pm. Approximately half of the employees currently drive to the Downtown office and the remainder are either dropped off or arrive using the City Bus. Similar conditions are expected for the Ke'ehi Small Boat Harbor site which is anticipated to add a maximum of 15 vehicles to the morning and afternoon peak travel times. The remaining employees will commute outside of periods of peak traffic hours, or will seek alternative methods of transportation (e.g., they will be picked up or will use the City Bus).

The added volume of this traffic is expected to be negligible and would not significantly add to existing levels of traffic.

The required number of parking stalls needed to accommodate employee vehicles will be provided at the facility, therefore the proposed project is not expected to impact parking availability at the Ke'ehi Small Boat Harbor or other nearby areas.

The project is not expected to have a significant impact to the existing traffic volume; therefore no additional mitigation measures are proposed or are anticipated to be required.

4.2.2 WATER SYSTEM

The New Administrative Office will be connected to the Ke`ehi Small Boat potable water system, which has adequate capacity for the new office. The water system is connected to a 12-inch water main running along the Sand Island Access Road. The 12-inch water main is owned by the Honolulu Board of Water Supply. The fire protection for the office will be provided by a new fire hydrant that will be installed along with a new water line to the proposed Honolulu Marine Shipyard project.

4.2.3 SEWER SYSTEM

The New Administrative Office will be connected to the Ke`ehi Small Boat sewer system, which has adequate capacity for the new office. The building sewer system will be connected to a new gravity sewer main to the existing sewer pump station. The pump station pumps the wastewater through a force main, which runs under the channel to Honolulu Harbor exiting in a sewer manhole near the Marine Education Training Center. The sewer manhole and Sand Island Wastewater treatment plant is owned by the City and County of Honolulu.

SECTION 5
RELATIONSHIP TO STATE AND COUNTY LAND USE PLANS AND POLICIES

5.1 STATE LAND USE DISTRICT

The project site and surrounding area are within the State Urban District. Areas surrounding the project site are currently developed and are in industrial use. The proposed project is consistent with this current land use designation.

5.2 GENERAL PLAN

The current edition of the General Plan for the City & County of Honolulu was adopted in 1977, revised in 1992, and was last updated in October 2006. The Plan is a comprehensive statement of objective and policies for the future development of Honolulu. The proposed project is consistent with the objectives and policies of the General Plan for the City & County of Honolulu.

Physical Development and Urban Design

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

Policy 2: Coordinate the location and timing of new development with the availability of adequate water supply, sewage treatment, drainage, transportation, and public safety facilities.

The project will take place in a location that has adequate water supply and sewage treatment facilities. The administrative office will provide better service to harbor users, recreational boaters and the public by being located in the Ke`ehi Small Boat Harbor. The project is located in an industrial area with air, ground and harbor related linkages. The added vehicular traffic from the proposed project is not expected to have a significant impact on existing traffic volume. Fire protection is provided by the City and County of Honolulu Fire Department out of the Kalihi Kai Fire Station #31, and police service is provided by the Kalihi Police Station.

Policy 5: Provide for more compact development and intensive use of urban lands where compatible with the physical and social character of existing communities.

The proposed location for the new Administrative Office is compatible with the surrounding uses, which include fuel storage facilities, Harbor Master's office, maintenance facility, future shipyard and the Ke`ehi Small Boat Harbor. The proposed project will result in a more compact, efficient and compatible development in an existing urban waterfront industrial area.

Policy 6: Encouraging the clustering of developments to reduce the cost of providing utilities and other public areas.

The proposed project is located in an industrial area along the Sand Island Access Road with the access to existing basic infrastructure. The construction of the new office will not necessitate the need for major development of new utilities or other public services. The proximity to existing utilities used by the Ke`ehi Small Boat Harbor and adjoining waterfront industrial activities will reduce the public costs of providing these services in comparison to alternative locations were considered.

5.3 PRIMARY URBAN CENTER DEVELOPMENT PLAN

The project site is designated for major parks and open space in the Primary Urban Center (PUC) Development Plan Land Use Map (March 2004). The proposed project is consistent with the existing Ke`ehi Small Boat Harbor and is located next to the Harbor Master's Office, and is related to the services provided to the harbor users.

5.4 ZONING

The project site is designated I-3, Waterfront Industrial District. The intent of the I-3 zoning is to set apart and protect areas considered to be vital to the performance of port functions and to their efficient operations. The new Administrative office will house the administrative personnel for DOBOR and O`ahu District, which manages the Ke`ehi Small Boat Harbor and 19 other small boat harbors throughout the State of Hawai`i.

5.5 SPECIAL MANAGEMENT AREA

The City & County of Honolulu has designated the shoreline and certain inland areas of O`ahu as being within the Special Management Area (SMA), as set forth in Chapter 25, Shoreline Management, ROH, and Section 205A, Coastal Zone Management, HRS.

The project site is located in the SMA. The proposed office will not result in changes to the existing land use. Shoreline access to areas adjacent to the proposed facility will be maintained. No existing recreational facilities will be adversely affected by the proposed project. The project area is located in a waterfront industrial area adjacent to properties in industrial land uses.

**SECTION 6
NECESSARY PERMITS AND APPROVALS**

6.1 CITY AND COUNTY OF HONOLULU

City and County of Honolulu Building Permit

6.2 STATE OF HAWAII

None

6.3 FEDERAL

None

**SECTION 7
CULTURAL IMPACT ASSESSMENT**

7.1 IMPACTS TO TRADITIONAL/CULTURAL RESOURCES

A cultural impact assessment, archaeological literature review, and field inspection was conducted for the proposed Honolulu Marine Shipyard at Ke`ehi Lagoon. The proposed Honolulu Marine site is located to the East of the proposed project site. This Cultural and Archaeological Assessment is enclosed in the Appendix C.

The project site is located in area that has been previously impacted by the existing Ke`ehi Small Boat Harbor and is presently a graded unpaved parking area. No impacts to the use of flora and fauna associated with the cultural practices are anticipated.

**SECTION 8
AGENCIES AND ORGANIZATIONS CONSULTED**

The following agencies, organizations, and individuals were/will be contacted regarding the preparation of the DEA and FEA for this project.

8.1 CITY AND COUNTY OF HONOLULU

Department of Planning and Permitting
Department of Environment Services
Department of Design and Construction
Fire Department
Police Department

8.2 STATE OF HAWAII

Department of Land and Natural Resources – State Historic Preservation Division

8.3 ORGANIZATIONS AND INDIVIDUALS

State Senator Wakai
The Kalihi Palama Neighborhood Board No. 15
Sand Island Business Association
Ke`ehi Trailer Boat Club

SECTION 9
SUMMARY OF IMPACTS AND SIGNIFICANCE DETERMINATION

9.1 SHORT TERM IMPACTS

Short term impacts associated with the proposed project are expected to be minimal. The construction contractor will need to access the project site via Sand Island Access Road. Noise will be generated from construction and related mobilization of equipment.

Construction equipment is expected to include, but not be limited to, a compactor, grader, bulldozer, hoist, forklift, crane, concrete mixers, concrete delivery trucks, cranes, welders and powered hand tools. All equipment will be muffled in accordance with standard engine operating practices. The work will be limited to weekday daylight hours and engine exhausts will be governed in accordance with applicable state and county regulations. Upon construction completion, noise levels will return to ambient levels.

Dust and associated nuisance problems are expected to be slight to insignificant due to the limited scope and scale of the project. Fugitive dust will be controlled with regular wetting of the soil by the contractor.

Construction activity will temporarily disturb soil on the property and the bottom substrate fronting the site. To minimize soil erosion, silt fences, berms, and other applicable erosion control devices will be utilized to prevent construction-related soil and silt from leaving the active work area. If required, exposed soils will be covered with PVC sheet plastic or similar material to prevent inadvertent contact and mixing with storm water.

9.2 LONG TERM IMPACTS

The new office will be more accessible to the public conducting business with DOBOR. No long term adverse impacts are anticipated.

9.3 SIGNIFICANCE CRITERIA

Based on the significance criteria set forth in HAR, Title 11, Chapter 200, Environmental Impact Statement Rules, the proposed project is not anticipated to result in significant environmental impacts. The recommended preliminary determination for the proposed project is a Finding of No Significant Impact (FONSI). The findings and reasons supporting this determination are summarized as follows:

1. Involves an irrevocable commitment to loss or destruction of any natural or cultural resource.

The proposed project will not result in the adverse loss of natural or cultural resources. There are no threatened or endangered species of plants or wildlife that inhabit the project site. Given the history, industrial use of the area, and the composition of the underlying soils, historic or archaeological sites are not known to be present at the site. However, in the unlikely event of a discovery of significant historic or archaeological resources, the State Historic Preservation Division will be immediately notified for appropriate action and treatment. No impacts to view planes or visual resources are expected. See site photos in Appendix B.

2. Curtails the range of beneficial uses of the environment.

The subject property is zoned for waterfront industrial use and is currently vacant. The proposed use is consistent with the industrial designation of the site and will be contained entirely within the property. The proposed action does not curtail beneficial uses of the environment.

3. Conflicts with the State's long-term environmental policies or goals and guidelines as expressed in Chapter 343, HRS, and any revisions thereof and amendments thereto, court decisions, or executive orders.

The proposed project is consistent with the environmental policies, goals and guidelines expressed in HRS, Chapter 343. Potential sources of adverse impacts have been identified and appropriate measures have been developed to either mitigate or minimize potential impacts to negligible levels.

4. Substantially affects the economic and social welfare of the community or state.

The proposed project will use an industrially-zoned site for an office facility which will continue to provide for the operation and management of DOBOR's facilities and ocean recreation areas. The operation of the facility is expected to maintain the social and economic environment of O'ahu by allowing easier access to the public for services provided by the DOBOR Administrative office.

5. Substantially affects public health.

Factors affecting public health, including air quality, water quality, and noise levels, are expected to be only minimally affected, or unaffected, by the proposed project.

6. Involves substantial secondary impact, such as population changes or effects on public facilities.

The proposed activity is expected to have little to no substantial secondary or indirect impacts such population changes or effects on public facilities based on the limited scope and scale of the project.

7. Involves a substantial degradation of environmental quality.

Impacts to air water quality, noise levels, natural resources, and land use associated with the project are anticipated to be minimal. Mitigation measures will be employed as practicable to further minimize potentially detrimental effects to the environment during the construction activities. The proposed project does not involve substantial degradation of environmental quality.

8. Is individually limited but cumulatively has considerable effect upon the environment or involves a commitment for larger action.

The proposed improvements are not expected to cause adverse cumulative impacts to the environment, nor does the project involve a commitment for larger actions. The area of use is limited and is not likely to be further expanded.

9. Substantially affects a rare, threatened or endangered species.

There are no rare, threatened or endangered species on the project site.

10. Detrimentially affects air or water quality or ambient noise levels.

On a short-term basis, ambient air and noise conditions may be affected by construction activities related to the proposed improvements, but these short-term potential impacts will be controlled by mitigative measures as described in this EA. Once the project is completed, air and noise in the project vicinity will return back to its preconstruction conditions. Erosion control measures will be employed to prevent untreated runoff from construction activities from entering State waters.

11. Affects or is likely to suffer damage by being located in an environmentally sensitive areas such as a flood plain, tsunami zone, erosion-prone area, geologically hazardous land, estuary, freshwater or coastal waters.

A portion the project area is located within in area determined by the Federal Emergency Management Agency to be within the 1-percent annual chance floodplain with a Base Flood Elevation of 5 feet. The proposed office and maintenance buildings and parking area are not expected to have a significant impact on, nor will be impacted by flood conditions. In addition, the first floor elevation of the office will be above the Base Flood Elevation of 5 feet.

12. Substantially affects scenic vistas and view planes identified in county or state plans or studies.

The Primary Urban Center Development Plan as well as the City and County of Honolulu's Coastal View Study (1987) identifies important views to be protected. The Coastal View Study, indicates there are "Continuous Coastal Views" from the Sand Island Bridge only. Existing views of the ocean from Sand Island Access Road and Ke`ehi Small Boat Harbor are constrained and impacted by existing improvements in the area, mainly the large fuel storage tanks.

From a regional perspective, the proposed project will not obstruct any significant scenic features and view planes due to its elevation close to sea level and number of industrial activities in close proximity to the project site. Additionally, the proposed office building will be below the established 60-foot maximum building height limit. The site improvements will not substantially affect any existing views from the surrounding area.

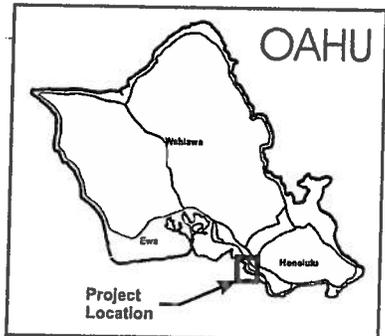
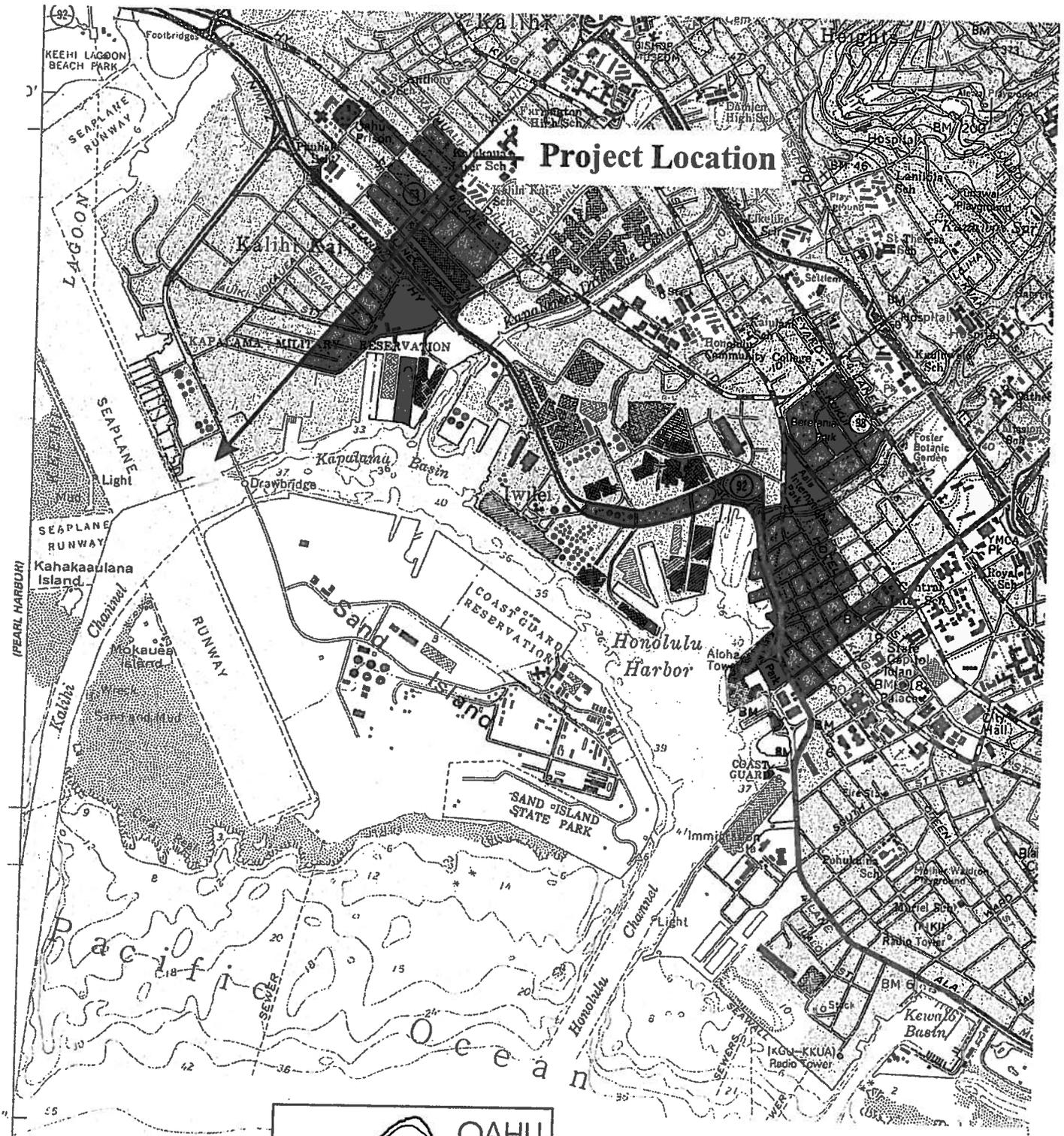
13. Requires substantial energy consumption.

Construction of the proposed improvements and daily activities associated with the new office building will not require substantial amounts of energy. The new Administrative Office at Ke`ehi Small Boat Harbor is anticipated to require the same energy requirement as the current office in the Melim Building.

DOBOR will incorporate energy efficient lighting, equipment, appliances and air conditioning into the design of the new office. In addition, DOBOR is considering the installation of Photovoltaic (PV) panels to provide electricity for the new office.

