BENJAMIN J. CAYETANO
GOVERNOR

BRIAN K. MINAAI
DIRECTOR

DEPUTY DIRECTORS
JEAN L. OSHITA
JADINE Y. URASAKI

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

IN REPLY REFER TO:

HWY-DS 2.5602

FEB 1 3 2002

TO: GENEVIEVE SALMONSON, DIRECTOR
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

FROM: BRIAN K. MINAAI
DIRECTOR OF TRANSPORTATION

SUBJECT: FINAL ENVIRONMENTAL ASSESSMENT (FEA) AND FINDING OF NO SIGNIFICANT IMPACT (FONSI) FOR KAMEHAMEHA HIGHWAY DRAINAGE IMPROVEMENTS: VICINITY OF KAHUKU HOSPITAL AND REPLACEMENT OF KII BRIDGE, PROJECT NO. 83C-02-01

The Department of Transportation (DOT) has reviewed letter comments received during the 30-day public comment period which began on November 8, 2001. DOT has determined that this project will not have significant environmental effect and issues this Finding of No Significant Impact. Please publish this notice in the OEQC Bulletin on February 23, 2002.

Enclosed is a completed OEQC Bulletin Publication Form and four (4) copies of the FEA. An electronic file of the project description (WordPerfect) will be e-mailed to you.

Thank you for your assistance with this important project. If there are any questions please contact Mr. Scot Urada, Project Engineer, at 692-7553, Technical Design Services Office, Design Branch, Highways Division.

Enclosures

c: Brian Takeda
R. M. Towill Corporation

RECEIVED
'02 FEB 14 P5:10
OFC. OF ENVIRONMENTAL
QUALITY CONTROL

12

2002-03-08-OA-FEA-

Prepared in Accordance with Chapter 343, Hawaii Revised Statutes

Final Environmental Assessment for

KAMEHAMEHA HIGHWAY DRAINAGE IMPROVEMENTS: VICINITY OF KAHUKU HOSPITAL AND REPLACEMENT OF KII BRIDGE

Project No.: 83C-02-01
District of Koolauloa, Kahuku, Island of Oahu

January 2002

Prepared for:
STATE DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
601 Kamokila Boulevard
Kapolei, Hawaii 96707

1-19101-01E

Final Environmental Assessment

KAMEHAMEHA HIGHWAY DRAINAGE IMPROVEMENTS, VICINITY OF KAHUKU HOSPITAL AND REPLACEMENT OF KII BRIDGE

Project No.: 83C-02-01

District of Koolauloa, Kahuku, Island of Oahu

January 2002

Prepared for:
State Department of Transportation
Highways Division

Prepared by:
R.M. Towill Corporation
420 Waiakamilo Road, Suite 411
Honolulu, Hawaii 96817-4941

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PROJECT SUMMARY

Project Name:	Kamehameha Highway Drainage Improvements, Vicinity of Kahuku Hospital and Replacement of Kii Bridge, Project No.: 83C-02-01
Applicant:	State of Hawaii, Department of Transportation Highways Division 601 Kamokila Boulevard Kapolei, Hawaii 96707 Contact: Scott Urada, P.E., Project Manager Phone: (808) 692-7553 Fax: (808) 692-7555
Accepting Authorities:	State of Hawaii, Department of Transportation U.S. Department of Transportation, Federal Highway Administration
Location:	Kamehameha Highway, Route 83, Mile Post 15.2 and 15.4, Kahuku, Island of Oahu
Property Acreage:	±5.0 to ±6.0 Acres
Property Owner and TMK Designation:	KAMEHAMEHA HIGHWAY (FAP 3-E) State of Hawaii, Department of Transportation PARCELS ADJACENT HOSPITAL DITCH: James Campbell Trust Estate - 5-6-02:25 (por); 5-6-06:54 (por); and 5-6-02:17 (por) PARCELS ADJACENT KII BRIDGE James Campbell Trust Estate - 5-6-02:01 (por); and 5-6-02:21 (por) State of Hawaii - 5-6-05:09 (por)
Agent:	R.M. Towill Corporation 420 Waiakamilo Road, Suite 411 Honolulu, Hawaii 96817-4941 Contact: Brian Takeda, Project Planner Phone: (808) 842-1133 Fax: (808) 842-1937
State Land Use District:	Agricultural
Existing County Zoning:	AG-2
Development Plan Land Use Designation:	Public Facility
Special Designation:	Special Management Area (portion)
Determination:	Finding of No Significant Impact (FONSI)
Proposed Action:	Kii bridge along Kamehameha Highway will be replaced and drainage improvements will be constructed at Hospital Ditch. The project will help to relieve stormwater overtopping of the highway at both locations.

CHAPTER 1
PURPOSE AND NEED FOR PROPOSED PROJECT

1.1 OVERVIEW

The State Department of Transportation, Highways Division (DOT-H), proposes to construct box culverts and a replacement bridge along Kamehameha Highway in Kahuku, Oahu (**Figure 1-1**). The purpose of the project is to alleviate overtopping of Kamehameha Highway at an area known as Hospital Ditch, immediately fronting the Kahuku Hospital, and at Kii Bridge (**Figure 1-2**). Box culverts will be constructed at Hospital Ditch (**Figure 1-3**) and a replacement bridge with drainage improvements will be constructed at Kii Bridge (**Figure 1-4** and **Figure 1-5**). The box culverts proposed for Hospital Ditch will also help to reduce the incidence of ponding and improve accessibility and safety within the Kahuku area during heavy rainfall events.

The proposed project will require the evaluation of existing land uses and environmental conditions to determine the overall impact of construction activities to the surrounding area and community. All project activities will be assessed for compliance with State and County policies and land use plans.

The project is planned as a design-build contract. Construction is estimated to occur in the 4th quarter of 2002 or in the 1st quarter of 2003. The total project cost is estimated at $8 million. The Hospital Ditch portion of the project is estimated at $3 million, and for Kii Bridge it is estimated at $5 million. DOT is utilizing funds from several sources including City and County of Honolulu Vision funds, State Highway funds, Federal Housing and Urban Development (HUD) funds, and Federal Highway Administration (FHWA) funds.

Major portions of Kahuku Town along Kamehameha Highway are subject to periodic flooding from numerous sources including Ohia Gulch, Kalaeokahipa Gulch, Hoolapa Gulch, Oio Gulch, Keaaulu Gulch, and Malaekahana Stream (**Figure 1-6**). The potential for flooding during storms and periods of heavy rainfall is high. Problems associated with flooding include the overtopping and ponding of portions of Kamehameha Highway. This prevents access along the highway from communities including Haleiwa and Waialua which are located west of Kahuku Hospital. Kahuku High School,

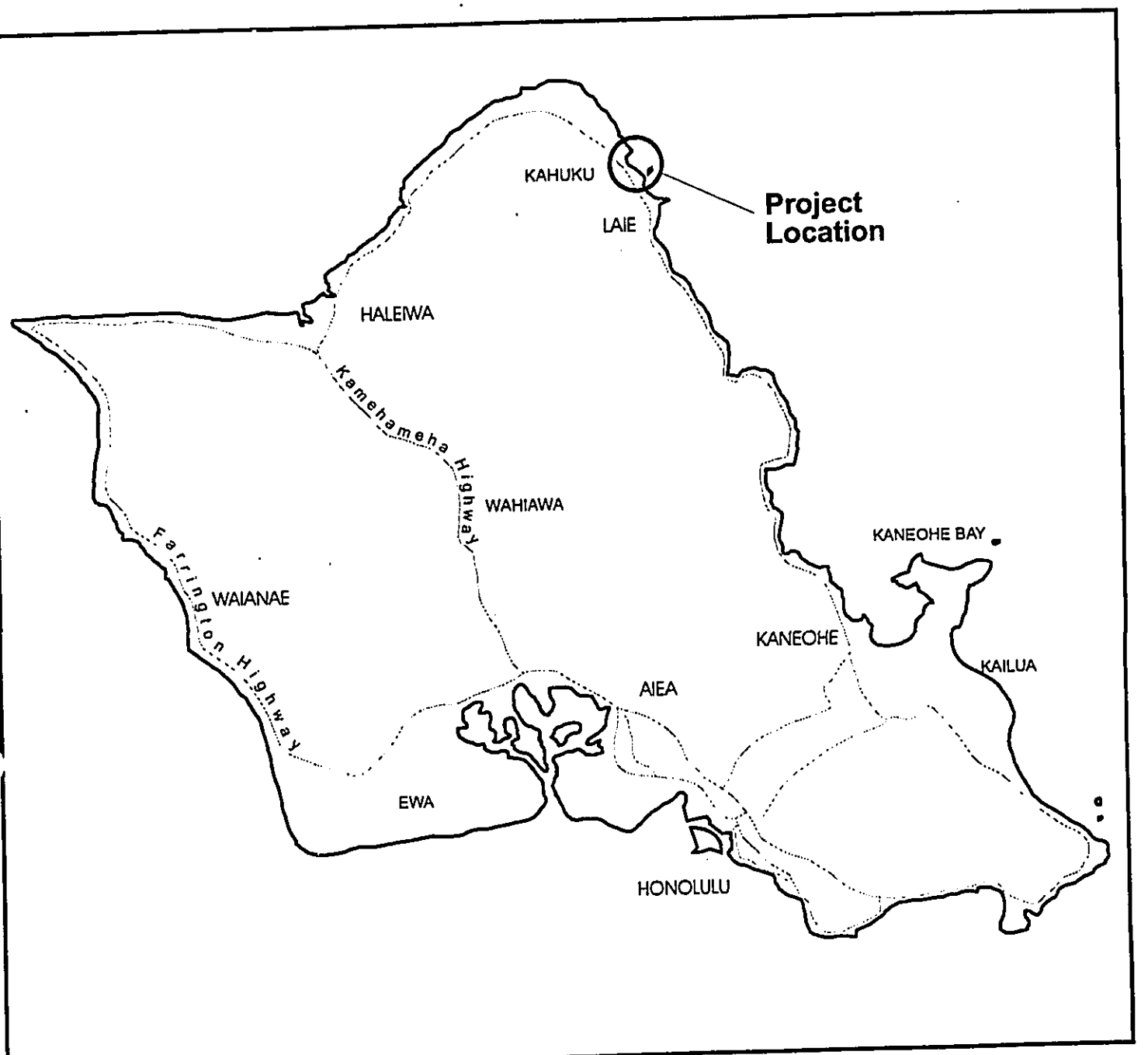


FIGURE 1-1
Location Map

4 2 0 2 6
MILES

Kamehameha Highway Drainage Improvements
Vicinity of Kahuku Hospital, Oahu, Hawaii
State Department of Transportation, Highways Division

R.M. TOWILL CORPORATION
May 2001

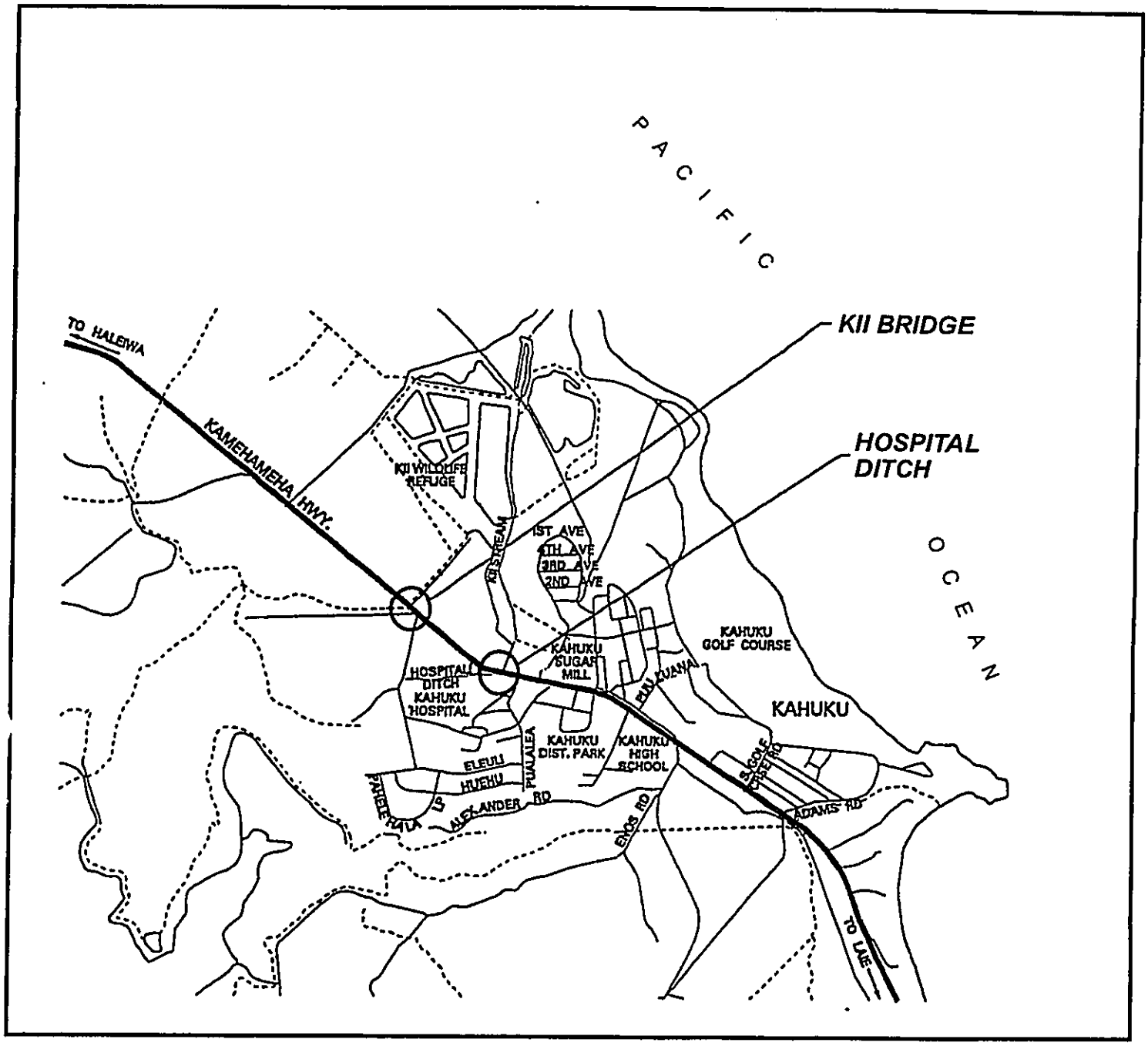
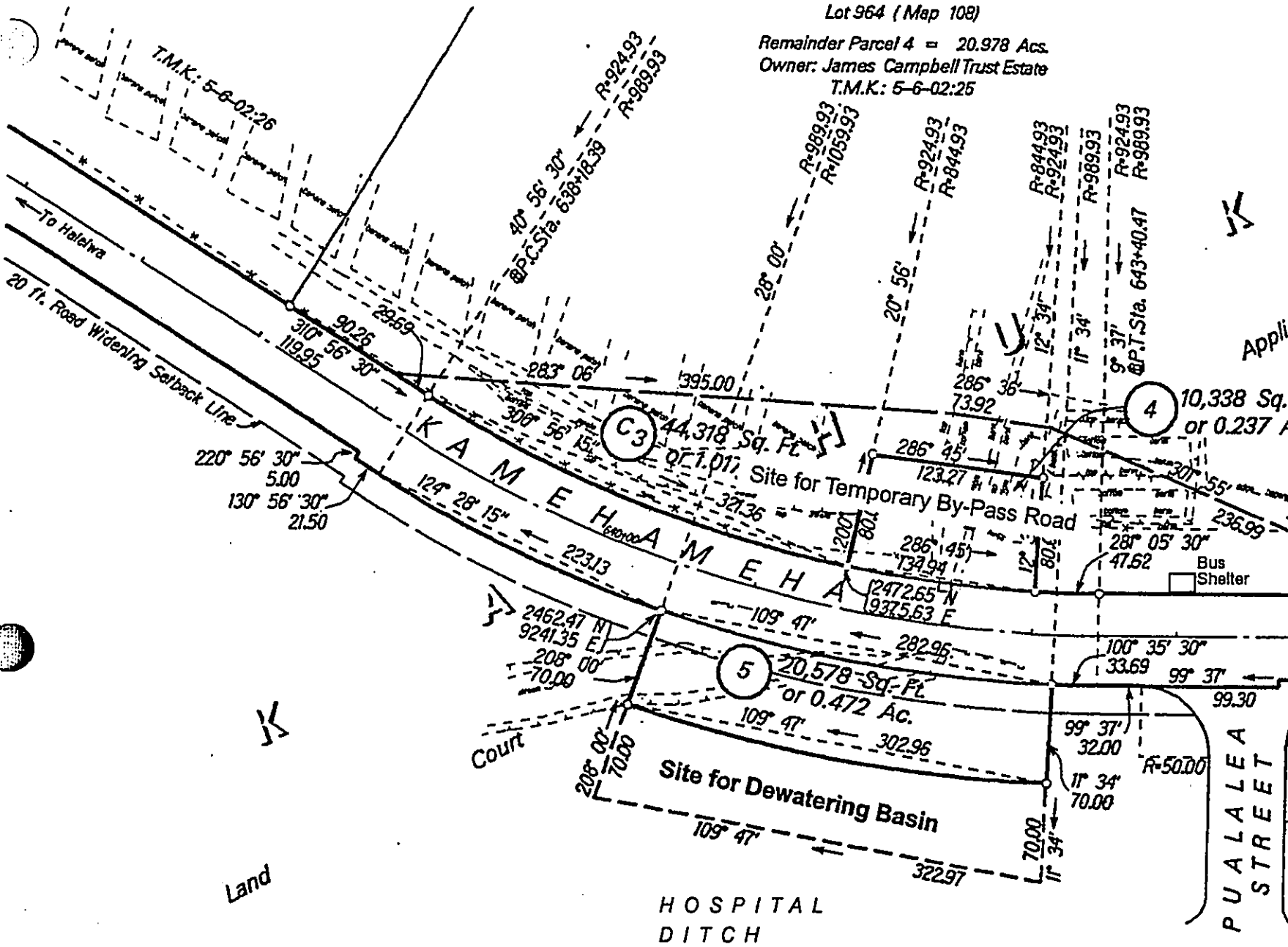


FIGURE 1-2
Vicinity Map

3 0 3
THOUSAND FEET

Kamehameha Highway Drainage Improvements
Vicinity of Kahuku Hospital, Oahu, Hawaii
State Department of Transportation, Highways Division

R.M. TOWILL CORPORATION
May 2001



Lot 1163-A (Map 138)

Remainder Parcel 5 = 16.942 Acs.
Owner: James Campbell Trust Estate
T.M.K.: 5-6-06:54

K A H U K U
H O S P I T A L

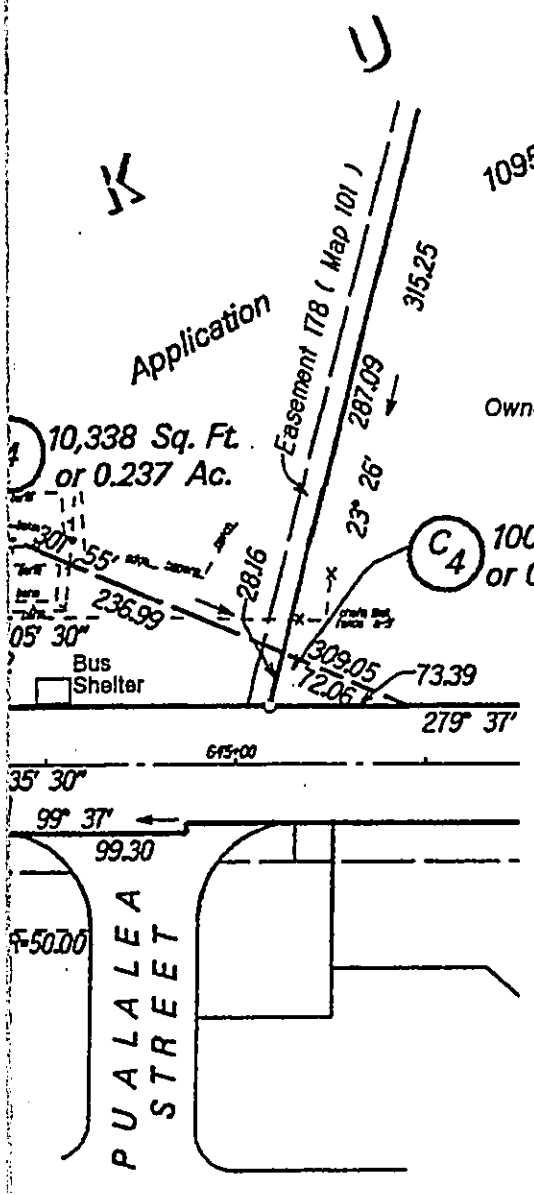
FIGURE 1-3
Hospital Ditch

SCALE AS NOTED

Kamehameha Highway Drainage Improvements
Vicinity of Kahuku Hospital, Oahu, Hawaii
State Department of Transportation, Highways Division

R. M. TOWILL CORPORATION
May 2001

Source: State Dept. of Transportation,
Highways Division, Jan. 2001



Lot 485-A (Map 79)

Owner: James Campbell Trust Estate
T.M.K.: 5-6-(

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

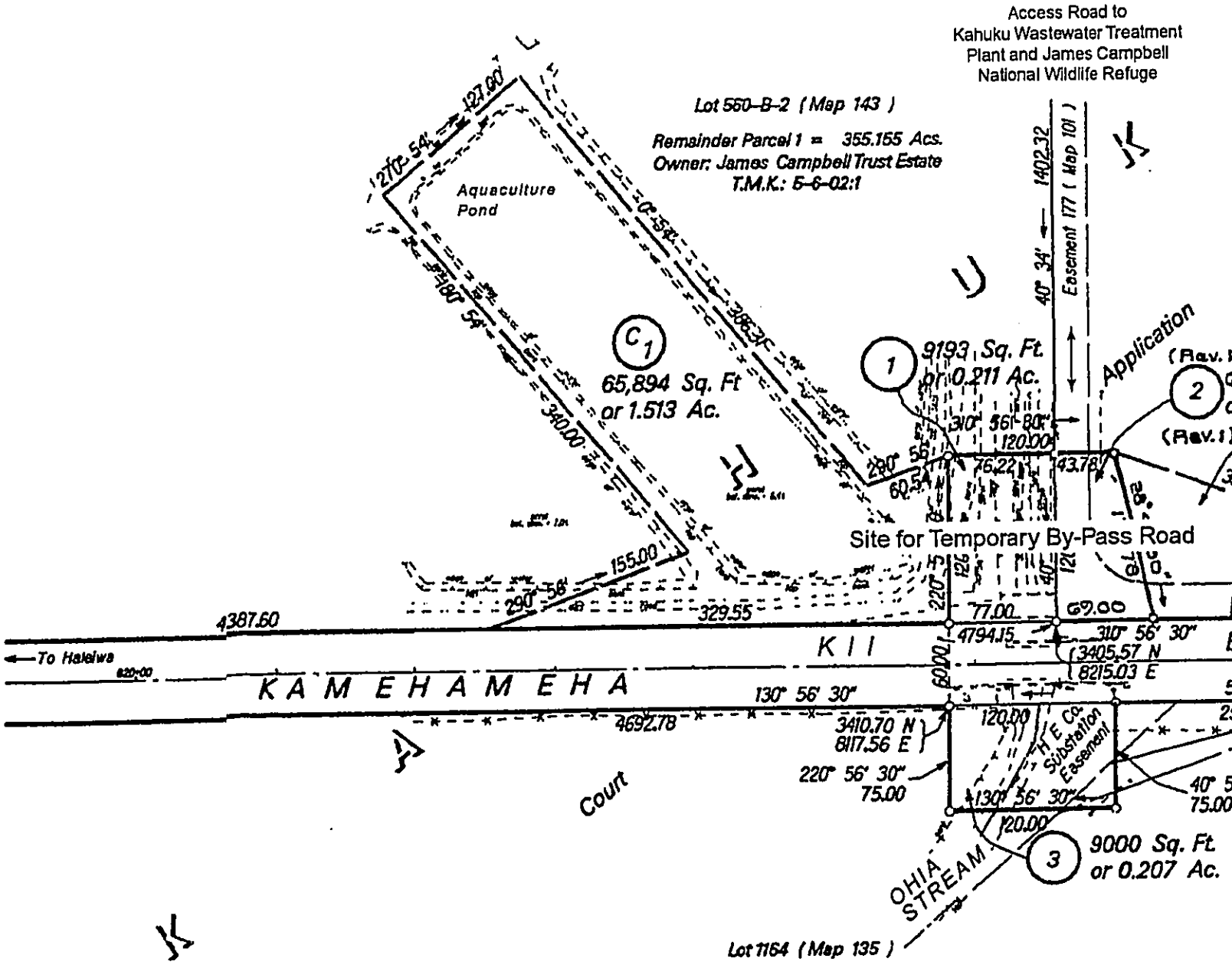
RIGHT OF WAY MAP
KAMEHAMEHA HIGHWAY DRAINAGE IMPROVEMENTS
PROJECT NO. 83C-02-01
MAP SHOWING PARCELS 4 & 5 AND CONSTRUCTION PARCELS C-3 & C-4
AT KAHUKU, KOOLAULOA, OAHU, HAWAII

HONOLULU, HAWAII
January 11, 2001

SCALE: 100 0 100 200

APPROVED:
CADASTRAL ENGINEER

APPROVED:
FOR: ADMINISTRATOR, HIGHWAYS DIVISION



NO.	REVISION
2	Parcel 2 and Construction Parcel C-2 revised.
1	Title block revised with new project title.

FIGURE 1-4
Kii Bridge

SCALE AS NOTED

Kamehameha Highway Drainage Improvements
Vicinity of Kahuku Hospital, Oahu, Hawaii
State Department of Transportation, Highways Division

R.M. TOWILL CORPORATION
May 2001

Source: State Dept. of Transportation,
Highways Division, Jan. 2001

ad to
er Treatment
Campbell
e Refuge

1095

Lot 962 (Map 108)
Remainder Parcel 2 (Rev.1)=39.730 Acs.
Owner: James Campbell Trust Estate
T.M.K: 5-6-02:21

Application
(Rev.1) 2 6766 Sq. Ft. or 0.155 Ac.
(Rev.1) C2 18,160 Sq. Ft. or 0.417 Ac.
331° 00'
349.88
ass Road
302.65
302.92
674.57
310° 56' 30"
05.57 N
75.03 E
BRIDGE
630.00
HIGHWAY (F.A.P. 3-E)
To Laie
5066.85
254.07
℄ Easement (25 ft. wide)
40° 56' 30"
75.00
Lot 1158 (Map 135)
000 Sq. Ft.
r 0.207 Ac.

tion Parcel	C.A.	1/19/01
roject title.	C.A.	2/12/01
	APPROVED:	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

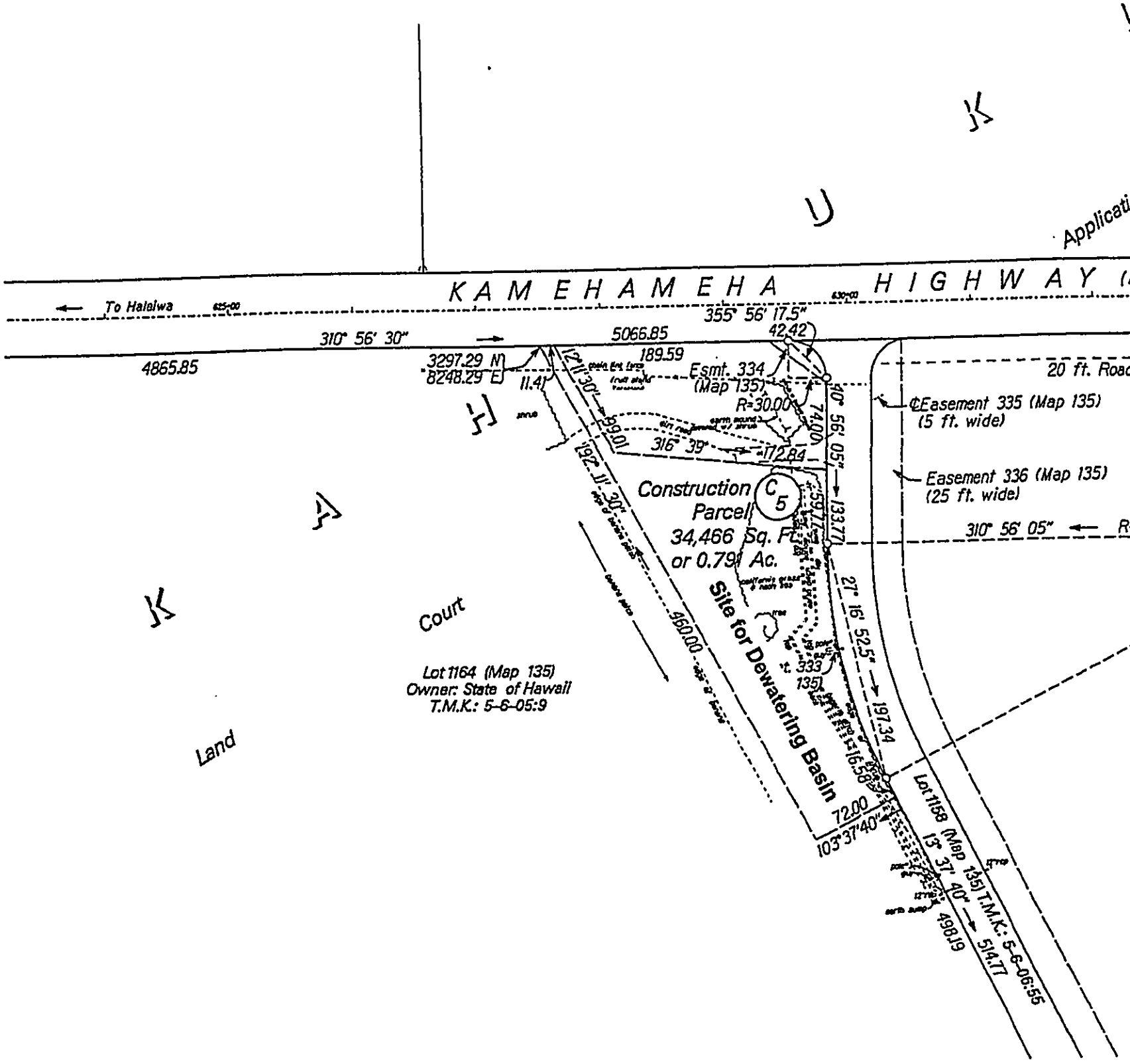
RIGHT OF WAY MAP
KAMEHAMEHA HIGHWAY DRAINAGE IMPROVEMENTS
(VICINITY OF KAHUKU HOSPITAL AND REPLACEMENT OF KII BRIDGE)
PROJECT NO. 83C-02-01
MAP SHOWING PARCELS 1, 2, & 3 AND CONSTRUCTION PARCELS C-1 & C-2 AT KAHUKU, KOOLAULOA, OAHU, HAWAII

HONOLULU, HAWAII
January 11, 2001

SCALE: 100 0 100 200

APPROVED:
CADASTRAL ENGINEER

APPROVED:
FOR: ADMINISTRATOR, HIGHWAYS DIVISION



NOTE:
Origin of Azimuths: "Puuki" △
Coordinates referred to: "Puuki" △

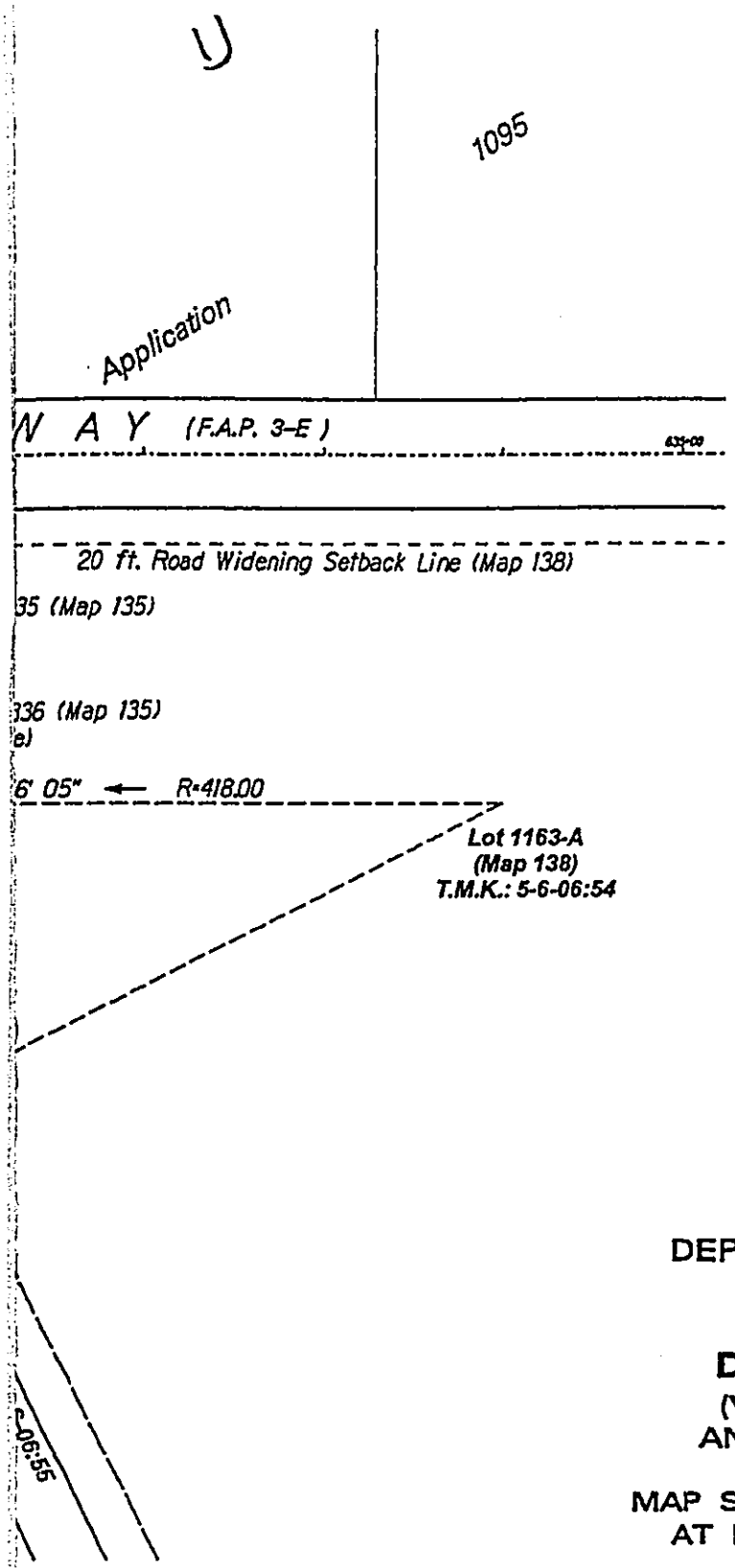


FIGURE 1-5
Dewatering Basin - Kii Bridge

SCALE AS NOTED

Kamehameha Highway Drainage Improvements
Vicinity of Kahuku Hospital, Oahu, Hawaii
State Department of Transportation, Highways Division

R. M. TOWILL CORPORATION
Sept 2001

Source: State Dept. of Transportation,
Highways Division, Sept. 2001

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

KAMEHAMEHA HIGHWAY
DRAINAGE IMPROVEMENTS
(VICINITY OF KAHUKU HOSPITAL
AND REPLACEMENT OF KII BRIDGE)
PROJECT NO. 83C-02-01
MAP SHOWING CONSTRUCTION PARCEL C-5
AT KAHUKU, KOOLAULOA, OAHU, HAWAII

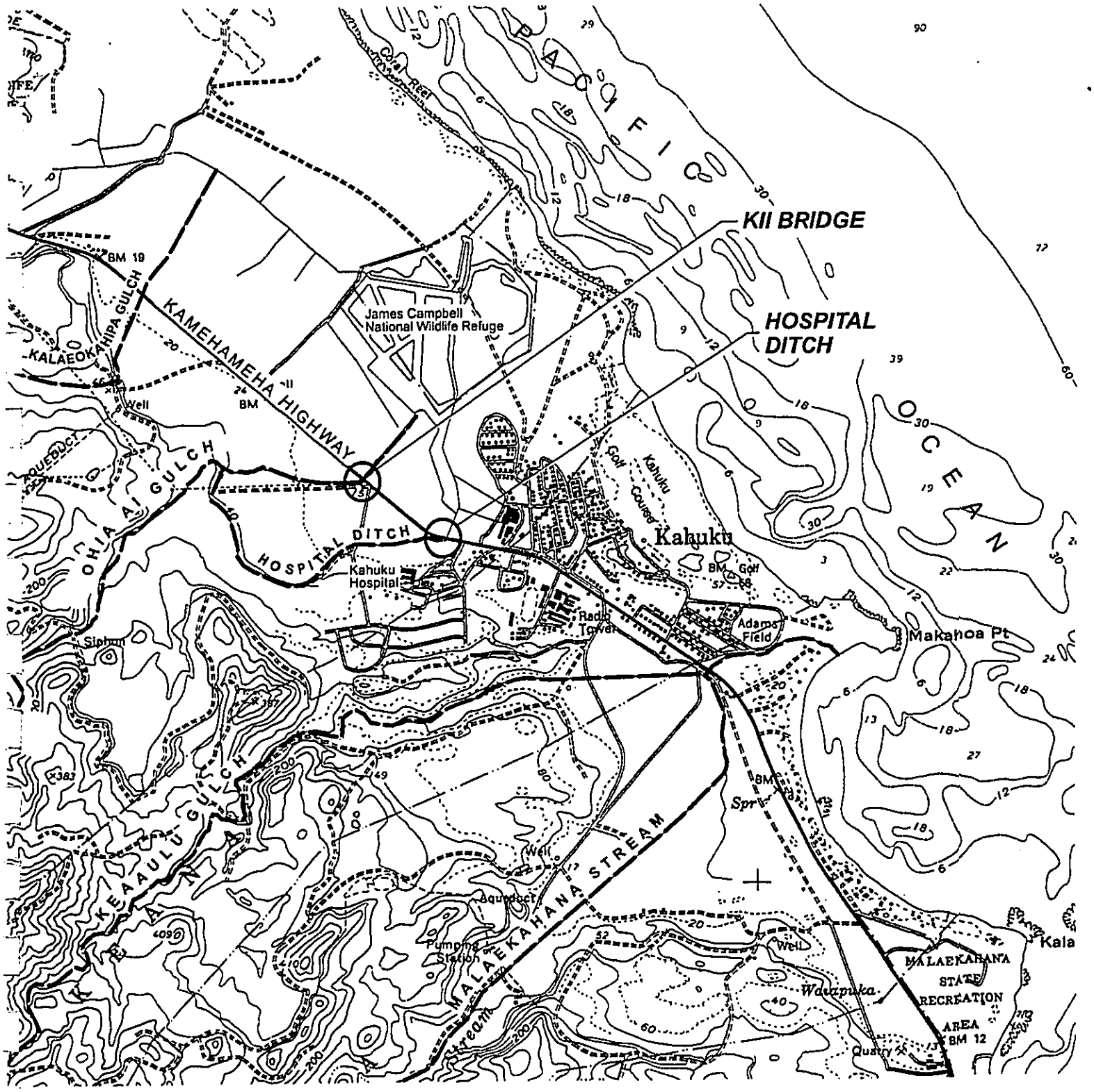
HONOLULU, HAWAII
JULY 18, 2001

SCALE: 100 0 100 200

APPROVED:

CADASTRAL ENGINEER

P.H. 5-C



Note:
Oio Gulch and Hoolapa Gulches are located west; Omao Gulch is located east, off map.

FIGURE 1-6
Drainageways Map

2 1 0 2
THOUSAND FEET

Kamehameha Highway Drainage Improvements
Vicinity of Kahuku Hospital, Oahu, Hawaii
State Department of Transportation, Highways Division

R.M. TOWILL CORPORATION
May 2001

located west of the project sites, has been subject to chronic, annual flooding due to the low lying surrounding land as well as the relatively high rainfall in Kahuku. The elevation of Kamehameha Highway is higher than the ground where it floods the high school, so the highway acts as a dam.

Major problems associated with flooding can be traced back to the history of land use by various land owners and tenants including Kahuku Sugar Plantation and others. Most of the former sugar lands have since been graded or modified for diversified agricultural uses including aquaculture and truck crops. The U.S. Fish and Wildlife Service (USFWS) controls the James Campbell National Wildlife Refuge and has similarly modified the site. It is believed that the cumulative result of these changes over time, have modified the existing drainage patterns.

Flood waters crossing Kamehameha Highway traverse the area makai of the highway where it eventually reaches waters of the Pacific Ocean along the shoreline. Waters that cannot reach the ocean collects in streams and temporary ponds. The flood flows are large and a means of conveying flood waters to the ocean will eventually be needed to relieve flooding problems at Kahuku Town and along Kamehameha Highway. (Preliminary Analysis for the Kahuku Regional Drainage Master Plan, 1998).

The Preliminary Analysis for the Kahuku Regional Drainage Master Plan proposes in the future to direct storm runoff from the uplands through Kahuku Village using a series of lined concrete or graded and grassed drainage swales to existing ocean outlets and to a depression in the sand dunes next to the existing Kahuku Golf Course.

1.2 PURPOSE OF ENVIRONMENTAL ASSESSMENT

This Environmental Assessment (EA) is prepared pursuant to the requirements of Chapter 343, Hawaii Revised Statutes (HRS), and State Department of Health, Hawaii Administrative Rules (HAR), Title 11-200, implementing rules. DOT, Highways Division, is the accepting authority for this document under Chapter 343, HRS. This document provides a written evaluation to determine whether the proposed action may have a significant environmental effect. As appropriate, mitigation measures to address the potential for negative adverse environmental impacts are proposed.

Additional environmental documentation to fulfill the requirements of the National Environmental Policy Act (NEPA) for federal projects will be completed in a separate document by the Federal Highway Administration (FHWA).

The primary benefit of the project will be an improvement of existing drainage conditions along Kamehameha Highway at Hospital Ditch and Kii Bridge. The project will help to prevent future overtopping due to a 100-year design storm and promote drainage in accordance with the Kahuku Regional Drainage Master Plan. Secondary benefits will be an enhancement of safety for the traveling public through provision of a clear, unobstructed travelway. Safety upgrades will include installation of new end treatments at Kii Bridge and Hospital Ditch, and provision of sidewalk areas that incorporate safety standards in the design.

1.3 PROJECT LOCATION

The proposed project is located along Kamehameha Highway (Route 83, Mile Post 15.2 and 15.4) in Kahuku, in the district of Koolauloa, on the island of Oahu. The project is located west of the Kahuku Sugar Mill at the existing Hospital Ditch and Kii Bridge crossings. Kamehameha Highway (Route 83) is the main coastal thoroughfare on the island of Oahu. The city of Honolulu is approximately 35 miles away on the south central portion of the island. The project area includes approximately 5 to 6 acres of land on the mauka and makai sides of the Hospital Ditch and Kii Bridge.

The project area involving Hospital Ditch includes Kamehameha Highway and adjacent portions of TMKs: 5-6-02:25; 5-6-06:54; and, 5-6-02:17. All adjacent parcels are owned by the James Campbell Trust Estate. The project area involving Kii Bridge includes the highway and adjacent portions of TMKs: 5-6-02: 01 and 21, owned by the James Campbell Estate Trust; and 5-6-05:09, owned by the State of Hawaii.

Hospital Ditch is directly west (makai) of Pualalea Place and consists of a mowed lawn around the existing bus stop and within the existing highway right-of-way, and fallow, overgrown banana fields. The drainageway of Hospital Ditch is a channelized soil embankment ditch.

The area surrounding Kii Bridge contains mowed grass within the highway right-of-way, a number of large ironwood trees bordering the highway, and active banana fields. On the northern side of the channelized drainageway are active shrimp ponds. The proposed temporary bypass road at Kii Bridge will also intersect a main, coral paved access road to the James Campbell National Wildlife Refuge.

1.4 REQUIRED PERMITS AND CLEARANCES

The proposed action requires various Federal, State, and City and County of Honolulu permits which are in addition to the environmental disclosure requirements of Chapter 343, HRS. These permits include the U.S. Army Corps of Engineers (COE) Section 404 Permit (Department of the Army Permit), Section 401 Water Quality Certification (WQC), Coastal Zone Management Federal Consistency Determination (CZM FEDCON), Stream Channel Alteration Permit (SCAP), National Pollutant Discharge Elimination System (NPDES) Permits, Section 106, National Historic Preservation Act Clearance, and a City and County of Honolulu Special Management Area (SMA) Permit.

