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IN REPLY REFER TO:
HWY-DD
2.8140

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APR 27 2000

TO: GENEVIEVE SALMONSON, DIRECTOR
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

FROM: KAZU HAYASHIDA
DIRECTOR OF TRANSPORTATION

SUBJECT: FINDING OF NO SIGNIFICANT IMPACT (FONSI) FOR KAMEHAMEHA HIGHWAY, HALAWA STREAM BRIDGE (INBOUND) REPLACEMENT, TMK 9-9-02 AND 9-9-03, DISTRICT OF EWA, OAHU, HAWAII FEDERAL-AID PROJECT NO. BR-099-1(19)

The Department of Transportation has reviewed the comments received during the 30-day public comment period which began on February 23, 2000. The agency has determined that this project will not have significant environmental effects and has issued a FONSI. Please publish this notice in the May 8, 2000, OEQC Environmental Notice.

We have enclosed a completed OEQC Publication Form and four copies of the final EA. Please call Christine Yamasaki at 692-7572 if you have any questions and reference HWY-DD 2.8140 as noted above.

Enclosure

5b

2000-05-08-OA-FEA-

Final Environmental Assessment (EA)

(Halawa Stream Bridge (Inbound) Replacement)

Kamehameha Highway
District of Ewa, Oahu

Proposing Agency:

State of Hawaii
Department of Transportation
Highways Division

Accepting Agency:

State of Hawaii
Department of Transportation
Highways Division

Prepared by:

Earth Tech, Inc.
700 Bishop Street
Suite 900
Honolulu, Hawaii 96813

April 2000

EXECUTIVE SUMMARY

The purpose of this environmental assessment (EA) is to analyze the potential environmental consequences of the proposed State Department of Transportation Highways Division (DOT-HD) Halawa Stream Bridge (Inbound) Replacement project activities, to determine if there would be significant short-term, long-term and /or cumulative impacts on the human, natural and historic environments. This project is in compliance with the National Environmental Policy Act (NEPA); Department of Defense (DOD) Directive 6050.1, Chapter 343, Hawaii Revised Statutes (HRS 343), and Title 11, Chapter 200 (11-200), Hawaii Administrative Rules (HAR) of the State Department of Health (DOH) implementing rules for the environmental assessment process.

The proposed bridge replacement project will provide a safer structure for motorist and pedestrian traffic by upgrading portions of the bridge that do not meet current live load and seismic requirements. The new structure will be wider providing sidewalks, a bike lane, and railings that meet current design standards.

ALTERNATIVES CONSIDERED

A replacement bridge design and the no-action alternative were considered in the development of the proposed project. The proposed project's replacement bridge design is based upon AASHTO Bridge Design Specifications.

ANTICIPATED IMPACTS

The analysis detailed in Chapter 4 indicates that implementation of the Halawa Stream Bridge Replacement project would not pose any anticipated significant long term or cumulative impacts on the human, natural and historic environments. However, potential impacts from the development of the detour road and bridge and alterations to traffic flow would cause minimal short-term impacts to vegetation, stream topography, water quality, visual resources, noise, and air quality.

SUMMARY OF RESULTS

Air Quality. Project activities would generate exhaust products and fugitive dust emissions from construction vehicles and excavation and construction activities, respectively. Air quality effects will be short-term in nature. The detour road will route traffic with as few delays as possible to minimize vehicular emissions. Additionally, construction vehicles will be scheduled to arrive and depart the site during non-peak traffic hours.

Biological Resources. The impacts to aquatic biota, plants (flora and wetlands), birds, and mammals will be short-term and related to construction activities such a stream work, clearing, and noise associated with the proposed action. The natural drainage flow will be maintained for aquatic biota, vegetation will be inspected for nesting birds prior to clearing activities, and the use of the

wetland-type area will be held to a minimum. Areas disturbed will be revegetated with appropriate species. No effects on endangered or threatened species are expected.

Cultural Resources. Substantial existing archaeological documentation of the Halawa area is available. No prehistoric, historic, or traditional sites have been identified within the area of potential effect. Sites located within the vicinity have been compromised from previous 20th century activities.

Hazardous Wastes and Materials. There are no anticipated short-term or long-term effects from hazardous wastes and materials or petroleum products. Appropriate construction BMPs and spill contingency plans will be implemented throughout the duration of the project.

Noise. Intermittent elevated noise levels from specific construction activities are unavoidable, but are expected to be short-term and minor. Typical heavy construction equipment noise levels are within the decibel range identified for a day time, noisy urban environment.

Socioeconomic. The development of the replacement bridge should not induce or decrease economic or population growth in the project vicinity or region. Construction activities will take place Monday through Friday during normal working hours. No weekend and holiday construction activities are planned.

Transportation. Traffic patterns throughout the course of the proposed project should not be substantially altered. A detour road and bridge will be constructed to accommodate inbound traffic. Minor delays will be expected during peak traffic hours on the detour road. Appropriate traffic signs and a temporary traffic signal system will be provided to minimize the effect.

Utilities and Infrastructure. The proposed activities may have short-term effects to various utilities located within the project limits. Owners of the utilities will be consulted prior to relocation. The disposal of the proposed projects generated solid waste will have a secondary long-term effect on the island's sanitary landfill. This is not expected to have a significant impact on the landfill capacity.

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

Water Resources. Turbidity will be increased and water quality will be reduced downstream of the bridge during the demolition and the bridge widening portions of the project, but this is expected to be short-term in nature. Construction activities have been scheduled to start in the spring to avoid heavy rains. Extensive monitoring of the stream water will also be conducted throughout the duration of the project.

APPLICABLE ENVIRONMENTAL PERMITS

- U.S. Army Corps of Engineers Section 404 Permit
- Section 401 Water Quality Certification
- State Stream Channel Alteration Permit
- State DOH, NPDES Form G (Construction Dewatering)
- State Historic Preservation Clearance

DETERMINATION

The proposed action was reviewed and analyzed pursuant to the "Significant Criteria" established in 11-200-12, HAR, environmental impact assessment process. No significant negative environmental impacts were identified and a Finding of No Significant Impact (FONSI) has been given by DOT-HD.

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FIGURES

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ACRONYMS AND ABBREVIATIONS

µg/l	micrograms per liter
µg/m	micrograms per meter
µg/m^3	micrograms per meter cubed
µS/cm	microseimons per centimeter
°C	degrees Celsius
°F	degrees Fahrenheit
AASHTO LRFD	American Association of State Highways and Transportation Officials Load Resistance Factor Design
ADA	Americans with Disabilities Act
ANSI	American National Standards Institute
APE	area of potential effect
BMP	best management practice
CDUA	Conservation District Use Application
CFR	Code of Federal Regulations
cfs	cubic feet per second
CO	carbon monoxide
CO_2	carbon dioxide
CWA	Clean Water Act
CWB	Clean Water Branch
CZMA	Coastal Zone Management Act
CZMP	Coastal Zone Management Program
dB	decibel
dBA	A-weighted decibels
DLNR	Department of Land and Natural Resources
DOH	Department of Health
DOT	Department of Transportation
DOT-HD	Department of Transportation, Highways Division
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency, United States
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
FL	fill land
FONSI	finding of no significant impact
GRP	grouted rubble paving
HAR	Hawaii Administrative Regulations
HRS	Hawaii Revised Statutes
ld_n	average day night sound level
mgd	million gallons per day

ml	milliliter
msl	mean sea level
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NTU	nephelometric turbidity unit
O_3	ozone
OSHA	Occupational Safety and Health Act
PM_{10}	particulate matter < 10 microns
POL	petroleum, oil, and lubricant
ppt	parts per thousand
SMA	Special Management Area
SHPD	State Historic Preservation Division
SO_2	sulfur dioxide
TL-4	*test level-4*
TSP	total suspended particulate matter
USACE	United States Army Corps of Engineers
USGS	United States Geological Survey

1. INTRODUCTION

The DOT-HD, in cooperation with the Federal Highway Administration (FHWA), proposes to replace a portion of the existing inbound concrete bridge located over the Halawa Stream. The proposed project includes the development of a temporary detour road and bridge to accommodate traffic during the construction of the replacement bridge.

This EA was prepared for the proposed action pursuant to the HRS 343, and the DOH HAR Title 11-200 environmental impact statement rules. The proposed action "triggers" 40 CFR parts 1500-1508 and HRS 343-5(1) because of the use of federal and state funds in the development of the replacement bridge.

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

1.1 Purpose and Need for Action

The purpose for this Kamehameha Highway, Halawa Stream (Inbound) Replacement Bridge project is to provide a safer structure for motorist and pedestrian traffic by replacing portions of the bridge that do not meet current live load and seismic requirements. The existing Halawa Stream Bridge was constructed in 1933 (N.R.H. No. 9-A). The new structure will be wider, provide sidewalks for pedestrian traffic, have bridge railings that meet current DOT and FHWA design standards, and current seismic design criteria, and will be designed to accommodate present day vehicular loadings.

1.2 Required Permits

In addition to the environmental disclosure requirements of HRS 343, the proposed action requires federal, state, and county permits. These permits may include: the U.S. Army Corps of Engineers (USACE) Section 404 Permit; DOH Section 401 Water Quality Certification; State Coastal Zone Management Program (CZMP) Consistency Determination; State Stream Channel Alteration Permit; National Pollutant Discharge Elimination System (NPDES) Construction Dewatering Permit; and State Historic Preservation Clearance. The project does not require a State Conservation District Use Application 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 requires a permit pursuant to Section 404 of the U.S. Clean Water Act (CWA). Section 404 regulates actions involving the discharge of dredged or fill material into

waters of the United States, including 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 323.2.

The USACE has jurisdiction over dredge and fill actions in U.S. waters, including the Halawa Stream. Certain discharges specified in 33 CFR 330 are permitted under a "Nationwide Permit" system, while others receive regional and individual permits. The proposed project at Halawa Stream may meet the conditions for a Nationwide Permit under the criteria established in Permit No. 3 (Maintenance), Permit No. 14 (Linear Transportation Crossings), and Permit No. 33 (Temporary Construction, Access and Dewatering), (61 FR 65874). Requirements for the permits are as follows:

Permit No. 3 Maintenance regulates 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. 14 Linear Transportation Crossings regulates fills for roads crossing waters of the United States (including wetlands and other special aquatic sites), provided the activity meets all the following criteria:

- the width of the fill is limited to the minimum necessary for the actual crossing;
- the fill placed in waters of the United States is limited to a filled area of no more than 1/3 acre. Furthermore, no more than a total of 200 linear feet of the fill for the roadway can occur in special aquatic sites, including wetlands;
- the crossing is culverted, bridged or otherwise designed to prevent the restriction of, and to withstand, expected high flows and tidal flows, and to prevent the restriction of low flows and the movement of aquatic organisms;
- the crossing, including all attendant features, both temporary and permanent, is part of a single and complete project form crossing of a water of the United States;
- for fills in special aquatic sites, including wetlands, the permittee notifies the District Engineer in accordance with the "Notification" general condition. The notification must also include a delineation of affected special aquatic sites, including wetlands.

Permit No. 33 Temporary Construction, Access and Dewatering regulates temporary structures, work, and discharges, including cofferdams, necessary for construction activities, access fills, or dewatering of construction sites, provided that the associated primary activity is authorized by the USACE or the U.S. Coast Guard (USCG), or for other construction activities not subject to the USACE or USCG 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

This application is required per Title IV Permits and Licenses, Certification, Section 401(a)(1) of the 1977 CWA (Public Law 95-217) and HRS 342D. The CWA and Section 401 of its implementing regulations (33 USC 1341) require any applicant for a federal license or permit conducting any activity that 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 DOH Clean Water Branch (CWB) administers the Water Quality Certification permitting process in Hawaii through Chapter 11-54 of the Hawaii Administrative Rules so construction discharge activities ca be monitored and conducted in a manner that will not violate the basic water quality criteria applicable to the class of receiving waters at the site.

1.2.3 Coastal Zone Management Permit

Authorized by HRS Chapter 205A, the Hawaii Coastal Zone Management Program (CZMP) guides the use, protection, and development of land and ocean resources within Hawaii's coastal areas. The National Coastal Zone Management Act of 1972, Section 307(c)(1), requires Federal agencies to conduct their planning, management, development, and regulatory activities in a manner consistent with the state CZMP. Informational and procedural requirements for Federal agencies are established under 40 CFR Part 930. The Office of State Planning (OSP), the State's lead agency for review for consistency, must agree with the determination that the proposed action is consistent with the State of Hawaii's CZMP or provide specific conditions on the proposed action to place it in consistency. All proposed developments within the Special Management Area (SMA) of Hawaii's community development districts are subject to assessment of valuation and potential environmental effects of the proposed work and the significance of each effect. The proposed project may be authorized under Nationwide Permit No. 3 and covered under a blanket certification, if this is the case a CZM consistency determination will not be required.

1.2.4 State Stream Channel Alteration Permit

HRS 174C 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 HAR Title 13, Chapter 169-50 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 that diminishes the quantity or quality of the stream water below the minimum standards.

1.2.5 State Historic Preservation Clearance

The proposed actions at Halawa Stream are also regulated by the National Historic Preservation Act and its implementing regulations (36 CFR 800), as well as the State Historic Preservation Act (HRS 6E). 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 HRS 205A authorizes 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 SMAs, 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. Although the proposed project has been identified as residing partially in the SMA, an exemption is expected from the Director of Permitting and Planning, City and County of Honolulu per ROH, Section 25-3.3(3)(B) Determination, because the project is not defined as development under Section 25-1.3(2)(B and F).

1.2.7 NPDES General Permit Coverage for Construction Dewatering

Title IV – Permits and Licenses, of the CWA gives the United States Environmental Protection Agency (EPA) the authority and responsibility to issue discharge permits to every point source discharger. Section 402 (33 USC 1342) of the CWA describes the NPDES permit system. The CWA allows states to request EPA authorization to administer the NPDES program within their borders. The DOH CWB administers the General Permitting process in Hawaii through the HAR Chapter 11-55 Notice of Intent (NOI) Appendix B-I. The NPDES Construction Dewatering permit is covered by CWB-NOI Form G.

2. PROJECT DESCRIPTION

This section provides general information regarding the proposed project's technical, social, economic, and environmental characteristics, pursuant to HRS 343, and the DOH HAR Title 11-200-10 content requirements for an environmental assessment.

2.1 Project Location and Background

The Halawa Stream Bridge is located on Kamehameha Highway (Route 99) in the ahupua'a of Halawa in the district of Ewa, on the island of Oahu (Figure 2-1). Kamehameha Highway is the main coastal thoroughfare on the island of Oahu. The proposed project site is located on a tangent of a crest vertical curve on the southeastern side of the East Loch of Pearl Harbor, one-half mile southeast of the Arizona Memorial (Figure 2-2). The proposed construction area, or area of potential effect (APE), includes approximately 3 acres of land towards the mountain (mauka) and towards the ocean (makai) sides of the bridge (Figure 2-3).

Halawa View and Centre Court apartment complexes are adjacent to the northeast, and are the closest population centers to the APE. The city of Honolulu is approximately 8 miles away on the south-central portion of the island.