SECTION 10
FINDINGS

In accordance with the provisions set forth in HRS, Chapter 343, and the significance criteria in HAR, Section 11-200-12 of Title 11, Chapter 200, it is anticipated that the proposed project will have no significant adverse impacts to water and air quality, existing utilities, noise levels, social welfare, archaeological sites, or wildlife habitat. All anticipated impacts are expected to be temporary in duration and will not adversely impact the environmental quality of the area. It is expected that an Environmental Impact Statement (EIS) will not be required, and that a Finding of No Significant Impact (FONSI) will be issued for this project.



**New Administrative Office
at Ke'ehi Small Boat Harbor
Honolulu, O'ahu, Hawai'i**



R. M. TOWILL CORPORATION

March 2007

Figure 1 – Project Location

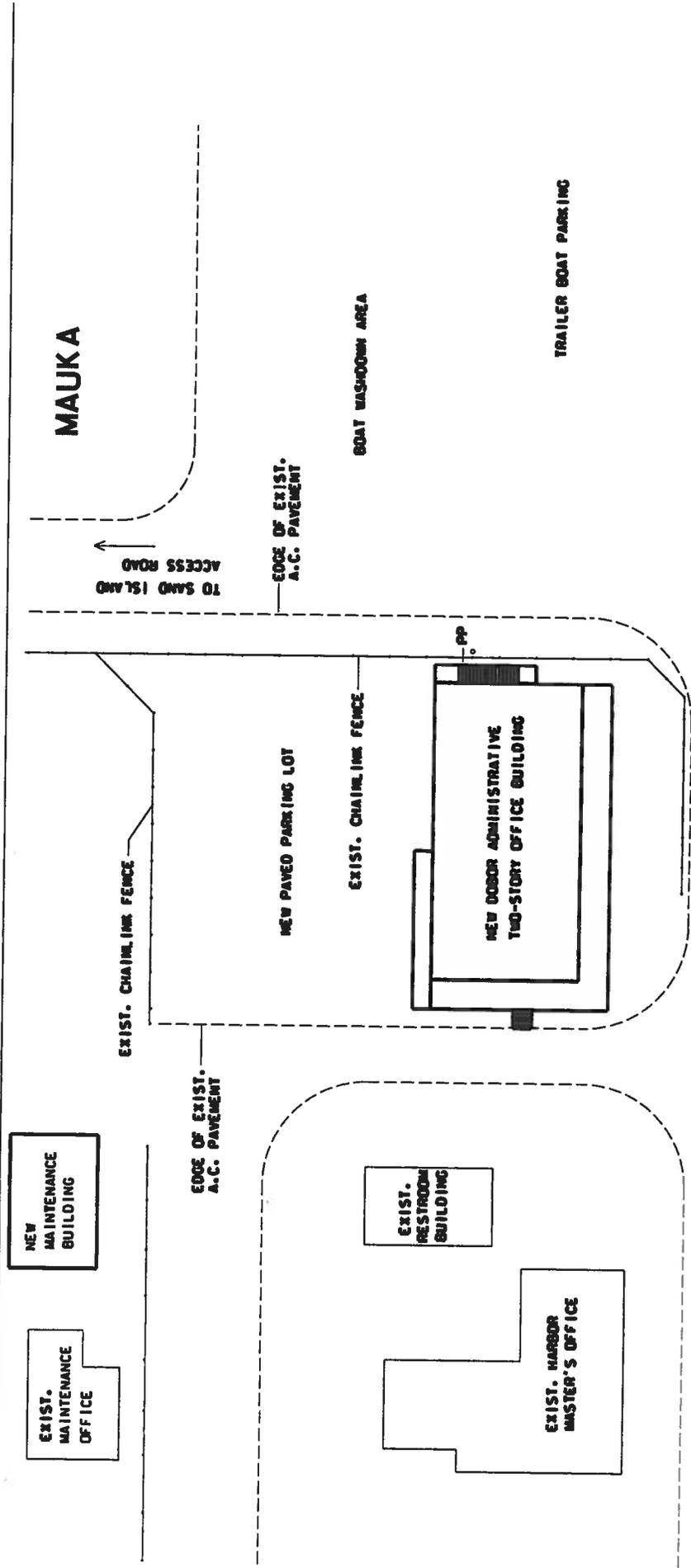
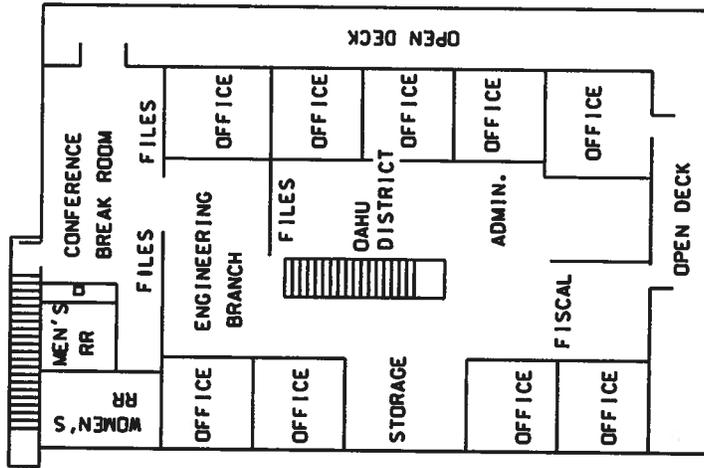


Figure 2 – Site Plan

SITE PLAN

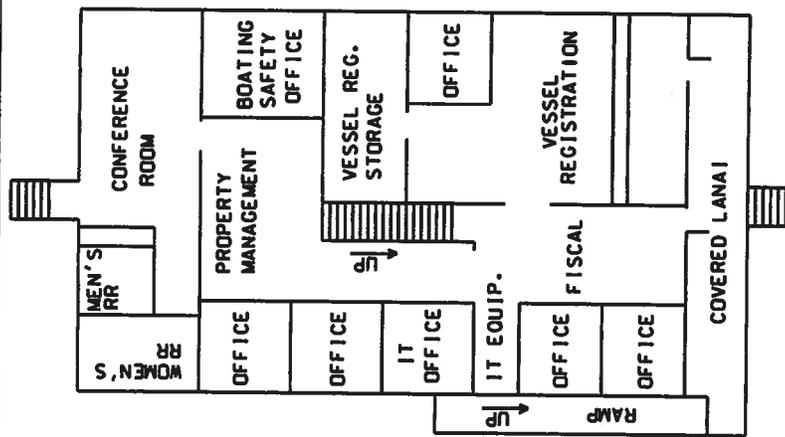
MAKAI



SECOND FLOOR PLAN

MAUKA

MAKAI



FIRST FLOOR PLAN

MAUKA

Figure 3 – Office Floor Plan

APPENDIX A – OFFICE SPACE REQUIREMENTS

The State of Hawai'i Department of Accounting and General Services has developed minimum space requirements for State employees based on their SR or EM ratings; tasks performed in the office space and standards for the office space. These space requirements are noted below:

Employee Rating	Min. Required Space
Division Chief EM03-07	180 full-height partition
Section Head and Staff Agency Supervisor: SR 28 and above with 8 or more employees	140 partial-height partition
Section Head and Staff Agency Supervisor: SR 28 and above with less than 8 employees	120 partial-height partition
Section Head and Staff Agency Supervisor: SR 21-27with 4 or more employees	100 partial-height partition
Section Head and Staff Agency Supervisor: SR 21-27with less than 4 employees	100
Staff SR24 and above	90
Staff SR14-23	80
Staff SR 13 and below	65

In addition, DAGS requires an additional 30% of space for office circulation. For facilities with 20-39 employees, a sink and counter with 40 S.F. will be allowed. The establishment of conference rooms shall be based on needs established from past records. Conference rooms shall be sized to accommodate average attendance. Air conditioning shall be provided for all office buildings. Lighting shall be provided based on the type or task: 75-100 for difficult seeing task; 50 for general office areas, private offices and conference rooms. The floor covering shall be appropriate for the office usage and may be carpet or tile. Additional space for reception, library and storage areas are allowed based on needs established from past records.

The Government Services Administration (GSA) recommends following the best industry standards used in designing for efficient useful workspaces. After gathering information from sources ranging from call centers to software design firms, GSA determined the average private sector workspace was 230 square feet per employee. While an employee's cubicle may only measure about 50-60 square feet, the rest of the space is allocated for storage, file rooms, copier and fax areas, work and meeting rooms, and the corridors connecting the cubicles. The U.S. State Department has developed its own criteria (especially for work in other countries), which call for a maximum of 153 square feet per person.

Table 1: Administrative Office and O`ahu District Positions

Office/Branch	Symbol	Position	Min. Space Required (SF)
Administration	BOR	Administrator	180
Administration	BOR	Secretary III	80
Program Services	BOR-A	Boating Staff Officer	100
Program Services	BOR-A	Secretary II	80
Planning	BOR-R	Planner IV	100
Vessel Registration	BOR-AV	Clerical Supervisor II	80
Vessel Registration	BOR-AV	Office Assistant III	65
Vessel Registration	BOR-AV	Office Assistant III	65
Vessel Registration	BOR-AV	Office Assistant III	65
Boating Safety & Education Program	BOR-S	Boating Safety Education Specialist	90
Engineering Branch	BOR-E	Engineer VI	120
Engineering Branch	BOR-E	Engineer V	100
Engineering Branch	BOR-E	Engineer V	100
Engineering Branch	BOR-E	Office Assistant IV	65
Property Management	BOR-PM	Property Manager	100
Property Management	BOR-PM	Property Manager	90
Property Management	BOR-PM	Secretary	80
Fiscal	BOR-F	Auditor IV	100
Fiscal	BOR-F	Accountant IV	100
Fiscal	BOR-F	Accountant III	80
Fiscal	BOR-F	Account Clerk IV	65
Fiscal	BOR-F	Account Clerk III	65
Data Processing	BOR-DP	System Analyst IV	90
O`ahu District	BOR-O	O`ahu District Manager	100
O`ahu District	BOR-O	Asst. O`ahu District Manager	100
O`ahu District	BOR-O	Secretary II	80
O`ahu District	BOR-O	Office Assistant III	65

APPENDIX B – Project Site Photos and Aerial View
New Administrative Office
at Keehi Small Boat Harbor
Honolulu, Oahu, Hawaii



View from project site looking East towards the boat washdown stations.
Photo taken on 11/2/12.



View from project site looking West towards the Harbor Master's Office.
Photo taken on 11/2/12.

APPENDIX B – Project Site Photos and Aerial View
New Administrative Office
at Keehi Small Boat Harbor
Honolulu, Oahu, Hawaii



View from project site looking Makai towards the Pier 100. Photo taken on 11/2/12.



View from project site looking Mauka towards the fuel storage tanks. Photo taken on 11/2/12.

APPENDIX B – Project Site Photos and Aerial View
New Administrative Office
at Keehi Small Boat Harbor
Honolulu, Oahu, Hawaii



View of project site from the boat washdown station located to the East. Photo taken on 11/2/12.



View of project site looking Makai towards Pier 100. Photo taken on 11/2/12.

New Division of Boating and Ocean Recreation
Administrative Office
at Keehi Small Boat Harbor
Honolulu, Oahu, Hawaii



Keehi Small Boat Harbor and Adjacent Areas
Aerial Photo. Photo from Google Maps - 2008

Appendix C

Cultural Impact Evaluation, Archaeological Literature Review
and Field Inspection for the Development of a Small Shipyard
at Ke'ehi Small Boat Harbor, Kalihi Kai, Kona, O'ahu

**A Cultural Impact Evaluation, Archaeological Literature
Review and Field Inspection for the Development of a Small
Shipyard at Ke'ehi Lagoon Small Boat Harbor,**

Kalihi Kai, Kona, O'ahu

TMK: [1] 1-2-025:024

**Prepared for
R.M. Towill Corporation**

**Prepared by
Hallett H. Hammatt, Ph.D.
and
David W. Shideler, M.A.**

**Cultural Surveys Hawai'i, Inc.
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(Job Code: KALIH 4)**

March 2007

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Management Summary

Reference	A Cultural Impact Evaluation, Archaeological Literature Review and Field Inspection for the Development of a Small Shipyard at Ke'ehi Lagoon Small Boat Harbor, Kalihi Kai, Kona, O'ahu TMK: [1] 1-2-025:024 (Hammatt and Shideler 2007)
Date	March 2007
Project Number (s)	Cultural Surveys Hawai'i, Inc. (CSH) Job Code: KALIH 4
Project Location	The project location is at the south end of the Ke'ehi Lagoon Small Boat Harbor off of Sand Island Access Road.
Land Jurisdiction	Department of Transportation, Division of Harbors
Agencies	R. M. Towill Corporation/ DOT, Division of Harbors
Project Description	The proposed project is the construction of a building and docks associated with a small shipyard
Project Acreage	71,200 square feet
Area of Potential Effect (APE) and Survey Acreage	Because the proposed project may involve dredging, the waters off the project area may be affected
Historic Preservation Regulatory Context	The project requires compliance with the State of Hawai'i environmental review process [Hawai'i Revised Statutes (HRS) Chapter 343], which requires consideration of a proposed project's effect on traditional cultural practices.
Fieldwork Effort	A field inspection was carried out by K.W. Bushnell, B.A. on December 17, 2006
Number of Historic Properties Identified	None
Findings	No archaeological or historical sites were identified during the field inspection. The land component of the project area is believed to be entirely 20 th century fill. Historic and archival research and previous cultural studies suggest there are rich traditions associated with the Mokauea Fishery where the project area is located.
Mitigation Recommendation	The potential for adverse impact of the proposed project to near shore resources and fishing access is unclear to us at this time. Given the long-tradition of utilization of coastal resources in the vicinity and the expressed concerns associated with the struggle for access to and residence on Mokauea Island and vicinity we recommend that the project attempt to minimize adverse impact to the coastal environment and minimize adverse impact to coastal access for purposes of fishing and accessing other coastal resources.

Table of Contents

Management Summary	i
Section 1 Introduction	1
1.1 Project Background	1
1.2 Scope of Work	1
1.3 Environmental Setting	1
1.3.1 Project Area Description.....	1
Section 2 Methods	7
2.1 Field Methods	7
2.2 Document Review	7
Section 3 Background Research	8
3.1 Traditional and Historical Background.....	8
3.1.1 Mythological and Traditional Accounts	8
3.1.2 Early Historic Period	9
3.1.3 Mid- to late-1800s.....	12
Growth of Honolulu Harbor and Sand Island.....	13
3.1.4 1900s.....	14
3.1.5 Modern Land Use	15
3.2 Previous Archaeological Research	17
Section 4 Results of Fieldwork.....	22
4.1 Field Inspection	22
Section 5 Traditional Cultural Practices.....	26
5.1 Fishing and Gathering of Marine Resources	26
5.1.1 Loko I'a (Fishponds)	26
5.1.2 Kai o Mokauea/ Kai o Kaliawa.....	29
5.1.3 Salt Beds	30
5.1.4 The Reef.....	30
5.1.5 The Fish	31
5.1.6 'Ohana Style Fishing.....	33
5.1.7 Fishing Techniques	33
5.1.8 Traditional Beliefs about Fishing	34
5.1.9 Changes to Traditional Fishing Lifestyle.....	34
Section 6 Summary and Recommendations	37
Section 7 References Cited	39

List of Figures

Figure 1. Portion of 1998 Honolulu Quad with location of project area	4
Figure 2. Tax Map Key (TMK) 1-2-25 showing location of project area	5
Figure 3. Aerial Photo of Kalihi Kai with Project Area denoted in red.....	6
Figure 4. Portion of 1897 Monsarrat Map showing location of current project area; notice the project area is in the water	10
Figure 5. 1945 USGS showing project area on edge of seaplane channel	16
Figure 6. Portion of 1998 USGS Honolulu Quad showing locations of previous archaeological studies	18
Figure 7. General view of project area looking south toward Sand Island.....	22
Figure 8. General view of project area oriented north.....	23
Figure 9. General view, project area in foreground and Mokauea Islet in background. View to southwest.....	23
Figure 10. Photo of project area with view of Bascule Bridge and Honolulu Harbor in background. View to east.....	24
Figure 11. Close up of native sedge 'aki 'aki growing near the eastern border of the project area	25
Figure 12. Photo of project area facing northwest. Note 50 gallon drums and hull of abandoned ship on parcel.	25
Figure 13. 1919 USGS Map showing project area, major fishponds in Kalihi Kai, salt beds, O&R Railroad and project area in red	28

List of Tables

Table 1. List of Former Fishponds in the Kalihi Kai, Iwilei Areas Subjected to Palynological Studies.....	11
Table 2. Māhele Claimants for Fisheries in Kalihi Ahupua'a (information adapted from Maly and Maly 2003).....	26
Table 3. List of Fish in Mokauea Fishery (Adapted from Oppenheimer 1976 and Brock 1975)..	31

Section 1 Introduction

1.1 Project Background

At the request of R.M. Towill Corporation, Cultural Surveys Hawai'i, Inc. conducted this cultural impact evaluation, archaeological literature review and field inspection study for the development of a small shipyard at Honolulu Harbor at Ke'ehi Lagoon, Kalihi Ahupua'a, Honolulu (Kona) District TMK: (1) 1-2-025:024. The proposed shipyard is situated at the south end of the Ke'ehi Lagoon Small Boat Harbor and at the intersection of the Seaplane Runway "D" and the sea channel that leads into the Kapālama Basin of Honolulu Harbor. The project area is approximately 71,200 square feet and includes fast land and a submerged area. The Ke'ehi Lagoon Small Boat Harbor is situated on the causeway that connects Sand Island to the Kapālama mainland. The parcel and the adjacent parking lot and small boat harbor are devoted to waterfront industrial and recreational activities. The area is under consideration of development for a small shipyard.

