Malaekahana Stream Bridge Replacement

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SUBJECT: FINAL ENVIRONMENTAL ASSESSMENT (EA) FOR KAMEHAMEHA HIGHWAY, REPLACEMENT OF MALAEKAHANA BRIDGE, VICINITY OF KAHUKU, OAHU, FEDERAL-AID PROJECT NO. BR-083-1(27)

- FONSI (see title) document

Please review and publish in the *Environmental Notice* the enclosed Final Environmental Assessment (FEA) for the Malaekahana Stream Bridge Replacement Project. The FEA is prepared pursuant to Chapter 343, HRS, and the Title 11-200, HAR, implementing regulations for the environmental assessment process.

If there are any questions regarding the proposed project or the FEA, please call Mr. Jeffrey Fujimoto at 587-2249.

1997-12-23-OA-FEA-MalaeKahana Stream Bridge Replacement

MALAEKAHANA STREAM BRIDGE REPLACEMENT
KAMEHAMEHA HIGHWAY
KAHUKU, KOOLAULOA, OAHU
FEDERAL-AID PROJECT No. BR-083-11(27)

FINAL ENVIRONMENTAL ASSESSMENT (FEA)
and
FINDING OF NO SIGNIFICANT IMPACT (FONSI)

Submitted pursuant to Chapter 343, Hawaii Revised Statutes (HRS)

By

State of Hawaii
Department of Transportation
Highways Division

Prepared by:

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November 1997

EXECUTIVE SUMMARY

INTRODUCTION

The State Department of Transportation, Highways Division (State DOT) in cooperation with the Federal Highway Administration (FHA) proposes to replace the existing bridge over the Malaekahana Stream in Kahuku, District of Koolauloa, Oahu. The proposed project includes the development of a temporary detour road and bridge to accommodate traffic during the development of the replacement bridge.

This final environmental assessment (FEA) was prepared for the proposed action pursuant to Chapter 343, Hawaii Revised Statutes (HRS), and the State Department of Health Title 11-200 implementing rules for the environmental assessment process. The proposed action "triggers" Chapter 343-5(1), HRS, because of the use of state funds in the development of the replacement bridge. This FEA also is being submitted to the City and County of Honolulu pursuant to Chapter 205A, HRS, and Chapter 25, Revised Ordinances of Honolulu, for the Special Management Area Permit (SMAP).

Although the proposed project involves the use of federal funds, it received a "Categorical Exclusion" from the National Environmental Policy Act (NEPA) by the Federal Highway Administration (FHA). The proposed replacement of the bridge is considered "exempt" under Federal Highway Administration implementing regulations for NEPA (23 CFR 771.117).

ALTERNATIVES CONSIDERED

A replacement bridge design and the "no-action" alternative were considered in the development of the proposed project. The proposed project and bridge design is based on various flood control alternatives developed by R.M. Towill (1985, 1985a, 1985b) for the James Campbell Estate that were included in the Kahuku Master Flood Control Plan of 1993. The alternatives for the replacement bridge include the:

1. 105-foot Bridge with No Center Pier
2. No-Action

In addition to the design for the replacement bridge, makai and mauka alternative alignments for the proposed detour road and bridge were considered for the proposed project. The 105-foot Bridge and a mauka alignment of the detour road and bridge were chosen as the preferred alternative.

ANTICIPATED IMPACTS

It is anticipated that impacts from the proposed project will be short-term and related to construction activities. A small wetland patch (less than 100 square feet) in the mauka portion of the project area will be temporarily affected by the development of the detour road and bridge. Other short-term impacts will occur from the development of the detour road and alterations to traffic flow. Project area vegetation and stream topography will be temporarily affected and short-term visual, noise, and

air quality effects may occur. There are, however, no anticipated significant long-term or cumulative impacts associated with the proposed project.

APPLICABLE ENVIRONMENTAL PERMITS

- U.S. Army Corps of Engineers Section 404 Permit
- Section 401 Water Quality Certification
- Coastal Zone Management Program Consistency Determination
- State Stream Channel Alteration Permit
- State Historic Preservation Clearance
- City and County of Honolulu Special Management Area Permit

DETERMINATION

The proposed action was reviewed and analyzed pursuant to the "Significance Criteria" established in the State Department of Health's 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.

NOTICE OF DETERMINATION

FINDING OF NO SIGNIFICANT IMPACT (FONSI)
for the
MALAEKAHANA STREAM BRIDGE REPLACEMENT
KAMEHAMEHA HIGHWAY
KAHUKU, KOOLAULOA, OAHU
FEDERAL-AID PROJECT No. BR-083-1(27)

A. Proposing Agency

Highways Division, Department of Transportation, State of Hawaii

B. Accepting Authority

Department of Transportation, State of Hawaii

C. Description of the Proposed Action

The State of Hawaii Department of Transportation (State DOT), in cooperation with the Federal Highway Administration, proposes to replace the existing bridge over the Malaekahana Stream on Kamehameha Highway in the Koolauloa District of the City and County of Honolulu. The proposed project is located on the southern edge of Kahuku Village, approximately one mile north of Malaekahana State Recreation Area. The proposed project includes construction of a new 105-foot clear single-span bridge in the same location as the existing bridge, and the development of a detour bridge and road to accommodate traffic through the duration of the project.

D. Determination

The proposed action was reviewed and analyzed pursuant to the "Significance Criteria" established in the State Department of Health's 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 the analysis in the final environmental assessment (FEA) the following conclusions were made:

1. There would be no irrevocable commitment to loss or destruction of any natural or cultural resource;
2. The proposed action would not curtail the range of beneficial uses of the environment;
3. The proposed action does not conflict with the state's long-term environmental policies or goals and guidelines as expressed in Chapter 344, HRS, and any revisions thereof and amendments thereto, court decisions, or executive orders;
4. The economic and social welfare of the community or State will not be substantially affected by the proposed action;
5. The proposed action would not substantially affect public health;

6. The proposed action does not involve substantial secondary impacts, such as population changes or effects on public facilities;
7. It is anticipated that no substantial degradation of environmental quality will occur as a result of the proposed action;
8. The proposed action does not involve a commitment to larger actions, nor would it contribute to a considerable cumulative impact upon the environment;
9. No rare, threatened, or endangered species, or habitat would be substantially affected by the proposed action.
10. Air and water quality and ambient noise levels will not be detrimentally affected by the proposed action;
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;
12. Scenic vistas and viewplanes identified in county and state plans and studies will not be substantially affected by the proposed action; and,
13. The proposed action does not require substantial energy consumption.

E. Reasons Supporting the Determination

The FEA for the proposed action, prepared pursuant to Chapter 343, HRS, and the State Department of Health Title 11-200 administrative rules, is attached to support the Finding of No Significant Impact (FONSI).

F. Name, Address, and Telephone Number of Contact Person

Mr. Jeffrey Fujimoto, P.E.
Highways Division
Department of Transportation
State of Hawaii
869 Punchbowl Street
Honolulu, Hawaii 96813-5097
587-2249

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CHAPTER 1
INTRODUCTION

1.0 INTRODUCTION

The State Department of Transportation, Highways Division (State DOT) in cooperation with the Federal Highway Administration (FHA) proposes to replace the existing bridge over the Malaekahana Stream in Kahuku, District of Koolauloa, Oahu. The proposed project includes the development of a temporary detour road and bridge to accommodate traffic during the development of the replacement bridge.

This draft environmental assessment (DEA) was prepared for the proposed action pursuant to Chapter 343, Hawaii Revised Statutes (HRS), and the State Department of Health Title 11-200 implementing rules for the environmental assessment process. The proposed action "triggers" Chapter 343-5(1), HRS, because of the use of state funds in the development of the replacement bridge. This DEA also is being submitted to the City and County of Honolulu pursuant to Chapter 205A, HRS, and Chapter 25, Revised Ordinances of Honolulu, for the Special Management Area Permit.

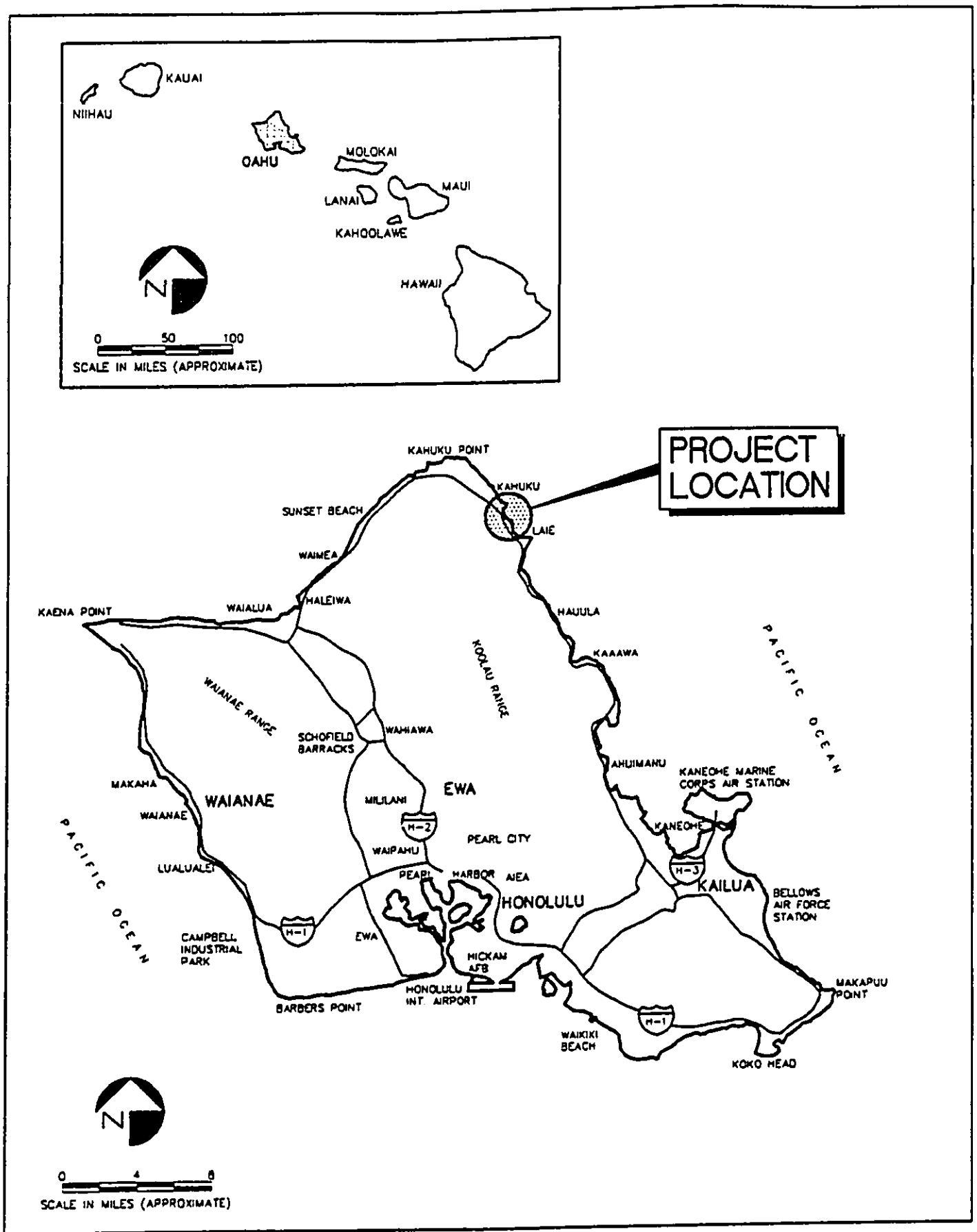
The proposed action received a "Categorical Exclusion" from the National Environmental Policy Act (NEPA) by the Federal Highway Administration (FHA). The proposed replacement of the bridge is considered "exempt" under Federal Highway Administration implementing regulations for NEPA (23 CFR 771.117).

1.1 PROJECT LOCATION

Malaekahana Stream Bridge is located on Kamehameha Highway in the Ahupua`a of Malaekahana, District of Koolauloa, Oahu (**Figure 1.1**). Kamehameha Highway (Route 83) is the main coastal thoroughfare on the island of Oahu. The proposed project site is located on the southeastern edge of Kahuku Village, one-half mile southwest of Makahoa Point, and approximately one mile north of the Malaekahana State Recreation Area (**Figure 1.2**). The proposed construction area or Area of Potential Effect (APE) includes approximately 3 acres of land on the mauka and makai sides of the bridge (**Figure 1.3**).

Kahuku Village, directly adjacent to the north, and Laie, located approximately 2 miles to the south, are the closest population centers to the APE. The Church of the Holy Cross is adjacent on the Laie side of the proposed construction area. The city of Honolulu is approximately 35 miles away on the southcentral portion of the island.

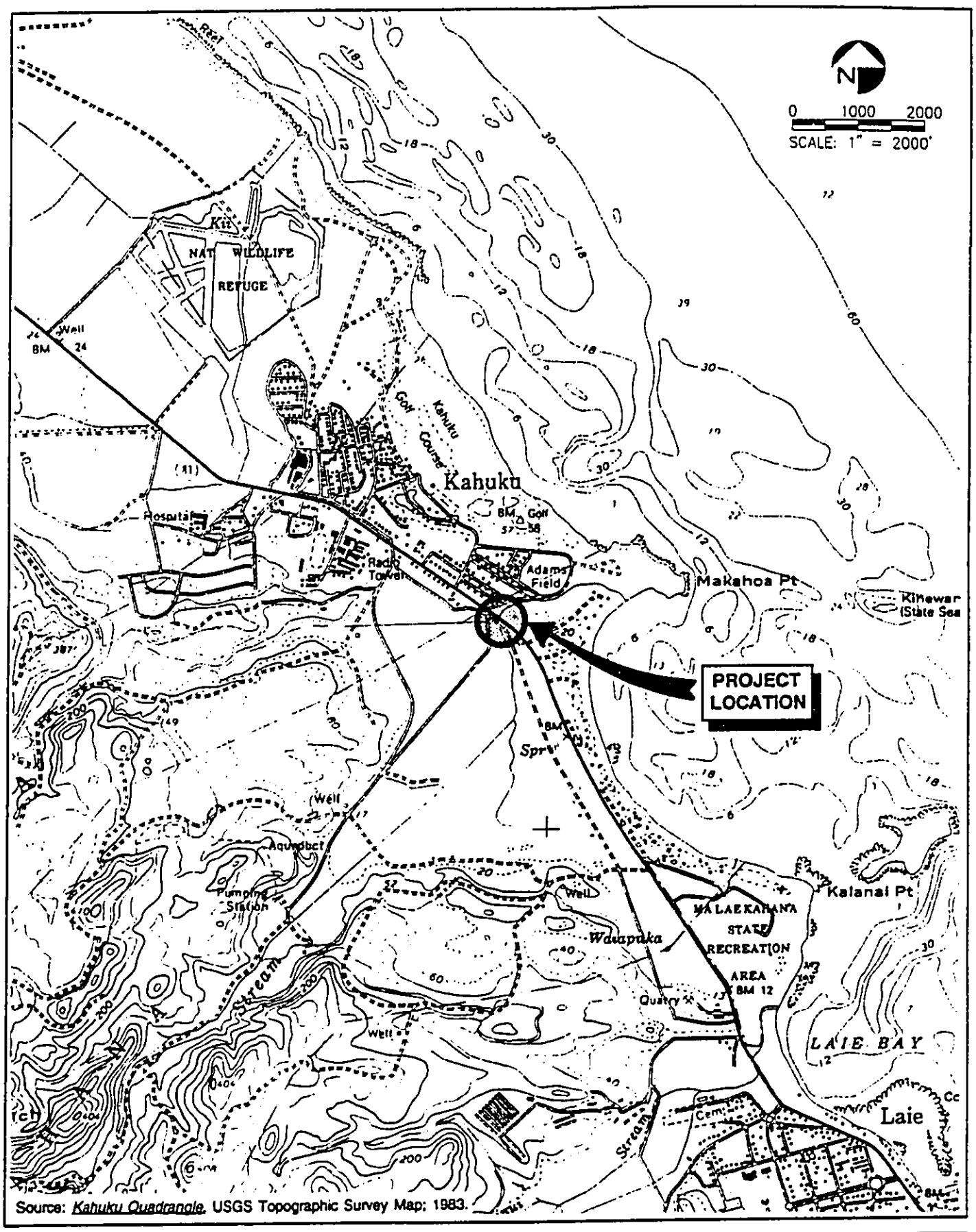
Malaekahana Stream flows in a northeasterly direction from an elevation of approximately 1,500 feet in the Koolau Mountains to the coast approximately one-eighth of a mile southwest of Makahoa Point. An irrigation ditch ties to the Malaekahana Stream from the north, approximately 70 feet mauka of the existing bridge. An unused cane haul road also crosses the stream 30 feet mauka of the existing bridge. A 24" culvert and concrete jacket serve as the wet-crossing for the stream. A 36" pipe culvert also is located in the stream approximately 70 feet mauka of the bridge.



EARTH TECH

Malaekahana Stream Bridge Replacement
Environmental Assessment
Location Map

FIGURE
1.1

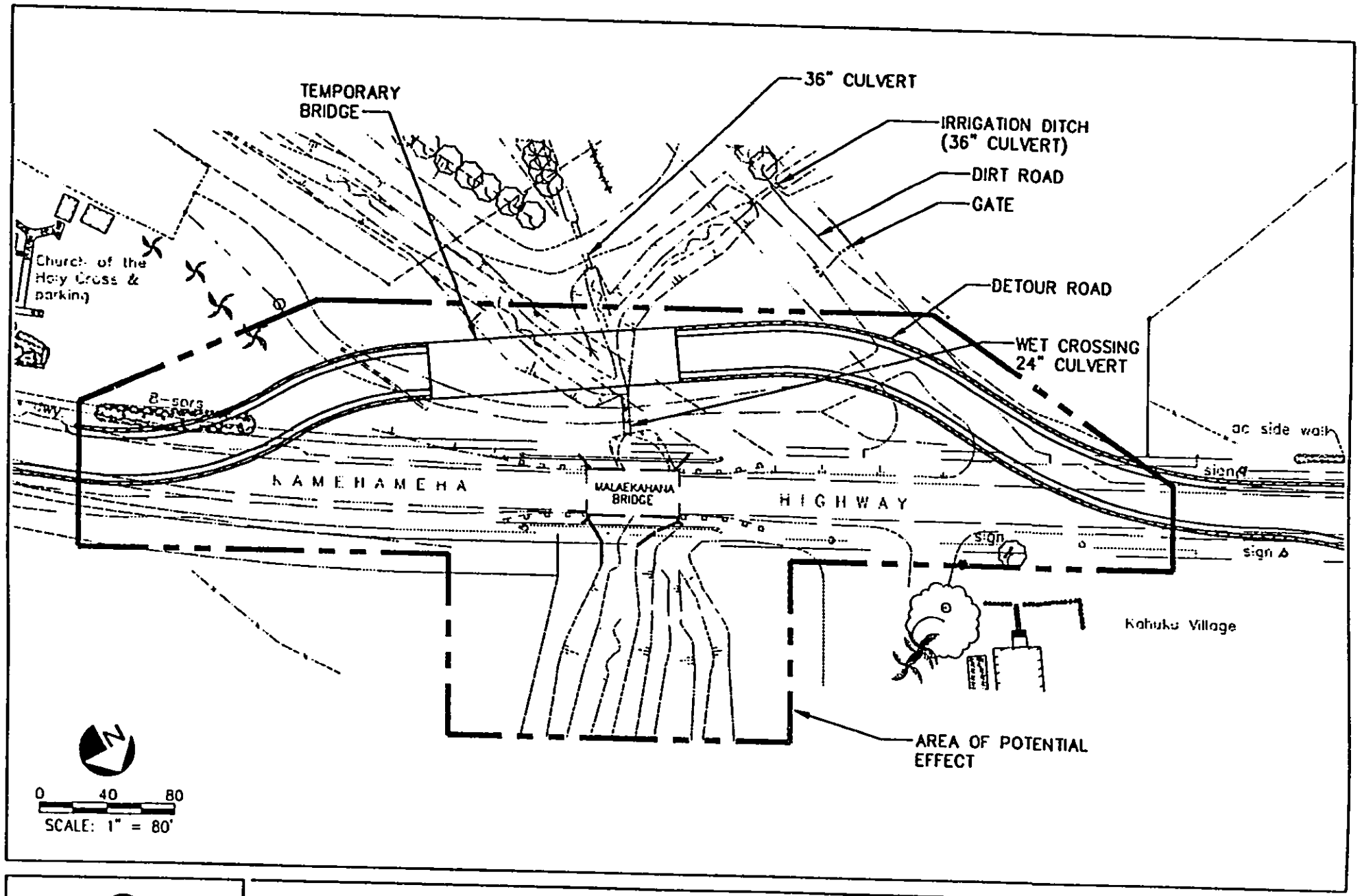


Source: *Kahuku Quadrangle*, USGS Topographic Survey Map; 1983.

EARTH TECH

Malaekahana Stream Bridge Replacement
Environmental Assessment
Regional Location Map

FIGURE
1.2



EARTHTECH

Malaekahana Stream Bridge Replacement
Environmental Assessment
Area of Potential Effect (APE)

FIGURE
1.3

1.2 REQUIRED PERMITS

In addition to the environmental disclosure requirements of Chapter 343, HRS, the proposed action requires various federal, state, and county permits. These permits include the U.S. Army Corps of Engineers (USACE) Section 404 Permit, Section 401 Water Quality Certification, State Coastal Zone Management Program (CZMP) Consistency Determination, State Stream Channel Alteration Permit, State Historic Preservation Clearance, and a City and County of Honolulu Special Management Area (SMA) Permit. The project does not require a State Conservation District Permit because the project area is not located in or adjacent to the State Conservation District.

1.2.1 U.S. Army Corps of Engineers Section 404 Permit

The proposed action is required to be permitted pursuant to the U.S. Clean Water Act and its Section 404 implementing regulations that regulate actions involving the discharge of dredged or fill material into waters of the United States. This includes areas designated as wetlands. The proposed development of the detour bridge and replacement bridge, involves a "discharge of fill material" in jurisdictional waters, as defined by 33 CFR part 323.2. Less than 100 square feet of wetlands would be affected, as well as a portion of the Malaekahana Stream.

The USACE has jurisdiction over "dredge and fill" actions in U.S. waters, including the Malaekahana Stream. Certain discharges specified in 33 CFR part 330 are permitted by that regulation under a "Nationwide Permit" system, while others receive regional and individual permits. The proposed project at Malaekahana meets the conditions for a Nationwide Permit under the criteria established in 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). Requirements for the permits are as follows:

Permit No. 3 Maintenance. The repair, rehabilitation, or replacement of any previously authorized, currently serviceable, structure or fill, or of any currently serviceable structure or fill authorized by 33 CFR 330.3, provided that the structure or fill is not to be put to uses differing from those uses specified or contemplated for it in the original permit or the most recently authorized modification.

Permit No. 33 Temporary Construction, Access and Dewatering. Temporary structures, work and discharges, including cofferdams, necessary for construction activities or access fills or dewatering of construction sites; provided that the associated primary activity is authorized by the USACE or the U.S. Coast Guard, or for other construction activities not subject to the USACE or U.S. Coast Guard regulations. Appropriate measures must be taken to maintain near normal downstream flows and to minimize flooding. Fill must be of materials, and placed in a manner, that will not be eroded by expected high flows.

1.2.2 Section 401 Water Quality Certification

The U.S. Clean Water Act and Section 401 of its implementing regulations (33 CFR 1341) require any applicant for a federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into the navigable waters, to obtain a water quality certification from the State where the discharge takes place or originates.

The State Department of Health, Clean Water Branch administers the Water Quality Certification permitting process in Hawaii.

1.2.3 Coastal Zone Management Consistency Determination

Section 307(c)(1) of the Coastal Zone Management Act (CZMA) requires the USACE to provide a consistency determination of the proposed action 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. Since the proposed project is being authorized under Nationwide Permits No. 3 and No. 33 a CZM consistency determination will not be required. These two Nationwide permits are already approved for CZM consistency.

1.2.4 State Stream Channel Alteration Permit

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 Water Commission regulates actions that propose to alter stream channels and flows under the Title 13, Chapter 169-50, Hawaii Administrative Rules (HAR) of the State Water Commission 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 which diminishes the quantity or quality of the stream water below the minimum standards.

1.2.5 State Historic Preservation Clearance

The proposed actions at Malaekahana also are regulated by the National Historic Preservation Act and its implementing regulations (36 CFR 800), as well as the State Historic Preservation Act found in Chapter 6E, Hawaii Revised Statutes. This clearance process is designed to minimize project impacts to historically or archaeologically significant sites.

1.2.6 City and County of Honolulu Special Management Area Permit

The State of Hawaii's Chapter 205A, HRS, authorizes the counties to establish Special Management Areas (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. The City and County of Honolulu, Department of Land Utilization 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 also is used to preserve scenic views and ensure public access to beaches, coastal recreation areas, and natural reserves. Actions affecting wetland areas, including dredging, also are regulated in this process. The makai portion of the proposed project area, including one-half of the replacement bridge, is located in the SMA.

CHAPTER 2
PURPOSE AND NEED

2.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

The purpose of the proposed action is to replace the existing Malaekahana Stream Bridge. This bridge replacement is needed because similar to other low-lying coastal areas on the island of Oahu, the Kahuku area experiences flooding during and after periods of heavy rains, tsunamis, and high surf. In particular, the Malaekahana Stream, located in the southern part of the Kahuku floodplain, experiences flash floods that cause the flooding of Kahuku Village and Kamehameha Highway. These conditions can, at least in part, be attributed to the inability of the Malaekahana Stream to flow heavy storm runoff. The narrow width of the Malaekahana Stream and obstruction caused by the Malaekahana Stream Bridge and Kamehameha Highway directly contribute to the flooding problems in the area. The periodic flooding of the area poses hazards for residents of the area and traffic along Kamehameha Highway.

In addition, the existing Malaekahana Stream Bridge is a narrow two-lane structure with no shoulders or alternate transportation travel lanes. Pedestrian and bicycle traffic are forced to travel in the automobile travel lanes, causing hazards for motorists, pedestrians and bicyclists.

2.1 BACKGROUND OF FLOOD CONTROL INITIATIVES IN KAHUKU

In 1985, the James Campbell Estate, owner of Kahuku Village and land mauka and makai of the bridge, examined the drainage and flooding problems of the Malaekahana Stream and the adjacent area of Kahuku Village (R.M. Towill 1985, 1985a, 1985b). The studies concluded that the 50 and 100 year discharge rates of the stream were 13,630 cubic feet per second (cfs) and 17,630 cfs, respectively. The studies also made recommendations for the replacement of the Malaekahana Bridge and channelization of the Malaekahana Stream makai of Kamehameha Highway to alleviate the overtopping of Kamehameha Highway and flooding of Kahuku Village.

In response to the flooding problems, the 1992 Hawaii State Legislature passed House Concurrent Resolution and Senate Bill No. 2997 directing the State Department of Land and Natural Resources and the State DOT to prepare and implement the Kahuku Flood Control Master Plan. The Legislature appropriated $250,000 for the implementation of the plan contingent on the participation and allocation of matching funds by the City and County of Honolulu and the USACE. It was determined by the USACE, however, that the cost for construction of a new bridge over the Malaekahana Stream would reduce the total project's cost-benefit ratio below an acceptable level. Consequently, the flood control plan did not receive matching funds.

In 1993, the Hawaii State Legislature appropriated funds in Act 289 for the State Department of Transportation to replace the Malaekahana Bridge based on the findings and recommendations included in the previous studies of the Kahuku area. The proposed replacement of the Malaekahana Bridge by the State DOT and the FHA represents the implementation of this legislative directive.