1.4.1 U.S. ARMY CORPS OF ENGINEERS SECTION 404 PERMIT (DEPARTMENT OF THE ARMY PERMIT)

The U.S. Army Corps of Engineers has jurisdiction over "dredge and fill" actions in U.S. waters which is expected to include the Hospital Ditch and Ohia Stream areas. Certain discharges specified in 33 CFR Part 330 are permitted under a "Nationwide Permit" system, while other categories require regional and individual permits.

Coordination with the Corps of Engineers has been initiated to ascertain permitting requirements. The proposed project is expected to be classified under the Nationwide Permits program based on criteria established for Permit No. 3 (Maintenance) and Permit No. 33 (Temporary Construction, Access and Dewatering) (1996 Federal Register, Final Notice of Issuance, reissuance, and Modification of Nationwide Permits, 61 FR 65874).

The appropriate Department of the Army permit will be prepared and filed pending a receipt of determination from the Corps of Engineers.

1.4.2 SECTION 401 WATER QUALITY CERTIFICATION

Section 401 of the U.S. Clean Water Act (33 CFR 1341), requires that a water quality certification (WQC) be obtained under certain circumstances for any applicant for a federal license or permit which allows or permits discharges into navigable waters due to the construction or operation of certain types of facilities. The 401 WQC must be obtained from the State where specified types of discharges take place or originates. The State Department of Health, Clean Water Branch, is the authorizing agency for the Section 401 WQC in Hawaii.

The proposed project will involve discharges of construction related materials at both Kii Bridge and Hospital Ditch. It is anticipated, therefore, that based on the requirement for a Department of the Army Permit, that a Section 401 WQC would be needed.

1.4.3 COASTAL ZONE MANAGEMENT (CZM) CONSISTENCY DETERMINATION

Section 307(c)(1) of the Coastal Zone Management Act (CZMA) requires a consistency determination of the proposed action by the U.S. Army Corps of Engineers in relation to the federally approved State CZMP. The State Coastal Zone Management Office must agree with the determination that the proposed action is consistent with the State of Hawaii's CZMP and/or provide specific conditions on the proposed action to place it in consistency.

Administration of the CZM Consistency Determination is through the Office of Coastal Zone Management, within the State Department of Business, Economic Development, and Tourism (DBEDT).

1.4.4 STREAM CHANNEL ALTERATION PERMIT (SCAP)

Chapter 174C, HRS, authorizes the regulation and permitting of activities that propose to alter stream channels and flow characteristics in the State of Hawaii. The State Commission on Water Resource Management (CWRM) regulates actions that propose to alter stream channels and flows under Title 13, Chapter 169-50, Hawaii Administrative Rules (HAR) of the State Commission on Water Resource Management for Stream Channel Alteration Permits. The regulations state that channel alterations that would adversely affect the quantity and quality of the stream water or the

stream ecology should be minimized or not allowed. Where instream flow standards have been established, no permit shall be granted for any channel alteration that diminishes the quantity or quality of the stream water below the minimum standards.

1.4.5 NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMITS

Section 402 of the Federal Clean Water Act, regulates discharges of certain storm- and non-storm water into waters of the U.S. as a result of development or environmental clean-up activities. Regulation of NPDES related discharges in the State of Hawaii are delegated by the Environmental Protection Agency (EPA) to the State Department of Health, Clean Water Branch. State regulations governing NPDES rules are in Title 11, Chapter 55, HAR, Water Pollution Control.

NPDES permits which are expected based on proposed construction activities include:

NPDES, Notice of Intent (NOI) for Discharges of Stormwater Associated with Construction Activity, Form C - The combined acreage of both project sites are approximately ±5 to ±6 acres. Both inland waterways and coastal waters of Kahuku may be subject to construction activity related discharges in stormwater in the form of increased, but temporary, siltation and turbidity. The NPDES permit will require that project Best Management Practices (BMPs) be used to reduce and minimize potential impacts associated with these discharges.

NPDES, Notice of Intent (NOI) for Construction Dewatering, Form G - Construction within Hospital Ditch and Ohia Stream is anticipated to require construction dewatering to maintain dry working conditions for the installation of drainage structures. The discharge of dewatering effluent into waters of the State will require sufficient treatment of the effluent to maintain state water quality standards. BMPs will also need to be specified as a means of minimizing the potential for dewatering associated impacts.

1.4.6 SECTION 106, NATIONAL HISTORIC PRESERVATION ACT

The proposed action at Ohia Stream (Kii Bridge crossing) is regulated by Section 106 of the National Historic Preservation Act (NHPA) and the implementing regulations of 36 CFR 800. Section 106 requires that Federal agencies take into account the effects of their undertaking on historic properties. Consultation with affected parties and the State Historic Preservation Officer (SHPO) is used to facilitate the identification and provide an assessment of historic properties potentially affected by the undertaking. As appropriate, measures are proposed to avoid, minimize, or mitigate any adverse effects on historic properties.

Preliminary consultation to complete the requirements of Section 106 have been initiated by the State DOT, Highways Division. Once appropriate parties have been identified, they will be notified to further identify historic properties or sites and whether there will be adverse effects. As required, adverse effects will be addressed through avoidance or use of mitigation measures. Where appropriate, the Advisory Council on Historic Preservation will be consulted for guidance.

1.4.7 CITY AND COUNTY OF HONOLULU SPECIAL MANAGEMENT AREA PERMIT

The State of Hawaii Chapter 205A, HRS, authorizes the counties to establish Special Management Area (SMAs) to protect and preserve the coastal zone in Hawaii. The City and County of Honolulu regulates actions taking place in the SMA under Chapter 25, Revised Ordinances of Honolulu (ROH). The City and County of Honolulu, Department of Planning and Permitting administers the SMA Permit process to control development in the SMA, minimize effects to sensitive ecological areas, and avoid permanent loss of valuable coastal resources. The permit process is used to preserve scenic views and ensure public access to beaches, coastal recreational areas, and natural reserves. Actions affecting wetland areas, including dredging, also are regulated in this process. The makai portion of the proposed project area is located in the SMA and will require filing of this permit.

CHAPTER 2
PROJECT DESCRIPTION AND ALTERNATIVES CONSIDERED

2.1 PROPOSED ACTION

The proposed project involves the construction of drainage improvements along Kamehameha Highway at Kii Bridge and Hospital Ditch to alleviate flooding along the highway and ponding in the area surrounding the Hospital Ditch. The proposed improvements will involve the following:

1. Major work at the existing Hospital Ditch will involve construction of a temporary two-lane bypass road along the makai side of Kamehameha Highway; installing multi-cell concrete box culverts; and, possibly raising the roadway at the proposed culvert location.

2. Major work at the existing Kii Bridge will involve construction of a temporary two-lane bypass road along the makai side of Kamehameha Highway, and replacement of the existing 38 foot long bridge.

3. Underground and overhead utilities will be relocated. Existing utilities are located along the mauka side of Kamehameha Highway. The temporary relocation of an existing bus shelter, located on the makai side of the highway near the T-intersection of the highway with Pualalea Place, east of Hospital Ditch, will also be completed.

4. Related work will involve construction of dewatering basins and site restoration, and relocation of fresh fruit vending stands along Kamehameha Highway that are affected by the project. Relocation of the fresh fruit vending stands will be subject to 49 Code of Federal Regulations (CFR), Part 24, Uniform Relocation Assistance and Real Property Acquisition for Federal and Federally Assisted Programs.

In the future, two new floodways are proposed (not a part of this Environmental Assessment) which will be created by possibly relocating the access road to the James Campbell National Wildlife Refuge (JCNWR) to the west of the new Kii Bridge. This will be achieved in the future with a new

access road which will function as a berm to keep Ohia Stream and Hospital Ditch floodwaters to the east of the refuge for the smaller storms. Consultation and cooperation with the U.S. Army Corps of Engineers (COE) and the U.S. Fish and Wildlife Service (USFWS) has been initiated to ensure safety and protection of the JCNWR.

2.2 CONSTRUCTION ACTIVITIES

2.2.1 HOSPITAL DITCH CROSSING (see **Figure 1-3**)

Work will consist of constructing a paved two-lane bypass road on the makai side, possibly raising Kamehameha Highway, installing multi-celled box culverts beneath Kamehameha Highway, and, removing the bypass road.

Construction of the temporary bypass road will include: excavation; construction of asphalt concrete (A.C.) pavement structure and striping; installation of temporary roadway signs and lighting; installation of temporary drainage culverts or an acro-panel bridge at the ditch crossing; relocation of an existing bus shelter; and, construction of pavement transitions to Kamehameha Highway.

Construction of the drainage improvements will include: relocation of existing utility poles and overhead lines; relocation and/or adjusting placement of existing utilities; trenching; installation of multi-celled box culverts, constructing inlet and outlet headwalls; backfilling; the possible raising of Kamehameha Highway to accommodate the new drainage structures; reconstruction and restoration of the A.C. pavement structure; removal of existing guardrails and installation of new metal guardrails and concrete end treatments; restriping; and, replacement of a bus shelter at its original location immediately north of the T-intersection of the highway with Pualalea Place.

2.2.2 KII BRIDGE CROSSING (see **Figure 1-4**)

Work will consist of constructing a temporary paved two-lane bypass road on the makai side, removing the existing Kii Bridge and constructing a new concrete bridge, and restoration of the bypass road site to preconstruction conditions.

Construction of the temporary bypass road will include: excavation; construction of A.C. pavement structure and striping; installation of temporary roadway signs and lighting; use of an existing cane

haul road located on the makai side as part of the temporary bypass road; and, construction of pavement transitions to Kamehameha Highway.

Construction of the replacement Kii Bridge and drainage improvements will involve excavation of the existing Ohia Stream channel, constructing a new concrete bridge, structural backfilling, relocation and/or adjusting placement of existing utilities, reconstruction and restoration of the A.C. pavement structure, removal of existing guardrails and installation of new metal guardrails and concrete end treatments and, restriping the roadway.

2.2.3 RELATED WORK

Improvements at both the Hospital Ditch and Kii Bridge crossing will involve acquisition of construction parcels for the bypass roads, restoration of the construction parcel to original preconstruction conditions, acquisition of additional right-of-way and/or drainage easements, and relocation of fresh fruit vending stands.

Preliminary hydraulic calculations indicate that the proposed design at both sites will be capable of accommodating a 100-year flood. However, the proposed improvements will not resolve the larger regional flooding of the area until all other portions of the Kahuku Regional Drainage Master Plan are completed (the proposed project will complete two parts of the Regional Drainage Master Plan).

2.3 ALTERNATIVES TO THE PROPOSED ACTION

2.3.1 NO ACTION ALTERNATIVE

The No Action Alternative involves no further action to develop the proposed drainage improvements at Hospital Ditch and Kii Bridge. No further action would mean that the City and County of Honolulu, State of Hawaii, and Federal government would incur no further planning and development costs. The existing situation involving inadequate drainage would persist, with the potential for further flood damage to area residences and public and private property and resources. Because the drainage problem in the Kahuku area is chronic, it is likely that during a severe storm event, such as the 1991 Kahuku Flood, that there will be a continuing threat to public health, safety, and welfare. Emergency clean up and rescue costs could be incurred, as well as reconstruction costs for any damage to public facilities, such as roads, schools, and parks.

The No Action alternative is rejected from further consideration because it does not address the timely need for drainage improvements along Kamehameha Highway in Kahuku. Flooding and associated damage along the highway is expected to continue until appropriate drainage controls are constructed.

2.3.2 PREFERRED ALTERNATIVE

The preferred alternative involves construction of the proposed project and is the only alternative that addresses the existing situation involving flooding and ponding at Hospital Ditch and Kii Bridge. The existing Hospital Ditch crossing at Kamehameha Highway is a 5 feet by 8 feet reinforced concrete box culvert. The culvert is not large enough to convey the 100-year flood under Kamehameha Highway. The existing culvert will be replaced with appropriately sized culverts to convey the 100-year design flood under the highway.

The existing Ohia Stream crossing at Kamehameha Highway is a 30 foot wide concrete bridge (Kii Bridge). A new bridge will replace the existing bridge to convey the 100-year design flood.

2.4 PROJECT SCHEDULE AND ESTIMATED COST

The proposed project is planned as a design-build contract. The anticipated project advertisement is in the first calendar quarter of 2002. Project award is estimated to occur in the 3rd quarter of 2002, and construction start is estimated to occur in the 4th quarter of 2002 or in the 1st quarter of 2003. The design-build contract from the time of award to the time of completion is anticipated to have a total duration of 24 months.

Project cost for the Hospital Ditch improvements is estimated at $3 million, and for Kii Bridge it is estimated at $5 million. Multiple funding sources will be utilized, as noted, including City and County of Honolulu Vision Funds, HUD Funds, and FHWA Funds.

CHAPTER 3
DESCRIPTION OF THE AFFECTED ENVIRONMENT

3.1 PHYSICAL ENVIRONMENT

3.1.1 CLIMATE

The climate in the Kahuku area is typical of windward Oahu. The summer months from July to October are drier and warmer, while the winters are usually wetter and cooler. The area is subject to prevailing northeast tradewinds with average velocities between 14 to 16 miles per hour for a majority of the year. Strong gusts of 20 to 25 miles per hour occur intermittently. Tradewinds prevail 90 percent of the time during the summer and 50 percent in the winter. The area also experiences Kona (Southern) winds and storms, particularly during the winter months.

Average temperatures in Kahuku vary depending on the seasons in Hawaii. Temperatures in the drier summer months tend to be higher and range from an average of 70°F to 85°F (University of Hawaii, 1998). Temperatures range from an average of 62°F to 75°F in the cooler winter months (ibid).

Average rainfall in the Kahuku area is between 39 and 59 inches per year (Giambelluca et al, 1986). The upper reaches of the Koolau Mountains receive increased amounts of rain from the cooling of moisture-laden cloud systems. A third of the year the days are clear, a third of the year the days are partly cloudy, and the remainder of the year the days are overcast.

3.1.2 GEOLOGY AND TOPOGRAPHY

The proposed project site at Kahuku is located in the coastal plain at the northeastern tip of the Koolau Mountain Range on the island of Oahu. The Koolau Mountain Range is the eroded remnant of a major shield volcano, and forms the rugged interior boundary of windward Oahu from Makapuu at the southeast to Kawela and Kahuku at the north. The rugged topography of the area, including deep gulches and high sea cliffs, was formed as persistent rainfall and streams eroded basalt lava flows. During the long period of volcanic quiescence and erosion, large coastal plains

were formed on windward Oahu by the deposition of sediments on coral reefs and changes in sea level.

The project area lies in the central area of the coastal plain encompassing the area bounded by Kahuku Point at the north, Malaekahana State Recreation Area at the south, and the foothills of the Koolau Mountain Range to the west. The upper elevations of the area are steep and serve as a watershed for the northeastern portion of the Koolau Mountains. Numerous gulches cut deeply through the area from the mountains to the low-lying floodplain. The low-lying areas are generally flat and poorly drained during storm events, particularly makai of Kamehameha Highway (Route 83). There are two perennial streams (Oio and Malaekahana) and various intermittent streams and gulches (Hina, Lamaloa, Keaaulu, Keana, and Ohia Ai) in the Kahuku area. The Oio Stream is located at the western portion of the floodplain and runs from the upper reaches of the Koolau Mountains (approximately 1,900 feet) to the sea at the tip of Oahu. Malaekahana Stream is at the easternmost side extending from approximately 1,500 feet at the upper reaches of the Koolaus in the Kahuku Forest Reserve, to the sea at the southern edge of Kahuku approximately one-half mile from Makahoa Point.

3.1.3 WATER RESOURCES AND HYDROLOGY

Typically, waters draining off the interior slopes simply flow to low areas on the plain, thereby forming coastal marshes. Springs arising on the plain, some artesian, contribute to freshwater resources in this area. However, the low slopes of the broad plain and the fact that storms can occasionally deposit large quantities of rainfall over a short period of time, produces flooding in the area. Consequently, some watercourses across the plain have been trenched and diked to minimize flooding on the surrounding plain. Hospital and Kii ditches are two such features at the western edge of Kahuku Town.

Both ditch features eventually feed into channels located between a cluster of diked ponds that were built as settling ponds for mill wash-water from the nearby former Kahuku Sugar Mill. These ponds have more recently been converted in the James Campbell National Wildlife Refuge (JCNWR) managed by USFWS. The ditch system drains toward the Kii Outlet Pump in the refuge and excess water is pumped into Kii outlet, an opening through the coastal dunes which allow flows into the

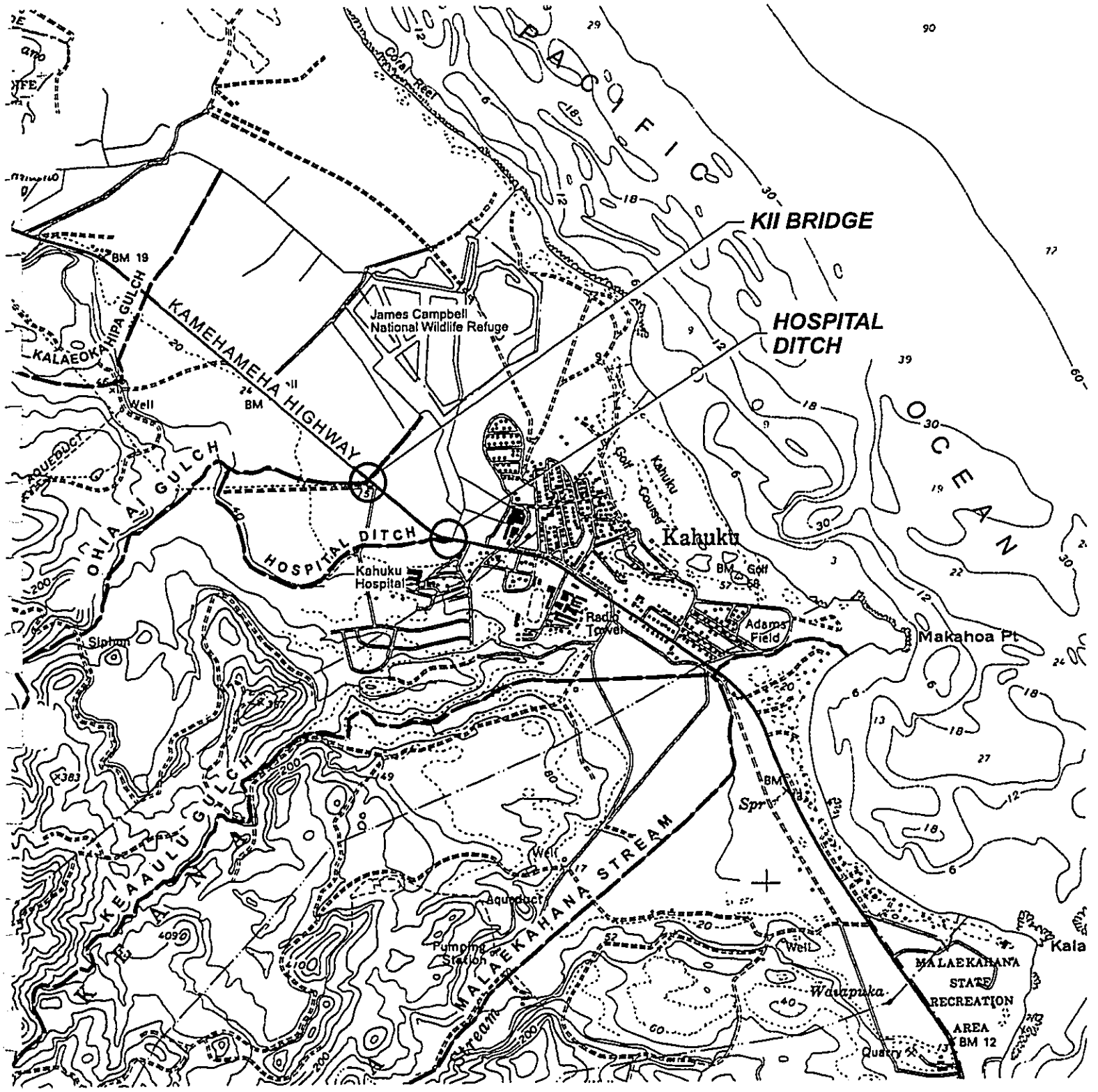
Pacific Ocean (**Appendix A** - Aquatic Resources Survey for Hospital Ditch and Kii Ditch at Kahuku, Oahu, AECOS 2001).

While some coastal marshes still remain on the Kahuku coastal plain, much of the area has been converted to agricultural and aquacultural uses.

Hospital Ditch is located along the makai edge of a large mowed field on the north side of Kahuku Hospital (**Figure 3-1**, Surface Hydrology). The ditch is not associated with any substantial gulch or drainage feature in the mountains behind Kahuku. The ditch holds water that may be leakage or overflow from an irrigation system serving the area and/or from springs. Keaaulu Gulch, immediately mauka, drains into Malaekahana Stream (State ID No. 3-1-06) discharging on the eastern end of Kahuku Town. The next gulch westward is Ohia Ai (no State ID number), which drains toward Kii Ditch. Thus, Hospital Ditch is a man-made feature related to the inland irrigation system that serves a floodwaters drainage role (AECOS, 2001).

Kii Ditch arises from several small gulches and Ohia Ai Gulch that extends to the ridgeline of the Koolau Mountain at an elevation of a little over 1600 feet. Like Hospital Ditch, this feature is in the lowlands, is man-made, and contains ditches and a diked channel that flows through channels around the wetland ponds of JCNWR. Measurements of runoff contributions to the refuge made by Hunt and De Carlo (1999) between 1996 and 1998, established that approximately 89 percent of surface flows into JCNWR were accounted for by the discharge from Ohia Ai Gulch.

The State of Hawaii classification system for perennial streams (Hawaii Cooperative Park Service Unit, 1990) has no code designation for this system of drainages that eventually flow into the Pacific Ocean through Kii outlet. Despite the questionable sources of the water with respect to intermittent versus perennial stream flows and irrigation water transfers across watersheds, the reality is that the man-made outlet at Kii represents a perennial flow of water into the ocean derived at least in part from springs (AECOS 1987; Hunt and DeCarlo 1999). Just as the exclusion of many intermittent flowing streams throughout the Hawaiian Islands limits the usefulness of the coding system for cataloging aquatic resources (AECOS 2000), the exclusion of wetlands not associated with perennial streams misses other potentially important aquatic resources (AECOS 2001).



Note:
Olo Gulch and Hoolapa Gulches are located west; Omao Gulch is located east, off map.

FIGURE 3-1
Surface Hydrology

2 1 0 2
THOUSAND FEET

Kamehameha Highway Drainage Improvements
Vicinity of Kahuku Hospital, Oahu, Hawaii
State Department of Transportation, Highways Division

R.M. TOWILL CORPORATION
May 2001

3.1.4 WATER QUALITY

Water quality measurements were made in two locations on each ditch, one upstream of Kamehameha Highway (Station 1) and one downstream (Station 2). A full suite of basic water quality parameters was measured in order to characterize the aquatic environments present. In all cases, some flow of water was occurring at the time of the sampling. Flow in Kii Ditch was estimated to be on the order of 5-6 liters per minute (lpm) (1.3-1.6 gallons per minute) and flow in Hospital Ditch was about half that volume[1]. At all of the stations except Kii Station 1, the samples were collected in essentially large pools. The water quality results are presented in **Table 3-1.**

TABLE 3-1
Water Quality Characteristics of the Lower Reaches of
Hospital and Kii Ditches from Samples Obtained May 20, 2001

	Time	Temp. (°C)	pH	DO (mg/l)	DO Sat. (%)	Sal.. (o/oo)	Turbidity (ntu)
Hospital Ditch							
Sta. 1 *04-20-01*	*1135*	*22.7*	*7.3*	*2.62*	*31*	*2*	*7.29*
Sta. 2 *04-20-01*	*1110*	*22.2*	*7.2*	*2.02*	*24*	*2*	*9.21*
Kii Ditch							
Sta. 1 *04-20-01*	*1200*	*23.1*	*7.0*	*2.23*	*26*	*0*	*1.84*
Sta. 2 *04-20-01*	*1215*	*25.1*	*7.3*	*5.88*	*72*	*0*	*13.0*

		TSS (mg/l)	Ammonia (mg N/l)	Nitrate + nitrite (mg N/l)	Total N (mg N/l)	Ortho-P (mg P/l)	Total P (mg P/l)
Hospital Ditch							
Sta. 1 *04-20-01*	*1135*	*6.1*	*55*	*185*	*353*	--	*105*
Sta. 2 *04-20-01*	*1110*	*7.8*	*53*	*239*	*490*	--	*180*
Kii Ditch							
Sta. 1 *04-20-01*	*1200*	*1.3*	*69*	*2290*	*2360*	--	*26*
Sta. 2 *04-20-01*	*1215*	*8.8*	*136*	*887*	*1100*	--	*36*

Source: AECOS, May 2001

The results of the water quality testing indicates that turbidity is generally high. Conditions of low oxygenation in the samples and another close to the JCNWR boundary (well downstream of the highway) were noted. Nitrates were also noted to be elevated, especially nitrogen compounds in Kii

[1] A reading of 1.59 was made off the USGS/USFWS staff gage at the gauging station on Hospital Ditch.

Ditch and phosphorus compounds in Hospital Ditch. It is possible that these values reflect agricultural activities upslope or more locally (AECOS 2001).

The presence of the measured nutrients encourage weedy growth in the stream bed as well as the extensive growth of floating plants observed in the area. Nutrients also encourage phytoplankton development in the slow flowing waters where or when floating plants do not completely cover the water surface. This eutrophication of the water body leads to wide swings in dissolved oxygen (DO) content, from possibly very high in the daylight, to anoxic at night, with adverse impacts on aquatic animals. Eventually high nutrient content or the organic material generated by the high nutrient subsidies to the aquatic plant communities are swept out of the system at Kii Outlet at the ocean, contributing to coastal pollution.

3.1.5 SOILS

Soils in the area are described as Waialua silty clays (WkA), 0 to 3 percent slopes that typically occur on smooth coastal plains adjacent to the ocean. Waialua silty clay is generally used for sugarcane, truck crops and pasture (Foote et al 1972). (**Figure 3-2**, Soils).

3.1.6 NATURAL HAZARDS

Natural hazards include floods, tsunamis, hurricanes, earthquakes, and other natural events that may occur at the project area. These are assessed to determine how they may affect conditions at the proposed project site.

FLOODS

According to the FEMA Flood Insurance Rate Map, the project sites lie within the Zone AE floodway (**Figure 3-3**, Flood Zone Map). This area is designated as a flood hazard area subject to inundation by the 100 year flood.

The Kahuku area, in general, experiences periodic flash floods because of its location in the coastal floodplain. Most flooding is confined to areas makai of Kamehameha Highway, but flood events have caused damage to areas mauka of the highway including Kahuku High School, residences, and have caused loss of access along Kamehameha Highway to important facilities such as the hospital.

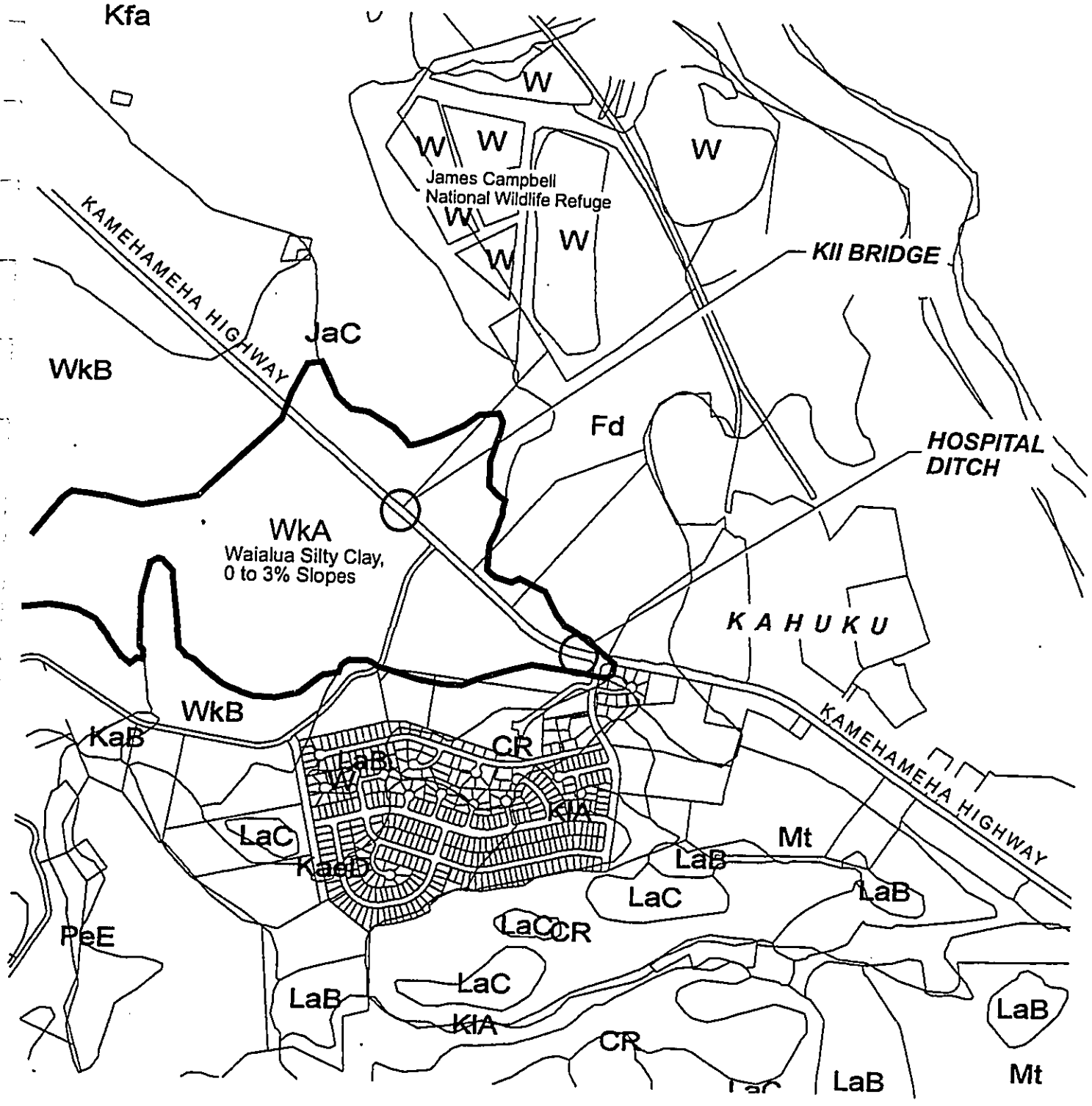
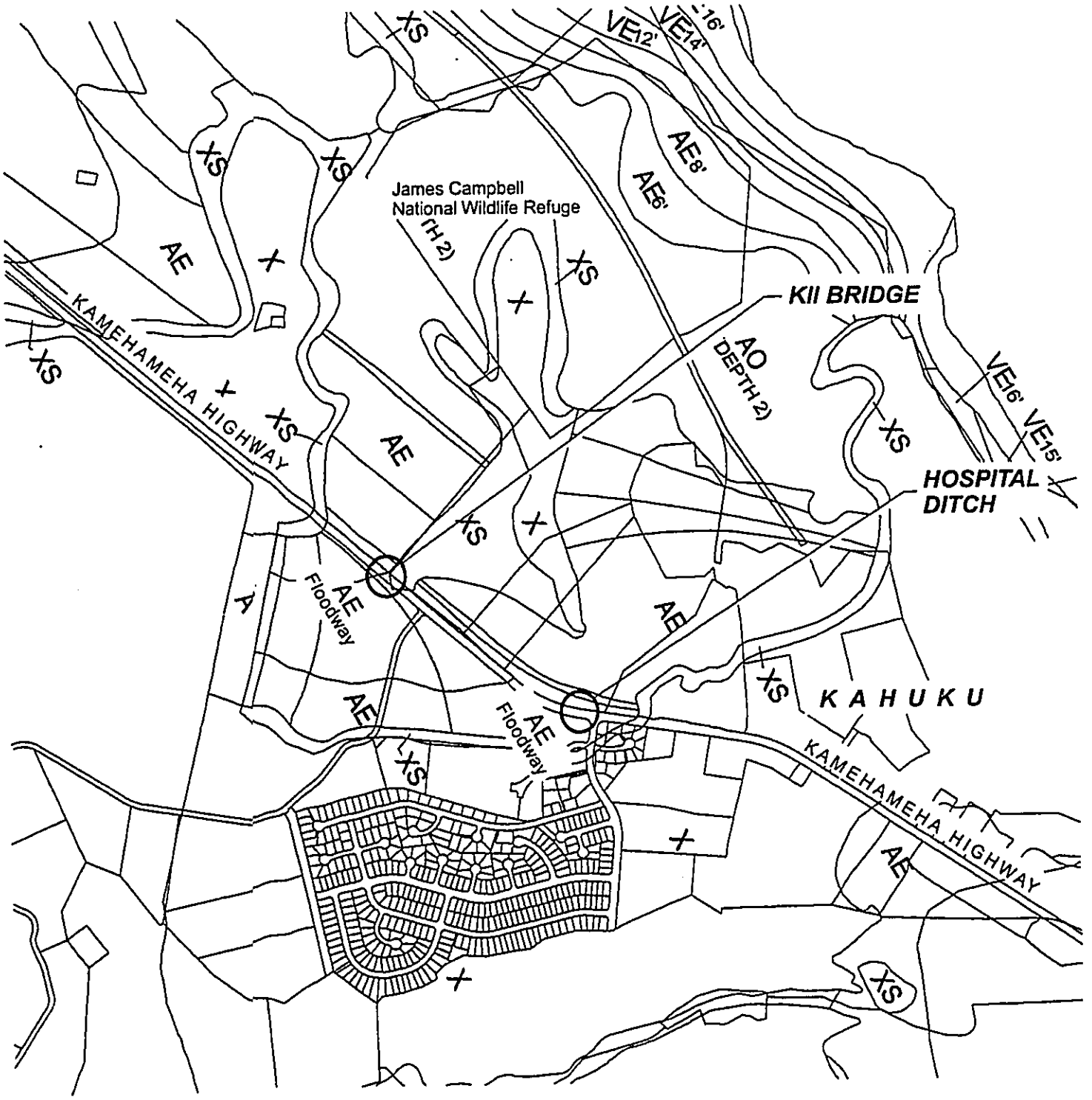


FIGURE 3-2
Soils

1 0.5 0 1
THOUSAND FEET

Kamehameha Highway Drainage Improvements
Vicinity of Kahuku Hospital, Oahu, Hawaii
State Department of Transportation, Highways Division

R.M. TOWILL CORPORATION
May 2001



FLOOD ZONE LEGEND

Special Flood Hazard Areas Inundated by 100-Year Flood
ZONE A - No base flood elevations determined.
ZONE AE - Base flood elevations determined.
ZONE VE - Coastal flood with velocity hazard (wave action); base flood elevation determined.

Other Flood Areas
ZONE X - Areas of 500-year flood; areas of 100-year flood average depths of less than 1 foot or with drainage areas less than 1 sq. Mile; and areas protected by levees from 100-year.

Other Areas
ZONE X - Areas determined to be outside 500-year flood plain.
ZONE DA - undetermined.

FIGURE 3-3
Flood Zone Map

1 0.5 0 1
THOUSAND FEET

Kamehameha Highway Drainage Improvements
Vicinity of Kahuku Hospital, Oahu, Hawaii
State Department of Transportation, Highways Division

R.M. TOWILL CORPORATION
May 2001

Data Source: National Flood Insurance Program, Flood Insurance Rate Map, Panel 5 of 135, 9/4/87 (Map: IDS, Honolulu Digital Maps, 1998)

Kahuku High School has chronic (yearly) flooding problems. The High School is built on low-lying land and a fair amount of the school is lower than the adjoining Kamehameha Highway. The result is that the football field, gymnasium, and high school administrative offices flood because the facilities are lower than Kamehameha Highway. The flooding problem is further worsened because no water runs off the school until Kamehameha Highway is overtopped. The high flood elevations make it impossible to relieve the flooding problems of Kahuku High School because the 100-year flood elevation makai of Kamehameha Highway is higher than the ground where it floods at the high school. Another problem during major floods is that when Kamehameha Highway is overtopped, access to Kahuku Hospital is cut off from communities west of Kahuku such as Haleiwa and Waialua.

The Kahuku area makai of Kamehameha Highway has seen many changes since the days of the sugar plantation. Farmers have graded the area for fields and the USFWS has assumed management of two wildlife refuges. During the course of normal activities, the farmers and USFWS may have inadvertently modified some of the drainage patterns in the area. This has caused concern by the City and County of Honolulu, Public Works Department (now Department of Planning and Permitting) about flooding in the area. The concern is that the extent of flooding previously determined by the U.S. Army Corps of Engineers (COE) and Federal Emergency Management Agency (FEMA) in 1971 may have worsened.

The area provides flowage of floodwaters to the ocean through ditches and overland flow as well as ponding for flood waters that cannot discharge to the ocean through outlets. After the 1991 storm, the Estate of James Campbell opened the Bakahan outlet. The new outlet at Bakahan helps to reduce the flooding problem but does not solve the flooding problems in Kahuku. The flood flows are large and a way to carry flood waters to the ocean is needed to relieve the flooding problems at Kahuku Town and the access road off Kamehameha Highway to the Kahuku Hospital.

The sand dunes along the coast change over time and now block flow to the ocean except in two places, the Kii Outlet and the Bakahan Outlet. According to longtime residents and plantation workers, the sugar plantation used to open other outlets in the sand dunes to the ocean during a major flood. This helped to prevent the type of flooding experienced in 1991 when half of the Kahuku High School grounds and most of Kahuku Town along Kamehameha Highway were inundated with floodwaters. The floodwater could not flow to the ocean so it flooded the area and took hours to drain from the area through the Kii outlet.

TSUNAMIS

Tsunamis are a series of destructive ocean waves generated by seismic activity that could potentially affect all shorelines in Hawaii. Tsunamis affecting Hawaii are typically generated in the waters off South America, the west coast of the United States, Alaska, and Japan. Local tsunamis also are generated by seismic activity in Hawaii.

The State of Hawaii Civil Defense establishes tsunami inundation zones and maps for all coastal areas in Hawaii. The border of the tsunami inundation zone is located makai of Kamehameha Highway in the area of the proposed project (State Civil Defense Tsunami Evacuation Maps).

HURRICANES

The Hawaiian Islands are seasonally affected by Pacific Ocean hurricanes from the late summer to early winter months. These storms generally travel toward the islands from a southerly or southeasterly direction and can dump large amounts of rain with high winds on all islands. The storms generally contribute to localized flooding and coastal storm surges.

The Kahuku area is less vulnerable to the effects of hurricanes than other areas on Oahu because of its location on the windward side. The area, however, can experience heavy rains, high winds, and storm surges along the coast from hurricanes. These events can contribute to the flooding of the low-lying areas makai of Kamehameha Highway.

EARTHQUAKES

Due to its relatively old geologic age, the island of Oahu is not considered particularly prone to seismic activity. Oahu is listed in Seismic Zone 1 on a scale of 1 to 4 under the Uniform Building Code. Zone 1 indicates a place that has the lowest potential for ground motion created by seismic activity.

3.1.7 FLORA AND FAUNA

3.1.7.1 FLORA

The Hospital Ditch location will include a temporary by-pass road and installation of box culverts. A botanical survey of the by-pass road right-of-way on the makai (northern) side of Kamehameha Highway and an approximately one-half acre construction site on the mauka (southern) side of Kamehameha Highway was carried out in April 2001 (**Appendix B** - Botanical Survey Report for the Kamehameha Highway Drainage Improvements Site - Vicinity of Kahuku Hospital, Oahu, Hawaii, Evangeline Funk, Ph.D., Botanical Consultants, April 2001).

The portion of the by-pass right-of-way nearest Kamehameha Highway includes an open mowed area and a bus stop. The Hospital Ditch crosses this area in a makai-mauka direction. The vegetation of the mowed area is made up of many weedy species. Grasses found include pitted beardgrass (Bothriochloa pertusa (L.) A. Camus), Bermuda grass (Cynodon dactylon (L.) Pers.), stinkgrass (Eragrostis cilianensis (All.) Link), several species of Chloris, and Guinea grass (Panicum maximum Jacq.). In addition, common plants such as Bidens alba (L.) DC, nodeweed (Synedrella nodiflora (L.) Gaertn.), Boerhavia coccinea Mill., Coccinia grandis (L.) Voigt, and Malvastrum coromandelianum L. are also found. Makai of the fence is a producing banana farm (Musa x paradisiaca L.) with some interplanted red ginger (Alpinia purpurata (Vieill.)) K. Schum. and torch ginger (Phaecomeria magnifica (Roscoe) K. Schum.).

The construction site mauka of Kamehameha Highway is vegetated by mostly Guinea grass interspersed with castor bean bushes (Ricinus commuis L.) and bingabing (Macaranga mappa (L.) Mull. Arg.) bushes near the highway. At the western edge of the construction area the vegetation becomes California grass (Brachaiaria mutica (Forssk.) Stapf.) with koa haole (Leucaena leucocephala (Lam.) deWit.) mixed in. There is one large hummock of cattail (Typha latifolia L.) and some 'Ahu'awa haole (Cyperus alternifolius L.) near the stream bank. There are also scattered individuals of Chinese violet (Asystasia gangetica (L.) T. Anderson), Bidens alba, ivy gourd, primrose willow (Ludwigia octovalvis (Jacq.) Raven), and Macroptilium atropurpureum (DC) Urb.

The intermittent Hospital Ditch stream channel has been greatly modified. Upstream, the culvert has been moved, straightened, and channelized between earthen berms. It is narrowly channelized

as it emerges from the culvert on the north side, then just past the study site boundary it broadens out, although this portion has also been straightened. There is ponding both upstream and downstream of the study site. At the time of the survey there was standing water in the streambed. Makai of Kamehameha Highway the stream vegetation consisted of primrose willow, swamp cabbage (Ipomoea aquatica Forssk), California grass, Bidens alba, koa haole, and Chinese violet.

The Kii Bridge site, approximately five hundred feet west of the Hospital Ditch, consists of a proposed by-pass road right-of-way and a construction area for the replacement of the bridge. Part of the by-pass road contains mowed grass, a small shack, a banana farm, and a major portion of an aquaculture pond. All are located on the northeast side of Kamehameha Highway.

A mix of grasses and weeds covers the mowed portion of the Kii Bridge site. Grasses found include Guinea grass, Bermuda grass, swollen finger grass (Chloris barbata (L.) Sw.), stargrass (Chloris divaricata R. Br.), and stinkgrass. Common weeds include Malvastrum coromandeliamum L., slender amaranth (Amaranthus viridis L.), Bidens alba, hairy spurge (Chamaesyce hirta (L.) Millsp.), and many others. A fence divides the by-pass road right-of-way portion of the study area. Across the fence on the southeastern side of Kii Stream is a banana farm. On the northwestern side of the stream is an aquaculture pond.

The aquaculture pond portion of the study site is surrounded by high berms that are covered with neatly mowed grasses. The most common grasses are goose grass (Eleusine indica (L.) Gaertn.), Guinea grass, California grass, and mixed weeds. The aquaculture pond did not support hydrophytic vegetation. It has steeply cut banks and there is no waterproof liner in the pond. There was standing water but no other discernable evidence that the fishpond is a protected water of the United States.

The vegetation of the construction area or that portion of the Kii Bridge site that is located on the southwest side of Kamehameha Highway consists of Guinea grass, koa haole, Chinese violet, ironwood trees (Casuarina equisetifolia L.) and Macaranga tanarius (L.) Mull. Arg.

The intermittent Kii Stream has been altered on both sides of Kamehameha Highway. It has been straightened and channelized, and is now a narrow, steep-sided waterway as it passes through the

study site. There was standing water in the channel. Growing on steep banks of the stream on the northeast side of Kamehameha Highway is dense mixed vegetation including primrose willow, koa haole, castor bean, 'ahu'awa haole, Bidens alba, ivy gourd, and star grass.