The Halawa Stream is comprised mainly of the North Fork and the South Fork, which originate at the crest of the Koolau Mountains, within the Pearl Harbor Drainage Basin, and flow through steep terrain until just prior to their convergence directly below the Moanalua Freeway. From this point, the stream continues for approximately two miles along a relatively flat course to its outlet in the East Loch of Pearl Harbor (Figure 2-4). Halawa Stream has been enlarged and lined with concrete over the years, along the stretch from Salt Lake Boulevard to beyond Moanalua Freeway. A concrete channel lines the northeasterly stream bank, just mauka of the outbound bridge. Large drainpipes encased in a mortared cobble foundation are interspersed throughout the concrete-lined portion of the stream channel. A semi- subterranean cast iron pipe, approximately 6 inches in diameter, crosses the width of the stream bank on the southeasterly side. A second cast iron pipe, approximately two feet in diameter, lies within the bank parallel with Halawa Stream on the makai side. The presence of the concrete pipes within fill deposits attests to the degree of recent disturbance of, and modification to, the landscape within the project area (IARII 1999).

2.1.1 Climate

The climate in the Halawa-Pearl Harbor area is typical of Leeward Oahu. It is characterized by two distinct seasons, primarily defined by the annual variation in persistence of the northeast tradewinds. The summer months from May to September are typically drier and warmer, while the winters from October to April 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 of the time in the winter. The area also experiences Kona (southerly or westerly) winds and storms, particularly during the winter months.

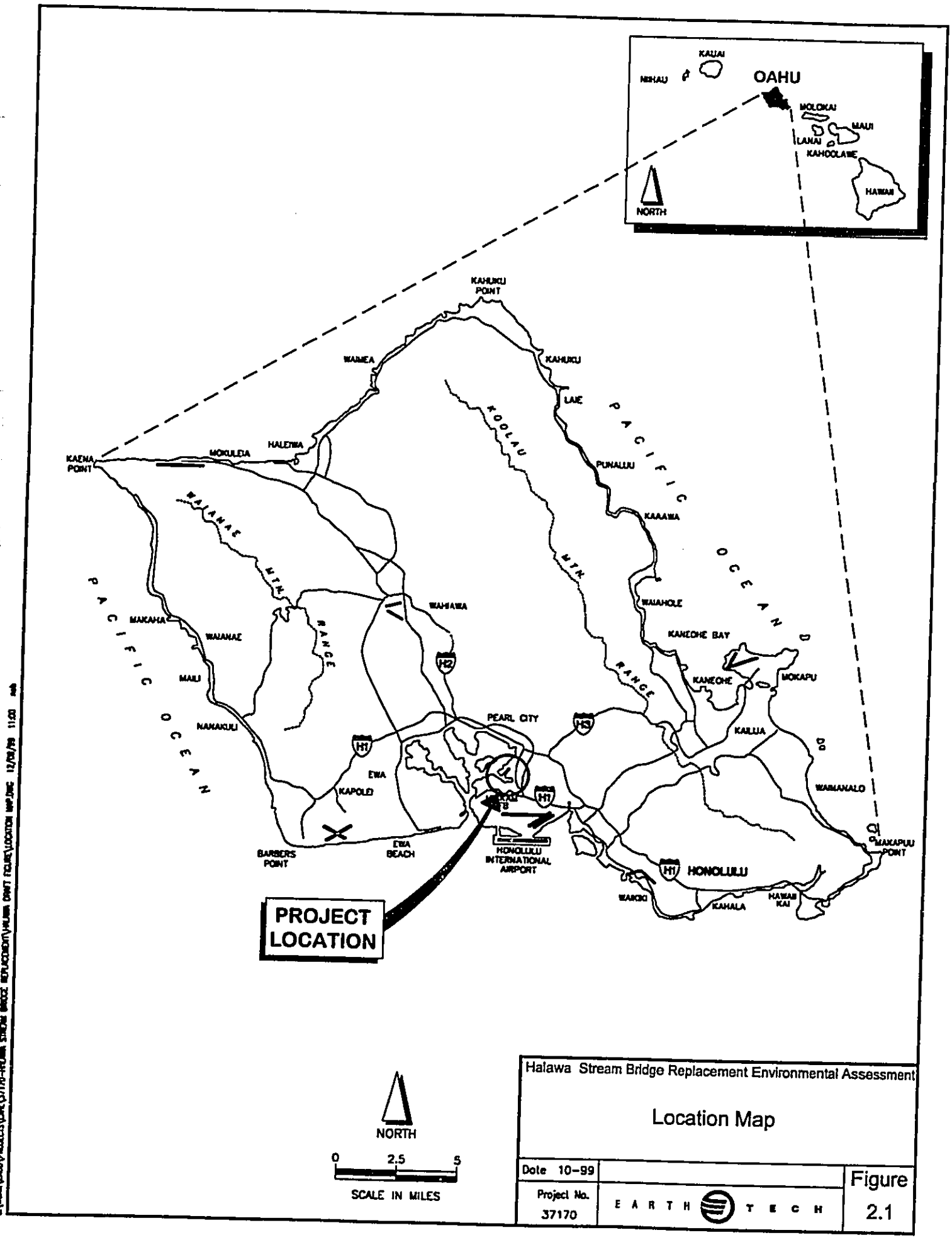
The average rainfall recorded between 1984 and 1991 at stream-gauging station 16226200 ranges from 23.5 to 56.5 inches. This gauging station is located approximately 2.4 miles upstream from the project site. The upper reaches of the Koolau Mountains receive over 150 inches of rain from the cooling of moisture-laden cloud systems moving with the tradewinds (USGS HI-96-1). Approximately 40 percent of the days are clear, 30 percent of the days are partly cloudy, and 30 percent overcast.

Average temperatures in the Pearl Harbor area vary depending on the two seasons in Hawaii. Temperatures in the drier summer months tend to be higher and range from an average of 75°F to 88°F, in the cooler winter months, temperatures range from an average of 66°F to 78°F.

2.1.2 Geography and Topography

The Halawa Stream is located within the Pearl Harbor Drainage Basin and is composed of two major forks: the North and South Halawa Streams. Both streams originate at the crest of the Koolau Mountains (elevation 2,800 feet). The two forks of Halawa Stream flow through relatively narrow valleys in steep topography until they converge near the Moanalua Freeway. From the confluence of the two forks, Halawa Stream flows in a westerly direction prior to discharge into the East Loch of Pearl Harbor. The average discharge for Halawa Stream is approximately 11 cubic feet per second (cfs). The perennial stream extends from 2,400 to 2,800 feet at the upper reaches of the Koolau Mountains. The streams overall gradient averages 0.074 ft/ft. It is composed of two main branches that converge in a single channel approximately 2 miles upstream of the existing bridge. The total watershed area encompasses approximately 6,130 acres; the north fork drains 3,000 acres, the south fork drains 2,000 acres and the watershed below the confluence makes up the remaining 1,130 acres (VTN 1978).

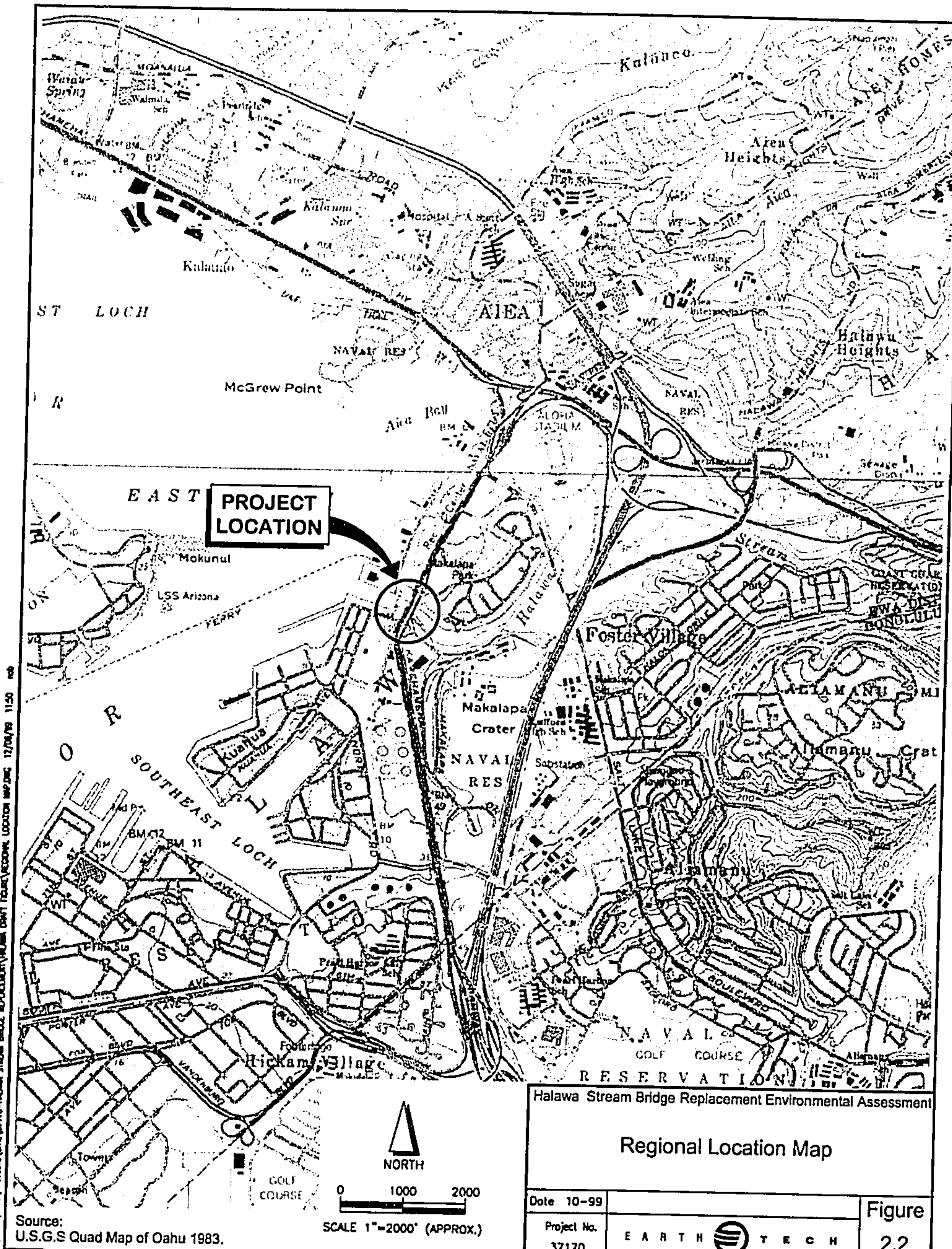
The northeasterly side of the stream is occupied by Halawa View and Centre Court apartment complexes. A 24-inch storm drain outfall, which drains a portion of the Kamehameha Highway and the apartment complexes, is located at the edge of the stream approximately 20 feet from the bridge. Most of the land on the makai side of the stream is U.S. Navy Reservation property. The lands to the northwest of the project site are occupied by the U.S.S. Arizona Memorial Landing, the Arizona and Bowfin Museums, and the Ford Island ferry terminal.



Halawa Stream Bridge Replacement Environmental Assessment

Location Map

Date 10-99		Figure
Project No. 37170	EARTH TECH	2.1



Source:
U.S.G.S Quad Map of Oahu 1983.