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CHAPTER 3
PROJECT DESCRIPTION

3.0 PROJECT DESCRIPTION

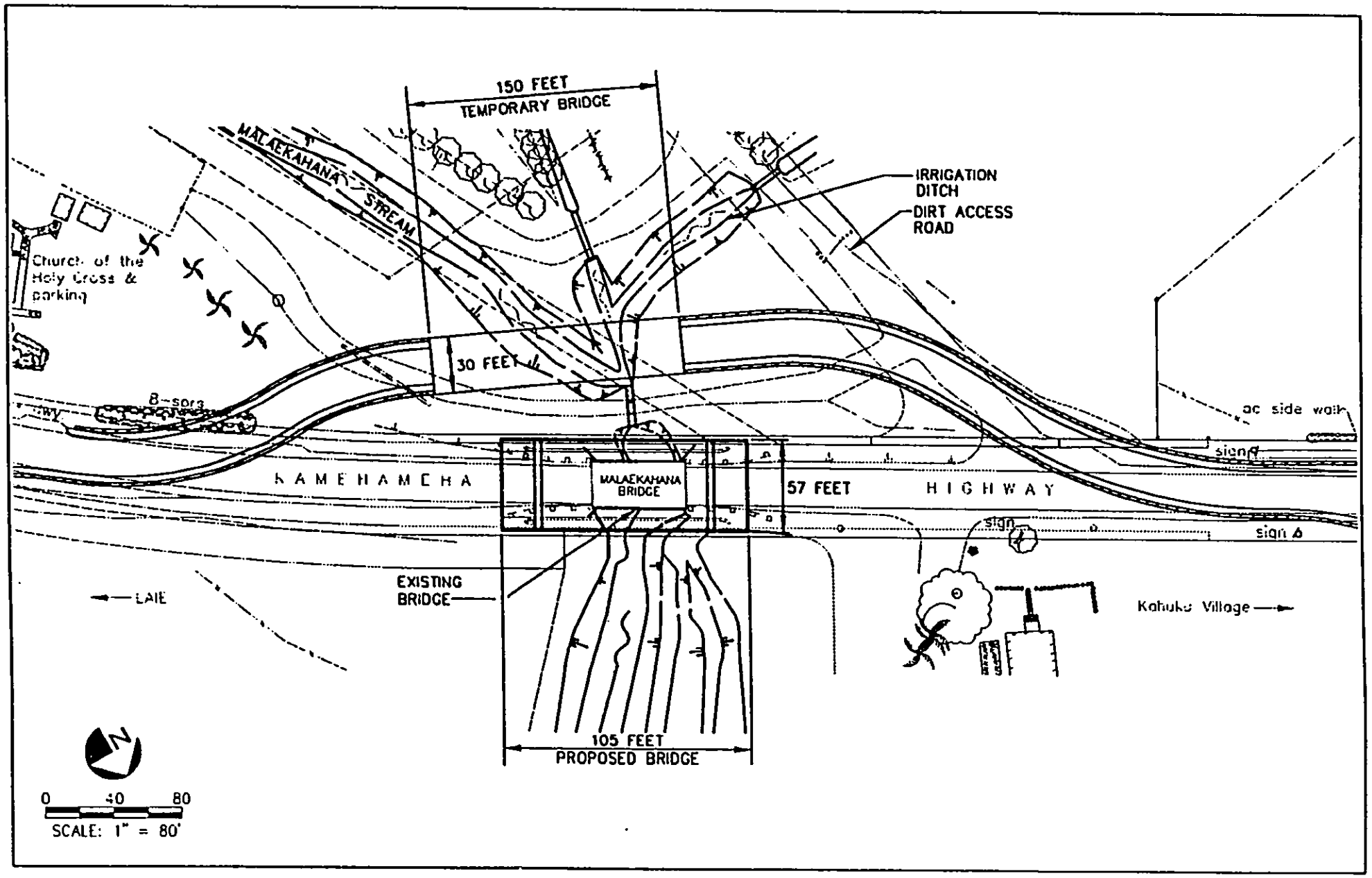
This chapter provides a general description of the proposed project's technical, social, economic, and environmental characteristics pursuant to Chapter 343, HRS, and the State Department of Health Title 11-200-10, HAR, content requirements for an environmental assessment.

3.1 PROPOSED ACTION

The State DOT in cooperation with the FHA proposes to replace the 50-foot bridge over the Malaekahana Stream on Kamehameha Highway with a new 105-foot clear single-span bridge with vertical abutments. The proposed bridge will be 57 feet wide with two 12-foot travel lanes and two 12-foot shoulders (**Figure 3.1**). The replacement bridge will be in the same location as the existing bridge and will increase the finished grade height of the approaches of Kamehameha Highway by one foot. Twelve foot shoulders on either side of the travel lanes will accommodate pedestrian and bicycle traffic through the area. This is designed to reduce the hazards associated with the narrow design of the existing bridge. The road surface and low chord of the bridge will be retained at 12.9 and 9.5 feet above mean sea level (msl), respectively. The proposed replacement bridge will be constructed of prestressed steel girders. **Figure 3.2** shows the longitudinal view of the existing and proposed replacement bridge over the Malaekahana Stream.

The vertical abutments will be placed outside the stream away from the ordinary high water mark to minimize the discharge of excavated material to the stream during construction. The abutments will be aligned with the downstream channel away from nearby dwellings to minimize local flooding. Riprap revetments also will be constructed along the stream banks under the bridge to protect the vertical abutments from scouring. On the southern (Laie) side of the bridge, the riprap will extend 10 feet mauka of the bridge to 119 feet downstream from the edge of the new bridge's deck. On the northern (Kahuku) side of the bridge the riprap revetment will extend 18 feet mauka of the bridge to 119 feet downstream of the bridge's deck. No concrete lining of the stream is proposed for this project.

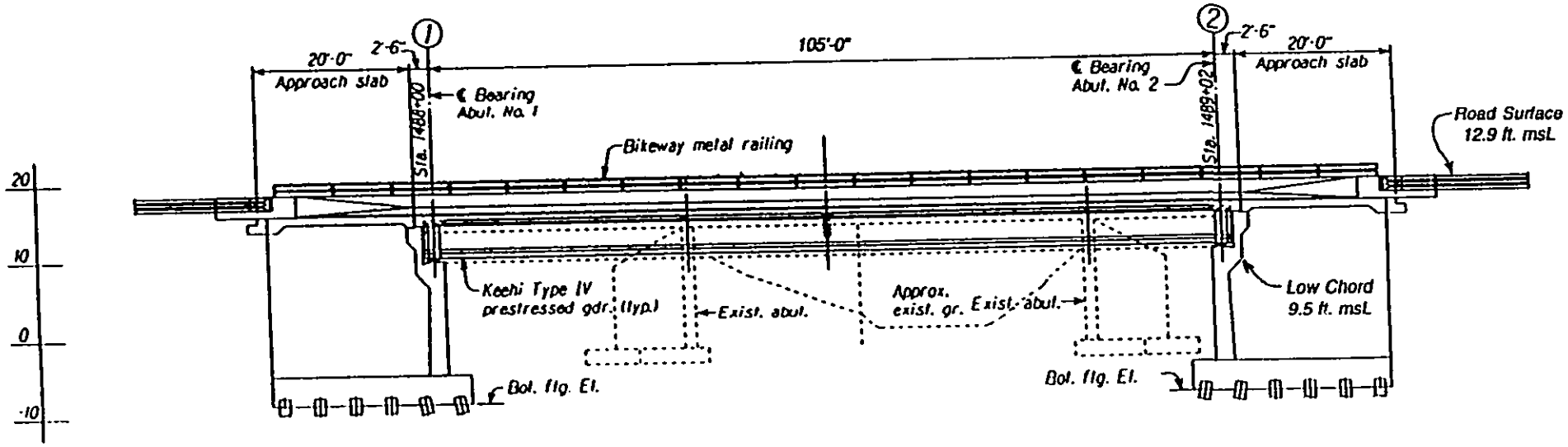
Since no other primary road exists to serve the area, a 720-foot detour road will be constructed to accommodate traffic during the construction of the replacement bridge. The detour road will have two 11-foot wide lanes and two 4-foot wide shoulders that connect Kamehameha Highway from the grassy parking area of the Church of the Holy Cross to the existing dirt road owned by the James Campbell Estate on the Kahuku side of the Malaekahana Stream (**Figure 3.3**). Current drainage patterns will be maintained through all phases of the bridge construction through the placement of four 78" and two 36" inlet culverts in the stream (**Figure 3.3**).



EARTHTECH

Malaekahana Stream Bridge Replacement
Environmental Assessment
Project Plan

FIGURE
3.1



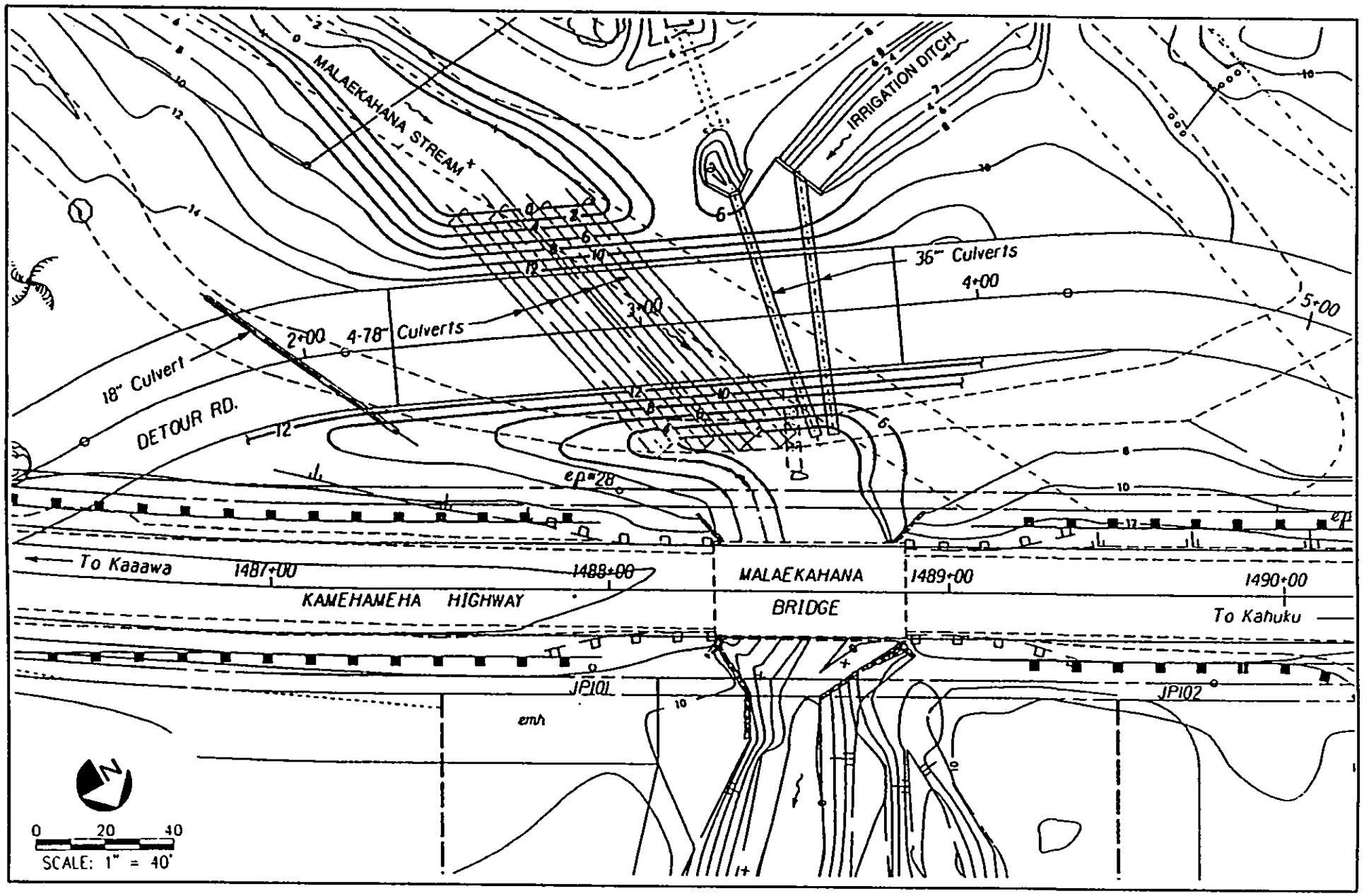
ELEVATION

SCALE: 1" = 20'-0"

EARTH TECH

Malaekahana Stream Bridge Replacement
Environmental Assessment
Longitudinal View

FIGURE
3.2



EARTHTECH

Malaekahana Stream Bridge Replacement
Environmental Assessment
Drainage Plan

FIGURE
3.3

The construction of the temporary detour road will include temporary, limited stream channelization and backfilling around prefabricated culverts.

The detour road will include an access ramp to the James Campbell Estate's dirt road on the Kahuku side of the stream. This will accommodate local traffic traveling to and from the agricultural areas mauka of the project area. Traffic entering the detour road from the dirt road will be prevented from turning right towards Laie to reduce the likelihood of accidents. A double-lane access ramp also will be established at the southern end of the detour road to provide access to the Church of the Holy Cross grassy parking area. This entrance point will accommodate local church parishioners traveling in both directions.

Utilities will be relocated along the mauka side of Kamehameha Highway and the detour road. Construction vehicles and equipment will be baseyarded within the borders of the project area through the duration of the proposed project in the area between the detour road and the existing bridge.

The detour road, culverts, and all fill material will be removed after construction is completed. All excavated material, fill, and debris from the existing bridge will be removed and placed in a DOH-approved landfill on Oahu. The 24" culvert, wet-crossing, the grassy parking area of the Church of the Holy Cross, and the Campbell Estate's dirt road will be restored to their pre-construction state following completion of the proposed project. The stream area also will be revegetated with native species following completion of construction.

3.2 PROJECT SCHEDULE AND COSTS

The proposed project is scheduled to begin in late March or early April 1998, and will be completed in approximately 12 months. Construction related activities including construction of the detour road (6 weeks), demolition of the existing bridge (3 weeks), and construction of the replacement bridge (22 weeks) will be completed in the first 8 months of the project. The last 4 months of the project will include demolition of the detour road, removal of all fill material from the stream, revegetation of the stream area in the APE, and restoration of the grassy parking area and dirt road. As much as possible, restoration activities will occur between September and April to avoid disturbing the area during the breeding season of the Hawaiian Stilt.

The estimated total cost for the proposed project is $5.4 million. The State DOT and the FHA are jointly funding the project through the Statewide Transportation Improvement Program (STIP).

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CHAPTER 4
ALTERNATIVES CONSIDERED

4.0 ALTERNATIVES CONSIDERED

This chapter discusses the alternatives considered in the development of the proposed project. Two alternatives were developed and analyzed for the proposed project including the replacement of the bridge and the "no-action" alternative. Two different alignments for the detour road also were considered as part of the proposed action.

The proposed action is based on recommendations developed in the 1993 Kahuku Master Flood Control Plan. These recommendations also are discussed to show the evolution of flood control alternatives in Kahuku that resulted in the proposed action.

4.1 1993 KAHUKU MASTER FLOOD CONTROL PLAN

The 1993 Kahuku Master Flood Control Plan included recommendations for three alternative plans to alleviate flooding in the Kahuku area. These alternatives were based, in part, on the studies completed by R.M. Towill in 1985 for the James Campbell Estate. The alternatives included:

1. Construction of a new 100-foot span bridge, a levee system of earthen berms on the mauka sides of the highway to control stream flow under the bridge, and a 100-foot concrete lined channel downstream of the bridge;

2. Construction of a levee system, lowering the bottom of the stream, bridge improvements, and a 50-foot wide concrete lined channel; and,

3. Construction of a levee system, lowering the bottom of the stream, and minimal bridge and channel improvements.

Alternative No. 3 was recommended in this plan because of the prohibitive costs associated with constructing a new bridge and concrete channel. This proposal, however, was not implemented because of economic reasons.

4.2 DEPARTMENT OF TRANSPORTATION BRIDGE REPLACEMENT

In 1994, the State DOT initiated plans to replace the Malaekahana Bridge. Two alternatives were considered for the proposed action including the "no action alternative". The proposed project was confined to development of a new bridge at Malaekahana because of the prohibitive costs and environmental effects associated with additional flood control actions and stream channelization.

4.2.1 105-Foot Bridge

This alternative includes construction of a new 105-foot clear single-span bridge. The low chord elevation of the bridge and road would remain at the existing levels of 12.9 msl and 9.4 msl, respectively. No up-stream berming would occur under this planned alternative. Riprap would be constructed along the stream under the bridge adjacent to the vertical abutments to protect them from scouring.

A detour road with culverts would be constructed to accommodate traffic flows during the construction of the replacement bridge. Various alternative alignments for the detour road (makai and mauka of the bridge) were developed for the project.

A. In this alternative, the alignment for the detour road and culverts is on the makai side of the existing bridge. The centerline of the detour road would be located approximately 40 feet down stream with the project APE extending approximately 150 feet downstream of the existing bridge. The road would stretch from Kamehameha Highway on the Laie side across the stream to the area fronting the adjacent residential structures in Kahuku Village.

   The makai alignment of the detour road was not chosen for the project, because of its proximity to Kahuku Village residents. This detour road alignment would have traversed residential property and, due to the limited area available between Kahuku Village and the existing bridge, residents would need to be relocated through the duration of the project.

B. This alternative would align the centerline of the detour road and culverts approximately 40 feet mauka of the existing bridge, stretching from the Church of the Holy Cross parking area on the Laie side of the stream to the dirt access road owned by the James Campbell Estate on the Kahuku side. The makai edge of the detour road and culverts in this proposed alignment would affect a small area (less than 100 square feet) adjacent to the canehaul road wetcrossing that was identified as a wetland.

   Two other locations for the detour road and culverts on the mauka side of the existing bridge were considered to avoid potential effects on the wetland area. This includes an alignment of the detour road and culverts centerline approximately 60 feet from the existing bridge. This alignment further from the existing bridge area was not chosen because of its potential impacts to the stream. A larger portion of the stream would need to be channelized and more vegetation disrupted under this alignment. The area near the irrigation ditch also was identified as containing wetland plant species, and would be directly effected. Furthermore, this alignment would not facilitate the development of safe travel lanes, because of the need to include a sharp turn near the center of the stream.

   The other mauka alignment considered under this alternative placed the detour road and culverts centerline, approximately 20 feet from the existing bridge. This closer alignment was not chosen because the wetland area would continue to be affected by the project and there would not be enough space for construction related activities between the detour road and the replacement bridge project site.

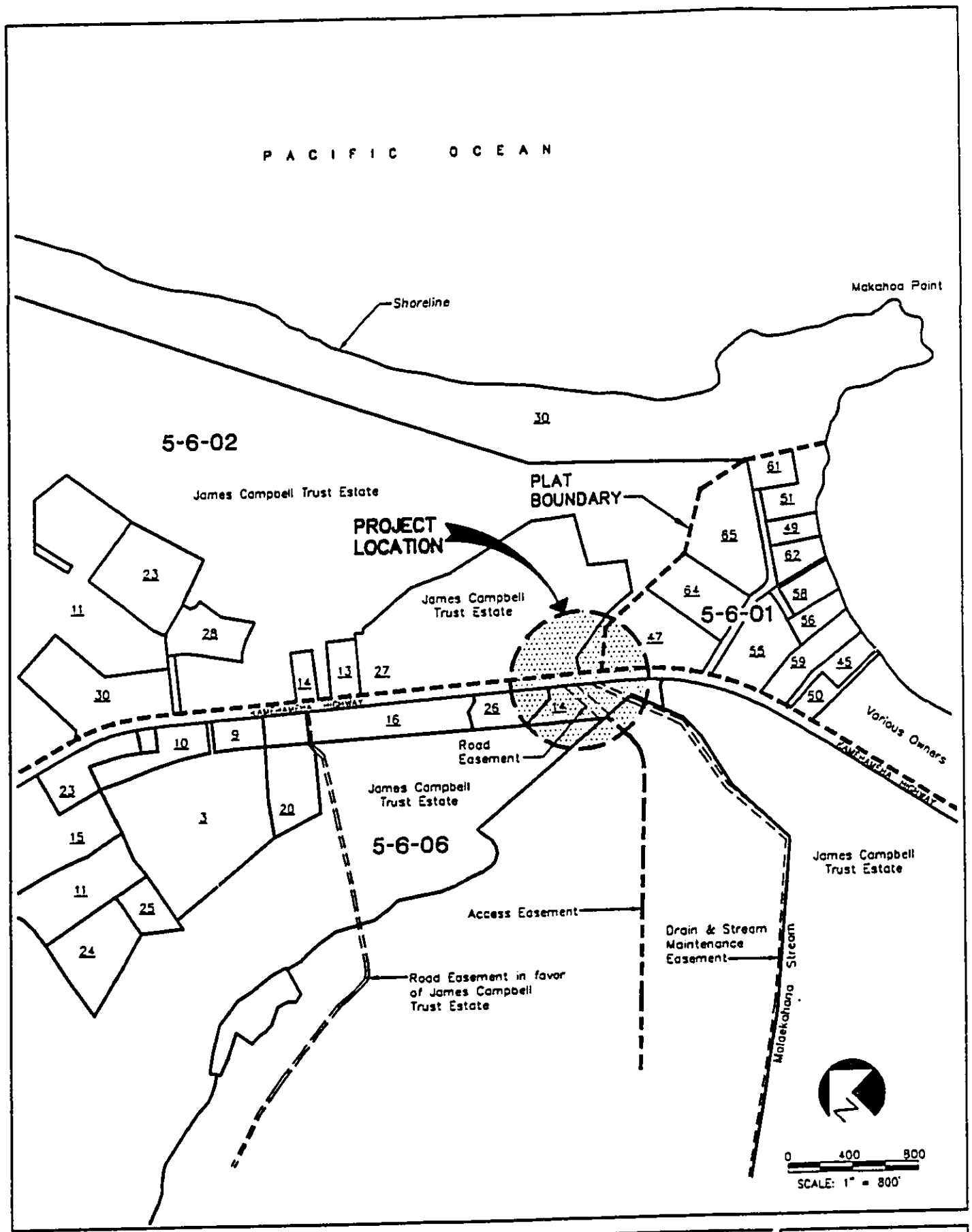
4.2.2 No-Action

The "no-action" alternative would retain the existing conditions at the Malaekahana Stream and Bridge. Debris and silt would continue to build-up on the Laie side of the bridge from scouring along the opposite abutment. There would be no improvement to the drainage of the area, and periodic flash floods and overtopping of Kamehameha Highway would continue to pose hazards for the residents of Kahuku Village and traffic along the highway.

4.3 DISCUSSION

The construction of a new 105-foot single-span bridge was selected as the preferred alternative for the proposed project, because of the need to alleviate flooding in the area. The mauka alignment 40 feet from the existing bridge also was chosen for the detour road and culverts because of its potential for less environmental and social impacts to the area. The small wetland area will be restored following the completion of the project.

The no-action alternative was not selected because of the need to alleviate flooding in the Kahuku Village area and along Kamehameha Highway. If the proposed action is not taken flooding in the area most likely will continue in the future.



EARTH TECH

Malaekahana Stream Bridge Replacement
Environmental Assessment
Land Ownership – TMK

FIGURE
5.1

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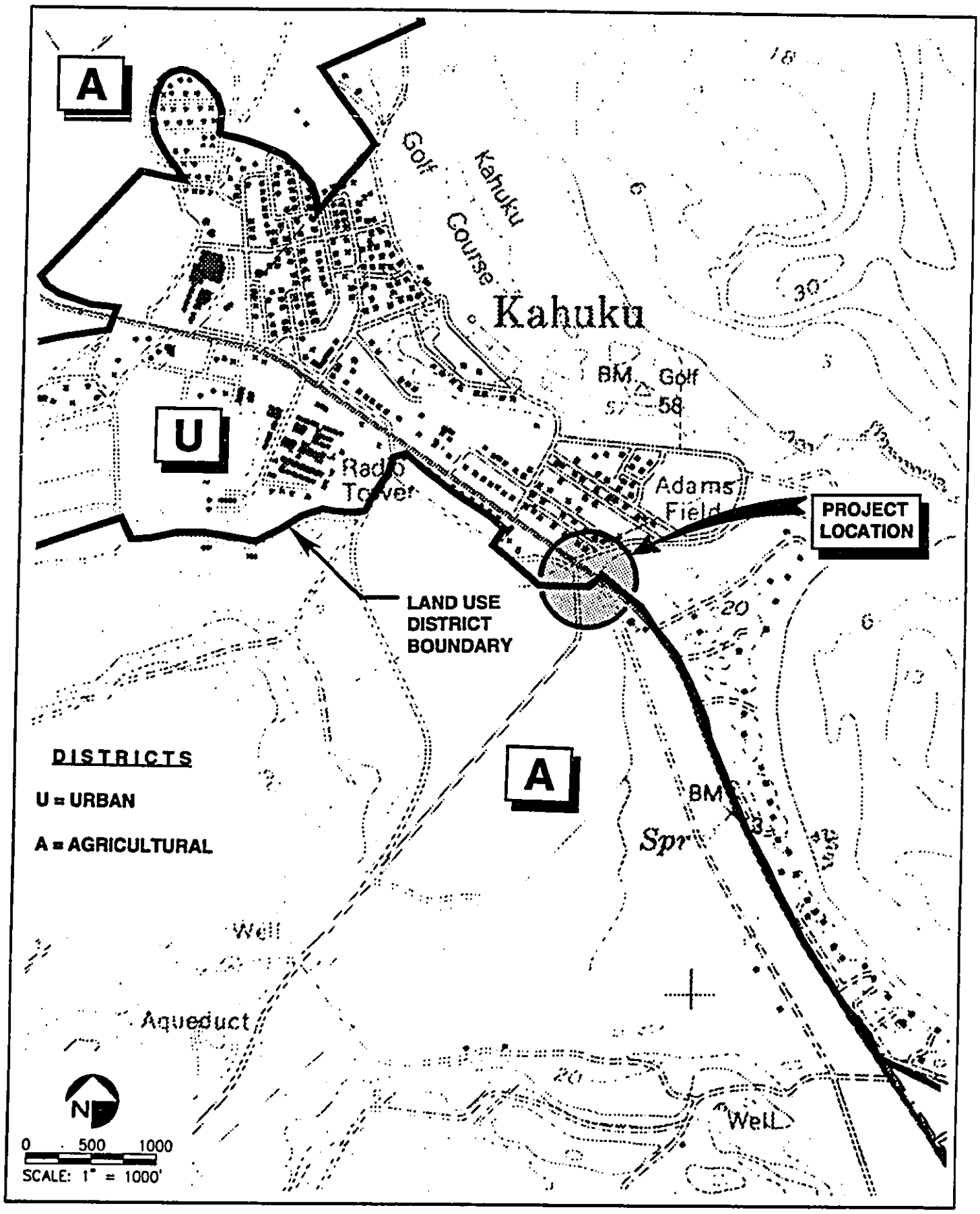
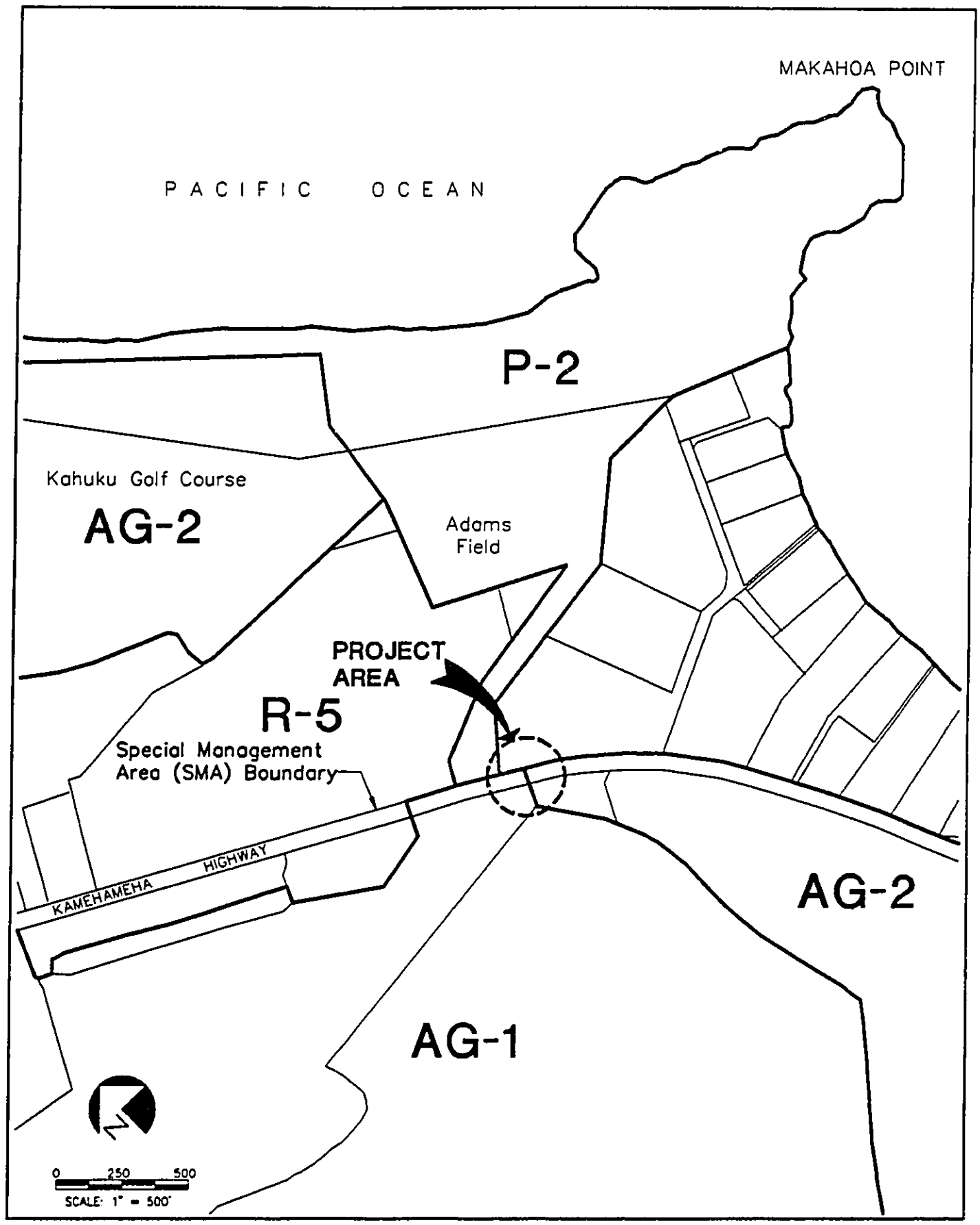


EARTH TECH

Malaekahana Stream Bridge Replacement
Environmental Assessment
Land Use District Map

FIGURE
5.2



EARTH TECH

Malaekahana Stream Bridge Replacement
Environmental Assessment
City and County of Honolulu Developement
Plan Designations and
Special Management Area (SMA) Boundary

FIGURE
5.3

on Kamehameha Highway approximately one-half mile from the opening of the Malaekahana Stream at the coastline near Makahoa Point. The bridge is 50 feet long with 12 foot lanes and no shoulders. The existing vertical abutments rest in the stream with rip-rap revetments along each bank under the bridge. There is extensive scouring of the Kahuku side abutment that causes a build-up of silt and debris under the bridge on the Laie side of the stream. The low chord of the bridge has a vertical clearance varying from approximately 4 feet to 11 feet above mean sea level (msl).