3.1.7.2 WETLANDS

The portions of each ditch downstream of Kamehameha Highway would seem to be permanent bodies of water (perennial) and therefore, potential jurisdictional waters (USACOE, 1987). Considering the low elevation, connectivity with a system of ditches across this part of the Kahuku Plain, and inputs from area springs, the entire channel system is unlikely to dry up under conditions other than severe droughts. Water flowing over small drops in elevation could be observed at and above the highway crossings in both ditches. For Kii Ditch, the small amount of flow present from Ohia Stream during our field visit and the narrow bed suggest that, above the highway, this stream is intermittent. For Hospital Ditch, the situation is somewhat different. Whether because of the small culvert under Kamehameha Highway, or the extensive emergent vegetation in the channel bed or both, the ditch inland from the highway contains a more or less permanent body of water supporting a clear predominance of wetland indicator plant species such as California grass, cattail, and primrose willow (USFWS, 1988). Given a permanent water source, a clear dominance of facultative and obligate wetland plant species, and a likely layer of hydric soil on the bottom, this area could qualify as a jurisdictional wetland (USACOE 1987, AECOS 2001).

3.1.7.3 STREAM FAUNA

Hospital ditch in the project area is a broad (18 to 23 feet), shallow, diked feature with water depths on the order of 1-2 feet. Within this wetland, inland of the highway, algae (Spyrogyra sp.), crayfish (Procambarus clarkii), guppies (Poecilia reticulata), snails (Melanoides tuberculata), and small crustaceans (Amphipoda) were moderately common. All were difficult to observe because of the thick growth of grass. A single duck (Anas sp., probably a mallard) flew out of the pond when approached (AECOS 2001).

Kii Ditch is a narrow and deep trench directly inland from Kamehameha Highway. This ditch is some 10-12 feet deep and 5 to 6 feet across at the bottom. Water in the ditch is flowing, and mostly

only a few inches deep, but increasing in depth close to the highway bridge to almost 3 feet. Within the upstream segment only apple snails were observed. However, immediately downstream of the highway bridge, the water shoals beneath an old bridge (former cane haul road crossing) becomes a long pond. In this area, green algae (Rhizoclonium sp.), apple snails, prawn, guppies, and Bufo tadpoles (Bufo marinus) are all present. Black-crowned night heron was observed both upstream and downstream of the highway along Kii Ditch (AECOS 2001).

Both Hospital Ditch and Kii Ditch in the area of the proposed construction contains flowing water that support a variety of aquatic organisms that are dominated by introduced species. Of the aquatic fauna observed during the field reconnaissance, the only native species were wetland associated birds. All other aquatic species, both fishes and invertebrates, observed were alien species widely naturalized throughout the Hawaiian Islands and are generally common inhabitants of lowland streams on Oahu (AECOS 2001).

3.1.7.4 FAUNA AND AVIFAUNA

A avifaunal and faunal survey of the proposed project area was carried out between April and May 2001 (**Appendix C** - Avifaunal and Feral Mammal Field Survey for the Proposed Kamehameha Highway Drainage Improvements Project, Oahu, Phil Bruner Environmental Consultant, 11 May 2001). The following describes the findings of the survey.

Five species of native waterbirds were recorded during the survey. While no nests were discovered, the birds were observed foraging and loafing. The Black-necked Stilt (Himantopus mexicanus knudseni), Common Moorhen (Gallinula chloropus sandvicensis), Hawaiian Coot (Fulico alai), Koloa or Hawaiian Duck (Anas wyvilliana), and Black-crowned Night Heron (Nycticorax nycticorax), were documented (All except the Black-crowned Night Heron are endangered species as listed by the U.S. Fish and Wildlife Service, 1996):

1. Black-necked Stilt (Himantopus mexicanus knudseni). This endemic and endangered subspecies forages in a variety of habits including shallow ponds, mud flats, flooded fields and even wet lawns (Hawaii Audubon society 1993). As many as 20 stilts have been seen foraging on the Kahuku Hospital lawn adjoining the

Hospital Ditch (Bruner 2001). During this survey (April-May 2001), a total of six stilt were observed foraging on the lawn on two mornings when passing showers dampened the lawn.

2. Common Moorhead (Gallinula chloropus sandvicensis). Two pairs were present along the mauka section of the Hospital Ditch on each survey visit. One pair was seen on three survey visits on the makai section of the Hospital Ditch. A pair of moorhen was also seen on the mauka portion of the Kii Stream about 140 feet from the highway. The Common Moorhen in Hawaii is an endangered and endemic subspecies of the Common Moorhen that belongs to the Rail family. They are typically shy retiring birds and quickly retreat into the cover of vegetation when approached (Pratt et al 1987). The dense grass along the ditch provides ideal cover, foraging and nesting habitat for this bird.

3. Hawaiian Coot (Fulica alai) is an endemic and endangered species. Two coots were recorded in Kii Stream makai of the Kii Bridge on two different site visits. Coots seem to prefer a more open habitat than Common Moorhen. They can be seen foraging on large ponds as well as in open section ditches. They are members of the Rail family but are generally not as shy as the Common Moorhen.

4. Koloa or Hawaiian Duck (Anas wyvilliana) is an endangered and endemic species. Two Koloa were startled from foraging activities in the mauka section of Hospital Ditch on two separate site visits. On each occasion there were two pairs of Koloa observed. This duck frequents not only ponds but also streams (Hawaii Audubon Society 1993). This species is monogamous so it is not uncommon to see them in pairs.

No native land birds were observed during the survey. One Pacific Golden-Plover (Pluvialis fulva) and two Wandering Tattlers (Heteroscelus incanus) were noted along the makai section of Kii stream. Thirteen species of introduced birds were counted and are identified in **Table 3-2**. None of the land species identified are endangered.

TABLE 3-2
Introduced Birds Recorded at Two
Drainage Improvement Sites at Kahuku, Oahu

COMMON NAME	SCIENTIFIC NAME
Cattle Egret	Bubulcus ibis
Ring-necked Pheasant	Phasianus colchicus
Spotted Dove	Streptopelia chinensis
Zebra Dove	Geopelia striata
Red-vented Bulbul	Pycnonotus cafer
Japanese Bush-warbler	Cettia diphone
Common Myna	Acridotheres tristis
Japanese White-eye	Zosterops japponicus
Northern Cardinal	Cardinalis cardinalis
Red-crested cardinal	Paroaria coronata
House Finch	Carpodacus mexicanus
Common Waxbill	Estrilda astrild
Java Sparrow	Padda oryzivora

Three Small Indian Mongoose (Herpestes auropunctatus) were counted on the survey along with two feral cats (Felis catus). No rats or mice were seen but likely occur in this area. The endangered and endemic Hawaiian Hoary Bat (Lasiurus cinereus semotus) is rarely recorded on Oahu but is frequently observed on Kauai and the Big Island (Tomich 1986; Kepler and Scott 1990). No bats were seen during this survey.

3.1.8 ARCHAEOLOGICAL AND CULTURAL RESOURCES

An Archaeological Inventory Survey Report was completed for the project site (**Appendix D** - Archaeological Inventory Survey Report for Hospital Ditch and Kii Bridge in the Ahupuaa of Kahuku, District of Koolauloa, Island of Oahu, Cultural Surveys Hawaii, Inc., May 2001). The following provides a summary of the report.

> Archaeological and cultural resources are prehistoric and historic sites, structures, districts, artifacts, or any other physical evidence of human activity considered important to a culture, subculture, or community for scientific, traditional, religious, or any other reason. For the purposes of this EA, cultural resources are defined to include prehistoric and historic archaeological sites, historic buildings and structures, and traditional (i.e., native Hawaiian) sites.

This review of cultural resources has been conducted in accordance with the National Historic Preservation Act and Hawaii Revised Statutes, Chapter 6E, Historic Preservation. Potential effects on cultural and historic resources are also a component of the Coastal Zone Management Act review process.

KAHUKU AHUPUAA: HISTORICAL AND CULTURAL DOCUMENTATION

The project area is located within the ahupuaa of Kahuku within the District of Koolauloa, at the northernmost tip of Oahu.

The first historical reference to Kahuku was in 1779 when the H.M.S. Resolution passed along the north side of Oahu. Lieutenant James King noted "rich cultivated valleys," that represented the predominant agricultural activity (McAllister 1933:153). The Mahele period, between 1846 and 1855, marked an era of change in the local traditional land tenure system. The ahupuaa of Kahuku (4,752 acres) was retained as part of the Crown Lands of King Kamehameha III (Indices of Awards, 1929:27). Although no individual kuleana parcels are recorded in the present project area, a large cluster of Land Commission Awards was located northwest of the project area, on the makai side of Kamehameha Highway centered on Punamano Spring and its associated wetlands.

The recorded Native Register and supporting Foreign Testimony presented before the Board of Commissioners in the mid-1800s provides information about traditional land use in the area by native Hawaiians. According to the Native Register, agricultural activity was taking place throughout the ahupuaa of Kahuku, from the uplands to the sea, loi, mala, and kula were reported, as well as, hala groves, fishponds, "salt land", watercourses, kukui, wiliwili, and koa trees for canoes.

By 1852, the Englishman Charles Gordon Hopkins had purchased over 8,000 acres in the Kahuku area for approximately $14,000 for cattle and sheep ranching. The lands changed hands more than once until James Campbell bought a 15,000-acre parcel, who in 1889, leased the land to Benjamin Dillingham for fifty years and subleased a portion to James Castle. The following year, James Castle and Alexander Young started the Kahuku Plantation Company on lands leased from Campbell. In 1902, Alexander and Baldwin

became the agent for Kahuku Plantation, which was utilized for commercial sugar cane cultivation; the plantation became a wholly owned subsidiary of A&B in 1968 and closed in 1971.

Kii Bridge was built in 1937 as part of Kamehameha Highway improvements. Hospital Bridge is of more modern construction related to improvements near Kahuku Hospital, Pualea Street, and Kamehameha Highway.

Previous archaeological studies within, or in the vicinity of the project area include those conducted by McAllister (1933), Rosendahl (1977, 1988), Dye (1977), Barrera (1979, 1981, 1985), Clark (1979), Schilt (1979), Riley and Malpass (1979), Sinoto (1980), Davis (1981), Rogers-Jordane (1984), Jensen (1988/89), Smith (1989), Kennedy (1989), Pfeffer and Hammatt (1992), Cultural Surveys Hawaii (1992, 1998), Farrell and Cleghorn (1995), and Ogden Environmental (1998). Historical research and ethnographic studies of the area have also been conducted and include that of Silva (1984) of 9 sites and one reporting a calibrated date of 165 BD to AD 210 at the Kuilima area, and another by Smith (1989) for 866 acres including areas to the north of the present project area. Results of the studies indicate that, in the vicinity of the project area, few prehistoric, and several historic and traditional use sites have been recorded. Site types include shelter complexes, agricultural terrace/ditch complexes, habitation sites, World War II historic sites, and burials.

The project area has also been part of historic-era transportation corridors for at least as long as the sugar cane cultivation. Historic maps depict the predecessor of Kamehameha Highway, essentially at the same location. Kamehameha Highway's Kahuku section was built to 'modern' standards in the mid- to late 1930s. Adjacent to the highway, on the makai side, where the proposed bypass roads are located, was the Kahuku Plantation railroad alignment. The plantation rail line lasted from ca. 1890s to the 1950s.

Kii Bridge, while built in 1937, is not on the Historical Bridges listing (State of Hawaii, Draft Historic Bridge Inventory and Evaluation, May 1996). Pursuant to Section 106 compliance procedures, the FHWA, as part of the consultation process, has requested a letter from SHPD to confirm that the project will not have adverse effects on the project area (A letter

of response was received from SHPD on September 22, 2000, validating this assessment, see **Appendix E** - Letter Response of "No Effect").

CONTEMPORARY CULTURAL PRACTICES

The project site involves a portion of the Kamehameha Highway alignment which is a public transportation corridor. The area immediately surrounding Kii Bridge is used for agricultural activities and is on private property. Access to the stream is constrained by the steep banks of the drainageway and during storms constitutes a public safety hazard.

The site at Hospital Ditch serves as a drainageway adjoining the front lawn of the Kahuku Hospital. The Kahuku Hospital sponsors an outdoor market in the lawn area every other Saturday, however, vending activities occur in the immediate area fronting Pualalea Street. Proposed construction activities in this location are not expected to adversely affect the vendors. This location is not known or any other cultural, recreational, religious, or gathering activities.

3.1.9 NOISE CONDITIONS

Noise is defined as sound that is undesirable because it interferes with speech communication and hearing, or is intense enough to damage hearing, or is otherwise annoying. Under certain conditions, noise can interfere with human activities at home or work and affect people's health and well-being. The accepted unit of measure for noise levels is the decibel (dB) because it reflects the way humans perceive changes in sound amplitude. Sound levels are easily measured, but human response and perception of the wide variability in sound amplitude is subjective.

Community noise levels change continuously during the day; therefore, to compare levels over different time periods, several descriptors have been developed that take into account this time-varying nature. The most common descriptor is the annual average day-night sound level (Ldn). The Ldn is the average A-weighted level for a 24-hour period with a 10dB upward adjustment added to the nighttime levels (10:00 PM to 7:00 AM). This adjustment accounts for the increased sensitivity of most people to noise in the quiet nighttime hours. Ldn has been adopted by many federal and state agencies as the accepted unit for quantifying human annoyance to general

environmental noise and for assessing and correlating the various effects of noise on humans and animals, including land use compatibility, sleep interference, annoyance, hearing loss, speech interference, and startle effects.

The Hawaii State Department of Health monitors noise issues in accordance with HRS, Title 19, Chapter 342F. The Director issues noise permits only when excessive noise levels are expected. In addition, the Occupational Safety and Health Act of 1970 (OSHA) was established to "assure safe and healthy working conditions for working men and women." OSHA regulations established a maximum noise level of 90 A-weighted decibels (dBA) for a continuous 8-hour exposure (typical work day); maximum noise levels for shorter periods of time are higher (**Table 3-3**).

The nearest sensitive noise receptors to the project sites include Kahuku Hospital, which is located mauka of the highway and Hospital Ditch; Kaiser Clinic and the Kahuku Sugar Mill Market Place, both located makai of the highway. The nearest wildlife sensitive noise receptor is the Kii National Wildlife Refuge, which is .75-mile makai of Kii Bridge project site, and 1.5 miles from the Hospital Ditch project site.

TABLE 3-3
Permissible Noise Exposure Levels
State Department of Health

Duration (Hours/Day)	Sound Level in Decibels
8	90
6	92
4	95
3	97
2	10
1 to 1.5	102
1	105
0.5	110
0.25 or less	115

Source: 29 CFR 1910.95

The major contributors of noise in the vicinity of the project area are vehicles. Kamehameha Highway is the primary transportation corridor along this section of windward Oahu. Because of this, traffic is somewhat continuous and ambient daytime noise levels are intermittently above that which is expected in a rural town landscape. In addition, most of the identified properties in the

bridge and ditch areas are located in close proximity to Kamehameha Highway (less than 100 feet), causing noise levels near the buildings to be more similar to a noisy urban area (80-85 dBA).

3.1.10 AIR QUALITY

Existing air quality conditions and the potential effects of the proposed action on these conditions are required to be assessed as part of the Environmental Assessment process. Ambient air quality, which refers to the purity of the general outdoor atmosphere, is regulated under the Clean Air Act and the U.S. EPA National Ambient Air Quality Standards (NAAQS) (50 CFR 40). The State of Hawaii, Department of Health also regulates air quality and has established ambient air quality standards (Chapter 11-59, HAR) that are as strict and in some cases stricter than NAAQS. **Table 3-4**, summarizes the national and state ambient air quality standards.

TABLE 3-4
National and State Ambient Air Quality (NAAQS) Standards

Pollutant	Averaging Time	National Ambient Air Quality Standard ppm (µg/m³)	Hawaii Ambient Air Quality Standard ppm (µg/m³)
Carbon Monoxide	1-hour	35 (40,000)	9 (10,000)
	8-hour	9 (10,000)	4.5 (5,000)
Ozone	1-hour	0.120 (235)	0.051 (100)
Nitrogen Dioxide	Annual	0.05 (100)	0.035 (70)
Sulfur Dioxide	3-hour	0.5 (1,300)	0.5 (1,300)
	24-hour	0.14 (365)	0.14 (365)
	Annual	0.03 (80)	0.03 (80)
Fine Respirable Particulate Matter	24-hour	150 µg/m³	None
	Annual	50 µg/m³	None
Total Particulate Matter	24-hour	None	150 µg/m³
	Annual	None	60 µg/m³
Lead	Quarterly	1.5 µg/m³	1.5 µg/m³

Source: Earth Tech, Inc. November 1997

There is no ambient air quality monitoring station in the vicinity of Kahuku. The nearest monitoring site on the windward side of Oahu is Waimanalo. In general, however, it can be assumed that air quality at the project site is good. Persistent trade winds during approximately 70 percent of the time in the summer months and 50 percent of the time in winter contribute to favorable climatic conditions in the area for air quality. There also are no large stationary industrial facilities in the immediate vicinity of the project area.

However, agricultural activities (spraying of pesticides and fungicides) and natural sources (sea spray and pollen) contribute to air pollution in the area. The most noteworthy source of air pollution is the vehicular traffic that produces carbon monoxide (CO) and carbon dioxide (CO2).

Although located 20 to 21 miles to the south, air quality data from Waimanalo gives an indication of ambient air quality levels in Kahuku. Waimanalo is a rural community on the windward side of Oahu with similar characteristics to Kahuku. There is little commercial and industrial activity other than the Waimanalo sewage treatment plant where the monitoring site is located. The State has monitored PM10 in Waimanalo since 1971, and the data indicates that particulate levels are within Federal and State standards.

A previous air quality impact study conducted for the golf course at Malaekahana in 1990 (Morrow 1990) used modeling and limited field sampling to estimate air quality conditions and the potential affects of vehicular traffic. The results of the study indicated that estimated carbon monoxide (CO) levels for current (1990) and projected (1994) traffic counts are within Federal and State of Hawaii standards (Morrow 1990).

3.1.11 VISUAL RESOURCES

Visual resources are the aggregate of characteristic features imparting visually aesthetic qualities to a natural, rural, or urban environment. Potential visual resource effects are also a component of the Coastal Zone Management Act review process.

The landscape along Kamehameha Highway between Laie and Kahuku town is predominantly rural in its visual character. Vegetation buffers both sides of the Kamehameha Highway, almost continuously on the makai side; randomly on the mauka side, until Kahuku town. Facilities including Kahuku Hospital, Kahuku High School, the Sugar Mill Market Place, and community buildings dominate the views within Kahuku town from the Hospital Ditch site. Approaching from the north (makai side), Kii Bridge is visible as view planes are open. The experience of open space and views is limited to key landmarks of Kahuku town and approaching traffic; scenic vistas and/or view planes are limited.

3.2 SOCIO-ECONOMIC ENVIRONMENT AND DEMOGRAPHICS

The socioeconomic characteristics of the project area include demographics, employment, and commercial activities. The following discusses the existing social and economic characteristics of the Koolauloa district that includes Kahuku.

The Koolauloa census district was estimated to have a population of 14,195 in 1980, 18,443 in 1990, and 19,294 in 1995. The percentage change in population between 1980 and 1990 was 29.9 percent and between 1990 and 1995 the change was 4.6 percent. The area contains approximately 38 percent Caucasians, 7 percent Japanese, 3 percent Chinese, 7 percent Filipinos, 22 percent Hawaiians, and approximately 23 percent other ethnicities.

Kahuku town has historically been associated with the local Kahuku Sugar Plantation and mill. The Kahuku Sugar Plantation provided the majority of jobs and economic activity in the area until it closed operations in 1971. Economic activity in the area has diversified from the sugar-based industry to include aquaculture, diversified farming, and tourism. The area contains a small hospital, fire and rescue services, a high and intermediate school, and small commercial stores. Employment in the area now is dominated by service industry jobs, particularly in North Shore and Laie resorts, hotels, and restaurants. Many residents travel to Laie for jobs at BYU-Hawaii and the Polynesian Cultural Center.

Laie is the largest community in the Koolauloa District. It is the religious and educational center of the Church of Jesus Christ of Latter Day Saints. The church temple and the campus of Brigham Young University-Hawaii (BYU-Hawaii) are located in Laie. The Church and BYU-Hawaii also own and operate the Polynesian Cultural Center, which provides income and jobs to students and local residents. Economic activity in the area revolves around the church, the university, and the cultural center. Numerous businesses located in Laie mainly service the church, university, local residents, and tourists.

3.3 ENVIRONMENTAL JUSTICE

Executive Order (EO) 12898 regarding Environmental Justice requires federal agencies to take appropriate and necessary steps to identify and avoid disproportionately high and adverse effects of federal projects on minority and low-income populations' health or environment. Because there is partial federal participation by way of funding or sponsorship in this project, compliance with EO 12898 is required in this evaluation.

The proposed drainage improvements are located within 0.5 miles from existing residential areas. However, there are no minority or low-income populations which would experience disproportionate short-term construction-related or long-term adverse impacts from the proposed project.

3.4 PUBLIC FACILITIES AND SERVICES

3.4.1 TRANSPORTATION FACILITIES

Kamehameha Highway (Route 83) is a rural road connecting several communities on the windward side of Oahu. Kamehameha Highway serves as the main transportation route for travel between Haleiwa and Kaneohe; the highway including the towns of Laie and Kahuku serves rural communities. The highway is State maintained with a 50-foot right-of-way and has 10-foot wide travelway lanes in either direction. The posted speed limit is 35 miles per hour approaching Kahuku town from either direction.

The character of the area around the project site is rural with predominately local traffic. There are numerous access roads in Kahuku leading to Kamehameha Highway including unimproved canehaul and secondary roads. There are rural residential and agricultural and aquacultural land uses to the south and immediately to the north of Kahuku town where the project sites are situated. Kahuku High and Intermediate School is located on Kamehameha Highway immediately south of the project site.

Traffic patterns across the Hospital Ditch and Kii Bridge are influenced by early morning and afternoon commuters (7:00 AM to 8:00 AM). Early morning and afternoon traffic patterns are

dominated by local use. Early morning southbound travelers commuting from Kahuku to Laie for work dominate traffic, while afternoon peak traffic (2:00 PM to 3:00 PM) in the area appears to be dominated by travelers leaving Kahuku school campuses. Evening traffic peaks are indicative of travelers returning home to Kahuku from Laie and Honolulu.

3.4.2 UTILITIES AND INFRASTRUCTURE

Utility lines and infrastructure are located in or near the project area and include electrical lines and poles, telephone and cable lines, water pipelines, storm drains, and traffic signs. Electrical lines run above-ground on the mauka side of Kamehameha Highway, and water lines run below the existing Ditch and Kii Bridge along Kamehameha Highway. Fire and police services are located in Kahuku town.

3.4.3 HAZARDOUS WASTES AND MATERIALS

No known hazardous wastes and materials, or petroleum products are stored at the project sites. There are no known sources of contaminants in the project area.

3.5 RECREATIONAL FACILITIES

Kahuku District Park, maintained by the City and County of Honolulu, is 0.5 mile south of the project sites and located mauka of Kamehameha Highway. Kahuku Golf Course, a nine-hole municipal course, under the jurisdiction of the Department of Enterprise Services, is approximately one-mile makai of the project sites. Malaekahana State Recreational Area, managed by the State Department of Land and Natural Resources (DLNR), is located about two miles to the south and is located makai of Kamehameha Highway. It is recognized as an important open space and recreational asset in the Koolauloa Sustainable Communities Plan.

3.6 WASTEWATER AND SOLID WASTE

The majority of development in Koolauloa is served by individual wastewater treatment systems. Wastewater service areas, including the City and County of Honolulu wastewater service area in

Kahuku and two private wastewater service areas at Kuilima Resort and Laie, serve parts of Koolauloa.

The Kahuku Wastewater Treatment Plant is the only municipal wastewater treatment facility (WWTP) in the Koolauloa region. The facility is located to the north of Kahuku town, beyond the Kahuku Sugar Mill, near the Kii Pond Wildlife Refuge. The facility has a design capacity of 0.4 mgd average flow and is operating at approximately 30 to 40 percent of capacity. The plant receives residential wastewater from Kahuku Villages and other residential and commercial users in Kahuku town. The Kahuku WWTP system is designed as a gravity flow collection system from the mauka development areas. Disposal is via an injection well system into the brackish groundwater.

Solid waste collection, transport and disposal operations on the island are a consolidated responsibility of the City and County of Honolulu, Department of Environmental Services, Refuse Division (for domestic curbside pickup) and private haulers (for commercial and multi-family pickup). In addition, individuals can haul their own trash to one of six convenience centers around Oahu. The collected refuse is ultimately recycled or disposed of either in a waste incineration facility or sanitary landfill.

In Koolauloa, there is one convenience center at Laie where residents can dispose of household trash, green waste, and large items. The Laie Water Reclamation Facility has a green waste composting facility. The next closest facilities are at Kawailoa Transfer Station north of Haleiwa and Kapaa Transfer Station in Kailua.

CHAPTER 4
ENVIRONMENTAL CONSEQUENCES, POTENTIAL IMPACTS AND MITIGATION MEASURES

4.1 INTRODUCTION

Environmental Assessments (EAs) and Environmental Impact Statements (EISs) are required to contain a summary of potential project impacts and mitigation measures (Chapter 343, HRS). Project related effects, both detrimental and beneficial, include primary, secondary, and cumulative effects. Primary effects are effects that are directly caused by the action and occur at the same time and place. Secondary effects are effects that are caused by the action and occur later in time or are farther removed in distance, but are still reasonably foreseeable. Cumulative impacts refer to effects that result from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor, yet collectively significant actions taking place over a period of time.

Effects of the proposed project can also be divided into short-term and long-term effects. Short-term effects are related to construction activities associated with the proposed project. Long-term effects refer to impacts caused from the operation of the proposed action, and are longer in duration.

Mitigation measures should be designed to address the potential for negative adverse impacts by lessening the extent or duration of the action resulting in the impact.

The following is a summary of the anticipated environmental impacts and proposed mitigation measures for the proposed project. The potential for environmental impacts are generally short-term and related to construction activities.

4.2 PHYSICAL ENVIRONMENT

4.2.1 CLIMATE

No short- or long-term adverse impacts are anticipated to the climatic conditions of the project area. Because no adverse impacts are expected, mitigation is not required.

4.2.2 GEOLOGY AND TOPOGRAPHY

No short- or long-term adverse impacts are anticipated to the geology and topography of the project area. Although construction will require earthwork to replace a bridge structure and provide drainage improvements, the action will be largely restorative. Upon completion the project will benefit the surrounding community through improved control of stormflows beneath Kamehameha Highway.

4.2.3 WATER RESOURCES AND HYDROLOGY

Water resources, including drainage, stream flow, and water quality, will be temporarily affected by the proposed project. Environmental effects related to water resources are anticipated to be short-term and primarily related to construction activities. It is anticipated that there will be no long-term negative effects to water resources from the proposed action.

Construction activities related to building two bypass roads and the replacement of Kii Bridge will temporarily permit the continuation of existing drainage patterns which allow the overtopping of Kamehameha Highway. Construction will include installation of new A.C. pavement structure and striping, temporary roadway signs and lighting, and temporary drainage culverts (or an acro-panel bridge at Hospital Ditch crossing).

The proposed project is anticipated to have a beneficial impact on long-term drainage patterns at Hospital Ditch and Kii Bridge. Scouring of abutments and the build-up of silt and debris under the Kii Bridge and Hospital Ditch area will be reduced as a result of the project.

Short-term increases in turbidity could occur at and downstream of the ditches during construction and bridge replacement work. Runoff and erosion from grading and the temporary loss of vegetation along the ditches during the construction phase of the project also may contribute to reduced ditch water quality.

There are no anticipated long-term negative impacts on coastal waters based on proximity of the project area to the coast (approximately 1 mile). There is potential for short-term increased sedimentation from construction of the bypass roads which could affect water quality in the nearshore area.

MITIGATION MEASURES

The two bypass roads will be constructed prior to installation of drainage improvements to minimize potential for disruption to highway travelers. During construction, the contractor will implement temporary erosion control BMPs as part of the National Pollutant Discharge Elimination System (NPDES) and Section 401 Water Quality Certification (WQC) permits. This includes, but is not limited to: the creation of control swales to channel runoff near the bypass roads; establishment of sediment traps; and, construction of runoff control berms. Areas graded and denuded of vegetation will be revegetated through use of hydromulch during all construction phases. Silt fences along the ditches will also be used to reduce short-term erosion.

Following completion of the construction phase, permanent erosion control measures will be implemented. This will include revegetation of the ditch banks and areas graded during construction. A water quality monitoring program also will be implemented during construction as part of the Section 401 WQC permit.

The replacement bridge abutments will be placed outside the stream, and construction in the ditch and stream areas will be minimized to the extent possible. The contractor will comply with the requirements of Section 639, "Temporary Project Water Pollution Control (Soil Erosion)," of the Standard Specifications for Road and Bridge Construction, State of Hawaii.

4.2.4 SOILS

No short- or long-term adverse impacts are anticipated to soils at the project area. Because no adverse impacts are expected, mitigation is not required.

4.2.5 NATURAL HAZARDS (FLOODS, TSUNAMIS, HURRICANES, AND EARTHQUAKES)

The proposed project will have a positive effect on the flooding problem in the Kahuku area. The replacement of the culvert with new culverts at Hospital Ditch and the widening of the Kii Bridge, and the corresponding reduction in the amount of silt and debris accumulation, will reduce the incidence and intensity of overtopping at Kamehameha Highway. The alignment of the replacement bridge abutments with the stream channel makai of the highway also will direct stream flow away from Kahuku Village.

The proposed project will have no further effect on potential for earthquake generated damage. However, during a tsunami or hurricane, the proposed drainage improvements are expected to help maintain access along Kamehameha Highway by correcting the current situation involving ponding of flood water. Low lying areas makai of Kamehameha Highway would remain subject to flooding.

MITIGATION MEASURES

The primary mitigation measure to address flooding will involve construction of the proposed project. Existing drainage flows at Hospital Ditch and Kii Bridge will be accommodated through use of proposed improvements to mitigate future flooding and ponding across Kamehameha Highway.

4.2.6 FLORA AND WETLANDS

Construction of the temporary bypass roads and the replacement bridge will have short-term impacts on vegetation. Various areas will be disturbed and vegetation will be removed to accommodate installation of drainage structures including culverts and bridge supports. However,

given the existing botanical conditions within the project area and the short duration of construction, the proposed action is not expected to have any significant negative effects.

No candidate, proposed, or listed threatened or endangered species as set forth in the Endangered Species Act of 1973, as amended (16 U.S.C 1531-1543) are known to exist within the project sites and none were found during the terrestrial botanical resource survey (Funk 2001). Because of this, if the vegetation documented by this survey were disturbed, it will quickly regenerate in a few months.

No other projects (federal, state, City and County of Honolulu, and community) were identified in the vicinity of the Hospital Ditch and Kii Bridge project sites. Therefore, when reviewed against past, present, and reasonably foreseeable future actions, no cumulative effects on flora resources and wetland resources are expected.

MITIGATION MEASURES

Wherever possible, grading and disturbances to vegetation in the area will be minimized. To the extent possible areas will be revegetated with endemic, indigenous, and wetland plant species to reduce erosion in the stream and ditch areas.

Construction of the bypass road and bridge will be completed with as little disruption to potential wetland sites as possible. The use of fill material will be minimized in the development of the bypass road at both locations. After completion of the project, all unused fill material will be removed and wetland sites affected by the project will be restored.

4.2.7 STREAM FAUNA

Impacts to aquatic fauna are anticipated to be short-term and related to construction. Construction activities and the resulting increase in turbidity will negatively affect the local aquatic population. However, the existing stream and ditch ecology is expected to recover following completion of work. It is also anticipated that aquatic species will not suffer long-term negative effects from increased short-term turbidity because of the already degraded and silted condition of the existing

habitat. Proposed changes to the existing culverts and crossings are not anticipated to have long-term impacts to native aquatic species.

No other projects (federal, state, City and County of Honolulu, and community) were identified in proximity to the project area. Therefore, when reviewed against past, present, and reasonably foreseeable future actions, no cumulative effects, except for further improved long-term flood controls, on aquatic biology are expected.

MITIGATION MEASURES

Erosion control BMPs will be used to control turbidity and decrease negative effects to water quality and stream habitat. The drainage culverts also will provide for the movement of fish and other aquatic species upstream and downstream of the project throughout the duration of the project.

4.2.8 FAUNA AND AVIFAUNA

According to the Avifaunal and Feral Mammal Survey for the Proposed Kamehameha Highway Drainage Improvements Project, Oahu, the project site is known to serve as foraging and loafing habitat for federally listed endangered waterfowl. While no nesting sites were observed during the survey, activities such as clearing and noise associated with construction could temporarily affect local avifauna and mammal species in the vicinity of the project area. In particular, waterbirds that visit the area would be discouraged from foraging or nesting in the area during construction. However, all effects on avifauna and related habitat are anticipated to be short-term; adverse effects on endangered or threatened species are not expected.

No other projects (federal, state, City and County of Honolulu, and community) were identified in the vicinity of the Hospital Ditch and Kii Bridge project, with the exception of the possible future expansion of the James Campbell National Wildlife Refuge. The expansion of the refuge is expected to result in an expansion of the area available for avifaunal nesting, foraging, and loafing. When reviewed against past, present, and reasonably foreseeable future actions, however, no cumulative adverse effects on avifauna and mammal populations and habitat are expected.

MITIGATION MEASURES

While the project area is not critical habitat for threatened or endangered species, the proximity of both sites to potential habitat must be considered in devising BMPs for the construction phase. Proposed changes to the existing culverts and crossings would not have any impact on listed species.

It is recommended by USFWS that an individual designated by the construction contractor be assigned to monitor presence of native waterbirds during the construction phase when vegetation in and around the ditch and streams are removed. Appropriate instructions to the contractor's designated individual will be provided by USFWS following selection of the contractor and during the preconstruction briefing. The purpose will be to ensure that no nests of native waterbirds such as the moorhen are disturbed. (Consultation with James Campbell National Wildlife Refuge management, USFWS, August 7, 2001).

USFWS should also be consulted to develop BMPs and long-term management and maintenance plans to mitigate potential for impacts. For example, the potential for siltation and contamination of the down-stream habitat for this project must be addressed and a plan developed to address this potential problem.

4.2.9 ARCHAEOLOGICAL AND CULTURAL RESOURCES

Results of a records search conducted by Cultural Surveys Hawaii (April 2001) at the State Historic Preservation Division (SHPD), indicate that while prehistoric, historic, and traditional sites are known to occur in the vicinity of the proposed bridge replacement and ditch improvement areas, no sites have been identified within the Area of Potential Effect (APE), which includes both proposed alignments for the bypass roads.

Consultation with the Island of Oahu Historic Preservation Specialist at SHPD (November 2000), indicates that although Kii Bridge is more than 50 years in age, it is not listed on the Hawaii Register of Historic Places or Historic Bridges, or the National Register of Historic Places and does not meet the criteria for historical significance outlined in guidance provided by the SHPD ("How to Apply the National Register Criteria for Evaluation"). The bridge retains reasonable physical integrity, but

is not associated with events or persons of historical significance; does not embody the distinctive characteristics of a type, period, or method of construction, represent the work of a master, or possess high artistic values; nor is it likely to yield information important in history. The bridge does not have traditional cultural significance for an ethnic group. As a result demolition of the bridge will have no effect on historic properties.

Based on the evaluation and analysis contained in the Cultural Surveys Hawaii report completed for this project (May 2001), because the APE is small and previously disturbed, because none of the recorded sites are in close proximity to the APE, and because there is substantial existing archaeological documentation of the Kahuku town area, no additional archaeological survey appears warranted.

No other projects (federal, state, county, or community) were identified in the vicinity of the Hospital Ditch and Kii Bridge project. Therefore, when reviewed against past, present, and reasonably foreseeable future actions, no cumulative effects on cultural resources are expected.

MITIGATION MEASURES

ARCHAEOLOGICAL RESOURCES

No effects on historic properties are expected from the proposed project (**Appendix E** - Letter Response of "No Effect" from SHPD, September 22, 2000). However, the presence of cultural resource sites in the vicinity of the APE indicate that there is some potential for subsurface cultural materials to be encountered during the course of construction. If cultural materials, particularly human remains, are discovered during ground disturbing activities, work in the area will be stopped immediately and the SHPO/DLNR will be notified of the discovery. Burial finds will be treated in accordance with Chapter 6E-43.6, Hawaii Revised Statutes (HRS), and Chapter 12-300, Hawaii Administrative Rules. SHPO/DLNR will determine the appropriate treatment of the remains and any associated cultural material in consultation with recognized descendants and the Oahu Island Burial Council.

SECTION 106 CONSULTATION

Formal consultation for Section 106 of the National Historic Preservation Act is a further requirement for the proposed project based on use of federal funding through the Federal Highway Administration (FHWA). The process of consultation including notification and coordination with potentially affected parties has been completed (A record of correspondence is contained in

Appendix F - Record of Section 106 Consultation Letters and Memoranda). No effect to archaeological or historic resources is anticipated. However, as noted by the Oahu Island Burial Council, Section 106 Committee, Memorandum, November 14, 2001:

> "Ki'i Bridge project in Kahuku: the area has many sand dunes which are known to be traditional burial areas (refer to past projects and finds in the area especially Turtle Bay, Campbell Estate lands, etc.). If any burials are discovered, the project must stop and the Burials Specialist et al be called as required by Section 6E of the HRS."

In accordance with the recommendation of the Oahu Island Burial Council and the State Historic Preservation Division, should any burials be discovered, construction activity in the affected area will stop immediately and SHPO/DLNR notified for appropriate treatment.

CONTEMPORARY CULTURAL PRACTICES

No adverse impacts to contemporary cultural sites or use of the project site for cultural practices are anticipated. No impacts are anticipated at the Kii Bridge location due to constrained access to the site by the steep banks along the drainageway and periodic stormflows which constitute a public safety hazard. Construction activities at Hospital Ditch are similarly anticipated to have no adverse impact due to the location of the outdoor market vendors at Pualalea Street, which is not within the vicinity of the project site.

4.2.10 NOISE

Intermittent elevated noise levels from certain types of construction activities are unavoidable but are expected to be short-term and minor. Typical heavy construction equipment noise levels are provided in **Table 4-1**. Long-term effects are not expected and noise levels are not expected to exceed the permissible noise exposure levels identified in **Table 3-3**, or as defined by the State Department of Health. Because Noise levels are not expected to increase from preconstruction conditions, a noise study is not anticipated to be required.

Construction activities will be planned on weekdays and in daytime hours in accordance with Chapter 342-F-1, HRS. As a result, no significant noise impacts are expected from improvements to Hospital Ditch and replacement of the Kii Bridge.

TABLE 4-1
Heavy Construction Equipment Noise Levels at 50 Feet

Equipment Type	Generated Noise Level (dBA)
Bulldozer	88
Backhoe (rubber tire)	80
Front Loader (rubber tire)	80
Dump Truck	75
Concrete Truck	75
Concrete Finisher	80
Crane	75
Asphalt Spreader	80
Roller	80
Flat-Bed Truck (18 Wheel)	75
Scraper	89
Trenching Machine	85

Source: U.S. Army Corps of Engineers, Construction Engineering Research Labs, 1978

No other projects (federal, state, City and County of Honolulu, or community) have been identified in the vicinity of the project. Therefore, when reviewed against past, present, and reasonably foreseeable future actions, no cumulative noise effects are expected.

MITIGATION MEASURES

Short-term construction-related noise impacts are unavoidable, but will be controlled to within acceptable limits by the timing and phasing of construction. In accordance with OSHA guidance, occupational exposure to noise from construction equipment will be reduced by requiring construction workers (e.g., bulldozer operators) to wear appropriate hearing protection.

4.2.11 AIR QUALITY

The principle sources of air pollution associated with the proposed action will be fugitive dust emissions from excavation and construction, and vehicular emissions from construction equipment and vehicles. Effects are expected to be short-term; no long-term impacts on air quality are anticipated.

Construction vehicles traveling to and from the project area will increase vehicular emissions in the area at the beginning and end of the project. On-site construction equipment, consisting primarily

of diesel engines, also will contribute to local air pollution during the construction phase of the project. These sources will be combined with existing emissions from local traffic. Due to the low background levels of pollutants in the area and favorable climatic conditions, increased vehicular emissions are not expected to be significant.

Construction activity also will generate short-term fugitive dust particulate emissions. It is estimated that construction activity can generate approximately 1.2 tons per acre of fugitive dust per month in areas with medium soil silt content. Soils in the project area contain relatively high levels of silt. It is anticipated that USEPA and the State DOH standards will not be exceeded.

No other projects (federal, state, City and County of Honolulu or community) have been identified in the vicinity of the project. Therefore, when reviewed against past, present, and reasonable foreseeable future actions, no cumulative effects on air quality are expected.

MITIGATION MEASURES

To reduce impacts from vehicular emissions traffic will be routed through the area with as few delays as possible. Construction vehicles also will be scheduled to arrive and depart the project site during non-peak traffic hours.

The relatively wet climate in windward Oahu reduces impacts from fugitive dust emissions. Construction activities also will be conducted in accordance with State of Hawaii and U.S. EPA Air Pollution Control Regulations. This includes a regular dust-watering program and the covering of trucks during transport and storage of soils. Areas graded and cleared of vegetation also will be revegetated as soon as possible to reduce dust emissions.

4.2.12 VISUAL RESOURCES

Disruption of the existing visual quality near Hospital Ditch and Kii Bridge will be short-term and minor as a result of construction (e.g., grading, contouring for the bypass road and stream improvements), necessary vegetation removal, stockpiling of materials, and utility pole relocations. Long-term effects are not expected and the overall visual qualities of the bridge area will not change

significantly. As a result, no significant visual impacts are expected from the drainage improvements at Hospital Ditch and Kii Bridge.

CUMULATIVE IMPACTS

No other projects (federal, state, City and County of Honolulu, or community) have been identified in the vicinity of the project. Therefore, when reviewed against past, present, and reasonably foreseeable future actions, no cumulative effects on visual resources are expected.

MITIGATION MEASURES

Short-term construction-related visual impacts are unavoidable, but will be controlled to within acceptable limits by timing and phasing of construction and by revegetation of cleared areas.

4.3 SOCIO-ECONOMIC ENVIRONMENT

There are no anticipated short-term or long-term socio-economic impacts from the proposed project. The development of drainage improvements at Hospital Ditch and the replacement of Kii bridge should not induce economic or population growth in the Kahuku area or the region in general.

Existing lifestyles in the area will not be altered during the construction of the project or in the long-term. All construction will take place during normal working hours on weekdays. There will be no construction activities during weekends and holidays.

CUMULATIVE IMPACTS

No other projects (federal, state, City and County of Honolulu, or community) were identified in the vicinity of the project. Therefore, when reviewed against past, present, and reasonably foreseeable future actions, no cumulative effects on socio-economic conditions are expected.

MITIGATION MEASURES

No further mitigation measures are anticipated or expected to be required.

4.4 ENVIRONMENTAL JUSTICE

The proposed drainage improvements to Hospital Ditch and Kii Bridge are expected to provide long-term benefits to Kahuku residents by helping to alleviate chronic flooding and attendant potential safety and health hazards resulting from flooding in the area. No negative impacts are therefore expected.

4.5 PUBLIC FACILITIES AND SERVICES

4.5.1 TRANSPORTATION

Effects on transportation 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 area. Occasional increases in construction traffic will result from the periodic movement of construction materials and is expected to occur primarily during the installation of concrete box culvert cells, demolition, and construction of bridge and bypass roads. Construction activity is planned during the daytime hours with no night work anticipated.

The bypass roads will be completed before work on the bridge and culverts begins, after which traffic will be routed away from the existing ditch and bridge along bypass roads. The bypass roads may require a reduced speed limit from the posted speed limit of 35 miles per hour.

Traffic patterns throughout the course of the proposed 24 month long project should not be substantially altered by the proposed action; however, some minor delays during peak traffic hours can be expected. A bus stop will also be temporarily relocated to an appropriate location to ensure safety of passengers transiting busses.

The greatest disruption to normal traffic patterns will occur during the period when the bypass roads are placed into service. Disruptions to the flow of traffic will occur to traffic leaving and entering Kamehameha Highway, and will change access for vehicles entering and leaving the vicinity of the two project sites.

No other projects (federal, state, City and County of Honolulu, or community) were identified in the immediate vicinity of the project. Therefore, when reviewed against past, present, and reasonably foreseeable future actions, no cumulative effects on traffic conditions are expected.