Halawa Stream Bridge Replacement Environmental Assessment

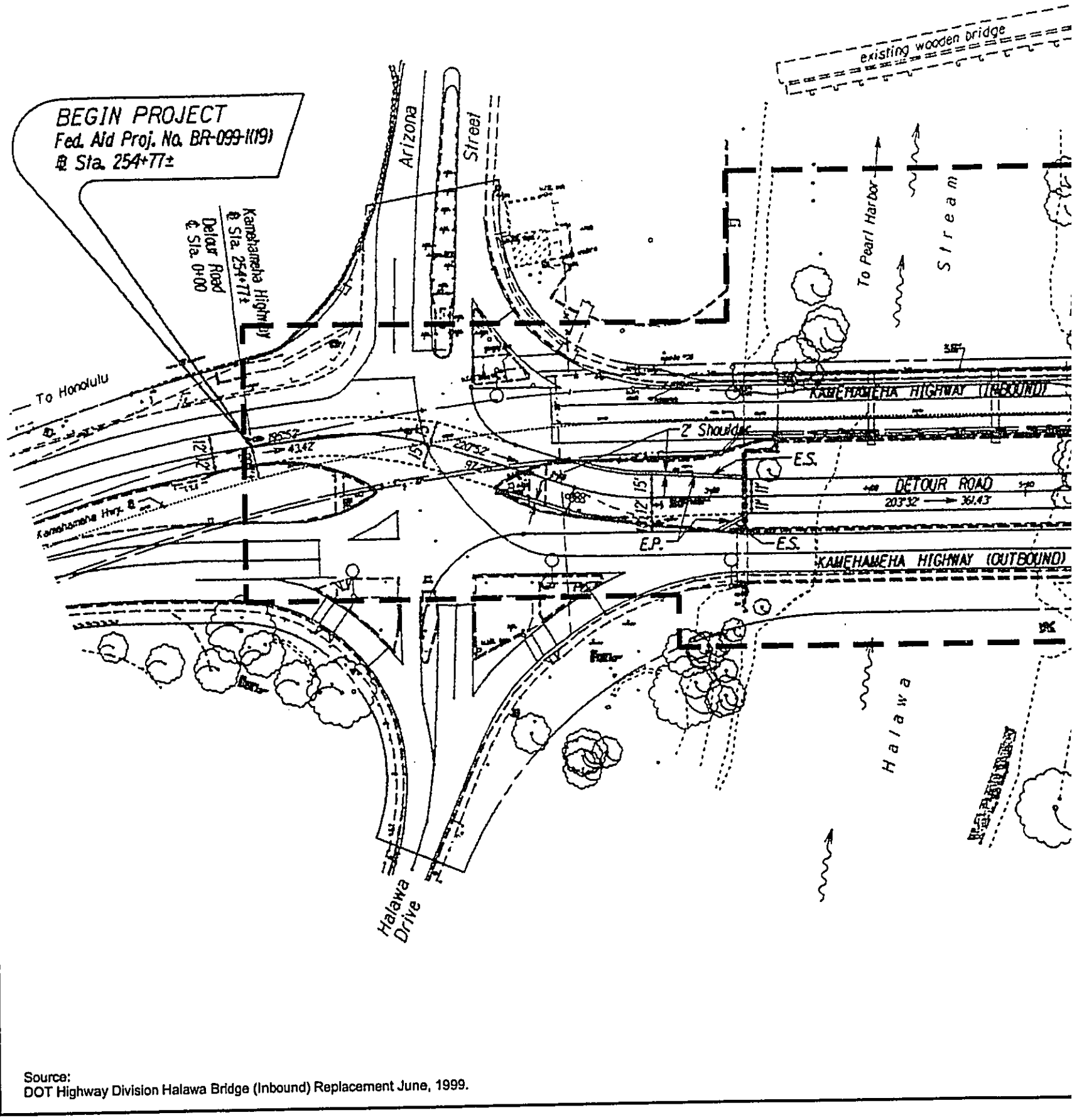
Regional Location Map

Date 10-99

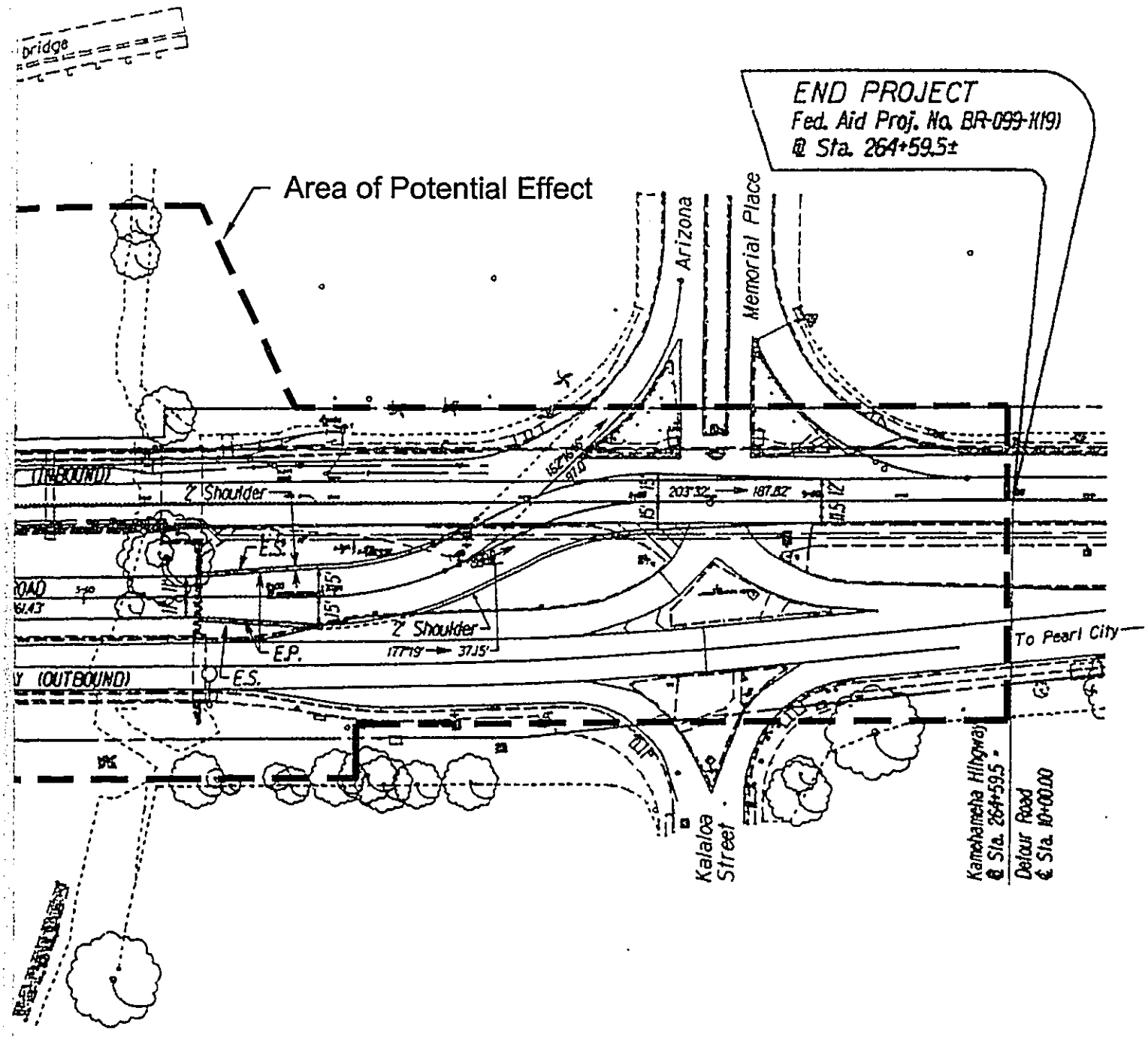
Project No. 37170

EARTH TECH

Figure 2.2



Source:
DOT Highway Division Halawa Bridge (Inbound) Replacement June, 1999.



NORTH

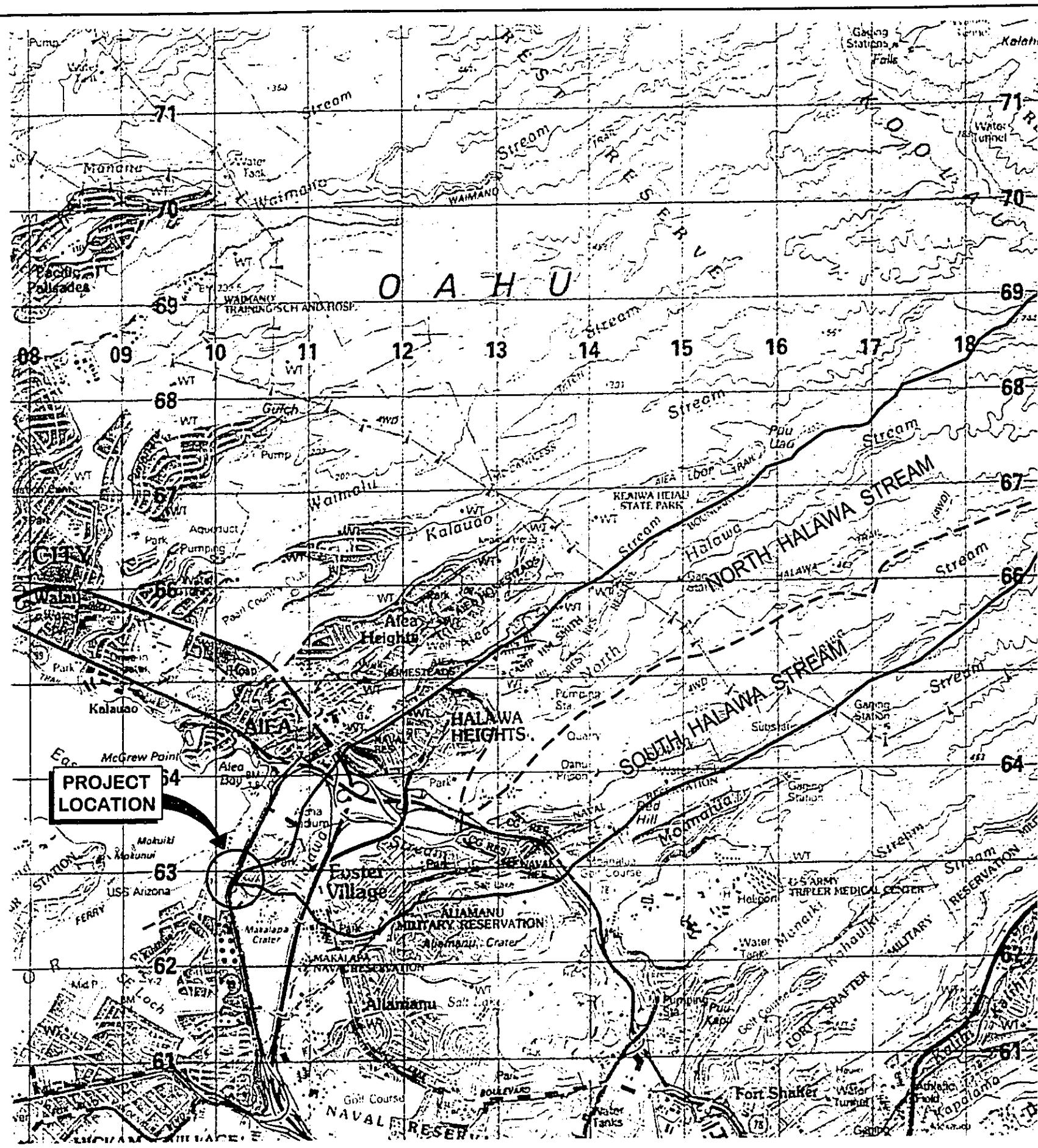
0 20 40

SCALE: 1"=40' (APPROX.)

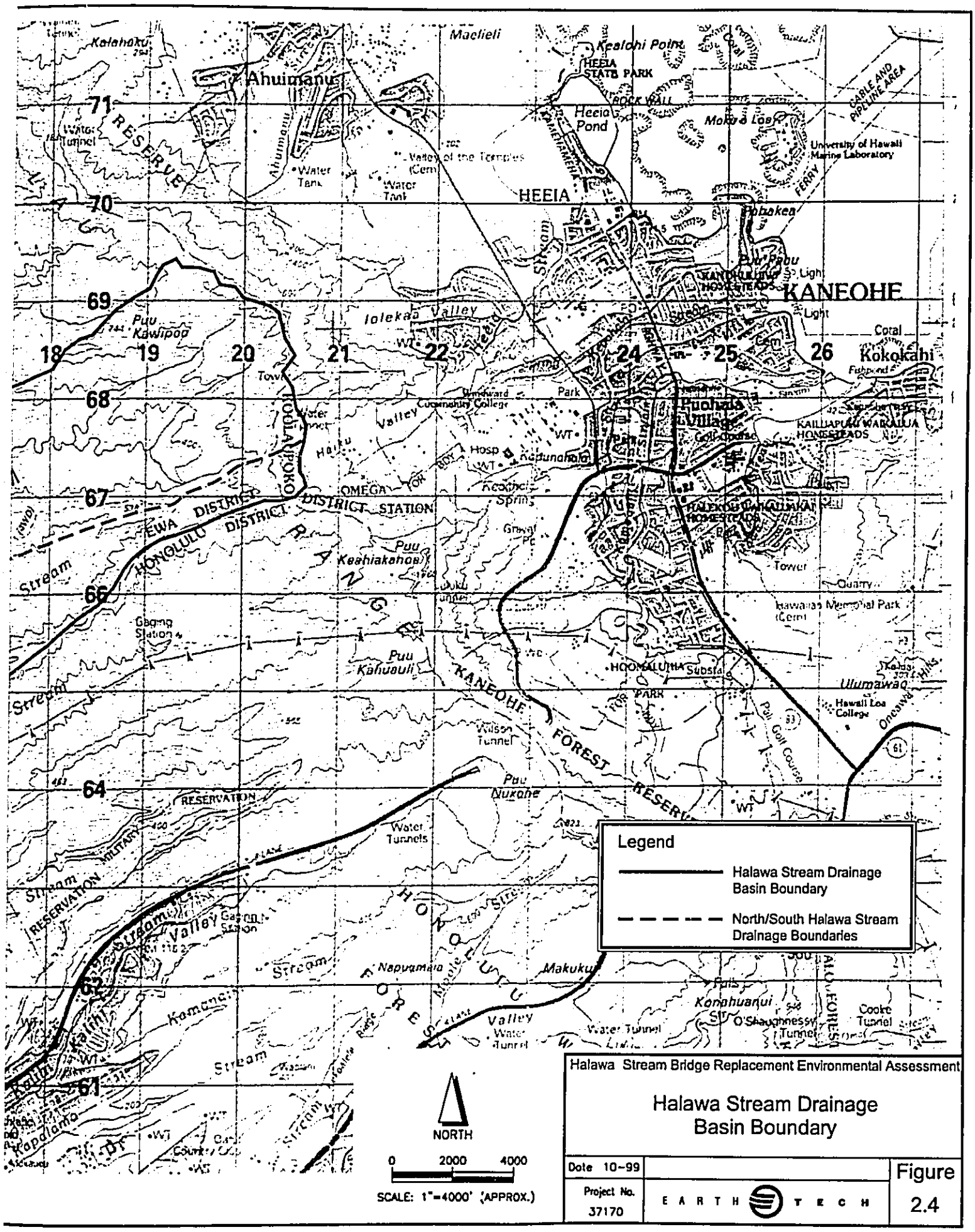
Halawa Stream Bridge Replacement Environmental Assessment

Area of Potential Effect

Date 10-99		Figure
Project No. 37170	EARTH TECH	2.3



Source:
U.S.G.S Quad Map of Oahu 1983.



Halawa Stream Bridge Replacement Environmental Assessment

Halawa Stream Drainage Basin Boundary

Date 10-99		Figure
Project No. 37170	EARTH TECH	2.4

Topography at the project site is varied, due largely to the influence of the Halawa Stream and past dredging operations. Makalapa Crater is the predominant landform located on the southerly bank of the stream. The northeast side of the stream, which is occupied by apartment complexes, has terrain that ranges in elevation from 5 to 15 feet above sea level. The lowest point at the site is approximately at sea level in the Halawa Stream bed.

2.2 Proposed Action

The DOT-HD, in cooperation with the FHWA, proposes to replace a portion of the three-lane Honolulu-bound (inbound) Halawa Stream Bridge (constructed in 1933) on Kamehameha Highway to meet current design standards. The interior portion of the bridge will be widened toward the existing State r-o-w and upgraded to meet current safety standards. The three-lane Aiea-bound (outbound) portion of the bridge that will remain was upgraded in 1970 during the Halawa Stream Bridge Widening project (F.A.P. #U-090-1[15]).

The proposed bridge will be approximately 230 feet in length (abutment to abutment), remain 15 feet in height and 57 feet wide, with three 12-foot travel lanes, two 8 or 10-foot shoulders, a 3-foot railing section, and one 2-foot gutter. A 6-foot sidewalk will be constructed on the new widened portion of the bridge and will accommodate pedestrian and bicycle traffic (Figure 2-5 and Figure 2-6) The new bridge will be designed using American Association of State Highways and Transportation Officials (AASHTO LRFD) Bridge Design Specifications (1998). It will be designed to accommodate the present day HL-93 design vehicular live load. The speed limit on the bridge is 35 mph. Bridge railings will meet current design standards and vehicular collision force of test level 4 (TL-4). The bridge will be designed for seismic zone 2.

The replacement bridge will have a wider cross section than the existing bridge. In order to account for the wider shoulders and improved pedestrian access way, the centerline of the travel way will be shifted makai and the bridge will be expanded mauka, toward the center State existing right-of-way. The portions of Kamehameha Highway leading up to the new bridge will be realigned to account for the new bridge centerline. The access way will need to be designed to meet the width, longitudinal, and cross slope requirements of the Americans with Disabilities Act (ADA).

Falsework will be needed in the area of the existing piers to build the new piers. A footing for the falsework will be built to support the bridge during construction. The new concrete structure will have abutments located behind the existing abutments to avoid the old wooden abutment piles. The new piers will be located in the exact area of the existing piers to match the piers of the existing widened portion. The demolition and construction phases of the replacement bridge will require the contractor to work directly in the stream.

Temporary, limited stream channelization and backfilling around prefabricated culverts will maintain current drainage patterns through all phases of the project.

To accommodate traffic flow during the construction of the replacement bridge and remain within the (state) r-o-w, the detour road and 240-foot clear span detour bridge will be constructed in the median area between the two bridges, adjacent of the existing outbound bridge. The detour bridge will be a portable, two-lane steel bridge with a 240-foot clear span and 24-foot curb-to-curb-roadway width (30 feet 6 inch out-to-out) and will rest upon the existing concrete abutments, eliminating the need for temporary stream channelization or backfilling. The design loading for the temporary bridge is the standard loading of the AASHTO HS20-44. The detour road will include a temporary traffic signal system, since the Halawa Drive intersection is signalized. This will accommodate local traffic traveling towards Honolulu and Aiea.