5.3 CLIMATE

The climate in the Malaekahana, Kahuku area is typical of windward Oahu. The summer months from July to October are typically drier and warmer, while the winters are usually wet 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 up to 20 or 25 miles per hour do 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.

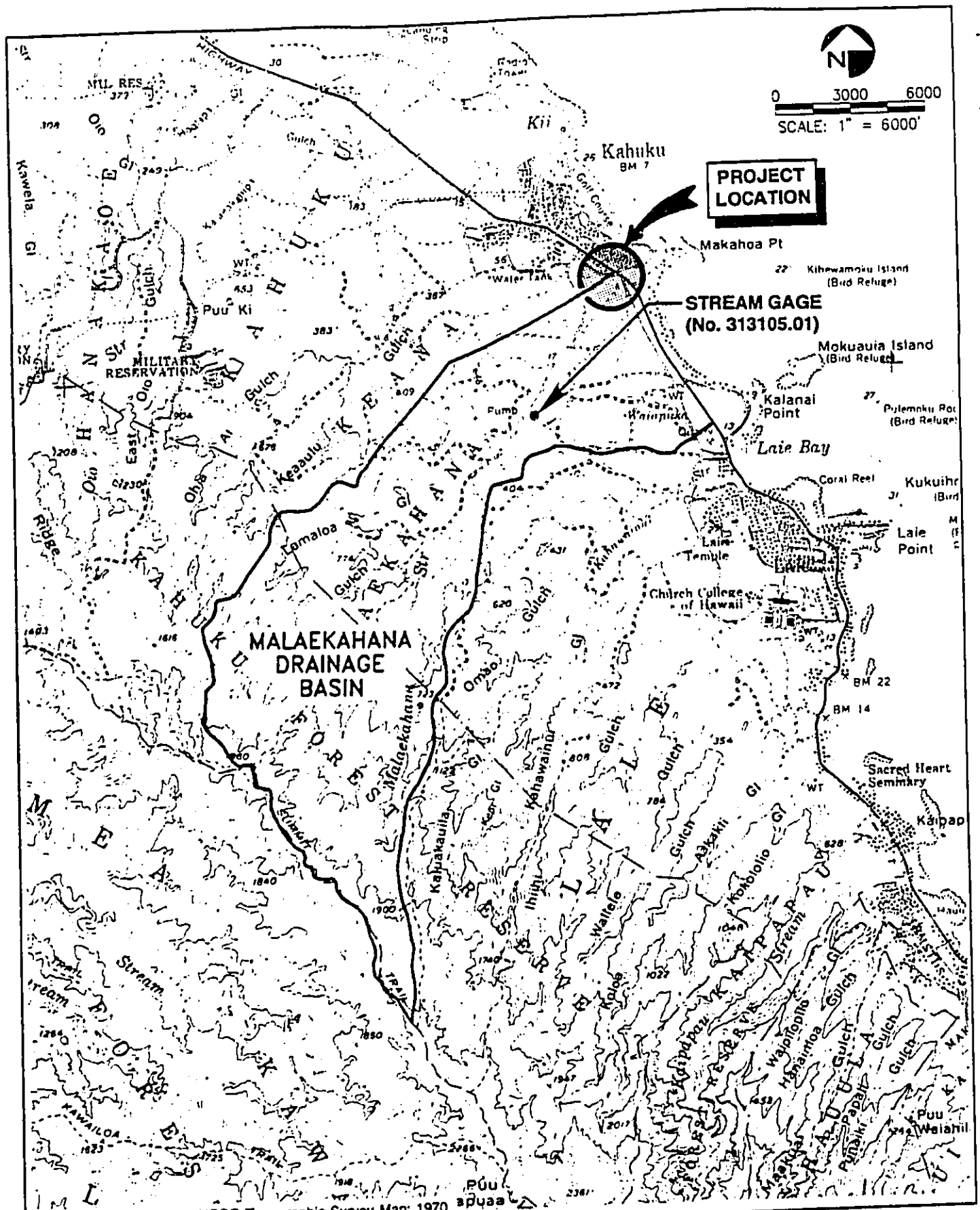
The average rainfall in the Kahuku area is between 39 and 59 inches per year (Giambelluca et al, 1986). The upper reaches of the Koolau Mountains receive increased amounts of rain from the cooling of moisture-laden cloud systems. Approximately 30 percent of the days are clear. Thirty percent of the days are partly-cloudy, and 30 percent overcast.

Average temperatures in Kahuku vary depending on the two seasons in Hawaii. Temperatures in the drier summer months tend to be higher and range from an average of 70° to 85° (University of Hawaii, 1973). Temperatures ranges from an average of 62° to 75° in the cooler winter months (University of Hawaii, 1973).

5.4 GEOGRAPHY AND TOPOGRAPHY

The APE at Malaekahana 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 basalt lava flows were eroded by persistent rainfall and streams. 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 at the southern edge 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 (**Figure 5.4**). 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



EARTH TECH

Malaekahana Stream Bridge Replacement
Environmental Assessment
Stream Drainage Basin

FIGURE
5.4

and gulches (Hina, Lamaloa, Keaaulu, Keana) 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.

5.5 WATER RESOURCES

Water resources include the drainage characteristics of the Malaekahana Ahupua`a, stream flow data, and water quality information. Information on water resources was derived from various sources including the U.S. Geological Survey (USGS), State Department of Land and Natural Resources, and a field water quality survey.

Federal, state, and county laws regulate actions proposing to affect water resources through permit processes including the USACE 404 Permit, the Section 401 Water Quality Certification, the State of Hawaii Stream Channel Alteration Permit, the CZMP Consistency Determination, and the City and County of Honolulu SMA Permit.

5.5.1 Affected Environment

The Malaekahana Stream is a small (averaging less than 20 cfs) perennial stream that extends from approximately 1,500 feet at the upper reaches of the Koolau Mountains in the Kahuku Forest Reserve to the sea at the southern edge of Kahuku approximately one-half mile from Makahoa Point. The stream gradient averages .8%, and ranges from .3% in the lower reaches to 1.5% in the upper areas. It is composed of two main branches that converge in a single channel 50 feet upstream of the existing bridge. The intermittent Keana Stream, Hina, Lamaloa, and Keaaulu Gulches, and two irrigation ditches also contribute to the Malaekahana Stream. The roughly rectangular drainage area encompasses approximately 4,819 acres (DLNR 1983) (**Figure 5.4**).

No portion of the stream is diverted or dammed, and a portion of the stream is channelized upstream of the existing bridge (HCPSU, 1990). The upstream channels and approaches to the bridge are not well-defined because of the considerable overgrowth on both embankments. Downstream, the channel is more well-defined but also has instream areas that are congested with silt and debris, particularly near the bridge. Anecdotal evidence indicates that the stream was dredged to reduce silt build-up and flooding in the area.

Some historical water flow data is available for the Malaekahana Stream from three discontinued and one existing U.S. Geological Survey (USGS) stream flow gages. The Department of Land and Natural Resources (1983), *In-Stream Use Study* indicates that the average stream flow at discontinued USGS Gage Station 310000 (middle branch of the Malaekahana) ranged from 0.0 to 5.6 cubic feet per second (cfs) with an average of 0.84 cfs for all years on record. The *Hawaii Stream Assessment* (HCPSU, 1990) indicates that the stream had a 2.14 cfs average for yearly mean flows based on recordings from discontinued USGS Gage Station 308000 (Malaekahana near Laie) between 1963 and 1971.

The existing USGS Gage Station 310501 is located approximately 4,000 feet upstream of the stream mouth at the ocean adjacent to an abandoned plantation railroad bridge at an elevation of 30 feet msl. It is 1.1 miles southwest of the junction of the plantation road and Kamehameha Highway and 1.2

miles south of Kahuku Hospital (**Figure 5.4**). This crest-stage, partial flow gage has been operating since 1958 and was used to calculate projected peak flows based on annual maximum flows for the Malaekahana Stream from 1958-1982 (R.M. Towill May 1985).

Table 5.1 shows the projected peak flows for the Malaekahana Stream that were calculated using the Federal Emergency Management Agency (FEMA) Log Pearson Type III Frequency Curve plot (R.M. Towill May 1985). **Table 5.2** shows the maximum peak flows for the years 1959-1982 and 1991-1994 at Gage Station 310501.

Table 5.1
Projected Peak Flows for the Malaekahana Stream (R.M. Towill May 1985)

Event	*Cubic Feet per Second (cfs)*
10 - Year	6,190
50 - Year	13, 630
100 - Year	17,630
500 - Year	28,570

Water Quality

No historical water quality data from Malaekahana Stream could be located for this report. It is assumed that years of agricultural production on the lands mauka of the project area affected stream water quality through the deposition of silt in the stream. Water quality also may have been negatively effected by past dredging activities in the stream to reduce silt build-up and flooding.

Basic water quality measurements including temperature, conductivity, and pH were taken just mauka (west) of the bridge at 1000 hrs on February 17, 1997 and at 1200 hrs on March 4, 1997. Visual observations of turbidity also were noted. This data is shown in **Table 5.3.**

Conductivity measurements indicate that the stream water near the bridge is fresh with limited tidal influence. Visibility in the stream is limited due to the increased turbidity from the predominately silty stream bottom.

5.6 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 APE and the development of the proposed project.

Table 5.2
Malaekahana Stream Gage Data - 310501

Date	*Flow (cfs)*	*Rank*	*Date*	*Flow (cfs)*
10/23/59	2010	1	04/15/63	4640
03/06/60	425	2	03/21/82	3950
01/14/61	224	3	02/11/67	3480
03/13/62	3140	4	03/16/68	3250
04/15/63	4640	5	03/13/62	3140
01/06/64	2010	6	01/13/71	2740
05/02/65	2320	7	11/14/66	2630
11/14/66	2630	8	05/02/65	2320
02/11/67	3480	9	10/23/59	2010
03/16/68	3250	10	01/06/64	2010
01/03/69	705	11	04/15/72	1990
01/14/70	1040	12	02/10/79	1300
01/13/71	2740	13	01/14/70	1040
04/15/72	1990	14	05/18/80	830
00/00/73	100	15	01/03/69	705
04/19/74	618	16	02/01/75	700
02/01/75	700	17	04/19/74	618
11/25/76	300	18	02/13/94	446
04/19/77	100	19	03/06/60	425
06/28/78	200	20	11/25/76	300
02/10/79	1300	21	10/16/91	300
05/18/80	830	22	10/16/94	280
05/08/81	50	23	01/14/61	224
03/21/82	3950	24	06/28/78	200
10/16/91	300	25	1973	100
11/26/92	100	26	4/19/77	100
02/13/93	446	27	10/26/92	100
10/16/94	280	28	05/08/81	50

Source: U.S. Geological Survey

Table 5.3
Basic Water Quality Characteristics of Malaekahana Stream

Location - Date - Time	*Temp. (°C)*	*pH (pH units)*	*Cond. (µmhos/cm)*	*Visibility in feet*
Mauka of Bridge - 3/4/97 - 1200	24.5	8.8	582	.5
Mauka of Bridge - 2/17/97 - 0915	24.0	8.9	680	.5
Mauka of Bridge - 4/5/97 - 1615	27.2	7.2	483	.25
Upstream (40 m) - 4/5/97 - 1615	27.6	6.8	378	.25
Downstream (40m) - 4/5/97 - 1615	27.3	6.9	460	.5

Floods

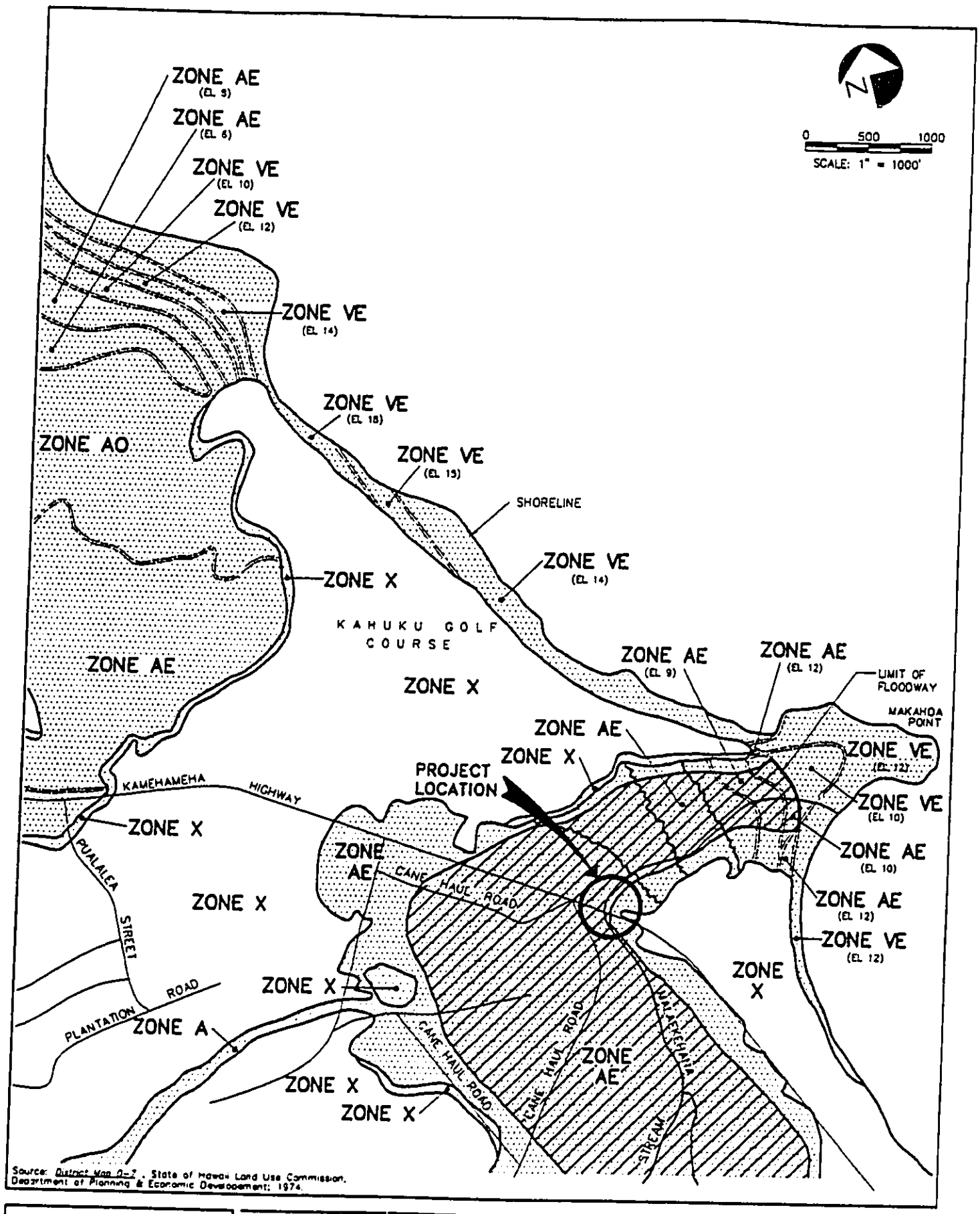
The Kahuku area, in general, experiences periodic flash floods because of its location in the coastal floodplain. Most flooding is confined to areas makai of Kamehameha Highway, but recent flood events have caused damage to areas mauka of the highway including Kahuku High School.

The Malaekahana Stream is subject to periodic flash flooding in the low-lying areas near Malaekahana Bridge and Kahuku Village. Storm events in the 1960s, 1982, and 1993 flooded Kamehameha Highway and inundated portions of the neighboring residential areas. Floods in the area are caused by the confluence of increased water flows from the Malaekahana Stream drainage area and high tidal conditions on the coast. The accumulation of debris and stream channel overgrowth also contributes to the back-up of water near the bridge area and overtopping of Kamehameha Highway. Currently, the existing bridge is only capable of flowing 1,200 cfs, while the projected 100-year flood is 17,630 cfs.

FEMA updated the Flood Insurance Rate Map (FIRM) for the Kahuku area in 1990, and listed coastal floods as the most hazardous for the Malaekahana Stream area. The Malaekahana Bridge and the APE lie in Flood Zone AE at a 6 to 10 foot elevation. Zone AE is defined as a special flood hazard area subject to inundation by the 100-year flood. The 100-year flood zone also extends to the middle of Kahuku Village on the makai side of Kamehameha Highway. **Figure 5.5** shows the flood zones for the Malaekahana area as established by FEMA and the USACE.

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.



Source: District Map O-2, State of Hawaii Land Use Commission, Department of Planning & Economic Development; 1974.

EARTH TECH

Malaekahana Stream Bridge Replacement
Environmental Assessment
Flood Zones (FIRM)

FIGURE
5.5

The State of Hawaii Civil Defense establishes tsunami inundation zones and maps for all coastal areas in Hawaii. Kamehameha Highway is the border of the tsunami inundation zone at Malaekahana, according to the State Civil Defense Tsunami Evacuation Maps (**Figure 5.5**). The makai portion of the APE for the proposed replacement bridge lies in the tsunami inundation zone.

Hurricanes

The Hawaiian Islands are seasonally affected by Pacific 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 the islands. The storms generally contribute to localized flooding and coastal storm surges.

The Malaekahana 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 at Malaekahana.

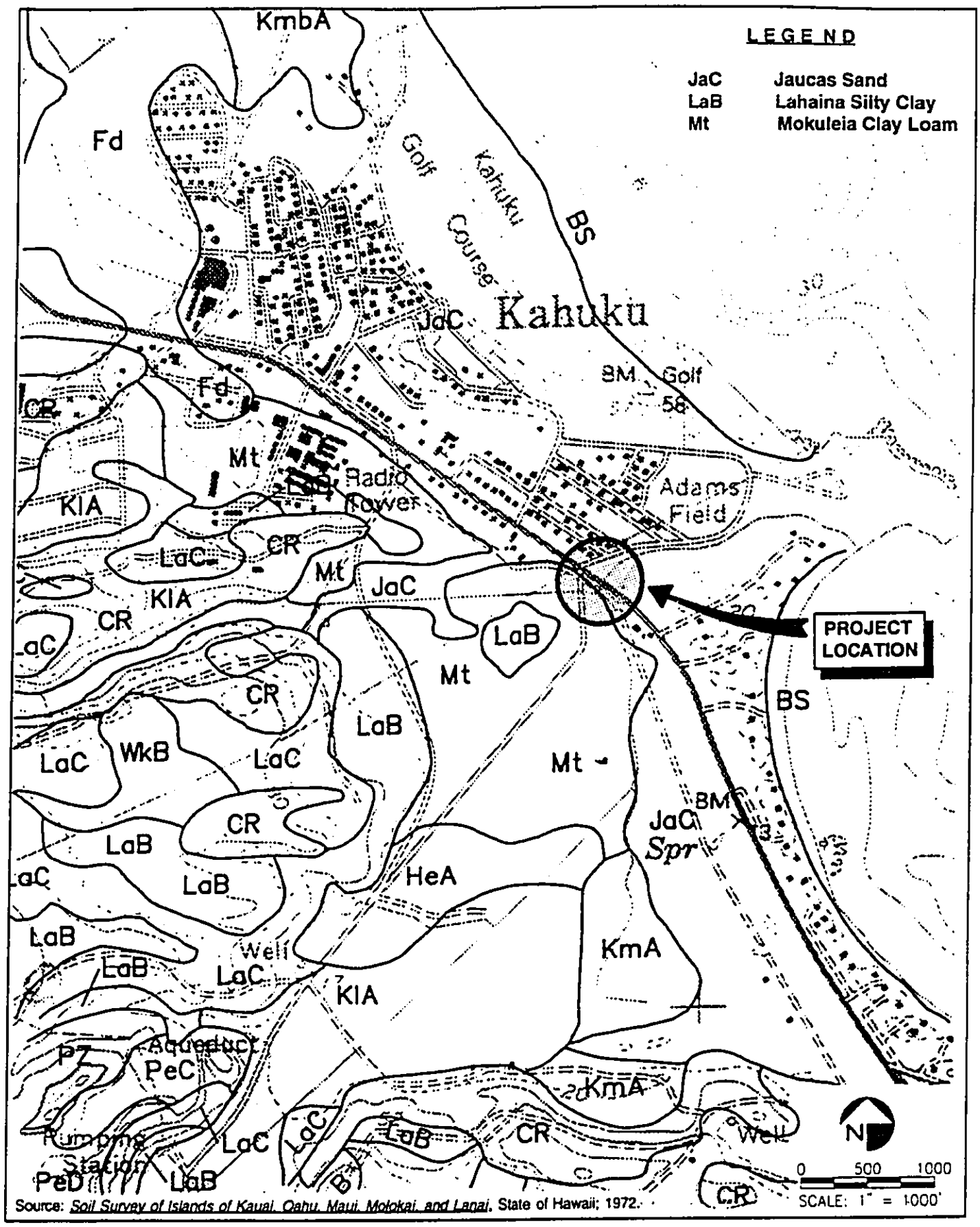
Earthquakes

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.

5.7 SOILS

The soils in or near the proposed project area consist of alluvial and colluvial materials derived from basic igneous rock, residual soils, calcareous beach deposits, coralline limestone, and consolidated and unconsolidated dune sand. The U.S. Department of Agriculture Soil Conservation Service, *Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii* (1972) shows that the proposed project area consists of approximately 90% Jaucas sand (JaC, 0 to 15% slopes) and 10% Mokuleia clay loam (Mt) on the mauka side of the bridge. Small patches of Lahaina silty clay (LaB, 3 to 7% slopes) border the project area on the mauka sides of the stream. **Figure 5.6** shows the distribution of soils at the proposed project site.

According to the USDA (1972), the Jaucas series consists of excessively drained, calcareous soils that occur as narrow strips in coastal plains near the sea. They occur at elevations ranging from sea level to 100 feet, and are deposited remnants of seashells and coral. Jaucas sand (JaC) is found in areas with a slope ranging from 0 to 15%. These soils are used for pasture land, recreation, sugarcane, and truck crop production. In the representative profile the soil is single grain, pale brown to vary pale brown, and sandy. Permeability is rapid and runoff is slow to very slow. The erosion hazard from water is slight, but severe for wind in areas devoid of vegetation.



Source: *Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai*, State of Hawaii; 1972.

EARTH TECH	Malaekahana Stream Bridge Replacement Environmental Assessment Soils Map	FIGURE 5.6

The Mokuleia series consists of well-drained soils along coastal plains that formed in recent alluvium deposited over coral sand (USDA 1972). These soils are found in elevations that range from sea level to 100 feet. The soils, like other soils in the area, are used for sugarcane, truck crops, and pasture. Mokuleia clay loam (Mt) occurs in small, nearly level areas along coastal plains. In a representative profile the soil is very dark greyish-brown clay loam at the surface. Below 16 inches the soil is dark-brown and light gray, single grain, and loamy sand. Permeability is moderate in the surface layer and rapid in the subsurface. Runoff is very slow and the erosion hazard is very slight.

The Lahaina series consists of well-drained soils on uplands that developed in material weathered from basic igneous rock (USDA 1972). These soils range in elevation from 10 to 1,500 feet and are used for sugarcane, pineapple, and truck crop cultivation. The Lahaina silty clay (LaB) is found on smooth uplands, and contains fragments of coral, stones, gravel, or sand when found near coastal plains. In the representative profile the surface layer is dark reddish-brown about 15 inches thick. Permeability is moderate and runoff is slow.

Soil borings conducted for the engineering of the proposed replacement bridge indicate that the near-surface soils (10 to 30 inches) are composed of medium compact coral sand and gravel. Deeper sections (70 to 80 inches) include firm, compact brown clay and gravel. Areas immediately mauka of the bridge contain fill material from previous construction and grading activities.

A survey of the project area by the USACE identified a small pocket of hydric soils on the mauka side of the bridge adjacent to the 24-inch wet-crossing and canehaul road. Hydric soils tend to support wetland vegetation and are one of the three indicators used to identify wetlands. They have characteristics that indicate they were developed in conditions where soil oxygen is limited by the presence of saturated soil for long periods during the growing season. Hydric soils predominately consist of decomposed plant material, has a thick layer of decomposing plant material on the surface, has a bluish gray or gray color below the surface, has the odor of rotten eggs, or is sandy with dark stains or dark streaks of organic material in the upper layer below the soil surface.

5.8 AQUATIC BIOLOGY

A recent survey of the aquatic biology and basic water quality of the Malaekahana Stream was conducted on March 4, 1997. This survey is included as Appendix A. The survey area included the project area and 40 meters upstream and downstream of the existing bridge. The following is a summary of the information provided in Appendix A.

5.8.1 Affected Environment

Malaekahana Stream is a somewhat degraded, partially channelized, perennial stream. Past agricultural practices in the area, channelization, and deposition of silt have most probably altered the natural flow characteristics and habitat for native aquatic species. The stream bottom upstream and downstream of the bridge is heavily silted with small, intermittent patches of rocks.

According to the *Hawaii Stream Assessment* (Cooperative Park Service Unit, 1990), the Malaekahana Stream is not rated as a significant stream in terms of its aquatic, cultural, and riparian resources. The stream was identified as having "moderate" recreational resources. The State

Department of Land and Natural Resources, *Instream Use Study* (DLNR 1983) also identified the Malaekahana Stream as having "low" and "poor" potential for stream fauna habitat, aesthetic enjoyment, and water-based recreation. The urban section, however, including the lower reaches downstream of bridge was rated as having a high potential for fauna habitat (DLNR 1983).

The field survey indicates that stream aquatic biology is dominated by introduced species including the Tahitian prawn (*Macrobrachium lar*) and the tilapia (*Sarotherodon mossambica*). Mosquito fish (*Gambusia affinis*), swordtail (*Xiphophorus helleri)* of the Family POECILIIDAE, and the native goby `O`opu naniha (*Stenogobius hawaiiensis*) also were identified in this stream. Additionally, the Juvenile Aholehole (Kuhlia sandwicensis) and the Juvenile Mullet (*Mugil cephalus*), both marine, euryhaline species were locally dominant and found schooling.

The *POECILIIDAE* fish and juvenile estuarine fish generally were congregated in the deeper sections of the stream near the cover of overhanging grass on the banks just downstream of the bridge. The tilapia and native 'O'opu appeared to prefer the riffle sections under the bridge. A filamentous green algae (*Chlorophyta*) also is present in thin layers on all the rocks in the stream bed. The numerous individuals of the endemic estuarine snail species Hapa-wai *(Neritina vespertina)* also were spotted grazing on algae covered rocks in the stream bed under the bridge.

No State of Hawaii or federally threatened or endangered species (USFWS, 1994a) were found in the project area during the field survey.

5.9 FLORA AND WETLANDS

A botanical and wetlands survey was completed at the project area in March 1997, and is included as Appendix B. An additional field reconnaissance survey of possible wetland sites in the APE was completed on March 28, 1997 by the USACE. The following is a summary of the information found in Appendix B and the results of the follow-up survey.

5.9.1 Affected Environment

The project area previously has been disturbed and cleared at various times since the original construction of the bridge. Consequently vegetation on the proposed construction parcel is dominated almost exclusively by introduced or alien plant species such as elephant grass, Guinea grass, Bermuda grass, koa haole, and many weedy annual species. Only two native species were observed during the field studies; these were the popolo (*Solanum americanum*) and 'uhaloa (*Waltheria indica*). Another species, the primrose willow or kamole (*Ludwigia octovalvis*), is possibly of early Polynesian introduction.

None of the plants found during the field studies is a listed, proposed, or candidate threatened or endangered species; nor is any plant considered a species of concern (U.S. Fish and Wildlife Service 1995, 1996). No sensitive native plant-dominated communities/vegetation types exist on the project area or on the immediate adjacent lands.