1.2 Scope of Work

The following Scope of Work was proposed to meet the Hawaii Revised Statutes Chapter 343 requirements for an environmental assessment.

1. Historical and previous archaeological background research to include study of archival sources, historic maps, Land Commission Awards, and previous archaeological reports to construct a history of land use and to determine if archaeological sites have been recorded on or near this property.
2. A field inspection of the project area to identify any surface archaeological features and to investigate and assess the potential for impact to such sites. This assessment identifies any sensitive areas that may require further investigation or mitigation before the project proceeds.
3. Preparation of a report that contain the results of research and findings.

This report assesses the likelihood that the proposed project will impact cultural practices. This assessment is based on the background research and the review of land use within the vicinity of the project area.

1.3 Environmental Setting

1.3.1 Project Area Description

The current project area (Figures 1-3) is located on the southern leeward coast of Honolulu just west of the north end of the causeway leading to Sand Island. This area is also known as the Kalihi Basin as it is flanked on the east and west sides with fresh water streams. To the east Niuhelewai Stream, or what is today known as the Kapālama Drainage Canal, drains into the

Kapālama Basin. To the west, Kalihi Stream empties into the Kalihi Basin or what is now more popularly known as Ke'ehi Lagoon.

Elevation at this project area is approximately sea level to 6 ft (0-1.8 m) above sea level and this area receives approximately 600-800 millimeters (20-30 inches) of precipitation annually (Giambelluca et al. 1986:138). Temperatures on Sand Island range between 52 and 95°F, with a monthly low of 52-80°F in January, to a monthly high of 65-95°F in September (Armstrong 1983: 62-64). Vegetation in the project area is sparse with the exception of the eastern edge of the parcel. This area that borders on the Sand Island Access Road contains a depression that is filled with intertidal water and some vegetation, primarily a native rushgrass, *'aki'aki*. The remaining part of the project area consists of fill. Soil underlying the project area consists of Fill land, mixed (F1), containing areas filled with material dredged from the ocean and hauled from nearby areas. This land type is generally used for urban development, including airports, housing areas, and industrial facilities (Foote et al. 1972:31).

The modern Hawaiian shoreline configuration, including that of the current project area, is primarily the result of: (1) rising sea level following the end of the Pleistocene (Stearns 1978; MacDonald et al. 1983); (2) the mid to late Holocene c. 1.5-2.0 m high-stand of the sea (see summary in Dye and Athens 2000:18-19); and, particularly in the case of the current project area (3) post-contact human landscape modification.

At the end of the Pleistocene, between approximately 20,000 and 5-6,000 years ago, water previously locked in glacial ice returned to the world's oceans, and the sea-level rose over 100 m to approximately its current level. In the vicinity of the current project area, rising sea levels flooded the previously dry, earlier Pleistocene reef deposits, which had formed hundreds of thousands of years previously when sea level was comparable to modern levels. When sea level reached approximately modern levels, the now coastal regions became depositional environments, where for tens of thousands of years previously, during the lower sea-levels, they had been erosional environments.

A high stand of the sea for the Hawaiian Islands, c. 1.5 to 2.0 m above present sea level, has been well documented between 4,500 and 2,000 years ago (Stearns 1978; Athens and Ward 1991; Fletcher and Jones 1996; Grossman and Fletcher 1998; Grossman et al. 1998; Harney et al. 2000). During this high stand, there appears to have been an increase in coral reef production and the production of detrital reef sediments. Littoral environments appear to have been augmented substantially by the deposition of marine sediments. "What this means is that the great shoreline sand berms must have developed around the islands at this time because this was when calcareous sand was being produced and delivered to the shorelines in large quantities" (Dye and Athens 2000: 19). The Kalihi and Kapālama estuaries were likely greatly affected by the deposition of marine sediments during this elevated sea level. The subsequent drop in sea level to its present level, c. 2000 years ago, most likely created a slightly erosional regime that may have removed sediments deposited during the preceding period of deposition (Dye and Athens 2000:19). However, the net gain in sediments would have been substantial. The many lagoonal/estuary environments on the southern coasts that pre-contact Hawaiians utilized for the construction of fishponds was a direct result of the deposition from this later Holocene high stand.

The pre-contact construction of fishponds in the vicinity of the project area helped create the modern land form we see today. Fishpond walls served as sediment anchors for the accumulation of detrital reef sediments. They also likely affected long shore sediment transport, resulting in new littoral deposition and erosion patterns. In the post-Western contact period, when the fishponds were no longer utilized, they became obvious locations for the deposition of fill. These reclaimed areas provided valuable new land near the heart of growing urban Honolulu. Additionally, the O'ahu coastline in the vicinity of the project area was greatly altered by the expansion of Honolulu Harbor, the Honolulu Airport and associated industrial infrastructure which required massive excavations, dredging and filling episodes. The Sand Island Causeway and Ke'ehi Small Boat Harbor are part of this 19th and 20th century transformation of the industrial hub of Hawai'i's capital, Honolulu.

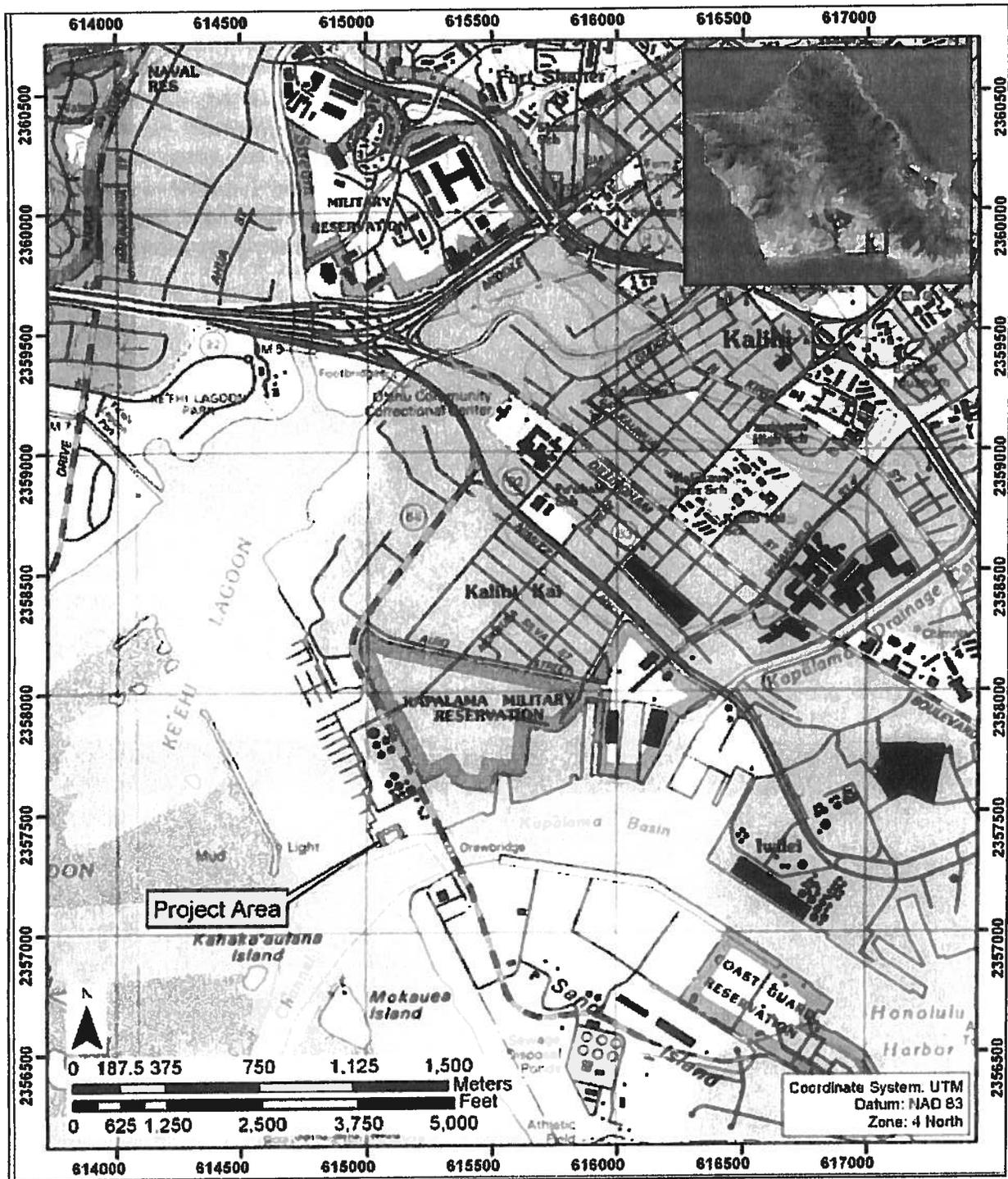


Figure 1. Portion of 1998 Honolulu Quad with location of project area

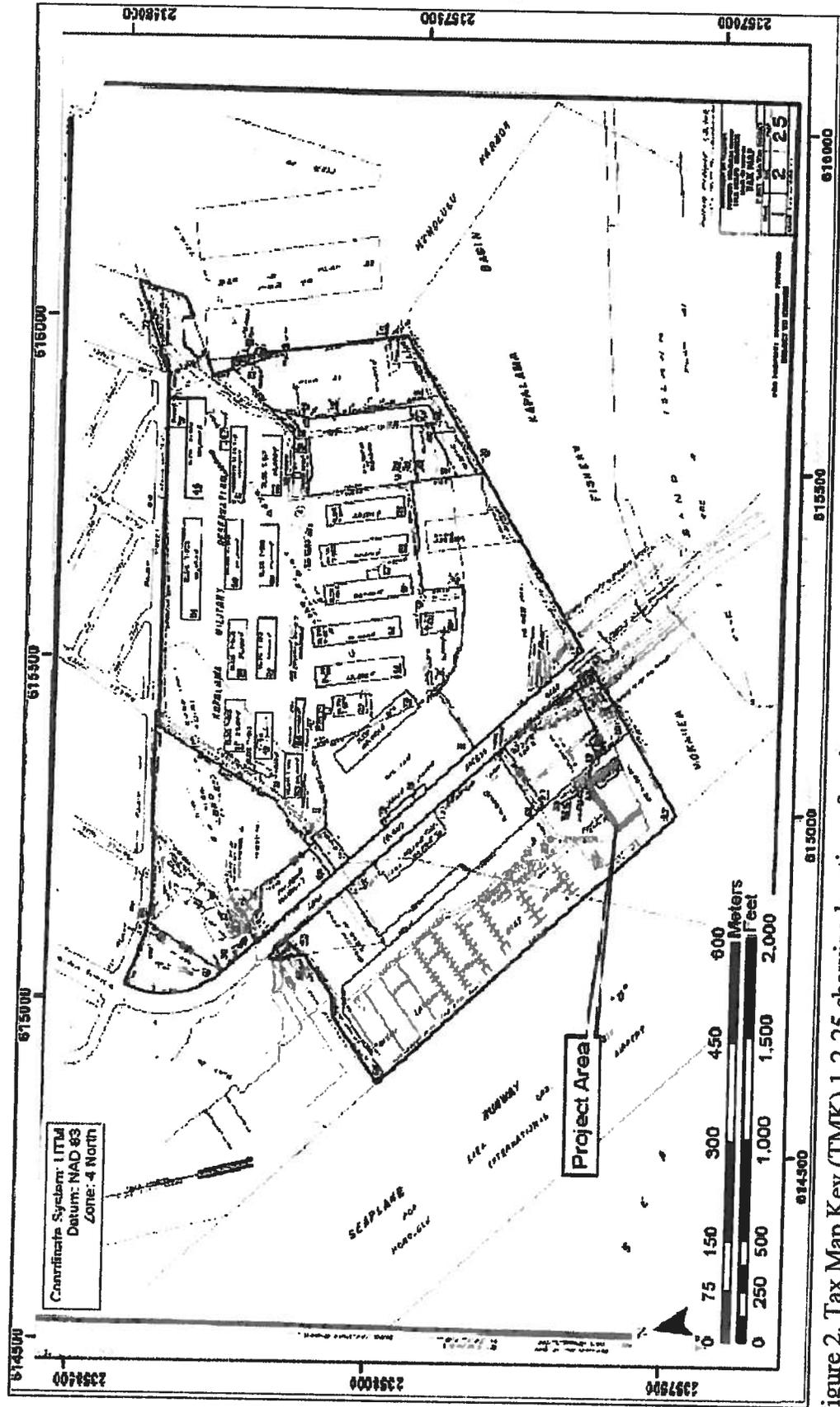


Figure 2. Tax Map Key (TMK) 1-2-25 showing location of project area

CIE, Literature Review and Field Inspection for Development of a Small Shipyard at Ke'ehi Lagoon

TMK: [] 1-2-025:024

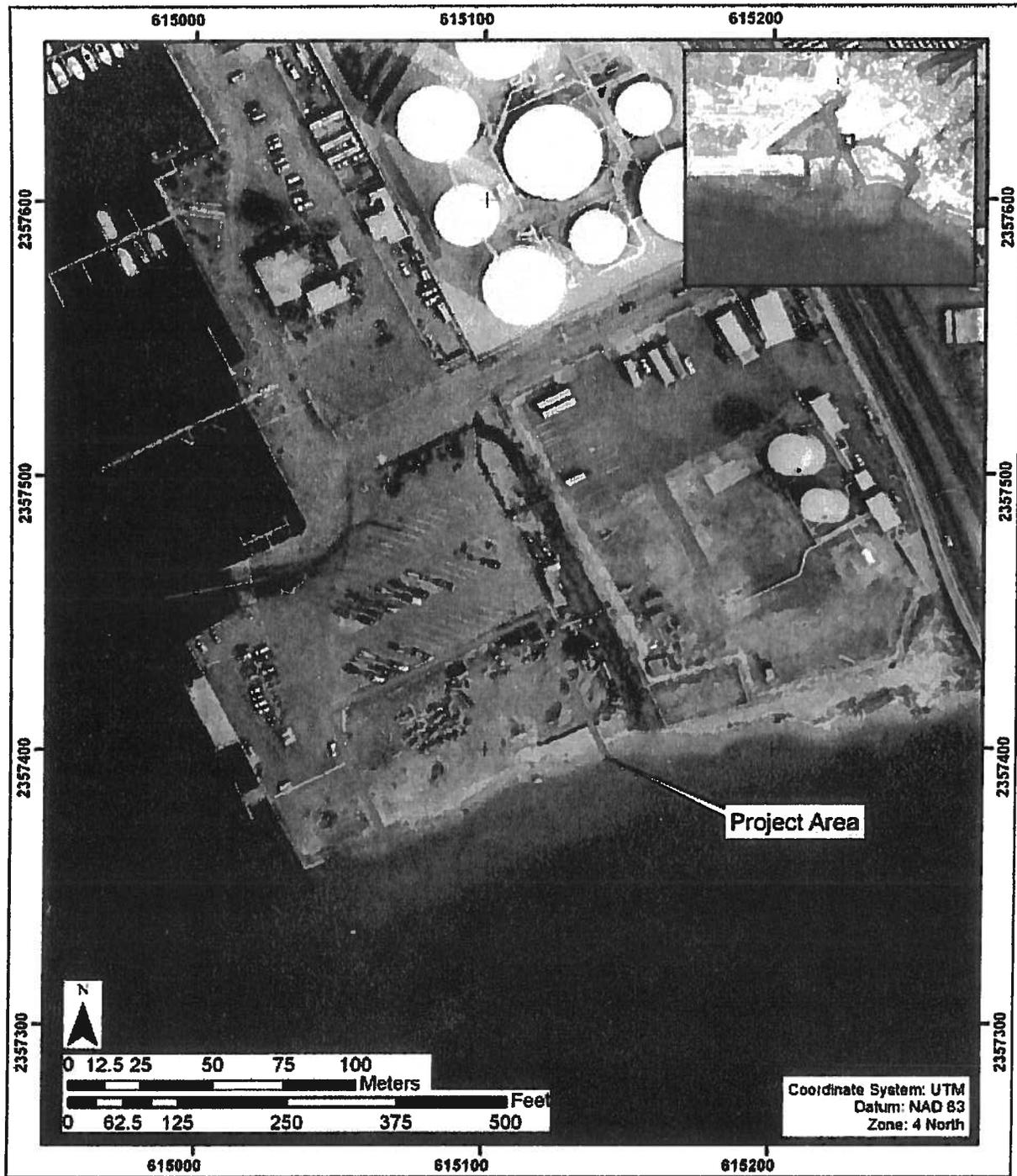


Figure 3. Aerial Photo of Kalihi Kai with Project Area denoted in red

Section 2 Methods

2.1 Field Methods

This project included a field inspection that consisted of a visual reconnaissance of the surface of the project area. The entire parcel was traversed and field notes were taken. The types of soils and fills were recorded in addition to any plants and other items of interest that were found in the area. Because the project also consists of a submerged portion, this area was also inspected.