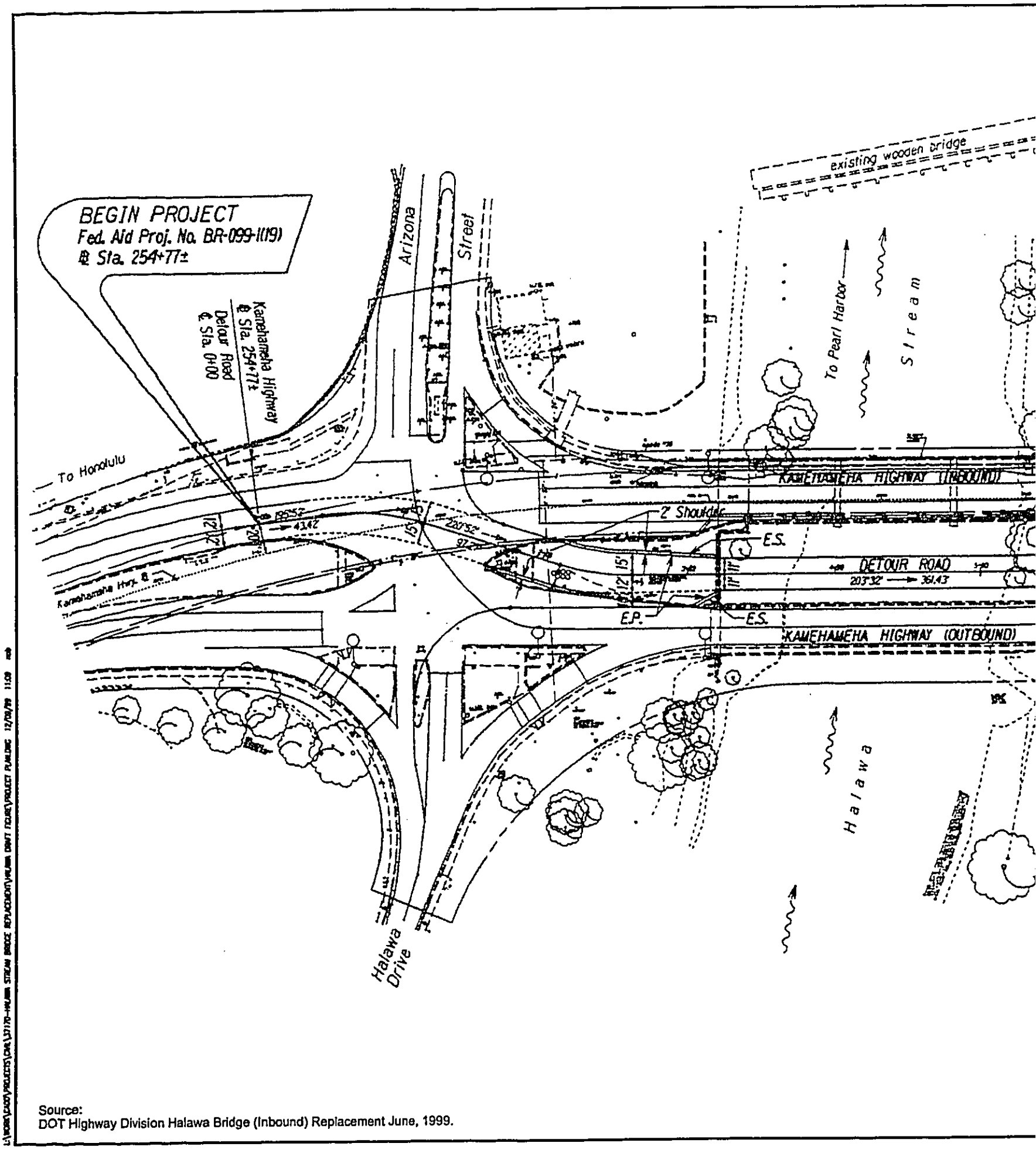
DOT-HD will consult with the utility companies and the U.S. Navy on the current status of utility lines and ducts within the proposed construction area. During the demolition of the bridge, the existing utilities may need to be supported and protected from demolition equipment. The existing utilities on the bridge and overhead electrical lines can be relocated, if necessary. If relocated, utilities will be fastened to allow a minimum clearance for maintenance and inspection.

The detour road and bridge will be removed after construction is completed. All excavated material, fill, and debris from the construction operation will be removed and placed in a DOH-approved landfill on Oahu.

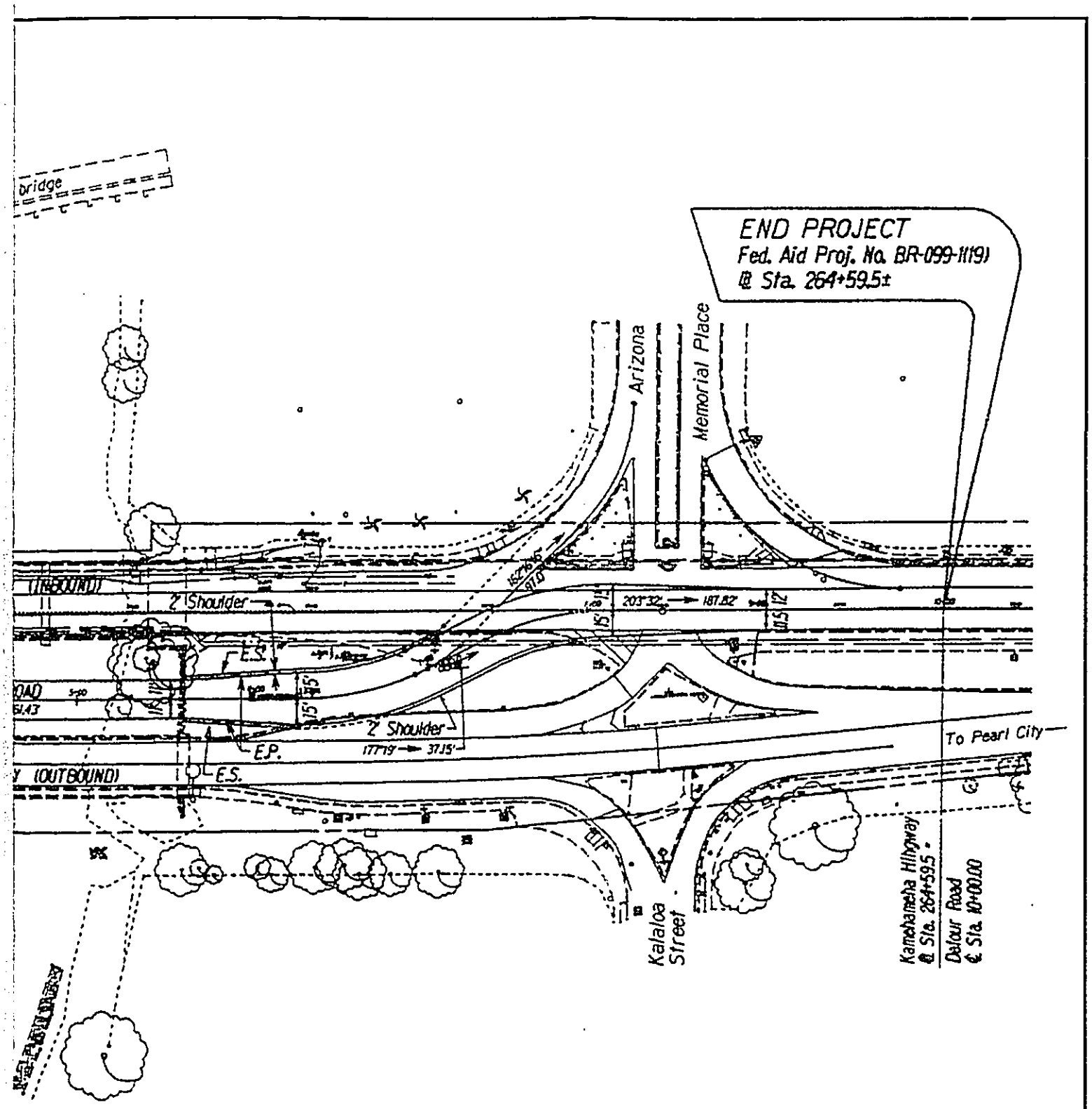
2.3 Project Schedule And Costs

The proposed project is scheduled to begin construction in February 2001, and will be completed in approximately 20–27 months (Table 2-1). Construction-related activities include construction of the detour road (2–3 months) and steel bridge (9–10 days), demolition of the existing bridge (2–3 months), and construction of the replacement bridge (14–18 months). The last 2–3 months of the project will include demolition of the detour road and bridge, removal of all fill material, and revegetation of the stream bank area in the APE.

The DOT-HD and the FHWA are jointly funding the project through the Statewide Transportation Improvement Program. The estimated total cost for the proposed project is $8.5 million.



Source:
DOT Highway Division Halawa Bridge (Inbound) Replacement June, 1999.



NORTH

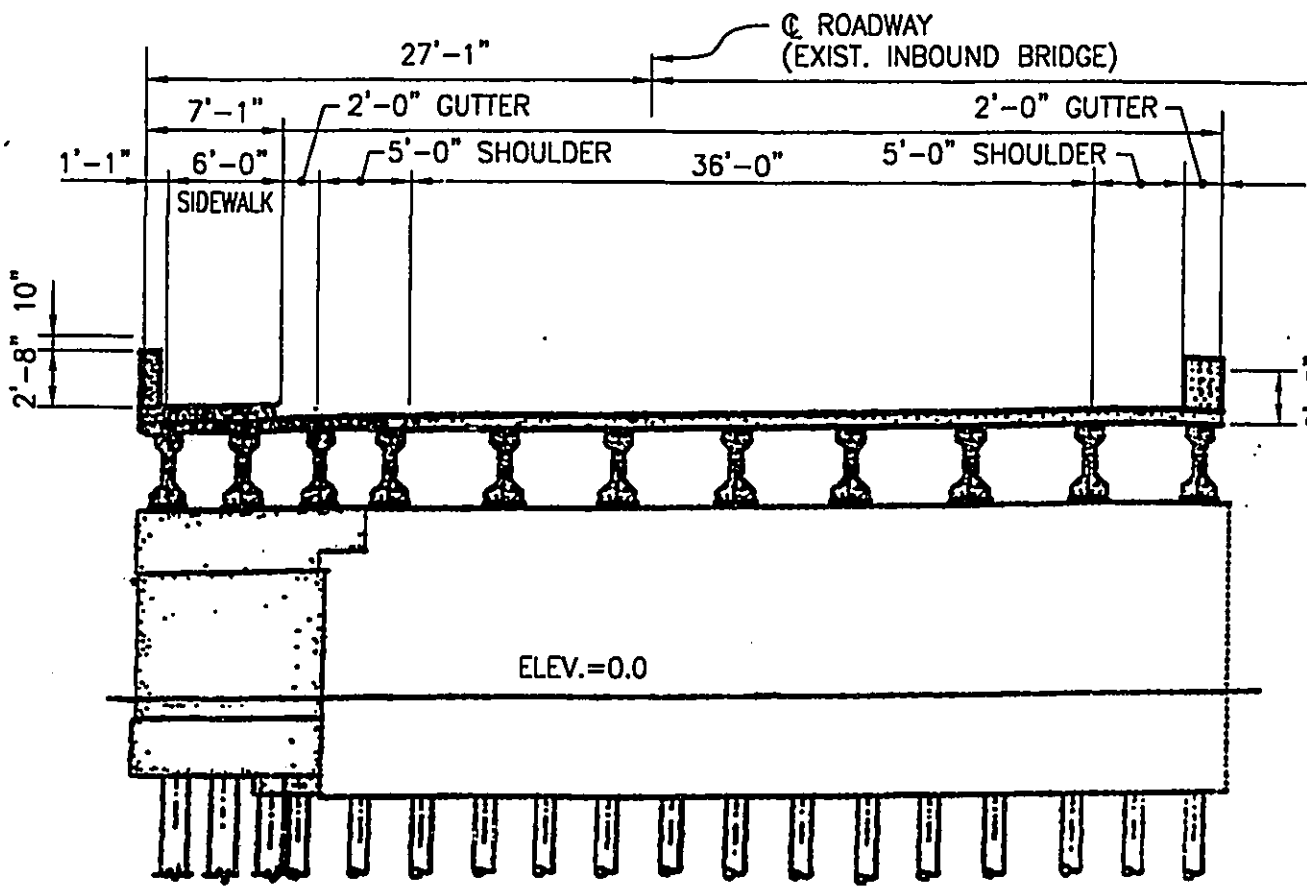
0 20 40

SCALE: 1"=40' (APPROX.)

Halawa Stream Bridge Replacement Environmental Assessment

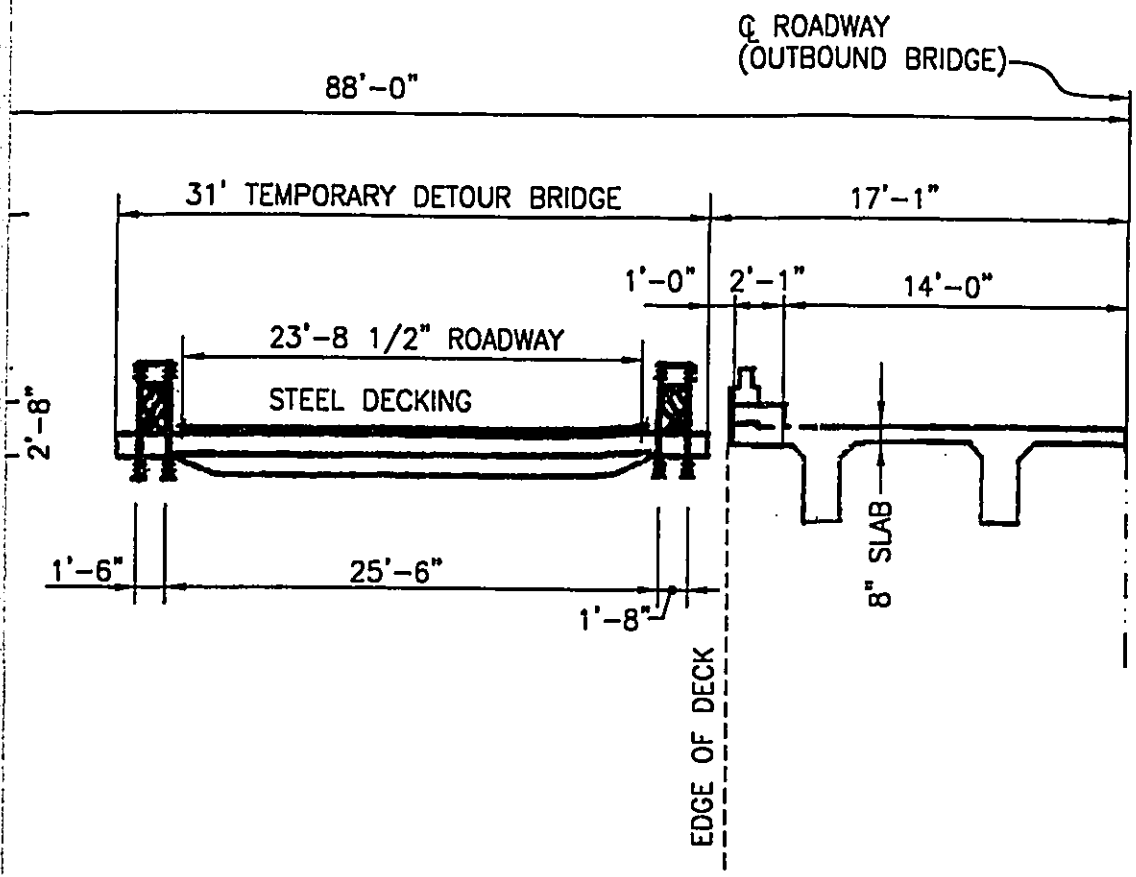
Project Plan

Date 10-99		Figure
Project No. 37170	EARTH TECH	2.5



Section
Not To Scale

Source:
Department of Transportation Highways, 1999.