Wetlands

The USACE and the U.S. Environmental Protection Agency (USEPA) define wetlands as:

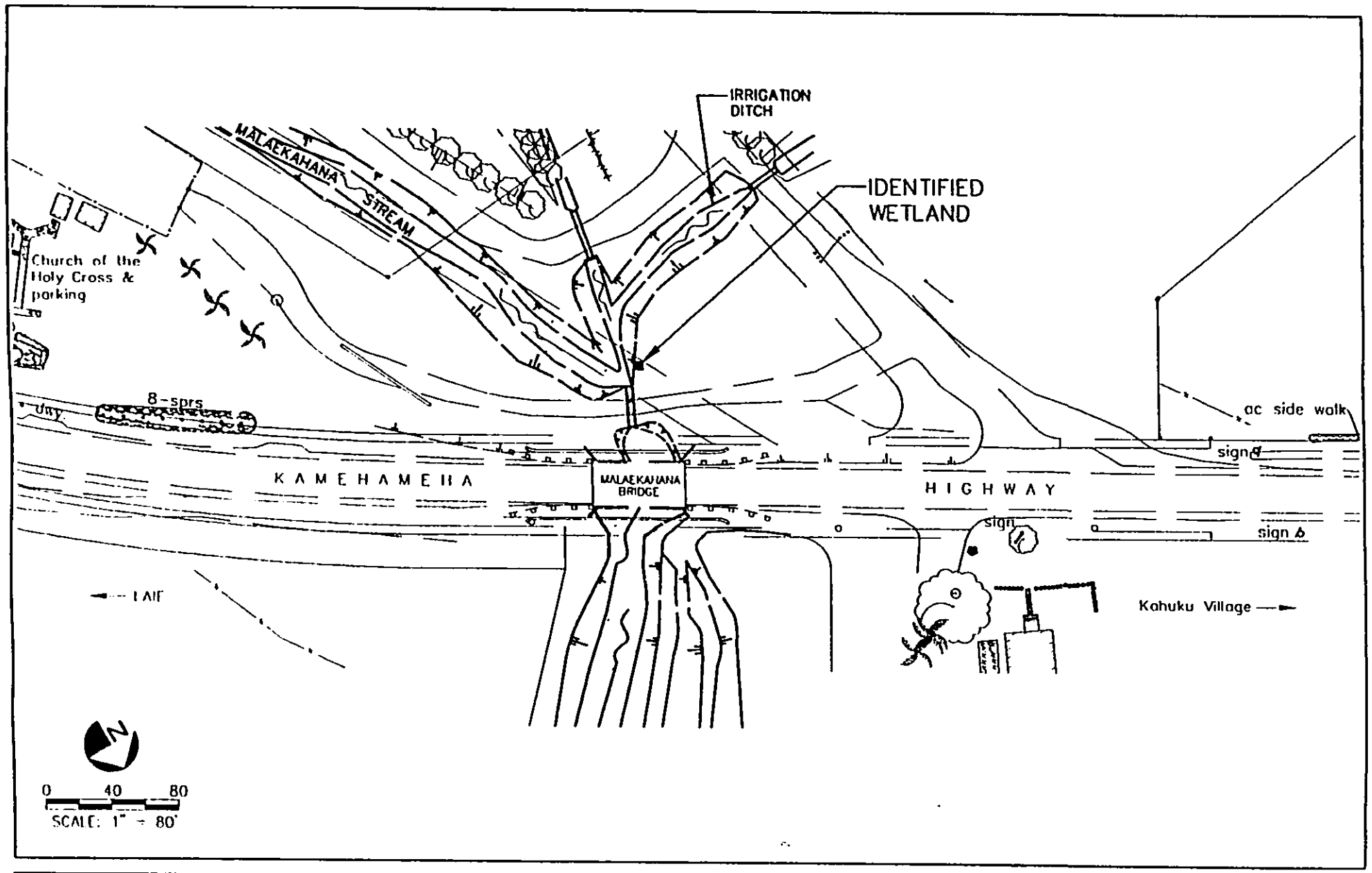
> Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

The USACE evaluates three indicators of wetlands when making wetland determinations - (1) vegetation, (2) soil, and (3) hydrology. All three characteristics must be present during some portion of the growing season for an area to be a wetland. If the area occurs in a floodplain or otherwise has low spots in which water stands at or above the soil surface during the growing season it meets the criteria for wetland hydrology. Vegetation types associated with wetlands are those that commonly occur in areas having standing water for part of the growing season. Soils also must be anaerobic hydric.

The APE contains a small area (less than 100 square feet) that was identified as having the three characteristics of a wetland. The area, directly mauka of the existing bridge adjacent to the wet-crossing on the Kahuku side of the stream, is periodically flooded, contains hydric soils, and wetland vegetation (**Figure 5.7**). Another small area in the irrigation ditch, approximately 50 feet from the bridge near the dirt access road, also was identified in the botanical survey as an area that may have the three characteristics of a wetland. Since it is outside the APE, however, it was not included in the follow-up wetland survey.

Wetland vegetation near the bridge consisting of wetland indicator species (Reed 1988) occurs as a narrow band along the edge of the stream mauka of the bridge. The wetland and wetland vegetation is limited by the top bank of the stream. California grass, a facultative wet (FACW) plant, lines most of the stream mauka and makai of the bridge and also the irrigation ditch. Honohono (*Commelina diffusa*), a FACW+ plant, also is abundant in places. There are scattered clumps of Job's tears (*Coix lachryma-jobi*), a FACW plant; and primrose willow or kamole (*Ludwigia octovalvis*), an obligate (OBL) wetland species. Where the irrigation ditch joins the Malaekahana Stream, there is a patch of water hyacinth (*Eichhornia crassipes*), an OBL plant.

The isolation and marginal condition of the wetland is the result of past extensive grading, clearing, and construction that occurred in the vicinity. Most of the area contains fill material used in the construction of the existing bridge, the canehaul road wetcrossing, the Church of the Holy Cross parking area, and the adjacent secondary road on the Kahuku side of the stream. Consequently, only a small area of hydric soils was identified in the APE.



EARTHTECH

Malaekahana Stream Bridge Replacement
Environmental Assessment
Wetland Map

FIGURE
5.7

and the Sanderling (*Calidris alba*) are common migrants found in or near the project area. These species are not threatened or endangered.

The field survey recorded two native waterbirds, the Black-crowned Night Heron (*Nycticorax nycticorax*) and the endangered Hawaiian Duck or Koloa (*Anas wyvilliana*). These birds are commonly seen in streams and wetlands in the Kahuku area. Three night heron and two koloa were tallied over the course of the spot checks at the project site. Other birds including the Hawaiian Coot (*Fulica americana*) and the Black-necked Stilt, both endangered species, have been recorded in the area in previous years.

Mammals

A limited amount of terrestrial mammals were recorded during the survey of the project area, including several feral cats (*Felis catus*) and the Small Indian Mongoose (*Herpestes auropunctatus*). Dog tracks also were noted but probably do not represent feral animals. The endangered Hawaiian Bat (*Lasiurus cinereus semotus*) was not found.

5.11 TRANSPORTATION

A traffic study was completed for this draft EA to review flow patterns at the Malackahana Bridge and assess potential impacts of the proposed project on traffic in the area. Information for the analysis was derived from the State DOT traffic counts for the Malaekahana section of Kamehameha Highway, and from manual morning and evening traffic surveys.

The State DOT counts were taken at the intersection of Hale Laa Boulevard and Kamehameha Highway (Station C-26-E), approximately 2 miles south of the bridge. An additional survey of traffic patterns just north of the Malaekahana Bridge was conducted for this draft EA on the morning of Friday February 28, 1997 (7:00 am to 8:00 am) and on the afternoon of Thursday March 13, 1997 (2:00 pm to 3:00 pm).

5.11.1 Affected Environment

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; sixteen rural communities are served by the highway including Laie and Kahuku. The highway is State maintained with a 50 foot right of way and 10-foot lanes in either direction. The posted speed limit is 35 miles per hour approaching the bridge 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 is minor urban development to the south, and Kahuku Village is immediately to the north. A small number of residences in Kahuku Village, on the makai side of the highway, access Kamehameha Highway directly from their properties approximately 75 to 100 feet from the existing bridge.

Kahuku High and Intermediate Schools are located on Kamehameha Highway approximately ½ mile north of the bridge. The St. Roch Catholic Church is located north of the APE on the mauka side of Kamehameha Highway. Another church (Church of the Holy Cross) is directly south of the APE, and has two right of way access points to the highway. The church also has a grassy parking area, of which a portion lies inside the APE at the Laie end of the proposed detour road (Figure 1.3). The parking area is most heavily used during Easter and Christmas.

To the immediate north of the project area on the mauka side of the highway is an unimproved access road owned by the James Campbell Estate. The access road primarily serves the estate's agricultural and aquaculture operations. No traffic use information is available for the road, however, reconnaissance observations during the traffic survey indicate that the road primarily is used by farmers, agricultural workers, and employees of the James Campbell Estate. Approximately 5 to 8 vehicles entered or exited the road to Kamehameha Highway at peak traffic hours in the morning and evening. Most traffic observed at the road entered and exited the access road from Kahuku.

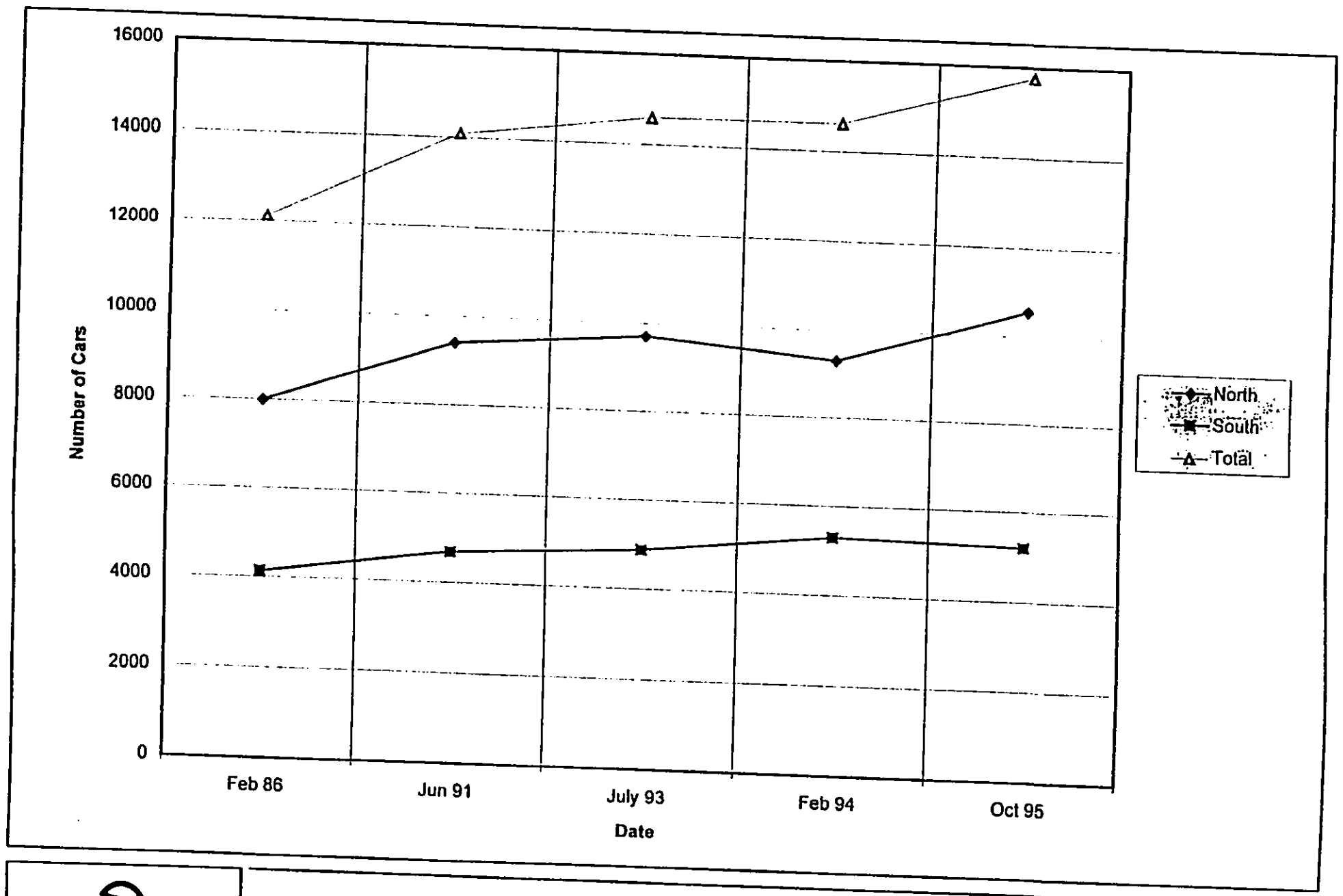
Traffic Patterns

Traffic patterns across the bridge are influenced by early morning and afternoon commuters (7:00 am to 8:00 am). Early morning south-bound traffic is dominated by people commuting from Kahuku to Laie for work. Some commuters travel to work in Honolulu in this direction, though it is likely that the majority travel from Kahuku to Honolulu via Haleiwa. North bound traffic appears to be dominated by people commuting to Kahuku for work and school.

Afternoon peak traffic (2:00 pm to 3:00 pm) in the area appears to be dominated by people leaving Kahuku school. Evening traffic peaks are indicative of people returning home to Kahuku from Laie and Honolulu.

Traffic counts for Kamehameha Highway are shown in **Figures 5.8, 5.9,** and **5.10. Figure 5.8** summarizes 24 hour traffic counts taken by the State DOT. The graph shows a gradual upward trend in traffic counts between the years 1986 and 1995 with the largest increase occurring in traffic flowing in the northerly direction. A 24 hour traffic count for 1996 was not available.

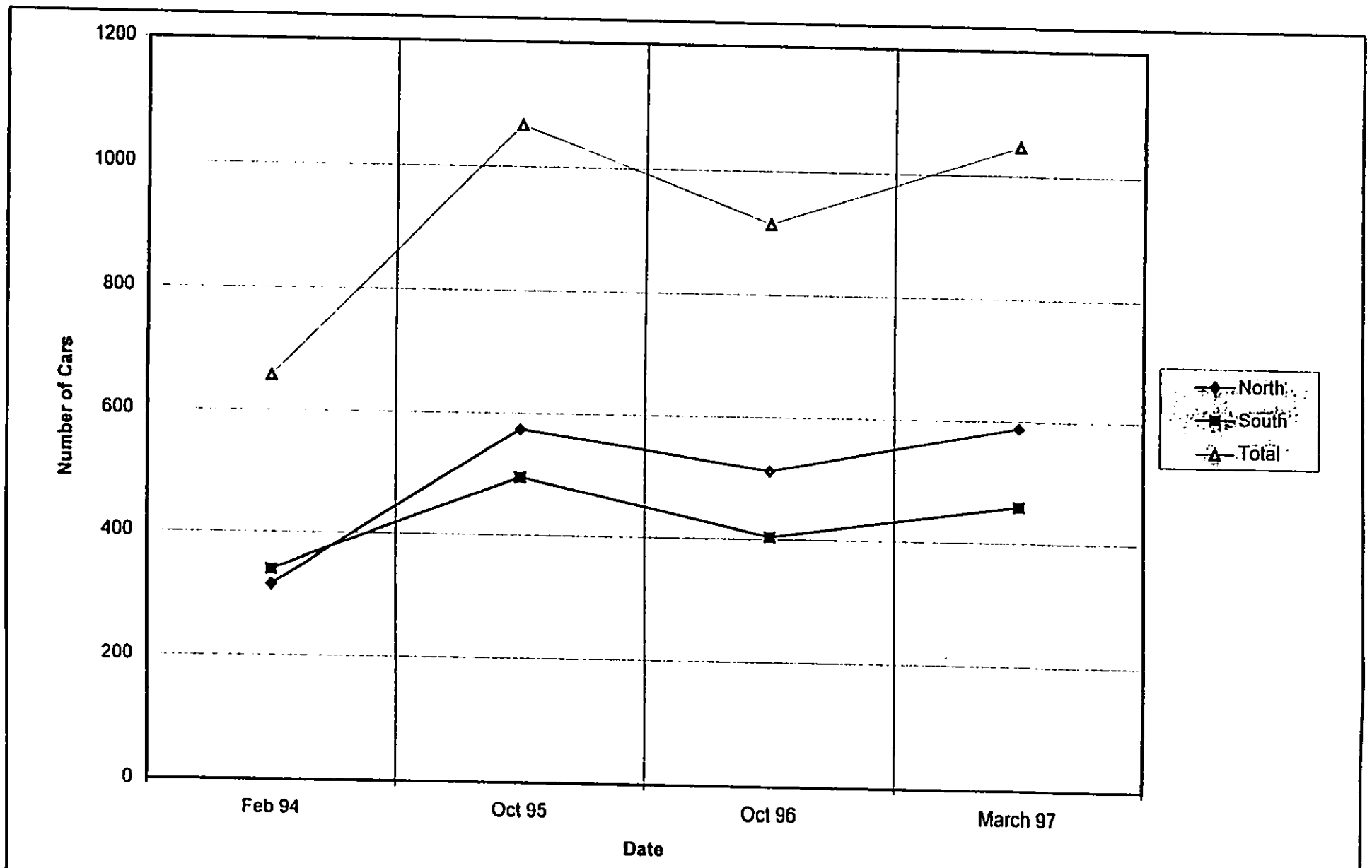
Figures 5.9 and 5.10 show the peak morning (7:00 am - 8:00 am) and afternoon (2:00 pm - 3:00 pm) traffic counts, respectively, for the years 1994 to present. From 1994 through 1996 the counts were done by the State DOT at the Hale Laa Boulevard/Kamehameha intersection, while the March 1997 count was done for this draft EA at the north side of the bridge. The graph of morning traffic (**Figure 5.9**) shows a substantial increase in traffic on Kamehameha Highway between 1994 and 1997. Conversely, the graph of evening traffic (**Figure 5.10**) shows a gradual decrease in traffic over the same time period. These figures further demonstrate that traffic patterns are dominated by local use.



EARTHTECH

Malaekahana Stream Bridge Replacement
Environmental Assessment
24 Hour Traffic Count

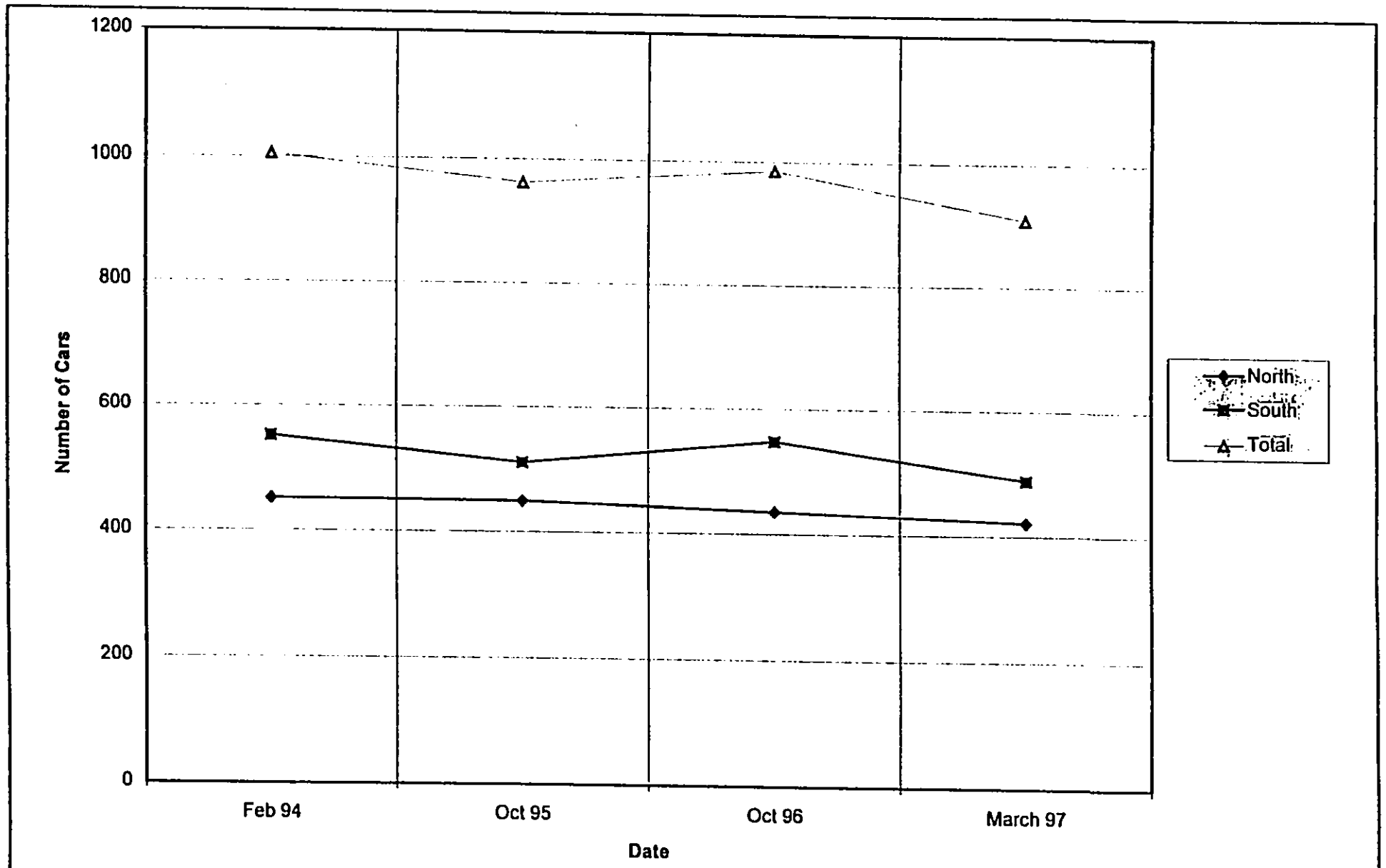
FIGURE
5.8



EARTHTECH

Malaekahana Stream Bridge Replacement
Environmental Assessment
Peak Traffic Count Morning

FIGURE
5.9



EARTHTECH

Malaekahana Stream Bridge Replacement
Environmental Assessment
Peak Traffic Count Evening

FIGURE
5.10

5.12 CULTURAL RESOURCES

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.

Because this document analyzes potential impacts from an undertaking that is partially financed by federal funds, federal statutes and regulations also apply. In addition to NEPA, these laws include the National Historic Preservation Act and its implementing regulations (36 CFR 800) and the Native American Graves Protection and Repatriation Act (NAGPRA). Review of cultural resources also has been conducted in accordance with Hawaii Revised Statutes, Chapter 6E, Historic Preservation. Potential effects on cultural and historical resources also are a component of the Coastal Zone Management Act review process.

To prevent sensitive archaeological areas from unauthorized collection and/or vandalism, the Freedom of Information Act (5 U.S.C. 552(b)) exempts site location information from disclosure; therefore, no site location maps are provided within this EA. Site records can be reviewed at the Hawaii State Historic Preservation Division, Department of Land and Natural Resources (HPD, DLNR).

5.12.1 Affected Environment

The area of potential effect (APE) for cultural resources encompasses approximately 3 acres of land beneath and to the north of the existing Malaekahana Bridge (within the Malaekahana Stream channel). The entirety of the project area has been previously disturbed from the original bridge construction, from the construction of a network of dirt roads, and from the grading and landscaping of the Church of the Holy Cross parking area.

Prehistoric, Historic, and Traditional Resources

The APE is situated within the Malaekahana Ahupua'a, between Laie and Kahuku on the northeast coast of Oahu. References to Malaekahana in the cultural resources literature are sparse; however, a settlement there was described in a journal written by Levi Chamberlain as early as 1826; other references to Malaekahana are found in missionary reports of the 1800s and historical works from the 1900s.

According to Handy and Handy (1972), the Malaekahana area was densely populated during pre-Contact and early post-Contact periods, with agricultural terraces situated near streams and springs. Malaekahana was conveyed to Charles Hopkins for use as a ranch in 1850 and, sometime before 1889, the land was purchased by James Campbell. Campbell used the land for ranching and, in the 1920s and 1930s, leased portions for the growing of sugar cane (which destroyed most of the early agricultural terraces) and railroad development (Water Resources Associates 1996). The portion of Malaekahana mauka of the Kamehameha Highway remains under the ownership of the Campbell Estate and continues to be used as ranchland (Jensen 1989); the portion of Malaekahana makai of

the Kamehameha Highway was purchased by the state of Hawaii in 1975. A portion of this parcel is set aside as the Malaekahana State Recreation Area.

Previous archaeological studies within, or in the vicinity, of the Malaekahana Ahupua'a include those conducted by McAllister (1933), Dye (1977), Clark (1978), Schilt (1979), Yent and Estioko-Griffin (1980), Barrera (1979), Sinoto, (1981), Davis (1981 and 1982); Rogers-Jourdane (1982), Bath (1984), Neller (1984), Walker and Haun (1986), Jensen (1989), Dunn and Rosendahl (1992), and Hammatt (1996). Historical research and ethnographic studies of the area have also been conducted and include those by Handy and Handy (1972), Nakamura (1981), and Smith (1989). Results of the studies indicate that, in the vicinity of the project area, several prehistoric, historic, and traditional use sites have been recorded. Site types include fishing shrines, habitation sites, World War II historic sites, and burials. None of the recorded sites are located within the APE.

Historic Buildings and Structures

The only structure within the APE is the bridge itself. The short-span bridge is constructed of reinforced concrete and is believed to have been built by the Kahuku Sugar Company in 1937.

5.13 SOCIOECONOMIC CHARACTERISTICS

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

5.13.1 Affected Environment

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 21 percent other ethnicities.

The town of Kahuku is located just north of the Malaekahana Stream Bridge, and 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 sugar-based industries 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.

The Malaekahana area borders Kahuku Village and stretches to Malaekahana State Recreation Area to the south. The area contains vacation homes and cottages along the coast, as well as the Malaekahana State Recreation Park. The mauka portions of the Malaekahana area contain aquaculture ponds and ex-sugarcane fields planted in various truck crops.

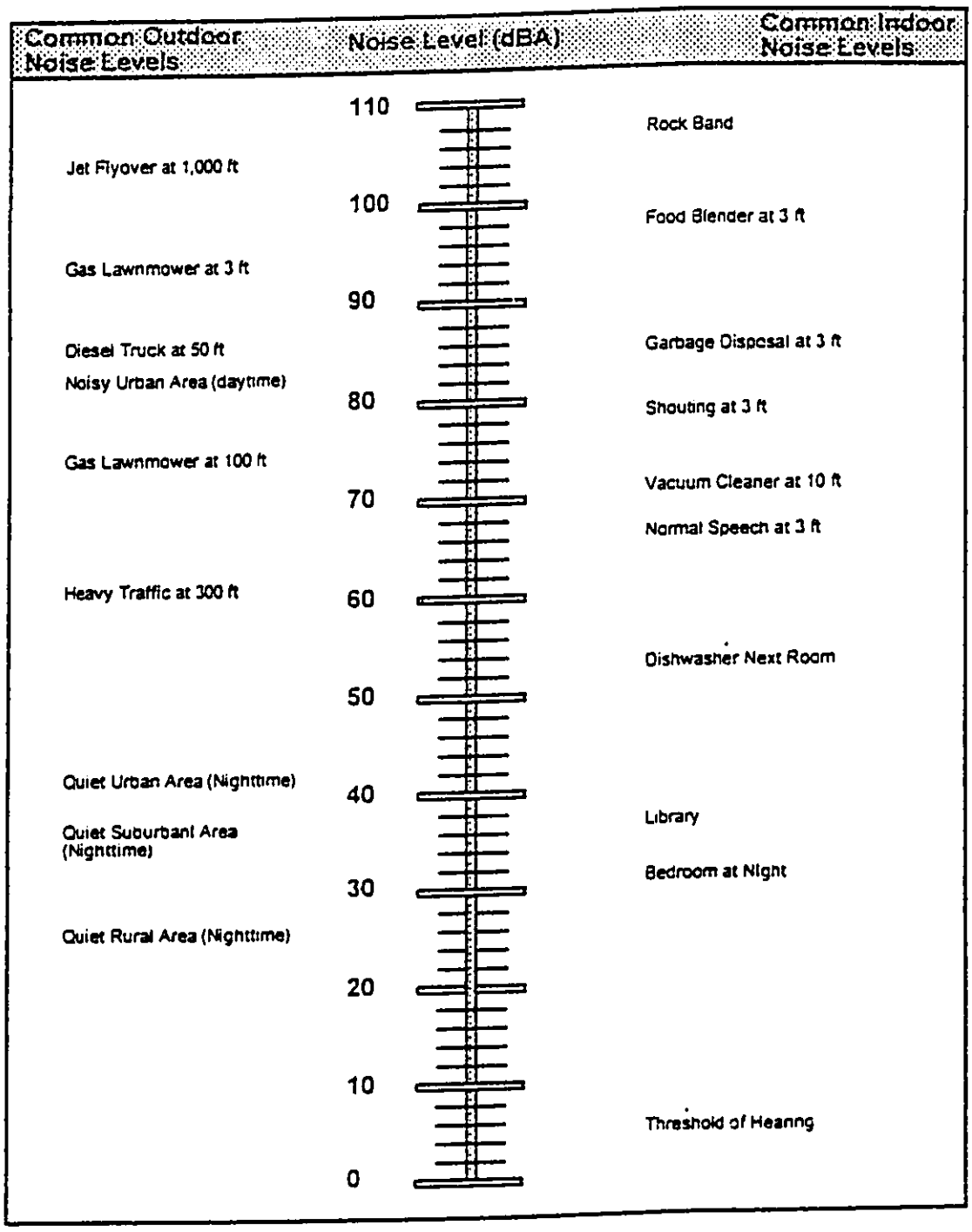
Laie is the largest community in the Koolauloa District. It is the religious and educational center of the Church of Jesus Christ of Latter Day Saints. The church temple and the campus of Brigham Young University - Hawaii (BYU-Hawaii) are located in Laie. The Church and BYU-Hawaii also own and operate 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.

5.14 NOISE

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 amplitudes is subjective.

Different sounds have different frequency content. When describing sound and its effect on a human population, A-weighted (dBA) sound levels are typically used to account for the response of the human ear. The term "A-weighted" refers to a filtering of the noise signal to emphasize frequencies in the middle of the audible spectrum and to de-emphasize low and high frequencies in a manner corresponding to the way the human ear perceives sound. This filtering network has been established by the American National Standards Institute (ANSI 1983). The A-weighted noise level has been found to correlate well with a persons judgment of the noisiness of different sounds and has been used for many years as a measure of community noise. Typical noise levels from various sources are shown in **Figure 5.11.**

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 (L_{dn}). The L_{dn} 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. L_{dn} 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.