In addition to the above, activities that people were engaged in on and adjacent to the property were noted. This was done to obtain cultural context and explore the cultural traditions that may be associated with the area.

2.2 Document Review

Background research included a review of previous archaeological studies, cultural impact studies, fishpond studies and other relevant cultural texts on file at the Cultural Surveys Hawai'i Inc. library and at State Historic Preservation Division of the Department of Land and Natural Resources; a review of geology and cultural history documents at Hamilton Library of the University of Hawai'i; a study of historic maps at the Survey Office of the Department of Accounting and General Services. Information on Land Commission Awards was accessed through Waihona Aina Corporation's Māhele Data Base (Waihona 'Aina Corporation 2000<waihona.com>).

Section 3 Background Research

3.1 Traditional and Historical Background

3.1.1 Mythological and Traditional Accounts

Kalihi was first the earthly residence of Papa, in her human form of Haumea, “where she marries her children and grandchildren, begetting the Hawaiian race. Kaieie Heiau in Kalihi was built for her worship “ (in Landrum and Klieger 1991:10). Haumea is the mother of Pele whose sister Kapo made Kalihi her home and thus famous in legend (Pukui et al. 1974). Haumea is known for her regeneration abilities, whether this is manifested as food for the people or the powers of female reproduction to secure the existence of humankind (Beckwith 1970).

Most of the recorded myths are situated in the *mauka* areas of Kalihi and there is very little documented information for the *mākaʻi* areas. This is quite surprising considering the abundance of fishpond and extensive fisheries in the area. One story was found relating to the waters of the Kalihi Basin. A shark guardian of Moanalua, Makaliʻi is known to frequent the waters of Kalihi Kai, particularly near Kahakaʻaulana, the little islets off Sand Island (Oppenheimer 1976:15). It was at Kahakaʻaulana that Makaliʻi had his cave. Native Hawaiians (*Kanaka maoli*) who inhabited Mokauea in the 1970s have noted during the time of Makaliʻi's residence in his cave at Kahakaʻaulana, that the sand patterns change above his cave and also that the *akule* fishing is good (Oppenheimer 1976:15).

Kahakaʻaulana was also noted as a place in Kalihi harbor that was used as a passage for travelers going from Kou to Puʻuloa.

Kahakaaulana: The narrow place in the Kalihi harbour inlet, and formerly the place where travelers used to swim across to Kalaekao or Puuloa to avoid the long detour by way of Moanalua (in Sterling and Summers 1978: 322).

In *Place Names of Hawaii*, Kahakaʻaulana is listed as the old name for Sand Island (Pukui, Elbert and Mookini 1974:62). As a literal translation, ‘the floating swimmers pass by’, perhaps this refers to the travelers who would make their way to or from Puʻuloa by swimming through the channels of Moanalua, Kalihi and Kapālama instead of walking. As an alternative Pukui, Elbert and Mookini suggest this refers to the fishermen’s containers that float by as fishermen fished for crabs and seaweed (Pukui, Elbert and Mookini 1974:62).

There is some evidence that the people of Kalihi Kai were also producing salt (in Sterling and Summers 1978: 327). Salt pans can be identified on an 1870 Monsarrat map, adjacent to Loko Apili, northwest of the project area (Landrum and Klieger 1991:18). A later Monsarrat map does not depict the salt pans suggesting that they were no longer in use in Kalihi Kai at the end of the 19th century.

The waters of Kalihi Kai were traditionally noted for their calmness. Mary Kawena Pukuʻi recorded one *ʻōlelo no ʻeau* or Hawaiian proverb for the ocean off of Puʻuhale, “*Ke kai nehe o Puʻuhale*”, “the murmuring sea of Puʻuhale” (Pukuʻi 1983:186). Today, the waters are still

distinguished for their tranquility by the fishermen who fish off the pier at Ke'ehi Small Boat Harbor (Conversation with G. Fujishima, 12/17/06). Part of what makes the place so pleasing are the perpetually calm waters, created by the extensive reef that protects the inshore areas from the breakers.

At Ke'ehi the fishponds were famous for their *'anae* or mullet. Two *'ōlelo no'eau* refer to methods used to drive the large schools of mullet into nets: Creating noise by talking or shouting was one method, "*Ka i'a leo nui o Ke'ehi*", "Loud-voiced fish of Ke'ehi" (Puku'i 1983:185). Another method was slapping the water with hands or *lau*, leaves or vines to scare fish into the awaiting nets, "*Ke kai kā 'anae o Ke'ehi*" "the mullet-driving sea of Ke'ehi" (Puku'i 1983: 148).

In the legend of the traveling mullet (*'anae holo*), Ihuopalaai of Pu'uloa furnishes his sister, living in Lā'ie at the time, with *'anae* via his fishgod, Ku'ula. This variety of *'anae* is said to make its run from October through March along the following route beginning at Pu'uloa: "Kumumanu, Kalihi, Kou, Kalia, Waikiki, Kaalawai and so on around to the Koolau side, ending at Laie, and then returning by the same course to their starting point" (Thrum 1998: 271). It is no doubt that the fishing grounds at Kalihi Kai were rich in *'anae*.

3.1.2 Early Historic Period

Early explorers were impressed with the extensive networks of fishpond and ponded fields for taro present in southeast O'ahu in the early 1800s. Baron Otto von Kotzebue, an explorer who traversed between Nu'uaniu and Moanalua remarks on how beautiful the scene is

I have seen whole mountains covered with such fields, through which the water gradually flowed; each sluice formed a small cascade, which ran through avenues of sugarcane, or banana, into the next pond, and afforded an extremely picturesque prospect" (*in* Landrum and Klieger 1991:13).

In his history of Hawai'i written in the 1860s, John Papa 'Ī'ī recounts the trail from Nu'uaniu to Moanalua,

When the trail reached a certain bridge, it began going along the banks of taro patches, up to the other side of Kapalama, to the plain of Kaiwiula on to the taro patches, up to the other side of Kapalama, to the plain of Kaiwiula; on into Kahauiki and up to the other side; turned right to the houses of the Portuguese people...('Ī'ī 1959: 95)

Numerous taro pondfields or *lo'i* were claimed during the Māhele, particularly along the Kalihi and Niuhelewai Streams, which served as the eastern and western boundaries of Kalihi. However, on the flat of Kaluapuhi where Kalihi Kai meets the ocean, there is no indication of taro *lo'i* or fresh water sources.

The United States Fish Commission Report for 1903 (Cobb 1905: 748) lists twelve fishponds located on the periphery of Ke'ehi Lagoon which were in operation in 1901 with a total of 857 acres. Some of these fishponds were located just inland of the present project area. The fishponds that were once nearest the project area were Loko Auiki and Loko Ananoho. A review of the cartographic renditions of these *loko* (Figure 4) suggest that the fishponds were being utilized

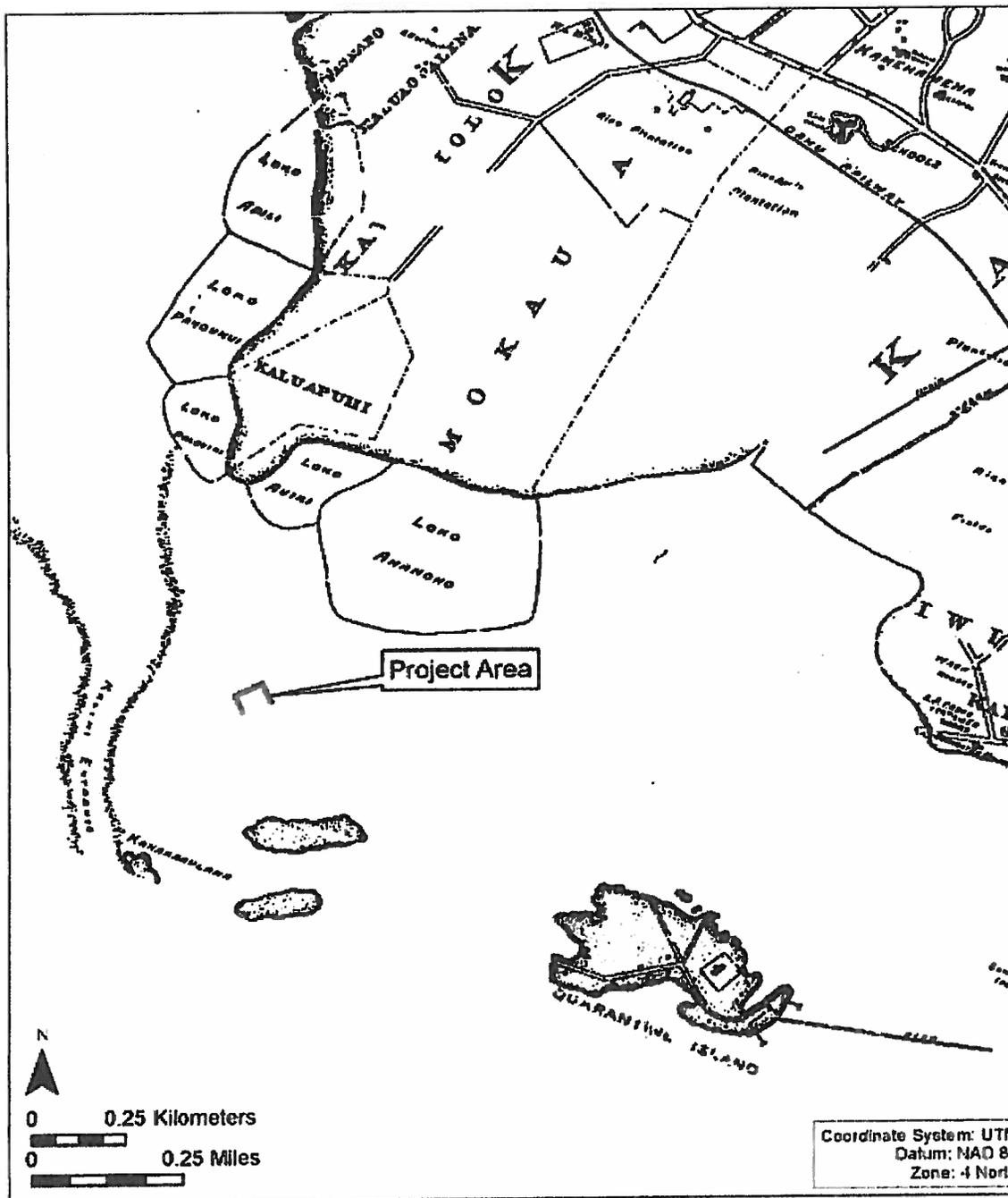


Figure 4. Portion of 1897 Monsarrat Map showing location of current project area; notice the project area is in the water

and that towards the end of the nineteenth century their use became more commercial (Athens and Ward 2002). By 1901, Loko Auiki had been partially filled. This may have been the result of lack of maintenance or reflect patterns of infilling, as was beginning to occur at the nearby Kewalo Basin (Honolulu Harbor). Ananoho and Auiki were completely filled during World War II at which time an Army port and warehouse complex was built (Athens and Ward 2002:1). Later, this became part of the Kapalama Military Reservation. Today, this area where the Plant Quarantine and Measurement Standards and Commodities (MS & C) buildings are situated is used by the Department of Agriculture. A paleo-environmental study of these two *loko* was conducted in 2002 (Athens and Ward 2002). It was surmised that though cores taken from both fishponds showed characteristic fishpond sediments, the sediments had probably been disturbed during filling. Based on the pollen analysis, it was impossible to provide an accurate chronological assessment of the age of the fishponds (Athens and Ward 2002:43). Tentative chronologies of the nearby Kūwili and Weli Fishponds (Table 1) suggest that Ananoho and Auiki were probably constructed sometime between the 16th and 17th centuries.

Table 1. List of Former Fishponds in the Kalihi Kai, Iwilei Areas Subjected to Palynological Studies

Fishpond	Location	Size	Date	Reference
Auiki and Ananoho	Kalihi Kai, O'ahu	Auiki 12 acres Ananoho 52 acres	No date recorded	Athens and Ward 2002
Kūwili	Honolulu Harbor, Kapālama, O'ahu		A.D. 1500	Athens and Ward 1997
Weli	Ke'ehi Lagoon (Ft. Shafter flats), Kahauiki, O'ahu	30 acres	A.D. 1650	Athens and Ward 2000
Apili and Pahounui	Kalihi Kai, Ke'ehi Lagoon, O'ahu	Apili 28 acres Pahounui 26 acres	No date recorded	Moore 2004

Other fishponds in Kalihi Kai were Pahounui, Pahouiki, Weli and Apili. Weli Fishpond was approximately 30 acres and it was constructed of mostly earth embankments (Sterling and Summers, 1978:322). One of the meanings of *weli* is "phosphorescent light on water, believed caused by a ghost that was interfering with fishing" and suggests a phenomenon unique to that fishpond. The other large fishpond, Apili, was noted for its *awa*, a fish "which vied with the 'ama 'ama (mullet) in popularity" (Titcomb, 1972:70).

“Apili” in Hawaiian meaning ‘caught, snared, or stuck’: Land surrounding the fishpond in Kalihi, Oahu belonging to the Adams’ family. It was there that Capt. Alexander Adams had his famous gardens, which was quite a place of resort for strangers and whale men, about 1850. The fishpond is yet famous for the superior flavor of its fish, particularly the awa [milkfish], which, eaten raw, is esteemed a rare treat by native epicures (Sterling and Summers, 1978: 323).

A *kama‘āina* born in Kalihi recalls fishponds in the vicinity of the former Apili Pond when he was a youngster in the 1930s. At that time, the Apili Pond was split into several ponds and was operated by the Hamada Family who would harvest the fish from tin boats (pers. communication, G. Kaeliwai, 7/16/02 in Bushnell and Hammatt 2002:7).

3.1.3 Mid- to late-1800s

Māhele Accounts

Records of the Land Commission Awards associated with the Kuleana Act of 1850 allow us to reconstruct something of the land use pattern in Kalihi at that time. Undoubtedly residential patterns had changed from pre-contact times as a result of massive depopulation owing to introduced diseases on the one hand and in-migration into greater Honolulu from out-lying areas on the other hand. The pattern of land-holdings circa 1850 suggest the majority of Hawaiians in the *ahupua‘a* were living relatively close to Kalihi Stream inland of present day Dillingham Boulevard and seaward of the confluence of Kalihi and Kamanaiiki Streams.

The *kuleana* located nearest the project area were concentrated on a piece of land that jutted into the sea at Pu‘uhale named Kaluapuhi (Figure 4). Today, this land is located near the intersection of Auiki Street and Sand Island Access Road, approximately one mile from the project area. At the time of the Māhele, the *makai* tip of Kaluapuhi land separated Loko Auiki from Loko Pahouiki. Land Commission Awards 3237, 1255, 7234 and 2038 are clustered in this area. Lands in Kalihi Kai were principally awarded to very notable people, including advisors to the Kamehameha line or to royalty themselves, most likely on account of the abundant fishponds in the locality. Queen Kalama was awarded a houselot in Puuhale, Kalihi Kai (LCA 2038) adjacent to Loko Auiki. Kalama Kapakahaili, a descendant of the Moana family from Hawai‘i Island, was married to Kauikeaouli, Kamehameha III (Kamakau 1961:341). As Dowager Queen, Kalama was awarded some of the richest lands in the kingdom, including Waikahalulu water rights, fronting Honolulu (Smith and Rosendahl: 1990:14).

Another high ranking *ali‘i*, Kaunuohua, received land in Kalihi during the Māhele (<waihona.com>) Kaunuohua was a female descendant of a high ranking *ali‘i* of Hawai‘i Island, Kalaninui‘īamamao, father of Kalani‘ōpu‘u (Kame‘eleihiwa 1992:249). She was also Kamehameha IV, Alexander Liholiho’s guardian. Though she had many lands prior to the Māhele, most of these were lost with the exception of three, Pu‘ulena in Waikīkī, Mokauea in Kalihi and Kalaupapa on Moloka‘i (Ibid:264). Land Commission Award 6450 to Kaunuohua names 5 *‘ili* in Kalihi being awarded to her including Kaluaopalena, Keaouhou, Mahani, Niau and Mokauea (Barrère n.d.:286)

Hewahewa, a descendant from the Paoa priestly class who served three of the Kamehameha's, was awarded the *'ili* of Kaluapulu in Kalihi which included fishponds at Kalihi Kai (Kamakau 1961; LCA 3237). A second *kahuna* of the same Hewahewa line, Nahinu, was also awarded lands in Kalihi, near the outlet of the Kalihi Stream (Bushnell and Hammatt 2002: 6). Nahinu also served as *konohiki* for Kalihi Kai during the time of the Māhele (Landrum and Klieger 1991:22-23). Kamakau mentions the two *kahuna* as contemporaries skilled in diagnosis of illness:

Boki returned and lived at his place at Beretania and devoted himself to medicine, in which he was proficient, and all those joined him who were skilled in placing pebbles [in diagnosis], such as Kaa, Kuauau, Kinopu, Kahiōle, Nahinu, Kekaha, Hewahewa, and their followers and other *kahunas* besides (Ibid: 291).

Apparently, *kahuna* were given lands near fresh water because it was important for them to practice their *ho'oponopono* there (Bushnell and Hammatt 2002:6).