Halawa Stream Bridge Replacement Environmental Assessment

Project Plan Section

Date 10-99		Figure
Project No. 37170	EARTH TECH	2.6

Table 2-1: Project Phasing and Timing

Phase of Project	Calendar Period	Duration
Completion of Engineering Design	July 2000	—
Plan to Advertise	August 2000	—
Bid Opening	October 2000	—
Construction of detour road	February – April 2001	2–3 months
Demolition of existing inbound bridge	April – June 2001	2–3 months
Construction of new bridge	June – August 2002	14–18 months
Removal of detour road and restoration of project site	August – October 2002	2–3 months

*Restoration time is included in the time frame for the removal of the detour road.

2.4 Alternatives to the Proposed Plan

The proposed project has been listed on the Oahu Transportation Plan and is required to bring the existing bridge to current live load and seismic requirements. The bridge improvements have been planned as part of the DOT-HD bridge improvement schedule. The proposed project has been fully funded for design and construction, in cooperation with FHWA, to provide a safer facility for motorists, pedestrians, and bicyclists.

2.4.1 Alternatives Considered

The alternatives for upgrading the existing inbound portion of the bridge included no action taken, complete replacement of the entire structure with a new bridge, an alternate design, and rehabilitation of the existing bridge. The "no-action" alternative would leave the existing bridge in the current condition. The railings do not meet current AASHTO standards and vehicular collision force standards of TL-4. Additional sidewalk and shoulder width is needed to accommodate pedestrian and bicycle traffic through the area. Complete bridge replacement was not economically feasible due to the presence of extensive utilities attached to the bridge and the difficulty involved in utility relocation. An alternate design was one in which the pedestrian/bikeway is an attachment to the main body of the bridge and physically separated from the lanes for motor traffic. This design would require a smaller shoulder, reduce the overall width of the bridge and provide additional protection for foot and bike traffic. This alternate design was not selected because Kamehameha Highway is classified as an urban arterial. According to federal design standards, shoulders on urban arterials shall have a minimum width of 6-feet. However Halawa Stream Bridge is considered a "long bridge" and can have minimum shoulder widths of 4-feet. The current shoulder widths on Kamehameha Highway do not meet this requirement and need to be widened. Therefore rehabilitation of the existing bridge was chosen.

Implementation of this project will allow DOT-HD to replace a portion of the inbound concrete Halawa Stream Bridge (constructed in 1933) with a structure that will be designed using AASHTO LRFD Bridge Design Specifications, 1998 and meet present day HL-93 live load and seismic zone 2 requirements.

2.4.2 Alternative Technologies

The inbound replacement of Halawa Stream Bridge will pose unique challenges. The project design and construction planning must consider impacts to:

- water quality in Halawa Stream and Pearl Harbor;
- near-by private and U.S. Navy properties, including the Arizona Memorial parking area; and,
- access to the area by vehicles, bikes, and pedestrians.

The foundation for the replacement bridge, required to withstand various external loads and scouring caused by the erosive action of water, may be either drilled shafts or deep-driven piles. Drilled shafts are generally appropriate and cost effective when the presence of hard coral and boulders makes it difficult to drive piles into the subsurface. Where boulders are present, they are removed in the drilling process prior to installation of the steel and concrete for the drilled shaft. In addition, the large diameter of the shaft allows substantially greater resistance to lateral loads. Drilled shafts are also, generally, more appropriate and cost effective in variable, medium stiff to stiff soil conditions above hard rock formations.

Generally, driven piles are more efficient as foundation supports when subsurface conditions consist of a soft upper layer underlain by hard rock or coral formation. Soil borings determine whether driven piles are appropriate and cost effective, and whether high end-bearing capacity can be developed and pile driving could proceed rapidly. Difficulties may arise when obstructions, such as stream boulders, are present to hinder the penetration of the piles. Additionally, deep scour could expose substantial lengths of the piles, reducing their capacity to resist high lateral loads.

The existing Halawa Bridge abutment bottoms are exposed due to erosion. The effect of the excavation in front of the abutment and construction of the footing for the falsework will be evaluated to see if the falsework footing may be left intact to prevent scour of the abutment. Alternatively, the new abutments may be constructed with Grouted Rubble Paving (GRP) fronting abutments to protect the vertical abutments from scouring.

Protective measures, such as epoxy-coated reinforced steel, glass fiber reinforced polymer rears, dense concrete, increased concrete cover or cathodic protection, will be considered in controlling concrete deterioration from chloride-induced corrosion for this bridge.

Corrosion is recognized as one of the major causes to the deterioration of reinforced and prestressed concrete structures. The proximity to the ocean and associated saltwater exposure problems will require that special attention be given to corrosion protection.

The new widened bridge section will be constructed using pre-cast concrete sections. Options for pre-cast section shapes are box beam, single tee, channel, double tee, inverted tee and AASHTO-girder. The AASHTO-girder section will most likely be included in the final design because it is the most economical choice that meets the live load and seismic requirements.

3. DESCRIPTION OF THE AFFECTED ENVIRONMENT

The following sections describe the existing natural and built environmental conditions for the APE at Halawa. The objective of this description is to provide background information for the determination of how the proposed action may affect the area. This includes, but is not limited to, the biological, structural, historical and archaeological, cultural, socio-economic, topographic, soils, and climatic conditions of the APE.

3.1 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 HRS 343 EA 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 DOH also regulates air quality and established ambient air quality standards (HAR Chapter 11-59) that are as strict or in some cases stricter than the NAAQS.

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 (l50 µg/m). PM_{10} comprises approximately half of the total suspended particulate matter 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. However, prior to 1971, 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 < 10 microns (PM_{10})
- Carbon Monoxide (CO)
- Sulfur Dioxide (SO2)
- Ozone (O3)
- Total Suspended Particulate Matter

Table 3-1 summarizes the national and state ambient air quality standards.

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

Table 3-1: National and State Ambient Air Quality Standards

Pollutant	Averaging Time	National Ambient Air Quality Standard [a] ppm (µg/m^3)	State Ambient Air Quality Standard [b] ppm (µg/m^3)
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/m^3	None
	Annual	50 µg/m^3	None
Total particulate matter	24 hour	None	150 µg/m^3
	Annual	None	60 µg/m^3
Lead	Quarterly	1.5 µg/m^3	1.5 µg/m^3

[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.

Sources of air pollution in the vicinity of the project site include vehicular traffic from Kamehameha Highway, Salt Lake Boulevard, and the H-1 Freeway (producing CO and CO_2), and natural sources (sea spray and pollen). Potential sources of air pollution include Pearl Harbor Shipyard, Pearl Harbor Peninsula Landfill, and the HECO power plant located in Pearl City. Persistent tradewinds contribute to favorable climatic conditions in the area for air quality. The state has monitored PM_{10}, ozone, carbon monoxide, sulfur dioxide, and nitrogen dioxide at various locations across the state and island of Oahu; results from 1994 through 1998 indicate that state and federal standards were not exceeded (Table 3-2). Because these standards were not exceeded, it can be assumed that air quality at the APE is currently acceptable.

Table 3-2: Hawaii Air Monitoring Data 1994-1998

Constituent	Monitoring Stations	Federal Standard	State Standard	Monitoring Result
PM_{10}	Honolulu, Liliha, Pearl City, Waimanalo, West Beach, Kapolei, Lihue	50 $\mu g/m^3$	50 $\mu g/m^3$	<30 $\mu g/m^3$
1-Hour Ozone (1994–1998)	Sand Island	230 $\mu g/m^3$	100 $\mu g/m^3$	< 70 $\mu g/m^3$
1-Hour Carbon Monoxide (1994–1998)	Honolulu, Waikiki, West Beach, Kapolei	40,000 $\mu g/m^3$	10,000 $\mu g/m^3$	< 5,000 $\mu g/m^3$
Sulfur Dioxide Annual Average (1994–1998)	Honolulu, West Beach, Kapolei, Makaiwa	80 $\mu g/m^3$	80 $\mu g/m^3$	< 10 $\mu g/m^3$
Nitrogen Dioxide Annual Average (1994–1998)	West Beach, Kapolei	100 $\mu g/m^3$	70 $\mu g/m^3$	< 10 $\mu g/m^3$

Particulate matter equal to or less than 10 microns in diameter
< = less than.
$\mu g/m^3$ = micrograms per cubic meter.
Source: State of Hawaii Department of Health – Clean Air Branch , Annual Hawaii Air Quality Data, 1998

During construction, potential sources that may impact air quality at the project site include the following:

- Vehicular traffic (sources of additional CO and CO_2);
- Soil and concrete or asphalt removal or placement (particulate); and
- Removal of sediment (possible odor issues if the sediment is from an anaerobic environment).

It is not anticipated that construction activities would significantly impact current air quality in the project area. However, to maintain current air quality, construction activities will employ the proper administrative and engineered controls to reduce air emissions (i.e., dust control, sediment containment, reduced construction traffic).

3.2 Biological Resources

The following section summarizes the aquatic biology and the avifaunal and mammal resources found at the Halawa Stream site. Surveys were conducted in October 1999, on the aquatic biology and on avifaunal and mammals, both are included as Appendix A.

3.2.1 Aquatic Biology

The survey area included the project area and approximately 40 meters upstream and downstream of the existing bridge.

The lower reach of Halawa Stream is highly modified (channelized) and subject to runoff from an urbanized watershed. The stream project area is approximately 30 to 40 m (100 to 130 ft.) across and clearly tidally influenced, exposing mud flats on either side of the channel, particularly on the north. The shoreline is mostly fill material, with areas of dispersed rocks, and numerous active and inactive pipes and outfalls located along the shore in the immediate project area. The stream bottom upstream and downstream of the bridge is heavily silted with small, intermittent patches of rocks under the bridge; stream flow was negligible during site visits. A recent survey at the upper boundary of the urbanized portion or Halawa Stream found the aquatic flora and fauna uninteresting (AECOS, 1999) from a resource conservation perspective.

State DLNR surveys (last done in 1989), did not provide sufficient data to rank the Halawa Stream for aquatic resource value. However, according to the summary section of the *Hawaii Stream Assessment* (Cooperative Park Service Unit 1990), the stream is not rated as a significant stream in terms of its aquatic, cultural, and riparian resources. The stream was identified as having moderate cultural resources and limited aquatic resources.

No rare, threatened, or endangered species (as listed by USFWS 1994) are known from aquatic environments in the project area, and the estuarine habitat is of marginal resource value (AECOS 1999). The project is not anticipated to have any adverse impact on Halawa stream fauna, either at the project location or upstream and downstream of the project.

The field survey indicates that there are a variety of invertebrates, including intertidal species such as the mangrove littorinid (Littorina scabra), serpulid worm (Salmacina dysteri.), false limpet (Siphonaria normalis), acorn barnacle (Balanus sp.), oyster (Crassostrea sp.), and shore crab (Metopograpsus thukuhar), were observed as generally abundant along the shore and in the intertidal zone. However, shells of oysters and tests of barnacles, while conspicuous on most hard surfaces, were remains of non-living organisms. Presumably, these species flourish during the dry season, when salinity levels are more stable, as neither can tolerate fresh water submersion for any extended period. Other typical invertebrates in this environment are glass shrimp (Palaemon debilis) and blue pincher crabs (Thalamita integra). A sponge was observed on pilings of the footbridge. Swarms of a small planktonic shrimp (Mysidacea) were noted in the shallow water beneath the footbridge.

3.2.2 Avifauna And Mammals

In general, the project area is located in a highly urbanized location with limited opportunities for wildlife. Migratory birds, a native shorebird, several introduced species of birds, mongoose, and feral cats are present. None of the species observed or anticipated to be in the project area are endangered or threatened. The bridge replacement will temporarily disrupt the habitat and wildlife around the bridge, but should not significantly impact native waterbird or migratory bird populations for this portion of Oahu.

Avifauna. Migratory shorebirds present during the survey included the Pacific golden plover and wandering tattler. They are common winter migrants in the central Pacific Ocean area, and were seen foraging on the lawns near the Arizona Memorial, and a small rocky area makai of the bridge, respectively. Another migratory bird, the ruddy turnstone was not observed in the project area, but is also a common migrant likely to be in the area. None of these migratory species are threatened or endangered.

One native waterbird, the black-crowned night heron, was observed perched in the red mangrove trees. This species takes a wide spectrum of prey, and utilizes natural and manmade wetlands. This species is not endangered. It should be noted that the endangered black-necked stilt would be less likely to utilize this area due to the water depth and limited area for wading.

Introduced birds make up virtually all of the terrestrial species in the lowlands. Table 3-3 lists the introduced species recorded on the survey, and these species are typical of exotic species found on Oahu.

Table 3-3: List of Introduced Species Recorded at the Proposed Halawa Bridge Replacement Project Site

Common Name	Scientific Name
Spotted dove	Streptopelia chinensis
Zebra dove	Geopelia stiata
Common myna	Acridotheres tristis
Northern cardinal	Cardinalis cardinalis
Red-crested cardinal	Paroaria coronata
Red-vented bulbul	Pycnonotus cafer
Japanese white-eye	Zosterops japonicus
House finch	Carpodacus mexicanus
House sparrow	Passer domesticus

Mammals. A limited amount of terrestrial mammals were recorded during the survey of the project area, including several feral cats *(Felix catus)* and the small indian mongoose *(Herpestes auropunctatus)*. The endangered Hawaiian bat *(Lasiurus cinereus semotus)*

was not found, and records for the bat at this location are not known. Rats and mice likely occur at the site, but were not observed during the survey.

3.3 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. 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). In the unlikely event that historic sites, including human burials, are uncovered during routine construction activities all work in the vicinity will stop and the State Historic Preservation Division (SHPD) will be contacted. Review of cultural resources also has been conducted in accordance with HRS 6E, Historic Preservation. Potential effects on cultural and historical resources also are a component of the CZMA review process.

To prevent sensitive archaeological areas from unauthorized collection 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.

An archaeological resources survey was completed in October 1999. This survey is included as Appendix B. The survey area included approximately 3 acres along the Halawa Stream to be impacted by the bridge replacement. The following section presents a summary of cultural resource information for the project site.

The approximate APE for cultural resources encompasses less than 3 acres of land beneath and to the east and west of the existing Halawa Bridge (within the Halawa Stream channel). The entirety of the project area has been previously disturbed from the original bridge construction and from the previous dredging of the stream in years past.

Prehistoric, Historic, and Traditional Resources. The APE is situated within the ahupua'a of Halawa, in the Ewa District, on the south central coast of Oahu. It was a large mountain-to-sea ahupua'a, with almost all the necessary constituents for a traditional Hawaiian life. Little of Halawa's early history is known, probably due to the extermination of the traditional rulers during the island unification wars, and contemporaneous western contact.