EARTH TECH

Malaekahana Stream Bridge Replacement
Environmental Assessment
Comparative Noise Levels

FIGURE
5.11

The Hawaii Department of Health monitors noise issues in accordance with HRS, Title 19, Chapter 342F. Noise permits are issued by the Director 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 5.5**).

Table 5.5
Permissible Noise Exposure Levels

Duration (Hours/Day)	*Sound Level in Decibels*
8	90
6	92
4	95
3	97
2	100
1 to 1.5	102
1	105
0.5	110
0.25 or less	115

Source: 29 CFR 1910.95

5.14.1 Affected Environment

The nearest sensitive noise receptors (human) to the Malaekahana Bridge project area include the Church of the Holy Cross, which is located on the mauka side of the highway (immediately adjacent to the bridge on the south approach); the Malaekahana State Recreation Area located mauka of the highway; and a number of dwellings associated with the Village of Kahuku that are located on both sides of Kamehameha Highway along the north approach (see Figure 1.3). The nearest wildlife sensitive noise receptors are more than one mile from the project area. These areas include the Kii National Wildlife Refuge and the Kihewamoku Island and Mokuaula Island State Seabird Sanctuaries.

The major contributor of noise in the vicinity of the project area is vehicular. As described in Section 5.11, the 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 landscape. In addition, most of the identified properties in the bridge area are located in close proximity to the Kamehameha Highway (less than 75 feet), causing noise levels near the buildings to be more similar to a noisy urban area (80-85dBA) (**Figure 5.11**).

5.15 VISUAL RESOURCES

Visual resources are the aggregate of characteristic features imparting visually aesthetic qualities to a natural, rural, or urban environment. This resource is assessed during the environmental impact analysis process to determine whether or not projects will be compatible with the existing landscape. Potential visual resource effects are also a component of the Coastal Zone Management Act review process.

5.15.1 Affected Environment

The landscape along the Kamehameha Highway between Laie and Kahuku is predominantly rural in its visual character. Vegetation buffers both sides of the Kamehameha Highway--randomly on the mauka side of the road; almost continuously on the makai side. Immediately adjacent to the Malaekahana Bridge, the vegetation is dense on both sides, obscuring the bridge from view in either direction; approaching views of the bridge from Kamehameha in both directions, are unobstructed. A single facility (the Church of the Holy Cross), is located on the mauka side of the highway and is in direct view of the bridge approaching from the south. Approaching from the north, the bridge is visible from several dwellings (associated with the Village of Kahuku) located on the makai side of the highway. Because of the placement of the bridge and the surrounding vegetation, the experience of open space and views is limited to a few dwellings and approaching traffic; scenic vistas and/or viewplanes are not present.

5.16 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 Chapter 343, HRS, 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 established ambient air quality standards (Chapter 11-59, HAR) that are as strict or in some cases stricter than the NAAQS. **Table 5.6** summarizes the national and state ambient air quality standards.

Table 5.6
National and State Ambient Air Quality Standards

Pollutant	*Averaging Time*	*National Ambient Air Quality Standard*[a] *ppm (µg/m³)*	*Hawaii Ambient Air Quality Standard*[b] *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

a. National standards, other than ozone and those based on annual or quarterly averages, are not to be exceeded more than once a year. Standards based on annual or quarterly averages are not to be exceeded. The ozone standard is not to be exceeded on more than an average of 1 day a year over a 3-year period.

b. Hawaii standards, other than those based on annual or quarterly averages, are not to be exceeded more than once in any 12-month period. Standards based on annual or quarterly averages are not to be exceeded.

Air quality standards are consistently amended by the U.S. EPA and the state to reflect current research findings in the field. In 1993, the State of Hawaii amended the Chapter 11-59 Ambient Air Quality standards by relaxing the standards for particulate matter equal to or less than 10 microns in diameter (PM_{10}) to the federal level ($150\mu g/m^3$). PM_{10} comprises approximately half of the total suspended particulate matter (TSP) in Hawaii. The State of Hawaii also established standards for fugitive dust emissions emanating from construction activities. This standard prohibits any visible release of fugitive dust from construction sources.

The State of Hawaii has monitored ambient air quality since 1957. Prior to 1971, however, monitoring only occurred at one site. By 1993, there were a total of 12 stations throughout the state that monitor five regulated pollutants including:

- Particulate Matter $\leq$ 10 microns (PM_{10})
- Carbon Monoxide (CO)
- Ozone (O_3)
- Sulfur Dioxide (SO_2)
- Total Suspended Particulate Matter (TSP)

The following section describes the existing ambient air quality conditions at the Malaekahana Stream Bridge area.

5.16.1 Affected Environment

There is no ambient air quality monitoring station in the vicinity of Malaekahana. The nearest monitoring site on the windward side of Oahu in Waimanalo. In general, however, it can be assumed that air quality at the APE 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. Agricultural activities (spraying of pesticides and fungicides) and natural sources (sea spray and pollen) also contribute to air pollution in the area. Agricultural activity, however, has declined since the demise of the Kahuku Plantation. The most noteworthy source of air pollution is the vehicular traffic that produces carbon monoxide (CO) and carbon dioxide (CO_2).

Although it is located 20 miles to the south, air quality data from Waimanalo gives an indication of ambient air quality levels in Kahuku and Malaekahana. 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 PM_{10} in Waimanalo since 1971, and the data indicates that particulate levels are within federal and state standards. **Table 5.7** shows PM_{10} monitoring data for Waimanalo.

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 standards (Morrow 1990).

5.17 HAZARDOUS WASTES AND MATERIALS

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

5.18 UTILITIES AND INFRASTRUCTURE

Utility lines and infrastructure are located in or near the project area, including 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 bridge along Kamehameha Highway. Fire and police services are located in Kahuku less than one mile from the project area. There are no storage structures in the project area.

Table 5.7
Hawaii Air Monitoring Data

Particulate Matter (µg/m³); Monthly Average - 24-Hour Sampling

	Month												
Year	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Annual Average*
1979	34	30	38	31	30	30	32	26	26	30	30	24	30
1980	30	29	46	39	24	25	24	23	25	27	34	23	29
1981	34	37	27	23	26	31	24	22	20	20	37	32	28
1982	20	31	29	31	30	17	31	25	29	19	34	27	27
1983	20	38	26	28	23	22	20	20	21	26	21	19	26
1984	23	17	29	27	22	22	27	23	16	23	24	36	25
1985	24	25	43	29	29	24	24	18	20	27	20	39	26
1986	30	39	36	37	28	26	20	22	22	23	32	23	28
1987	29	32	30	28	28	25	27	26	28	22	21	30	25
1988	34	43	36	27	25	22	29	26	25	18	27	34	29
1989	30	30	24	32	33	30							

From 7/89, replaced by PM-10 sampler. See below.

PM-10* (µg/m³); Monthly Average - 24-Hour Sampling

	Month												
Year	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*June*	*July*	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*	*Annual Average*
1989							19	16	13	16	16	13	16
1990	20	15	14	15	14	15	11	11	16	16	20	18	15
1991	17	22	23	19	27	12	11	13	13	11	16	19	17
1992	17	16	16	19	18	19	16	17	21	12	15	17	17
1993	12	15	17	16	32	--	20	18	12	14	14	18	17

* Particulate matter equal to or less than 10 microns in diameter.
* Source State of Hawaii Department of Health

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CHAPTER 6
SUMMARY OF ANTICIPATED ENVIRONMENTAL IMPACTS AND PROPOSED MITIGATION MEASURES

6.0 SUMMARY OF ANTICIPATED ENVIRONMENTAL IMPACTS AND PROPOSED MITIGATION MEASURES

Chapter 343, HRS, and Title 11-200-10 Hawaii Administrative Rules (HAR) require the identification and summary of impacts or effects on the environment within the project area or APE. Project related effects, both detrimental and beneficial, include primary, secondary, and cumulative effects. Primary effects are effects which are caused by the action and occur at the same time and place. Secondary effects are effects which are caused by the action and occur later in time or farther removed in distance, but are still reasonably foreseeable. Cumulative effects refer to effects which 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 also are divided into short-term and long-term effects. Short-term effects are related to construction activities. Long-term effects refer to the effects caused from the operation of the proposed action, and are longer in duration.

Environmental assessments also are required to contain a summary of any proposed mitigation measures. These measures should be designed to lessen the extent or duration of the anticipated environmental effects.

The following is a summary of the anticipated environmental effects and proposed mitigation measures for the proposed replacement of the Malaekahana Stream Bridge. In general, environmental impacts will be short-term and related to construction activities.

6.1 WATER RESOURCES

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.

Malaekahana Stream drainage will be temporarily affected during the placement and removal of the prefabricated 78" and 36" culverts, and grading activities for the project. The existing drainage conditions, however, will be retained throughout the duration of the construction activities.

The development of the replacement bridge is anticipated to have a beneficial impact on long-term drainage patterns at Malaekahana. The increased width of the bridge abutments from 50 feet to 100 feet will increase the capacity of the bridge to accommodate storm water flows. Scouring of the abutments and the build-up of silt and debris under the bridge will be reduced as a result of the project. It is anticipated that flooding of Kahuku Village and the overtopping of Kamehameha

Highway in the vicinity of the bridge will be reduced as a long-term result of the bridge replacement project.

Due to the heavily silted condition of the stream bottom, short-term turbidity will be increased and water quality reduced downstream of the bridge during the demolition of the existing bridge and the construction and removal of the culverts and detour bridge. Runoff and erosion from grading and the temporary loss of near stream vegetation during the construction phase of the project also may contribute to reduced stream water quality.

Due to the proximity of the project area to the coast (approximately ½ mile) and the existing water quality conditions, there are no anticipated long-term impacts for coastal waters. Increased sediment from construction of the detour bridge may temporarily affect water quality in the nearshore area, but this is expected to be short-term.

6.1.1 Cumulative Impacts

No other projects (federal, state, county, or community) were identified in the vicinity of the Malaekahana Stream bridge replacement project. Therefore, when reviewed against past, present, and reasonably foreseeable future actions, no cumulative effects on water resources are expected.

6.1.2 Mitigation Measures

To provide continuous drainage through the duration of the project, culverts will be placed in the stream and the detour road will be constructed prior to any construction activities. Construction activities also are scheduled in the spring and summer months to avoid heavy rains and hurricanes that may cause construction related delays.

During the construction phase of the project, temporary erosion control Best Management Practices (BMP) will be implemented by the contractor. This includes, but is not limited to, the creation of control swales to channel runoff near the detour bridge, establishment of sediment traps, and construction of control berms. Areas graded and denuded of vegetation will be mulched during all phases of the project. Silt fences along the stream will be used to reduce short-term erosion.

Following completion of the construction phase, permanent erosion control measures will be implemented in the project area including the revegetation of the stream banks and areas graded during construction. A water quality monitoring program also will be implemented during construction, pursuant to the requirements of the 401 Water Quality Certification.

The replacement bridge abutments will be placed outside the stream, and construction in the stream area will be minimized to the furthest 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.

6.2 AQUATIC BIOLOGY

The impacts to aquatic biota are anticipated to be short-term and related to construction activities. Construction activities and the resulting increase in turbidity will negatively affect the local aquatic population. It is anticipated, however, that the existing stream ecology will return following the completion of these activities. It also is anticipated that aquatic species will most probably not suffer long-term negative effects from increased short-term turbidity because of the already degraded and silted condition of their existing habitat.

6.2.1 Cumulative Impacts

No other projects (federal, state, county, and community) were identified in the vicinity of the Malaekahana Stream Replacement project. Therefore, when reviewed against past, present, and reasonably foreseeable future actions, no cumulative effects on the aquatic biology are expected.

6.2.2 Mitigation Measures

Erosion control BMPs will be used to control turbidity and decrease negative effects to water quality and stream habitat (see Section 6.1.2). 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.

6.3 FLORA AND WETLANDS

Construction of the temporary detour road and the replacement bridge will have short-term impacts on vegetation. Approximately 3 acres of riparian area will be disturbed; however, given the existing botanical conditions within the project area and the short duration of the construction activities, the proposed action is not expected to have any significant negative effects.

Wetlands

The wetland area (less than 100 square feet) on the Kahuku side of the stream, mauka of the bridge will be temporarily affected by the proposed action. The proposed path of the detour road crosses the area near the existing canehaul road wet-crossing. The area will be temporarily graded and filled to accommodate the detour bridge.

Disturbance of the small wetland area is not expected to cause significant long-term effects. The area was identified as marginally meeting the criteria of a wetland, because of the past disturbances in the area, and it is anticipated that wetland vegetation in the area will again rapidly repopulate the area and thrive following the removal of the detour road and completion of the project. Consequently, there are no anticipated long-term impacts of the proposed action on botanical and wetland resources in the project area. Wetlands located outside the project area will not be affected by the proposed project.

6.3.1 Cumulative Impacts

No other projects (federal, state, county, and community) were identified in the vicinity of the Malaekahana Stream bridge replacement project. Therefore, when reviewed against past, present, and reasonably foreseeable future actions, no cumulative effects on the floral resources and wetlands are expected.

6.3.2 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 area.

All project related materials will be placed or stored in ways to avoid or minimize disturbance to the stream area. Construction equipment will be baseyarded in the area between the detour road and the replacement bridge to reduce potential impacts to vegetation bordering the project area.

Wetlands

Construction of the detour bridge and road will be completed with as little disruption to the small wetland area as possible. The use of fill material will be minimized in the development of the detour bridge near the small wetland area. After completion of the project, all fill material will be removed and the area will be restored and revegetated with compatible native wetland species.

6.4 AVIFAUNA AND MAMMALS

Construction activities such as clearing and noise associated with the proposed action would 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 activities. Clearing of the near-stream vegetation will reduce cover used by various bird species, including the endangered Hawaiian Duck, Black-necked Stilt, and Hawaiian Owl. Effects on birds and their habitat are anticipated to be short-term; effects on endangered or threatened species are not expected.

6.4.1 Cumulative Impacts

No other projects (federal, state, county, and community) were identified in the vicinity of the Malaekahana Stream bridge replacement project. Therefore, when reviewed against past, present, and reasonably foreseeable future actions, no cumulative effects on the avifauna and mammal populations and their habitat are expected.

6.4.2 Mitigation Measures

During the clearing and construction phase of the project, if any nesting birds are discovered in the area project activities will cease. The State Department of Land and Natural Resources and the U.S. Fish and Wildlife Service will be contacted for advice before proceeding.

Following completion of the proposed project, the area will be restored and revegetated to as close to its original condition as is possible. Cleared areas are expected to recover quickly.

6.5 TRANSPORTATION

Effects on transportation are expected to be short-term and will mainly be experienced 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 demolition and bridge and detour road construction phases.

The detour road will be completed during the first 6 to 8 weeks of the project, after which traffic will be routed away from the existing bridge along the detour road. The detour road will have the same posted speed limit of 35 miles per hour.

Traffic patterns throughout the course of the proposed 12 month project should not be substantially altered by the proposed action; however, some minor delays during peak traffic hours can be expected. This can be largely attributed to the arrival and departure of construction crews.

The greatest disruption to normal traffic patterns will occur during the 6 month period when the detour is in 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 dirt access road owned by the James Campbell Estate. Due to the potential for reduced visibility of vehicles entering the detour road from the dirt access road, traffic will be prohibited from making right turns on the detour road from the dirt access road.

Traffic entering and leaving the Church of the Holy Cross may also be affected by temporary obstruction of the Laie bound entrance to the church parking area. Vehicles traveling from Kahuku to the church will have to enter the church parking area at the end of the detour road.

Approximately one-third of the Church of the Holy Cross parking area is included in the project area. Consequently, church parking will be affected through the duration of the project. The church sprinklers near the beginning of the detour road also will be temporarily removed during construction. These effects will not pose a significant impact to the church, according to the church pastor.

Vehicles entering and exiting the project area from Kahuku Village on the makai side of Kamehameha Highway also will be affected by the proposed detour road alignment. Vehicles entering the detour road from the Kahuku Village area will have a reduced line of site and a sharper turn to the Laie direction.

There are no anticipated long-term negative effects from the proposed project. Short-term effects include minor changes to traffic patterns as a result of the detour road; however, those changes will be alleviated by new signage. Pedestrian and bicycle accessibility and safety in the area will be enhanced as a result of the widening of the traffic lanes and the addition of shoulders and bicycle lanes.

6.5.1 Cumulative Impacts

No other projects (federal, state, county, and community) were identified in the vicinity of the Malaekahana Stream bridge replacement project. Therefore, when reviewed against past, present, and reasonably foreseeable future actions, no cumulative effects on transportation in the area are expected.

6.5.2 Mitigation Measures

Appropriate traffic signs and controls will be posted along the highway on either side of the project area, and along the detour road to reduce traffic flow delays and potential hazards from reduced visibility. Baseyarding of equipment will be restricted from the church parking area to reduce the impact to church parking on weekends and holidays. The access point at the church parking area will be widened to accommodate two lanes of entering and exiting traffic. To the extent possible, the construction work also will begin after Easter and end prior to Christmas to allow full use of the church parking area by church parishioners. The church parking area and sprinklers will be restored to their pre-construction condition at the end of the project.

6.6 CULTURAL RESOURCES

Results of a records search conducted at the State Historic Preservation Division, DLNR, indicate that while prehistoric, historic, and traditional sites are known to occur in the vicinity of the bridge replacement project area, no sites have been identified within the APE. Consultation with the Island of Oahu Historic Preservation Specialist (Jourdane) at HPD, DLNR (January 1997), indicates that 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 Malaekahana area, no additional archaeological survey and no construction monitoring will be required. Based on the existing information and the recent consultation with the Hawaii HPD, no effects on historic properties are expected.

The Malaekahana Stream Bridge is greater than 50 years in age. It is not listed on the Hawaii Register of Historic Places or the National Register of Historic Places and does not meet the criteria for historical significance outlined in guidance provided by the Hawaii HPD or National Park Service Bulletin 15 (*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.

6.6.1 Cumulative Impacts

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

6.6.2 Mitigation Measures

Although no effects on historic properties are expected from the Malaekahana Stream Bridge replacement, the presence of cultural resources sites in the vicinity of the project area 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 unexpectedly discovered during the course of construction, ground disturbing activities will cease in the immediate area and the HPD, DLNR will be contacted. If native Hawaiian remains are encountered, the Oahu Burial Council also will be consulted.

6.7 SOCIOECONOMIC

There are no anticipated short-term or long-term socioeconomic impacts from the proposed project. The development of the replacement 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.

6.7.1 Cumulative Impacts

No other projects (federal, state, county, or community) were identified in the vicinity of the Malaekahana Stream bridge replacement project. Therefore, when reviewed against past, present, and reasonably foreseeable future actions, no cumulative effects on socioeconomic conditions are expected.

6.8 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 6.1.** Long-term effects are not expected and noise levels would not exceed the permissible noise exposure levels shown in **Table 5.5** or as defined by the State Department of Health; construction activities would be conducted on weekdays and in daytime hours in accordance with Chapter 342-F-1, HRS. As a result, no significant noise impacts are expected from replacement of the Malaekahana Bridge.

Table 6.1
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

6.8.1 Cumulative Impacts

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

6.8.2 Mitigation Measures

Short-term construction-related noise impacts are unavoidable, but will be controlled to within acceptable limits by 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.

6.9 VISUAL

Disruption of the existing visual quality near the bridge will be short-term and minor as a result of construction (e.g., grading, contouring for the detour road and stream improvements), necessary vegetation removal, stockpiling of materials, and utility pole relocation. 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 bridge replacement.

6.9.1 Cumulative Impacts

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

6.9.2 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.

6.10 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. Effects are expected to be short-term; no long-term impacts on air quality are anticipated.

Construction vehicles traveling to and from the APE will increase vehicular emissions in the area at the beginning and end of the project. On-site construction equipment, consisting of primarily 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 the 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 1.2 tons/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 State DOH standards will not be exceeded.

6.10.1 Cumulative Impacts

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

6.10.2 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.

6.11 HAZARDOUS WASTES AND MATERIALS

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

6.11.1 Cumulative Impacts

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

6.11.2 Mitigation Measures

Construction materials, including petroleum products, will be stored in a confined area away from the stream and wetland. To the extent possible, equipment will be kept free of pollutants during construction activities. All wastes will be removed from the project area after completion of the project.

A contingency plan to control accidental spills of petroleum products shall be developed and implemented at the project site. Absorbent pads and containment booms shall be stored on-site to facilitate quick response and clean-up of any spills. The contractor also will avoid dumping any material in the stream during clearing and construction activities.

6.12 UTILITIES AND INFRASTRUCTURE

There will be short-term effects to utilities in the area resulting from their relocation to the mauka side of the detour road during the proposed project.

Excavation activities, demoltion of the detour road, and demolition of the existing bridge also will create solid wastes that will be disposed of off-site. The disposal of these solid wastes will have a secondary, long-term effect on the island's sanitary landfills. The disposal of project wastes is not expected to have a significant effect on the island's landfill capacity.

6.12.1 Cumulative Impacts

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

6.12.2 Mitigation Measures

After completion of the project all utilities will be replaced to their pre-construction locations along the highway.

Wastes generated from the proposed project will be disposed of at approved landfills. To the extent possible, soil and useable materials will be recycled to minimize effects on landfills in the area.

6.13 Natural Hazards

Floods

The proposed project will have a positive effect on the flooding problem in the Malaekahana area. The widening of the 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.

6.13.1 Cumulative Impacts

No other projects (federal, state, county or community) have been identified in the vicinity of the Malaekahana Stream bridge replacement project. Therefore, when reviewed against past, present, and reasonable foreseeable future actions, no cumulative effects on, or from, flooding are expected.

6.13.2 Mitigation Measures

Existing drainage patterns will be maintained to minimize any potential flooding throughout the duration of the proposed project.

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CHAPTER 7
AGENCIES, CITIZEN GROUPS, AND INDIVIDUALS CONSULTED IN THE ENVIRONMENTAL ASSESSMENT PROCESS

7.0 CONSULTED AGENCIES, CITIZEN GROUPS, AND INDIVIDUALS

The following agencies, community organizations, and individuals were either consulted in the development of the draft environmental assessment (DEA) or were provided a copy for review. Pursuant to Chapter 343, HRS, and the Title 11-200-9, the draft environmental assessment is subject to a 30-day review and comment period.

FEA Preparers

EARTH TECH, Inc.	
Phillip Bruner, BYU-Hawaii	Avifauna and Mammal Survey
Char & Associates	Botanical and Wetland Survey

Federal Agencies

Federal Highway Administration
U.S. Army Corps of Engineers
U.S. Department of Agriculture, Natural Resources Conservation Service
U.S. Department of the Interior, Fish and Wildlife Service

State Agencies

State Representative, District
State Senator, District
Department of Agriculture
Department of Business, Economic Development and Tourism, Land Use Commission Department of Health, Environmental Management Division
Department of Land and Natural Resources, Land Division and Aquatic Division
State Historic Preservation Division
Office of Environmental Quality Control
Office of Hawaiian Affairs
Office of Planning, DBET
University of Hawaii, Environmental Center

City and County of Honolulu Agencies

City Council, District II
Department of Land Utilization
Fire Department
Police Department
Department of Public Works

Community Groups and Individuals

James Campbell Estate
Church of the Holy Cross
Kahuku Neighborhood Board

CHAPTER 8
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APPENDIX A

AQUATIC BIOLOGY AND WATER QUALITY SURVEY

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MALAEKAHANA AQUATIC BIOLOGY AND WATER QUALITY SURVEY

INTRODUCTION

This report, prepared in accordance with Chapter 343, Hawaii Revised Statutes (HRS) and Hawaii Administrative Rules (HAR) Title 11 Chapter 200, presents the results of the site survey conducted on March 4, 1997 at Malaekahana Bridge on Kamehameha Highway. A biological stream survey and basic water quality study was conducted on March 4, 1997 for inclusion in the draft environmental assessment. The report also will supplement a U.S. Army Corps 404 Permit, 401 Water Quality Certification, State Coastal Zone Management Program Consistency Determination and State Stream Channel Alteration Permit (SCAP) for the proposed replacement of the Malaekahana Bridge.

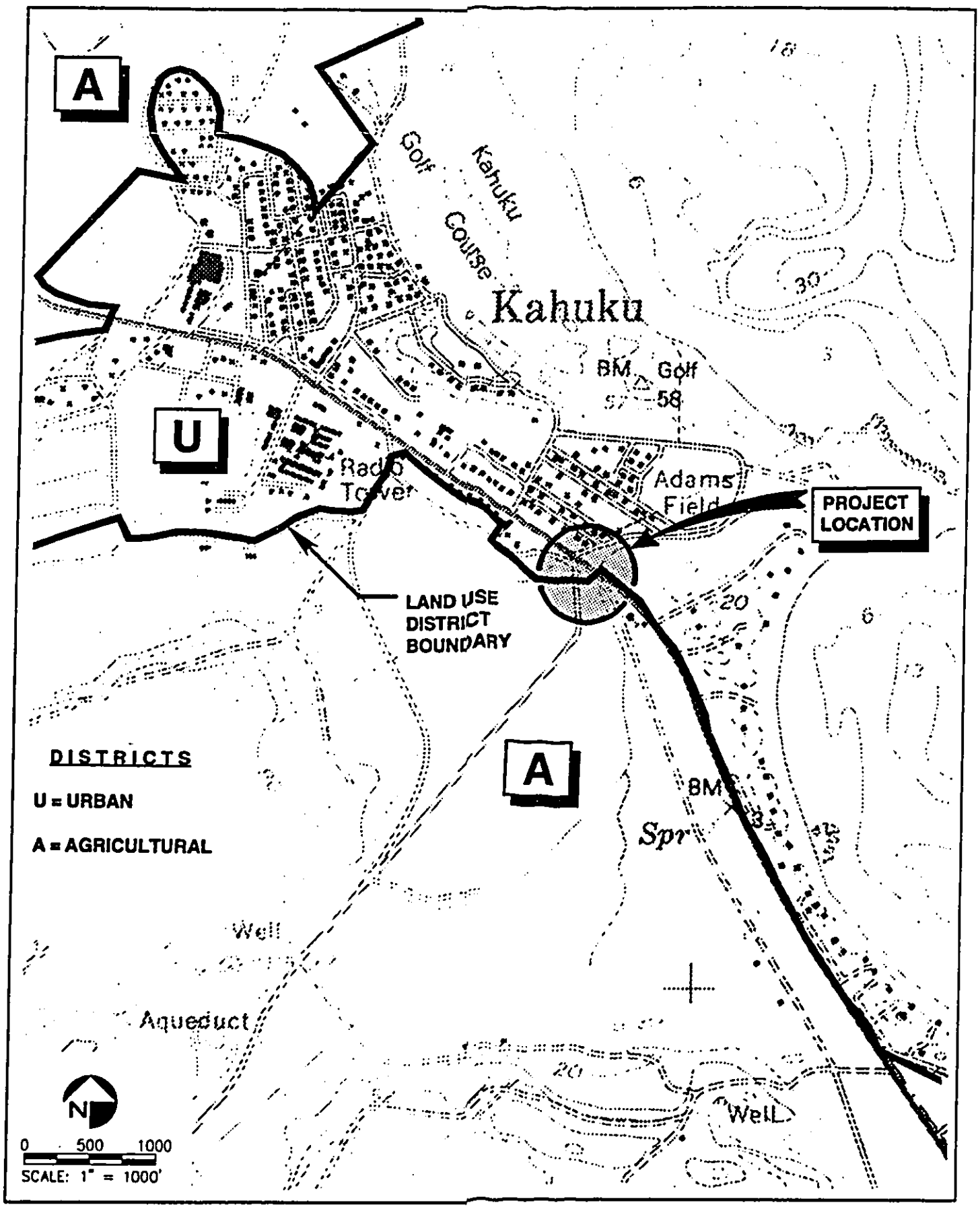
PREVIOUS SURVEYS

Very little information about the Malaekahana Stream is included in the statewide survey of modified-channel streams by Timbol and Maciolek (1978) or *The Hawaii Stream Assessment* (Hawaii Cooperative Park Service Unit, 1990). The stream was identified as having a wetland approximately 1,500 meters above the Malaekahana Bridge in the special areas classification, and was listed as having "moderate" recreational resources. The stream, however, was unranked as a significant stream in Aquatic, Cultural, and Riparian resources. The *Instream Use Study* (DLNR, 1983) generally identified Malaekahana Stream as non-navigable, and "low" and "poor" for potential stream fauna habitat, waterbird habitat, aesthetic enjoyment and water-based recreation. However, the urban section (lower reach, downstream of bridge to the mouth of the stream) was rated as having a high potential for fauna habitat.

STREAM DESCRIPTION

Malaekahana Stream is influenced by drainage from the portion of Kahuku between the Keaaulu Gulch and the Malaekahana Stream drainage basin. The sub-area, as presented in the *Instream Use Study, Windward Oahu* (State of Hawaii, Department of Land and Natural Resources (DLNR), 1983, encompasses approximately 4,819 acres. Rainfall in the sub-area ranges from a high of 220 inches in the mountain areas to a low of 50 inches along the coastal plains. Malaekahana Stream is located on the northeastern side of the Island of Oahu, approximately five miles south of Kahuku Point, and just south of Kahuku town (**Figure 1**).