Although there are no plans for road construction projects in the immediate vicinity of Hospital Ditch and Kii Bridge, the proposed project will be coordinated with the following:

1. Kamehameha Highway Intersection Improvements at Kuilima Drive
   Project No.: 83B-01-99
   Anticipated Start of Construction: October 2001

2. Kamehameha Highway Safety Improvements
   Project No.: 83CDE-01-99
   Anticipated Start of Construction: August 2001

Coordination with the above projects are expected to consist of appropriate scheduling of construction related equipment and vehicular movement along Kamehameha Highway to avoid major disruptions to traffic.

MITIGATION MEASURES

Mitigation to reduce potential for traffic impacts will involve use of signage, traffic controls, and flagmen to advise motorists of construction in the area. As indicated, a bus stop will also require temporary relocation to maintain safety. The initial placement of the bypass roads into service will involve use of flagmen to help direct the flow of traffic onto the by pass roads to maintain safe travel conditions.

Transit of construction vehicles to and from the two project sites will similarly involve use of signage and flagmen to maintain safe conditions.

4.5.2 UTILITIES AND INFRASTRUCTURE

There will be short-term effects to utilities in the area resulting from relocation during the proposed project.

An existing bus shelter, located on the mauka side of Hospital Ditch, will be temporarily relocated to make way for construction activities. There will be some minor inconvenience caused to bus riders and pedestrians, but clear and visible signage will demarcate the temporary bus stop location.

Utility poles will also be relocated to accommodate the bypass roads and proposed construction. No impacts associated with relocation of the utility poles and lines are expected.

No other projects (federal, state, City and County of Honolulu, or community) have been identified in the vicinity of the project. Therefore, when reviewed against past, present, and reasonable foreseeable future actions, no cumulative effects on utilities and infrastructure are expected.

MITIGATION MEASURES

As required, utilities will be returned to pre-construction locations along the highway following completion of the project. The bus shelter also will be returned to its original pre-construction location along the highway.

4.5.3 HAZARDOUS WASTES AND MATERIALS

There are no anticipated short-term or long-term effects from hazardous wastes and materials or petroleum products.

No other projects (federal, state, City and County of Honolulu, or community) have been identified in the vicinity of the project. Therefore, when reviewed against past, present, and reasonable foreseeable future actions, no cumulative effects on, or from, hazardous wastes and materials are expected.

MITIGATION MEASURES

Mitigation measures are neither anticipated nor required.

4.6 RECREATIONAL FACILITIES

Existing recreational facilities in the project vicinity including the District Park, Kahuku Golf Course, and Malaekahana State Recreational Area, are not expected to be affected in the short- or long-term by the project. Those seeking access to recreational facilities during construction may experience minor delays, but once construction is completed, access during pre-construction periods will be restored.

No other projects (federal, state, City and County of Honolulu, or community) have been identified in the vicinity of the project. Therefore, when reviewed against past, present, and reasonable foreseeable future actions, no cumulative effects on, or from, recreational facilities, are expected.

MITIGATION MEASURES

Mitigation measures are neither anticipated nor required.

4.7 WASTEWATER AND SOLID WASTE

No impacts to wastewater resources are anticipated as the project will not in itself generate or require wastewater treatment.

Excavation activities, demolition of the bypass road, and demolition of the existing bridge will generate solid waste that will be disposed of off-site. The off-site disposal of solid waste will probably be directed to the PVT Landfill, located in Waianae. The landfill accepts construction and demolition waste and therefore is not expected to be negatively impacted.

No other projects (federal, state, City and County of Honolulu, or community) have been identified in the vicinity of the project. Therefore, when reviewed against past, present, and reasonable foreseeable future actions, no cumulative effects on, or from, solid waste handling and disposal services, are expected.

MITIGATION MEASURES

Mitigation measures are neither anticipated nor required.

CHAPTER 5
RELATIONSHIP TO STATE AND COUNTY LAND USE POLICIES AND CONTROLS

5.1 HAWAII STATE PLAN

The Hawaii State Plan, Chapter 226, HRS, serves as a written guide for the future long-range development of the State. The plan identifies goals, objectives, policies, and priorities to serve as guidelines for the growth and development of the State. The proposed project is generally consistent with the State Plan in the following areas:

> Section 226-13: Facility Systems-Objectives and Policies for physical environment, (b)(5) Reduce the threat to life and property from erosion, flooding, tsunamis, hurricanes, earthquakes, volcanic eruptions, and other natural or man-induced hazards and disasters.

> Section 226-14: Facility Systems- In General
> The proposed project supports the State's goals for installation of improved drainage systems necessary to achieve Statewide social, economic, and physical objectives of safe and healthy living environments for residents and visitors.

The proposed drainage improvements project supports these objectives by facilitating the necessary improvements to Hospital Ditch and Ohia Stream to reduce threats to future health and safety hazards caused by serious flooding and overtopping in the immediate area of Kamehameha Highway.

5.2 STATE FUNCTIONAL PLANS

The Hawaii State Functional Plans (Chapter 226) provides a management program that allows for use of Hawaii's natural resources to improve current conditions and attend to various societal issues and trends. The project conforms to the objectives and policies of the State Functional Plans for health, transportation and water resources development by facilitating the development and improvement of much needed drainage facilities for an area of Oahu that has a history of chronic

flooding. Storm flood conditions have caused overtopping of Kamehameha Highway, the area's main transportation corridor, and resulted in damage to public and private property in and around Kahuku Village.

5.3 STATE LAND USE LAW

The State Land Use District classification for the project sites is Agricultural (**Figure 5-1**). Because the project involves installation of utility infrastructure, no land use district change is necessary.

STATE AGRICULTURAL DISTRICT

The purpose of the State Agricultural District is to maintain a strong agricultural economic base and to prevent unnecessary conflicts among incompatible uses. The accommodation of utilities is one of various identified uses within this district. According to Chapter 205, HRS:

> "Section 4.5 – Permissible uses within the agricultural district
> (a)(7) Public, private, and quasi-public utility lines and roadways, transformer stations, communications equipment building, solid waste transfer stations, major water storage tanks, and appurtenant small buildings such as booster pumping stations, but not including offices or yards for equipment, material vehicle storage, repair or maintenance, or treatment plants, or corporation yards, or other like structures."

According to Section 4.5, the proposed construction of drainage facility improvements would fall within the definition of a public utility line and roadway. Because this is consistent with uses identified above for public purposes, no further Land Use Law related permit from the State is required.

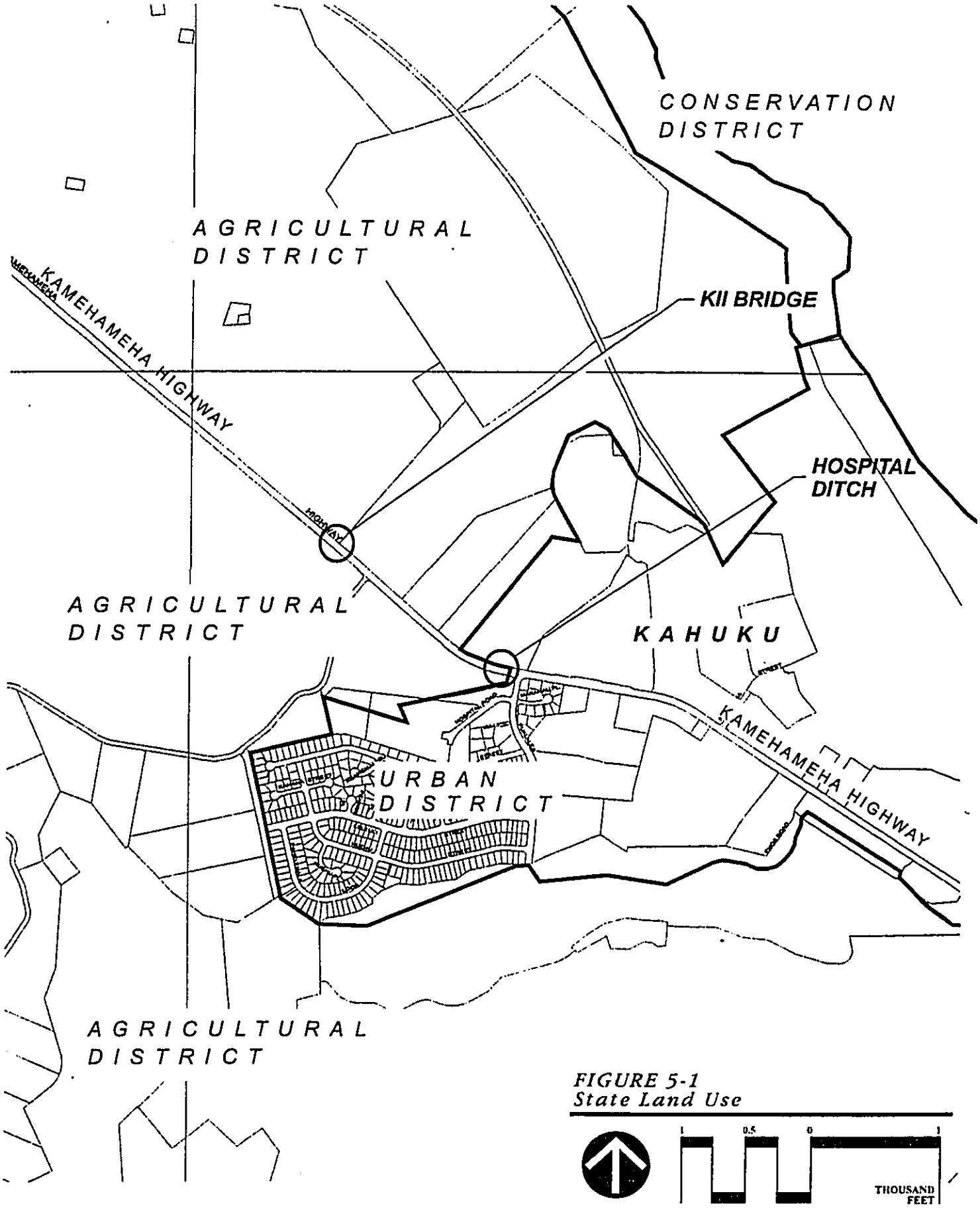


FIGURE 5-1
State Land Use

Kamehameha Highway Drainage Improvements
Vicinity of Kahuku Hospital, Oahu, Hawaii
State Department of Transportation, Highways Division

R.M. TOWILL CORPORATION
May 2001

5.4 CITY AND COUNTY OF HONOLULU LAND USE DESIGNATIONS, POLICIES AND CONTROLS

5.4.1 GENERAL PLAN

The General Plan of the City and County of Honolulu provides a statement of long range social, economic, environmental, and design objectives for the Island of Oahu and State. A specific objective of the General Plan relating to the proposed project is the maintenance and expansion of existing utilities systems. The proposed project is generally in conformance with the goals and objectives of the City and County General Plan.

5.4.2 DEVELOPMENT PLANS

The City and County of Honolulu, development or sustainable communities plans consist of conceptual schemes for implementing the development objectives and policies of the general plan within Oahu's eight development plan areas. The project site is located within the Koolauloa Development Plan area. A Sustainable Communities Plan has been adopted by the City Council as Ordinance 99-72 in October 1999, and incorporated in Article 7, Chapter 24, Revised Ordinances of Honolulu 1990.

KOOLAULOA SUSTAINABLE COMMUNITIES PLAN

The overall vision, as expressed in the Koolauloa Sustainable Communities Plan, is that Koolauloa should remain as an uncrowded rural area with low population density, and limited growth in Kahuku, Laie, and Hauula. Issues identified by the community include the, "...need for improvements to enhance safety on Kamehameha Highway, more dependable sewer, water and drainage systems..." (Koolauloa Sustainable Communities Plan, October 1999).

Chapter 4: Public Facilities and Infrastructure Policies and Principles, of the plan, includes need for comprehensive plans or systematic solutions to local flooding and drainage problems (p. ES-6). The proposed project supports these policy objectives by proposing to improve the drainage facilities of Hospital Ditch and Ohia Stream (Kii Bridge replacement). Further, the project conforms to the Plan's goals and objectives for the proposed project design through the following:

1. Improving existing habitat capability by working with USFWS to ensure maintenance of the integrity of the wildlife refuge;
2. Maintaining existing rural and aesthetic qualities so that vegetation and surfaces will be returned to existing conditions at the end of construction; and,
3. Avoiding degradation of existing coastline and estuarine areas or nearshore water quality by requiring that the contractor implement appropriate Best Management Practices (BMPs).

5.5 LAND USE ORDINANCE (LUO)

TMKs 5-6-002:05 and 06, within which the project sites are situated, are designated as Ag-2 Restricted Agriculture, according to the LUO (**Figure 5-2**). Infrastructure improvements such as drainage improvement projects are a permitted use of Agricultural lands.

5.6 SPECIAL MANAGEMENT AREA PROGRAM AND SHORELINE SETBACK RULE

The City and County of Honolulu has designated the shoreline and certain inland areas of Oahu as within the Special Management Area (SMA). SMA areas are felt to have a sensitive environment and are to be protected in accordance with the State Coastal Zone Management (CZM) policies. Portions of the project sites including work within Kamehameha Highway, involving construction of support infrastructure, are within the SMA boundary as defined by the City and County of Honolulu (**Figure 5-3**). An SMA permit for work involving installation of the multi-cell box culvert, replacement of the Kii Bridge, and related infrastructure will be required from the City and County of Honolulu.

A shoreline setback variance for the proposed action will not be required as the project sites are located greater than 40 feet inland from the designated shoreline.

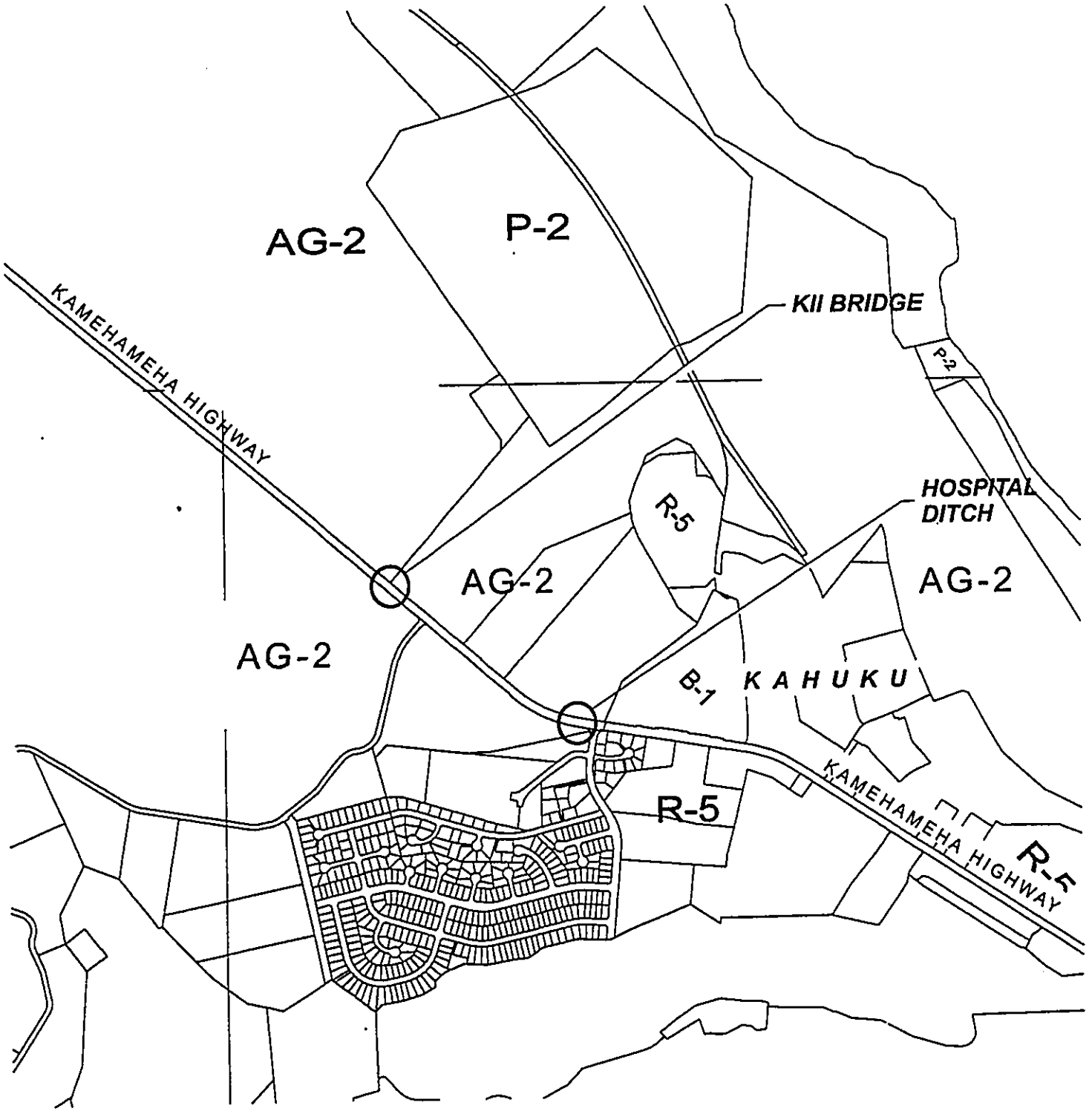


FIGURE 5-2
Zoning

1 0.5 0 1
THOUSAND FEET

Kamehameha Highway Drainage Improvements
Vicinity of Kahuku Hospital, Oahu, Hawaii
State Department of Transportation, Highways Division

R.M. TOWILL CORPORATION
May 2001

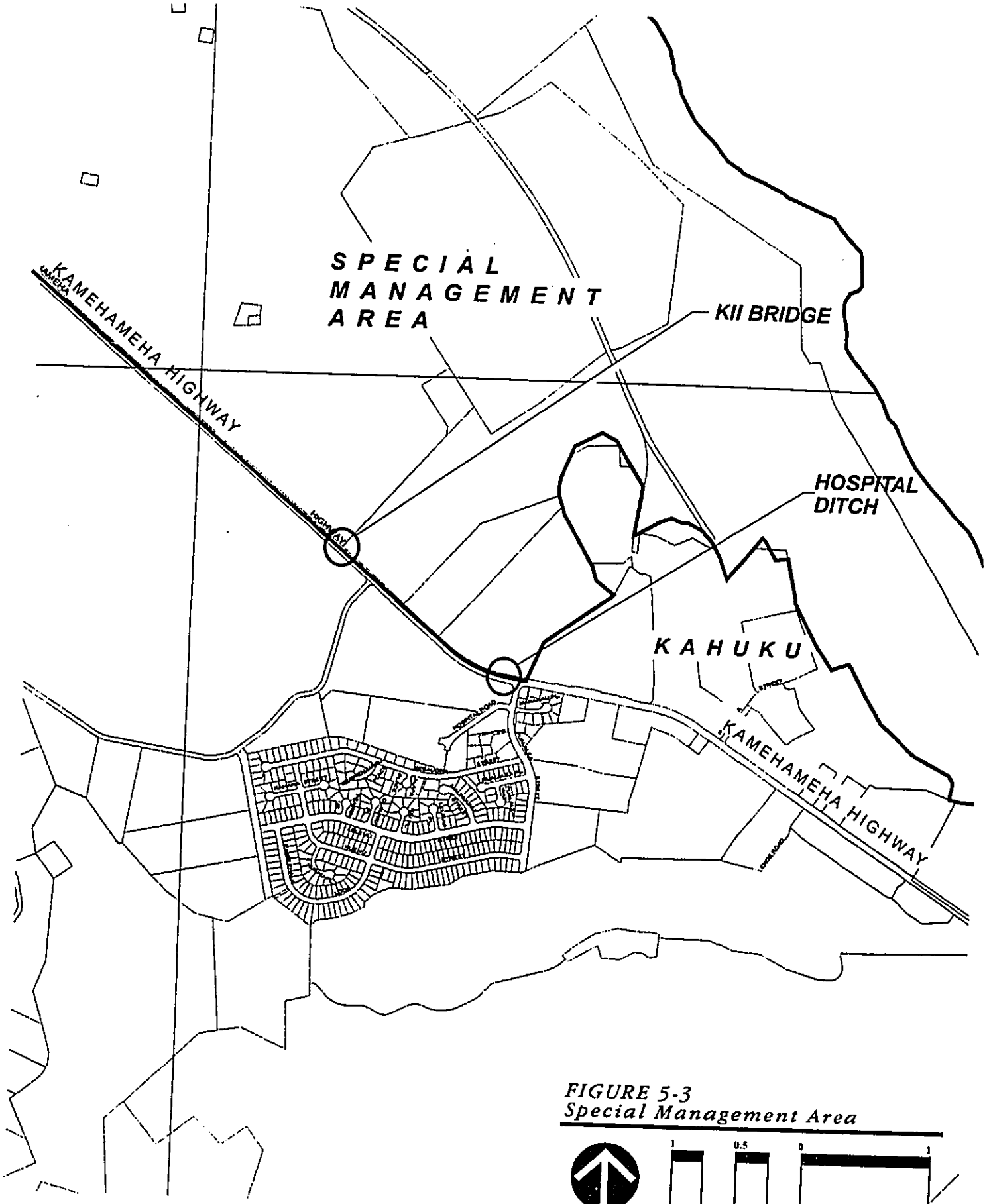


FIGURE 5-3
Special Management Area

1 0.5 0 1
THOUSAND FEET

Kamehameha Highway Drainage Improvements
Vicinity of Kahuku Hospital, Oahu, Hawaii
State Department of Transportation, Highways Division

R.M. TOWILL CORPORATION
May 2001

CHAPTER 6
RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF THE ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Development of the proposed project will commit the necessary construction materials and investment of human and fiscal resources. Short-term construction activities will increase job opportunities as well as improve drainage facilities in the area.

Long-term gains resulting from development of the proposed project include provision of more effective flood control capabilities (by means of storm water conveyance facilities from an improved Hospital Ditch and Kii Bridge) through the makai area to the ocean.

CHAPTER 7
IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES BY THE PROPOSED ACTION

Development of the proposed project will involve the irretrievable loss of certain environmental and fiscal resources. However, costs associated with use of these resources should be evaluated in light of benefits to the residents of the State and the City and County of Honolulu.

It is anticipated that construction of the proposed project will commit the necessary construction materials and human resources (in the form of planning, engineering, construction and labor). Reuse for much of these resources is not practicable. Although labor is compensated during the various stages of development, labor expended for project development is non-retrievable.

CHAPTER 8
NECESSARY PERMITS AND APPROVALS

8.1 FEDERAL GOVERNMENT

U.S. Army Corps of Engineers, Section 404/10 Permit with
Section 7 Consultation with U.S. Fish and Wildlife Service
Federal Highways Administration, Section 106 National Historic Preservation Act Consultation

8.2 STATE OF HAWAII

Department of Health (DOH), Section 401 - Water Quality Certification (WQC)
DOH, National Pollutant Discharge Elimination System (NPDES) Permits
Coastal Zone Management Federal Consistency (CZM FEDCON) Determination
Commission on Water Resource Management (CWRM), Department of Land and Natural Resources (DLNR), Stream Channel Alteration Permit (SCAP)

8.3 CITY AND COUNTY OF HONOLULU

Department of Planning and Permitting, Special Management Area Use Permit
Building Permit
Erosion Control Plan (if required)

CHAPTER 9

FINDINGS AND REASONS SUPPORTING PRELIMINARY DETERMINATION OF FINDING OF NO SIGNIFICANT IMPACT

The proposed action was preliminarily reviewed and analyzed pursuant to the "Significance Criteria" established in the State Department of Health, Title 11-200-12, administrative rules for the State Chapter 343, HRS, environmental impact assessment process. The proposed action will not have a significant effect on the environment. Based on review of the subject project the following conclusions were made:

1. There would be no irrevocable commitment to loss or destruction of any natural or cultural resource. In fact, the project will result in the protection and enhancement of wetland and avifaunal resources along the new drainage improvements.

2. The proposed action would not curtail the range of beneficial uses of the environment. At present, the project site is part of the Kahuku regional drainage area. The proposed project will reduce flooding and overtopping along Kamehameha Highway in the vicinity of Kii Bridge and Hospital Ditch.

3. The proposed action does not conflict with the state's long-term environmental policies or goals and guidelines as expressed in Chapter 344, HRS, and any revisions thereof and amendments thereto, court decisions, or executive orders. The proposed action is consistent with the environmental goals and objectives of the State of Hawaii as delineated in Section 5.1, 5.2, and 5.3.

4. The economic and social welfare of the community or State will not be substantially affected by the proposed action. The proposed project will benefit Kahuku and the surrounding area by reducing the potential for damage from flooding. This will promote greater social and community-wide stability through relief from potential impacts due to storm-associated flooding.

5. The proposed action is not expected to substantially affect public health. The project will improve public health and well-being through an increase of the capacity of existing drainage facilities to handle stormflows.

6. The proposed action does not involve substantial secondary impacts, such as population changes or effects on public facilities. The proposed project will not involve secondary impacts. Traffic slowdowns expected due to the temporary bypass roads are anticipated to be minor and short-term such that there would be no significant increase in adverse effects such as noise or decrease in air quality.

7. It is anticipated that no substantial degradation of environmental quality will occur as a result of the proposed action. This project will not involve degradation of the existing rural environmental quality of Kahuku. Proposed improvements to the drainage facilities are designed to be unobtrusive and below grade at Kamehameha Highway, and appearances of crossings and channels will be returned to pre-construction conditions upon completion. Where appropriate, grounds will be revegetated with native species.

8. The proposed action does not involve a commitment to larger actions, nor would it contribute to a considerable cumulative impact upon the environment. The new drainage improvements are designed to address chronic flooding problems associated with the overtopping of Kamehameha Highway at Kii Bridge and Hospital Ditch. This improvement over existing conditions will not increase nor worsen the flooding condition downstream of the project site.

9. No rare, threatened, or endangered species, or habitat would be substantially affected by the proposed action. Endangered waterbird species known to forage in the makai area (Wildlife Refuge) are the Black-necked Stilt, Common Moorhen, Hawaiian Coot and Koloa or Hawaiian Duck. The proposed berming of the access road from Kamehameha Highway to the wildlife refuge will help redirect storm flood waters away from the refuge to protect the wetland areas will keep improvements from affecting existing foraging areas for these species.

10. Air and water quality and ambient noise levels will not be detrimentally affected by the proposed action. Any decrease in air, water quality and ambient noise levels will be construction-related and short-term. Upon completion of construction and installation of drainage improvements, air, water quality and noise levels will return to pre-project conditions.

11. The proposed action will not affect or likely suffer damage by being located in an environmentally sensitive area such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land area, estuary, fresh water, or coastal waters. The project site is not located in an area prone to natural hazards such as tsunami, erosion, or geologically sensitive. It is in an area prone to serious flood events, therefore the proposed project is intended to help resolve the chronic flooding and overtopping of Kamehameha Highway by improving the drainage facilities. Therefore, this project will likely benefit Kahuku, which is an area that is flood prone.

12. Scenic vistas and viewplanes identified in county land state plans and studies will not be substantially affected by the proposed action. None of the project area is identified in the City and County of Honolulu's Coastal View Study. Therefore, the proposed project will not have an adverse effect on views or viewplanes. Any impact on existing views will be short-term and construction-related. Views and visual character will be returned to existing conditions upon completion of construction.

13. The proposed action does not require substantial energy consumption. Energy requirements are directly related to construction activities and equipment needed to construct the temporary bypass roads, to trench, grade soils, and to install drainage improvements. These are temporary and short-term energy requirements that will not be needed once construction and installment activities are completed.

CHAPTER 10
CONSULTED AGENCIES AND PARTICIPANTS: ORGANIZATIONS AND AGENCIES CONSULTED IN THE PREPARATION OF THE ENVIRONMENTAL ASSESSMENT

The following agencies, community organizations, and individuals were consulted in the development of the Draft and Final Environmental Assessment (DEA/FEA). Documentation of correspondence, meetings, and pre-consultation discussions are included in **Appendix F** and **Appendix G** of this document.

10.1 FEDERAL AGENCIES

Federal Highway Administration (FHWA)
U.S. Army Corps of Engineers (COE), Honolulu Regulatory Branch
U.S. Department of Housing and Urban Development (HUD)
U.S. Department of the Interior, Fish and Wildlife Service (USFWS)
Pacific Island Fisheries

10.2 STATE OF HAWAII

Department of Agriculture
Department of Business, Economic Development and Tourism
- Land Use Commission
- Planning Office

Department of Health
- Environmental Management Division, Clean Water Branch

Department of Land and Natural Resources
- Commission on Water Resource Management (CWRM)
- Land Division
- Aquatic Resources Division
- State Historic Preservation Division (SHPD)
- Oahu Island Burial Council (OIBC)

Office of Environmental Quality Control (OEQC)

Office of Hawaiian Affairs (OHA)

10.3 CITY AND COUNTY OF HONOLULU

Board of Water Supply (BWS)

Department of Design and Construction (DD&C)

Department of Parks and Recreation (DPR)

Department of Planning and Permitting (DPP)

Department of Public Facility Maintenance

10.4 PRIVATE AND COMMUNITY ORGANIZATIONS, AND ELECTED OFFICIALS

Estate of James Campbell

Koolauloa Vision Team

Koolauloa Neighborhood Board No. 28

Kahuku Community Association

Kahuku Village Association

Kahuku Farmers Association

Hui Malama I Na Kupuna O Hawaii Nei

Historic Hawaii Foundation

Koolauloa Hawaiian Civic Club

Lanihuli Hawaiian Civic Club

Senator Daniel Akaka

Senator Daniel Inouye

10.5 COMMUNITY COORDINATION

Community-wide discussion to develop implementable solutions to general flooding and drainage problems in Kahuku began in 1996 (R. Makaiau, Jr., teleconference, May 2001). Multiple working sessions and meetings occurred with a general focus on the problem as the Koolauloa regional flooding issue.

Presentations before the Koolauloa Neighborhood Board regarding a Flood Mitigation Plan were made and discussed beginning in 1998. The initial series of presentations led to other forums including the community based, Koolauloa Visioning process, as well as the Empowerment Zone, Round 2 meetings, sponsored by the City and County of Honolulu. The result of these discussions included funding for flood mitigation planning, of which the proposed drainage improvements project for Hospital Ditch and Kii Bridge (Ohia Stream), is a part.

Current community-wide coordination consists of additional consultation with the Kahuku Community Association, Kahuku Village Association, Koolauloa Vision Team, and the Koolauloa Neighborhood Board. On June 14, 2001, the Koolauloa Neighborhood Board voted unanimously to support the proposed project.

CHAPTER 11
COMMENTS AND RESPONSES TO
THE DRAFT ENVIRONMENTAL ASSESSMENT

This section reserved for public comments and responses to comments.

BENJAMIN J. CAYETANO
GOVERNOR

GENEVIEVE SALMONSON
DIRECTOR

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
235 SOUTH BERETANIA STREET
SUITE 702
HONOLULU, HAWAII 96813
TELEPHONE (808) 586-4185
FACSIMILE (808) 586-4186

December 7, 2001

Mr. Scott Urada
Department of Transportation
Highways Division, State of Hawai'i
601 Kamokila Boulevard
Kapolei, Hawai'i 96707

Mr. Brian Takeda
R. M. Towill Corporation
420 Waiakamilo Road, Suite 411
Honolulu, Hawai'i 96817

Dear Messrs. Urada and Takeda:

We have reviewed your draft environmental assessment for the Kamehameha Highway Drainage Improvements in the Vicinity of Kahuku Hospital and the Replacement of Ki'i Bridge, Project No. 83C-02-01, Ko'olauloa District, Island of O'ahu and offer the following comments for your consideration and response.

(1) CULTURAL IMPACTS. Page 3-16 and Appendix already document archaeological and cultural resources. The discussion is focused on the past historical and cultural landscape. Please discuss present day cultural uses (if any) and what impacts (if any) will the proposed action have on cultural practices and activities in the region (i.e., Do people gather or fish or play in the region? How will the action affect (if any) cultural resources (plants, animals, religious sites) and practices (fishing, swimming, surfing, gathering, etc.)? Chapter 343, Hawai'i Revised Statutes now requires that cultural impacts be assessed (see enclosed copy of Act 50, SLH 2000). A copy of the Environmental Council's guidelines for assessin0g cultural impacts is enclosed for your use.

(2) USE OF RECYCLED GLASS IN CONSTRUCTION PROJECTS. To promote the use of recycled materials in-state, section 103D-407, Hawai'i Revised Statutes recommends that State/county agencies purchase materials with minimum recycled glass content. We ask that you consider this in the design of your station.

(3) NATIVE, INDIGENOUS AND POLYNESIAN INTRODUCED PLANTS FOR USE IN PUBLIC LANDSCAPING: We ask that you consider the use of native, indigenous and polynesian introduced plants in your landscaping.

If there are any questions, please call Leslie Segundo of my staff at (808) 586-4185. Thank you for the opportunity to comment.

Sincerely,

GENEVIEVE SALMONSON
Director

BENJAMIN J. CAYETANO
GOVERNOR

BRIAN K. MINAAI
DIRECTOR

DEPUTY DIRECTORS
JEAN L. OSHITA

JADINE Y. URASAKI

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

IN REPLY REFER TO:

HWY-DS 2.5312

JAN 10 2002

WES		KTS	
R-F		NM	
RTT		BRT	
REC'D JAN 14 2002 RMTC			

TO: GENEVIEVE SALMONSON, DIRECTOR
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

FROM: BRIAN K. MINAAI
DIRECTOR OF TRANSPORTATION

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT - KAMEHAMEHA HIGHWAY DRAINAGE IMPROVEMENTS: VICINITY OF KAHUKU HOSPITAL AND REPLACEMENT OF KII BRIDGE, PROJECT NO. 83C-02-01, KAHUKU, ISLAND OF OAHU

Thank you for your comment letter dated December 7, 2001, concerning the subject Draft Environmental Assessment (EA). We have prepared the following in response:

1. Cultural Impacts - No adverse impacts to contemporary cultural sites or use of the project site for cultural practices are anticipated. The project site involves a portion of the Kamehameha Highway alignment which is a public transportation corridor. The area immediately surrounding Kii Bridge is used for agricultural activities and is on private property. Access to the stream is constrained by the steep banks of the drainageway and during storms constitutes a public safety hazard and this location is not known for cultural, recreational, religious, or gathering activities. The site at Hospital Ditch serves as a drainageway adjoining the front lawn of the Kahuku Hospital. The Kahuku Hospital sponsors an outdoor market in the lawn area every other Saturday, however vending activities occur in the immediate area fronting Pualalea Street. The proposed construction site is not anticipated to displace or adversely impact the vendors. This location is not known for any other cultural, recreational, religious, or gathering activities.

2. Use of Recycled Glass in Construction Projects - HDOT Construction specifications allows the contractor the option to use recycled glass, such as plant mix glassphalt concrete base course, or other suitable materials for certain portions of roadway construction. This option will be provided in the construction contract documents.

3. Use of Native, Indigenous, and Polynesian Introduced Plants - No landscaping is required or anticipated for this project. Disturbed areas will be restored to preconstruction conditions.

   One of the dewatering sites is located within a clear, mowed grass field and a second site is located in an agricultural area. The first dewatering site will be restored to preconstruction conditions using the same species of grass found on-site. The second site will be returned to the tenant for agricultural use. According to the botanical survey report contained in the subject Draft EA, disturbances to vegetative cover are expected to quickly recover within a few months.

We appreciate your review of the Draft EA. Should you have any further comments please contact Mr. Scot Urada, Project Manager, at 692-7553, Technical Design Services Office, Design Branch, Highways Division.

c: Mr. Brian Takeda, R.M. Towill Corporation

CHAPTER 12
REFERENCES

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APPENDIX A

Aquatic Resources Survey

AECOS No. 975

Aquatic resources survey for Hospital Ditch and Ki`i Ditch at Kahuku, O`ahu

AECOS, Inc., 970 N. Kalaheo Ave., Suite C311
Kailua, Hawai'i 96734

Aquatic resources survey for Hospital Ditch and Ki`i Ditch at Kahuku, O`ahu[1]

May 8, 2001 *AECOS* No. 975

AECOS, Inc. 970 N. Kalaheo Ave., Suite C311
Kailua, Hawai'i 96734
Phone: (808) 254-5884 Fax: (808) 254-3029 Email: guinther@aecos.com

Introduction

The northern tip of the Island of O`ahu between Kahuku and Kawela Bay (Figure 1) is characterized by a coastal plain which reaches a maximum width of some 2.4 km (1.5 mi). Geologically, this feature is an ancient reef formed during a higher stand of the sea (the Waimanalo +25 ft stand). Inland (mauka), the marine sediments of this reef formation are covered with a layer of alluvium: material eroded from the Ko`olau mountain and deposited by water flow on the plain. Because of the porous nature of the underlying limestone and the modest rainfall falling on the mountain slopes (annual median rainfall of 40 to 50 inches), only small streams cross the plain, and these do not naturally reach the shore or are intermittent flowing. More typically, waters draining off the interior slopes simply flow to low areas on the plain, there forming coastal marshes. Springs arising on the plain, some artesian, contribute to freshwater resources in this area. However, the low slopes of the broad plain and the fact that occasionally storms can dump large quantities of rainfall over a short period of time, produces flooding in the area. Consequently, some water courses across the plain have been trenched and diked to minimize flooding on the surrounding plain. Hospital and Ki`i ditches are two such features at the western edge of Kahuku town.

Both ditch features eventually feed into channels located between a cluster of diked ponds that were built as settling ponds for mill wash-water from the nearby Kahuku Sugar Mill. These ponds have more recently been converted into the James Campbell National Wildlife Refuge (NWR) managed by the U.S. Fish and Wildlife Service. The ditch system drains towards the Kii Outlet Pump in the refuge and excess water is pumped into Ki`i outlet, an opening through the coastal dunes into the Pacific Ocean. While some coastal marshes still remain on the Kahuku coastal plain, much of the area has been converted to agricultural and aquacultural uses.

[1] Report prepared for R. M. Towill, Inc. for an environmental assessment entitled: "Project Assessment report for Kamehameha Highway drainage improvements, vicinity of Kahuku Hospital" This report will become part of the public record.

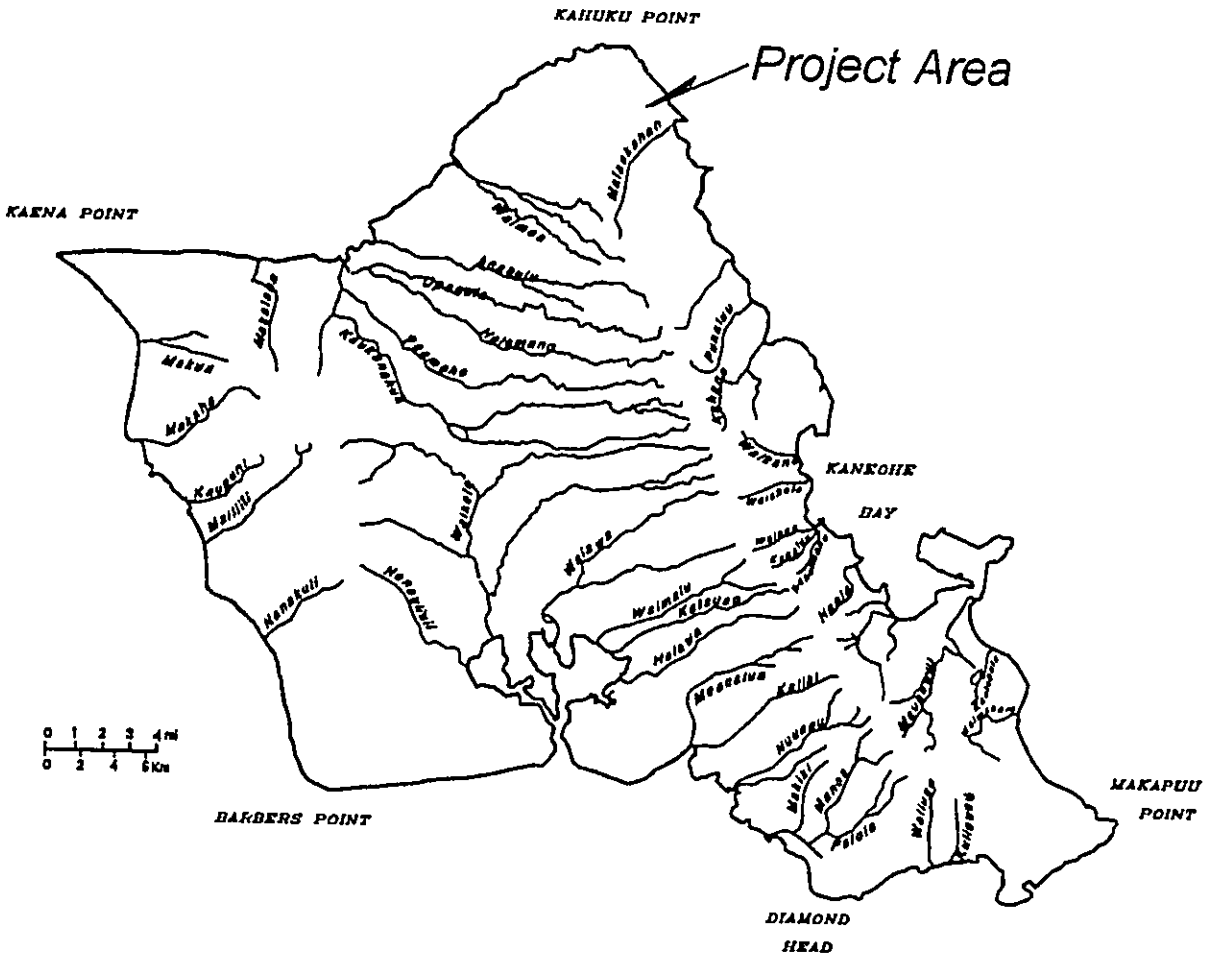

Figure 1. Map of O`ahu perennial streams showing project location at the northern end of the Island.

Hospital Ditch is located along the makai edge of a large mowed field on the north side of Kahuku Hospital. The ditch is not associated with any substantial gulch or drainage feature in the mountains behind Kahuku. The ditch holds water that may be leakage or overflow from an irrigation system serving the area and/or from springs. Kea`aulu Gulch, immediately mauka, drains into Malaekahana Stream (State ID No. 3-1-06) discharging on the eastern end of Kahuku Town. The next gulch westward is Ohia Ai (no State ID number), which drains towards Ki`i Ditch (see below). Thus, Hospital Ditch is a man-made feature related to the inland irrigation system that serves a floodwaters drainage role as well.

Ki`i Ditch arises from several small gulches and Ohia Ai Gulch which extends to the ridgeline of the Ko`olau mountain at an elevation of a little over 490 m (1600 ft). Like Hospital Ditch, this feature is, in the lowlands, a man-made, ditched and diked channel that flows through channels

around the wetland ponds of the James Campbell NWR. Measurements of runoff contributions to the refuge made by Hunt and De Carlo (1999) between 1996 and 1998, established that approximately 89% of surface flows into James Campbell NWR were accounted for by the discharge from Ohia Ai Gulch.

The State of Hawaii classification system for perennial streams (Hawaii Cooperative Park Service Unit, 1990) has no code designation for this system of drainages that eventually flow into the Pacific Ocean through Ki'i outlet. This is unfortunate. Despite the questionable sources of the water with respect to intermittent versus perennial stream flows and irrigation water transfers across watersheds, the reality is that the man-made outlet at Ki'i represents a perennial flow of water into the ocean derived at least in part from springs (see *AECOS*, 1987; Hunt and DeCarlo, 1999). Just as the exclusion of many intermittent flowing streams throughout the Hawaiian Islands limits the coding systems usefulness for cataloging aquatic resources (see AECOS, 2000), the exclusion of wetlands not associated with perennial streams misses other potentially important aquatic resources.

Methods

Biology – The survey of Hospital and Ki'i drainage ditches, conducted on April 20, 2001, was limited to the vicinity of Kamehameha Highway where it is proposed to reconstruct the stream channels and build temporary bypass bridges for traffic during the construction period. In general, the surveys extended a distance of approximately 60 m (200 ft) upstream and downstream of the existing highway bridge, well beyond the limits of the proposed construction project. Aquatic biota was sampled by direct observation and by using hand-nets. Conditions ranged from poor to good for this approach: poor in some areas of extensive coverage of the water surface by emergent and floating plants that made direct observations impossible. More intrusive sampling methods (snorkeling, fish poison, electric shocker) would likely reveal additional species not observed by us, although in heavily vegetated stream segments, any type of collecting or observation would be difficult. We visited the sites during the wet season, and conditions may be somewhat different during extended dry periods.