Before modern development, Halawa was its own ahupua'a, or Hawaiian land management system division. The mauka area was typically used for hunting, harvesting timber and forest products, and agricultural (i.e. taro and sweet potato) purposes and gathering and fiSHPDnd (i.e. shellfish, seaweed, salt) use makai. A major socioeconomic change occurred during the island unification wars, with the extermination of the traditional Halawa ruling class and King Kamehameha I gave the ahupua'a to Caucasian chiefs Isaac Davis and John Young in return for their help in the wars. Land use changed drastically after that; common Hawaiians in the ahupua'a were displaced from their lands and epidemics and introduced diseases decimated the native population. With the introduction of western culture, there was a shift from subsistence to a market economy. For example, in Halawa, prosperous forest products, such as sandalwood and charcoal, were gathered and sold, and lands were turned over to ranching activities. By the time the Great Mahele, or land division, occurred in 1848, only 23 native Hawaiian commoners were left in the valley to claim lands in the redistribution. As native Hawaiians left, irrigated lowlands were farmed by immigrant Chinese as rice paddies, and later as sugarcane plantations. In the 1900s, Pearl Harbor Naval Base grew as an economic center, phasing out the profitability of sugarcane, which was discontinued after World War II. The Halawa area then changed to support the growth of the naval base and metropolitan Honolulu, with residential, light industrial, and recreational areas. With its location near military bases and between Honolulu and the leeward side of the island, it is a major component of the Federal Interstate Highway System, supporting the H-1 Freeway and Moanalua Freeway, and well as Kamehameha Highway (Klieger 1995).

An archaeological resources survey, consisting of a background search and pedestrian survey of 3 acres along the Halawa Streams banks in the vicinity of the project area, was performed in October 1999. The background search indicated that at the time of the Great Mahele, land use patterns in the vicinity of the site include loko (fish ponds), and possibly pasture. Three small fish ponds measuring less than 50 meters in diameter were located along the edges of the stream in the vicinity of project area.

These ponds were Puuone Kaulailoa on the Honolulu side, Wai Aluna on the Waianae side, and an unnamed pond adjacent to Wai Aluna.

During the pedestrian survey, the ground surfaces were found to have grass, pickleweed, mangrove and concrete covers; observation revealed an absence of historic sites. Where the stream bank was evident, only fill deposits were visible. Numerous marine shells are present along the lower banks of the stream; they result from the natural ebb and flow of the tide and the shellfish larder within the estuary environment.

Due to the presence of fill materials (up to 3 meters thick), pipes, and concrete structures, the presence of fish ponds was not observed. The fill deposits combined with recent

disturbances in the channel lining and absence of surface features indicate that historic period activities would have destroyed sites that may have been present.

The APE also extends into the Pearl Harbor National Historic Landmark. The project is not expected to impact the Landmark. The Landmark boundary runs along the Pearl Harbor fence line on the makai side of the Kamehameha Highway.

Historic Buildings and Structures. The only structures within the APE are the bridge itself and two pillar monuments attached to the mauka side of the inbound bridge. The short-span bridge is constructed of reinforced concrete and was built in 1933. The pillar monuments are located in the center of the bridge (between the inbound and outbound lanes) their historical significance has not been determined.

3.4 Existing Bridge

The Halawa Stream Bridge is a concrete bridge located on a 150-foot crest vertical curve. Halawa Stream Bridge was originally constructed in 1933. The outbound side of the bridge was widened by 12-feet in 1970, during the Halawa Stream Bridge Widening project. A portion of the inbound bridge , constructed in 1933, will be replaced. The bridge length, width and height is approximately 200-feet, 46-feet and 15-feet respectively. The existing roadway cross section consists of three 12-foot travel lanes, a 2-foot gutter, a 4-foot railing section and a 4-foot sidewalk.

3.5 Flora and Wetlands

A botanical and wetlands survey was completed at the project area in October 1999, and is included as Appendix C. The following is a summary of the information found in Appendix C.

Flora. The project area has been previously disturbed since the original construction of the bridge. Consequently, vegetation on the proposed construction parcel is dominated almost exclusively by introduced or alien plant species. Ground cover is comprised of pickle weed, Buffel grass, inflated finger grass, Boerhavia coccinea, guinea grass, Chinese violet, sour grass, and ivy gourd. Trees are also present in the project area in the following locations:

- Monkey Pod in the area between the inbound and outbound bridges;
- Red mangrove lines most of the stream banks;
- Kiawe is present behind the mangrove in the vicinity of the Arizona Memorial parking lot;
- Milo, klu, Christmas berry, koa haole, and Indian pluchea are present on the southwest portion of the site.

Two native species were present in the project area: the beach heliotrope and uhaloa. Both are wide-ranging indigenous species. They are common in disturbed areas. Endemic species were not present onsite.

Wetlands. The USACE and the EPA define wetlands as the following: 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 and are referred to as hydrophytic vegetation. Wetland soils, called hydric soils, are waterlogged for long periods of time and typically become depleted of oxygen.

Areas of possible concern onsite are covered by patches of pickle weed and thickets of red mangrove, that line the stream (Figure 3-1). Both of these species are hydrophytic vegetation capable of growing in high saline content waters and soils, as described in the botanical report in Appendix C. It should be noted that these are alien species, the areas covered by them are small, and the area was not mentioned in the definitive survey of Hawaiian wetlands – *Wetlands and Wetland Vegetation* (Elliot and Hall 1977). However, these small areas should be avoided if possible during construction.

The bridge replacement project will not create any significant long-term impact to the area. There are no botanical problems from using some of the area at the site for storing construction equipment and dredged material, especially on the stream banks located mauka of the outbound bridge.

3.6 Hazardous Wastes And Materials

Several pipelines are present in the vicinity of the project site. These include the following:

- An abandoned 10-inch petroleum, oil, and lubricant (POL) pipeline used by the U.S. Air Force (USGS 1990);
- A 32-inch POL pipeline used by the U. S. Navy is located to the west of the Halawa Bridge, along the bike-path/ foot-bridge near the Halawa Gate, on U. S. Navy property;
- A pipeline used by Chevron of unknown size; and

- An 8-inch pipeline used by Tesoro to deliver diesel fuel marine to the Pearl Harbor Naval Complex is present on the mauka side of the bike path bridge.

Various releases of petroleum product have historically occurred from these pipelines. Additionally, it should be noted that exposure to contamination exists for the bridge and its surroundings because various types of materials are transported on Kamehameha Highway.

3.7 Land Use and Ownership

The land surrounding the existing Halawa Bridge is owned by the U.S. Navy, City and County of Honolulu, State of Hawaii, and private landowners. Figure 3-2 shows the Tax Map Key for the Halawa Stream Bridge area. The land in the APE is zoned urban by the State land Use Commission and is designated medium density apartment and residential on the mauka side of Kamehameha Highway and federal preservation district on the makai side by the City and County of Honolulu. Figure 3-3 shows the City and County of Honolulu development plan designations.

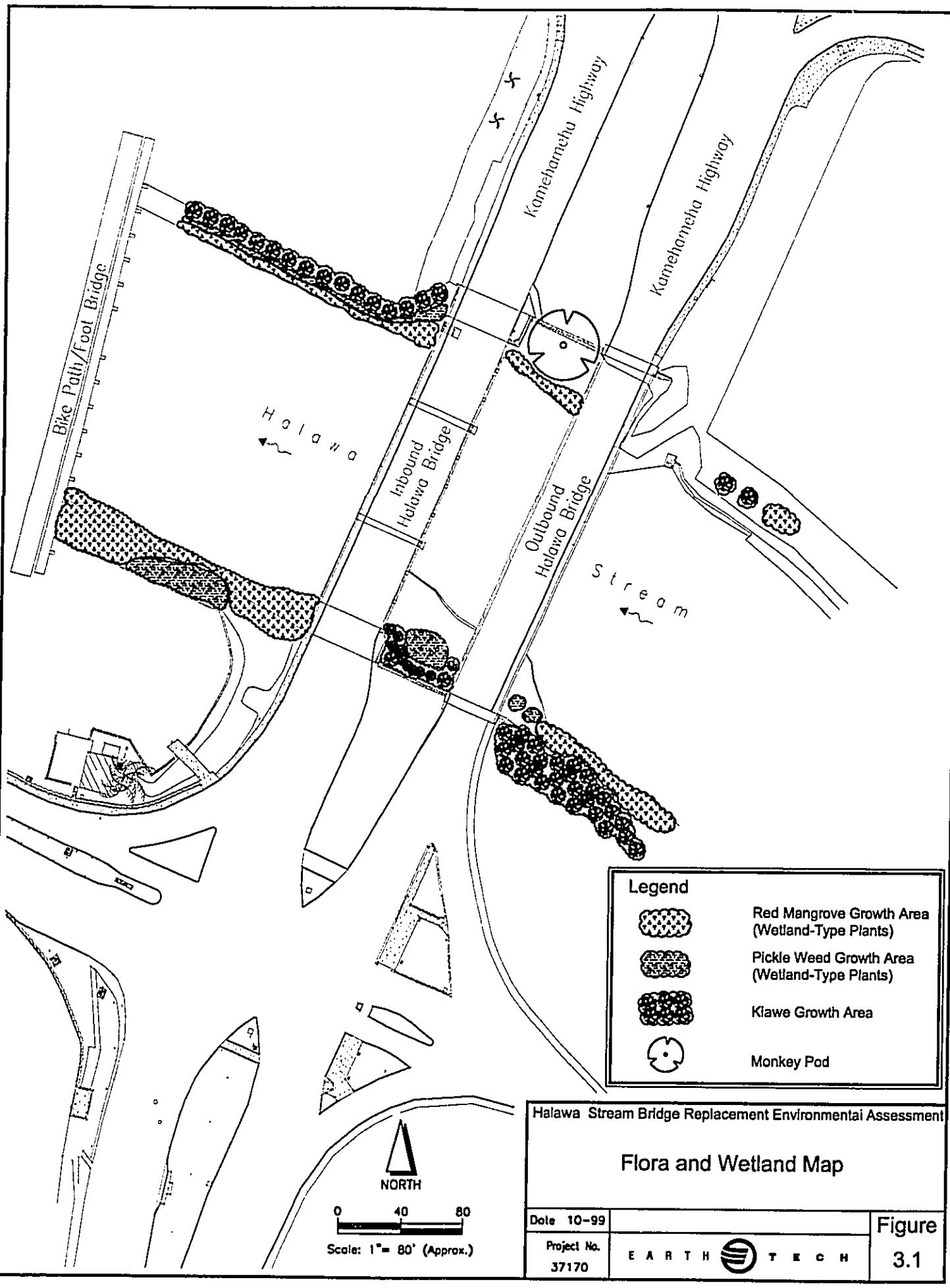
3.8 Natural Hazards

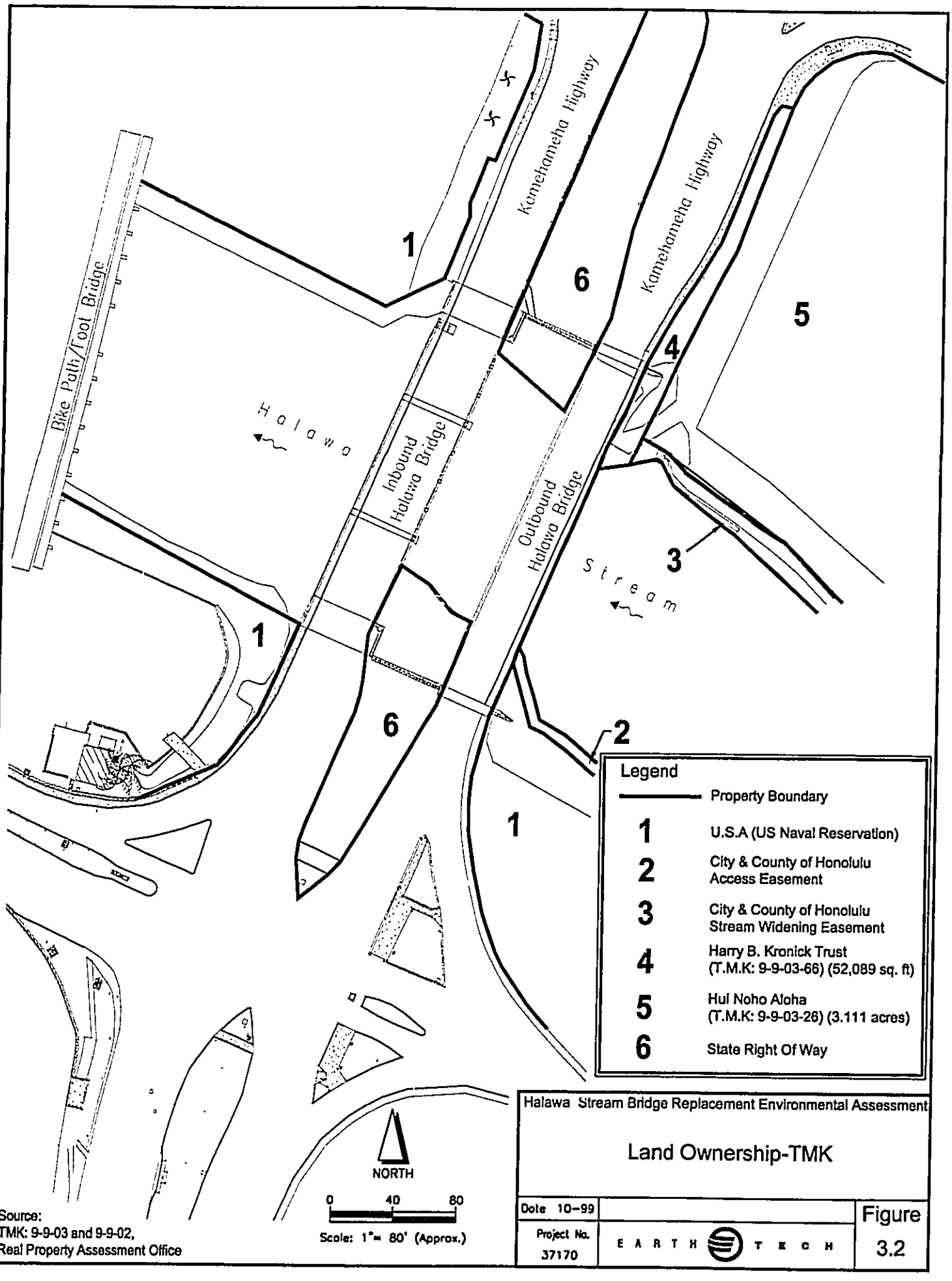
Natural hazards include floods, tsunamis, hurricanes, earthquakes, and other natural events that may occur at the project area. These are assessed to determine how they may affect conditions at the APE and the development of the proposed project.