Other noted landowners in Kalihi Kai area were John Papa 'Ī'ī and Mr. Adams. 'Ī'ī held the position of treasurer and spokesman to the Chiefs of the Hawaiian Kingdom during the 1840s (Kamakau 1961).

Growth of Honolulu Harbor and Sand Island

The first harbor facilities were developed on the shore of "Honoruru" town in 1825 when the hulk of an old ship was sunk to create a small wharf (Alexander 1908). This wharf served the growing sandalwood trade and the subsequent whaling industry. Through the 1850s, the commercial development of Honolulu and its harbor facilities appears to have been concentrated above the southeast side of Nu'uānu Stream, far removed from Kalihi Kai. In 1856, the outskirts of town in Iwilei became the site of a new prison along with a new road connecting it to what is now King Street.

In 1872 the small island off Iwilei—"Ka-moku-'ākulikuli"—became the site of a quarantine station to handle the influx of immigrant laborers drawn to the islands' developing sugar plantations. The site is described as "little more than a raised platform of sand and pilings to house the station, with walkways leading to the harbor edge wharf, where a concrete sea wall had been constructed" (Beechert 1991:105) and as "a low, swampy area on a reef in the harbor" (van Hoften 1970:3). By 1888, Kamoku'ākulikuli Island had been expanded and was known as "Quarantine Island". A pier and tramway had been built connecting the island to the Honolulu harbor (Renard 1975:A4). If vessels arrived at the harbor after 15 days at sea and contagious disease was aboard, quarantine and disinfecting procedures were required at Quarantine Island (Renard 1975:A3).

Following the initiation of Dillingham's Oahu Railway and Land Company (O.R. & L.), a railroad track was built across Kūwili Fishpond in 1889. This and the construction of associated infrastructure such as a depot, buildings, store houses and stations would eventually lead to the expansion of Honolulu Harbor towards Kapālama Basin and Iwilei. John Hungerford writes of O.R. & L.'s influence on the harbor:

Honolulu in the years to follow was outgrowing its small harbor where, according to an entry on company records, on a single day in 1901 were 24 deepwater sailing vessels, six of them unloading coal and four loading sugar at railroad wharves. The company had led the way, in conjunction with other private interests, in creating some 500 acres of waterfront land (Hungerford 1963:14).

The increasing prominence of the harbor and its activities over the traditional use of the fishponds and adjoining *kalo* patches becomes apparent in 1896 when an outbreak of cholera caused the infilling of Kawa Pond. Between 1895 at the beginning of O.R. & L.'s development of their railroad and 1901, Kūwili Pond was filled and an estimated 6,000,000 cubic yards of mud, sand, loose coral as well as blasted hard coral was used to fill low land near the harbor and terminal (McGerry et al. 1997:20).

3.1.4 1900s

Dredging of the harbor continued into the 20th century. Following annexation of the Hawaiian Islands in 1898 and the establishment of the Honolulu Engineer District in 1905, federally-funded dredging of the harbor was initiated and completed in December 1908. It was at this time that reclamation projects would create Sand Island; as a history of the Honolulu Engineer District notes:

As anticipated, enlarging the small island just seaward of the lighthouse calmed the entire harbor; indeed reclamation of this land, today known as Sand Island, has eliminated the need for a breakwater in Honolulu Harbor...A separate project to reclaim Quarantine Island, a low, swampy area on a reef in the harbor, was adopted in February 1906 and was carried out by contract until funds were exhausted in March 1908. Continued reclamation over the next four decades would result in the absorption of Quarantine Island into an enlarged Sand Island. (van Hoften 1970:3).

Quarantine Island became the largest United States quarantine station of the time period, accommodating 2,255 individuals (Renard 1975:A6). This space included two hospitals and a crematorium. Besides operating as a quarantine, the station had other objectives such as implementing plague preventive measures, immigration inspection and also as a marine-hospital relief (Renard 1975:A9). During Wilson's administration in 1920, Sand Island was taken under the control of the War Department. Despite this, quarantine measures continued there until 1927.

During reclamation projects in the first two decades of the 20th century, Sand Island and Quarantine Island were joined to the Kalihi Kai peninsula. In 1925 and 1926, a channel was dug from the Kalihi Channel into Kapālama Basin creating a true island out of "Sand Island". This is the channel that lies to the southern seaward boundary of the project area. By 1941, reclamation projects and dredging of the harbor had enlarged Sand Island to 410 acres (Renard 1975:A20). Another 100+ acres were added to Sand Island between 1940 and 1945 from the spoils of Ke'ehi Lagoon's seaplane channel, located on the western seaward boundary of the project area. Between 1946 and 1952, the Ke'ehi seaplane channels were used by Naval Air Squadrons for transporting "Mars" flying boats between Hawai'i and the continental U.S. A dirt causeway was

constructed connecting Sand Island to the mainland in 1943 (Renard 1975:A29). It is unknown whether this causeway is in the same location as the Bascule Bridge, adjacent to and east of the project area. Built in conjunction with the dredging of the Kapalama turning basin between 1959 and 1962, the Bascule Bridge was intended to be a drawbridge to allow harbor traffic entering Honolulu Harbor to leave by way of Kalihi Channel (www.hawaii.gov/dot/harbors/oahu/history.htm:7). The bridge however, was not used much as a drawbridge (Smith and Rosendahl 1990: A3).

A 1945 USGS map illustrates the location of the current project area on the periphery of the newly reclaimed land (Figure 5). The seaplane channel and the bridge connecting Sand Island to Kalihi Kai are also depicted. There is no land use indicated on the 1945 map for the vicinity of the study parcel.

3.1.5 Modern Land Use

The Ke'ehi Small Boat Harbor, adjacent to the project area, was built as a marina in 1967-1968 and has been operating as such ever since. The study parcel seems to be serving as a holding area for construction materials for the Department of Transportation, Harbors Division.

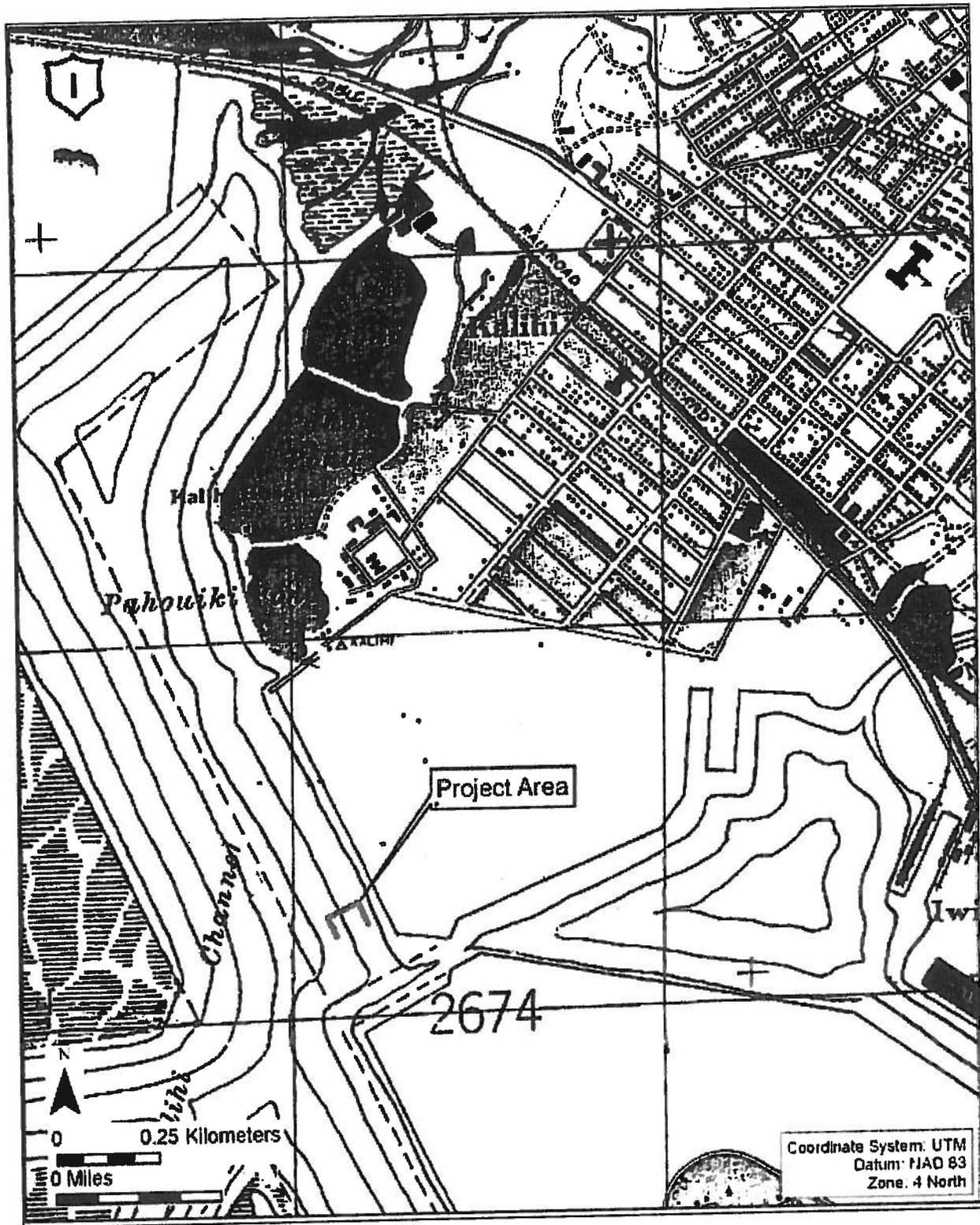


Figure 5. 1945 USGS showing project area on edge of seaplane channel

3.2 Previous Archaeological Research

Many of the earliest recorded archaeological sites in the coastal areas were fishponds and *heiau*. McAllister (1933) references Thrum in the mention of two *heiau* in Kalihi Kai, Kaoleo and Haunapo. There is an *'ili* in Kalihi Kai named Haunapo which may be associated with the *heiau* (Figure 4) No details are known of these two *heiau*. McAllister also records five fishponds in Kalihi Kai (that he lumps under two site numbers), Ananoho and Auiki (Site 73) and Pahouiki, Pahounui and Apili (Site 74). A very brief description is provided for each pond:

Ananoho: A 52 acre oval-shaped pond with walls approximately 4700 feet long. The walls are 3 feet high and 6 feet wide and constructed of coral. McAllister also notes the new houses and makaha (1933:90)

Auiki: A 12 acre pond adjoining Ananoho. The walls extend 900 feet and the pond is partially filled (1933:90)

Pahouiki: A 14 acre pond enclosed in a coral stone wall 1050 feet in length. There are two makaha and one house on this loko. (McAllister 1933:91)

Pahounui: A 26 acre pond opened to Loko Pahouiki. A wall 2600 feet surrounds this larger pond and there are two makaha and one house on the wall. (McAllister 1933:91)

Apili: A 28 acre pond adjoining Loko Pahounui. The wall surrounding Apili is 1500 feet. (McAllister 1933:91)

Archaeological studies did not resume in the Kalihi Kai area until the 1980s. In 1986, Cultural Surveys Hawaii conducted an archaeological reconnaissance of a parcel on Sand Island, TMK 1-2-25: por.36, por. 7 to determine the presence or absence of archaeological sites (Hammatt 1986) (Figure 6). This site is situated approximately ¼ mile north of the project area near the intersection of Sand Island Access Road and Auiki Street. No archaeological or historical resources were found during the survey. Hammatt concludes that the land was previously low lying marsh land containing fishponds, but since the 1920s has been filled with coral fill dredged from the creation of Honolulu Harbor (Hammatt 1986).

Excavation work on the corner of Robello Lane and North King Street in Kapālama exposed two human burials in 1991, SHPD Site 50-80-14-3373 (Dunn et. al 1991). In addition, several historic artifacts were recovered including glass, porcelain, metal, ceramics, plastic and concrete. Abundant faunal remains representing several taxa such as dog, bird, rat, cattle and pig were intermixed in the burial fill. Historical research suggests these burials may be associated with a cemetery used for small pox in the 19th century in the area of Keone'ula, however the authors indicates that there is insufficient evidence to substantiate this (Ibid:7).

Several studies were undertaken to fulfill the requirements of an environmental impact assessment for the proposed development of the City and County of Honolulu Bus Repair Shop Facility in Kalihi, O'ahu (TMK 1-2-16:17). Beginning 1991, the studies for this 4.2 acre lot included a historical literature search (Landrum and Klieger 1991), an archaeological survey with subsurface testing (Folk et al. 1993), a mitigation plan for human burials (Folk and Hammatt 1993) and a burial treatment plan (Hammatt and Folk 1992). This site is approximately

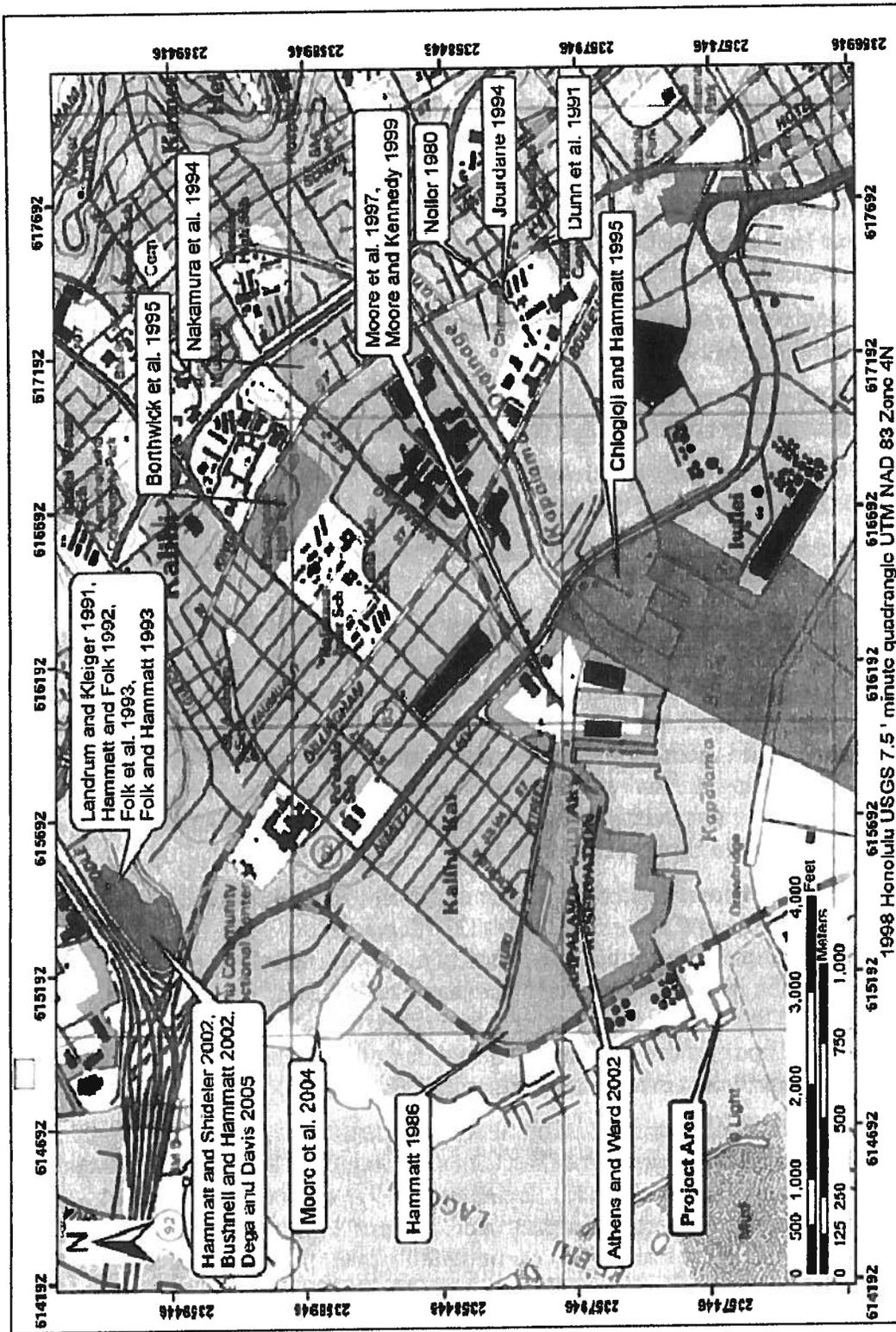


Figure 6. Portion of 1998 USGS Honolulu Quad showing locations of previous archaeological studies

CIE, Literature Review and Field Inspection for Development of a Small Shipyard at Ke'ehi Lagoon

TMK: [] 1-2-025:024

1 ½ miles from the current project area. During the historical research, it was found that this site was used extensively from the Prehistoric period through the historical period and its proximity to a fishpond, Loko Weli may make it significant. It is indicated that despite its possible significance due to its location, the research did not identify any archaeological remains (Landrum and Klieger 1991:35). During the archaeological inventory survey, 19 trenches were excavated by backhoe. Three burials were exposed during testing including two coffin burials and one burial without coffin. In addition, a cultural layer was identified. The burials and cultural layer were assigned Site Number 50-80-14-4525 and given the National Register significance criteria code "D" (Folk et al. 199:28). Based on recommendations in these reports a mitigation plan and a burial treatment plan were written to address the human remains found during the test excavations (Folk and Hammatt 1993; Hammatt and Folk 1992).