Malaekahana is considered a small perennial stream (average flows less than 20 cfs) having no listed tributaries in the Hawaii Stream Assessment (HSA), December 1990 database. However, three intermittent streams to the north, including the Hina Gulch, Lamaloa Gulch, and the Keaaulu Gulch contribute to Malaekahana Stream (3-1-06 HSA Stream Code) as recognized on the 7.5-minute series, topographic map (USGS Kahuku Quadrangle). Average stream flow data from discontinued gauges at Malaekahana Stream include the following: 0.84 cfs at the middle branch USGS Station



EARTH TECH

Malaekahana Stream Bridge Replacement
Environmental Assessment
Land Use District Map

FIGURE
1

1310000 (1914-1918); 2.14 cfs at USGS Station 308000 near Laie from (1963-1971); and an estimated peak flow of 282 cfs (126,570 gpm), (HSA, 1990 and *Instream Use Study*, 1983).

Malaekahana extends to approximately the 1500-foot (500 m) elevation, into the Kahuku Forest Reserve on the east side of the Koolau Range. The gradient over the entire reach of the Malaekahana Stream is about 0.8%, ranging from 0.3% in the lower reach to 1.5% in the upper reach. Malaekahana flows eastward from the Koolau Range, then forks to the north (700 feet from Kamehameha Highway) and parallels this road until heading east again crossing Kamehameha Highway at Malaekahana Bridge. The discharge point into the sea is located approximately 1000 feet west of Makahoa Point. A palustrine wetland, beginning where the Malaekahana Stream bends and begins to flow north, is approximately 1,500 m upstream from the Malaekahana Bridge and encompasses an area of approximately 3.6 acres.

Much of the lands associated with Malaekahana Stream area were once used for sugarcane cultivation. However, since the closing of the Kahuku Sugar Plantation Company, agricultural activities have shifted to orchards, row crops, and aquaculture.

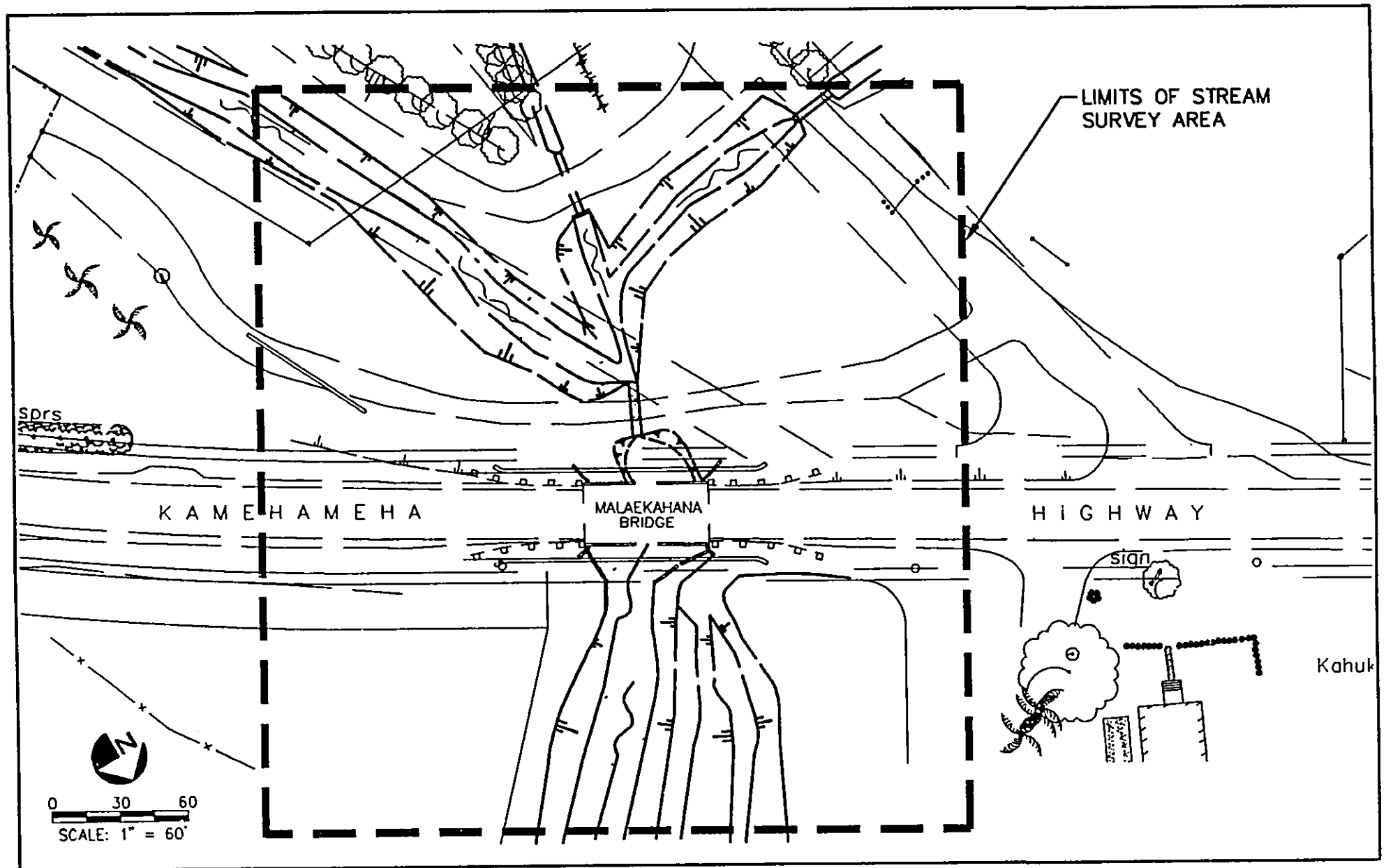
SITE SURVEY - AQUATIC BIOLOGY

The stream survey was performed at 1200 on March 4, 1997 and observations were limited to the area approximately 40 meters upstream and downstream of the Malaekahana Bridge (**Figure 2**). The survey was conducted following intermittent periods of rainfall. A listing of aquatic species observed and/or collected on March 4, 1997 at the project site are listed in **Table 1**.

The stream survey at Malaekahana Bridge indicates that aquatic biology is dominated by introduced species including the Tahitian prawn (*Macrobrachium lar*), the Juvenile Aholehole (Kuhlia sandwicensis), and tilapia (*Sarotherodon* spp.)(most likely *Sarotherodon mossambica*). Additionally, the Mosquito fish (*Gambusia affinis*) and swordtail (*Xiphophorus helleri) of the* Family POECILIIDAE, Juvenile Mullet (*Mugil cephalus*), and the native goby, 'O'opu naniha (*Stenogobius hawaiiensis*) were all fishes in this stream. The *POECILIIDAE* fish, and juvenile estuarine fish were generally congregated in the deeper sections of the stream near the cover of overhanging grass on the banks just downstream of the bridge. The tilapia and native 'O'opu appeared to prefer the riffle sections under the bridge. A filamentous green algae (Chlorophyta) is present in thin layers on all the rocks in the stream bed. The endemic estuarine species of snail, Hapa-wai *(Neritina vespertina)* were abundant on these rocks.

FIELD WATER QUALITY MEASUREMENTS

Basic water quality measurements taken using the Hydac 910 meter just mauka (west) of the bridge at 1200 hrs on March 4, 1997 and can be seen in **Table 2**. No historical water quality measurements from Malaekahana Stream could be found for this report.



EARTHTECH

Malaekahana Stream Bridge Replacement
Environmental Assessment
Stream Biology and Field Water Quality Survey

FIGURE
2

Table 1
Checklist of aquatic animals observed or collected from Malaekahana Stream

Species	*Common Name*	*Status*	*Abundance*
	VERTEBRATES		
FISHES-MUGILIDAE *Mugil cephalus*	Juvenile Mullet	nat	common
FISHES-KUHILIIDAE *Kulia sandwicensis*	Juvenile Flagtail (Aholehole)	nat	abundant
FISHES-CICHILIDAE *Sarotherodon spp.*	Tilapia	nat	abundant
FISHES-GOBIIDAE *Stenogobius hawaiiensis*	'O'opu naniha - Goby	end	uncommon
FISHES-POECILIIDAE *Gambusia affinis* (Baird & Giard) *Xiphophorus helleri* (Heckel)	mosquitofish swordtail	nat nat	occasional occasional
	INVERTEBRATES		
	ARTHROPODA, INSECTA		
ODONATA-COENAGRIIDAE *Enallagma civile* (Hagen)	Damselfly-blue (adult)	nat	uncommon
ODONATA uniden.	Dragonfly	nat	uncommon
	ARTHROPODA, CRUSTACEA		
DECAPODA-PALAEMONIDAE *Macrobrachium lar* (Fabricius)	Tahitian prawn	nat	abundant
DECAPODA-CAMBARIDAE *Procambarus clarki* (Girard)	Crayfish	nat	common
	MOLLUSCA		
PULMONATA-NERITIDAE *Neritina vespertina* (Haynes)	Hapa-wai	end	abundant
THIARIDAE *Thiarides spp.*	Snail	nat	uncommon
AMPHIBIANS-BUFONIDAE *Bufo marinas*	Neotropical toad / (tadpole)	nat.	uncommon
AMPHIBIANS-RANIDAE *Rana catesbeiana* *Rana rugosa*	American bullfrog Wrinkled frog	nat. nat.	occasional occasional

Distribution Status: Endemic (end) = native to Hawaii and found naturally nowhere else.
Indigenous (ind) = native to Hawaii, but not unique to the Hawaiian Islands.
Naturalized (nat) = introduced, exotic species, now established in stream

Abundance = abundance ratings are for the classification of Malaekahana Stream site biology only

Abundant = organism found in large numbers, locally dominant
Common = observed numerous times, considered an important part of the community
Occasional = organism observed between five and times per hour survey
Uncommon = organism observed less than five times per hour survey

Table 2
Basic Water Quality Characteristics of Malaekahana Stream

Location - Date - Time	*Temp. (°C)*	*pH (pH units)*	*Cond. (µmhos/cm)*	*Visibility (Feet)*
Mauka of Bridge - 3/4/97 - 1200	24.5	8.8	582	1.5
Mauka of Bridge - 2/17/97 - 0915	24.0	8.9	680	2.0
Mauka of Bridge - 4/5/97 - 1615	27.2	7.2	483	.75
Upstream (40 m) - 4/5/97 - 1615	27.6	6.8	378	.5
Downstream (40m) - 4/5/97 - 1615	27.3	6.9	460	1.0

CONCLUSIONS

Generally, Malaekahana Stream is a somewhat degraded, channelized, perennial stream. A large portion of the identified stream biota are introduced species. Past agricultural practices in the area have affected flow characteristics and deposited layers of silt on the stream bottom. The stream bottom is easily disturbed and suspended which causes a decrease is local water quality. Two native aquatic species (the *Hapa-wai, Neritina vespertina* and the goby, *Stenogobius hawaiiensis* were identified from Malaekahana Stream. The biological inventory of aquatic animals and water quality data performed March 1997 for this report is the only information on file for Malaekahana Stream, so it can not be compared to previously known fauna and water quality data for this watershed.

The proposed replacement bridge will be a 105-foot clear single-span bridge with vertical abutments, having two 12-foot travel lanes and two 12-foot shoulders. The vertical abutments will be placed outside the streams high water mark to minimize the discharge of excavated material to the stream during construction. Riprap revetments will also be constructed along the stream banks under the bridge to prevent scouring. This design will not impair the upstream migratory patterns of stream fauna and the replacement bridge should have no short- or long-term adverse impacts on water quality or native aquatic resources. A detour road will be constructed upstream to accommodate traffic during the replacement of Malaekahana Bridge. Current drainage patterns will be maintained through the placement of four 78" and two 36" pipe culverts under the temporary bridge. The proposed project may involve minor discharges of fill material into the stream during construction, but will not have any long-term adverse affects once the project is complete. A Best Management Practice (BMP) plan and water quality monitoring plan in accordance with the Clean Water Act, Section 401 will be prepared and in place during construction. This will mitigate any potential water quality impacts.

THREATENED OR ENDANGERED SPECIES

No State of Hawaii or Federally threatened or endangered species of aquatic species (USFWS, 1994a) were found in the project area.

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APPENDIX B

BOTANICAL RESOURCES SURVEY

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BOTANICAL RESOURCES SURVEY
MALAEKAHANA STREAM BRIDGE REPLACEMENT PROJECT
KO'OLAU LOA DISTRICT, ISLAND OF O'AHU

by

Winona P. Char

CHAR & ASSOCIATES
Botanical Consultants
Honolulu, Hawai'i

Prepared for: EARTH TECH, INC.

March 1997

BOTANICAL RESOURCES SURVEY
MALAEKAHANA STREAM BRIDGE REPLACEMENT PROJECT
KO'OLAU LOA DISTRICT, ISLAND OF O'AHU

INTRODUCTION

The Malaekahana Stream Bridge is located on Kamehameha Highway and lies on the southeastern edge of Kahuku Village. The proposed construction area encompasses approximately 3 acres of land on the mauka and makai sides of the bridge.

The State Department of Transportation (DOT) proposes to replace the existing bridge over the Malaekahana Stream with a new single-span bridge with vertical abutments in the same location. The proposed bridge will be 57 feet wide with two 12-foot travel lanes and two 12-foot shoulders. The project will enhance drainage and reduce flooding in the area by eliminating the medial support in the design of the new bridge. The current medial support traps debris during heavy rains.

A 720-foot detour road will need to be constructed to accommodate traffic during the construction of the replacement bridge. The detour road will extend from the grassy parking area of the Church of the Holy Cross to the existing dirt road owned by Campbell Estate. A temporary bridge will be constructed 40 feet mauka of the existing bridge; current drainage patterns will be maintained through placement of culverts under the bridge. The temporary detour bridge will include some stream channelization and back filling of culverts. The detour and all fill material will be removed after construction is completed. The grass parking area of the church will be restored to its pre-construction state.

Utilities will also be relocted along the mauka side of the highway.

Field studies to assess the botanical resources found on the Malaekahana Bridge Replacement Project site were conducted on 01 March 1997. The primary objectives of the survey were to: 1) describe the vegetation on the site; 2) search for threatened and endangered species; 3) determine the presence of wetlands and wetland vegetation within the project area; and 4) identify areas of potential environmental problems or concerns and propose appropriate mitigation measures.

A walk-through survey method was used. Notes were made on plant associations and distribution, substrate types, topography, past disturbances, etc. Plant identifications were made in the field; plants which could not be positively identified were collected for later determination in the herbarium (University of Hawai'i, Manoa - HAW), and for comparison with the most recent treatment of the Hawaiian flora. The plant names used in the following discussion are in accordance with Wagner et al. (1990) for the naturalized species, and St. John (1973) for the ornamental plants.

DESCRIPTION OF THE VEGETATION

Three vegetation types are recognized on the approximately 3 acres of land which make up the proposed construction parcel.

Maintained Vegetation

This includes the grassy strip along the highway which is periodically mowed and the grassy lawn of the Church of the Holy Cross which serves as a parking area. The roadside vegetation consists primarily of various grasses and weedy herbaceous species.

Bermuda grass or manienie (Cynodon dactylon) and pitted beardgrass (Bothriochloa pertusa) are abundant and form low mats along the highway. In places, the coarser-leaved wiregrass (Eleusine indica) is locally common especially in those areas where the vehicular traffic has compacted the substrate. Weedy herbaceous species frequently observed include the low, mat-forming Calyptocarpus vialis, the white-flowered Spanish needle (Bidens alba), bur clover (Medicago polymorpha), narrow-leaved plantain (Plantago lanceolata), hairy spurge (Chamaesyce hirta), etc. A few small koa haole shrubs (Leucaena leucocaphala) also occur along the highway.

The grassy lawn area of the church is dominated by Bermuda grass with smaller patches of pitted beardgrass. Again, wiregrass is locally common where the soil has been compacted by vehicles. The weedy herbaceous species mentioned previously also occur in the lawn area, but in smaller numbers. Fronting the highway side of the lawn is a planting of "Blue haze" (Evolvulus cultivar), an ornamental ground cover belonging to the morning glory family, and clumps of bird of paradise (Strelitzia reginae). A few saplings of Macaranga tanarius, a weedy tree species, have established themselves in the landscape planting. One of four coconut trees (Cocos nucifera) found on the lawn area may be impacted by the construction.

Scrub Vegetation

Scrub vegetation occurs on the unmaintained areas bordering the stream and irrigation ditch on uplands or nonwetlands. Mauka of the existing bridge it consists of dense elephant or Napier grass (Pennisetum purpureum), 10 to 20 feet tall, with scattered shrubs of koa haole and castor bean (Ricinus communis). An overgrown dirt road also occurs in this area where it follows along the grass parking area and down to the stream. It is covered by California grass (Brachiaria mutica) and a mixture of various

weedy species such as the white-flowered Spanish needle, Chinese violet (Asystasia gangetica), Guinea grass (Panicum maximum), spiny amaranth (Amaranthus spinosus), false mallow (Malvastrum coromandelianum), lion's ear (Leonotis nepetifolia), weed verbena (Verbena litoralis), etc.

On the makai side of the existing bridge, the vegetation on the uplands consists of Guinea grass with scattered plants of castor bean, banana (Musa cultivar), and Macaranga.

Wetland Vegetation

Wetland vegetation consisting of wetland indicator species (Reed 1988) occurs as a narrow band along the edge of the stream and irrigation ditch. The wetland and wetland vegetation are well-defined by the top bank of the stream and ditch.

California grass, a facultative wet (FACW) plant, lines most of the stream mauka and makai of the bridge and also the irrigation ditch. Honohono (Commelina diffusa), a FACW plant, is also abundant in places. Scattered here and there are clumps of Job's tears (Coix lachryma-jobi), a FACW+ plant; barnyard rice (Echinochloa crus-galli), a FACW plant; and primrose willow or kamole (Ludwigia octovalvis), an obligate (OBL) wetland species. Where the irrigation ditch joins the Malaekahana Stream, there is a patch of water hyacinth (Eichhornia crassipes), an OBL plant.

Obligate wetland indicator species occur almost always, more than 99% of the time, under natural conditions in wetlands. Facultative wetland indicator species usually occur in wetlands, about 67% to 99% of the time; a plus (+) sign indicates a frequency toward the higher end of the category.

DISCUSSION AND RECOMMENDATIONS

The vegetation on the proposed ±3-acre construction parcel is dominated almost exclusively by introduced or alien plant species such as elephant grass, Guinea grass, Bermuda grass, koa haole, and many weedy annual species. Introduced or alien plants are all those plants which were brought to the Hawaiian Islands by humans, intentionally or accidentally, after Western contact, that is, Cook's discovery of the islands in 1778. Only two native species were observed during the field studies; these were the popolo (Solanum americanum) and 'uhaloa (Waltheria indica). These two species are questionably native, that is, they are native to the Hawaiian Islands and elsewhere. There is a slight chance that they may have been introduced by humans, but the weight of evidence suggests that they probably occurred here naturally. One species, the primrose willow or kamole (Ludwigia octovalvis), is possibly of early Polynesian introduction. The seeds could have been unintentionally brought in on taro plants (Wagner et al. 1990). In addition to being dominated by introduced plants, the vegetation on portions of the parcel are periodically maintained and support a grassy lawn.

None of the plants found during the field studies is a listed, proposed, or candidate threatened and endangered species; nor is any plant considered a species of concern (U.S. Fish and Wildlife Service 1995, 1996). All of the plants can be found in similar environmental habitats throughout the Hawaiian Islands. No sensitive native plant-dominated communities/vegetation types exist on the proposed project site or on the immediately adjacent lands. This is not surprising as the fertile, lowland areas around Kahuku have long been used for various agricultural activities including a sugar cane plantation, vegetable farms, and orchards.

The narrow band of wetland vegetation is confined to the stream-side, and is easily delineated by the top bank of the stream and irrigation ditch. We did not find any overflow areas where water would pond for a long period and support wetland vegetation and development of anaerobic, hydric soils.

Given the findings above and the limited nature of the project, the proposed replacement bridge and temporary access road should not have a significant negative impact on the botanical resources found on the site or in the general windward area region. There are no botanical reasons to impose any restrictions, conditions, or impediments to the proposed project. It is recommended, however, that after construction is completed, the barren areas along the stream be revegetated to prevent soil erosion. Plants already in the area such as primrose willow, Job's tears, and California grass can be used.

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APPENDIX C

AVIFAUNAL AND FERAL MAMMAL SURVEY

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AVIFAUNAL AND FERAL MAMMAL SURVEY TO SUPPORT THE ENVIRONMENTAL ASSESSMENT FOR THE MALAEKAHANA BRIDGE REPLACEMENT PROJECT, KAHUKU, OAHU, HAWAII

Prep. for

Earth Tech

by

Phillip L. Bruner
Environmental Consultant - Faunal (bird & mammal) Surveys

12 March 1997

INTRODUCTION

This report provides the findings of a field survey of property involved in the proposed Malaekahana Bridge Replacement Project, Kahuku, Oahu, Hawaii. The survey was conducted between 24 February and 7 March 1997. Figure One gives the location of the area included in this faunal survey.

The objectives of the survey were:

1- To document the birds and mammals found on or near the site.

2- Supplement the field data with earlier observations, unpublished reports, and pertinent literature.

3- Focus the report on native and migratory species, particularly any that are listed as threatened or endangered.

GENERAL SITE DESCRIPTION

The stream on either side of the existing Malaekahana Bridge is bounded by dense second growth vegetation dominated by grass. Periodically the overburden of vegetation is cleared and the banks of the stream become more accessible to migratory shorebirds and resident waders like the native and endangered Black-necked Stilt (Himantopus mexicanus knudseni). The shoreline grass and brush also provide cover and refuge for waterbirds as well as reduces shoreline erosion. Water depth varies from a few inches to several

feet between dry and rainy seasons. During heavy rains the stream floods and on rare occasions overflows its banks. Surrounding lands include agricultural and residential habitats. Salt water intrusion at high tide may reach the bridge. Human impacts on this site include but may not be limited to: fishing; refuse dumping; and possible water contamination from agricultural activities upstream.

FIELD METHODS

Spot checks of the stream near the bridge as well as portions of the stream mauka and makai were made at different times of the day and early evening over the period 24 February through 7 March 1997. All species seen or heard were recorded. Mammal observations were based on direct sightings or scats and tracks.

The scattering of observation periods provided a broader window from which to view the faunal activities of this site. Some species were more active early or late in the day. No extensive search for nests was conducted due to the limited time allotted for the field survey. The accessibility of the site to predators probably limits nesting success.

I have lived in the Laie and Kahuku area between 1966 - 1970 and 1974 to the present. I have conducted field work in several areas near the site of this proposed project(Bruner 1978, 1980, 1989a, 1989b, 1991a, 1991b, 1991c, 1995). This long term familiarity with

this region and the stream involved in this Malaekahana Bridge Project make it possible to also include in this report observations obtained prior to this survey.

Scientific names used in this report follow those in either Pratt et al. 1987 or Hawaii Audubon Society 1993.

RESULTS AND DISCUSSION

Birds:

Table One lists the introduced species recorded on the survey. This list does not include all the species that potentially occur in the area but does account for the common species. Introduced birds make up virtually all of the terrestrial species in the lowlands. The only native landbird that occurs in the Kahuku area, at this elevation, is the Short-eared Owl or Pueo (Asio flammeus sandwichensis). This species is listed by the State of Hawaii as endangered on Oahu. I have seen Pueo near the Kahuku Golf Course just NW of this site as recently as November 1996. They forage in open fields and agricultural lands and certainly could occur in the area of this proposed project. None were recorded on this survey. The Pacific Golden-Plover was the only species of migratory shorebird seen on lawns and in fields adjoining the stream. These wintering migrants are territorial and have receive extensive study both here

in Hawaii and on their breeding grounds in western Alaska (Johnson et al. 1981, 1989, 1993). They are the most abundant migrant in Hawaii. During previous periods when the stream banks have been cleared of vegetation I have seen Wandering Tattler (Heteroscelus incanus) foraging makai of the bridge. This species is also present at the stream mouth along with two other common migrants, the Ruddy Turnstone (Arenaria interpres) and the Sanderling (Calidris alba) These species are not threatened or endangered.

This field survey recorded two native waterbirds, the Black-crowned Night Heron (Nycticorax nycticorax) and the endangered Hawaiian Duck or Koloa (Anas wyvilliana). These birds are commonly seen in streams and wetlands in the Kahuku area. Three night heron and two koloa were tallied over the course of the spot checks. I have seen Hawaiian Coot (Fulica americana) and Black-necked Stilt, both endangered species, in and around this stream drainage in 1995-1996 and in previous years. The only native waterbird I have not observed at this location is the endangered Common Moorhen (Gallinula chloropus sanvicensis). I suspect they could occur in the stream but are more shy and hence less easily detected.

Mammals:

Several feral cats (Felis catus) and the Small Indian Mongoose (Herpestes auropunctatus) were seen during the survey. Dog tracks were also noted but probably do not represent feral animals. The endangered Hawaiian Bat (Lasiurus cinereus semotus) was not found.

I know of no reliable records for this species at this location. Some long time residents of this sector of the island claim to have seen bats but I do not know the validity or recency of these observations.

CONCLUSIONS AND RECOMMENDATIONS

The site of the proposed bridge replacement is varied depending on rainfall and how recently the banks have been cleared of vegetation. Following exceptionally heavy rains, flooding can occur and the force of water will temporarily push back the shoreline vegetation. Dredging and bank clearing have also occurred in the past but the ground cover quickly returns reducing the size of the stream chanel. Waterbirds forage in this stream and use the shoreline vegetation for cover. Two waterbird species were observed on this survey, the endangered Hawaiian Duck and the non-endangered Black-crowned Night Heron. I have also seen the endangered Black-necked Stilt and Hawaiian Coot in this stream within the past two years. The Hawaiian Owl (a State of Hawaii listed endangered species) also occurs in the Kahuku area and could on occasion forage near this site.

The only migratory shorebird recorded near the proposed project was the abundant Pacific Golden-Plover. Other migrants have been seen makai of the Malaekahana Bridge. None of these migrants are threatened or endangered.

The list of introduced species of birds recorded on the survey is a typical array of exotics found in this region of Oahu.

Feral cats and the Small Indian Mongoose were the only mammals recorded. Dogs were seen but were probably not feral. The endangered Hawaiian Hoary Bat was not observed and I know of no records for this species at this location. I have heard from long term residents that bats have been seen in this region of the island but I do not know if these "sightings" are valid.

The proposed bridge replacement project will temporarily disrupt the vegetation and wildlife in and around the bridge and may have some small impact on down-stream wildlife.

The only recommendations I would suggest would be:

1- If during the clearing of vegetation, in and around the project, any nesting waterbirds are discovered the proper State and Federal Wildlife authorities should be contacted for advise on what can be done before proceeding to clear the vegetation and thus destroy the nest. These are endangered species and Federal and State law requires their protection.

2- As much as possible the cleaning and clearing process as well as subsequent construction should avoid dumping materials in the stream that further contaminate the area down-stream including the inshore waters at the river mouth.

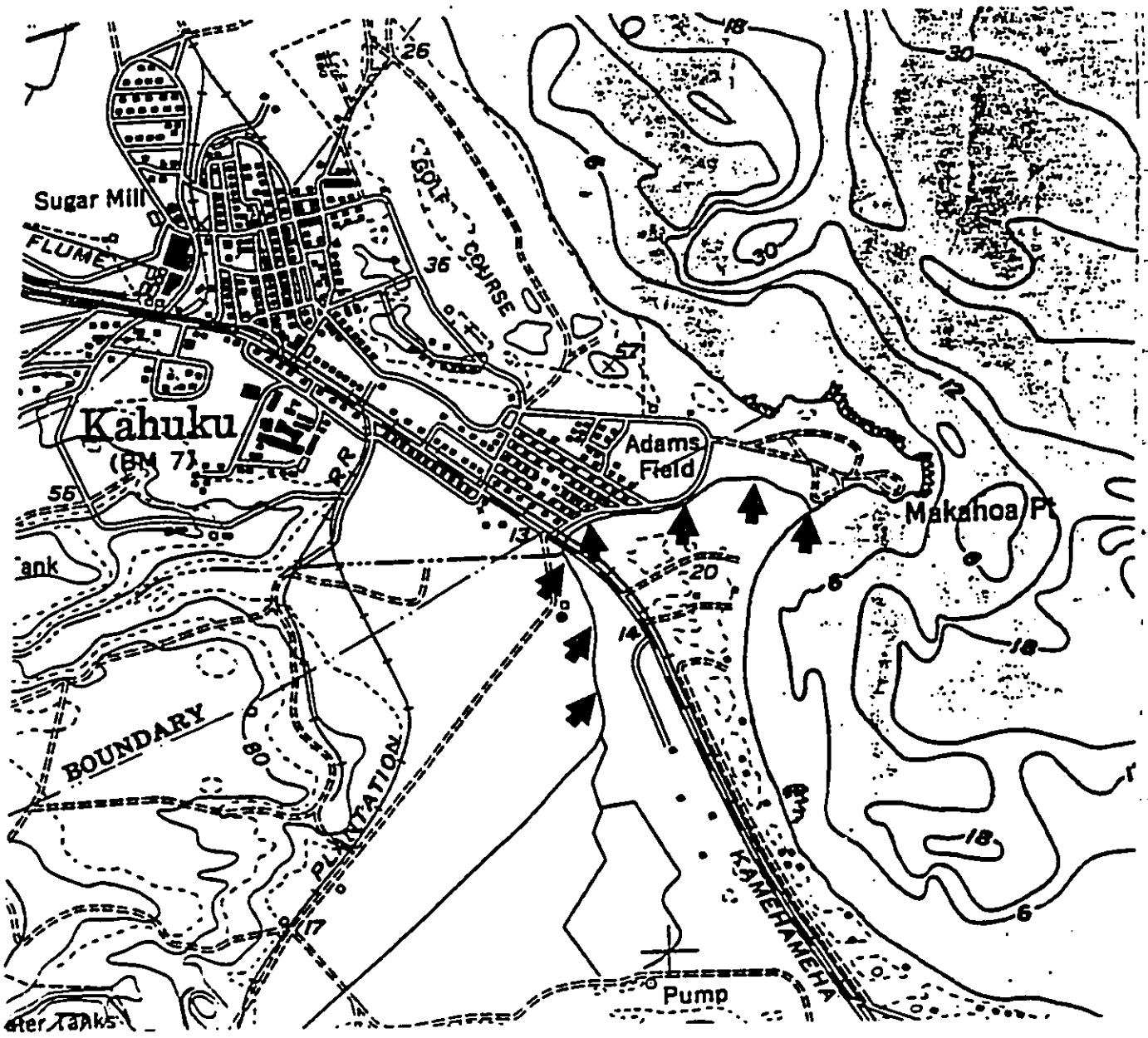

Fig. 1. Location of faunal survey. Area marked by solid arrows indicates the limits of the stream surveyed.