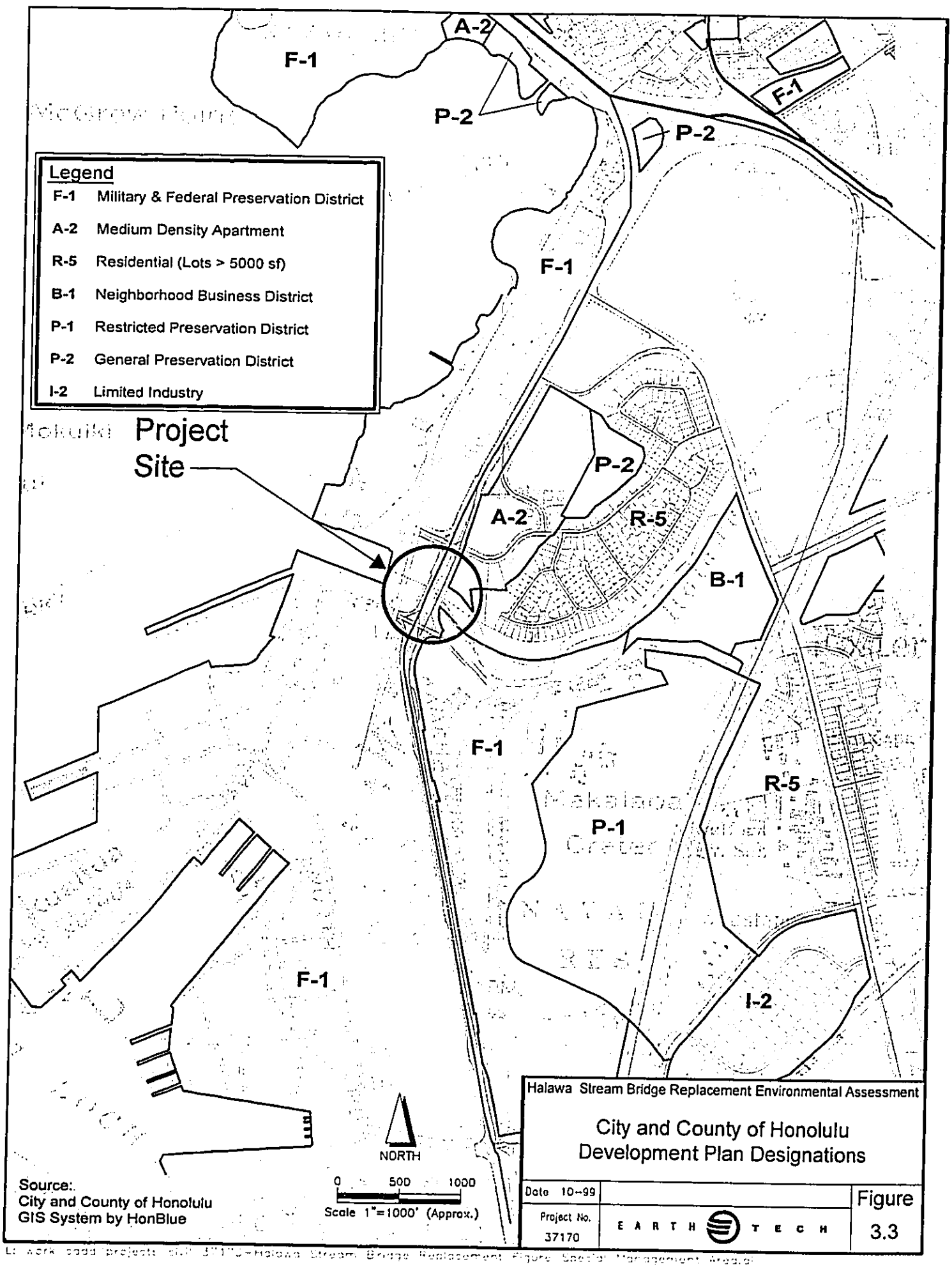
Floods. FEMA updated the Flood Insurance Rate Map (FIRM) for the Halawa area in 1990. Figure 3-4 shows the flood zones as determined by FEMA and the USACE. The area was listed as Zone D, an area in which flood hazards are undetermined.

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, Japan, Alaska, and the west coast of the United States. Local tsunamis have also been generated by seismic activity on the island of Hawaii.

The State of Hawaii Civil Defense establishes tsunami inundation zones and maps for all coastal areas in Hawaii. The project site is not located in the tsunami inundation zone (GTE, 1999). However, it is located in the flood zone as shown in Figure 3-4 and flooding associated with a tsunami is possible.


Bike Path/Foot Bridge
Kamehameha Highway
Kamehameha Highway
Halawa
Inbound Halawa Bridge
Outbound Halawa Bridge
Stream
Legend
Red Mangrove Growth Area (Wetland-Type Plants)
Pickle Weed Growth Area (Wetland-Type Plants)
Klawe Growth Area
Monkey Pod
NORTH
0 40 80
Scale: 1"= 80' (Approx.)
Halawa Stream Bridge Replacement Environmental Assessment
Flora and Wetland Map
Date 10-99
Project No. 37170
EARTH TECH
Figure 3.1


Kamehameha Highway
Kamehameha Highway
Bike Path/Foot Bridge
Halawa
Inbound Halawa Bridge
Outbound Halawa Bridge
Stream
1
6
4
5
3
1
6
2
1
Legend
Property Boundary
1 U.S.A (US Naval Reservation)
2 City & County of Honolulu Access Easement
3 City & County of Honolulu Stream Widening Easement
4 Harry B. Kronick Trust (T.M.K: 9-9-03-66) (52,089 sq. ft)
5 Hui Noho Aloha (T.M.K: 9-9-03-26) (3.111 acres)
6 State Right Of Way
NORTH
0 40 80
Scale: 1"= 80' (Approx.)
Source:
TMK: 9-9-03 and 9-9-02,
Real Property Assessment Office
Halawa Stream Bridge Replacement Environmental Assessment
Land Ownership-TMK
Date 10-99
Project No. 37170
EARTH TECH
Figure 3.2



Halawa Stream Bridge Replacement Environmental Assessment

City and County of Honolulu
Development Plan Designations

Date 10-99		Figure
Project No. 37170	EARTH TECH	3.3

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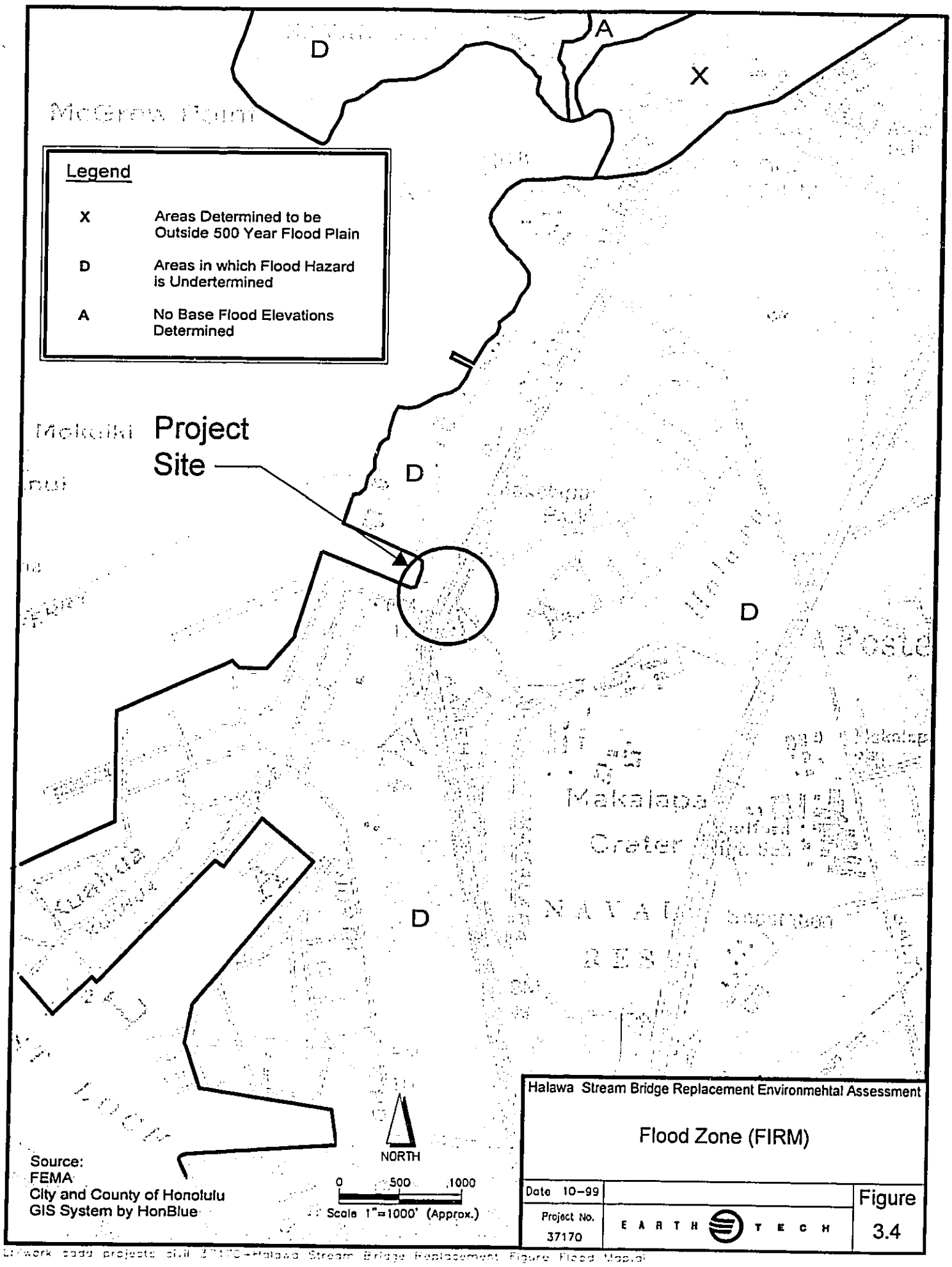

Halawa Stream Bridge Replacement Environmehtal Assessment

Flood Zone (FIRM)

Date 10-99		Figure
Project No. 37170	EARTH TECH	3.4

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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 deposit large amounts of rain with high winds on all the islands. The storms generally contribute to localized flooding and coastal storm surges.

Earthquakes. Because Oahu is an older Hawaiian island, it is not considered particularly prone to seismic activity. Oahu is listed in Seismic Zone 2A on a scale of 1 to 4 under the Uniform Building Code of 1997. Zone 2A indicates a place that has a low potential for ground motion created by seismic activity.

3.9 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 person's 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 3-5.

The DOH monitors noise issues in accordance with HRS Title 19, Chapter 342F, HAR Chapter 11-46, "Community Noise Control" and HAR Chapter 11-42, "Vehicular Noise Control for Oahu". Noise permits are issued by the Director only when excessive noise levels are expected as stated in HAR 11-46-6(a). 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 dBA for a continuous 8-hour exposure (typical workday); maximum noise levels for shorter periods of time are higher (Table 3-4).

Table 3-4: Permissible Noise Exposure Levels

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

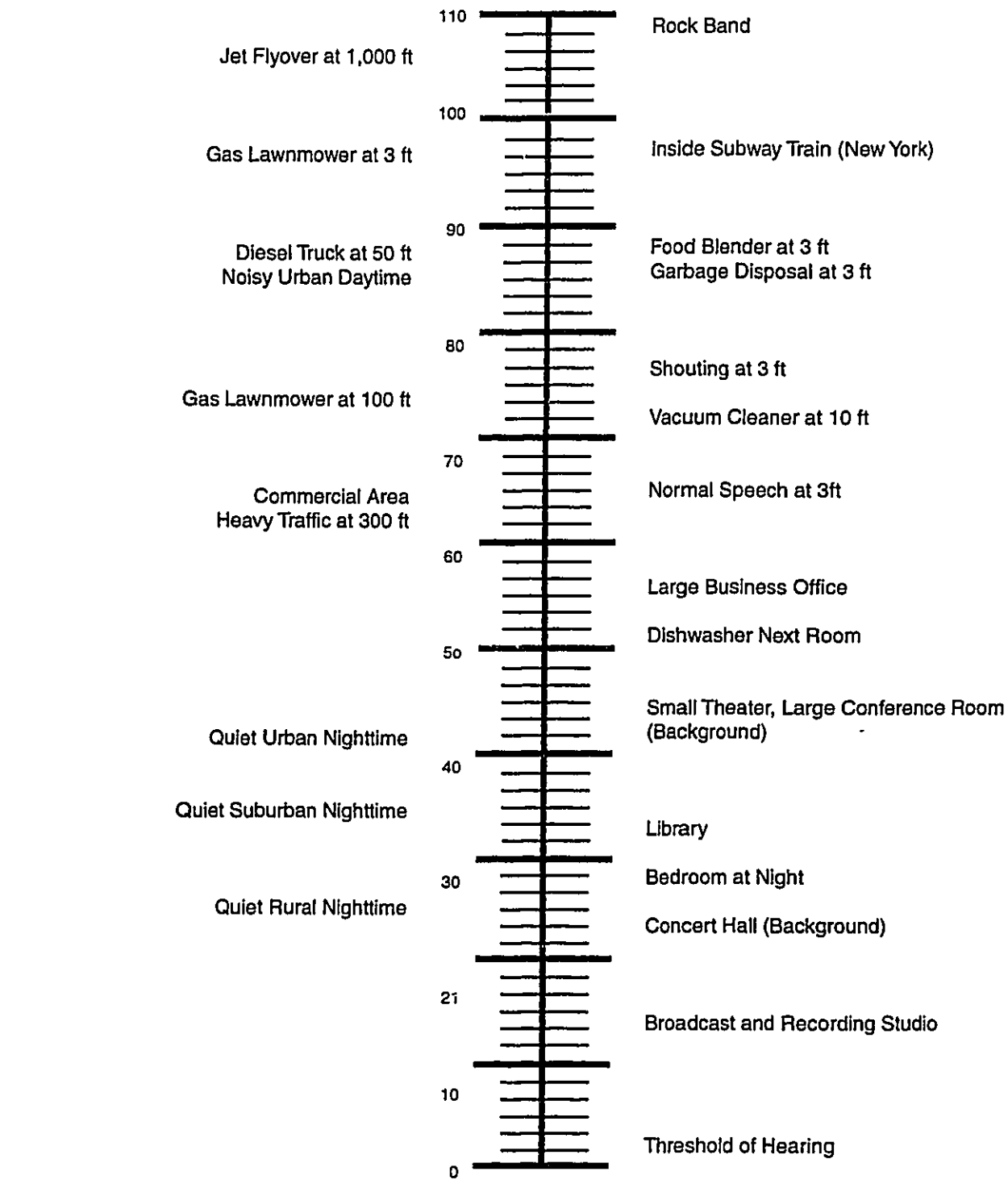
Source: 29 CFR 1910.95

The nearest sensitive noise receptors (human) to the Halawa Bridge project include the Halawa View and Centre Court apartment buildings, which are located on the mauka side of the highway (immediately adjacent to the bridge on the south approach). There are no wildlife preserves in the vicinity of the project area. The nearest potential wildlife receptors could be in the limited potential wetland areas lining the stream. However, because they are limited and in an urban setting, it is not anticipated that significant amounts of species or wildlife would be present.

The major contributor of noise in the vicinity of the project area is vehicular traffic. As described in Section 2.1, Kamehameha Highway is the primary transportation corridor along this section of leeward Oahu.

Because of this, traffic is somewhat continuous and ambient daytime noise levels are consistent with an urban 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 3-5).

To reduce noise pollution issues, the appropriate administrative and engineering controls will be taken. Onsite, the appropriate hearing protection will be utilized by the workers (i.e., ear plugs and muffs). Work will be completed during business hours to reduce problems with residential noise exposure. Special permitting, notification, and other controls will be employed in the event that noise levels from the construction activity are expected to exceed acceptable levels.



Source: U.S. Army Space and Strategic Defense Command, 1994a.

Halawa Stream Bridge Replacement Environmental Assessment

Comparative Noise Levels

Date 10-99		Figure
Project No. 37170	EARTH TECH	3.5

3.10 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 Ewa district that includes Halawa.

The project site is located on the island of Oahu, in the City and County of Honolulu. As of 1990, Honolulu claimed 830,000 residents, or approximately three-fourths of Hawaii's population. Approximately 96.4 percent of the population live in an urban setting with 3.6 percent living in a rural area. Ethnic diversity of Oahu is composed of the following populations: Caucasian (25 percent), Chinese (6 percent), Filipino (10.6 percent), Hawaiian (16.2 percent), Japanese (21 percent) and others (21.2 percent), (UH-H 1998).