Water Quality – Water quality measurements were made in two locations on each ditch, one upstream of Kamehameha Highway and one downstream. A full suite of basic water quality parameters was measured in order to characterize the aquatic environments present. All measurements represent conditions at a single point in time and may not be representative of average conditions.

The methods pertaining to the water quality analyses are given in Table 1. All water samples (assigned laboratory Log No. 14231) were taken to *AECOS* laboratory in Kailua immediately after collection and either preserved or analyzed immediately as required by standard methodology for each analysis. Salinity (by refractometer), temperature, pH, and dissolved oxygen were measured with instruments or probes *in situ*.

Table 1. Analytical methods and instruments used for the April 20, 2001 sampling in Hospital and Ki`i Ditches, Kahuku.

Analyses List	Method	Reference	Instrument
Ammonia	alkaline phenol	Koroleff in Grasshoff et al. (1986)	Technicon AutoAnalyzer II
Dissolved Oxygen	EPA 360.1	EPA (1979)	YSI Model 55 DO meter
Nitrate + Nitrite	EPA 353.2	EPA (1993)	Technicon AutoAnalyzer II
pH	EPA 150.1	EPA (1979)	pHep 3
Salinity (field)	refractive index	---	handheld, temperature compensating refractometer
Temperature	thermister calibrated to NBS cert. Thermometer (EPA 170.1)	EPA (1979)	YSI Model 55 DO meter
Total Nitrogen	persulfate digestion /EPA 353.2	D'Elia et al. (1977) / EPA (1993)	Technicon AutoAnalyzer II
Total Phosphorus	persulfate digestion /EPA 365.1	Koroleff in Grasshoff et al. (1986) / EPA (1993)	Technicon AutoAnalyzer II
Total Suspended Solids (TSS)	Method 2540D (EPA 160.2)	Standard Methods 18th Edition (1992); EPA (1979)	Mettler H31 balance
Turbidity	Method 2130B (EPA 180.1)	Standard Methods 18th Edition (1992); EPA (1993)	Hach 2100P Turbidimeter

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Stream Description

Hospital Ditch – Hospital ditch in the project area (Figure 2) is a broad (6 - 7 m or 18 to 23 ft), shallow, diked feature with water depths on the order of 0.5 m (1-2 ft). Upstream, the water body is almost completely overgrown with California grass (*Brachiaria mutica*). However, scattered clumps of cattail (*Typha latifolia*) and an open water pond occur well upstream of the project area. Plants observed in the project

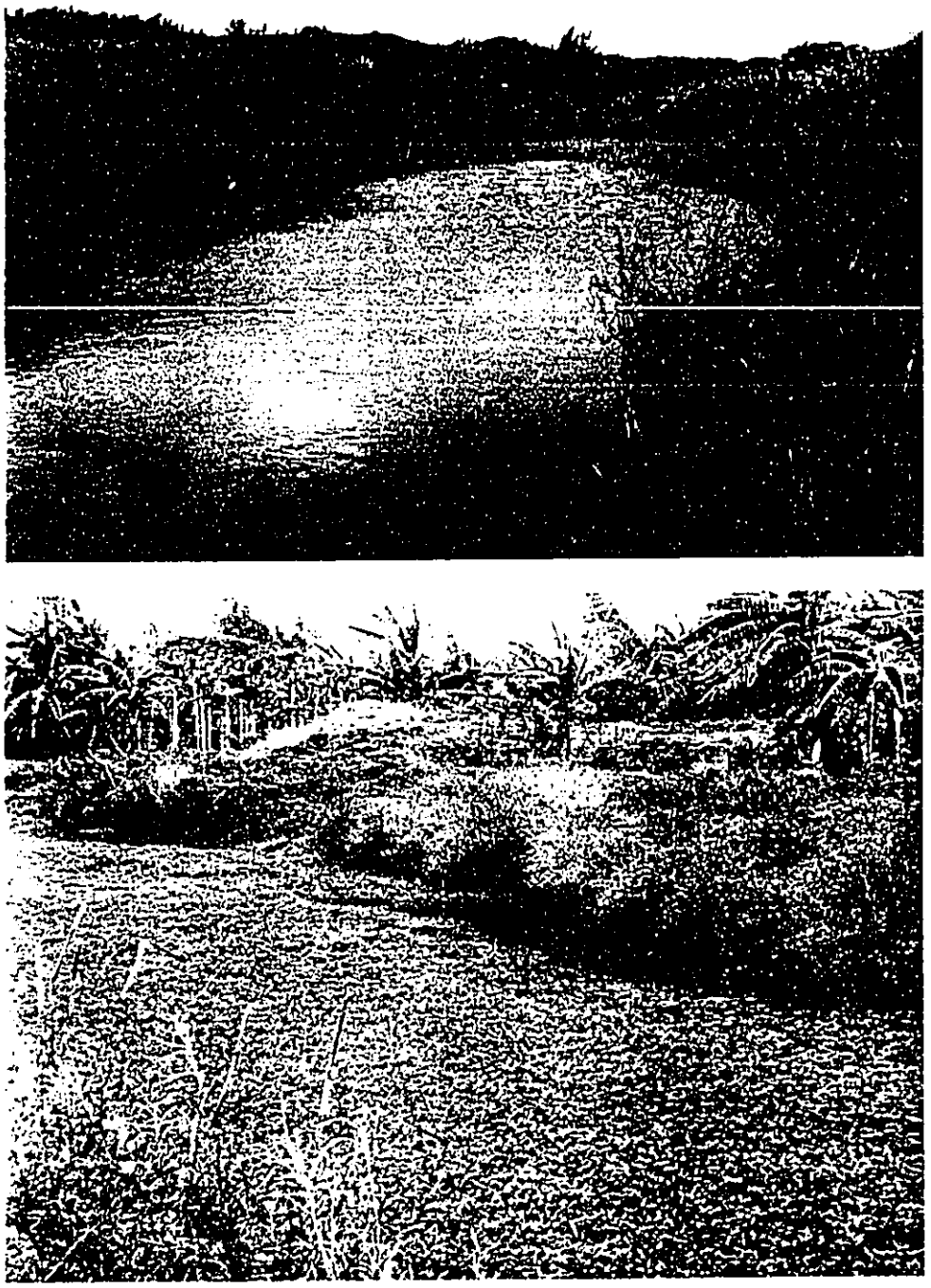

Figure 2. Two views of Hospital Ditch in Kahuku: (upper) An open water pond upstream of the project area; (lower) A dense mat of *ung choi* covers large portions of the ditch below the highway. A gallinule is seen swimming on the water in the lower picture.

vicinity at Hospital Ditch are detailed in Funk (2000). Within this wetland, inland of the highway, algae (*Spyrogyra* sp.), crayfish (*Procambarus clarkii*), guppies (*Poecilia reticulata*), snails (*Melanoides tuberculata*), and small crustaceans (Amphipoda) were moderately common. All were difficult to observe because of the thick growth of grass. A single duck (*Anas* sp., probably a mallard) flew out of the pond when approached.

Below the highway, at least half the channel width of Hospital Ditch is covered by floating *ung-choi* or swamp cabbage (*Ipomoea aquatica*), an aquatic plant that is being cultivated here. Hawaiian gallinule (*Gallinula chloropus sandvicensis*), cattle egret (*Bulbucus ibis*), and black-crowned night heron (*Nycticorax nycticorax hoactli*) were all observed in or along the waterway. American bullfrog (*Rana catesbeiana*) is present. The melanid snail noted above is abundant and shells of both apple snail (*Pomacea canaliculata*) and flume clam (*Corbicula fluminea*) were seen, but no living individuals of these two molluscs were observed. Both poecilid fishes and tilapia are abundant. Poecilids seen here include Mexican short-fin molly (*Poecilia mexicana*), Cuba lima (*Limia vittata*), mosquitofish (*Gambusia affinis*), and possibly sailfin molly (*Poecilia latipinna*; seen but avoided capture). Table 2 presents a checklist of the aquatic biota observed in and around Hospital Ditch in the project vicinity.

Table 2. Checklist of aquatic fauna observed from Hospital and Ki`i Ditches around Kamehameha Highway near Kahuku, O`ahu.

Species	Common Name	Status	QC Code	Hosp.	Ki`i
	INVERTEBRATES				
MOLLUSCA, GASTROPODA	(mollusks)				
PHYSIDAE					
?Physa virgata	pond snail	nat.	10	--	P
PILIDAE					
Pomacea canaliculata (Lam.)	apple snail	nat.	10	†	U
THIARIDAE					
Melanoides tuberculata (Müller)	melanid snail	nat	10	A	A
MOLLUSCA, BIVALVIA					
CORBICULIDAE					
Corbicula fluminea (Muller)	flume clam	nat.	10	†	--
ARTHROPODA, CRUSTACEA	(crustaceans)				
AMPHIPODA	(indet.)		10	C	--
DECAPODA, CAMBARIDAE					
Procambarus clarkii	crayfish	nat.	10	C	--
ARTHROPODA, INSECTA	(insects)				
ODONATA, COENAGRIONIDAE					
Ischnura ramburi (Selys-Longchamps)	adults & naiads	nat.	10	P	P

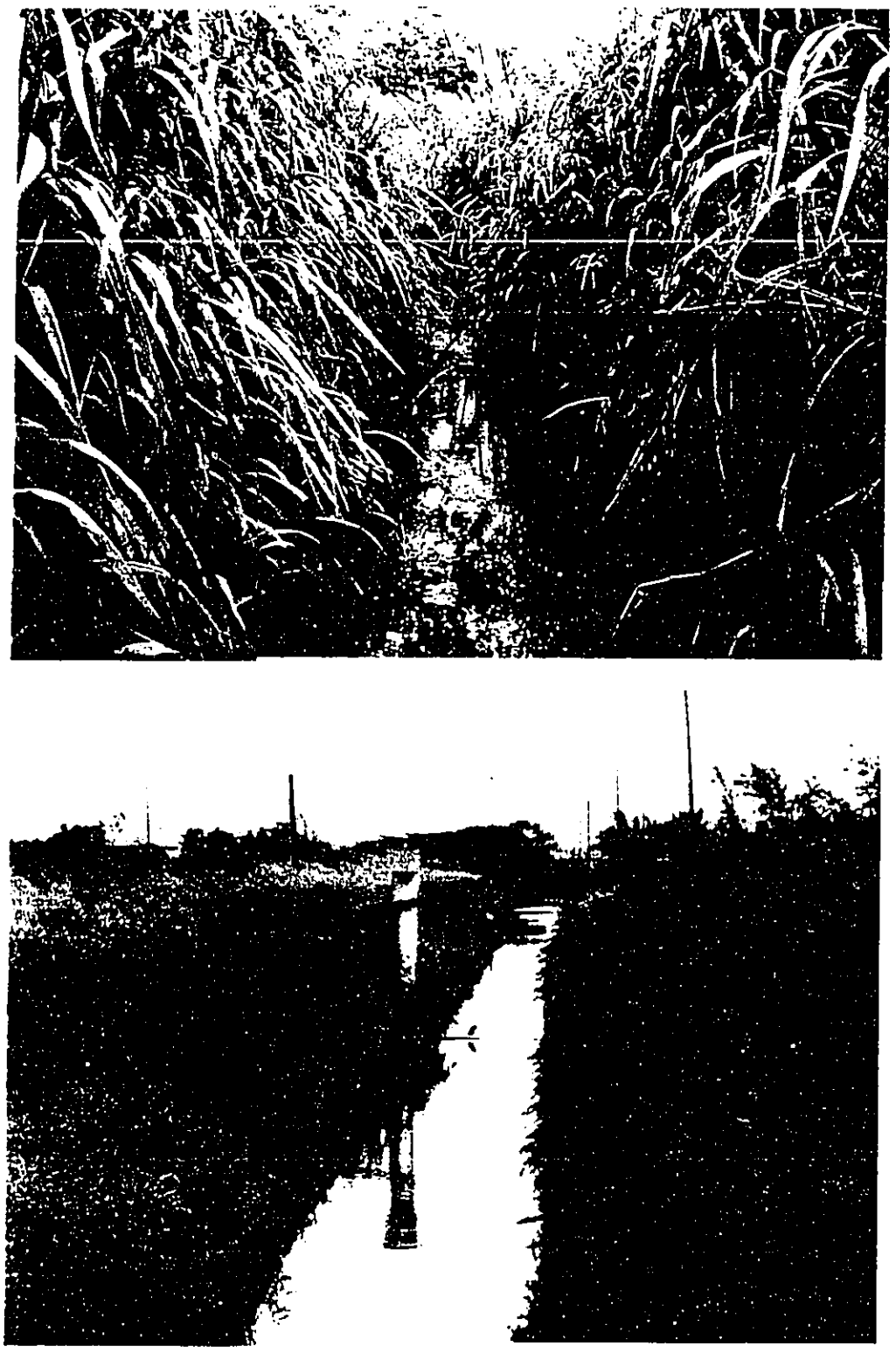

Figure 3. Two views of Ki`i Ditch in Kahuku: (upper) The steep-sides of the ditch upstream from the highway are covered with Guinea grass; (lower) Open water is dominant in the ditch below the highway. A black-crowned night heron is seen standing on the USGS/USFWS gaging station weir in the lower picture.

Table 2. Continued.

Species	Common Name	Status	QC Code	Hosp.	Ki'i
	VERTEBRATES				
VERTEBRATA, PISCES	(fishes)				
CICHLIDAE					
indet.	tilapia	nat.	10	P	P
POECILIIDAE					
Gambusia affinis (Baird & Girard)	mosquitofish	nat.	10	P	--
Limia vittata	Cuba lima	nat.	20	A	--
?Poecilia latipinna	sailfin molly	nat.	10	U	--
Poecilia mexicana (Steindachner)	Mexican mollie	nat	10	A	A
Poecilia reticulata	guppy	nat.	10	C	--
VERTEBRATA, AMPHIBIA	(frogs & toads)				
BUFONIDAE					
Bufo marinus	marine toad, tadpoles	nat.	10	--	P
RANIDAE					
Rana catesbeiana Shaw	American bullfrog	nat.	10	P	--
VERTEBRATA, AVES	(birds)				
ANATIDAE					
Anas sp.	duck (?mallard)	nat.	10	P	--
ARDEIDAE					
Nycticorax nycticorax hoactli	black-crowned night heron	ind.	10	P	P
RALLIDAE					
Gallinula chloropus sandvicensis	Common moorhen	**end.**	10	P	--

KEY TO SYMBOLS AND ABBREVIATIONS USED:

Status:

nat. - naturalized. An introduced or exotic species.
ind. - indigenous. A native species also found elsewhere in the Pacific.
end. - endemic - A native species found only in the Hawaiian Islands.

QC Code:

10 - Observed in the field by aquatic biologist on April 20, 2001.
20 - Collected; identified in the laboratory; specimen(s) not saved.

Abundance categories:

† - dead; remains (shell, etc.) only seen.
U - Uncommon - several to a dozen individuals observed.
C - Common - Seen everywhere, although generally not in large numbers.
A - Abundant - found in large numbers and widely distributed.
P – Present - noted as occurring, but quantitative information lacking.

Ki`i Ditch – Ki`i Ditch is a narrow and deep trench directly inland from Kamehameha Highway. This ditch is some 3-4 m (10-12 ft) deep and 1.5-2 m (5 to 6 ft) across at the bottom (Figure 3). The banks support a dense growth of Guinea grass. Other plants seen in the project vicinity of Ki`i Ditch are detailed in Funk (2000). Water in the ditch is flowing, and mostly only a few to 10 cm (a few inches) deep, but increasing in depth close to the highway bridge to almost 1 m (3 ft.). Within the upstream segment only apple snails were observed. However, immediately downstream of the highway bridge, the water shoals beneath an old bridge

(former cane haul road crossing), then becomes a long pond (Figure 3). In this area, green algae (*Rhizoclonium* sp.), apple snails, prawn, guppies, and Bufo tadpoles (*Bufo marinus*) are all present. Black-crowned night heron was observed both upstream and downstream of the highway along Ki`i Ditch. Table 2 (above) presents a checklist of the aquatic biota observed in and around Ki`i Ditch in the project vicinity.

Water Quality

As noted under methods above, water quality measurements and samples were made at two locations in each ditch: one (Station 1) representing water inland of the Kamehameha Highway bridge, and the other (Station 2) representing "stream" or ditch water downstream of the highway. In all cases, some flow of water was occurring at the time of the sampling. Flow in Ki`i Ditch was estimated to be on the order of 5-6 l/min (1.3-1.6 gpm) and flow in Hospital Ditch was about half that volume[2]. At all of the stations except Ki`i Station 1, the samples were collected in essentially large pools. The water quality results are presented in Table 3.

Table 3. Water quality characteristics of the lower reaches of Hospital and Ki`i Ditches from samples obtained May 20, 2001.

		Time	Temp. (°C)	pH	DO (mg/l)	DO Sat. (%)	Sal.. (o/oo)	Turbidity (ntu)
Hospital Ditch								
Sta. 1	04-20-01	1135	22.7	7.3	2.62	31	2	7.29
Sta. 2	04-20-01	1110	22.2	7.2	2.02	24	2	9.21
Ki`i Ditch								
Sta. 1	04-20-01	1200	23.1	7.0	2.23	26	0	1.84
Sta. 2	04-20-01	1215	25.1	7.3	5.88	72	0	13.0

			TSS (mg/l)	Ammonia (µg N/l)	Nitrate + nitrite (µg N/l)	Total N (µg N/l)	Ortho-P (µg P/l)	Total P (µg P/l)
Hospital Ditch								
Sta. 1	04-20-01	1135	6.1	55	185	353	--	105
Sta. 2	04-20-01	1110	7.8	53	239	490	--	180
Ki`i Ditch								
Sta. 1	04-20-01	1200	1.3	69	2290	2360	--	26
Sta. 2	04-20-01	1215	8.8	136	887	1100	--	36

The temperature and pH values obtained were fairly ordinary. Dissolved oxygen values, on the other hand, tended to be low, as further indicated by the percent of saturation these

[2] A reading of 1.59 was made off the USGS/USFWS staff gage at the gaging station on Hospital Ditch.

concentrations represent (Table 3). Hunt and DeCarlo (1999) established stations on both ditches: Sta. 3 presumably at or near the gaging station downstream of the highway on Ki`i Ditch, and Sta. 45 on Hospital Ditch close to the NWR boundary (well downstream of the highway). They also noted conditions of poor oxygenation in these waters. Turbidity and TSS values obtained on April 20 were varied, but generally high. However, these samples came from essentially ponds with considerable inert suspended matter and phytoplankton, making comparisons with stream values and the State of Hawaii, Department of Health (HDOH, 1992) regulatory limits of questionable application.

Nitrates were also noted to be elevated, especially nitrogen compounds in Ki`i Ditch and phosphorus compounds in Hospital Ditch (Table 3 above). Perhaps these values reflect agricultural activities upslope or more locally. Some nutrient values are reported by Hunt and DeCarlo (1999) for the same general areas. In Hospital Ditch: 90 µg nitrate+nitrate-N/l and 60 µg total-P/l (Sta. 45 on March 13-14, 1997). In Ki`i Ditch: 50 µg ammonia-N/l and 220 µg nitrate+nitrate-N/l (Sta. 3 on March 13-14, 1997). A runoff sample from a storm drain feeding into Hospital Ditch just above the highway yielded a much higher nitrate + nitrogen value: 1100 µg nitrate+nitrate-N/l (Sta. 4 in March 1997).

The presence of these nutrients encourage weedy growth in the stream bed as well as the extensive growth of floating plants observed in the area. Nutrients also encourage phytoplankton development in the slow flowing waters where or when floating plants do not completely cover the water surface. This eutrophication of the water body leads to wide swings in DO content, from possibly very high in the daylight, to anoxic at night, with adverse impacts on aquatic animals. Eventually high nutrient content or the organic material generated by the high nutrient subsidies to the aquatic plant communities are swept out of the system at Ki`i Outlet, contributing to coastal pollution.

Conclusions

The proposed modifications to two drainage ditches involve enlargement of the culvert openings beneath Kamehameha Highway to better facilitate movement of flood waters through the area. This action should reduce flooding and over-topping of Kamehameha Highway, although without structural changes in the ditch system downstream, flood prevention gains may be minimal. At Hospital ditch, flows that presently result in water flooding a large field below the hospital, will move on towards the James Campbell NWR and perhaps contribute to over-topping of the dikes that presently separate the drainage system from the refuge ponds (Donna Stoval, USFWS, pers. comm.). While there is a distinct ecological advantage to retaining this water mauka of the highway and releasing it slowly (the present situation), this has in the past resulted in flooding of the highway and access road to the area hospital. Raising the roadbed would seem the best solution, but as a practical matter and in furtherance of future flood relief plans (DLNR, 1993), simultaneous enlargement of the culvert under Kamehameha Highway becomes a logical step.

Both Hospital Ditch and Ki`i Ditch in the area of proposed construction of highway crossings contain flowing water that supports a variety of aquatic organisms that are dominated by introduced species. Of the aquatic fauna observed during the field reconnaissance, the only native species were wetland birds. All other aquatic species — both fishes and invertebrates — observed were alien species widely naturalized throughout the Hawaiian Islands and generally common inhabitants of lowland streams on O`ahu.

The portions of each ditch downstream of Kamehameha Highway would seem to be permanent bodies of water (perennial) and therefore potentially jurisdictional waters (USACOE, 1987). Considering the low elevation, connectivity with a system of ditches across this part of the Kahuku Plain, and inputs from area springs, the entire system of channels would unlikely dry up under conditions other than severe droughts. Water flowing over small drops in elevation could be observed at and above the highway crossings in both ditches. For Ki`i Ditch, the small amount of flow present during our field visit and the narrow bed suggest that, above the highway, this stream is intermittent. For Hospital Ditch, the situation is somewhat different. Whether because of the small culvert under Kamehameha Highway or the extensive emergent vegetation in the channel bed or both, the ditch inland from the highway contain a more or less permanent body of water supporting a clear predominance of wetland indicator plant species (USFWS, 1988) such as California grass (FACW), cattail (OBL), and primrose willow (OBL). Given a permanent water source, a clear dominance of facultative and obligate wetland plant species, and a likely layer of hydric soil n the bottom (not investigated), this area could qualify as a jurisdictional wetland (USACOE, 1987).

With two exceptions, no aquatic species listed as protected, threatened or endangered were observed in the project area (DLNR, 1986; Federal Register, 1999, 2001). The exceptions are a federally listed waterbird (Hawaiian moorhen; *Gallinula chloropus sandvicensis*) and the State protected heron (black-crowned night heron; *Nycticorax nycticorax hoactli*) that were observed in the project vicinity. While the project area is not critical habitat for these species, their proximity must be considered in devising BMPs for the construction phase. Proposed changes to the existing culverts and crossings would not have any impact on listed species, nor on any native aquatic animals in the long term.

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APPENDIX B

Botanical Survey Report

BOTANICAL SURVEY REPORT FOR THE KAMEHAMEHA HIGHWAY DRAINAGE IMPROVEMENTS SITE – VICINITY OF KAHUKU HOSPITAL, OAHU HAWAII

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INTRODUCTION

The Kamehameha Highway Drainage Improvements Site is composed of two small study areas. The Hospital Ditch Site is made up of four small parcels totaling 1.75 acres and the Kii Bridge site is made up of five small parcels totaling 2.50 acres. The vegetation of each site will be described separately, however a single species list will be presented due to the similarity of flora of these near neighbor areas.

HOSPITAL DITCH SITE

The Kamehameha Highway Drainage Improvements at the Hospital Ditch location will include a temporary by-pass road and installation of multicelled concrete box culverts. A botanical survey of the by pass road right-of-way on the northern side of Kamehameha Highway and an approximately one half acre construction site on the southern side of Kamehameha Highway was carried out in April 2001.

The portion of the by pass road right-of-way nearest Kamehameha Highway includes an open mowed area and a bus stop. The Hospital Ditch crosses this area in a north-south direction. The vegetation of the mowed area is made up of many weedy species. Grasses such as pitted beardgrass (*Bothriochloa pertusa* (L.) A. Camus), Bermuda grass (*Cynodon dactylon* (L.) Pers.), stinkgrass (*Eragrostis cilianensis* (All.) Link, several species of Chloris, and Guinea grass (*Panicum maximum* Jacq.). In addition common plants such *as Bidens alba* (L.) DC, nodeweed (*Synedrella nodiflora* (L.) Gaertn.), *Boerhavia coccinea* Mill., *Coccinia grandis* (L.) Voigt , and *Malvastrum coromandeliamum* L. are also found. North of the fence is a producing banana farm (*Musa* x *paradisiaca* L.) with some interplanted red ginger (*Alpinia purpurata* (Vieill.) K. Schum. and torch ginger (*Phaecomeria magnifica* (Roscoe) K. Schum.).

The construction site south of Kamehameha Highway is vegetated by mostly Guinea grass interspersed with castor bean bushes (*Ricinus commuis* L.) and bingabing (*Macaranga mappa* (L.) Mull. Arg. bushes near the highway. At the western edge of the construction area the vegetation becomes California grass (*Brachiaria mutica* (Forssk.) Stapf.) with koa haole (*Leucaena leucocephala* (Lam.) deWit.) mixed in. There is one large hummock of cattail (*Typha latifolia* L.) and some 'Ahu'awa haole (*Cyperus alternifolius* L.) near the stream bank. There are also scattered individuals of Chinese violet (*Asystasia gangetica* (L.) T. Anderson), Bidens alba, ivy gourd, primrose willow (*Ludwigia octovalvis* (Jacq.) Raven), and *Macroptilium atropurpureum* (DC) Urb.

The intermittent Hospital Ditch Stream has been greatly modified. Upstream of the culvert it has been moved, straightened, and channeled between earthen berms. It is narrowly channeled as it emerges from the culvert on the north side, then just past the study site boundary it broadens out, although, here too it has been straightened. There is ponding both upstream and down stream of the study site. At the time of the survey there was standing water in the streambed. North of Kamehameha Highway the stream vegetation consisted of primrose willow, swamp cabbage (*Ipomoea aquatica* Forssk), California grass, Bidens alba, koa haole, and Chinese violet among others.

KII BRIDGE SITE

The Kii Bridge site, approximately five hundred feet west of the Hospital Ditch site, also consists of a by-pass road right-of-way and a construction area for the replacement of the Kii Bridge. Part of the by-pass road right-of-way is mowed grass, a small shack, a banana farm and a major portion is a fish-pond. All are located on the northeast side of Kamehameha Highway.

The mowed portion of the Kii Bridge site is covered by a mix of grasses and weeds. Grasses such as Guinea grass, Bermuda grass, swollen finger grass (*Chloris barbata* (L.) Sw.), stargrass *(Chloris divaricata* R. Br.), and stinkgrass. Common weeds such as *Malvastrum coromandelianum* L., slender amaranth (*Amaranthus viridis* L.), Bidens alba, hairy spurge (*Chamaesyce hirta* (L.) Millsp.) and many others. There is a fence that divides the by-pass road right-of-way portion of the study. Across the fence on the south-eastern side of Kii Stream is a banana farm. On the northwestern side of the stream is a fish pond.

The fishpond portion of the study site is surrounded by high berms that are covered with neatly mowed grasses. Most common are goose grass (Eleusine indica (L.) Gaertn.), Guinea grass, California grass, and mixed weeds.

This fishpond did not support hydrophytic vegetation, it has steeply cut banks and if there is a waterproof liner in the pond it was not visible. There was standing water but no other discernable evidence that the fishpond is a protected water of the United States.

The vegetation of the construction area or that portion of the Kii Bridge site that is located on the south-west side of Kamehameha Highway is made up of Guinea grass, koa haole, Chinese violet, ironwood trees (Casuarina equisetifolia L.) and Macaranga tanarius (L.) Mull. Arg.

The intermittent Kii Stream has been altered on both sides of Kamehameha Highway. It has been straightened and channeled and now is a narrow, steep sided waterway as it passes through the study site. There was standing water in the channel. Growing on steep banks of the stream on the north-east side of Kamehameha Highway is

dense mixed vegetation including primrose willow, koa haole, castor been, 'ahu'awa haole, Bidens alba, ivy gourd, star grass, and many, many others are common..

CONCLUSIONS

The plant taxa that make up the vegetation of the Kamehameha Highway Drainage Improvements Site are all alien species and are considered to be weeds. These species are to be found along roadsides and on farms on all of the Hawaiian Islands at low elevations. If the vegetation cover of these sites is disturbed, it will quickly regenerate in a few months. There is nothing in the flora of these sites that should prevent this project from going forward.

ENDANGERED SPECIES

No candidate, proposed, or listed threatened or endangered species as set forth in the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543) are known from this site and none were found during this survey.

SPECIES LIST OF THE PLANTS FOUND ON THE KAMEHAMEHA HIGHWAY DRAINAGE IMPROVEMENTS SITES – VICINITY OF KAHUKU HOSPITAL

The plant families in the following species list have been alphabetically arranged within two groups Monocotyledons, and Dicotyledons. The genera and species are arranged alphabetically within families. The taxonomy and nomenclature follow that of Wagner, Herbst, and Sohmer (1990). For each taxon the following information is provided:

1. An asterisk before the plant name indicates a plant introduced to the Hawaiian Islands since Cook or by the aborigines.
2. The scientific name of the plant.
3. The Hawaiian name or the most widely used common name of the plant.
4. Abundance ratings are for this site only and they have the following *meanings:*
   Uncommon = a plant that was found less than fine times.
   Occasional = a plant that was found between five and ten times.
   Common = a plant considered an important part of the vegetation.
   Locally abundant = plants found in large numbers over a limited area. For example the plants found in grassy patches.

This species list is the result of an extensive survey of these sites during the early growing season (April 2001) and it reflects the vegetation composition of the flora during a single season. Minor changes in the vegetation will occur due to introductions and losses and a slightly different species list would result from a survey conducted during a different growing season.

Scientific Name	Common Name	Abundance
	MONOCOTYLEDONS	
AGAVACEAE – Agave Family		
**Cordyline fruticosa* (L.) A. Chev.	Ti	Uncommon
ARECACEAE - Palm Family		
**Cocos nucifera* L.	Coconut palm	Uncommon
CYPERACEAE - Sedge Family		
**Cyperus alternifolius* L.	'Ahu'awa haole	Common
MUSACEAE – Banana Family		
**Musa* x *paradisiaca* L.	Banana	Common
POACEAE - Grass Family		
**Bothriochloa pertusa* (L.) A. Camus	Pitted beardgrass	Common
**Brachiaria mutica* (Forssk.) Stapf.	California grass	Common
**Chloris barbata* (L.) Sw.	Swollen fingergrass	Common
**Chloris divaricata* R. Br.	Star grass	Locally abundant
*Cynodon *dactylon* (L.) Pers.	Bermuda grass	Common
**Eleusine indica* (L.) Gaertn.	Wiregrass	Locally abundant
**Eragrostis cilianensis (*All.) Link	Stinkgrass	Locally abundant
**Panicum maximum* Jacq.	Guinea grass	Common
**Paspalum conjugatum* Bergius	Hilo grass	Locally abundant
**Setaria verticillata* (L.) P. Beauv.	Bristly foxtail	Occasional
**Sorghum halpense* (L.) Pers	Johnson grass	Occasional
TYPHACEAE – Cattail Family		
**Typha latifolia* L.	Common cattail	Locally abundant
ZINGIBERACEAE – Ginger Family		
**Alpinia purpurata* (Vieill.) Schum.	Red ginger	Occasional
**Phaecomeria magnifica* (Roscoe.) Schum.	Torch ginger	Occasional

Scientific Name	Common Name	Abundance
	DICOTYLEDONES	
ACANTHACEAE – Acanthus Family		
**Asystasia gangetica* (L.) T. Anderson	Chinese violet	Common
AMARANTHACEAE – Amaranth Family		
**Amaranthus viridis* L.	Slender amaranth	Occasional
ANACARDIACEAE – Mango Family		
**Schinus terebinthifolius* Raddi	Christmas berry	Occasional
ARALIACEAE – Ginseng Family		
**Schefflera actinophylla* (Endl.) Harms	Octopus tree	Uncommon
ASTERACEAE – Sunflower Family		
**Bidens alba* (L.) DC		Common
**Calyptocarpus vialis* Less.		Locally abundant
**Eclipta alba* (L.) Hassk.	False daisy	Uncommon
**Pluchea symphytifolia* (Mill.) Gillis	Sourbush	Common
**Sonchus oleraceus* L.	Sow thistle	Occasional
**Synedrella nodiflora* (L.) Gaertn.	Nodeweed	Uncommon
**Tridax procumbens* L.	Coat buttons	Locally abundant
BORAGINACEAE – Borage Family		
**Heliotropium procumbens* Mill.		Occasional
BRASSICACEAE – Mustard Family		
**Coronopus didymus* (L.) Sm.	Swinecress	Uncommon
CASUARINACEAE – Ironwood Family		
**Casuarina equisetifolia* L.	Ironwood	Common
CONVOLVULACEAE – Morning glory Family		
**Ipomoea aquatica* Forssk.	Swamp cabbage	Locally abundant
**Ipomoea triloba* L.	Little bell	Occasional

Scientific Name	Common Name	Abundance
CUCURBITACEAE – Gourd Family		
**Coccinia grandis* (L.) Voigt	Ivy gourd	Common
EUPHORBIACEAE – Spurge Family		
**Chamaesyce hirta* (L.) Millsp.	Hairy spurge	Occasional
**Chamaesyce hypericifolia* (L.) Millsp.	Graceful spruge	Occasional
**Chamaesyce prostrata* (Aiton) Small	Prostrate spurge	Occasional
**Euphorbia cyathophora* J. A.Murry	Mexican fire plant	Locally abundant
**Macaranga mappa* (L.) Mull. Arg.	Bingabing	Occasional
**Macaranga tanarius* (L.) Mull. Arg		Locally abundant
**Ricinus cummunis* L.	Castor bean	Occasional
FABACEAE – Bean Family		
**Desmodium triflorum* (L.) DC		Locally abundant
**Glycine wightii* (Wight & Arnott) Verdc.		Locally abundant
**Indigofera spicata* Forssk.	Creeping indigo	Occasional
**Lablab purpureus* (L.) Sweet	Hyacinth bean	Uncommon
**Leucaena leucocephala* (Lam.) de Wit	Koa haole	Common
**Macroptilium atropurpureum* (DC) Urb.		Occasional
**Melilotus indica* (L.) All.		Uncommon
**Mimosa pudica* L.	Sensitive plant	Common
LAMIACEAE – Mint Family		
**Leonotis nepetifolia* (l.) r. Br.		Occasional
MALVACEAE – Mallow Family		
**Abutilon grandifolium* (Willd.) Sweet	Hairy abutilon	Occasional
**Malva parviflora* L.	Cheese weed	Occasional
**Malvastrum coromandeliamum* (L.) Garcke	False mallow	Occasional
**Sida rhombifolia* L.		Occasional
**Sida ciliaris* L.		Common
**Sida spinosa* L.	Prickly sida	Occasional
MYRTACEAE – Myrtle Family		
**Psidium guajava* L.	Guava	Uncommon

Scientific Name	Common Name	Abundance
NYCTAGINACEAE – Four-o'clock Family		
**Boerhavia coccinea* Mill.		Occasional
ONAGRACEAE – Evening Primrose Family		
**Ludwigia octovalvis* (Jacq.) Raven	Primrose willow	Locally abundant
PASSIFLORACEAE – Passion Flower Family		
**Passiflora foetida* L.	Love-in-a-mist	Common
PLANTAGINACEAE – Plantain Family		
**Plantago lanceolata* L.	Narrow-leafed plantain	Occasional
PORTULACACEAE – Purslane Family		
**Portulaca oleracea* L.	Pig weed	Common
VERBENACEAE – Verbena Family		
**Stachytarpheta dichotoma* (Ruiz & Pav.)	Owi	Uncommon
**Stachytarpheta jamaicensis* (L.) Vahl	Vervain	Occasional
**Verbena litoralis* Kunth	Owi	Uncommon

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APPENDIX C

Avifaunal and Feral Mammal Field Survey

AVIFAUNAL AND FERAL MAMMAL FIELD SURVEY FOR THE PROPOSED KAMEHAMEHA HIGHWAY DRAINAGE IMPROVEMENTS PROJECT, OAHU

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INTRODUCTION

The purpose of the report is to present the findings of a field survey of two bridge sites located at milepost 15.2 and 15.4 on Kamehameha Highway, Kahuku, Oahu. The existing bridges at these locations have been proposed for replacement. The goals of the field survey were to:

1- Document the species of birds and mammals currently on or near the proposed bridge replacement sites.

2- Focus special attention on native species, particularly those that are listed as endangered.

3- Note the natural resources important to native birds at these sites. Published and unpublished resources were also used to supplement the results of the field survey.

GENERAL SITE DESCRIPTION

The two bridge sites are located along Kamehameha Highway (Route 83, Milepost 15.2 and 15.4). One bridge serves the Hospital Ditch fronting Kahuku Hospital and the other bridge is known as Kii Bridge. The streams mauka of Kamehameha Highway are choked with grass and brush. The sections of the streams makai of the highway are more open and in the case of the Kii stream are periodically cleaned to allow better drainage. Both streams usually obtain flowing water even during the drier parts of the

year (pers. obser.). The surrounding lands near these bridges include a variety of habitats ranging from agricultural plots, aquaculture ponds, lawns, sewage plant, and the James Campbell National Wildlife Refuge (JCNWR) Kii Unit.

SURVEY METHODS

The survey was conducted from the bridges and by walking mauka and makai of the bridges for a distance of approximately 100 meters. Some sections of the streams were walked. This afforded an opportunity to search for waterbird nests. Observations were taken during the morning hours before 09:00 in the late afternoon 17:00 hours. The data were obtained between 29 April and 4 May 2001. All native waterbirds were tallied and the repeated visits to these sites made it possible to get a reasonably accurate number for each waterbird species using this area. Migratory birds were also counted. Introduced birds and mammals were of less importance to this survey, however, a list of all such species was kept and is reported in Table One. The weather during the survey period was mixed with passing showers and clear to partly cloudy conditions. Scientific and common names used in this report follow Pyle (1997) and Honacki et al. (1982).

RESULTS AND DISCUSSION

Native Waterbirds:

Five species of native waterbirds were recorded during the survey. Four of these species are listed as endangered. No nests were discovered. The birds were observed foraging and loafing. Below is a summary of the data obtained on each species:

1- Black-necked Stilt (*Himantopus mexicanus knudseni*): This endemic and endangered subspecies forages in a variety of habitats including shallow ponds, mud flats, flooded fields and even wet lawns (Hawaii Audubon Society 1993). As many as 20 stilts have been seen foraging on the Kahuku Hospital lawn adjoining the Hospital Ditch (pers. obser.). On this survey I observed a total of six stilt foraging on this lawn on two mornings when there were passing showers and the lawn was wet.

2- Common Moorhen (*Gallinula chloropus sandvicensis*): Two pairs were present along the mauka section of the Hospital Ditch on each survey visit. One pair was seen on three survey visits on the makai section of the Hospital Ditch. A pair of moorhen were also seen on the mauka portion of the Kii Stream about 50 meters from the highway. The Common Moorhen in Hawaii is an endangered and endemic subspecies of the Common Moorhen which belongs to the Rail family. They are typically shy retiring birds and

quickly retreat into the cover of vegetation when approached (Pratt et al. 1987). I have seen moorhen on the lawn adjoining the Hospital Ditch on many occasions over the past 20 years I have lived in Kahuku. The dense grass along the ditch provides ideal cover, foraging and nesting habitat for this bird.

3- Hawaiian Coot (*Fulica alai*): The Hawaiian Coot is an endemic and endangered species. Two coots were recorded in Kii stream makai of the Kii Bridge on two different site visits. Coots seem to prefer more open habitat than Common Moorhen. They can be seen foraging on large ponds as well as in open sections of ditches. They are members of the Rail family but are generally not as shy as the Common Moorhen.

4- Koloa or Hawaiian Duck (*Anas wyvilliana*): The Koloa is an endangered and endemic species. Two Koloa were startled from the mauka section of Hospital Ditch on two separate site visits. This duck frequents not only ponds but streams as well (Hawaii Audubon Society 1993). Several times over the last few years I have even seen them on the Kahuku Hospital lawn after a heavy. This species is monogamous so it is not uncommon to see them in pairs.

5- Black-crowned Night-Heron (*Nycticorax nycticorax*): This species is the only native waterbird that is not currently listed as endangered. They forage

in a wide variety of wetland habitats and are particularly abundant around aquaculture projects. Three adult night herons were tallied along the makai section of Kii Stream. One juvenile night heron was seen on the makai section of the Hospital Ditch. All of these birds were observed foraging.

Native Landbirds:

No native land birds were observed on this survey. The only species that might be seen in this area is the Short-eared Owl or Pueo (*Asio flammeus sandwichensis*). The Oahu population of this species is listed by the State of Hawaii as endangered. I have seen Pueo makai of JCNWR as recently as one year ago. They were formerly much more common in the Kahuku area (pers. obser.). Pueo forage over open fields as well as forests. They nest on the ground in areas with tall grass (Hawaii Audubon Society 1993).

Migratory Birds:

One Pacific Golden-Plover (*Pluvialis fulva*) and two Wandering Tattlers (*Heteroscelus incanus*) were noted over the course of the survey. These birds were seen along the makai section of Kii stream. Neither of these species is endangered. Tattler's commonly forage along streams, even in the interior of the island. Plover utilize wetlands but are also associated with open habitats such as lawns and fields. They are the most abundant migrant in Hawaii. Much has been learned about their wintering

behavior as a consequence of intensive research over the past 20 years (Johnson et al. 1981, 1989, 2001).

Introduced Birds:

Thirteen species of introduced birds were counted on the survey. Table One gives the names of these species. None are endangered. This list includes the typical array of introduced birds found in this area (Bruner 1980, 1989, 1991, 1997).

Mammals:

Three Small Indian Mongoose (*Herpestes auropunctatus*) were counted on the survey along with two feral Cats (*Felis catus*). No rats or mice were seen but likely occur in this area. The endangered and endemic Hawaiian Hoary Bat (*Lasiurus cinereus semotus*) is rarely recorded on Oahu but is frequently observed on Kauai and the Big Island (Tomich 1986, Kepler and Scott 1990). No bats were seen on the survey. I have seen bats on Oahu but never in the Kahuku area. All of my observations were in southeastern and leeward Oahu. They forage in a wide variety of habitats including urban areas and generally roost solitarily in trees.

CONCLUSIONS

This survey recorded all of the native waterbirds, two migrants and thirteen species of introduced birds. Four of the native waterbirds are federally listed endangered species. The Hospital Ditch and Kii Stream provides foraging and loafing habitat for these birds. Some may also nest in the dense vegetation along the stream and ditch. The bridge replacement project and the temporary by-pass roads will disturb the habitat in the immediate vicinity of the project. I did the faunal survey for the Malaekahana Bridge Replacement Project (Bruner 1997) and observed the impacts of that project on the area immediately around the bridge. The removal of vegetation and construction activity reduced the activity of waterbirds in the disturbed area. I saw waterbirds using the undisturbed areas mauka and makai of the construction site during the period of construction. The replacement bridge projects at the Hospital Ditch and Kii Bridge will likely have the same impact on waterbirds. It would be appropriate to have a competent biologist familiar with native waterbirds present during the phase of construction when the vegetation in and around the ditch and stream is removed. The purpose of this would be to make sure no nests of native endangered waterbirds like the moorhen are disturbed. It would be wise to consult with both the DOFAW and USFWS regarding how to handle the problem of active nests in the path of the construction. The potential for siltation and contamination of the down-stream habitat for this project must also be addressed and a plan developed to prevent this problem.

TABLE ONE

Introduced birds recorded at two bridge replacement sites at Kahuku, Oahu.

COMMON NAME	SCIENTIFIC NAME
Cattle Egret	*Bubulcus ibis*
Ring-necked Pheasant	*Phasianus colchicus*
Spotted Dove	*Streptopelia chinensis*
Zebra Dove	*Geopelia striata*
Red-vented Bulbul	*Pycnonotus cafer*
Japanese Bush-warbler	*Cettia diphone*
Common Myna	*Acridotheres tristis*
Japanese White-eye	*Zosterops japponicus*
Northern Cardinal	*Cardinalis cardinalis*
Red-crested cardinal	*Paroaria coronata*
House Finch	*Carpodacus mexicanus*
Common Waxbill	*Estrilda astrild*
Java Sparrow	*Padda oryzivora*

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APPENDIX D

Archaeological Inventory Survey Report

Archaeological Inventory Survey Report for Hospital Ditch and Kii Bridge in the *Ahupua`a* of Kahuku, District of Ko`olauloa, Island of O`ahu (TMK 5-6-02, 05 & 06)

by

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and
Hallett H. Hammatt, Ph.D.

for

R.M. Towill Corporation

Cultural Surveys Hawai`i, Inc.