TABLE 1

List of introduced species recorded at the proposed Malaekahana Bridge Replacement Project Site, Kahuku , Oahu.

COMMON NAME	SCIENTIFIC NAME
Cattle Egret	Bubulcus ibis
Ring-necked Pheasant	Phasianus colchicus
Spotted Dove	Streptopelia chinensis
Zebra Dove	Geopelia striata
Common Myna	Acridotheres tristis
Northern Cardinal	Cardinalis cardinalis
Red-crested Cardinal	Paroaria coronata
White-rumped Shama	Copsychus malabaricus
Japanese White-eye	Zosterops japonicus
Japanese Bush-warbler	Cettia diphone
House Finch	Carpodacus mexicanus
Java Sparrow	Padda oryzivora
Nutmeg Mannikin	Lonchura punctulata

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APPENDIX D

COLOR PHOTOS OF PROJECT AREA

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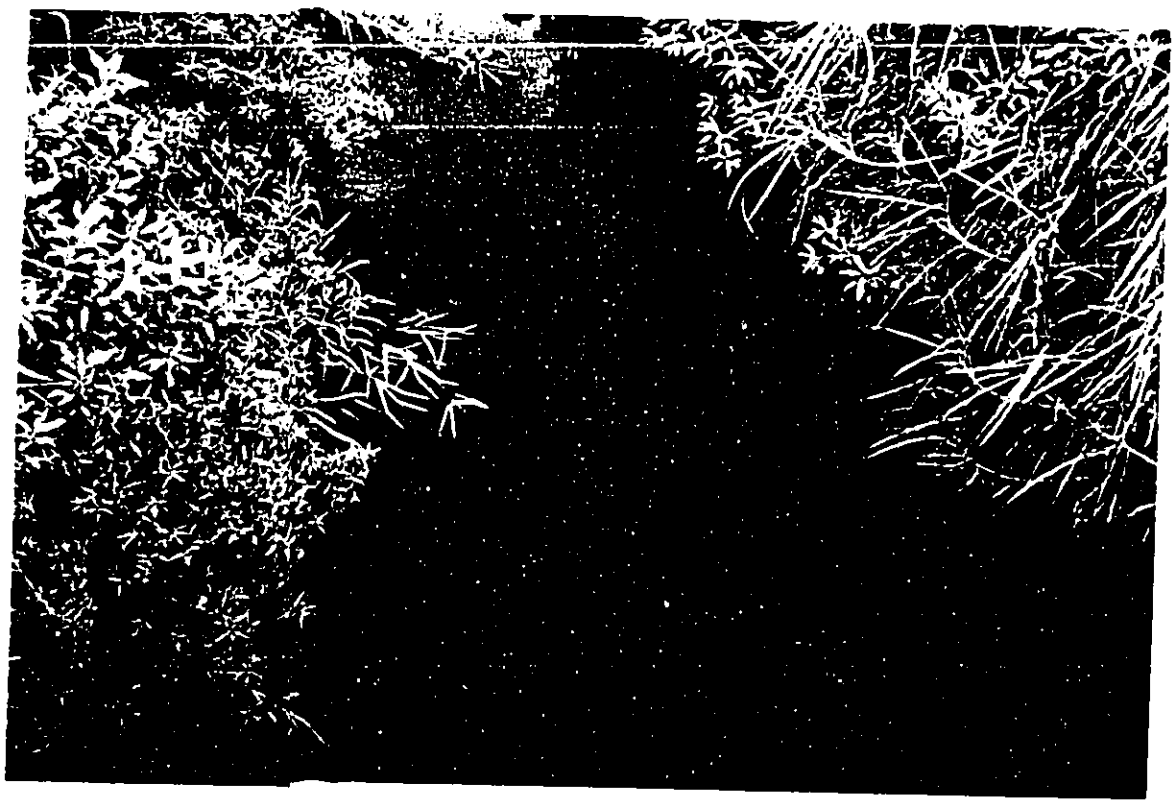

View Makai from the Bridge

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View Mauka from the Bridge

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View Toward Laie and Access Road

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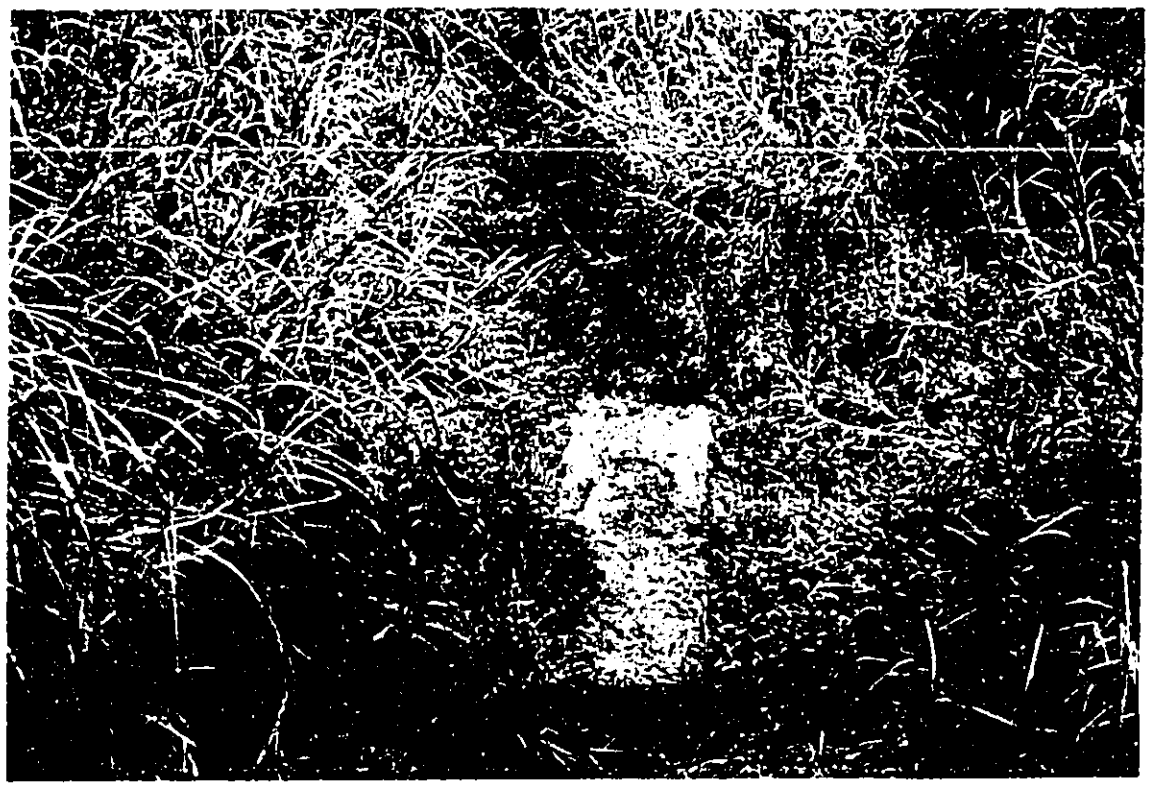

Malaekahana Bridge and Crossing

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View Toward Kahuku

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APPENDIX E

DRAINAGE/GRADING PLAN

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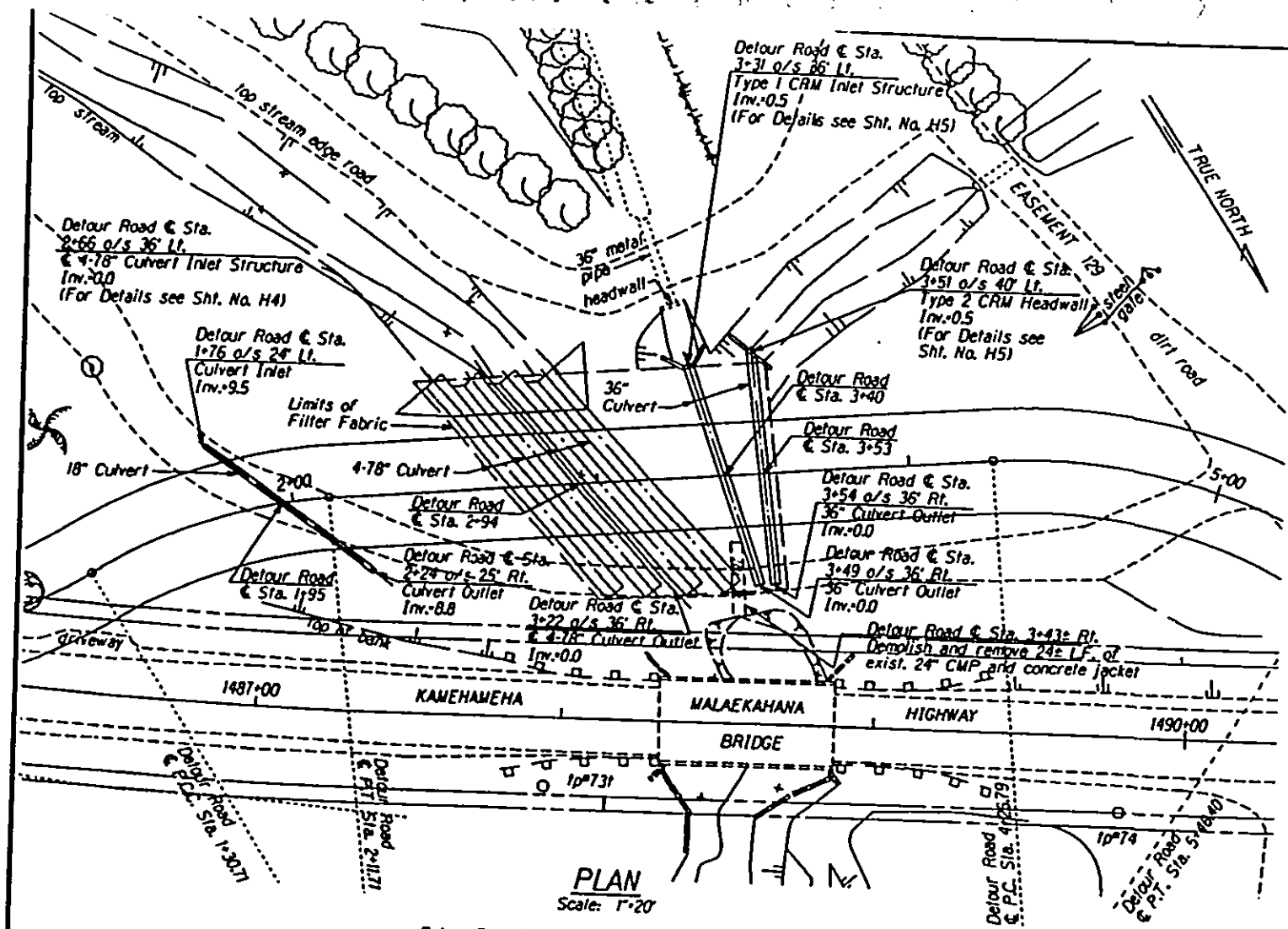
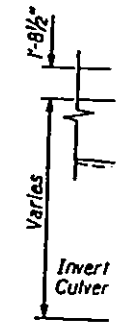
DRAINAGE

1. Existing draina construction. T labor, tools and of flow. The c Items.
2. The Contractor culverts and ut utilities damage replaced by the
3. Demolishing, re concrete jacket considered incic
4. Filter Fabric si Section 648 - P



PLAN
Scale: 1"=20'



TYPICAL

Detour Road ℄ Sta. 1+95
Install: 18" Culvert
(For Profile see Sht. No. H3)
Estimated Quantities
Structure Excavation • 6 C.Y.
18" Culvert • 68 L.F.
Bed Course Material • 6 C.Y.

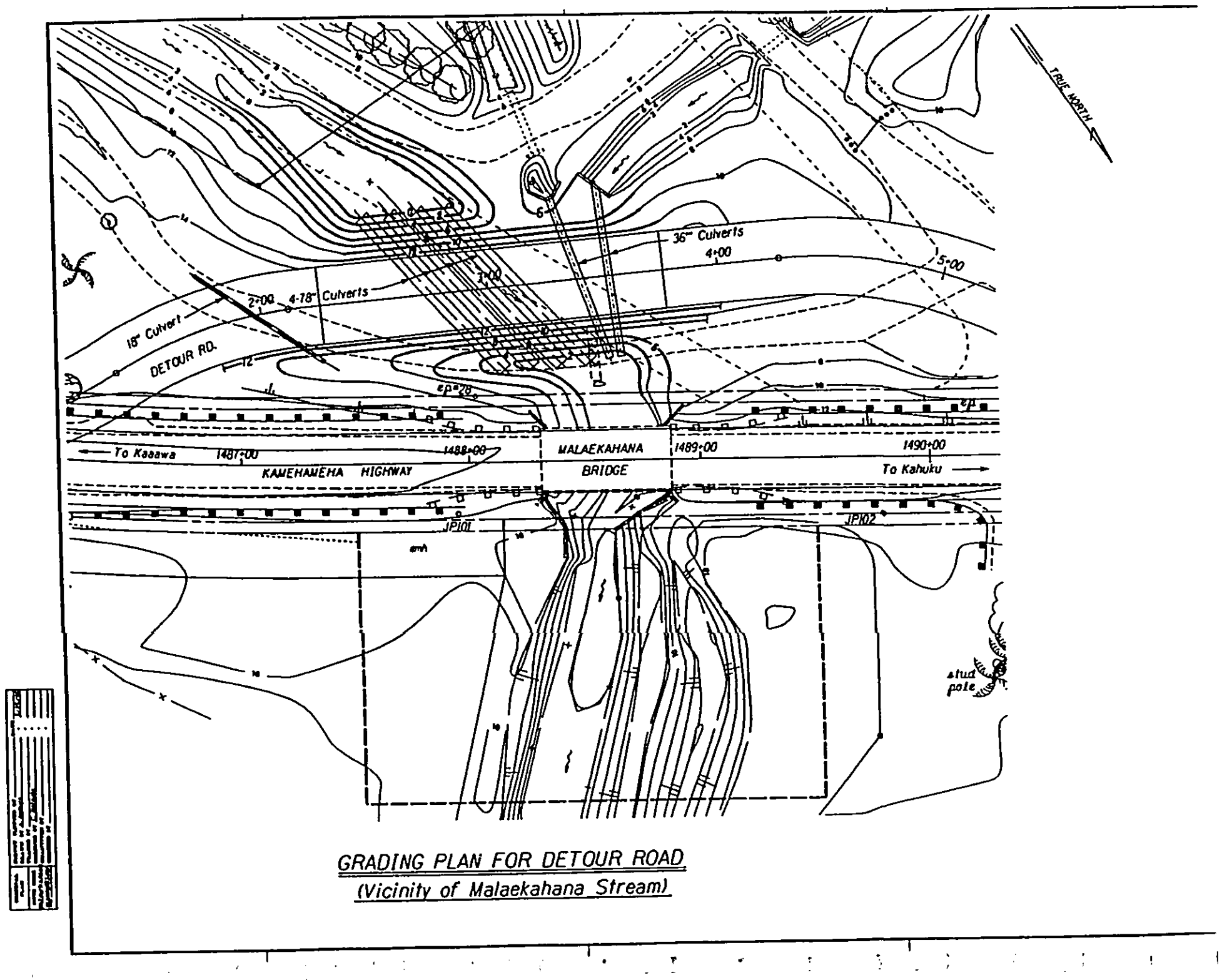
Detour Road ℄ Sta. 2+00± to ℄ Sta. 4+00
Install: Filter Fabric
(For Detail see Typical Culvert Trench Detail)
Estimated Quantities
Filter Fabric • 730 S.Y.

Detour Road ℄ Sta. 2+94
Install: 4-18" Culverts
(For Profile see Sht. No. H3)
Construct: GRP Inlet Structure
Estimated Quantities
Structure Excavation • 66 C.Y.
18" Culvert • 368 L.F.
Bed Course Material • 65 C.Y.
GRP • 27 C.Y.

Detour Road ℄ Sta. 3+40
Install: 36" Culvert
(For Profile see Sht. No. H3)
Construct: Type 1 CRM Inlet Structure
Estimated Quantities
Structure Excavation • 8 C.Y.
36" Culvert • 75 L.F.
Bed Course Material • 8 C.Y.
Type 1 CRM Inlet Structure • 1 EA.

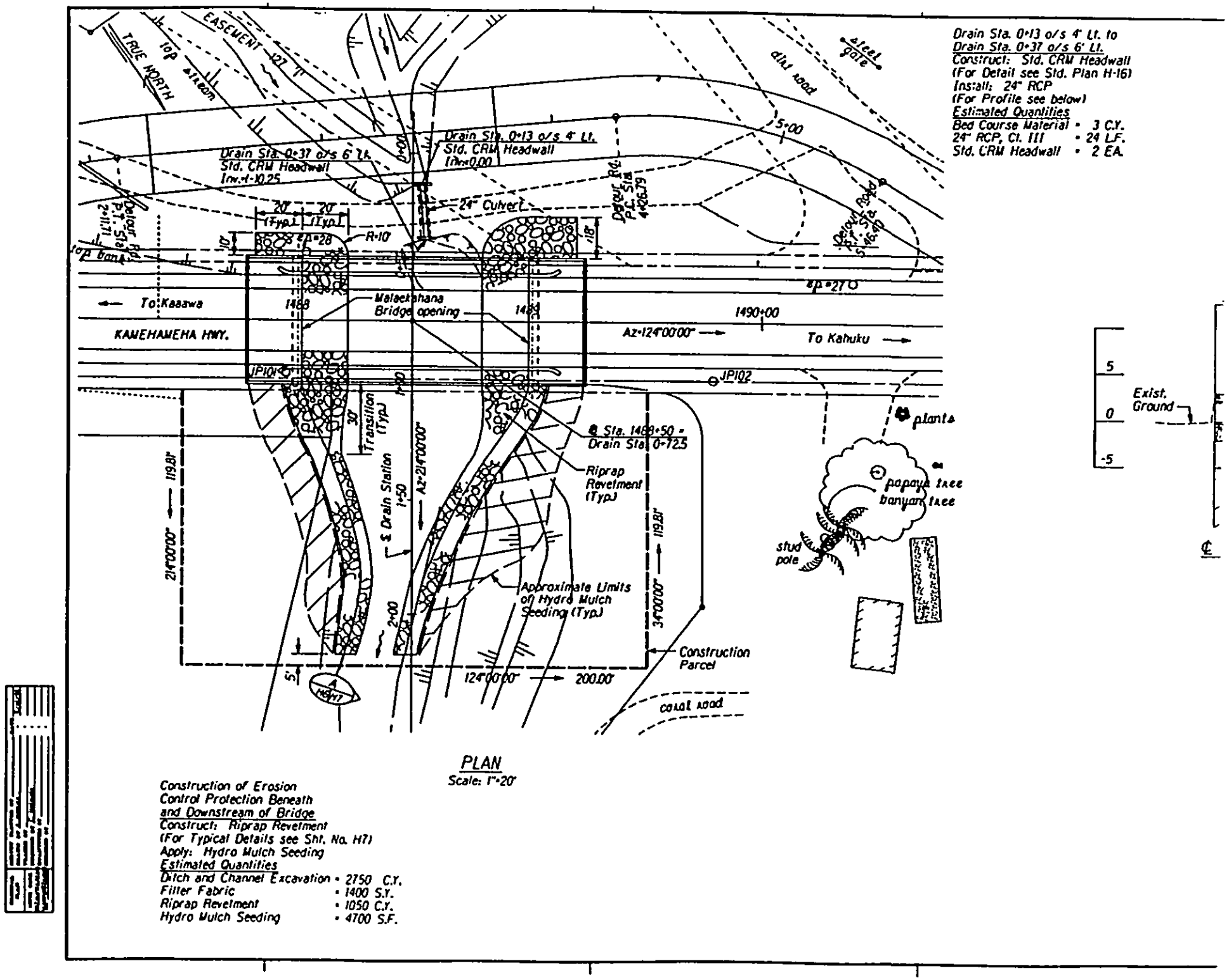
Detour Road ℄ Sta. 3+53
Install: 36" Culvert
(For Profile see Sht. No. H3)
Construct: Type 2 CRM Headwall
Estimated Quantities
Structure Excavation • 9 C.Y.
36" Culvert • 77 L.F.
Bed Course Material • 9 C.Y.
Type 2 CRM Headwall • 1 EA.

DRAINAGE PLAN FOR DETOUR ROAD



GRADING PLAN FOR DETOUR ROAD

(Vicinity of Malaekahana Stream)



PLAN
Scale: 1"=20'

Construction of Erosion Control Protection Beneath and Downstream of Bridge
Construct: Riprap Revetment
(For Typical Details see Sht. No. H7)
Apply: Hydro Mulch Seeding
Estimated Quantities

Ditch and Channel Excavation	• 2750 C.Y.
Filter Fabric	• 1400 S.Y.
Riprap Revetment	• 1050 C.Y.
Hydro Mulch Seeding	• 4700 S.F.

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APPENDIX F

COMMENTS AND RESPONSES ON THE DRAFT ENVIRONMENTAL ASSESSMENT

[THIS PAGE LEFT INTENTIONALLY BLANK]

BENJAMIN J. CAYETANO
GOVERNOR

GARY GILL
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

May 21, 1997

Mr. Kazu Hayashida, Director
State Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813

Dear Mr. Hayashida:

Subject: Draft Environmental Assessment for the Malaekahana Stream Bridge Replacement, Kamehameha Highway, Kahuku, Oahu

Thank you for the opportunity review the subject document. We have the following questions and comments.

1. Approximately 130 feet of riprap revetment will be constructed along the stream banks under the bridge to protect the vertical abutments from scouring. Please consider natural erosion control techniques instead of stone or concrete revetments. For example, plants and plant materials can be used to create a living, self sustaining barrier against erosion. For more details, please refer to the attached article, "Restoring streambanks, naturally."

2. The flow capacity of Malaekahana Stream under the new, longer bridge is expected to increase significantly with this project. How would potential periodic increases in water flow effect the flooding situation makai of Kamehameha Highway? Would it increase the chances of flooding? How would it impact native species mauka and makai of Malaekahana stream?

3. Please describe if there are any wetland areas outside the "Area of Potential Effect" that may be impacted by construction activities such as equipment storage/parking, dredged materials placement, etc.

4. Please revegetate disturbed areas within and outside the stream area with native Hawaiian plants.

5. Please describe the design of the temporary bridge. Will it be constructed of concrete or wood?

6. Please provide color photographs of the site to give readers a clearer illustration of field conditions.

Should you have any questions, please call Jeyan Thirugnanam at 586-4185. Mahalo.

Sincerely,

Gary Gill
Director

c: EarthTech

Enclosure

BENJAMIN J. CAYETANO
GOVERNOR

KAZU HAYASHIDA
DIRECTOR

DEPUTY DIRECTORS
Brian K. Minaai
GLENN M. OKIMOTO

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

IN REPLY REFER TO:

HWY-DD
2.5786

SEP 2 1997

Mr. Gary Gill, Director
State of Hawaii
Office of Environmental Quality Control
236 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Attention: Jeyan Thirugnanam

Subject: Draft Environmental Assessment Responses for Kamehameha Highway, Replacement of Malaekahana Bridge, Federal-Aid Project No. BR-083-1(27)

Dear Mr. Gill:

This letter is in response to your comments concerning the subject environmental assessment.

Response to Comment No. 1:

The riprap revetment provides immediate scour protection at the bridge abutment and the downstream embankment. Natural erosion control methods as described in your attached handout will require time to establish full ground cover. A high flow during the interim may cause scour of the bridge abutments and undermining of the downstream embankments.

Response to Comment No. 2:

The increase in flow capacity of the proposed bridge will alleviate some of the flooding problem makai of Kamehameha Highway. Flooding of the makai area occurs from roadway overtopping of Kamehameha Highway during periods of heavy rainfall.

Response to Comment No. 3:

There are wetlands outside of the "Area of Potential Effect", however no significant negative impacts to the wetlands by construction activities such as equipment storage/parking or placement of dredged materials is anticipated.

Response to Comment No. 4:

All disturbed areas within and outside the stream area will be revegetated with native Hawaiian plants, similar to the existing vegetation in the area.

Response to Comment No. 5:

Concrete pipe culverts will be used in place of a temporary bridge.

Response to Comment No. 6:

Color pictures will be provided with the final Environmental Assessment (EA).

If you have any questions, please contact Duane Taniguchi of our Highway Design Section at 587-2239.

Thank you for your interest in this project.

Very truly yours,

Kazu Hayashida

KAZU HAYASHIDA
Director of Transportation

bc: Oceanic Companies, Inc. (AT)

BENJAMIN J. CAYETANO
GOVERNOR

ESTHER UEDA
EXECUTIVE OFFICER

STATE OF HAWAII
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM
LAND USE COMMISSION
P.O. Box 2359
Honolulu, HI 96804-2359
Telephone: 808-587-3822
Fax: 808-587-3827

July 9, 1997

Mr. Kazu Hayashida, Director
Department of Transportation
State of Hawaii
869 Punchbowl Street
Honolulu, Hawaii 96813-5097

Dear Mr. Hayashida:

Subject: Draft Environmental Assessment (DEA) For Kamehameha Highway Replacement of Malaekahana Bridge, Vicinity of Kahuku, Oahu, Federal-Aid Project No. BR-083-1(27)

We have reviewed the subject Draft Environmental Assessment (DEA) as transmitted by your letter dated July 1, 1997, and it appears that the project area, as shown in Figure 1.2 of the DEA, is within the State Land Use Agricultural District.

We note that figure 5.2 appears to inaccurately reflect the Urban District Boundary which follows the makai side of Kamehameha Highway in the vicinity of the project area.

We have no further comments to offer at this time.

Thank you for the opportunity to provide comments on the subject Draft Environmental Assessment.

If you have any questions in regards to this matter, please feel free to contact me or Leo Asuncion of my staff at 587-3822.

Sincerely,

ESTHER UEDA
Executive Officer

EU:th

BENJAMIN J. CAYETANO
GOVERNOR

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

KAZU HAYASHIDA
DIRECTOR

DEPUTY DIRECTORS
BRIAN K. MINAAI
GLENN M. OKIMOTO

IN REPLY REFER TO:

HWY-DD
2.6945

TO: MS. ESTHER UEDA, EXECUTIVE DIRECTOR
LAND USE COMMISSION
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT
AND TOURISM

FROM: KAZU HAYASHIDA
DIRECTOR OF TRANSPORTATION

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT (EA) FOR KAMEHAMEHA HIGHWAY, REPLACEMENT OF MALAEKAHANA BRIDGE, VICINITY OF KAHUKU, OAHU, FEDERAL-AID PROJECT NO. BR-083-1(27)

Thank you for your letter regarding the Draft EA for the proposed bridge replacement project. We appreciate your efforts in reviewing the document and provide the following response to your comments.

1. Figure 5.2 will be revised in the Final EA to indicate that the Urban District Boundary follows the makai side of Kamehameha Highway in the vicinity of the project area.

Your letter will be included in the Final EA for the proposed project. If you have any questions, please call Mr. Jeffrey Fujimoto at 587-2249.

United States Department of the Interior

FISH AND WILDLIFE SERVICE

PACIFIC ISLANDS ECOREGION
300 ALA MOANA BOULEVARD, ROOM 3108
BOX 50088
HONOLULU, HAWAII 96850
PHONE: (808) 541-3441 FAX: (808) 541-3470

In Reply Refer To: CMC

Hugh Y. Ono
State of Hawaii
Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813-5097

Re: Draft Environmental Assessment (DEA) for Kamehameha Highway, Replacement of Malaekahana Bridge, Vicinity of Kahuku, Oahu, Federal-Aid Project No. BR-083-1(27).

Dear Mr. Ono:

The U.S. Fish and Wildlife Service (Service) has reviewed the referenced Draft Environmental Assessment for the proposed replacement of the existing bridge over Malaekahana Stream, construction of a temporary detour road, and restoration of the project area after completion of construction activities. Approximately 3 acres of stream and riparian area, as well as a small (less than 100 square feet) patch of wetland will be affected by the proposed project. The lead agency is the State of Hawaii Department of Transportation, Highways Division in cooperation with the Federal Highway Administration. This letter has been prepared under the authority of and in accordance with provisions of the National Environmental Policy Act of 1969 [42 U.S.C. 4321 *et seq.*; 83 Stat. 852], as amended, the Fish and Wildlife Coordination Act of 1934 [16 U.S.C. 661 *et seq.*; 48 Stat. 401], as amended, the Endangered Species Act of 1973 [16 U.S.C. 1531 *et seq.*; 87 Stat. 884], as amended, and other authorities mandating Service concern for environmental values. Based on these authorities, the Service offers the following comments for your consideration.