In an adjacent locale, several studies were undertaken based on sites identified and information collected during the investigations for the Bus Repair Shop Facility. These studies include an archaeological assessment (Hammatt and Shideler 2002), a cultural impact assessment (Bushnell and Hammatt 2002) and a follow-up inventory survey and subsurface testing of a site identified during previous studies (Dega and Davis 2005). Like the adjacent Bus Repair Facility, this proposed Transit Center is located approximately 1½ miles from the current project area. The Archaeological Assessment uncovered no new data regarding the project area however it was recommended that a program of subsurface testing be implemented to provide paleo-environmental information, particularly in regards to Waikulu Fishpond underlying the site (Hammatt and Shideler 2002). For the Cultural Impact Assessment, concerns were expressed regarding the potential for more burials in the project area and also the potential contamination of the Kalihi Stream that feeds into the fishing grounds of Ke'ehi Lagoon (Bushnell and Hammatt 2002:13). Scientific Consultant Services was contracted to perform subsurface testing on this site to mitigate the potential impacts to Waikulu Fishpond underlying the surface. Although many sediment samples were taken, it was impossible to distinguish between naturally deposited stream sediments and fishpond sediments in the project area. Evidence of prehistoric cultural activity was inconclusive, however evidence of historic industrial activity was abundant (Dega and Davis 2005:42).

A human burial was discovered during trenching activities on Austin Lane off of North King Street in Kapālama (Jourdane 1994). The remains of one individual were identified and the burial was determined to be historic based on associated historic artifacts in the soil matrix. The site was given State Historic Preservation Site Number 50-80-14-4929. No age or ethnicity could be determined at the time of the assessment (Jourdane 1994:2).

In Kalihi Waena, an archaeological assessment was conducted in 1994 (Nakamura et al. 1994). The corner of North King and Houghtailing Streets was surveyed for archaeological resources and assessed for potential archaeological and historical resources. Though no archaeological resources were found, several historic properties were identified based on their age including the storefront along King Street as well as several residences (Ibid: 21-22). Historical research as well as informal interviews of long-time residents suggest the parcel had a long history of agricultural use, beginning with pre-historic and historic wetland taro cultivation and most recently used by Chinese immigrants for truck farming. Nakamura et al. recommend

this site for further study as an example of the changing nature of a traditional ahupua'a in historic O'ahu.

An archaeological inventory survey was conducted of the Kamehameha Homes Project in Kapālama, Kona in 1995 (Borthwick 1995). This consisted of 16 test excavations in a 13.96-acre parcel between Kalihi and Houghtailing Streets off of King Street. Four distinct stratigraphic layers were recorded in the test trenches. No significant subsurface historic sites or features were identified during trenching activities. Historical research identifies this area was part of the Kapālama ridge dividing the well-watered plains of Kapālama and Kalihi. The Kamehameha Girls School was built on the site in 1893 where it stood until 1931. At this time, the Girl's School was demolished and the Kamehameha Homes Project was initiated. No further archaeological work was recommended (Borthwick 1995:33).

A 1995 archaeological assessment studying four alternative alignments for a wastewater pump station force main replacement encompassed a large portion of Honolulu Harbor (Chiogioji and Hammatt 1995). The area comprised of a corridor extending from the Hart Street pump station on the makai side of Nimitz Highway between piers 33 and 38, across the Kapalama Channel to piers 51 and 52 on Sand Island, and ending at the Sand Island waste water treatment plant. This corridor lies ½ mile east of the project area across the Kapalama Basin. This historical project found that the entire project area except for a small portion of the original Sand Island was once open water or tidal reef and was eventually filled or dredged during the construction and expansion of Honolulu Harbor and Sand Island, principally during the 1920s and 1930s (Chiogioji and Hammatt 1995: 23).

An inadvertent burial was discovered in 1997 at Pier 40 by Hawaiian Dredging (Moore 1997). Construction activities exposed the burial that required disinterment. Designated State Inventory of Historic Places (SIHP) Site 50-80-14-5581, the inadvertent burial was found approximately ¾ mile from the current project area. Further research of the area found that the burial was on the original coastline, within Land Commission Award 11019:2 awarded to Waolani (Moore and Kennedy 1999:5). Situated near the effluence of the Kapālama Stream, this burial was near many former fishponds, the nearest being Ananoho of Kalihi Kai. Site 5581 was determined to be a primary burial, probably post contact and was identified as significant for its potential to yield information of scientific value (criterion "D" of the National Register of Historic Places criteria) as well as being significant based upon its cultural value (criterion "E" of the Hawaii Register Review Board criteria) (Moore 1997:11).

A fishpond investigation was conducted in 2002 on the construction site for the proposed Department of Agriculture Plant Quarantine building and the Measurement Standards and Commodities (MS & C) building in Kalihi Kai approximately ½ mile N, N/E of the project area (Athens and Ward 2002). The current site consisted of fill overlaying traditional Hawaiian fishpond known as Auiki and Ananoho (SHPD Site 50-80-14-73). In an effort to mitigate anticipated negative impacts to the identified fishponds underlying the fill in this site, sediment cores were obtained to recover information regarding these fishponds (Criterion D). Based on four core samples taken from the two ponds, it was found that the sediments had been disturbed and thus further analysis was not possible (Athens and Ward 2002: 43).

A 2004 study of a property on the eastern coastline of Ke'ehi Lagoon, off of Sand Island Access Road, was conducted to meet requirements specified by the National Historic Preservation Act (NHPA) and the Department of Land and Natural Resources, State Historic Preservation Division (DLNR-SHPD) (Moore et al. 2004). The investigations included a pedestrian survey and subsurface testing consisting of six cores through old fill and into former fishponds which once ringed Kalihi Kai peninsula. Through historical research, it was found that the project area overlies two prehistoric/historic fishponds, Apili and Pahouiki. The results of the borings did not give definitive evidence of fishpond sediments and it was hypothesized based on this and previous fishpond studies that fishpond sediments form relatively thin layers 10cm+/-5cm in thickness (Moore et al. 2004:25).

Section 4 Results of Fieldwork

4.1 Field Inspection

On December 17, 2006 a field inspection was conducted by Ms. Tina Bushnell, B.A. (see Figures 7 - 12). The entire project area was traversed. On the eastern boundary of the project area, a low-lying depression serves as a drainage or for seepage from tidal fluctuations. On the southern boundary is the ocean and approximately 35 feet of shallow reef. On the western boundary is ocean and a sea channel (Seaplane Channel). And on the northern boundary of the parcel is the parking lot of the Ke'ehi Small Boat Harbor. The parking lot is distinguished from the project area by its macadam pavement while the parcel is comprised of fill. Concrete blocks divide the parking lot from the parcel so that people can't drive their vehicles on the property. In the center of the property, the hull of an old barge, possibly a military barge has been abandoned. Other modern garbage is strewn throughout the property including white, pvc pipes and 50 gallon steel and plastic barrels. The parcel appeared as if it had been recently graded with bull-dozer tracks and freshly upturned soil

The soils on the property consist of fill. This description corroborates the 1972 assessment of soils of Hawai'i (Foote et al. 1972). On the shoreline, fragments of coral are strewn along the high tide mark. There is also fishbone midden suggesting that fish are being cleaned and consumed in this area.

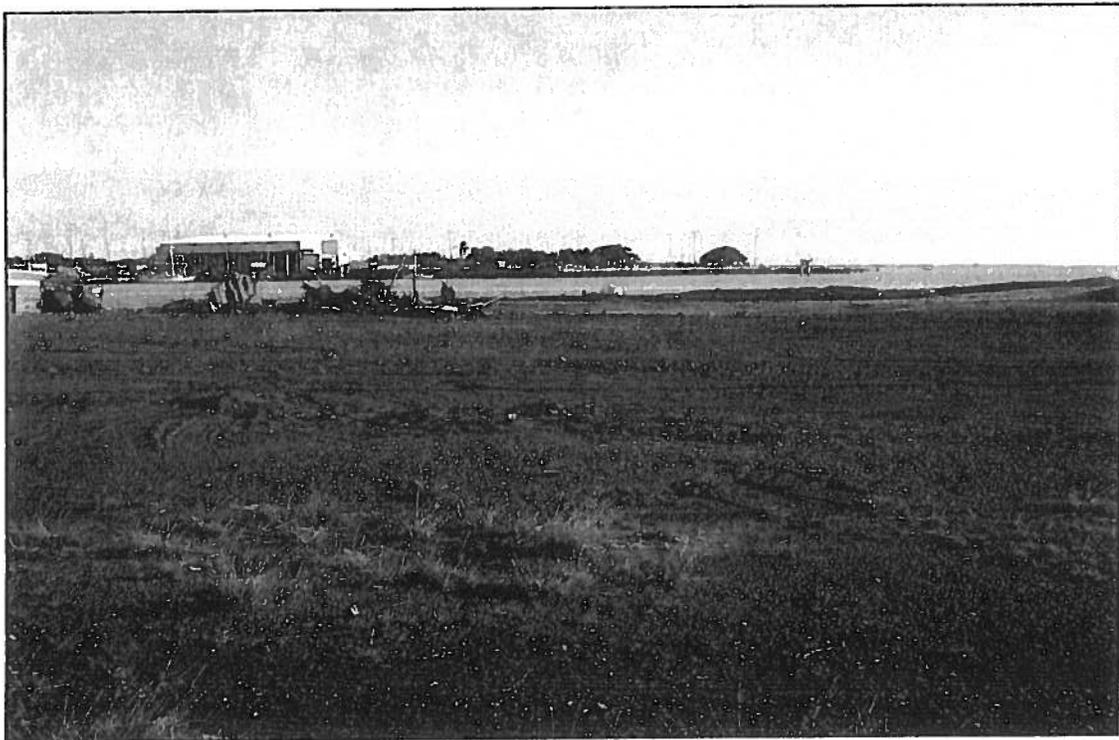


Figure 7. General view of project area looking south toward Sand Island

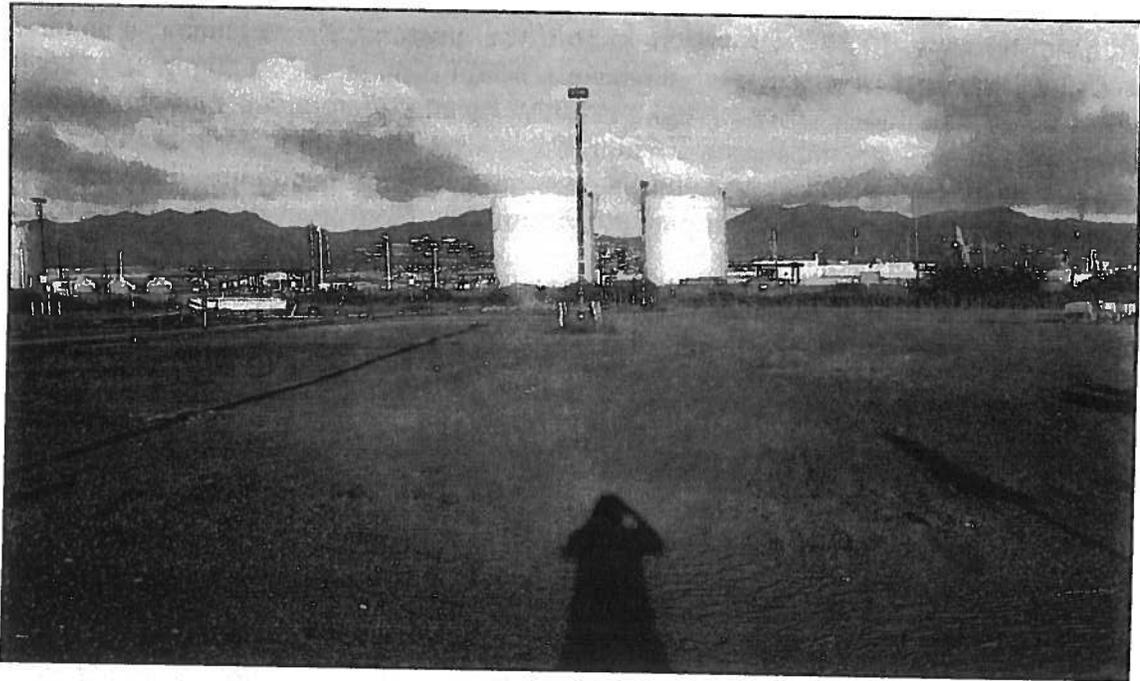


Figure 8. General view of project area oriented north



Figure 9. General view, project area in foreground and Mokauea Islet in background. View to southwest.

In the drainage ditch at the eastern edge of the property, the vegetation is dominated by 'aki'aki (*Sporobolus virginicus*), an indigenous, coastal rush grass (see Figure 10). Other plants in the area include *kiawe* (*Prosopis spp.*) and false *kamane* (*Terminalia catappa*). *Kiawe*, which thrives in semi-arid, coastal areas like Kalihi Kai, is often found with 'aki'aki as an undergrowth (Wagner et al. 1990:62). All vegetation is concentrated along this drainage ditch and near the fence demarcating the edge of the property. During the field inspection, no archaeological or historic sites were observed.

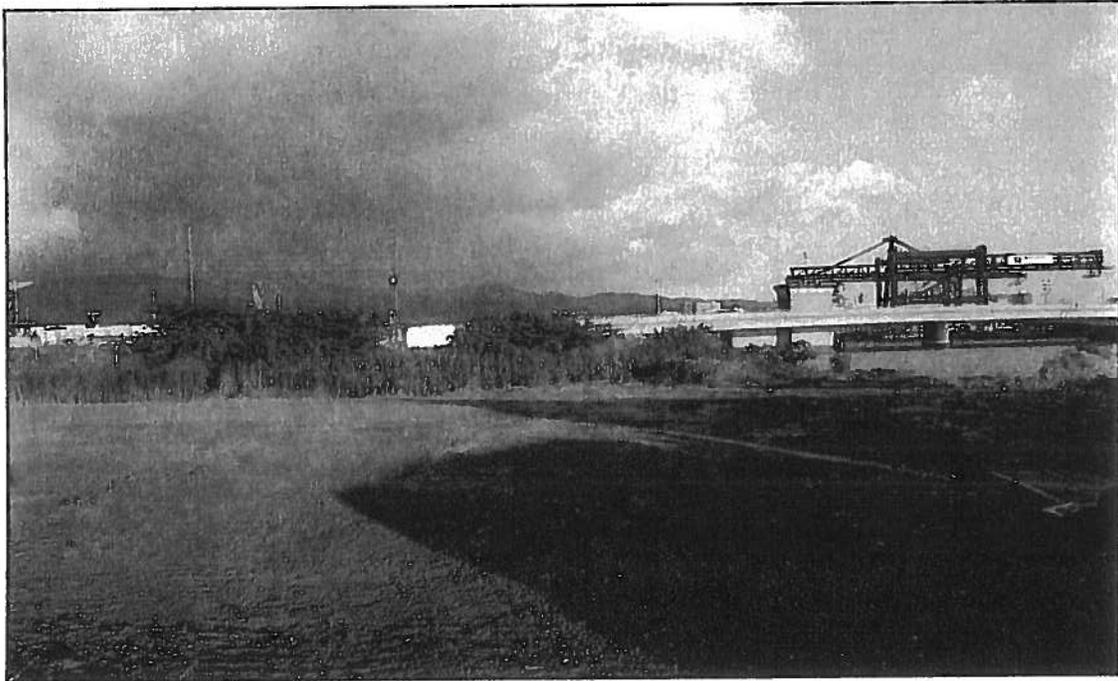


Figure 10. Photo of project area with view of Bascule Bridge and Honolulu Harbor in background. View to east

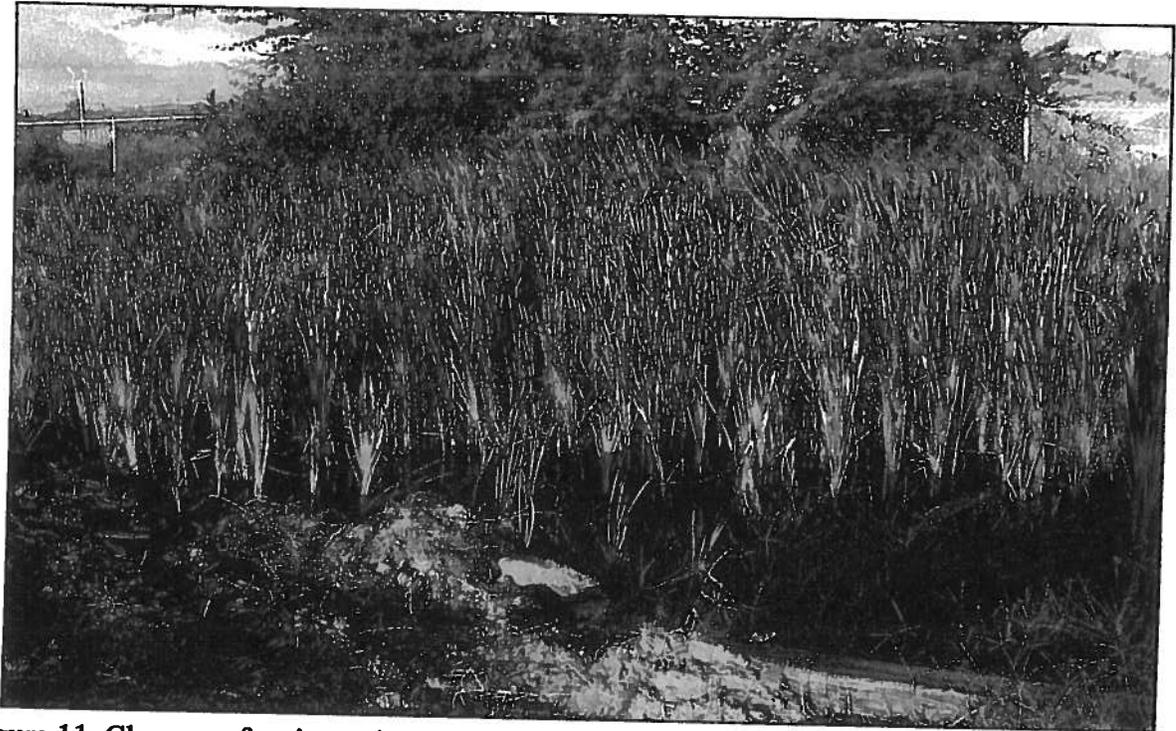


Figure 11. Close up of native sedge 'aki'aki growing near the eastern border of the project area



Figure 12. Photo of project area facing northwest. Note 50 gallon drums and hull of abandoned ship on parcel.