May 2001

ABSTRACT

Cultural Surveys Hawai`i conducted an archaeological inventory survey for the proposed drainage improvements on Kamehameha Highway near Kahuku, O`ahu. The improvements will be focused at two non-contiguous parcels west of Kahuku Town, at Hospital Ditch and Kii Bridge.

The inventory survey were for two detour roads, one at each of the proposed drainage improvement parcels. The detour roads will be on the makai (northern) side of Kamehameha Highway.

Based on historic background and previous archaeological research both parcels wee subjected to decades of commercial sugar cane cultivation, related to Kahuku Plantation. The plantation ceased operations in 1971. Subsequently the two detour road corridors became part of diversified agricultural pursuits, banana farming and aquaculture (shrimp ponds).

No historic properties of any kind were observed within the proposed detour road corridors. The two drainage ways, Hospital Ditch and Kii Drainage, are both relatively narrow and straight channelized soil embankment ditches. Existing or fallow banana fields are on either side of Hospital Ditch and on the eastern side of Kii Drainage. The west side of Kii Drainage is existing shrimp ponds.

Based on the absence of historic properties due to years of commercial agricultural no further archaeological research appears warranted.

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I. INTRODUCTION

A. Project Background

Cultural Surveys Hawaii, Inc. was contracted by R.M. Towill Corporation to perform an archaeological inventory survey for drainage improvements at two bridges (Hospital Ditch and Kii Bridge) along Kamehameha Highway (Mile Post 15.2 and 15.4) in the *ahupua`a* of Kahuku, within the District of Ko`olauloa on the Island of O`ahu (TMK 5-6-02,05 and 06) (Figures 1 & 2). The proposed project is for the alleviation of overtopping of Kamehameha Highway and flooding in the area fronting Kahuku Hospital during severe rainstorms. The proposed work will involve constructing a temporary two-lane detour road along the *makai* (ocean) side of the highway, installing multi-cell box culverts at the Hospital Ditch, constructing a two lane detour road along the *makai* side of the highway, and constructing a new bridge at the Kii Bridge locale.

Historical background and previous archaeological research for the current inventory survey was initiated in April 2001. Fieldwork for the project was conducted on May 1, 2001. Hallett H. Hammatt, Ph.D. directed all aspects of the project.

B. Project Area Description

The project area encompasses approximately 2 acres along both sides of Kamehameha Highway within the *Ahupua`a* of Kahuku. The project area includes two non-contiguous parcels, one at Hospital Ditch and the other at Kii Bridge.

The Hospital Ditch portion is directly *makai* (north) of Pualalea Place and consists of mowed lawn around the existing bus stop and within the existing highway right-of-way, and fallow, overgrown banana fields. The drainage way of Hospital Ditch is a channelized, soil embankment ditch.

The Kii Bridge portion is similar, with mowed grass highway right-of-way, though with a number of large ironwood trees bordering the highway, and active instead of fallow banana fields. Additionally, on the northern side of the channelized drainage-way are active shrimp ponds. The proposed temporary bypass road at Kii Bridge will also intersect with the main, coral-paved access road to the Campbell Wildlife Refuge.

The project area is at 20-30 a.m.s.l. (above mean sea level) and lies approximately 1.3 km. from the ocean. Vegetation within the project area includes various grasses, *koa haole* (*Leucaena glauca*), bananas, orchids, ironwood trees, and a variety of noxious weeds. The soils in the area are described as Waialua silty clays (WkA), 0-3% slopes, that typically occur on smooth coastal plains adjacent to the ocean. Waialua silty clay was generally used for sugarcane, truck crops and pasture (Foote *et al* 1972). Annual rainfall in the Kahuku area averages 40-60 in. (Juvic and Juvic 1998).

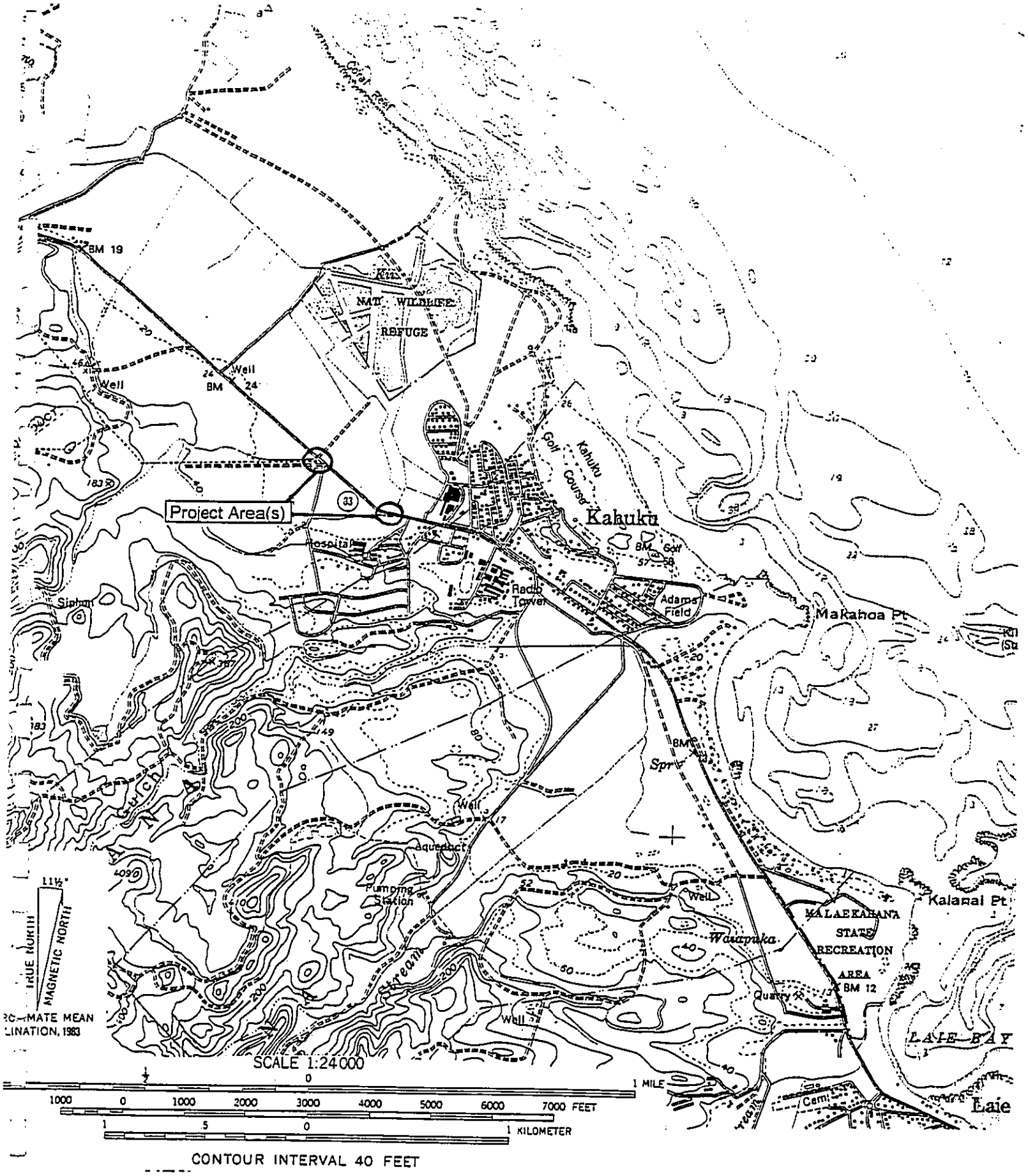


Figure 1 Portion of USGS Topographic Map, 7.5 Minute Series, Kahuku Quad, showing Kii and Hospital Bridges.

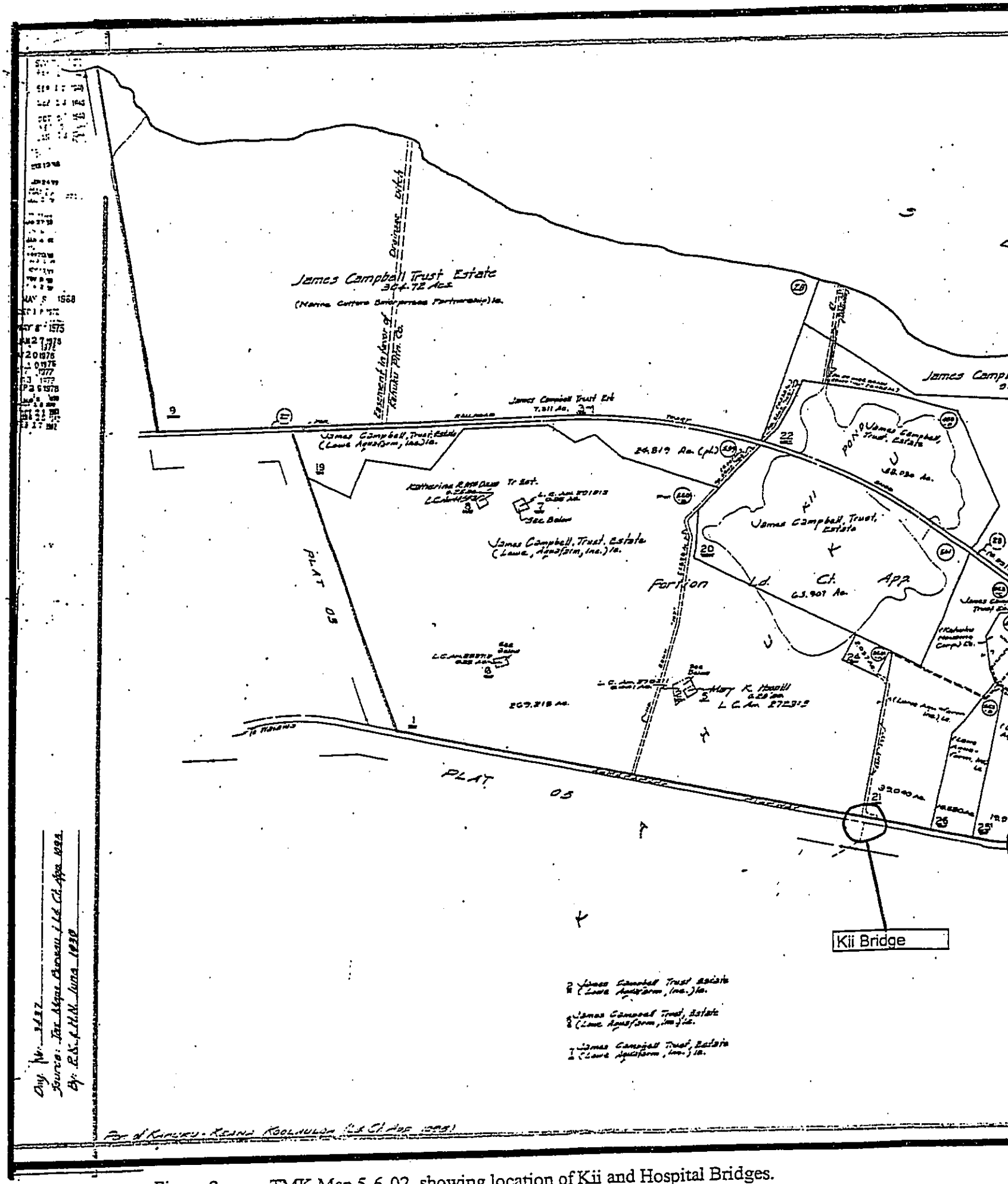
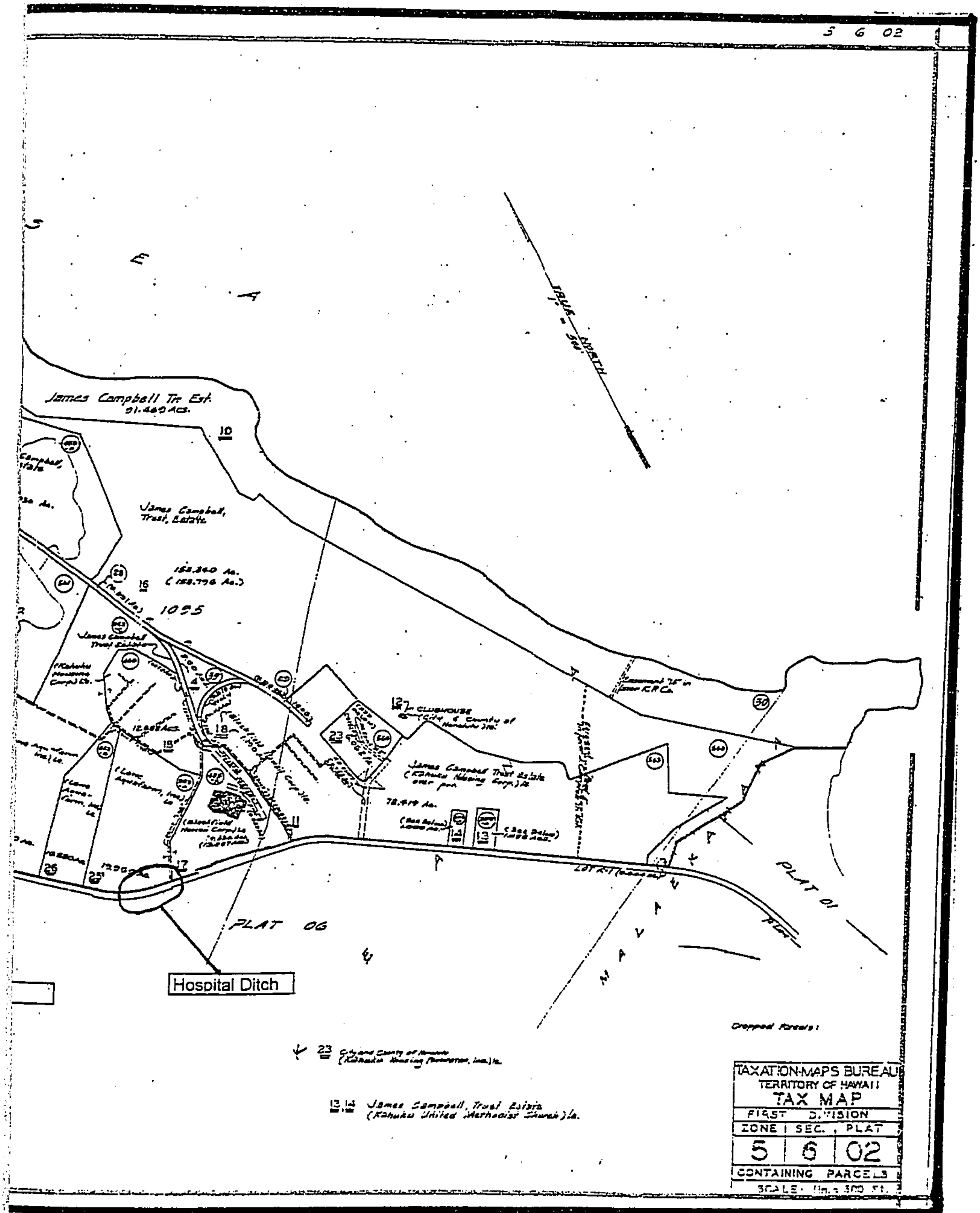


Figure 2 TMK Map 5-6-02, showing location of Kii and Hospital Bridges.


5 6 02
TRUE NORTH
James Campbell Tr. Est.
James Campbell, Trust, Estate
1095
CLUBHOUSE
James Campbell Trust Estate
PLAT 06
PLAT 01
Hospital Ditch
Dropped Parcels:
23 City and County of Honolulu
13,14 James Campbell, Trust Estate (Kahuku United Methodist Church) Le.
TAXATION MAPS BUREAU
TERRITORY OF HAWAII
TAX MAP
FIRST DIVISION
ZONE SEC. PLAT
5 6 02
CONTAINING PARCELS

C. Scope of Work

The following scope of work was designed to satisfy State and County requirements for an archaeological inventory survey:

1. A complete ground survey of the entire project area for the purpose of site inventory. All sites would be located, described, and mapped with evaluation of function, interrelationships, and significance. Documentation will include photographs and scale drawings of selected sites and complexes. All sites will be assigned State site numbers.

2. Limited subsurface testing, if warranted, with a backhoe to test for the presence of subsurface cultural deposits. If encountered, subsurface deposits were documented, and samples, including charcoal for radiocarbon dating, were collected.

3. Research on historic and archaeological background, including search of historic maps, written records, Land Commission Award documents. This research will focus on the specific area with general background on the *ahupua`a* and district and will emphasize settlement patterns.

4. Preparation of a survey report which will include the following:

   a. A topographic map, if available, of the survey area showing all archaeological sites and site areas;

   b. Description of all archaeological sites with selected photographs, scale drawings, and discussions of function;

   c. Historical and archaeological background sections summarizing prehistoric and historic land use as they relate to the archaeological features;

   d. A summary of site categories, their significance in an archaeological and historic context;

   e. Recommendations based on all information generated which will specify what steps should be taken to mitigate impact of development on archaeological resources - such as data recovery (excavation) and preservation of specific areas. These recommendations will be developed in consultation with the client and the State agencies.

This scope of work also includes full coordination with the SHPD, and Honolulu City and County relating to archaeological matters. This coordination takes place after consent of the owner or representatives.

D. Methods

Background research included a review of previous archaeological studies on file at the State Historic Preservation Division of the Department of Land and Natural Resources; a review of cultural history documents at Hamilton Library of the University of Hawai`i, the Hawai`i State Archives; study of historic photographs at the Hawai`i State Archives and a study of historic maps from the State Survey Office.

This research provided the environmental, cultural, historic and archaeological background data for the project area. The sources studied were used to formulate a predictive model regarding the expected type and location of historic properties in the project area.

The fieldwork included 100% surface survey of both proposed detour alignments. Access was from Kamehameha Highway. Survey areas included existing road shoulders, fallow and active banana fields, channelized drainage ways, and active shrimp ponds. Notes and photographs were taken specific to each detour alignment. Based on the extensive historic to modern land-altering activities (*i.e.* decades of commercial sugarcane, highway construction and maintenance, banana farming, drainage channelization, shrimp pond construction and maintenance), no subsurface testing was conducted.

II. KAHUKU *AHUPUA`A*: HISTORICAL AND CULTURAL DOCUMENTATION

The project area is located within the *ahupua`a* of Kahuku within the District of Ko`olauloa, at the northern-most tip of the Island of O`ahu.

A. The Legend of Kahuku

According to Hawaiian legend this area was once a floating island. Blown about by the trade winds, it was said that the people of Ko`olauloa District attached the small floating island with their fishhooks to the larger island of O`ahu. In *Archaeology of O`ahu*, McAllister (1933:155) relates:

> A story is told that Kahuku was once a land afloat, wafted about by the winds, drifting over the ocean. Just how it came to Oahu is not told, but old Hawaiians point out Polou, the place where Kahuku is fastened to Oahu. Formerly it was possible to dive into the pool and when a depth of 40 fathoms was reached, a shelf of rock was found upon which to rest. Forty fathoms deeper *Punakea* (white line from coral) was reached and on looking toward Malaekahana, the hook by which Kahuku was made fast could be seen. This hook was intricately fashioned of Kawila (*Alphitonia excelsior*). Seaward of the Waialee Industrial School, in another pool of water, known as Kalou, is the spot where Kahuku is attached to Waialee...

According to *Geologic Map and Guide of the Island of Oahu, Hawaii* (Stearns

1939:32) various stands of the sea, one given the named *Kahuku* and the other *Kahipa* are visible in the District of Ko`olauloa. In the Kahuku area there exists "beach limestone of the 55-foot stand of the sea which is overlain unconformably by stream-laid conglomerate which in turn is overlain by reef of the 95-foot stand of the sea and lithified dunes formed during the minus 60-foot stand of the sea."

It is possible to make a correlation between the Hawaiian legend of the floating island and the two depths found in the pool with the two stands of the sea, making the legend a descriptive explanation for the geology of the lands of Kahuku.

B. Early History, 1779-1846

The first historical reference to Kahuku was in 1779 when the H.M.S. *Resolution* passed along the north side of O`ahu. Lieutenant James King wrote:

> It [O`ahu] is by far the finest island of the whole group. Nothing can exceed the verdure of the hills, the variety of wood and lawn, and the rich cultivated valleys, which the whole face of the country displayed [McAllister 1933:153].

On February 28, 1779, in the journal of the *Resolution* now captained by Charles Clerk, due to the death of Captain James Cook at Kealakekua Bay on February 14, we find:

> Run round the Noern [Northern] Extreme of the Isle [O`ahu] which terminates in a low point rather projecting [Kahuku Point]; off it lay a ledge of rocks extending a full Mile into the Sea, many of them above the surface of the Water: the Country in this neighborhood is exceedingly fine and fertile: here is a large Village, in the midst of it is run up a high pyramid doubtlessly part of a Morai [Beaglehole 1967:572].

In 1794, British Captain George Vancouver noted:

> ...In every other respect our examination confirmed the remarks of Captain King: excepting, that in point of cultivation or fertility, the country did not appear in so flourishing a state, nor to be so numerously inhabited, as he represented it to have been at that time, occasioned most probably by the constant hostilities that had existed since that period [Vancouver, 1798: Vol. III, 71].

It is presumed from these early descriptions that in the thirteen years that separated Captain King's voyage from Captain Vancouver's, the cultural landscape of Kahuku had undergone significant changes. The probable cause for the decrease in

cultivation was the decline in population due not only to "the constant hostilities" of the inhabitants, but also to the spread of introduced diseases and out migration to port towns in other parts of O`ahu. In 1833, E.O. Hall wrote of the Ko`olauloa District, "Much taro land lies waste, because the diminished population of the district does not require its cultivation" (McAllister 1933:153).

C. Land Commission Awards, 1846-1855; Mahele Data

The Mahele Period, between 1846 and 1855, was an era of change in the local traditional land tenure system. Kuykendall wrote:

> The old feudal arrangement of joint and undivided ownership had given place to the system of individual allodial tenures, and aliens had been admitted to the enjoyment of the same rights as Hawaiian subjects in the ownership and use of land [Kuykendall, 1968: Vol. 1, 298].

The *ahupua`a* of Kahuku (4,752 ac.) was retained as part of the Crown Lands of King Kamehameha III (*Indices of Awards*, 1929:27). Within the *ahupua`a* of Kahuku were 63 Land Commission Awards of small parcels to commoners.

D. Settlement Patterns as Indicated by Mahele

Although no individual *kuleana* parcels are recorded in the present project area, a large cluster of LCA's was located northwest of the project area, on the *makai* side of Kamehameha Highway centered around Punamano Spring and its associated wetlands.

The recorded Native Register and supporting Foreign Testimony presented before the Board of Commissioners in the mid-1800's provides information about traditional land use in the area by native Hawaiians.

According to the Native Register, agricultural activity was taking place throughout the *ahupua`a* of Kahuku. From the uplands (*mauka*) to the sea (*makai*), *lo`i*, *mala*, and *kula* were reported, as well as, *hala* groves, fish ponds, 'salt land', watercourses, *kukui*, *wiliwili*, and *koa* trees for canoes.

Crops cultivated included:

Traditional -

wauke (Broussonetia papyrifera), noni (Morinda citrifolia), `awa (Piper methysticum), pili (Heteopogon contortus), `uala (Ipomoea batatas), `ōhi`a (Metrosideros polymorpha), mai`a (Musa paradisiaca), kī (Cordyline terminalis), `ulu (Cocos nucifera), kalo (Colocasia esculenta), koa (Acacia koa), kukui (Aleurites moluccana), olonā (Touchardia latifolia), ipu `awa`awa (Lagenaria siceraria), wiliwili (Erythrina sandwicensis), `aka`akai (Scirpus validus), lama (Diospyros hillebrandii), and *hala (Pandanus odoratissimus).*

Non-traditional-

`alani or oranges *(Citrus sinensis)*, tobacco (*Nicotiana glauca*), and watermelon (*Citrullus vulgaris*).

The *kuleana* parcels closest to the project area (*i.e.* LCA 2723:2, 2702:1, and 2887.2) are referred to as '*kula*' parcels. Plantings indicated for kula parcels include sweet potatos and *wauke*.

In the missionary census of 1831 the population of the lands of `Ō`io, Kanakaue (presumably Hanakaoe) Kawela, Kahuku and Punalau was 458 men, women and children. By 1835, the population had grown to 498 bucking the general trend for Ko`olauloa, O`ahu which lost an average of 7.2% of its population during these four years (Schmitt 1977:24).

E. 1850 to 1900

Government censuses of the second half of the 19th century recorded the declining Hawaiian population in Ko`olauloa District. A total population of 1,345 was recorded in the district in 1853; by 1860, the total had dropped to 1,187 and reached its nadir of 1,082 in 1878 (Schmitt 1977:12).

By 1852, the Englishman Charles Gordon Hopkins had purchased over 8,000 acres in the Kahuku area for approximately $14,000. Hopkins established a cattle and sheep ranch known as Kahuku Ranch and became known as the "Duke of Kahuku." (Nakamura 1981:7) By 1873, Judge H. A. Widemann acquired ownership of the entire Kahuku Ranch which included the *ahupua`a* of Kahuku and Hanakaoe. In 1874, Widemann sold the Kahuku and Malaekahana Ranch to Julius L. Richardson for $45,000. Richardson sold a 15,000 acre parcel including the ranch to James Campbell for $63,500.

In 1889, Benjamin F. Dillingham leased Cambell's Kahuku lands for fifty years and subleased a portion to James B. Castle.

In 1890, James Castle and Alexander Young started the Kahuku Plantation Company on lands leased from James Campbell. "Water was supplied entirely by groundwater sources, which yielded around 45 M.D." (Wilcox 1996:111). Kahuku Plantation planted 2,800 ac. in cane and harvested its first crop in 1892. A plantation railroad ran through the planted fields. An 1890 map of Kahuku Plantation (Loebenstein 1890) depicts only the 'Old Government Road' and plantation railway corridors near the present alignment of Kamehameha Highway; no other structures. The map does indicate some 219 ac. of 'ploughed fields' *mauka* of the corridors and 92 ac. *makai* (north). Based on the 1890 map, the two portions of the project area were in cane in the 1890's.

F. 1900 to Present

In 1902, Alexander and Baldwin became the agent for Kahuku Plantation.

The plantation remained relatively small, with less than 4,000 acres under cultivation until the early 1900's when it expanded to the southeast as far as Hau`ula. By 1935 the plantation had 4,490 acres under cultivation with 1,137 workers. "The workers and their dependents lived in seven camps known as Main Village (265 dwellings), New Camp (39 dwellings), Camp 2 (17 dwellings), Camp 3 (16 dwellings) Camp 5 (16 dwellings), Hau`ula Camp and Laie Camp. All camps had recreational facilities including lighted tennis courts." (Dorrance 1993:5). The Kahuku Plantation had a track line in the project areas heading to/ from the fields and the mill.

A 1928/30 Territory of Hawai`i Map, Kahuku Quad (Figure 3) depicts the Kahuku Plantation utilization of the project area at that time. Sugar cane was cultivated on both sides of the 'new' Kamehameha Highway. No houses or any other structures are shown within the project areas. A 1943 Territory of Hawai`i Map, Kahuku Quad (Figure 4) shows the continued development and use of the Kahuku Plantation.

The plantation became a wholly owned subsidiary of A & B in 1968 and closed in 1971.

Kii Bridge was built in 1937 as part of Kamehameha Highway improvements. Hospital Bridge is a more modern construction related to improvements near Kahuku Hospital, Pualea Street, and Kamehameha Highway.

Banana cultivation and shrimp farming are the two diversified forms of agriculture that have dominated the two proposed bypass routes after the closure of Kahuku Plantation.

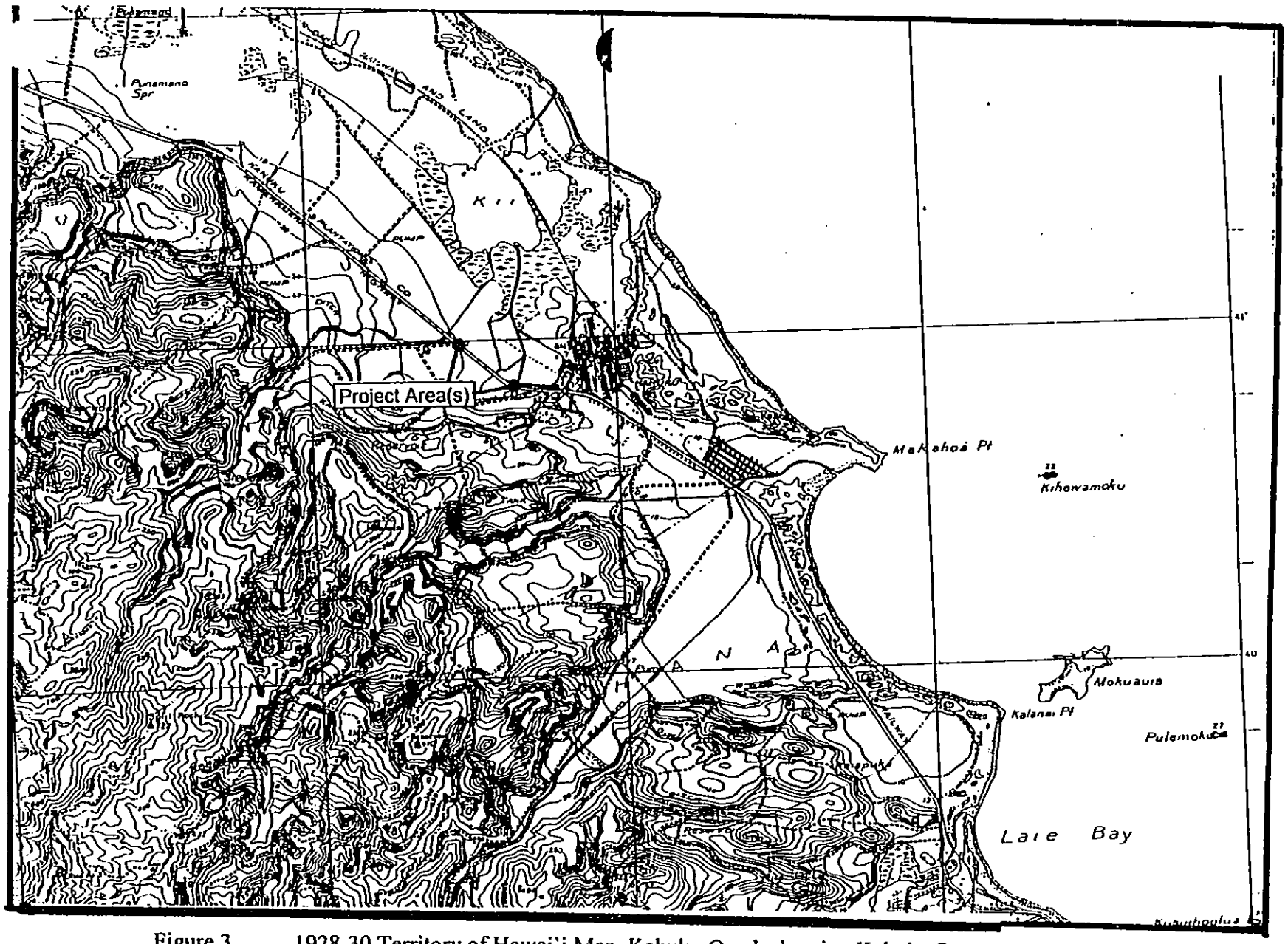


Figure 3 1928-30 Territory of Hawai'i Map, Kahuku Quad, showing Kahuku Sugar Plantation infrastructure.

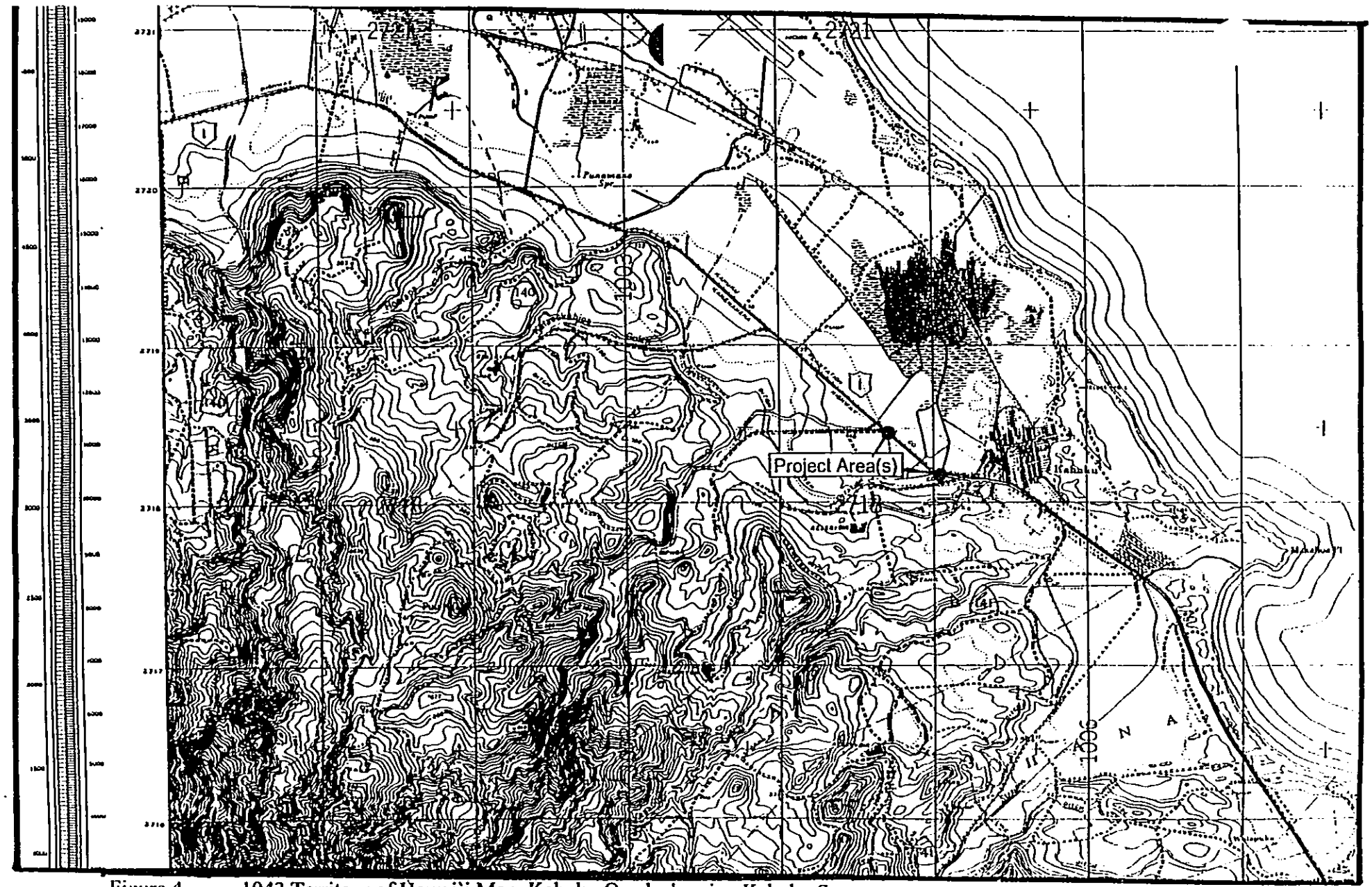


Figure 4 1943 Territory of Hawai'i Map, Kahuku Quad, showing Kahuku Sugar Plantation infrastructure.

III. PREVIOUS RESEARCH

A. Previous Archaeological Studies

Many archaeological studies have been completed in the nearby vicinity of the present project area.(Figure 5).

The first archaeological study in the vicinity of the present project area was performed by J. Gilbert McAllister in his survey of the archaeology of O`ahu. He identified twelve sites in Kahuku Ahupua`a. None of the twelve sites are in close proximity to the present study areas.

The McAllister site that appears to be nearest the present project area is "Kahuku Fishpond". McAllister relates (1933:154), "According to Kahione, the present fishpond was formerly a swamp and not used as a pond." Based on map location J. McAllister is referring to "Kii" pond/ swamp, the present location of the Kii Wildlife Refuge.

Other nearby sites include McAllister's Site 261 is a "Small water hole called Punamanō, pointed out by Kahiona, Kaleo and Luika *Kaio in the flat limestone plain* of Kahuku Point. It is about fifteen feet in diameter and brackish in taste." McAllister then goes on to recount the story of the guardian shark of Kahuku and asserts that "a plantation pump now marks the site of the spring, near the sea side of the road." This site is approximately 1.5 miles north of the the present project area.

McAllister's (1933:154) Site 267 encompasses Kalaeokahipa Ridge. He relates:

> The many caves in the porous formation were used as places of burial by the old Hawaiians. On the Waimea side is an overhanging ledge where formerly hung two stalactites from which water continually dripped. They very closely resembled the breasts of a woman, and this was said to be NāwaioLewa, a goddess of the region. Some years ago, a white man removed one of the stalactites, or breasts, according to the story, and the water immediately stopped dripping from the other. Kane and Kanaloa lived in the vicinity of the ridge; but that was at the time when the Kahuku plain was still under water, and waves lapped about Kalaeokahipa...

The limestone ridge of Kalaiokahipa is roughly 1 mile north of the project area.

Reconnaissance level survey of roughly 10.8% of the Kahuku Training Area resulted in the documenting of nine sites; three of which were previously destroyed, one of which was not relocated, and one of which (the "Hanakaoe Platform" in `Ō`io Gulch, State Site 50-80-02-2501) had previously been listed on the National Register of Historic Places (Rosendahl 1977: 1-29). Three newly identified sites included State Site 50-80-02-9507, an `Ō`io Stream terrace believed to be agricultural; State Site 50-80-02-9508, a stepped stone platform in East `Ō`io Gulch; and State Site 50-80-02-9509, an `Ō`io Gulch complex of agricultural terraces (*Op. cit.* 2-15), all in the adjacent *ahupua`a* of Hanakaoe. Rosendahl

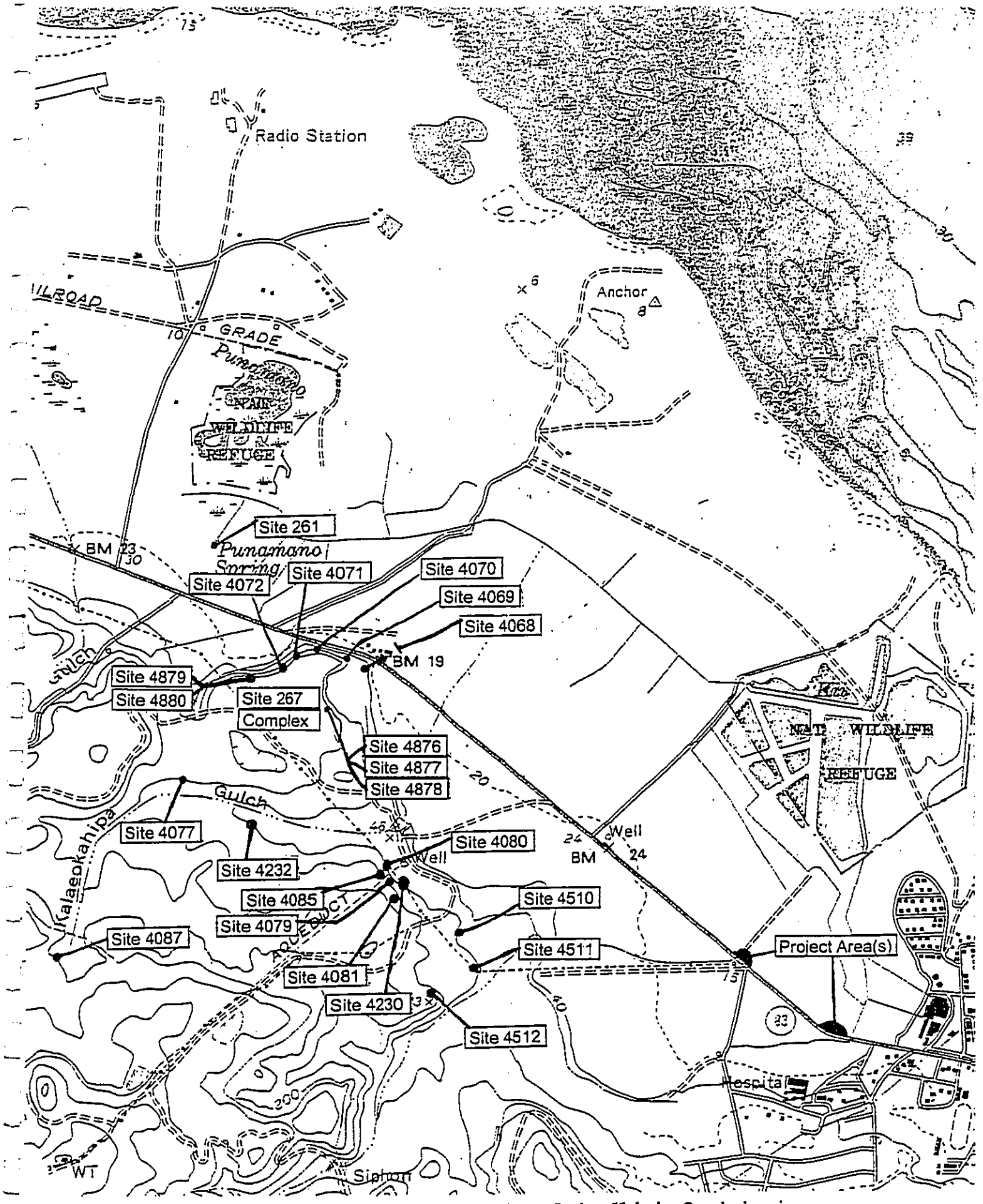


Figure 5 Portion of USGS Topographic Map, 7.5 Minute Series, Kahuku Quad, showing previous archaeological studies in the vicinity of the present project area.

(*Op. cit.* 1-29) commented "that historic-period field-scale cultivation of flat and gentle slope areas has removed most traces of earlier cultural remains. Also suggests principal human utilization of installation area mostly limited to more seaward and accessible portions."

Thomas Dye (1977) conducted a reconnaissance survey adjacent to the Kuilima resort at Kahuku in 1977 and recorded two sites of cultural layers in sand dunes.

William Barrera Jr. (1979) conducted a survey and salvage excavations in an area being developed by the Kahuku Housing Corporation, just inland of the post office at Kahuku. Five sites were recorded. These included wall structures, mounds, a cave, and an enclosure. His excavations revealed that these sites were associated with historic farming.

Stephan D. Clark (1979) conducted a reconnaissance survey for Department of Housing and Community Development, City and County of Honolulu, on December 28, 1978. The approximately 57.3-acre proposed Ko`olauloa *Housing Project* area and Park Expansion Area in Kahuku are located directly west of Kahuku High and Elementary School.

A "sacred way" located in the northeast section of the proposed housing area was visited. It was considered a "sacred way" by the Hawaiians working at Kahuku Plantation in the 1930's and earlier. Clark's report notes:

> During the early plantation days at Kahuku, no structures of any sort were built on it, in deference to the Hawaiian's beliefs; however, flowers and trees planted on the "sacred way" were acceptable to the Hawaiians. The area is a little over 60 meters in length with undetermined width. No physical features (*e.g.* rock alignments) mark its boundaries, and it was noted that no structures are presently built on it (Clark 1979)

In the field investigations of Chiniago for Kahuku Agricultural Park (Barrera Jr., 1979) no structural remains were discovered but some scatterings of cultural materials were located.

In August of 1979 Rose Schilt conducted a 4-acre archaeological reconnaissance survey of Proposed Extension, Kahuku Elementary School for Department of Accounting and General Services. A total of four sites were found during her survey. She found a rock shelter and a platform, both previously recorded by McAllister, a mound, and an overhang shelter.

In October of 1979 Thomas J. Riley and Michael Malpass of the B. P. Bishop Museum performed an archaeological reconnaissance and archaeological monitoring of a planned wind turbine facility on a knoll approximately 400 ft. north of the present project area. They noted the presence of two small concrete pill boxes, concrete footings, and a small telephone relay station in the immediate vicinity but nothing else.