The DEA adequately describes the flora, fauna, and habitats that exist at the proposed project sites. Although the Service does not condone filling wetland areas, we understand that upon completion of this project all fill material will be removed and the wetland at the site will be restored in a manner that will result in no-net loss of wetland habitat values. The Service supports the mitigative measures detailed in the DEA and recommends that the construction and restoration actions be

additionally conditioned to include the following measures:

a. Native species should be used whenever possible to revegetate disturbed areas. Staff at the neighboring James Campbell National Wildlife Refuge may be contacted for seedstock of native species.

b. According to a 1994 revised recovery plan for Hawaiian waterbirds, the Hawaiian stilt prefers to nest on freshly exposed mudflats interspersed with low-growing vegetation. The nesting season normally extends from March through August and peaks in May and June. Based on this information, the Service recommends that all wetland restoration efforts be conducted at the same time in order to minimize the likelihood that stilts will nest on exposed ground. Additionally, the Service recommends that restoration occur between the months of September and April to avoid the stilt breeding season.

Provided that the project sponsor adheres to the above recommendations and the mitigative measures specified in the DEA, the Service has no objections to the proposed bridge replacement and detour road construction. The Service appreciates the opportunity to comment on the proposed project. If you have questions regarding these comments, please contact Fish and Wildlife Biologist Christina Crooker at (808) 541-3441.

Sincerely,

Brooks Harper

Brooks Harper
Field Supervisor
Ecological Services

BENJAMIN J. CAYETANO
GOVERNOR

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

KAZU HAYASHIDA
DIRECTOR

DEPUTY DIRECTORS
Brian K. Minaai
GLENN M. OKIMOTO

IN REPLY REFER TO:

HWY-DD
2.6951

November 3, 1997

Mr. Brooks Harper, Field Supervisor
Fish and Wildlife Service
U. S. Department of the Interior
P. O. Box 50088
Honolulu, Hawaii 96850

Dear Mr. Harper:

Subject: Draft Environmental Assessment (EA) for Kamehameha Highway, Replacement of Malaekahana Bridge, Vicinity of Kahuku, Oahu, Federal-Aid Project No. BR-083-1(27)

Thank you for your letter regarding the Draft EA for the proposed bridge replacement project. The Final EA has been amended to reflect your comments. We appreciate your efforts in reviewing the document and provide the following response to your comments.

1. Native species will be used whenever possible to revegetate areas disturbed during the course of the proposed project.

2. The proposed construction schedule provides for restoration activities to be completed in the final four (4) months of the project. This will most likely occur between the months of October 1998 and February 1999. This schedule corresponds with your recommendation to conduct restoration activities between the months of September and April. The proposed schedule should provide adequate time for ground cover to be established by the start of stilt nesting season. Best efforts will be made to synchronize the revegetation of the project area to minimize the likelihood that stilts will nest on exposed ground.

If there are any further questions regarding the project or the document, please contact Mr. Jeffrey Fujimoto, P.E. at 587-2249. Thank you for your assistance in the review of this project.

Very truly yours,

for HUGH Y. ONO
Administrator
Highways Division

869 PUNCHBOWL ST., HON

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

RECEIVED
'97 JUL 10 P12:46
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HIGHWAYS
DEPT. OF TR.

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET, 6TH FLOOR
HONOLULU, HAWAII 96813

MICHAEL D. WILSON, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES
Gilbert Coloma-Agaran

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

July 8, 1997

MEMORANDUM

LOG NO: 19762
DOC NO: 9707EJ04

TO: Hugh Y. Ono, Administrator
Department of Transportation
Highways Division

FROM: Don Hibbard, Administrator
Historic Preservation Division

SUBJECT: **Chapter 6E-8 Historic Preservation Review -- Draft Environmental Assessment for Replacement of Malaekahana Bridge, Kamehameha Highway, Federal-Aid Project No. BR-083-1(27) [File No. HWY-DD 2.3475]**
Malaekahana, Ko'olauloa, O'ahu
TMK: 5-6-01

Thank you for the opportunity to review the DEA for the proposed replacement of the existing Malaekahana Bridge project. The DEA has correctly incorporated our earlier comments to the DOT that we concur that this project will have "no effect" on historic sites (Log No. 19514/Doc No. 9705EJ18).

EJ:jk

JUL 3 04 PH '97
RECEIVED
DEPT. OF TRANSPORTATION
HIGHWAYS DIVISION

BENJAMIN J. CAYETANO
GOVERNOR

KAZU HAYASHIDA
DIRECTOR

DEPUTY DIRECTORS
JERRY M. MATSUDA
GLENN M. OKIMOTO

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

IN REPLY REFER TO:

HWY-DD
2.3475

August 18, 1997

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

ATTN: MS. MUFFET JOURDANE

FROM: HUGH Y. ONO, ADMINISTRATOR
HIGHWAYS DIVISION

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT FOR KAMEHAMEHA HIGHWAY, REPLACEMENT OF MALAEKAHANA BRIDGE, VICINITY OF KAHUKU, OAHU, FEDERAL-AID PROJECT No. BR-083-1(27)

Thank you for your letter regarding the Draft EA for the proposed bridge replacement project. We appreciate your efforts in reviewing the document, and acknowledge your finding that the project will have "no effect" on historic sites. Your letter will be included in the Final EA for the proposed project.

If there are any questions regarding the proposed project or the Final EA please call Mr. Jeffrey Fujimoto at 587-2249.

ited States
Department of
Agriculture

tural
Resources
Conservation
vice

P.O. Box 50004
Honolulu, HI
350

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'97 JUL 18 P1:05

Our People...Our Islands...In Harmony

July 17, 1997

DESIGN BRANC
HIGHWAYS DIVI
DEPT. OF TRANSP

Mr. Jeffrey Fujimoto, Project Officer
Department of Transportation
State of Hawaii
869 Punchbowl Street
Honolulu, Hawaii 96813-5097

Dear Mr. Fujimoto:

Subject: Reply No. HWY-DD 2.3475 - Draft Environmental Assessment (DEA) - Replacement of Malaekahana Bridge, Kamehameha Highway, Vicinity of Kahuku, Federal - Aid Project No. BR-083-1(27)

We have reviewed the above-mentioned document and have no comments to offer at this time.

Thank you for the opportunity to review this document.

Sincerely,

KENNETH M. KANESHIRO
State Conservationist

BENJAMIN J. CAYETANO
GOVERNOR

KAZU HAYASHIDA
DIRECTOR

DEPUTY DIRECTORS
Brian K. Minaai
GLENN M. OKIMOTO

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

IN REPLY REFER TO:

HWY-DD
2.6947

November 3, 1997

Mr. Kenneth Kaneshiro
State Conservationist
USDA-NRCS
P. O. Box 50004
Honolulu, Hawaii 96850

Dear Mr. Kaneshiro:

Subject: Draft Environmental Assessment (EA) for Kamehameha Highway, Replacement of Malaekahana Bridge, Vicinity of Kahuku, Oahu, Federal-Aid Project No. BR-083-1(27)

Thank you for your letter regarding the Draft EA for the proposed bridge replacement project. We appreciate your efforts in reviewing the document. Your letter will be included in the Final EA for the proposed project.

If there are any questions, please call Mr. Jeffrey Fujimoto at 587-2249.

Very truly yours,

for HUGH Y. ONO
Administrator
Highways Division

FIRE DEPARTMENT
CITY AND COUNTY OF HONOLULU
3375 KOAPAKA STREET, SUITE H425
HONOLULU, HAWAII 96819-1869

JEREMY HARRIS
MAYOR

ANTHONY J. LOPEZ, JR
FIRE CHIEF

ATTILIO K. LEONARDI
FIRE DEPUTY CHIEF

July 2, 1997

Mr. Hugh Y. Ono, Administrator
State of Hawaii
Department of Transportation
Highways Division
869 Punchbowl Street
Honolulu, Hawaii 96813-5097

Dear Mr. Ono:

SUBJECT: Draft Environmental Assessment for Kamehameha Highway, Replacement of Malaekahana Bridge, Vicinity of Kahuku, Oahu, Federal-Aid Project No. BR-083-1(27)

We have reviewed the subject material provided and foresee no adverse impact in Fire Department facilities or services. Fire protection services provided from Kahuku and Hauula engine companies with ladder service from Kaneohe are adequate.

Access for fire apparatus, water supply and building construction shall be in conformance to existing codes and standards.

Should you have any questions, please call Acting Assistant Chief Arthur Ugalde of our Administrative Services Bureau at 831-7774.

Sincerely,

ANTHONY J. LOPEZ, JR.
Fire Chief

AJL/AP:ay

BENJAMIN J. CAYETANO
GOVERNOR

KAZU HAYASHIDA
DIRECTOR

DEPUTY DIRECTORS
Brian K. Minaai
GLENN M. OKIMOTO

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

IN REPLY REFER TO:

HWY-DD
2.6949

November 3, 1997

Mr. Anthony J. Lopez, Chief
Honolulu Fire Department
3375 Koapaka Street, Suite H-425
Honolulu, Hawaii 96819

Dear Chief Lopez:

Subject: Draft Environmental Assessment (EA) for Kamehameha Highway, Replacement of Malaekahana Bridge, Vicinity of Kahuku, Oahu, Federal-Aid Project No. BR-083-1(27)

Thank you for your letter regarding the Draft EA for the proposed bridge replacement project. We appreciate your efforts in reviewing the document, and acknowledge your finding that the project will not affect fire service to the Kahuku area. Your letter will be included in the Final EA for the proposed project.

If there are any questions, please call Mr. Jeffrey Fujimoto at 587-2249.

Very truly yours,

for HUGH Y. ONO
Administrator
Highways Division

POLICE DEPARTMENT
CITY AND COUNTY OF HONOLULU
801 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96813 - AREA CODE (808) 529-3111

JEREMY HARRIS
MAYOR

MICHAEL S. NAKAMURA
CHIEF

CLEE DONOHUE
WILLIAM B. CLARK
DEPUTY CHIEFS

OUR REFERENCE BS-DL

July 17, 1997

Mr. Hugh Y. Ono, Administrator
Highways Division
Department of Transportation
State of Hawaii
869 Punchbowl Street
Honolulu, Hawaii 96813-5097

Dear Mr. Ono:

This is in response to your letter of June 23, 1997, requesting comments on the Draft Environmental Assessment for Federal-Aid Project, Kamehameha Highway - Replacement of Malaekahana Stream, No. BR-083-1(27).

This project should have no significant impact on the operations of the Honolulu Police Department.

Thank you for the opportunity to comment.

MICHAEL S. NAKAMURA
Chief of Police

By
JAMES FEMIA, Assistant Chief
Administrative Bureau

BENJAMIN J. CAYETANO
GOVERNOR

KAZU HAYASHIDA
DIRECTOR

DEPUTY DIRECTORS
Brian K. Minaai
GLENN M. OKIMOTO

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

IN REPLY REFER TO:

HWY-DD
2.6948

November 3, 1997

Mr. Michael S. Nakamura, Chief
Honolulu Police Department
801 South Beretania Street
Honolulu, Hawaii 96813

Dear Chief Nakamura:

Subject: Draft Environmental Assessment (EA) for Kamehameha Highway, Replacement of Malaekahana Bridge, Vicinity of Kahuku, Oahu, Federal-Aid Project No. BR-083-1(27)

Thank you for your letter regarding the Draft EA for the proposed bridge replacement project. We appreciate your efforts in reviewing the document, and acknowledge your finding that the project will not have a significant impact on operations of the Honolulu Police Department. Your letter will be included in the Final EA for the proposed project.

If there are any questions, please call Mr. Jeffrey Fujimoto at 587-2249.

Very truly yours,

for HUGH Y. ONO
Administrator
Highways Division

DIRECTOR'S OFFICE DEPARTMENT OF LAND UTILIZATION
DEPT. OF TRANSPORTATION
Jul 28 11 20 AM '97

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 7TH FLOOR • HONOLULU, HAWAII 96813
PHONE: (808) 523-4414 • FAX: (808) 527-6743

RECEIVED
'97 JUL 30 A7:57
DESIGN BRANCH
HIGHWAYS DIVISION
DEPT. OF TRANSPORTATION

JEREMY HARRIS
MAYOR

JAN NAOE SULLIVAN
DIRECTOR

LORETTA K.C. CHEE
DEPUTY DIRECTOR

97-04102(AC/SHC)

July 25, 1997

RECEIVED
Jul 28 1 52 PM '97
DEPT. OF TRANSPORTATION
HIGHWAYS DIVISION

The Honorable Kazu Hayashida, Director
Department of Transportation
State of Hawaii
Aliiaimoku Hale
869 Punchbowl Street
Honolulu, Hawaii 96813

Dear Mr. Hayashida:

Draft Environmental Assessment (EA) For
Malaekahana Stream Bridge Replacement
Kamehameha Highway, Kahuku, Koolauloa, Oahu
Federal-Aid Project No. BR-083-1(27)
Tax Map Keys: 5-6-01: 47 and 5-6-06: 14

In response to your letter of July 1, 1997, we have reviewed the above document and offer the following comments:

1. The proposed project is located within the Special Management Area (SMA). Since the estimated cost exceeds $125,000, a Major Special Management Area Use Permit (SMP) is required prior to construction.

2. There should be a conceptual grading plan attached to the Final EA if grading work is implemented as indicated in Section 6.3.2.

Thank you for the opportunity to comment. Should you have any questions, please contact Art Challacombe of our staff at 523-4107.

Very truly yours,

JAN NAOE SULLIVAN
Director of Land Utilization

JNS:am

g:ppd\97-04102.shc

BENJAMIN J. CAYETANO
GOVERNOR

KAZU HAYASHIDA
DIRECTOR

DEPUTY DIRECTORS
BRIAN K. MINAAI
GLENN M. OKIMOTO

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

IN REPLY REFER TO:

HWY-DD
2.6943

NOV 17 1997

Ms. Jan Naoe Sullivan, Director
Department of Land Utilization
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Attention: Mr. Art Challacombe

Dear Ms. Sullivan:

Subject: Draft Environmental Assessment (EA) for Kamehameha Highway, Replacement of Malaekahana Bridge, Vicinity of Kahuku, Oahu Federal-Aid Project No. BR-083-1(27)

Thank you for your letter regarding the Draft EA for the proposed bridge replacement project. We appreciate your efforts in reviewing the document and provide the following response to your comments. Your comments will be included in the Final EA for the project.

1. A completed permit application form and supporting documents for a City and County of Honolulu Major Special Management Area Use Permit (SMAP) are enclosed for the subject project.

   Copies of the project plans and Final EA/Finding of No Significant Impact for the subject project were forwarded to the Department of Public Works to determine the project's compliance with Flood Hazard Variance requirements.

2. A conceptual grading plan is appended to the Final EA.

We appreciate your efforts in processing the enclosed permit application. If you have any questions, please contact Mr. Jeffrey Fujimoto at 587-2249.

Very truly yours,

KAZU HAYASHIDA
Director of Transportation

Enc.

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

JEREMY HARRIS
MAYOR

JONATHAN K. SHIMADA, PhD
DIRECTOR AND CHIEF ENGINEER
ROLAND D. LIBBY, JR.
DEPUTY DIRECTOR

EN 97-164

RECEIVED
AUG 12 3 29 PM '97
DEPT. OF TRANSPORTATION
HIGHWAYS DIVISION

August 8, 1997

Mr. Kazu Hayashida, Director
Department of Transportation
State of Hawaii
869 Punchbowl Street
Honolulu, Hawaii 96813-5097

Dear Mr. Hayashida:

Subject: Draft Environmental Assessment (DEA)
Replacement of Malaekahana Bridge at Kamehameha Highway
TMK: 5-6-06

We have reviewed the subject DEA and have no comments to offer at this time.

Should you have any questions, please contact Mr. Alex Ho, Environmental Engineer, at 523-4150.

Very truly yours,

JONATHAN K. SHIMADA, PhD
Director and Chief Engineer

DIRECTOR'S OFFICE
DEPT. OF
TRANSPORTATION
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HIGHWAYS DIVISION
DEPT. OF TRANSPORTATION

BENJAMIN J. CAYETANO
GOVERNOR

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

KAZU HAYASHIDA
DIRECTOR

DEPUTY DIRECTORS
BRIAN K. MINAAI
GLENN M. OKIMOTO

IN REPLY REFER TO:

HWY-DD
2.6944

Jonathan K. Shimada, Ph.D.
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Attention: Mr. Alex Ho

Dear Dr. Shimada:

Subject: Draft Environmental Assessment (EA) for Kamehameha Highway, Replacement of Malaekahana Bridge, Vicinity of Kahuku, Oahu, Federal-Aid Project No. BR-083-1(27)

Thank you for your letter regarding the Draft EA for the proposed bridge replacement project. We appreciate your efforts in reviewing the document.

If you have any questions, please call Mr. Jeffrey Fujimoto at 587-2249.

Very truly yours,

KAZU HAYASHIDA
Director of Transportation

DOCUMENT CAPTURED AS RECEIVED

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

REPLY TO ATTENTION OF

August 20, 1997

Operations Branch

Mr. Hugh Y. Ono
Department of Transportation
Highways Division
869 Punchbowl Street
Honolulu, Hawaii 96813-5097

Dear Mr. Ono:

This responds to Oceanic Companies, Inc. request on your behalf for Department of the Army (DA) authorization for discharge of dredged and fill material in waters of the U.S., associated with replacement of Malaekahana Stream Bridge, Kamehameha Highway, Kahuku, Oahu, Hawaii.

Based on the information provided, we have determined that the proposed work can be authorized by the Corps Nationwide permit (NWP) authority (December 13, 1996 Federal Register, Final Notice of Issuance, Reissuance, and Modification of Nationwide Permits, 61 FR 65874) NWP # 3, Maintenance and NWP # 33, Temporary Construction, Access and Dewatering and no further Department of the Army processing is necessary. The DA permit will be valid, however, only after you obtain a Section 401 Water Quality Certification, or waiver thereof, from the State Department of Health. Until these approvals, or waivers, are received, we are issuing you a "Provisional Nationwide Permit" for the proposed work. No work below the hightide line can begin until you receive the necessary approvals from the state.

If the state issues the necessary certification or waiver, this authorization will take effect from the issuance date and will remain valid for two years, or until the nationwide permits are modified, reissued, or revoked. Please note that if you commence, or are under contract to commence the proposed activity before the date that NWP # 3 or NWP # 33 are modified or revoked, you will have 12 months from the date of the modification or revocation to complete the activity under the existing terms and conditions.

Enclosed are the conditions of the new NWPs for your information and compliance. In addition to the general NWP conditions, we are adding two special conditions:

OPTIONAL FORM 99 (7-90)

FAX TRANSMITTAL # of pages ▸ 3

To Andy Anderson	From Kathy Dacey
Dept./Agency	Phone #
Fax # 835-2800	Fax #

a. Special Condition 1: All material placed in the water must be free of contaminants and fine-grained material.

b. Special Condition 2: You must submit a written compliance report to this office within two months of completion of the authorized project. The compliance report must include, as appropriate, description of the construction activities, discussion(s) of any deviations from the proposed project design and the cause of these deviations, results of any environmental monitoring required by the territorial agencies, discussion(s) of any necessary corrective action(s), and photographs documenting the progress of the permitted work (including pre- and post-construction photos).

In response to the request for comments on the Draft Environmental Assessment for the project (dated May 1997), the information contained in Section 1.2.1 regarding the DA permit program is generally accurate. We note, however, that the citation in the first paragraph of this section is incorrect. Title 33 U.S. Code 1344 is the citation for Section 404 of the Clean Water Act. There exist numerous implementing regulations, including: 33 CFR 323, 33 CFR 328, 40 CFR 110 and 40 CFR 230. In addition, the correct reference for the new Nationwide permits is December 13, 1996 Federal Register, Final Notice of Issuance, Reissuance, and Modification of Nationwide Permits, 61 FR 65874. Finally, please note that pursuant to Section 404 of the Clean Water Act, the Corps of Engineers has regulatory jurisdiction over discharge of dredged or fill material.

File Number NW 970000091 is assigned to this project. Please refer to this number in any future correspondence with us. Feel free to contact Ms. Kathleen A. Dadey of my staff at 438-9258, extension 15 if you have any questions.

Sincerely,

Linda M. Hihara-Endo

Linda M. Hihara-Endo, Ph.D., P.E.
Acting Chief, Operations Branch

Enclosures

OPTIONAL FORM 99 (7-90)

FAX TRANSMITTAL | # of pages ▶ 3

To Andy Tomlinson	From Kathy Dadey
Dept./Agency	Phone #
Fax # 543-2800	Fax #

NSN 7540-01-317-7368 5099-101 GENERAL SERVICES ADMINISTRATION

Copies Furnished (w/o enclosures):
National Marine Fisheries Service, Honolulu, HI
U.S. Fish and Wildlife Service, Honolulu, HI
Department of Land and Natural Resources, DAR, Honolulu, HI
Department of Land and Natural Resources, Water Commission, Honolulu, HI
Office of Planning, Coastal Zone Management Program Office, Honolulu, HI
Clean Water Branch, Department of Health, Honolulu, HI
Department of Land Utilization, Honolulu, HI

BENJAMIN J. CAYETANO
GOVERNOR

KAZU HAYASHIDA
DIRECTOR

DEPUTY DIRECTORS
Brian K. Minaai
GLENN M. OKIMOTO

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

IN REPLY REFER TO:

HWY-DD
2.6952

November 3, 1997

Linda M. Hihara-Endo, Ph.D., P.E.
Acting Chief, Operations Branch
U. S. Army Engineer District, Honolulu
Fort Shafter, Hawaii 96858-5440

Attention: Ms. Kathleen A. Dadey

Dear Dr. Hihara-Endo:

Subject: Draft Environmental Assessment (EA) for Kamehameha Highway, Replacement of Malaekahana Bridge, Vicinity of Kahuku, Oahu, Federal-Aid Project No. BR-083-1(27)

Thank you for your letter regarding the U. S. Army Corps of Engineers Nationwide Permits and Draft EA for the proposed bridge replacement project, File Number NW 970000091. We acknowledge your approval of a "Provisional Nationwide Permit" for the proposed work. We are in the process of obtaining a 401 Water Quality Certification from the Department of Health.

Pursuant to your two (2) Special Conditions, we will 1) ensure that all material placed in the water will be free of contaminants and fine-grained material, and 2) submit a written compliance report to your office within two (2) months of completion of the authorized project. The report will include a description of the construction activities, discussions of any deviations from the proposed project design and cause of the deviations, results of any environmental monitoring, discussions of any necessary corrective actions, and photographs documenting the progress of the work.

The Final EA also has been amended to reflect your comments. The citation in paragraph one (1) of Section 1.2.1 has been amended pursuant to your comments. It also is noted that the Corps of Engineers has regulatory jurisdiction over discharge of dredged or fill material.

If there are any further questions regarding the project or the document, please contact Mr. Jeffrey Fujimoto, P.E. at 587-2249. Thank you for your assistance in the review of this project.

Very truly yours,

for HUGH Y. ONO
Administrator
Highways Division

THE ESTATE OF JAMES CAMPBELL

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DESIGN BRANCH
HIGHWAYS DIVISION
DEPT. OF TRANSPORTATION

Mr. Hugh Y. Ono
Administrator
Highways Division
State of Hawaii
Department of Transportation
869 Punchbowl Street
Honolulu, HI 96813-5097

Dear Mr. Ono:

Draft Environmental Assessment for the
Malaekahana Stream Bridge Replacement, Federal-Aid Project No. BR-083-1(27)

Thank you for the opportunity to review the Draft Environmental Assessment for the Malaekahana Stream Bridge Replacement. At this time, we do not have any comments on the document.

If there are any questions, please contact me at 674-3102.

Very truly yours,

Lloyd M. Haraguchi
Project Manager
Community Development

ms:01003100\K10133

1001 Kamokila Boulevard, Kapolei, Hawaii 96707 Phone (808) 674-6674 Facsimile (808) 674-3111

BENJAMIN J. CAYETANO
GOVERNOR

KAZU HAYASHIDA
DIRECTOR

DEPUTY DIRECTORS
Brian K. Minaai
GLENN M. OKIMOTO

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

IN REPLY REFER TO:

HWY-DD
2.6950

November 3, 1997

Mr. Lloyd Haraguchi
The Estate of James Campbell
1001 Kamokila Boulevard
Kapolei, Hawaii 96707

Dear Mr. Haraguchi:

Subject: Draft Environmental Assessment (EA) for Kamehameha Highway, Replacement of Malaekahana Bridge, Vicinity of Kahuku, Oahu, Federal-Aid Project No. BR-083-1(27)

Thank you for your letter regarding the Draft EA for the proposed bridge replacement project. We appreciate your efforts in reviewing the document.

If you have any questions, please call Mr. Jeffrey Fujimoto at 587-2249. Thank you for your assistance in the review of this project.

Very truly yours,

for HUGH Y. ONO
Administrator
Highways Division

BENJAMIN J. CAYETANO
GOVERNOR
SEIJI F. NAYA
DIRECTOR
BRADLEY J. MOSSMAN
DEPUTY DIRECTOR
RICK EGGED
DIRECTOR, OFFICE OF PLANNING

DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

OFFICE OF PLANNING
235 South Beretania Street, 6th Flr., Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804
Tel.: (808) 587-2846
Fax: (808) 587-2824

Ref. No. P-6893

August 20, 1997

MEMORANDUM

TO: Kazu Hayashida, Director
Department of Transportation

ATTN.: Hugh Y. Ono, Administrator
Highways Division

FROM: Rick Egged
Director, Office of Planning

SUBJECT: Draft Environmental Assessment for the Malaekahana Stream Bridge Replacement at Kamehameha Highway, Kahuku, Oahu; Federal-Aid Project No. BR-083-1(27)

Section 1.2.3 of the Draft Environmental Assessment correctly states that the Coastal Zone Management (CZM) consistency requirements are applicable to the project. However, there seems to be some confusion about the agency responsible for the preparation of the consistency determination, perhaps because of the different roles of two Federal agencies involved with the project, the U.S. Army Corps of Engineers (COE) and the Federal Highway Administration (FHWA).

This project will require a permit from the COE, but the type of permit has not been determined yet. If the COE authorizes the project under Nationwide Permits No. 3 (Maintenance) and/or No. 33 (Temporary Construction, Access and Dewatering), CZM consistency determination will not be required because these permits have already been approved for CZM consistency. However, if Nationwide Permit No. 13 (Bank Stabilization), No. 14 (Road Crossings), or Other Nationwide Permit, or if an individual permit is required, the State Department of Transportation must submit a CZM consistency determination.

With regard to the FHWA, it is important to determine its role. If it is participating directly in the project as opposed to providing grant funds, the FHWA is responsible for submitting the required CZM consistency determination. On the other hand, if the FHWA is merely providing funds from the Highway Planning and Construction Program (OMB 20.205), the State Department of Transportation is responsible for submitting the consistency determination and obtaining its approval before the Federal funds can be released.

Programmatically, our primary concern is the wetland filling and near-stream vegetation clearing. After construction, the wetland should be restored to its original condition and function. In addition, since the near-stream vegetation is important to the endangered Hawaiian Duck, it should be restored to its original condition.

Thank you for the opportunity to review and comment on the Draft Environmental Assessment. If you have any questions, please call John Nakagawa of our CZM Program at 587-2878.

cc: U.S. Army Corps of Engineers, Operations Branch
U.S. National Marine Fisheries Service, Pacific Area Office
U.S. Fish and Wildlife Service, Pacific Islands Ecoregion
Department of Health, Clean Water Branch
Department of Land & Natural Resources,
Planning & Technical Services Branch
Commission on Water Resource Management
Department of Land Utilization, City & County of Honolulu

BENJAMIN J. CAYETANO
GOVERNOR

KAZU HAYASHIDA
DIRECTOR

DEPUTY DIRECTORS
Brian K. Minaal
GLENN M. OKIMOTO

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

NOV 28 1997

IN REPLY REFER TO:

HWY-DD
2.7208

TO: RICK EGGED, DIRECTOR
OFFICE OF PLANNING
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT AND TOURISM

FROM: KAZU HAYASHIDA
DIRECTOR OF TRANSPORTATION

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT (EA) FOR KAMEHAMEHA HIGHWAY, REPLACEMENT OF MALAEKAHANA BRIDGE, VICINITY OF KAHUKU, OAHU, FEDERAL-AID PROJECT NO. BR-083-1(27)

Thank you for your letter regarding the Draft EA for the proposed bridge replacement project. The Final EA has been amended to reflect your comments. We appreciate your efforts in reviewing the document and provide the following response to your comments.

The project is being partially funded by the Federal Highway Administration (FHWA). Funds have been allocated and released for the proposed project. Furthermore, the project is authorized by the U. S. Army Corps of Engineers under Nationwide Permit No. 3 (Maintenance) and No. 33 (Temporary Construction, Access and Dewatering). The approval for these Nationwide Permits was recently approved by the U. S. Army Corps Operations Branch and is included in the Final EA for the proposed project.

The wetland area and the near-stream vegetation will be restored to its original condition pursuant to the recommendations of the U. S. Fish and Wildlife Service and the U. S. Army Corps of Engineers.

If there are any questions, please contact Mr. Jeffrey Fujimoto at 587-2249. Thank you for your assistance in the review of this project.

Enc.