Section 5 Traditional Cultural Practices

5.1 Fishing and Gathering of Marine Resources

5.1.1 Loko I'a (Fishponds)

Ke'ehi Lagoon and the Kalihi Kai promontory consisting of Pu'uhale were once flanked by fishponds that yielded great quantities of fish. Some of these fishponds were still in production into the early twentieth century. As expressed in a previous study in Kalihi Kai conducted in 2002, *kama'āina* growing up in the 1930s and 1940s remember abundant quantities of fish, shellfish and crabs everywhere (Bushnell and Hammatt 2002). They were in the streams, at the stream mouths, in the fishponds, in Ke'ehi Lagoon, the fisheries of Kaliawa and Mokauea and further out.

The Hawaiian traditional perspective of land use rights encompassed both diverse resource pockets on land and fishery rights. During the partition of land that began in the 1840s known as the Māhele, hundreds of Hawaiians claimed fishery rights as well as land in their respective *ahupua'a*. A total of 1,233 fishery claims were recorded in the Land Commission notes for all the islands (Maly & Maly 2003:252). On O'ahu alone, there were 646 claims. The extent of the richness and abundance of the Kalihi Kai area is reflected in the numerous and varied claims made for marine resources there. Table 2 relates fishery claims by residents of Kalihi Kai.

Table 2. Māhele Claimants for Fisheries in Kalihi Ahupua'a (information adapted from Maly and Maly 2003)

Claim Number	Name of Claimant	Place of Claim	Claim
818	Heirs of George Beckley	Kalihi, O'ahu	Fishing grounds called Kaliheawa (sic. Kaliawa)
851	Salai Hiwauli (w)	Kalihi, O'ahu	Land with four fish ponds
1189	Ewa	Kahauiki, Kalihi, O'ahu	A lot bounded on west by the island of Mokumoa and Kaihikapu Pond
1243	Kahoowaha	Kalihi, O'ahu	Lot bounded on side by <i>kuapā</i> for ponds Pahou and Apili
1257	Kahalekai	Kalihi, O'ahu	Three <i>pu'uone</i> (dune-bank ponds) and some salt beds
1521	Haula	Kalihi, O'ahu	A <i>pu'uone</i> (dune-banked pond) adjoining the west side of Weuweu Pond
1530	Weuweu	Niau, Kalihi, O'ahu	A <i>pu'uone</i> (dune-bank pond) and the pond Keuwiiwi

Claim Number	Name of Claimant	Place of Claim	Claim
1537	Kauluhua	Kalihi, O'ahu	A <i>pu'uone</i> (dune bank pond)
1538	Kauiki	Kalihi, O'ahu	A <i>pu'uone</i> (dune bank pond) and <i>haha pa'akai</i> (salt bed) at Kaliawa
1677	Pao	Kaluaopalena, Kalihi, O'ahu	Lot bounded on south by pond named Weli
1800	Waianae	Kaluaopalena, Kalihi, O'ahu	A <i>pu'uone</i> (dune-banked pond)
2710	Haupu	Kalihi, O'ahu	A house lot in the 'ili of Haunapo and two "Kio hooholo ia" (small ponds in which to let fish go).
4452	C. Kanaina for Hazaleleponi Kalama	Kalihi, O'ahu	A house lot bounded on the Honolulu side by a fish pond belonging to Liholiho
7154	Kahookoikoi	Kalihi, O'ahu	One fish pond in the 'ili of Haunapo
7771	Kuhia	Kalihi, O'ahu	A <i>pu'uone</i> (dune bank pond) in the 'ili of Kahaukomo

Several fishponds were named, including several larger, well-known and established fishponds Weli, Pahou, Apili and Kaihikapu (See Figures 4 & 13). Other smaller ponds were also identified and these referred mainly to the *pu'uone*, the dune banked ponds or small ponds near the shore linked by ditch or stream to the ocean (definition from Pukui and Elbert 1986:359). Maly & Maly provide a description of how the *pu'uone* was developed:

Pu'uone ponds were close to shore ponds, *loko kuapā*, or to the seashore, and next to the mouths (*nuku*) of streams. The farmer cleared away the *mokae* sedges, 'aka'akai bulrushes, and the weeds, and deepened the pond, piling up the muck on the sides, until he had a clean pond. Then he stocked it with *awa* and fish fry, *pua i'a*—two or three gourds full—until the pond was full of fish. After two or three years the fish from the first gourd would have grown to a *ha'ilima* (18 inches) in length. The offering of sweet potatoes [made when the pond was first stocked] was a service to the 'aumakua (*he hana 'aumakua*). If there were no such service, the grubs of freshwater creatures, *mo'o* and dragonflies would take over, and there would be either no fish at all or else maimed and sickly fish that would soon die. He who assumes he is superior to the mana of his gods shall be smitten with thistles—as was Auwae, who assumed he had such mana himself. (Maly & Maly 2003:24)

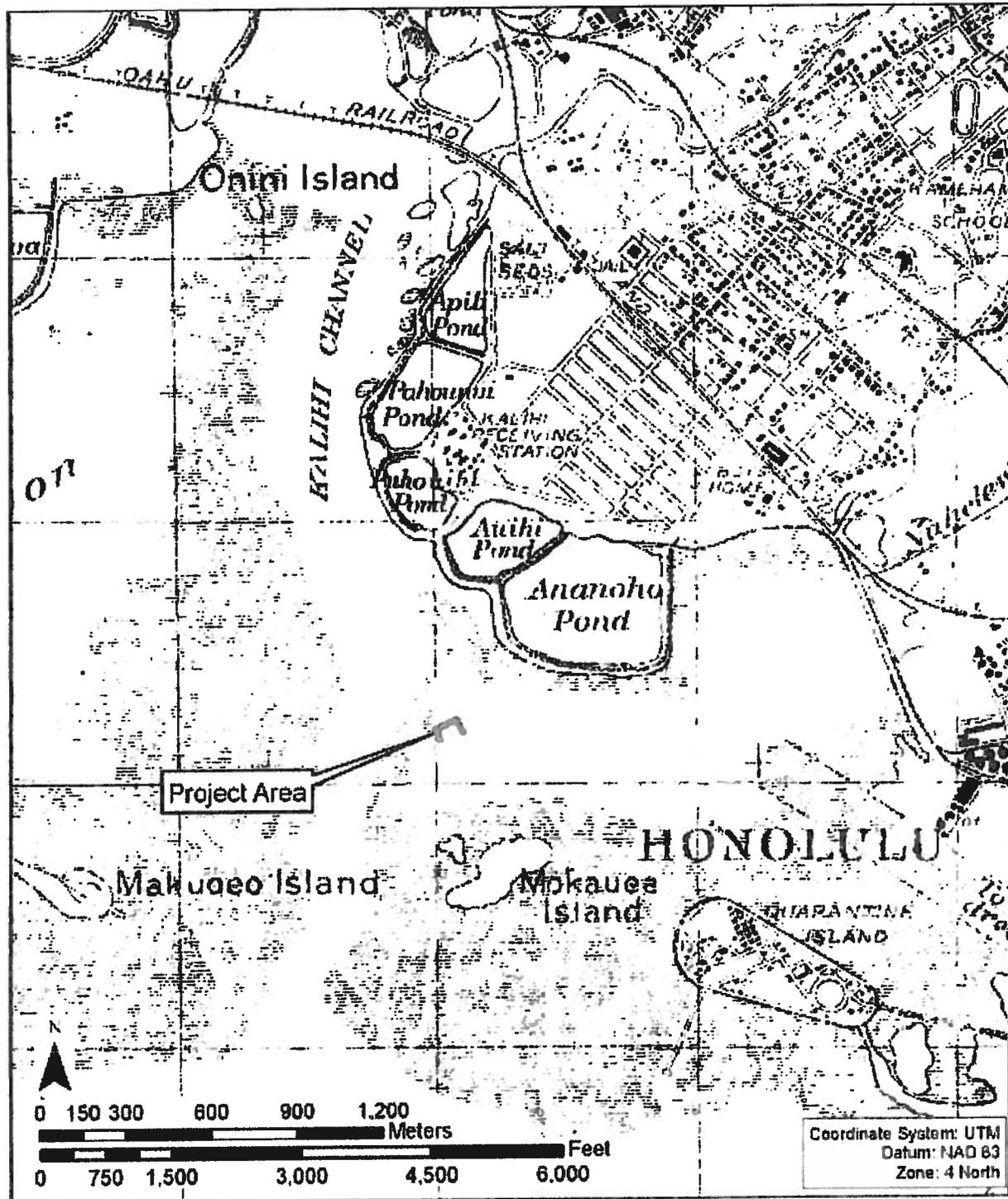


Figure 13. 1919 USGS Map showing project area, major fishponds in Kalihi Kai, salt beds, O&R Railroad and project area in red

These *pu'uone* identified in Kalihi Kai had names such as Keuwuwi and Weuweu and were probably often named after the person who cared for the pond, as is the case for Weuweu. *Pu'uone* generally belonged to *maka'āinana* and were in great demand by farmers (Maly & Maly 2003:24). A different type of small fishpond that was claimed was the *ki'o ho'oholo i'a* which was a type of pond for spawn, a fish run or holding pond (definition of *ki'o* from Pukui and Elbert 1986:153).

5.1.2 Kai o Mokauea/ Kai o Kaliawa

In 1890, a petition came before the Board of Land Commissioners claiming the Kaliawa Fishery, the fishery adjacent to and 'Ewa of Mokauea Fishery. The Kai o Kaliawa fishery was claimed by Samuel Damon as a gift from Bernice Pauahi Bishop. Because the traditional use of an *ahupua'a* also included a fishery, the Boundary Commission was charged with setting the legal boundaries of fisheries such as holes in reefs, sand islets, walls, gates and corners of fishponds, rocks and rock piles, small inlets and drains. The following are the boundaries shared by Kai o Kalawa and Kai o Mokauea:

Ka Poo ka Mahina (Poomahina)—just inside breakers of reef

Waiololi—small ditch

Kahakaaulana—small island of Mokauea 'Ili

Kalaeunaoa—sand hill (islet)

Kaluapuhi—little hole in the edge of the reef (*hiwai*)

Kalaeone—sand hill (islet)

The shared boundary of the two fisheries more or less follows the eastern edge of the Kalihi Channel. The eastern boundary of Kai o Mokauea is unknown. The Ananoho Fishpond was one of the points that marked the boundary between Mokauea and Kapālama (Moehonua 1862). The pond probably also marked part of the boundary between Mokauea Fishery and the fishery to the east, Kaholaloa (aka Kahaolola, Kaholoa). Kai o Kaholaloa was owned by William Sumner, a mariner who came into the service of Kamehameha III and who was later granted this fishery along with the land fronting it, Kahaohao (in Renard 1975:A2).

It is unclear who owned Kai o Mokauea. Given the entire *'ili* of Mokauea was granted to Kaunuohua (LCA 6450), it is likely that she was also the owner of the fishery (See LCA 2038 to H. Kalama). Apparently Liholiho owned one of the ponds, probably Loko Auiki (in Maly & Maly 2003:285). This makes sense considering Kaunuohua was *kahu* to Liholiho. Kaunuohua was awarded Loko Ananoho (Royal Patent 8147 to Moehonua, husband of Kaunuohua). In 1849, Kaunuohua died leaving her estate to her second husband W. L. Moehonua (Barrère n.d.:290).

The *hoa'āina* and particularly the *lawai'a*, the fishermen of this area knew well the boundaries of the fisheries as is evident in the Boundary Commission Reports for the Fishery of Kaliawa. According to Keamahu, the native informant who identified Kaliawa Fishery boundaries, though the boundaries between fisheries were clear, there was flexibility in fishing beyond the boundaries. "Sometimes the Mokauea fishermen go over into Kaliawa, and

sometimes the Kaliawa men go over into Mokauea, but the boundaries are well understood.” (in Maly and Maly 2003:386).

5.1.3 Salt Beds

The estuarine environment marking the area between land and ocean at Kalihi Kai was a perfect area to develop small aquaculture features. Salt beds or *hāhāpa'akai* were also noted at Kaliawa. These appear on a 1919 USGS map of Kalihi (Figure 13). Royal Patent 2388 to Meeks notes there were salt ponds adjacent to Apili Fishpond called “Punaula” (<waihona.com>). Salt was considered a necessity and used as a condiment for food and also in medicine. The processing of salt only took place in certain areas (Malo 1951:123). Salt beds were mentioned by several interviewees in a previous study of the area near the confluence of Kalihi Stream and Ke'ehi Lagoon.

Mr. Ah Tou claims that Nahinu used to have salt ponds where white salt was made (pers. Communication, G. Ah Tou, 6/25/02)...George Kaeliwai, who grew up in Kalihi Kai, mentioned the Lee Family, who ran the salt flats down at Puuhale... (pers. Communication, G. Kaeliwai, 7/16/02 in Bushnell and Hammatt 2002:9).

Salt from different areas had particular characteristics unique to that area. The salt from neighboring Moanalua was noted for its gray tinge (Bushnell and Hammatt 2002:9).

5.1.4 The Reef

The project area today represents what used to be a reef platform previous to the beginning of dredging in the 1930s and 1940s. The natural channel leading from the mouth of the Kalihi and Kahauiki Streams through the reef and out beyond the reef is illustrated clearly in old maps (Figures 4 & 13). The earliest written record of fishing and gathering on the Ke'ehi reef is described in 1825 during a survey made by British naval officer Charles Robert Malden. The reef is described as being dry in portions at low tide, particularly the seaward portions (in Renard 1975:A2). The reef here provided food for all the native tenants living in the surrounding areas. “The low orders of the natives get from it a considerable part of their daily subsistence, consisting of small fish, left in ponds, crabs, shell fish, etc.” (Malden in Renard 1975:A2). The interior portion was always submerged and during high tides was used as a passage for canoes between Honolulu and different areas of Pu'uloa. Others without canoes would swim to avoid the walking detour around Moanalua (Sterling and Summers 1978:322). For residents of Mokauea Island, canoe transportation was a necessity.

Canoes were the primary means of transportation prior to WWII. Children would go to school in small 10-foot koa canoes and water would be gotten in larger canoes. Sometimes they measured 20 feet or more. Since there was no water on the islands nearby Puuhale was the source for hand carried water. This is still the practice today. Prior to the advent of motors, people either paddled, sailed or poled (since most of the area was shallow, poling was the most common) [Oppenheimer 1976:16].

One hundred fifty years later in the 1970s, despite the massive growth and industrialization experienced by this area, Native Hawaiians and other ethnic settler groups continue to fish from reef and waters in and around Ke'ehi Lagoon and Mokauea Island.

5.1.5 The Fish

Two studies in the 1970s, one a historical study of Mokauea Island and the other a biological survey of Sand Island both produced lists of fish species (Table 3). The historical study of Mokauea relies on oral interviews with residents or former residents of Mokauea Island to come up with a list of fish and marine resources collected and consumed within the Ke'ehi Lagoon region (Oppenheimer 1976). The biological survey of Sand Island utilizes the scientific transect survey method to estimate the general health of the reef ecosystem based on diversity and numbers (Bowers 1975).