In 1980, Aki Sinoto of the B. P. Bishop Museum did a reconnaissance survey of the Kii and Punamano Wetland Refuge Units in Kahuku. He relocated two of McAllister's sites (Punamanō Spring, State Site 50-80-02-261 and Kii Fishpond) noting "remnants of structural foundations and several concrete bunkers indicating military activity in the area" (Sinoto 1981).

Bertell Davis (1981), in his reconnaissance survey of Hawaiian Wind Farm Project Area at Kahuku, located a religious site, two habitations and a boundary marker. He has suggested that "these sites were once associated with upland *kula* (dryland) and/or forest zoned agriculture and represent an aboriginal response to conditions of persistent wind, high annual rainfall and low topographic relief developed stream channels" (Davis 1981:1).

William Barrera Jr. of Chiniago (1981) conducted a cultural resources reconnaissance of the Kahuku Agricultural Park Project Area for Wilson Okamoto and Associates and demonstrated "that the project area had been the focus of considerable prehistoric activity." This report suggests that the paucity of findings in this area is due to the heavy modifications of commercial agriculture.

Elaine Rogers-Jourdane of the B.P. Bishop Museum surveyed 45 acres on the Kahuku plain northeast of the project area but observed no prehistoric remains and reported no significant sites (Jourdane 1982).

In 1984, Joyce Bath of PHRI (Bath *et al* 1984) conducted a subsurface reconnaissance survey of the Kuilima area, identifying nine new sites and reporting a controversial early calibrated cultural date of 165 BC to AD 210. Carol Silva (1984) did a companion historical study for this project.

In June, 1985, William Barrera Jr. performed an archaeological survey at a proposed well site adjacent to the present project area. No archaeological or historical remains were reported.

In 1986, PHRI (Rosendahl 1988) conducted further survey and test excavation at site 50-80-02-2911 in the Kuilima area documenting aspects of the Kahuku Air Base.

In 1988/1989, Peter Jensen of PHRI conducted an archaeological inventory survey of 866 acres including areas adjacent to the north of the present project area. Twenty sites of both prehistoric and historic origin were given state site numbers but sites regarded as of "modern" origin were typically not given state site designations. Helen Wong Smith (1989) did a companion historical study for this project.

In 1989, Joseph Kennedy of Archaeological Consultants Hawaii (ACH) re-surveyed and reevaluated the Punamano portion of the Jensen study area. His findings were incorporated in the *Final Environmental Impact Statement Country Courses at Kahuku, Punamano Volume II* as Appendix C Archaeological Inventory Survey (Wanket 1990.) Kennedy reports no sites from within the present project area.

Pfeffer and Hammatt (1992) conducted an archaeological assessment of the Waialua to Kahuku area for a power line project and noted that sites are likely to be present in the upland areas through which the proposed power line was to be built..

In 1992, Cultural Surveys Hawaii (Stride *et al* 1992) produced an archaeological inventory survey of the proposed 785-Acre Kahuku Agricultural Park. The project area originally consisted of 1666 acres with 21 archaeological sites located but was later down-sized to 785 acres; seven sites were in this reduced project area.

In 1995, Nancy Farrell and Paul Cleghorn performed a detailed study of the Punamanō Communication Station. They treated the entire military complex as one site (State Site 50-80-02-0599) and recommend "that the WWII era bunkers (Features 24, 25, and 26) be considered as potentially eligible for nomination to the National Register of Historic Places under the provisions of two criteria": Criteria C as possessing the distinctive characteristics of a type, period, or method of construction and Criterion A for the association with events that have made a significant contribution to the broad patterns of our history.

In 1998, Cultural Surveys Hawai`i conducted an archaeological assessment of 192 ac. in Kahuku and Hanakaoe *Ahupua`a*. The study parcel was about 1 mile southwest of the present project area. The research indicated the arable lands had been part of Kahuku Plantation fields and other than associated irrigation infrastructure, no historic properties in the "field" areas exist. However, in areas that were too steep and/ or rocky sites such as overhang shelters and military bunkers were observed (Hammatt and Shideler 1998).

Ogden Environmental and Energy Services conducted an inventory survey of selected areas within the Kahuku Training Area (Patolo 1998). Findings include a variety of both prehistoric and historic sites well south of the present project area.

Previously identified sites in the vicinity of the project area are summarized in Table 1 and their approximate locations are shown in Figure 1 below.

Table 1: Sites Identified in the Vicinity of the Project Area

STATE SITE # 50-80-02-	TYPE	FUNCTION	AGE (H)-Hist (P)-Pre-Hist	SOURCE
261	Punamano Waterhole	storied place	P	McAllister, 1933: 152-153
267	Kalaeokahipa Ridge	storied place/ burial cave	P	McAllister, 1933:154

STATE SITE # 50-80-02-	TYPE	FUNCTION	AGE (H)istoric (P)rehistoric	SOURCE
4068	overhang/ shelter complex	shelter	-	Kennedy 1990/II: 7A
4069	overhang/ wall	shelter	-	Kennedy 1990/II: 13
4070	overhang/ shelter complex	shelter	-	Kennedy 1990/II: 13
4071	overhang/ shelter complex	shelter	-	Kennedy 1990/II: 13
4072	overhang/ shelter	shelter	-	Kennedy 1990/II: 13
4077	terrace/ ditch complex	agricultural	-	Kennedy 1990/II: 13
4079	two stone walls	-	-	Kennedy 1990/II: 7A
4080	historic dump	trash pit	H	Kennedy 1990/II: 7A
4081	overhang/ shelter	shelter	-	Kennedy 1990/II: 7A
4230	site complex	shelter; burial	-	Kennedy 1990/II:7A
4232	earthen ditch	agricultural	H	Kennedy 1990/II: 7A
4510	two overhang shelters	temporary habitation	P/H	Stride *et al.* 1992:44-46
4511	two overhang shelters	temporary habitation	P	Stride *et al.* 1992:46-49
4876	rock terrace and mounds	habitation	-	Patolo & Williams, 1996. 28

STATE SITE # 50-80-02-	TYPE	FUNCTION	AGE (H)istoric (P)rehistoric	SOURCE
4877	rock enclosure and mounds	habitation	-	Patolo & Williams, 1996:28
4878	rock shelter	shelter/ temp. habitation	P/H	Patolo & Williams, 1996:28
4879	rock shelter	shelter/ temp. habitation	H	Patolo & Williams, 1996:28
4880	linear rock mound	habitation	-	Patolo & Williams, 1996:28

B. Predictive Model

The *ahupua`a* of Kahuku had many valuable resources which made it conducive to traditional Hawaiian settlement. The resources included the coastline which offered good fishing for both near and offshore resources, fresh water springs and extensive wetlands provided potable water and areas for taro *lo`i*, uplands for procurement of forest products, and good soils for *kula* or dryland agriculture. Archaeological data indicates habitation since at least *ca.* AD 1400 (Stride *et al* 1995) but probably much earlier. Radiocarbon analysis from a feature on the coastline produced a controversial early date of 165 BC to AD 210 (Bath *et al* 1984). However subsequent attempts to date similar deposits did not result in similar dates. Analysis of pollen and C^{14} material from `Uko`a Pond in Kawailoa suggest early occupation of that portion of the north shore by *ca.* AD 950 (Athens *et al* 1995). Based on available data the later date would seem more appropriate for similar early occupation for the Kahuku area.

Mid-1800's data related to Land Commission Awards (LCA's) indicates a substantial population in Kahuku. The vast majority of LCA *kuleana* parcels were located makai (north) of Kamehameha Highway centered around the springs and associated wetlands. Archaeological data indicates ravines and gulch side overhang shelters were utilized for temporary habitation and burials (Stride *et al* 1992). Burials have also been reported in the exposed limestone ridge, Kalaeokahipa (McAllister 1930), roughly one mile north of the project area.

The resources which made Kahuku attractive to Hawaiian settlement also proved enticing to historic-era enterprises. Kahuku Ranch started in *ca.* AD 1855. Kahuku Plantation was initiated in 1890 and lasted until 1971. Subsequently diversified agriculture has utilized much of the area formerly under sugar cane cultivation.

The project area(s) have also been part of historic-era transportation corridors for at least as long as the sugar cane cultivation. Historic maps depict the predecessor of Kamehameha Highway, essentially at the same location. Kamehameha Highway's Kahuku section, was built to 'modern' standards in the mid- to late 1930's with a date of 1937 for Kii Bridge. Adjacent to the highway, on the *makai* (northern) side, where the proposed bypasses will be, was the Kahuku Plantation railroad alignment. The plantation rail line lasted from *ca.* 1890's to 1950's.

Based on the historic background data and previous archaeological research no historic properties, other than Kii Bridge, were anticipated. Based on Kahuku Plantation data commercial sugar cane cultivation was occurring in the project area(s) by *ca.* 1890. Cane cultivation continued until *ca.* 1970, after which diversified agriculture commenced. In the Kii Bridge portion of the project area both active shrimp and banana farming area ongoing activities. In the Hospital Bridge portion of the project, fallow banana fields attest to post-cane agricultural pursuits.

IV. SURVEY RESULTS

The inventory level survey of the proposed bypass alignments for Hospital Ditch and Kii Bridge in Kahuku, O`ahu was conducted on May 1, 2001. The proposed bypass at Hospital Ditch is approximately 600 ft. long by 50 ft. wide. The bypass or temporary detour road will be entirely on the *makai* (northern) side of Kamehameha Highway. The eastern portion of the detour will be across existing mowed lawn open space that includes an existing bus stop (Figure 6). The central portion includes fallow banana fields and the channelized drainage ditch (Figures 7 & 8). The western portion also contains fallow banana fields and mowed lawn-type grasses of the highway right-of-way.

No historic properties of any kind were observed during the survey of the Hospital Ditch detour road. The fallow banana fields and mowed lawn of the project area allowed for good ground visibility. The channelized ditch or drainage way has bulldozer-pushed soil embankments, derived from both adjacent fields and excavated soil(s), from the ditch itself. Also observed was a recent water gauging station built on the eastern bank of the ditch.

The Kii Bridge detour road will be approximately 600 ft. long by 50 ft. wide and on the *makai* (northern) side of Kamehameha Highway. No historic properties of any kind were observed during the survey of the detour road. The terrain is similar to that at Hospital Ditch, however there is active diversified agriculture within the proposed detour road. The eastern portion is active banana fields (Figure 9) and the western portion is active aquaculture ponds (Figure 10). The central portion is the existing channelized

drainage way and the existing crushed coral-paved access road to the Kii Wildlife Refuge. The channelized drainage way has bulldozer-pushed soil embankments with soil coming from adjacent fields and ponds as well as from the drainage way itself. During the survey it was evident that recent aquacultural activity had included cleaning out and reusing the ponds closest to the drainage way. Soil and vegetation debris from the ponds has been piled on the western side of the drainage way increasing the width and height of the western embankment (Figure 11).

Observed during the survey was the historic Kii Bridge and another concrete with metal I-beam support bridge. The second bridge, located just *makai* (northeast) of Kii Bridge, is probably a remnant of Kahuku Plantation transportation route to and from fields and the mill.

V. SUMMARY AND RECOMMENDATIONS

The present study area is an inventory level survey for two proposed bypass, or detour, roads associated with Kamehameha Highway Drainage Improvements Projects in Kahuku, O`ahu. The detour roads are to be located on the makai (north) side of Kamehameha Highway at Hospital Ditch and Kii Bridge northwest of Kahuku town.

Based on background data, both detour roads are to be placed in areas that were part of Kahuku Sugar Plantation. Commercial sugar cane cultivation started *ca.* AD 1890 and lasted until the early 1970's. Subsequently both portions of the project area were utilized for diversified agriculture. At the Hospital Ditch detour portion, fallow banana fields attest to post 1970's use. At the Kii Bridge detour road, active banana fields are on the east side of the drainage way and active aquaculture ponds are on the western side of the drainage way.

Both drainage ways are soil embankment channelizations. Standing or slow-flowing water was observed in both during the time of the survey. Based on observations both probably have water flowing year around, as each appears excavated into the water table which is close to the surface for most of the plains of Kahuku.

Based on the absence of historic properties within either detour road no further archaeological research appears warranted. The project area(s) have been subjected to nearly 80 years of commercial sugar cane cultivation followed by 30 years of diversified agriculture, including aquaculture ponds northeast of Kii Bridge.

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APPENDIX A: PHOTOGRAPHS

Figure 6 Photograph showing eastern end of proposed detour road, near Hospital Ditch.

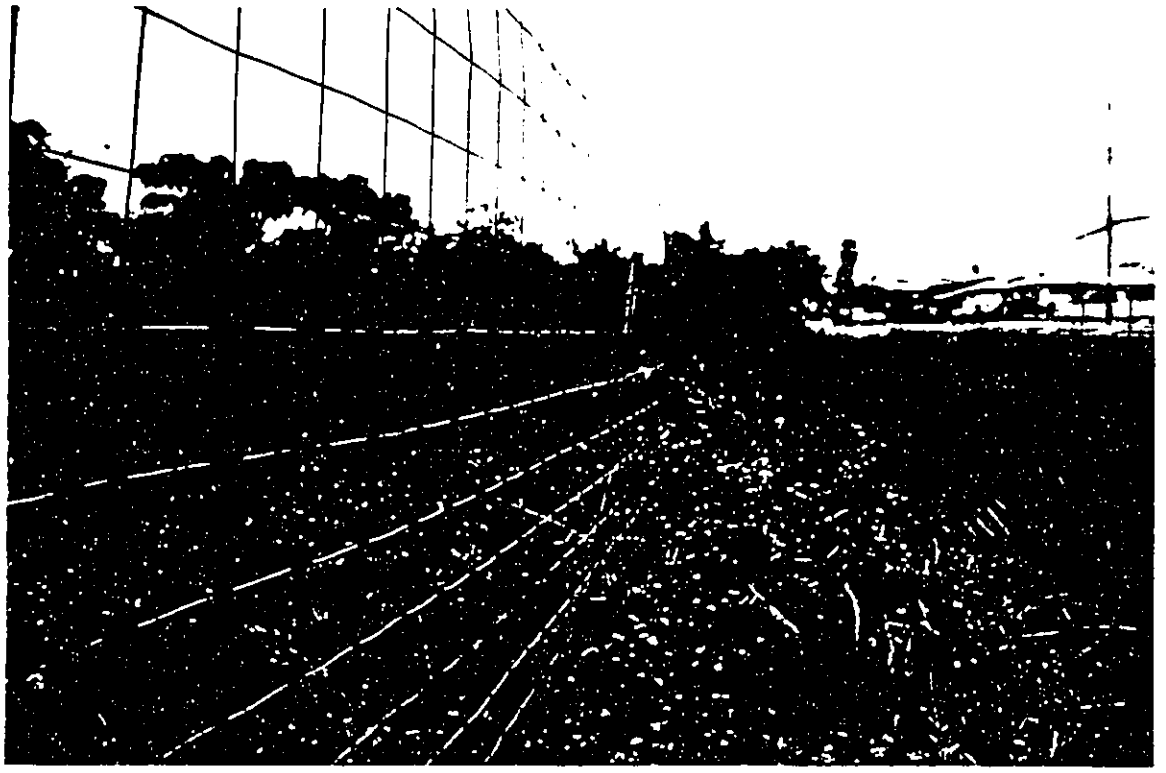

Figure 7 Photograph showing fallow banana fields at the western end of the proposed detour road, near Hospital Ditch.

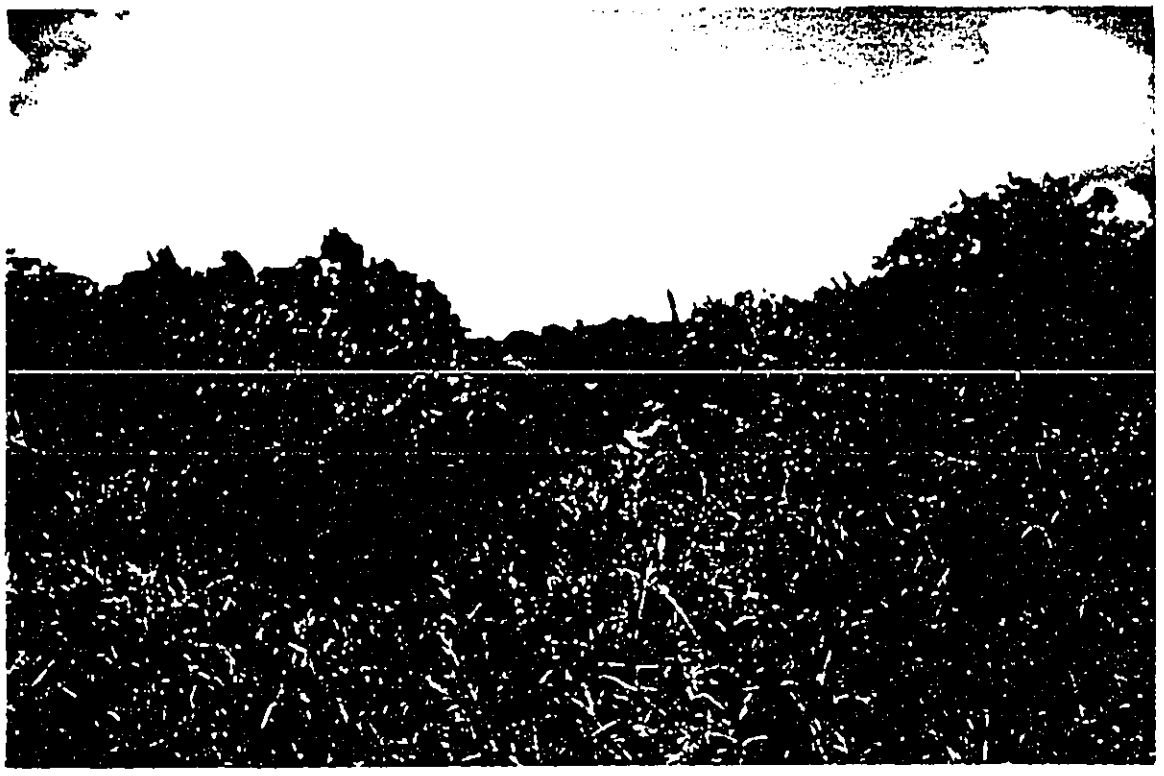

Figure 8 Photograph showing channelized Hospital Ditch.

Figure 9 Photograph showing active banana fields at the eastern end of the proposed detour road, near Kii Bridge.

Figure 10 Photograph showing existing aquaculture pond at the western end of proposed detour road, near Kii Bridge.

Figure 11 Photograph showing channelized ditch near Kii Bridge.

APPENDIX E

Letter Response of "No Effect" from State Historic Preservation Division (SHPD), September 22, 2000

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

TIMOTHY E. JOHNS, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

DEPUTIES
JANET E. KAWELO
LINNEL NISHIOKA

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION
Kakuhihewa Building, Room 555
601 Kamokila Boulevard
Kapolei, Hawaii 96707

SEP 22 2000

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND
STATE PARKS
WATER RESOURCE MANAGEMENT

REF:HP-JK

Curtis Matsuda
Department of Transportation
Highways Division, Design Branch
601 Kamokila Boulevard, Room 636
Kapolei, Hawaii 96707

LOG NO: 26183
DOC NO: 0009EJ08

Dear Mr. Matsuda:

SUBJECT: Chapter 6E-8 Historic Preservation Review –Pre-Draft Environmental Assessment for Kamehameha Highway Drainage Improvements, Vicinity of Kahuku Hospital (HWY-DH 2.9815)
Kahuku, Ko`olauloa, O`ahu
TMK:

Thank you for the opportunity to provide comment on the proposed drainage improvements along Kamehameha Highway in the vicinity of Kahuku hospital. Our review is based on historic reports, maps, and aerial photographs maintained at the State Historic Preservation Division; no field inspection was made of the project areas. We received notification of this undertaking from your office on September 1, 2000.

The Department of Transportation proposes to reduce potential flooding in the area fronting Kahuku Hospital caused by severe storms. The existing culvert opening at the Hospital Ditch crossing, beneath Kamehameha Highway, will need to be increased with the installation of either 3, 4 or 5-10' X 5' concrete box culverts adjacent to or replacing the existing 8" X 5' box culvert. A 2-lane detour road will also be constructed on the makai side of the drainage.

A review of our records shows that there are no known historic sites at this location although historic sites have been located in the general vicinity of the project. Because this area has been previously disturbed during road construction, it's subsequent maintenance, and construction of the existing culvert, it is unlikely that historic sites will be found. Therefore we believe that this action will have "no effect" on significant historic sites.

In the unlikely event that historic sites, including human burials, are uncovered during routine construction activities, all work in the vicinity must stop and the State Historic Preservation division must be contacted at 692-8015.

Should you have any questions, please feel free to call Sara Collins at 692-8026 or Elaine Jourdane at 692-8027.

Aloha,

TIMOTHY E. JOHNS, Chairperson and
State Historic Preservation Officer

EJ:jk

APPENDIX F

Record of Section 106 Consultation Letters and Memoranda

AMIN J. CAYETANO
GOVERNOR

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

BRIAN K. MINAAI
DIRECTOR

DEPUTY DIRECTORS
GLENN M. OKIMOTO
JADINE Y. URASAKI

IN REPLY REFER TO:

HWY-DS 2.3984

August 24, 2001

TO: DON HIBBARD, ADMINISTRATOR
STATE HISTORIC PRESERVATION DIVISION
DEPARTMENT OF LAND AND NATURAL RESOURCES

ATTEN: Ms. Sara Collins, Oahu Archaeologist

FROM: GLENN M. YASUI, ADMINISTRATOR
HIGHWAYS DIVISION
DEPARTMENT OF TRANSPORTATION

SUBJECT: SECTION 106 NOTIFICATION, NATIONAL HISTORIC PRESERVATION ACT OF 1966 (NHPA), KAMEHAMEHA HIGHWAY DRAINAGE IMPROVEMENTS: VICINITY OF KAHUKU HOSPITAL AND REPLACEMENT OF KII BRIDGE, PROJECT NO. 83C-01-01, KOOLAULOA DISTRICT, KAHUKU, ISLAND OF OAHU

The State Department of Transportation, Highways Division (DOT-H), proposes to construct a new culvert structure and a replacement bridge at two locations along Kamehameha Highway in Kahuku, Oahu. The purpose of the project is to alleviate overtopping of Kamehameha Highway at an area known as Hospital Ditch, immediately fronting the Kahuku Hospital, and at Kii Bridge. The new culvert structure proposed for Hospital Ditch will also help to reduce the incidence of ponding.

In conjunction with use of federal funds, the proposed project is subject to Section 106 NHPA regulations safeguarding against potential effects on historic properties and resources. Project impacts to historic and archaeological resources have been assessed and mitigation measures developed in the project Environmental Assessment. A finding of No Significant Impact (FONSI) is anticipated for the proposed activity.

The project Archaeological Inventory Survey Report for Hospital Ditch and Kii Bridge in the Ahupuaa of Kahuku, District of Koolauloa, Island of Hawaii, by Cultural Surveys Hawaii, dated May 2001, is provided for reference. Summarized below is an inventory of archaeological and historic resources in the Kahuku Ahupuaa, with a description of mitigation measures proposed to prevent adverse project impacts.

KAHUKU AHUPUAA: HISTORICAL AND CULTURAL DCOMENTATION

Few prehistoric and several historic and traditional use sites have been recorded in the vicinity of the project area. Site types include shelter complexes, agricultural terrace/ditch complexes, habitation sites, World War II historic sites, and burials.

The project area has also been part of historic-era transportation corridors since the introduction of commercial sugar cane cultivation in the late 1800s. Historic maps depict the predecessor of Kamehameha Highway at essentially the same location as at present. Kamehameha Highway's Kahuku section was built to "modern" standards in the mid-to-late 1930s. Adjacent to the highway, on the makai side where the proposed bypass roads are located, was the Kahuku Plantation railroad alignment. The plantation rail line lasted from the 1890s to the 1950s.

Kii Bridge was built in 1937 as part of Kamehameha Highway improvements. Hospital Bridge is of more modern construction related to improvements near Kahuku Hospital, Pualea Street, and Kamehameha Highway. Kii Bridge, while built in 1937, is not on the Historical Bridges listing (State of Hawaii, Draft Historic Bridge Inventory and Evaluation, May 1996), and does not meet the criteria for historical significance outlined in guidance provided by the SHPD ("How to Apply the National Register Criteria for Evaluation"). The bridge retains reasonable physical integrity, but is not associated with events or persons of historical significance; does not embody the distinctive characteristics of a type, period, or method of construction, does not represent the work of a master, or possess high artistic value; and is not likely to yield information important to history. The bridge does not have traditional cultural significance for an ethnic group. As a result, demolition of the bridge will have no effect on historic properties.

While prehistoric, historic, and traditional sites are known to occur in the vicinity of the proposed bridge replacement and ditch improvement areas, no sites have been identified within the Area of Potential Effect (APE), which includes both of the proposed alignments for the bypass roads. Because the APE is small and previously disturbed, because none of the recorded sites are in close proximity to the APE, and because there is substantial existing archaeological documentation of the Kahuku town area, no additional archaeological survey appears warranted.

CUMULATIVE IMPACTS

No other projects (federal, state, county, or community) were identified in the vicinity of the Hospital Ditch and Kii Bridge project. Therefore, when reviewed against past, present, and reasonably foreseeable future actions, no cumulative effects on cultural resources are expected.

MITIGATION MEASURES

Although no effects on historic properties are expected from the proposed project, the presence of cultural resource sites in the vicinity of the APE indicate that there is some potential for subsurface cultural materials to be encountered during the course of construction. If cultural materials, particularly human remains, are discovered during ground disturbing activities, work in the area will be stopped immediately and the SHPD/DLNR will be notified of the discovery. Burial finds will be treated in accordance with Chapter 6E-43.6, Hawaii Revised Statutes (HRS),

and Chapter 12-300, Hawaii Administrative Rules. SHPD/DLNR will determine the appropriate treatment of the remains and any associated cultural material in consultation with recognized descedants and the Oahu Island Burial Council.

Based on the documentation and mitigation measures contained in the Environmental Assessment, it is our determination that this project will have no adverse impacts on archaeological or historic resources. In accordance with Section 106, NHPA, we request your review of our findings. We will assume your concurrence if we receive no objections from your office within 30 days upon receipt of this letter.

Should you have any questions, please do not hesitate to contact Mr. Scot Urada, Technical Design Services Office, Design Branch, Highways Division at (808) 692-7553.

Attachments

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

GILBERT S. COLOMA-AGARAN, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

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JANET E. KAWELO
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STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION
Kakuhihewa Building, Room 555
601 Kamokila Boulevard
Kapolei, Hawaii 96707

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND
STATE PARKS

October 1, 2001

Glenn Yasui, Administrator
Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813-5097

LOG NO: 28282 ✓
DOC NO: 0109EJ30

Dear Mr. Yasui:

SUBJECT: National Historic Preservation Act Section 106 Review – Kamehameha Highway Drainage Improvements: Vicinity of Kahuku Hospital and Replacement of Kii Bridge; Project No. 83C-01-01
Kahuku, Ko`olauloa, O`ahu
TMK: 5-6-002: 005, 006

The Department of Transportation proposes to reduce potential flooding at the areas known as Hospital Ditch, fronting Kahuku Hospital, and at Kii Bridge. Improvements include replacement of the existing box culvert at the Hospital Ditch locale, construction of a new bridge at the existing Kii Bridge location and construction of a two-lane detour road along the makai side of the Kamehameha Highway.

We commented in September 2000 on the Hospital Ditch and detour road portions of this action. Those comments stated that:

> Because this area has been previously disturbed during road construction, its subsequent maintenance, and the construction of the existing culvert it is unlikely that historic sites will be found. Therefore we believe that this action will have "no effect" on significant historic sites. of this project (SHPD Log 26183, September 22, 2000)

Subsequent to our comments an archaeological inventory survey was conducted for the proposed project areas (*Archaeological Inventory Survey Report for Hospital Ditch and Kii Bridge in the Ahupua`a of Kahuku, District of Ko`olauloa, Island of O`ahu*, CSH, 2001). As anticipated, the survey did not locate any surface historic sites within the area of potential effect. Commercial sugar cane cultivation conducted from the late 1800s to the 1970s extensively altered the ground, making it unlikely that historic sites would be found. We also agree that Kii Bridge, although built in 1937, does not meet the criteria for historical significance.

Because no historic sites are known to exist within the APE or are subsurface historic sites likely to exist because of the past land alteration in the area, we believe that a "no historic properties affected" determination is appropriate.

In the unlikely event that historic sites, including human burials, are uncovered during routine construction activities, all work in the vicinity must stop and the State Historic Preservation division must be contacted at 692-8015.

Should you have any questions, please feel free to call Sara Collins at 692-8026 or Elaine Jourdane at 692-8027.

Aloha,

Gilbert Coloma-Agaran
State Historic Preservation Officer

EJ:jk

BENJAMIN J. CAYETANO
GOVERNOR

BRIAN K. MINAAI
DIRECTOR

DEPUTY DIRECTORS
GLENN M. OKIMOTO
JADINE Y. URASAKI

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

IN REPLY REFER TO:

HWY-DS 2.3984

August 24, 2001

TO: A. VAN HORN DIAMOND, CHAIRPERSON
OAHU ISLAND BURIAL COUNCIL
STATE HISTORIC PRESERVATION DIVISION
DEPARTMENT OF LAND AND NATURAL RESOURCES

FROM: GLENN M. YASUI, ADMINISTRATOR
HIGHWAYS DIVISION
DEPARTMENT OF TRANSPORTATION

SUBJECT: SECTION 106 NOTIFICATION, NATIONAL HISTORIC PRESERVATION ACT OF 1966 (NHPA), KAMEHAMEHA HIGHWAY DRAINAGE IMPROVEMENTS: VICINITY OF KAHUKU HOSPITAL AND REPLACEMENT OF KII BRIDGE, PROJECT NO. 83C-01-01, KOOLAULOA DISTRICT, KAHUKU, ISLAND OF OAHU

The State Department of Transportation, Highways Division (DOT-H), proposes to construct a new culvert structure and a replacement bridge at two locations along Kamehameha Highway in Kahuku, Oahu. The purpose of the project is to alleviate overtopping of Kamehameha Highway at an area known as Hospital Ditch, immediately fronting the Kahuku Hospital, and at Kii Bridge. The new culvert structure proposed for Hospital Ditch will also help to reduce the incidence of ponding.

In conjunction with use of federal funds, the proposed project is subject to Section 106 NHPA regulations safeguarding against potential effects on historic properties and resources. Project impacts to historic and archaeological resources have been assessed and mitigation measures developed in the project Environmental Assessment. A finding of No Significant Impact (FONSI) is anticipated for the proposed activity.

The project Archaeological Inventory Survey Report for Hospital Ditch and Kii Bridge in the Ahupuaa of Kahuku, District of Koolauloa, Island of Hawaii, by Cultural Surveys Hawaii, dated May 2001, is provided for reference. Summarized below is an inventory of archaeological and historic resources in the Kahuku Ahupuaa, with a description of mitigation measures proposed to prevent adverse project impacts.

KAHUKU AHUPUAA: HISTORICAL AND CULTURAL DCOMENTATION
Few prehistoric and several historic and traditional use sites have been recorded in the vicinity of the project area. Site types include shelter complexes, agricultural terrace/ditch complexes, habitation sites, World War II historic sites, and burials.

The project area has also been part of historic-era transportation corridors since the introduction of commercial sugar cane cultivation in the late 1800s. Historic maps depict the predecessor of Kamehameha Highway at essentially the same location as at present. Kamehameha Highway's Kahuku section was built to "modern" standards in the mid-to-late 1930s. Adjacent to the highway, on the makai side where the proposed bypass roads are located, was the Kahuku Plantation railroad alignment. The plantation rail line lasted from the 1890s to the 1950s.

Kii Bridge was built in 1937 as part of Kamehameha Highway improvements. Hospital Bridge is of more modern construction related to improvements near Kahuku Hospital, Pualea Street, and Kamehameha Highway. Kii Bridge, while built in 1937, is not on the Historical Bridges listing (State of Hawaii, Draft Historic Bridge Inventory and Evaluation, May 1996), and does not meet the criteria for historical significance outlined in guidance provided by the SHPD ("How to Apply the National Register Criteria for Evaluation"). The bridge retains reasonable physical integrity, but is not associated with events or persons of historical significance; does not embody the distinctive characteristics of a type, period, or method of construction, does not represent the work of a master, or possess high artistic value; and is not likely to yield information important to history. The bridge does not have traditional cultural significance for an ethnic group. As a result, demolition of the bridge will have no effect on historic properties.

While prehistoric, historic, and traditional sites are known to occur in the vicinity of the proposed bridge replacement and ditch improvement areas, no sites have been identified within the Area of Potential Effect (APE), which includes both of the proposed alignments for the bypass roads. Because the APE is small and previously disturbed, because none of the recorded sites are in close proximity to the APE, and because there is substantial existing archaeological documentation of the Kahuku town area, no additional archaeological survey appears warranted.

CUMULATIVE IMPACTS
No other projects (federal, state, county, or community) were identified in the vicinity of the Hospital Ditch and Kii Bridge project. Therefore, when reviewed against past, present, and reasonably foreseeable future actions, no cumulative effects on cultural resources are expected.

MITIGATION MEASURES
Although no effects on historic properties are expected from the proposed project, the presence of cultural resource sites in the vicinity of the APE indicate that there is some potential for subsurface cultural materials to be encountered during the course of construction. If cultural materials, particularly human remains, are discovered during ground disturbing activities, work in the area will be stopped immediately and the SHPD/DLNR will be notified of the discovery. Burial finds will be treated in accordance with Chapter 6E-43.6, Hawaii Revised Statutes (HRS),

and Chapter 12-300, Hawaii Administrative Rules. SHPD/DLNR will determine the appropriate treatment of the remains and any associated cultural material in consultation with recognized descedants and the Oahu Island Burial Council.

Based on the documentation and mitigation measures contained in the Environmental Assessment, it is our determination that this project will have no adverse impacts on archaeological or historic resources. In accordance with Section 106, NHPA, we request your review of our findings. We will assume your concurrence if we receive no objections from your office within 30 days upon receipt of this letter.

Should you have any questions, please do not hesitate to contact Mr. Scot Urada, Technical Design Services Office, Design Branch, Highways Division at (808) 692-7553.

Attachments

Post-it® Fax Note 7671	Date 10/4/01	# of pages ▶ 2
To Bron Talcode	From Scot Urada	
Co./Dept. RMTC	Co. HWY-DS	
Phone #	Phone #	
Fax #	Fax #	

U.S. Depc of Transp
Federal Adminis

Hawaii Division
Box 50206
300 Ala Moana Boulevard, Room 3-306
Honolulu, HI 96850

October 1, 2001

In Reply Refer To:
HEC-HI

CERTIFIED MAIL RETURN RECEIPT REQUESTED

COPY

Mr. A. Van Horn Diamond, Chairperson
Oahu Island Burial Council
State of Hawaii
Department of Land and Natural Resources
Kakuhihewa Building, Rm. 555
601 Kamokila Blvd.
Kapolei, Hawaii 96707

Dear Mr. Diamond:

Subject: Section 106, National Historic Preservation Act
Kamehameha Highway Drainage Improvements
Vicinity of Kahuku Hospital and Replacement of Kii Bridge
Request for Comments
(Reply due: 30 days from receipt of letter)

In accordance with Section 106 of the National Historic Preservation Act (NHPA), the Federal Highway Administration (FHWA) requests the Oahu Island Burial Council's comments on the religious and cultural significance to any historic or cultural properties that may be affected by this undertaking.

The FHWA and the Hawaii Department of Transportation (HDOT), Highways Division, propose to construct a new culvert structure and a replacement bridge at two locations along Kamehameha Highway in Kahuku, Oahu. The purpose of the project is to alleviate overtopping of Kamehameha Highway at an area known as Hospital Ditch, immediately fronting the Kahuku Hospital, and at Kii Bridge. The new culvert structure proposed for Hospital Ditch will also help to reduce the incidence of ponding.

Previously, a copy of the archaeological inventory survey, entitled Archaeological Inventory Survey Report for Hospital Ditch and Kii Bridge in the Ahupuaa of Kahuku, District of Koolauloa, Island of Hawaii, was transmitted to the Oahu Island Burial Council by the HDOT. The copy of the report is provided for the Oahu Island Burial Council's reference.

On September 12, 2001, a HDOT representative provided an oral presentation on the scope of the project, potential project issues and the status of section 106 consultation. The HDOT also requested the Burial Council's assistance with identifying other consulting parties. The Burial Council identified the following organizations: the Kahuku Farmers Association, Lanihuli Hawaiian Civic Club, and the Koolauloa Hawaiian Civic Club. Based on the Oahu Island Burial Council's recommendation, the HDOT submitted consultation letters to these three additional organizations. Enclosed are copies of the HDOT's consultation letters.

In summary, we are formally requesting the Oahu Island Burial Council's comment on the FHWA and the HDOT undertaking. In accordance with section 106 of the NHPA, we are providing the Oahu Island Burial Council with thirty (30) days to comment on the undertaking. However, if the Oahu Island Burial Council is unable to meet this time frame, please let us know so that we can address it accordingly.

Please contact me at 808-541-2700 extension 305 if there are any questions.

Sincerely yours,

Pat V. Phung

Pat V. Phung, P.E.
Transportation Engineer

Cc w/o enclosures: Mr. Scot Urada, HDOT, HWY-DS
Ms. Sara Collins, SHPO

BENJAMIN J. CAYETANO, GOVERNOR
STATE OF HAWAII

ORIGINAL

GILBERT S. COLOMA-AGARAN, CHAIRPERSON
• BOARD OF LAND AND NATURAL RESOURCES
• COMMISSION ON WATER RESOURCE MANAGEMENT

DEPUTIES
JANET E. KAWELO
LINNEL NISHIOKA

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION
555 Kakuhihewa Building
601 Kamokila Boulevard
Kapolei, Hawaii 96707
Tel: (808) 692-8015 • Fax: (808) 692-8020

November 8, 2001

Pat V. Phung, P.E.
Transportation Engineer
U.S. Department of Transportation
Federal Highway Administration, Hawaii Division
Box 50206
Honolulu, Hawaii 96850

Re: **Section 106, National Historic Preservation Act,**
Kamehameha Highway Drainage Improvements
Vicinity of Kahuku Hospital and Replacement of Kii Bridge
Request for Comments

Dear Mr. Phung:

Pursuant to discussion at the October 10, 2001, Oahu Island Burial Council meeting regarding your request for input, we hereby ask for an extension of 30 additional days, which should enable a response to your October 1, 2001, request.

Please anticipate a burial council response through the State Historic Preservation Division.

Your prompt cooperation and favorable response is appreciated.

Aloha,

A. Van Horn Diamond

A. Van Horn Diamond, Chair
Oahu Island Burial Council

cc: Scot Urada, HDOT, HWY-DS
Sara Collins, SHPD Oahu Archaeologist
Ka'iana Markell, Burial Sites Program Director
Don J. Hibbard, SHPD Administrator
OIBC Members

BENJAMIN J. CAYETANO, GOVERNOR
STATE OF HAWAII

GILBERT S. COLOMA-AGARAN, CHAIRPERSON
• BOARD OF LAND AND NATURAL RESOURCES
• COMMISSION ON WATER RESOURCE MANAGEMENT

DEPUTIES
JANET E. KAWELO
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STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
HISTORIC PRESERVATION DIVISION
555 Kakuhihewa Building
601 Kamokila Boulevard
Kapolei, Hawaii 96707
Tel: (808) 692-8015 • Fax: (808) 692-8020

MINUTES

O`AHU ISLAND BURIAL COUNCIL MEETING

DATE: WEDNESDAY, NOVEMBER 14, 2001
TIME: 10:00 A.M.
PLACE: KAPOLEI STATE OFFICE BUILDING
601 KAMOKILA BOULEVARD
264 KAKUHIHEWA BUILDING
KAPOLEI, HAWAI`I 96707

ATTENDANCE:

Members: Van Diamond
Pikake Pelekai
Ka`ohu Seto
Kalei Kini
Peter Apo
Charles Ehrhorn
Tom Shirai

Staff: Ka`iana Markell, Burial Sites Program Director
Kamana`olani Mills, Historic Sites Preservation Specialist
Sara L. Collins, O`ahu Archaeologist
Elaine "Muffet" Jourdane, Assistant O`ahu Archaeologist
Don J. Hibbard, SHPD Administrator
Alvin Tamashiro, SHPD Office Manager
Michelle K. Bradley, Historic Sites Preservation Specialist

Guests: Hannah Kaneaiakala
Alice Greenwood, Opunui
Kalehua Eli, Nanakuli
Midge Eli, Nanakuli Hawaiian Homestead Community Association
Myron K. Brumaghim, DOE
Agnes K. Cope, Wai`anae Coast Culture & Arts
Merrie Aipoalani, State Representative Michael Kahikina
Ralph Yukumoto, DAGS – Planning Branch
John Toguchi, Kober/Hanssen/Mitchell
David W. Shideler, Cultural Surveys Hawai`i

A motion was made and seconded that the council rescind its motion from last month, that the iwi be relocated and reinterred at the Nanakuli cemetery, and that specific location information be provided to the SHPD (Kini/Apo).

Vote: 3 in support (Kini/Pelekai/Apo)
2 in opposition (Seto/Diamond)
2 abstentions (Ehrhorn/Shirai)

Diamond said the motion failed.

A motion was made and seconded that the decision on the relocation be deferred to the Department (Pelekai/Kini).

Vote: 4 in support (Pelekai/Seto/Shirai/Kini)
2 in opposition (Ehrhorn/Diamond)
1 abstention (Apo)

Diamond said the motion passes, and the decision on the relocation is in the hands of the Department.

C. SECTION 106 SUBCOMMITTEE
Information/Recommendation: Report and recommendations by subcommittee regarding 106 process and issues.

Council Member Pikake Pelekai (Pelekai) said the subcommittee, comprised of Council Members Coochie Cayan (Cayan), Ka`ohu Seto (Seto), and herself, met on October 29th to come up with recommendations for the council to consider on how they might handle requests for Section 106 consultation.

There should be open communication. We're aware that these agencies and private entities are under timelines that need to be met. Therefore, communication should begin very early on in the planning stage when any agency or private entity proposes a project that requires Section 106 consultation so that we might be able to accommodate their schedules.

The subcommittee's recommendation for the council's Section 106 consultation process is outlined in Exhibit "A", attached hereto.

The subcommittee's recommendation for the council's Section 106 Decisions relative to Ki`i Bridge Project in Kahuku, Ala Moana Beautification Project, Waiahole DOT Resurfacing Project, Tycom (Waianae) Project, and Klipper Golf Course, Mokapu is attached hereto as Exhibit "B".

Pelekai said regarding the Klipper Golf Course, there seems to be a disagreement with respect to finds. The Marines are saying that the finds that are coming up are inadvertent, but we're

maintaining that it's not inadvertent because Mokapu is a known burial site so that is one area we need to work on resolving with the Marines.

The difference between informal and formal consultation is the clock starts ticking the minute you enter into formal consultation. Usually, agencies would request a 30-day response. Informal consultation is when an agency comes before the council early on in their project to provide information only, and council action isn't requested at that time. This enables the council to receive the information, review it, go over concerns with them, and try to iron all of that out before a formal presentation is made to the council. Informal consultation wouldn't start the ticking of the clock. This way we're able to consult with staff as well. In addition, the informal consultation process allows both sides of the table to contact as many people we know that would have an interest in the project so their mana`o can be solicited upfront.

We're also asking that the OIBC not be the venue for "consultation". In the past, there have been agencies guilty of calling ahead of time to other Native Hawaiian organizations asking that their representatives attend a certain meeting, and they consider that consultation. That's not consultation.

We further recommend that the council be provided with the handouts, general summaries, and flowcharts for Section 106 and that training be given to all council members because the subcommittee is going to need more help. With everyone up to speed, it will enable us to expedite the process and give it a really good review.

A motion was made and unanimously approved that the recommendations from the Section 106 subcommittee on the consultation process be adopted by the council (Pelekai/Seto).

Vote: All in favor.

A motion was made and unanimously approved that the recommendations for the OIBC's Section 106 decisions relative to Ki`i Bridge Project, Ala Moana Beautification Project, Waiahole – DOT Resurfacing Project, and Tycom (Wai`anae) Project, and Klipper Golf Course, Mokapu Project be accepted, pending appropriate recommendations (Pelekai/Seto).

Vote: All in favor.

E. 5-ACRE PORTION OF HALE`IWA ALI`I BEACH PARK; TMK:6-6 02:POR. 01; PA`ALA`A AHUPUA`A; WAIALUA DISTRICT; O`AHU ISLAND

Information/Recommendation: Discussion of project and proposed burial treatment; recognition of descendants; and testimony by descendants regarding proposed burial treatment.

Shideler stated that in the course of an archaeological inventory survey in support of construction of park infrastructure at Hale`iwa Ali`i Beach Park, one set of iwi kupuna was found and has remained in place. The matter was advertised and five individuals, including

O'AHU ISLAND BURIAL COUNCIL
Section 106 Committee
November 14, 2001

MEMORANDUM

TO: Van H. Diamond, Chairperson
O'ahu Island Burial Council

FROM: Section 106 Committee

SUBJECT: RECOMMENDATION FOR OIBC'S SECTION 106 CONSULTATION PROCESS

Your committee, comprised of members P. Cayan, D. Seto, and P. Pelekai met October 29, 2001 to consider a process by which the O'ahu Island Burial Council may facilitate requests received from federal and state agencies and private entities for consultation as required by Section 106 of the National Historic Preservation Act. After having deliberated and fully discussed this subject, your committee recommends the following be adopted at the OIBC's Section 106 Consultation Process:

1. A letter be sent to all agencies and entities who have and will be requesting consultation with the OISC informing of the OIBC's process for consultation; that the process will be both an informal and formal one; and that the following documents, at a minimum, are required to expedite the consultation process:
   - Project abstract/summary with TMK maps, Burial Treatment Plan, etc.
   - EIS or an Archaeological Monitoring Plan
   - SHPD staff's comments/letters of recommendations on project
   - List of Project or Agency contacts

2. All requests for consultation that are received will be acknowledged in writing to the sender and the request itself forwarded to the Section 106 committee for review, commenting and recommendation.

3. After referral, the Section 106 subcommittee will proceed to
   - Individually review, make comments and email/fax said comments to each other before the Committee meets;
   - Schedule a committee review meeting before the monthly OIBC meeting
   - Communicate concerns to project or agency contacts for clarification and/or resolution
   - When review is complete, submit written recommendations to the OIBC complete with reference to SHPD letters or Burial Treatment Plans (citing page numbers) and/or list of concerns for the specific project AND request that the project be placed on the agenda for the next regularly scheduled OIBC meeting. agendized
   - Notify the project or agency that its project will be ~~agenized~~ and that the meeting will constitute the formal consultation with the OIBC.
   - Facilitate the discussion on the project at the OIBC meeting by presenting the project summary and the subcommittee's findings and recommendations for action.

EXHIBIT "A"

O'AHU ISLAND BURIAL COUNCIL
Section 106 Committee
November 14, 2001

MEMORANDUM

TO: Van H. Diamond, Chairperson
O'ahu Island Burial Council

FROM: Section 106 Committee

SUBJECT: RECOMMENDATION FOR OIBC'S SECTION 106 DECISIONS

Your committee, comprised of members P. Cayan, D. Seto, and P. Pelekai met October 29, 2001 to review and make recommendations on the projects listed below for which Section 106 consultation had been requested. After full discussion on each of the projects, the Committee submits its comments and recommendations as follows:

1. Kii Bridge project in Kahuku: the area has many sand dunes which are known to be traditional burial areas (refer to past projects and finds in that area especially Turtle Bay, Campbell Estate ands, etc.). If any burials are discovered, the project must stop and the Burials Specialist et al be called as required by Section 6E of the HRS.

2. Ala Moana Beautification project: the area is known for its many finds of burials; committee concurs with staff recommendation to have on-site monitoring present (refer to Hibbard letter).

3. Wai'ahole - DOT Resurfacing: committee concurs with staff's recommendation for on site monitoring.

4. TyCom (Wai'anae): committee concurs with staff's recommendations that a burial treatment plan is needed. Committee also noted that TyCom has not provided a list of the community groups and/or families they have consulted with: this request was made at a previous OIBC meeting.

5. Klipper Golf Course, Mokapu: committee concurs with staff's recommendation that on-site monitoring is needed as Mokapu is a known burial site.

EXHIBIT "B"

BENJAMIN J. CAYETANO
GOVERNOR

BRIAN K. MINAAI
DIRECTOR

DEPUTY DIRECTORS
GLENN M. OKIMOTO
JADINE Y. URASAKI

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

IN REPLY REFER TO:

HWY-DS 2.3984

August 24, 2001

TO: COLIN KIPPEN
OFFICE OF HAWAIIAN AFFAIRS

FROM: GLENN M. YASUI, ADMINISTRATOR
HIGHWAYS DIVISION
DEPARTMENT OF TRANSPORTATION

SUBJECT: SECTION 106 NOTIFICATION, NATIONAL HISTORIC PRESERVATION ACT OF 1966 (NHPA), KAMEHAMEHA HIGHWAY DRAINAGE IMPROVEMENTS: VICINITY OF KAHUKU HOSPITAL AND REPLACEMENT OF KII BRIDGE, PROJECT NO. 83C-01-01, KOOLAULOA DISTRICT, KAHUKU, ISLAND OF OAHU

The State Department of Transportation, Highways Division (DOT-H), proposes to construct a new culvert structure and a replacement bridge at two locations along Kamehameha Highway in Kahuku, Oahu. The purpose of the project is to alleviate overtopping of Kamehameha Highway at an area known as Hospital Ditch, immediately fronting the Kahuku Hospital, and at Kii Bridge. The new culvert structure proposed for Hospital Ditch will also help to reduce the incidence of ponding.

In conjunction with use of federal funds, the proposed project is subject to Section 106 NHPA regulations safeguarding against potential effects on historic properties and resources. Project impacts to historic and archaeological resources have been assessed and mitigation measures developed in the project Environmental Assessment. A finding of No Significant Impact (FONSI) is anticipated for the proposed activity.

The project Archaeological Inventory Survey Report for Hospital Ditch and Kii Bridge in the Ahupuaa of Kahuku, District of Koolauloa, Island of Hawaii, by Cultural Surveys Hawaii, dated May 2001, is provided for reference. Summarized below is an inventory of archaeological and historic resources in the Kahuku Ahupuaa, with a description of mitigation measures proposed to prevent adverse project impacts.

KAHUKU AHUPUAA: HISTORICAL AND CULTURAL DCOMENTATION
Few prehistoric and several historic and traditional use sites have been recorded in the vicinity of the project area. Site types include shelter complexes, agricultural terrace/ditch complexes, habitation sites, World War II historic sites, and burials.

The project area has also been part of historic-era transportation corridors since the introduction of commercial sugar cane cultivation in the late 1800s. Historic maps depict the predecessor of Kamehameha Highway at essentially the same location as at present. Kamehameha Highway's Kahuku section was built to "modern" standards in the mid-to-late 1930s. Adjacent to the highway, on the makai side where the proposed bypass roads are located, was the Kahuku Plantation railroad alignment. The plantation rail line lasted from the 1890s to the 1950s.

Kii Bridge was built in 1937 as part of Kamehameha Highway improvements. Hospital Bridge is of more modern construction related to improvements near Kahuku Hospital, Pualea Street, and Kamehameha Highway. Kii Bridge, while built in 1937, is not on the Historical Bridges listing (State of Hawaii, Draft Historic Bridge Inventory and Evaluation, May 1996), and does not meet the criteria for historical significance outlined in guidance provided by the SHPD ("How to Apply the National Register Criteria for Evaluation"). The bridge retains reasonable physical integrity, but is not associated with events or persons of historical significance; does not embody the distinctive characteristics of a type, period, or method of construction, does not represent the work of a master, or possess high artistic value; and is not likely to yield information important to history. The bridge does not have traditional cultural significance for an ethnic group. As a result, demolition of the bridge will have no effect on historic properties.

While prehistoric, historic, and traditional sites are known to occur in the vicinity of the proposed bridge replacement and ditch improvement areas, no sites have been identified within the Area of Potential Effect (APE), which includes both of the proposed alignments for the bypass roads. Because the APE is small and previously disturbed, because none of the recorded sites are in close proximity to the APE, and because there is substantial existing archaeological documentation of the Kahuku town area, no additional archaeological survey appears warranted.

CUMULATIVE IMPACTS
No other projects (federal, state, county, or community) were identified in the vicinity of the Hospital Ditch and Kii Bridge project. Therefore, when reviewed against past, present, and reasonably foreseeable future actions, no cumulative effects on cultural resources are expected.

MITIGATION MEASURES
Although no effects on historic properties are expected from the proposed project, the presence of cultural resource sites in the vicinity of the APE indicate that there is some potential for subsurface cultural materials to be encountered during the course of construction. If cultural materials, particularly human remains, are discovered during ground disturbing activities, work in the area will be stopped immediately and the SHPD/DLNR will be notified of the discovery. Burial finds will be treated in accordance with Chapter 6E-43.6, Hawaii Revised Statutes (HRS),

and Chapter 12-300, Hawaii Administrative Rules. SHPD/DLNR will determine the appropriate treatment of the remains and any associated cultural material in consultation with recognized descedants and the Oahu Island Burial Council.

Based on the documentation and mitigation measures contained in the Environmental Assessment, it is our determination that this project will have no adverse impacts on archaeological or historic resources. In accordance with Section 106, NHPA, we request your review of our findings. We will assume your concurrence if we receive no objections from your office within 30 days upon receipt of this letter.

Should you have any questions, please do not hesitate to contact Mr. Scot Urada, Technical Design Services Office, Design Branch, Highways Division at (808) 692-7553.

Attachments

HWY-D 4292

PHONE (808) 594-1888

FAX (808) 594-1865

STATE OF HAWAI'I
OFFICE OF HAWAIIAN AFFAIRS
711 KAPI'OLANI BOULEVARD, SUITE 500
HONOLULU, HAWAI'I 96813

September 17, 2001

HRD01/285

Mr. Glenn Yasui, Administrator
State of Hawaii Department of Transportation
869 Punchbowl Street
Honolulu, HI 96813-5097

Dear Mr. Yasui:

Subject: Kamehameha Highway Drainage Improvements: Vicinity of Kahuku Hospital and Replacements of Kii Bridge, Proj. No. 83C-01-01, Koolauloa District, Kahuku, Island of Oahu

This is in response to the materials of August 24, 2001, within which you had requested the Office of Hawaiian Affairs to provide NHPA Section 106 review of the above referenced project. Upon review of the enclosed materials, the Office of Hawaiian Affairs has no significant concerns with the project as detailed.

With respect to historical or archaelogical resources, OHA relies on the State Department of Transportation's assurance that proper mitigation and consultation will occur should any unidentified cultural, historic, or burial sites and/or resources be encountered during project development.

OHA recommends that FHWA additionally contact and consult about this project relating to identifying cultural and historical resources or evaluation for traditional cultural places (if such consultation has not occurred already) with the following Native Hawaiian organization):

- Hawaiian Civic clubs
- Oahu Island Burial Council
- Knowledgeable individuals or families who reside in the area (or have previously resided in the area) who may be familiar with the cultural resources or practices of the areas affected by your undertaking

Thank you for the opportunity to review and comment regarding the proposed project. If you have any questions, please contact Wayne Kawamura, Policy Analyst at 594-1966, or email him at waynek@oha.org.

Sincerely,

Colin Kippen, Jr.
Deputy Administrator

CK:wk

cc: BOT
ADM

BENJAMIN J. CAYETANO
GOVERNOR

BRIAN K. MINAAI
DIRECTOR

DEPUTY DIRECTORS
GLENN M. OKIMOTO
JADINE Y. URASAKI

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

IN REPLY REFER TO:

HWY-DS 2.3984

August 24, 2001

Kahuku Community Association
P. O. Box 333
Kahuku, Hawaii 96731

Dear Sir/Madam:

Subject: Section 106 Notification, National Historic Preservation Act of 1966 (NHPA) Kamehameha Highway Drainage Improvements: Vicinity of Kahuku Hospital and Replacement of Kii Bridge, Project No. 83C-01-01, Koolauloa District, Kahuku, Island of Oahu

The State Department of Transportation, Highways Division (DOT-H), proposes to construct a new culvert structure and a replacement bridge at two locations along Kamehameha Highway in Kahuku, Oahu. The purpose of the project is to alleviate overtopping of Kamehameha Highway at an area known as Hospital Ditch, immediately fronting the Kahuku Hospital, and at Kii Bridge. The new culvert structure proposed for Hospital Ditch will also help to reduce the incidence of ponding.

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The project Archaeological Inventory Survey Report for Hospital Ditch and Kii Bridge in the Ahupuaa of Kahuku, District of Koolauloa, Island of Hawaii, by Cultural Surveys Hawaii, dated May 2001, is provided for reference. Summarized below is an inventory of archaeological and historic resources in the Kahuku Ahupuaa, with a description of mitigation measures proposed to prevent adverse project impacts.

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CUMULATIVE IMPACTS

No other projects (federal, state, county, or community) were identified in the vicinity of the Hospital Ditch and Kii Bridge project. Therefore, when reviewed against past, present, and reasonably foreseeable future actions, no cumulative effects on cultural resources are expected.

MITIGATION MEASURES

Although no effects on historic properties are expected from the proposed project, the presence of cultural resource sites in the vicinity of the APE indicate that there is some potential for subsurface cultural materials to be encountered during the course of construction. If cultural materials, particularly human remains, are discovered during ground disturbing activities, work in the area will be stopped immediately and the SHPD/DLNR will be notified of the discovery. Burial finds will be treated in accordance with Chapter 6E-43.6, Hawaii Revised Statutes (HRS),

and Chapter 12-300, Hawaii Administrative Rules. SHPD/DLNR will determine the appropriate. treatment of the remains and any associated cultural material in consultation with recognized descedants and the Oahu Island Burial Council.

Based on the documentation and mitigation measures contained in the Environmental Assessment, it is our determination that this project will have no adverse impacts on archaeological or historic resources. In accordance with Section 106, NHPA, we request your review of our findings. We will assume your concurrence if we receive no objections from your office within 30 days upon receipt of this letter.

Should you have any questions, please do not hesitate to contact Mr. Scot Urada, Technical Design Services Office, Design Branch, Highways Division at (808) 692-7553.

Very truly yours,

GLENN M. YASUI
Administrator
Highways Division

Attachments

BENJAMIN J. CAYETANO
GOVERNOR

BRIAN K. MINAAI
DIRECTOR

DEPUTY DIRECTORS
GLENN M. OKIMOTO
JADINE Y. URASAKI

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

IN REPLY REFER TO:

HWY-DS 2.3984

August 24, 2001

Kahuku Village Association
P. O. Box 398
Kahuku, Hawaii 96731

Dear Sir/Madam:

Subject: Section 106 Notification, National Historic Preservation Act of 1966 (NHPA) Kamehameha Highway Drainage Improvements: Vicinity of Kahuku Hospital and Replacement of Kii Bridge, Project No. 83C-01-01, Koolauloa District, Kahuku, Island of Oahu

The State Department of Transportation, Highways Division (DOT-H), proposes to construct a new culvert structure and a replacement bridge at two locations along Kamehameha Highway in Kahuku, Oahu. The purpose of the project is to alleviate overtopping of Kamehameha Highway at an area known as Hospital Ditch, immediately fronting the Kahuku Hospital, and at Kii Bridge. The new culvert structure proposed for Hospital Ditch will also help to reduce the incidence of ponding.

In conjunction with use of federal funds, the proposed project is subject to Section 106 NHPA regulations safeguarding against potential effects on historic properties and resources. Project impacts to historic and archaeological resources have been assessed and mitigation measures developed in the project Environmental Assessment. A finding of No Significant Impact (FONSI) is anticipated for the proposed activity.

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CUMULATIVE IMPACTS

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Should you have any questions, please do not hesitate to contact Mr. Scot Urada, Technical Design Services Office, Design Branch, Highways Division at (808) 692-7553.

Very truly yours,

GLENN M. YASUI
Administrator
Highways Division

Attachments

BENJAMIN J. CAYETANO
GOVERNOR

BRIAN K. MINAAI
DIRECTOR

DEPUTY DIRECTORS
GLENN M. OKIMOTO
JADINE Y. URASAKI

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

IN REPLY REFER TO:

HWY-DS 2.3984

August 24, 2001

Koolauloa Vision Team
c/o Mr. John R. Sabas, Deputy Director
Department of Community Services
City and County of Honolulu
715 South King Street, Room 311
Honolulu, Hawaii 96813

Dear Mr. Sabas:

Subject: Section 106 Notification, National Historic Preservation Act of 1966 (NHPA)
Kamehameha Highway Drainage Improvements: Vicinity of Kahuku Hospital and Replacement of Kii Bridge, Project No. 83C-01-01, Koolauloa District, Kahuku, Island of Oahu

The State Department of Transportation, Highways Division (DOT-H), proposes to construct a new culvert structure and a replacement bridge at two locations along Kamehameha Highway in Kahuku, Oahu. The purpose of the project is to alleviate overtopping of Kamehameha Highway at an area known as Hospital Ditch, immediately fronting the Kahuku Hospital, and at Kii Bridge. The new culvert structure proposed for Hospital Ditch will also help to reduce the incidence of ponding.

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Should you have any questions, please do not hesitate to contact Mr. Scot Urada, Technical Design Services Office, Design Branch, Highways Division at (808) 692-7553.

Very truly yours,

GLENN M. YASUI
Administrator
Highways Division

Attachments

BENJAMIN J. CAYETANO
GOVERNOR

BRIAN K. MINAAI
DIRECTOR

DEPUTY DIRECTORS
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JADINE Y. URASAKI

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

IN REPLY REFER TO:

HWY-DS 2.3984

August 24, 2001

Ms. Mary Ann Long, Chairperson
Koolauloa Neighborhood Board No. 28
P. O. Box 418
Hauula, Hawaii 96717

Dear Ms. Long

Subject: Section 106 Notification, National Historic Preservation Act of 1966 (NHPA) Kamehameha Highway Drainage Improvements: Vicinity of Kahuku Hospital and Replacement of Kii Bridge, Project No. 83C-01-01, Koolauloa District, Kahuku, Island of Oahu

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Very truly yours,

GLENN M. YASUI
Administrator
Highways Division

Attachments

BENJAMIN J. CAYETANO
GOVERNOR

BRIAN K. MINAAI
DIRECTOR

DEPUTY DIRECTORS
GLENN M. OKIMOTO
JADINE Y. URASAKI

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

IN REPLY REFER TO:

HWY-DS 2.3984

August 24, 2001

Mr. Kunani Nihipali
Hui Malama I Na Kupuna O Hawaii Nei
P. O. Box 190
Haleiwa, Hawaii 96712

Dear Mr. Nihipali

Subject: Section 106 Notification, National Historic Preservation Act of 1966 (NHPA) Kamehameha Highway Drainage Improvements: Vicinity of Kahuku Hospital and Replacement of Kii Bridge, Project No. 83C-01-01, Koolauloa District, Kahuku, Island of Oahu

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Very truly yours,

GLENN M. YASUI
Administrator
Highways Division

Attachments

BENJAMIN J. CAYETANO
GOVERNOR

BRIAN K. MINAAI
DIRECTOR

DEPUTY DIRECTORS
GLENN M. OKIMOTO
JADINE Y. URASAKI

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

IN REPLY REFER TO:

HWY-DS 2.3984

August 24, 2001

Mr. David Scott, Director
Historic Hawaii Foundation
P. O. Box 1658
Honolulu, Hawaii 96806

Dear Mr. Scott:

Subject: Section 106 Notification, National Historic Preservation Act of 1966 (NHPA) Kamehameha Highway Drainage Improvements: Vicinity of Kahuku Hospital and Replacement of Kii Bridge, Project No. 83C-01-01, Koolauloa District, Kahuku, Island of Oahu

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Very truly yours,

GLENN M. YASUI
Administrator
Highways Division

Attachments

BENJAMIN J. CAYETANO
GOVERNOR

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

BRIAN K. MINAAI
DIRECTOR

DEPUTY DIRECTORS
GLENN M. OKIMOTO
JADINE Y. URASAKI

IN REPLY REFER TO:

HWY-DS 2.4282

September 24, 2001

WES		KTS	
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Ms. Cathleen Piilani Mattoon
Koolauloa Hawaiian Civic Club
P.O. Box 532
Hauula, Hawaii 96717

Dear Ms. Mattoon:

Subject: Section 106 Notification, National Historic Preservation Act of 1966 (NHPA), Kamehameha Highway Drainage Improvements: Vicinity of Kahuku Hospital and Replacement of Kii Bridge, Project No. 83C-02-01, Koolauloa District, Kahuku, Island of Oahu

The State Department of Transportation, Highways Division (SDOT), proposes to construct a new culvert structure and a replacement bridge at two locations along Kamehameha Highway in Kahuku, Oahu. The purpose of the project is to alleviate overtopping of Kamehameha Highway at an area known as Hospital Ditch, immediately fronting the Kahuku Hospital, and at Kii Bridge. The new culvert structure will be constructed at Hospital Ditch and a replacement bridge with drainage improvements will be constructed at Kii Bridge. The new culvert structure proposed for Hospital Ditch will also help to reduce the incidence of ponding.

In conjunction with use of federal funds the proposed project is subject to Section 106 NHPA regulations safeguarding against potential effects on historic properties and resources. Project impacts to historic and archaeological resources have been assessed and mitigation measures developed in the project Environmental Assessment. A Finding of No Significant Impact (FONSI) is anticipated for the proposed activity.

The project Archaeological Inventory Survey Report for Hospital Ditch and Kii Bridge in the Ahupuaa of Kahuku, District of Koolauloa, Island of Hawaii, by Cultural Surveys Hawaii, dated May 2001, is provided for reference. Summarized below is an inventory of archaeological and historic resources in the Kahuku Ahupuaa, with a description of mitigation measures proposed to prevent adverse project impacts.

KAHUKU AHUPUAA: HISTORICAL AND CULTURAL DOCUMENTATION

Few prehistoric, and several historic and traditional use sites have been recorded in the vicinity of the project area. Site types include shelter complexes, agricultural terrace/ditch complexes, habitation sites, World War II historic sites, and burials.

The project area has also been part of historic-era transportation corridors since the introduction of commercial sugar cane cultivation in the late 1800s. Historic maps depict the predecessor of Kamehameha Highway at essentially the same location as at present. Kamehameha Highway's Kahuku section was built to 'modern' standards in the mid-to late 1930s. Adjacent to the highway, on the makai side where the proposed bypass roads are located, was the Kahuku Plantation railroad alignment. The plantation rail line lasted from the 1890s to the 1950s.

Kii Bridge was built in 1937 as part of Kamehameha Highway improvements. Kii Bridge is of more modern construction related to improvements near Kahuku Hospital, Pualea Street, and Kamehameha Highway. Kii Bridge, while built in 1937, is not on the Historical Bridges listing (State of Hawaii, Draft Historic Bridge Inventory and Evaluation, May 1996), and does not meet the criteria for historical significance outlined in guidance provided by the State Historic Preservation Division ("How to Apply the National Register Criteria for Evaluation"). The bridge retains reasonable physical integrity, but is not associated with events or persons of historical significance; does not embody the distinctive characteristics of a type, period, or method of construction, does not represent the work of a master, or possess high artistic value; and is not likely to yield information important to history. The bridge does not have traditional cultural significance for an ethnic group. As a result, demolition of the bridge will have no effect on historic properties.

While prehistoric, historic, and traditional sites are known to occur in the vicinity of the proposed bridge replacement and ditch improvement areas, no sites have been identified within the Area of Potential Effect (APE), which includes both of the proposed alignments for the bypass roads. Because the APE is small and previously disturbed, because none of the recorded sites are in close proximity to the APE, and because there is substantial existing archaeological documentation of the Kahuku town area, no additional archaeological survey appears warranted.

CUMULATIVE IMPACTS

No other projects (federal, state, county, or community) were identified in the vicinity of the Hospital Ditch and Kii Bridge project. Therefore, when reviewed against past, present, and reasonably foreseeable future actions, no cumulative effects on cultural resources are expected.

MITIGATION MEASURES

Although no effects on historic properties are expected from the proposed project, the presence of cultural resource sites in the vicinity of the APE indicate that there is some potential for subsurface cultural materials to be encountered during the course of construction. If cultural materials, particularly human remains, are discovered during ground disturbing activities, work in the area will be stopped immediately and the SHPD/DLNR will be notified of the discovery. Burial finds will be treated in accordance with Chapter 6E-43.6, Hawaii Revised Statutes (HRS), and Chapter 12-300, Hawaii Administrative Rules. SHPD/DLNR will determine the appropriate treatment of the remains and any associated cultural material in consultation with recognized descendants and the Oahu Island Burial Council.

Based on the documentation and mitigation measures contained in the Environmental Assessment, it is our determination that this project will have no adverse impacts on archaeological or historic resources. In accordance with Section 106, NHPA, we request your review of our findings. We will assume your concurrence if we receive no objections from your office within 30 days upon receipt of this letter.

Should you have any questions, please do not hesitate to contact Mr. Scot Urada at 692-7553, Project Manager, Technical Design Services Office, Design Branch, Highways Division.

Very truly yours,

GLENN M. YASUI
Administrator
Highways Division

Attachments
c: R.M. Towill Corporation, Mr. Brian Takeda
bc: Mr. Scot Urada, HWY-DS SU:at

BENJAMIN J. CAYETANO
GOVERNOR

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

BRIAN K. MINAAI
DIRECTOR

DEPUTY DIRECTORS
GLENN M. OKIMOTO
JADINE Y. URASAKI

IN REPLY REFER TO:

HWY-DS 2.4210

September 17, 2001

Lanihuli Hawaiian Civic Club
P.O. Box 305
Laie, Hawaii 96762

Dear Sir/Madam:

Subject: Section 106 Notification, National Historic Preservation Act of 1966 (NHPA), Kamehameha Highway Drainage Improvements: Vicinity of Kahuku Hospital and Replacement of Kii Bridge, Project No. 83C-02-01, Koolauloa District, Kahuku, Island of Oahu

The State Department of Transportation, Highways Division (SDOT), proposes to construct a new culvert structure and a replacement bridge at two locations along Kamehameha Highway in Kahuku, Oahu. The purpose of the project is to alleviate overtopping of Kamehameha Highway at an area known as Hospital Ditch, immediately fronting the Kahuku Hospital, and at Kii Bridge. The new culvert structure will be constructed at Hospital Ditch and a replacement bridge with drainage improvements will be constructed at Kii Bridge. The new culvert structure proposed for Hospital Ditch will also help to reduce the incidence of ponding.

In conjunction with use of federal funds the proposed project is subject to Section 106 NHPA regulations safeguarding against potential effects on historic properties and resources. Project impacts to historic and archaeological resources have been assessed and mitigation measures developed in the project Environmental Assessment. A Finding of No Significant Impact (FONSI) is anticipated for the proposed activity.

The project Archaeological Inventory Survey Report for Hospital Ditch and Kii Bridge in the Ahupuaa of Kahuku, District of Koolauloa, Island of Hawaii, by Cultural Surveys Hawaii, dated May 2001, is provided for reference. Summarized below is an inventory of archaeological and historic resources in the Kahuku Ahupuaa, with a description of mitigation measures proposed to prevent adverse project impacts.

KAHUKU AHUPUAA: HISTORICAL AND CULTURAL DOCUMENTATION

Few prehistoric, and several historic and traditional use sites have been recorded in the vicinity of the project area. Site types include shelter complexes, agricultural terrace/ditch complexes, habitation sites, World War II historic sites, and burials.

The project area has also been part of historic-era transportation corridors since the introduction of commercial sugar cane cultivation in the late 1800s. Historic maps depict the predecessor of Kamehameha Highway at essentially the same location as at present. Kamehameha Highway's Kahuku section was built to 'modern' standards in the mid-to-late 1930s. Adjacent to the highway, on the makai side where the proposed bypass roads are located, was the Kahuku Plantation railroad alignment. The plantation rail line lasted from the 1890s to the 1950s.

Kii Bridge was built in 1937 as part of Kamehameha Highway improvements. Hospital Bridge is of more modern construction related to improvements near Kahuku Hospital, Pualea Street, and Kamehameha Highway. Kii Bridge, while built in 1937, is not on the Historical Bridges listing (State of Hawaii, Draft Historic Bridge Inventory and Evaluation, May 1996), and does not meet the criteria for historical significance outlined in guidance provided by the State of Hawaii Preservation Division (SHPD) ("How to Apply the National Register Criteria for Evaluation"). The bridge retains reasonable physical integrity, but is not associated with events or persons of historical significance; does not embody the distinctive characteristics of a type, period, or method of construction, does not represent the work of a master, or possess high artistic value; and is not likely to yield information important to history. The bridge does not have traditional cultural significance for an ethnic group. As a result, demolition of the bridge will have no effect on historic properties.

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CUMULATIVE IMPACTS

No other projects (federal, state, county, or community) were identified in the vicinity of the Hospital Ditch and Kii Bridge project. Therefore, when reviewed against past, present, and reasonably foreseeable future actions, no cumulative effects on cultural resources are expected.

MITIGATION MEASURES

Although no effects on historic properties are expected from the proposed project, the presence of cultural resource sites in the vicinity of the APE indicate that there is some potential for subsurface cultural materials to be encountered during the course of construction. If cultural materials, particularly human remains, are discovered during ground disturbing activities, work in the area will be stopped immediately and the SHPD/DLNR will be notified of the discovery. Burial finds will be treated in accordance with Chapter 6E-43.6, Hawaii Revised Statutes (HRS), and Chapter 12-300, Hawaii Administrative Rules. SHPD/DLNR will determine the appropriate treatment of the remains and any associated cultural material in consultation with recognized descendants and the Oahu Island Burial Council.

Based on the documentation and mitigation measures contained in the Environmental Assessment, it is our determination that this project will have no adverse impacts on archaeological or historic resources. In accordance with Section 106, NHPA, we request your review of our findings. We will assume your concurrence if we receive no objections from your office within 30 days upon receipt of this letter.

Should you have any questions, please do not hesitate to contact Mr. Scot Urada at 692-7553, Technical Design Services Office, Design Branch, Highways Division.

Very truly yours,

GLENN M. YASUI
Administrator
Highways Division

Attachments
c: R.M. Towill Corporation, Mr. Brian Takeda ✓

BENJAMIN J. CAYETANO
GOVERNOR

BRIAN K. MINAAI
DIRECTOR

DEPUTY DIRECTORS
GLENN M. OKIMOTO
JADINE Y. URASAKI

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

IN REPLY REFER TO:

HWY-DS 2.4234

September 17, 2001

WES		KTS	
R-F		NM	
RTT		BRT	
REC'D SEP 2			RMTC

Mr. Clyde Conner, President
Kahuku Farmers Association
P.O. Box 748
Kahuku, Hawaii 96731

Dear Mr. Conner:

Subject: Section 106 Notification, National Historic Preservation Act of 1966 (NHPA), Kamehameha Highway Drainage Improvements: Vicinity of Kahuku Hospital and Replacement of Kii Bridge, Project No. 83C-02-01, Koolauloa District, Kahuku, Island of Oahu

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Based on the documentation and mitigation measures contained in the Environmental Assessment, it is our determination that this project will have no adverse impacts on archaeological or historic resources. In accordance with Section 106, NHPA, we request your review of our findings. We will assume your concurrence if we receive no objections from your office within 30 days upon receipt of this letter.

Should you have any questions, please do not hesitate to contact Mr. Scot Urada, Technical Design Services Office, Design Branch, Highways Division at (808) 692-7553.

Very truly yours,

GLENN M. YASUI
Administrator
Highways Division

Attachments

c: R.M. Towill Corporation, Mr. Brian Takeda

APPENDIX G

Record of Public Agency and Community Coordination

HWY-DH 2.0620

SEE ATTACHED LIST

Subject: Pre-Environmental Assessment Consultation for the Kamehameha Highway Drainage Improvements, Vicinity of Kahuku Hospital, Kahuku, Oahu

The Department of Transportation, Highways Division will begin preparing a Draft-Environmental Assessment for the subject project tentatively in January of 2001. We would appreciate any concerns or recommendations you may have regarding the project. Attached is a Draft-Project Assessment Report for your review.

For your information, the environmental review for the project must be completed by August of 2001. We therefore request that you respond to us by November 20, 2000.

If you have any questions or require more information, please contact Curtis Matsuda at 692-7563, Hydraulic Design Section, Design Branch, Highways Division. You may send your comments by facsimile transmission at 692-7617. If submitting a written reply, please reference HWY-DH 2.0620 as shown above.

Sincerely,

KAZU HAYASHIDA
Director of Transportation

Enclosure

CM:et

bc: HWY-DH (C. Matsuda)
HWY-DS (S. Urada)

List of Agencies and Organizations contacted by phone scheduled meeting:

Office of Environmental Quality Control
Contact: Jeyan Thirugnanam Date of Contact: 10/25/00 (meeting)

Estate of James Campbell
Contact: Bert Hatton and Keola Lloyd Date of Contact: 10/30/00 (meeting)

Pacific Island Fisheries
Contact: John Naughton Date of Contact: 10/30/00 (phone)

Department of Land and Natural Resources, Land Division
Contact: David Higa Date of Contact: 10/30/00 (meeting)

Office of Planning, DBEDT
Contact: Deborah Tom Date of Contact: 10/30/00 (meeting)

Department of Army, S. Army Engineer District, Honolulu Regulatory Branch
Contact: Lolly Silva Date of Contact: 11/1/00 (phone)

Department of Land and Natural Resources, State Historic Preservation Division
Contact: Sara Collins, Elaine Jourdane Date of Contact: 11/3/00 (meeting)
Tonia Moy

U.S. Department of the Interior, Fish and Wildlife Service
Contact: Donna Stovall Date of Contact: 11/13/00 (meeting)

Department of Health, Clean Water Branch
Contact: Ed Chen Date of Contact: 11/13/00 (meeting)

Department of Planning and Permitting
Contact: Dana Teramoto Date of Contact: 11/14/00 (phone)

MEMO FOR THE RECORD

DATE: October 25, 2000

PROJECT: Kamehameha Highway Drainage Improvements, Vicinity of Kahuku Hospital

Spoke w/ Jeyan Thirugnanam (Ph. 586-4185) at OEQC regarding the project. The following are his comments:

1. Describe the impact downstream of improvements.
2. The environmental issues for the project will be very similar to that of the replacement of the Malaekahana Stream Bridge project.

Curtis Matsuda
Hydraulic Design Section
Highways Division

MEMO FOR THE RECORD

DATE: October 27, 2000

PROJECT: Kamehameha Highway Drainage Improvements, Vicinity of Kahuku Hospital

---

The pre-consultation was referred to the Pacific Island Fisheries.

Contact Persons at the Pacific Island Fisheries:

Charles Karnella	973-2935	ext 206
John Naughton	same	ext 211
Margaret Dupree	same	ext 210

Curtis Matsuda
Hydraulic Design Section
Highways Division

KAHUKU DRAINAGE IMPROVEMENTS
Meeting Notes, 2:00 PM at James Campbell building 10/30/00

Attendees: HDOT: Curtis Matsuda, Scot Urada
Campbell Estate: Bert Hatton, Keola Lloyd

1. Curtis informed Campbell Estate that the replacement of Kii bridge will be included in this project.

2. In response to Bert's question, Scot said that permanent land acquisitions might be required. Curtis said that we will need to construct temporary detour roads, one around the new culvert area and another near Kii bridge where the existing cane haul bridge is currently situated. HDOT has not laid out the geometrics of the detour road, however at this time, Scot thinks that there is sufficient room where the banana crops will not be affected.

3. Curtis said that the existing 5'x8' culvert will be replaced by seven new culverts. The size of the new culverts will be 6' x 10'.

4. The new bridge span will be 80 ft long. Curtis informed Campbell Estate that the bridge will be lengthened to approximately 40 ft from the center in each direction. Scot said that the width will increase since shoulder areas and bike lanes will be added. In response to Keola's question, Scot said that the bike lanes are part of the overall State Transportation Plan where bike facilities are contained in the plan.

Scot said that since the new bridge will be longer, the stream will be regraded with wider stream banks that will need to be tied in to the current stream bank both upstream and downstream of Kii bridge. Since the abutments for the existing cane haul bridge will probably fall into the grading/excavation areas, Scot asked if Campbell Estate will require HDOT to replace the cane haul bridge?

Bert and Keola felt that the cane haul bridge is more of a liability now and will not require HDOT to replace it when it is removed.

5. In response to Scot's inquiry, Keola said that the banana farm near the hospital area is run by the Watanabe's. Keola will provide HDOT with a contact and phone number after the Watanabe's are contacted by Campbell Estate. The prawn farm is run by Romy Aguinaldo (293-0778). Campbell Estate was aware that HDOT spoke with Clyde Fukuyama earlier. Scot informed Campbell Estate that Clyde's main concerns were to keep the security fence intact and to maintain the 6" irrigation line that runs under Kamehameha Highway.

6. In response to Campbell Estate's inquiry, Scot explained that for this project, the federal funds needs to be obligated by September 2001. This project will be a modified design-build type. From that point, it may take 5 months to get a contractor-designer team "on-board", and probably 9 months for the contractor's designer to design the project based on design parameters given by the State. The design-construction contract will most likely have a total duration of 18 to 24 months.

   Scot said that HDOT will lay out the geometrics for the detour road and improvements and construction parcels and permanent acquisition areas will be based on the layouts. The contractor will be given HDOT's design parameters and construction parcel areas and the contractor would have to design the project with the given information.

   Curtis said that the bridge and culvert will be designed for a 100-year storm while the method of calculation for the hydrology might be different.

7. Scot told Keola and Bert that right-of-way maps showing the construction parcels and acquisitions will probably be completed in December. Bruce Shimokawa of the HDOT will be working with Keola on the land issues. Campbell Estate's request is to minimize any land taking and construction parcel areas to minimize impacts to the tenants.

8. In response to Keola's question, Scot said that 1-1/2 months for the right-of-entry request for surveying work should be sufficient. Keola will try to process the right-of-entry in the next few days.

9. Bert and Keola mentioned that there is an existing spring on the Kahuku side of the stream gauge near the culvert area (near the driveway to the medical offices). The Watanabe's might be using this springs as a water source for irrigation. Scot said that HDOT will try to lay out the detour road so that this is not affected.

MEMO FOR THE RECORD

DATE: October 30, 2000

PROJECT: Kamehameha Highway Drainage Improvements, Vicinity of Kahuku Hospital

---

Spoke w/ John Naughton (Ph. 973-2935 ext 211) of Pacific Island Fisheries regarding the project. The following are his comments:

They do not get involved with highway-type projects especially improvements in intermittent streams. However, their office will be contacted by the COE (Lolly Silva) as part of the Section 404 review process.

John Naughton mentiioned that as long as there are BMPs in-place during construction, there will be no comments from their agency.

Curtis Matsuda
Hydraulic Design Section
Highways Division

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION

MEMORANDUM

TO: FILE DATE: October 30, 2000
FROM: HWY-DH, Randy Kawamura
PROJECT: Kahuku Hospital Drainage Improvements

Met w/ Mr. David Higa (DLNR) 9:30 a.m.

- SCAP process takes about 90 days, includes Water Commission meeting.

- Will these improvements increase the flow velocities?

- How will the Fish & Wildlife be affected?

- David asked if we did a model run to calculate the amount of flow, the velocities and the capacity at the two locations.

- Is the landowner in agreement with the project? Will they sign the application? If not, they can argue in front of the water commission against the project. If the landowner is against the project, the State could condemn the land and sign the application.

- The federal government has something called ``Wetland Taking'' where if you need to acquire wetlands, you can subsidize the Fish & Wildlife in other ways to compensate for taking wetlands.

- SCAP is dependent on securing a SMA permit.

- We asked Mr. Sam Lemmo of the Division of Land if the project will be in a Conservation District. He mentioned that it was not. CDUA Permit not needed.

- The contact person at the City Department of Planning and Permitting is Mr. Steve Tagawa.

- Agencies which David mentioned we need to contact are: Fish & Wildlife, Corps of Engineers, Campbell Estates.

- David also said that Campbell wants to sue the FWLS for the flooding in the area.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION

MEMORANDUM

TO: FILE DATE: October 30, 2000
FROM: HWY-DH, Randy Kawamura
PROJECT: Kahuku Hospital Drainage Improvements

Met w/ Mr. Deborah Tom (DBEDT) 10:30 a.m.

- Asked if we met with the Corps and DOH (WQC)
  - o Corps sets precedence on how DBEDT will review projects. Depending on whether there are federal funds involved, federal activities (permits), and shoreline activities.
- DBEDT, Office of Planning oversees the CZM and SMA permits. But, they have delegated the responsibility to the counties to administer the SMA permit process.
- The areas of concern for the DBEDT are: Recreation, Ecosystem, View Plane and Public Participation.
- They ask that we call one week before the assessment comes to their office.
- Their comment period takes about two weeks.

MEMO FOR THE RECORD

DATE: November 1, 2000

PROJECT: Kamehameha Highway Drainage Improvements, Vicinity of Kahuku Hospital

---

Spoke w/ Lolly Silva (Ph. 438-7023) at Army Corps of Engineer - Fort Shafter regarding the project. The following are her comments:

1. The area, especially at the Hospital Ditch may be considered wetlands. A determination should be made.
2. An Army Corps of Engineers (404) and a Water Quality Certification Permit (401) will be required for the project.

Curtis Matsuda
Hydraulic Design Section
Highways Division

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION

MEMORANDUM

TO: FILE DATE: November 3, 2000
FROM: HWY-DH, Randy Kawamura
PROJECT: Kahuku Hospital Drainage Improvements

Met w/ Ms. Sara Collins, Ms. Elaine Jourdane, Ms. Tonia Moy

1:00 p.m.

- No archeological problems, however when Campbell Estates develops downstream to address the flooding concerns, work being done in sandy/alluvial areas will likely be in archeologically sensitive areas. Anywhere there is sand is a sign that there may be burials in the area.

- Kii Bridge is not on the Historical Bridges listing. Therefore, there is no adverse effects in that respect. Ms. Tonia Moy mentioned that we should check with FHWA to follow up with Section 106 compliance. Usually, Historical Preservation Office will wait for a letter from FHWA and respond with their findings. She will also request that for their archives they would like black and white negatives of the bridge before it is replaced.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION

MEMORANDUM

TO: FILE **DATE:** November 13, 2000
FROM: HWY-DH, Randy Kawamura
PROJECT: Kahuku Hospital Drainage Improvements

Met w/ Ms. Donna Stovall 1:00 p.m.

- Donna's main concern was whether the side road near the Kii Bridge could be moved to the other side of the stream. Donna mentioned that Richelle Suzuki (FHWA) said the road could be moved to the other side. Currently, the stream flows down towards the sewer treatment plant and refuge and wraps around the Haleiwa-side of the refuge. Donna wants to see the water flow in the Kahuku-side of the refuge as it heads toward the Kii Outlet. They would like to see the main flow on the Kahuku-side of the refuge and the secondary flow on the Haleiwa-side of the refuge.

- If we increase the opening at the highway, will there be an increase of flow downstream affecting the refuge area?

- During construction, how will the access to the treatment plant be affected by the detour road?

- Aerial photos can be obtained at Air Survey Hawaii on Lagoon Drive. The maps that they had were no. 1533 5-4 & 5-5, taken on 9/14/95.

MEMO FOR THE RECORD

DATE: November 13, 2000

PROJECT: Kamehameha Highway Drainage Improvements, Vicinity of Kahuku Hospital

Spoke w/ Ed Chen (Ph. 586-4309) at DOH-CWB regarding the project. The following are his comments:

The draft PAR submitted is to schematic to comment in detail however, the project will require a Water Quality Certification, NPDES Permit(s) for Construction Activities, Dewatering, and/or Hydrotesting.

Keep in mind that in March of 2003, an NPDES permit for construction activities will be required for all project of one acre or more.

Curtis Matsuda
Hydraulic Design Section
Highways Division

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION

PHONE MEMO

TO: FILE DATE: November 14, 2000
FROM: HWY-DH, Randy Kawamura
PROJECT: Kahuku Hospital Drainage Improvements

Spoke w/ Ms. Dana Teramoto (523-4648) 8:00 a.m.

- Areas to the Kahuku-side of Pualalea Road are outside of the Special Management Area (SMA). Areas to the Haleiwa-side of Pualalea Road falls inside the SMA area.

- Because of the size and the cost of the project, we will probably need a major SMA, similar to the Malaekahana project.

- Eileen Mark (527-5374) is now taking care of the SMA permits because of a recent reorganization.

- The SMA will not be reviewed until a FONSI is issued on the EA.