Table 3. List of Fish in Mokauea Fishery (Adapted from Oppenheimer 1976 and Brock 1975)

Mokauea Historical Study	Sand Island Biological Survey
Fish	Fish
<i>manini</i> (<i>Acanthurs sandvicensis</i>)	<i>manini</i> (Surgeon Fish)
<i>'upāpalu</i> (<i>Aporgonidae</i>)	<i>palani</i> (Surgeon Fish)
<i>'anae</i> or mullet (<i>Mugil cephalus</i>)	<i>paku'iku'i</i> (Surgeon Fish)
<i>āholehole</i> (<i>Kuhlia sandvicensis</i>)	<i>maiko</i> (Surgeon Fish)
<i>hīnālea</i> or wrasse (Labridae)	<i>na'ena'e</i> (Surgeon Fish)
<i>'ō'io</i> (<i>Albula vulpes</i>)	<i>kole</i> (Surgeon Fish)
<i>papi'o</i> or young <i>ulua</i> fish (crevalle or jack fish)	<i>nunu/ nunu peke</i> (Stick Fish ssp.)
<i>'oama</i> or young <i>weke</i> (<i>Mullidae</i>)	<i>humunukunukuapua'a</i> (Trigger Fish) <i>humuhumu umauma lei</i> (Trigger Fish)
<i>'ala'ihī</i> or squirrel fish (<i>Holocentrus</i>)	<i>'o'opu kawa/ 'o'opu hue</i> (Puffer Fish ssp).
<i>paki'i</i> or flounder (<i>Bothus pantherinus</i>)	<i>'omilu</i> (Jack)
<i>menpachi</i>	<i>kikakapu</i> (Butterfly Fish)
<i>kūmū</i> or goat fish (<i>Upensius porphyreus</i>)	<i>lauwiliwili</i> (Butterfly Fish)
<i>ulupapa</i>	<i>pili ko'a</i> (Hawk Fish)
<i>awa</i> (<i>Chanos chanos</i>)	<i>hinalea lauwili</i> (Saddle Wrasse)
<i>awa awa</i>	<i>hinalea lolo</i> (Clown Wrasse)
<i>'ōpelu</i> or mackerel (<i>Decapterus pinnulatus</i>)	<i>kumu</i> (Goat Fish)

Mokauea Historical Study	Sand Island Biological Survey
<i>akule (Trachurops crumenophthalmus)</i>	<i>munu</i> (Goat Fish)
<i>pūhi paka</i>	<i>moa</i> (Box Fish)
brown eel	<i>alo 'ilo 'i</i> (Damsel Fish)
white eel	<i>maomao</i> (Damsel Fish)
	Cleaner Wrasse
Limu	<i>uhu</i> (Parrot Fish)
<i>manauea (Grocilaria Coronopifalia)</i>	<i>kihikihi</i> (Moorish Fish)
<i>'o 'olu (Chondria tenuissima)</i>	<i>'o 'ili u wiwi</i> (File Fish)
<i>'ele 'ele (Enteromophora prolifera)</i>	<i>humuhumu 'ele 'ele</i> (Trigger Fish)
<i>lipēpe 'e (Laurencia Parvipapillata)</i>	<i>pu 'u u ola 'i</i> (Puffer Fish)
<i>kala (Sargassum echinocarpum)</i>	<i>lauhau</i> (Butterfly Fish)
<i>wawae 'iole (Codim edule)</i>	<i>kapuhili</i> (Butterfly Fish)
Shellfish	<i>'a 'awa</i> (Wrasse)
lobster	<i>weke 'a 'a</i> (Goat Fish)
<i>'ōpae</i> or shrimp	<i>paku</i> (Flat Fish)
<i>alamihi</i> or black crab (<i>Metopograpsus messor</i>)	<i>'ala 'ihi maoli</i> (Squirrel Fish)
red crab	<i>akule</i> (Jack)
white crab	<i>kapuhili</i> (Butterfly Fish)
	<i>lao</i> (Wrasse)
	<i>hinalea i 'iwi</i> (Wrasse)
	<i>moana</i> (Goat Fish)
	<i>pualu</i> (Surgeon Fish)
	<i>kala</i> (Surgeon Fish)
	<i>lau 'i pala</i> (Surgeon Fish)
	<i>lau wiliwili nukunuku 'oi oi</i> (Butterfly Fish)
	<i>hinalea luahine</i> (Wrasse)
	<i>menpachi</i> (Squirrel Fish)
	(Puffer Fish)

Mokauea Historical Study	Sand Island Biological Survey
	' <i>upapalu</i> (Cardinal Fish)
	Goby
	<i>aweoweo</i>
	<i>puhi</i> (Eel)
	<i>hihimanu</i> (Eagle Ray)
	Various species of algae, coral, sea urchins, chaetopterids, sea cucumbers, star fish and worm and shrimp holes

Many of the species found during the biological survey in 1976 are not consumed. The lists of fish give an idea of the diversity and variety of marine life near the project area in the 1970s.

5.1.6 'Ohana Style Fishing

Fish were plentiful in this area; There were approximately 885 acres of fishponds in the Ke'ehi area alone (Cobb 1905:429). Many fishing communities existed at the beginning of the 20th century, some on the small islands on either side of Kalihi Channel and others near the shoreline. *Hoa'āina* shared details about the way fishing worked within an '*ohana*.

The fisherman of Keehi would usually fish with their '*ohana* group. When fish were brought back to the island it would be shared with one's '*ohana* first then with neighbors and finally the remaining fish were either sold or bartered. No one would go hungry because everyone watched out for their neighbor's welfare (Oppenheimer 1976:11).

Most of the families owned homes on land or in the *mauka* areas of Kalihi as well while maintaining a fishing house on one of the islands. Anyone from the '*ohana* could go use the fishing house as this was where the fishing gear was kept. This lifestyle pattern is consistent with *kuleana* claims in Kalihi Kai, including the ones closest to the project area. Today, families continue to live on Mokauea and fish for subsistence.

5.1.7 Fishing Techniques

The historical study of Mokauea Island documents the struggle of the community on and around the island to maintain the fishing lifestyle of their ancestors (Oppenheimer 1976). The current project area, located in the traditional Mokauea fishery is part of the fishing grounds fished by the ancestors of many of the *kama'āina*. Within Mokauea fishery were two islands or groups of islands and islets, Kahakaaulana and Mokauea. Oppenheimer documents these islands as being continuously inhabited from 1853 (probably much earlier) until 1941 when it was dredged along with one of Mokauea islets (Oppenheimer 1976: 5). Following World War II in 1946, people returned to reside on Mokauea.

Several fishing techniques were documented as part of the Mokauea Island Historical Study. Some of the most common and popular fish in Mokauea were the *paki'i*, the flounder (*Bothus pantherinus*), squid and mullet (Oppenheimer 1976:13). The *paki'i* was found in sandy places and was caught by sticking it with a piece of metal wire. Squid was caught directly from the boat where a spear was used with a wire-ended barb (Oppenheimer 1976:13). Probably the most important fish, the mullet, was known to come in great numbers to these shores. One interviewee, Muriel Lupenui, speaks of the legendary '*anae holo*, the traveling mullet who made their runs from Pu'uloa all the way around to Ko'olauloa and back during the winter (Oppenheimer 1976:13; Thrum 1998:271). Though many of the fishponds were also stocked with mullet, it was noted that Mapunapuna was the primary one. Fishermen at Mokauea and in surrounding areas used nets to trap mullet and many other fish.

5.1.8 Traditional Beliefs about Fishing

The fishermen interviewed for the Mokauea study all spoke of the importance of fish breeding grounds, the *ko'a* and how every fisherman was familiar and respectful of the *ko'a* not taking more fish than was needed. Because *ko'a* were often difficult to locate, a system of triangulation was used to obtain bearings off of visible landmarks. Where the two bearings intersected identified the location of the *ko'a* (Malo 1951:211). *Ku'ula* were also emphasized during interviews with Mokauea fishermen. A *kū'ula* is "any stone god used to attract fish, whether tiny or enormous, carved or natural, named for the god of fishermen" (Pukui and Elbert 1986:187). *Kū'ula* offerings were observed on Mokauea Island by one of the fishermen in his youth. On the neighboring island of Kahaka'aulana was the *kū'ula* stone of Muriel Lupenui's '*ohana*.

On Kahaka'aulana Island they had a personal *kuula* god stone. This stone belonging to Muriel Lupenui was kept in a special house. This house was visited and described by Gertrude Damon and appears in her notebooks...It is remarkable that this practice existed up until the confiscation of the area in 1941 (in Oppenheimer 1976:14).

5.1.9 Changes to Traditional Fishing Lifestyle

It is difficult to imagine the massive change experienced by those who grew up in Kalihi Kai or Mokauea and neighboring areas. There is very little recognizable in the landscape from the childhoods of those who were born in the 1920s and 1930s. For the residents of Mokauea in the 1970s, the turning point was World War II. Following the war, the occupants of the Mokauea Fishery became more multiracial (Oppenheimer 1976:17).

Fishing practices were quickly adopted by immigrants. Informant Muriel Lupenui reported that the fleet of Japanese fishermen who docked their sampans at Puuhale, used her fishing *kuula* (stone god). They made offerings to the god and many of them spoke fluent Hawaiian. They would also leave fish at her house if they had a successful day (Oppenheimer 1976:16).

This transition was also noticed in the cultivation of the fishponds at Kalihi Kai. In a more recent cultural study of an area in Kalihi Kai, community members recall that the families operating the fishponds were largely Japanese.

A *kama'āina* born in Kalihi recalls fishponds in the vicinity of the former Apili Pond when he was a youngster in the 1930s. At that time, the Apili Pond was split into several ponds and was operated by the Hamada Family who would harvest the fish from tin boats (pers. Communication, G. Kaeliwai in Bushnell and Hammatt 2002:7).

The general condition of the Mokauea and Kaliawa fisheries has declined greatly since WWII as well. One of the major events which led to the decline of the fisheries was the dredging of Ke'ehi Lagoon in the 1940s. It was this dredging activity that created the seaplane runway and the current shape of the project area today.

Mr. Kaeliwai still remembers the day Pearl Harbor was attacked. At the time, the Ke'ehi Lagoon was being dredged to create Sand Island. The day of the attacks, young George was in the Ke'ehi Lagoon picking up shells, crabs and fish that were displaced from the dredging of the lagoon. He was talking story with the dredging workers and his sister called him from the bank to come home right away. Mr. Kaeliwai feels the dredging of the lagoon affected not only the form of the Lagoon, but the fish that lived in it (G. Kaeliwai in Bushnell and Hammatt 2002:12).

Others have pointed to the construction of the Nimitz Highway as the major development that wiped out the fishing grounds (Ibid). Still others focus on the negative impacts of non-point source pollution.

Mr. Akina still fishes in the Ke'ehi Lagoon and he has seen fishing conditions decline in the last few decades. He explained that Ke'ehi Lagoon was once a hammerhead shark breeding ground. Now, he sees very few sharks. Though he still goes crabbing for Samoan crab and pole fishing for mullet and *pāpio*, he feels the quantity and quality of the fish and crabs have been impacted negatively by all the pollutants coming into the Lagoon (E. Akina in Bushnell and Hammatt 2002:12).

It is difficult to pinpoint all the sources of pollution into the Ke'ehi Lagoon and neighboring Mokauea Fishery. The whole area has been heavily industrialized including the areas of Sand Island, Kalihi Kai and Mapunapuna. More specific sources of pollution were targeted in the 1970s when raw sewage effluent was rerouted as deep ocean outfall. However, this was not before much damage had been inflicted on the reef and waters of the fisheries. Between the 1920s and the 1970s, 62mgd (million gallons per day) of raw sewage was released into the near shore areas from one source point in the Honolulu Harbor (Brock 1997:28). The zones of "acute" impact extended 500m to 1000m from the source giving an idea of how far-reaching the pollutants had traveled. Industrial and urban runoff and storm water continue to pollute the waters of Mokauea and surrounding waters.

5.2 Burials

The project area is located in the former Mokauea Fishery. It is unlikely human burials will be encountered in the project area as it is entirely composed of fill. However, it is important to document the use of the islands, fishponds and coastlines as traditional burial sites utilized by Hawaiians. A burial was inadvertently discovered at Pier 40 during construction activities related to the pier (Moore 1997). This burial appears to have been buried in the original coastline near the mouth of the Kapālama Stream and also near the former Ananoho Fishpond. The burial is likely associated with the *kuleana* at the burial site. It was common practice for *kama'āina* to bury their family members within their *kuleana*.

Kamakau records the use of fishponds as burial sites. He describes the famous Kaloko Pond on Hawai'i Island. "Kaloko [pond] is another famous burial pit; it is at Kaloko, in Kekaha, Hawaii. {In a cave that opens into the side of the pond} were laid Kahekili, the ruler of Maui, his sister Kalola, and her daughter, Keku'iapoiwa Liliha, the grandmother of Kamehameha III" (Kamakau 1991:41). The name of one of the former fishponds at Kalihi Kai was Ananoho implying an inhabited "*ana*", cave. This does not suggest that Ananoho was a burial cave, but rather that fishponds often did contain caves which could have been used for burial.

The sand islets and islands in the Ke'ehi Lagoon are also known to contain burials. One of the *kama'āina*, Lama, charged with identifying the boundaries of the Kaliawa Fishery pointed out one of the "sand mounds", an islet in Kai o Kaliawa where some of her relatives were buried (in Maly and Maly 2003:386). The name of the islet was Makukaloa, referring possibly to "*kaloa*" the three sacred nights of the month belonging to the god Kanaloa. In a more recent study, many residents or former residents of Mokauea Islands were interviewed. Some of them discuss the burial of *'ohana* members on the islands (Oppenheimer 1976:14).

Section 6 Summary and Recommendations

Cultural Surveys Hawai'i, Inc. has conducted a cultural impact evaluation, an archaeological literature review and a field inspection for the proposed development of a small shipyard at Ke'ehi Lagoon Small Boat Harbor, Kalihi Kai, Kona, O'ahu [TMK 1-2-025:024]. The field inspection identified no historic or archaeological sites. There is a small drainage depression on the eastern boundary of the property in which *'aki 'aki*, a native rush grass grows. Fish scales and bones found near the southern boundary of the property at the shore suggest this area is actively used for fishing and consuming fish. This was confirmed by fishermen fishing from the dock on the western boundary of the property. Based on their comments, it seems fishermen prefer this dock for fishing as it parallels the seaplane channel and the fish seem to congregate there.

A review of the archaeological literature found no archaeological properties in the vicinity of the project area. Several traditional fishponds once existed somewhat inland, but all of these were filled as "reclamation" land beginning in early twentieth century. Paleoenvironmental studies of the fishponds have been unable to determine any good dates for the fishponds at Kalihi Kai though tentative dates have been presented for the *ahupua'a* flanking Kalihi, Kūwili Fishpond in Kapālama (1500 AD) and Weli Fishpond in Kahauiki (1650 AD). Some human burials have been found in coastline or coastal estuarine environments in Kalihi Kai, however these are scattered and are not near the project area.

The project area once existed as an inter-tidal reef. With the growth and urbanization of Honolulu Harbor, the construction of the O.R. & L. Railroad in the late 19th century and the creation of Sand Island, the project area was included as part of the reclamation of hundreds of acres of inter-tidal reef. Like the majority of the modern coastline near the urban center of Honolulu, the project area is composed entirely of fill. Fill events most likely began in the first few decades of the twentieth century when large amounts of fill were dredged from the Honolulu Harbor and Kapālama Basin to enlarge Quarantine Island (now Sand Island). The channel on the southern boundary of the project area was dredged in 1925-26 and the current Bascule Bridge was built between 1959 and 1962. The channel on the western boundary of the project area was dredged during the creation of the seaplane channel beginning in 1941.

Based on historical and archival research, it is found that the Ke'ehi Lagoon Small Boat Harbor is located in the traditional fishery of Mokauea, an *'ili* or land division of Kalihi, O'ahu. The literature specific to Kalihi Kai indicates an area rich in marine resources and Hawaiian traditions related to these resources. Fishponds flanked the coast including Loko Ananoho, Auiki, Pahounui, Pahouiki and Apili. In addition, numerous Māhele claims were made for small, dune-banked fishponds - *pu'uone*, valued and cultivated by the *kama'āina* of Kalihi. Salt particular to Kalihi Kai was produced on the western side of Kalihi. The inter-tidal areas on the interior part of the reef were used as a passage way for canoes traveling between Honolulu and Pu'uloa and other parts of 'Ewa. The reef itself was utilized intensively for collecting small fish, crabs, *limu* and other shellfish.

A small fishing community continues to live on Mokauea Island and has fought for their way of life to remain on the island. Despite the massive changes the community has witnessed in the

urbanization of Honolulu and the depletion of their fishing grounds over the last four to eight decades, they continue to do their best to retain a fishing lifestyle. Others who grew up in Kalihi and the surrounding area continue to fish the Ke'ehi Lagoon and other areas including from the vicinity of the project area. Very limited community consultation was carried out for this project that consisted of talking story with a few fishermen on the project area. In addition, interviews with community members from previous cultural and historical studies suggest the community feels strongly about protecting the waters and fishing areas. Even the fishermen fishing from the project area feel strongly about their fishing spot. Many of them have lived in Kalihi all their lives and have fished from the project area all their lives.

Because the dry land portion of the project area is believed to be entirely 20th century fill land development of this land seems exceedingly unlikely to adversely impact any land resources. Although the immediate marine environment has been much impacted by dredge and fill operations, spanning many decades, the vicinity is still popular for subsistence fishing by Hawaiian and non-Hawaiian residents of Kalihi and elsewhere. The potential for adverse impact of the proposed project to near shore resources and fishing access is unclear to us at this time. Given the long-tradition of utilization of coastal resources in the vicinity and the expressed concerns associated with the struggle for access to and residence on Mokauea Island we recommend that the project attempt to minimize adverse impact to the coastal environment and minimize adverse impact to coastal access for purposes of fishing and accessing other coastal resources.

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