Currently, the Halawa Bridge area is an urban setting, with a population of approximately 5,000 to 15,000 people per square mile according to the 1990 census. The population ethnicity in the immediate vicinity of the Halawa Bridge is composed mostly of Caucasian *(75–100 percent)*, *Filipino (5–25 percent)*, *Chinese (1–4 percent)*, *Hawaiian (1–5 percent)*, and Japanese (1–5 percent). According to 1990 census data, median household incomes for this area range from $20,000 to $50,000, (UH-H 1998).

The project area is located just northeast of the Pearl Harbor Naval Complex, and southwest of the Halawa Valley area, as well as the Salt Lake, Aliamanu, and Foster Village neighborhoods. This area supports Pearl Harbor Naval Complex, Hickam Air Force Base, Honolulu International Airport, and metropolitan Honolulu, with residential, light industrial, and recreational areas.

3.11 Soils and Geology

The soil in the vicinity of the project area is classified as fill land (FL), mixed FL on coastal plains (Figure 3-6). This area is mainly composed of material dredged from the ocean, or nearby areas, garbage and material from other sources. FL commonly occurs near the ocean around Pearl Harbor and Honolulu, and is used for urban development, airport land, housing developments and industrial facilities (USDA-SCS 1972).

A sediment/soil investigation for the *Halawa Stream Maintenance Dredging Environmental Impact Statement* was completed by VTN Pacific and Geolabs in March 1977 (VTN 1978). This investigation included the collection of numerous surface samples at low tide and the advancement of 11 borings ranging from 2 to 8.3 feet below ground surface in Halawa Stream from the Salt Lake Boulevard Bridge to the Halawa-Kamehameha Highway Bridge. Surface soil sampling resulted in the classification of surface sediments into 5 zones shown in Table 3-5. Generally, sediments showed a gradation from coarse to fine grained materials in the downstream direction. Results from the soil borings indicated that soil was

brown, silty sands and gravels at the surface, grading to silty sands and silts to the maximum depth explored.

Table 3-5: Halawa Stream Maintenance Dredging Sediment Zones From Salt Lake Blvd. To Halawa Bridge (VTN 1989, Figure 8)

Zone and Location		Sediment Description
1	Upstream at Salt Lake Blvd.	Silty Sandy Gravel (cobbles on the surface)
2	Upstream*	Gravelly Sand
3	Mid-Stream*	Silty Sand
4	Downstream	Sandy Silt
5	Downstream	Soft Silt

* Also seen in small areas downstream near the estuary area at Halawa Bridge.

3.12 Transportation

A traffic study was completed for this EA to review traffic patterns at the Halawa Bridge and assess potential impacts of the proposed project on traffic in the area. Information for the analysis was derived from traffic counts for the inbound side of Kamehameha Highway provided by DOT-HD. The counts were taken on Kamehameha Highway at Halawa Bridge (Station C-6-H).

Kamehameha Highway (Route 99) is a major thoroughfare connecting several communities in the Ewa district of Oahu. Kamehameha Highway serves as the main transportation route for travel used by commuters to the Pearl Harbor Naval Complex and visitors to the Arizona Memorial. The highway is state-maintained with a minimum 160-foot-wide right of way and three 12-foot lanes in the inbound direction. The posted speed limit is 35 miles per hour on the inbound side of Halawa Bridge.

Traffic Patterns. Traffic patterns across the bridge are influenced by early morning and afternoon commuters. Early morning inbound traffic is dominated by people commuting from the Aiea area to Honolulu for work. Some commuters travel to work in Honolulu in this direction since Kamehameha Highway connects to the H-1 Freeway and Nimitz Highway, major commuter roadways. Outbound traffic appears to be dominated by people commuting to Pearl Harbor for work and visitors to the Arizona Memorial.

Afternoon peak traffic in the area appears to be dominated by people leaving Pearl Harbor and the Arizona Memorial. Evening traffic peaks are indicative of people returning to Honolulu and East Oahu from the Arizona Memorial and Aiea.

Traffic counts for Kamehameha Highway are shown in Figure 3-7, Figure 3-8, and Figure 3-9. Figure 3-7 summarizes 24-hour traffic counts taken by the DOT-HD. The graph

shows a gradual upward trend in traffic counts between the years 1985 and 1999. Figure 3-8 and Figure 3-9 show the peak morning (6:15 a.m. – 7:15 a.m.) and afternoon (4:00 p.m. - 5:00 p.m.) traffic counts, respectively, for July 1999. The July 1999 counts were done by the DOT-HD at Station C-6-H.

3.13 Utilities And Infrastructure

Utility lines and infrastructure are located in or near the project area. Aboveground and underground utilities are present on the east and west sides of the bridge, including traffic controls, storm drains, telephone (Hawaiian Tel), cable television, and electric (Hawaiian Electric Company). As mentioned in the previous section, POL pipelines are present in the vicinity of the project area. Police and fire services are located in Pearl City and on base at the Pearl Harbor Naval Complex. Fire apparatus access will be maintained throughout the construction site for the duration of the project. The Fire Communication Center will be notified if there is any interruption in the existing fire hydrant system during the project.

3.14 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 CZMA review process.

The landscape along the project area of Kamehameha Highway is predominantly urban in its visual character, as seen in the site photographs (Appendix G). The approach to the Halawa Stream Bridge from both the inbound and outbound lanes contains buildings and grounds for the Pearl Harbor Naval Complex. On both sides of Halawa Stream, the banks are covered with shrubs, trees, and ground cover. This vegetation is seen at the approach of the bridge, Halawa Stream and East Loch of Pearl Harbor, the bike path bridge and the Waianae Range to the West and Halawa Stream and Pearl Harbor Naval Complex to the east. Because of the placement of the bridge and the surrounding vegetation, the experience of open space and views is limited to the upper floors of a few buildings of the Pearl Harbor Naval Complex and approaching traffic; scenic vistas or view planes are not present.

3.15 Water Resources

Water resources include the drainage characteristics of the Halawa 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 (DLNR), U.S. EPA's Sole Source Aquifer Program, Aquifer

Identification and Classification For Oahu: Groundwater Protection Strategy For Hawaii (Mink, 1990) and a field water quality survey.

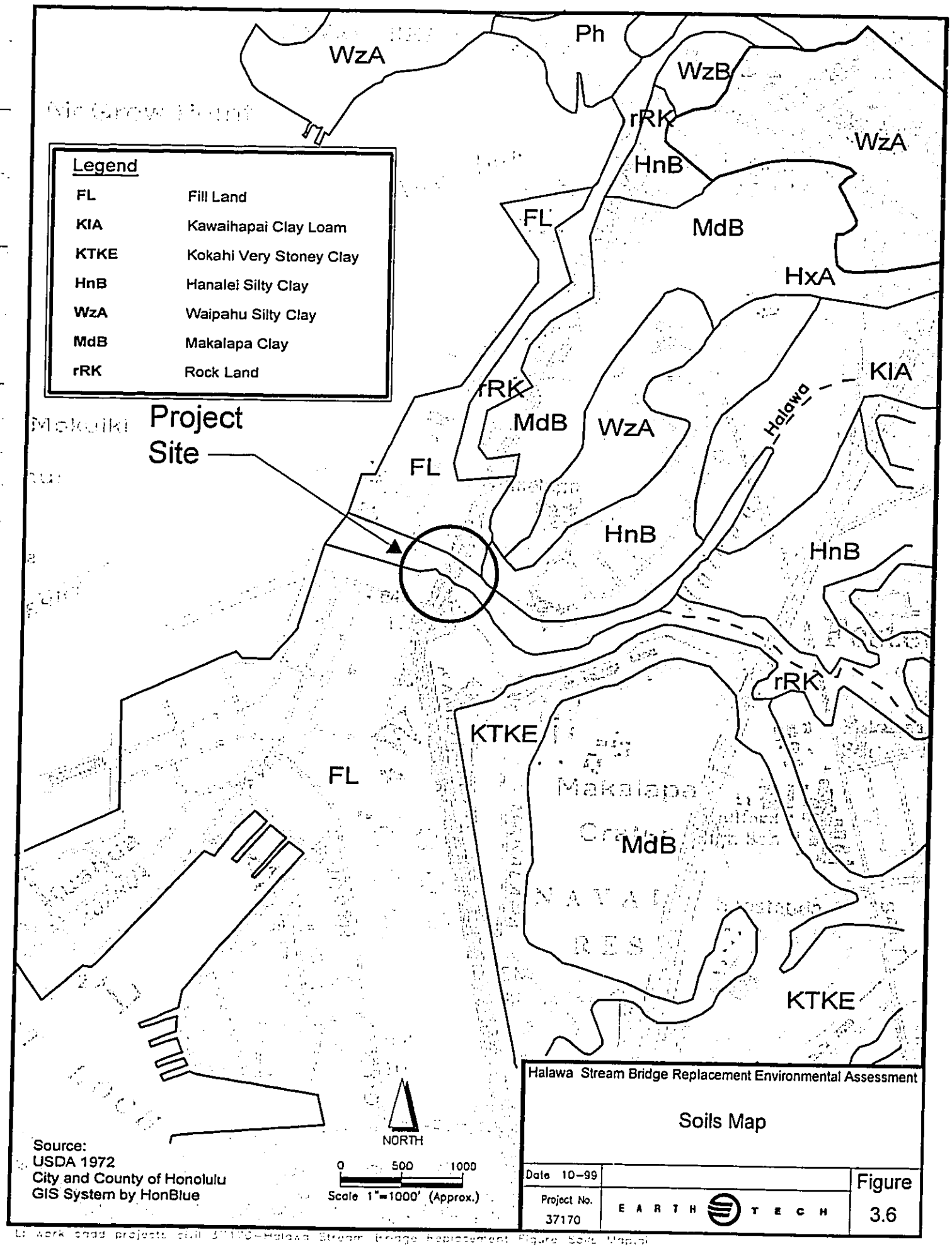
Water Quality. Data presented in this section illustrate past construction activities and related water quality monitoring, as well as more recent water quality monitoring data for Halawa Stream (Appendix E). Table 3-6 shows the projected peak flows for the Halawa Stream that were calculated by DOT-HD using the Federal Emergency Management Agency (FEMA) Log Pearson Type III Frequency Curve plot.

Table 3-6: Projected Peak Flows for the Halawa Stream

Event	Cubic Feet per Second (cfs)
10-Year	4,600
50-Year	7,500
100-Year	8,600
500-Year	14,600

Historical Data. Historical water quality data are present from the Halawa Stream Maintenance Dredging Revised Environmental Impact Statement (EIS) (VTN 1978), the EA and Notice of Negative Declaration for the Halawa Stream Maintenance Dredging Projects (DLNR 1989) and the Statistical Summary of Hydrologic and Water-Quality Data from the North Halawa, Haiku, and Kamooalii Drainage Basins, Water Years 1983–89, (USGS 1992). Construction activities and related water quality monitoring at Halawa Stream are summarized as follows.

- Recent historic flood control improvements for Halawa Stream in the vicinity of the project area include the initial dredging of the stream as part of the improvements for the development of the Halawa Valley Estates subdivision in 1964–65. For this period of construction, the alignment was designed to closely follow the meanderings of the existing stream. However, actual construction varied greatly from the design; more fill was removed to obtain additional material for the subdivision.
- In 1969–1971, approximately 1.1 miles of the stream were enlarged and lined with concrete from Salt Lake Boulevard to beyond the confluence of the north and south forks at the Moanalua Freeway.



Halawa Stream Bridge Replacement Environmental Assessment

Soils Map

Date 10-99		Figure
Project No. 37170	EARTH TECH	3.6

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Figure 3.7
24-Hour Traffic Count

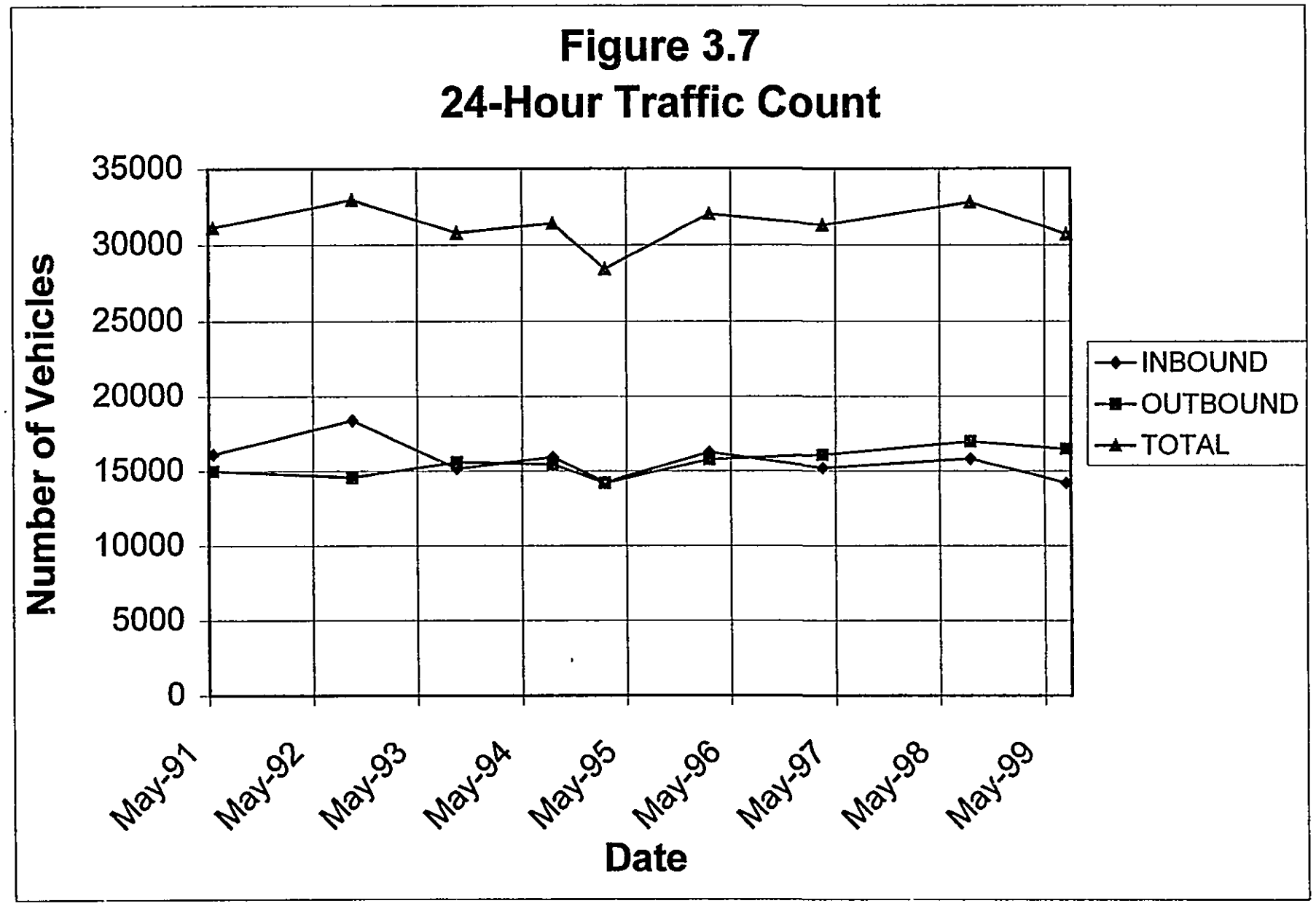


Figure 3.8
Peak Morning Commuter Traffic Counts

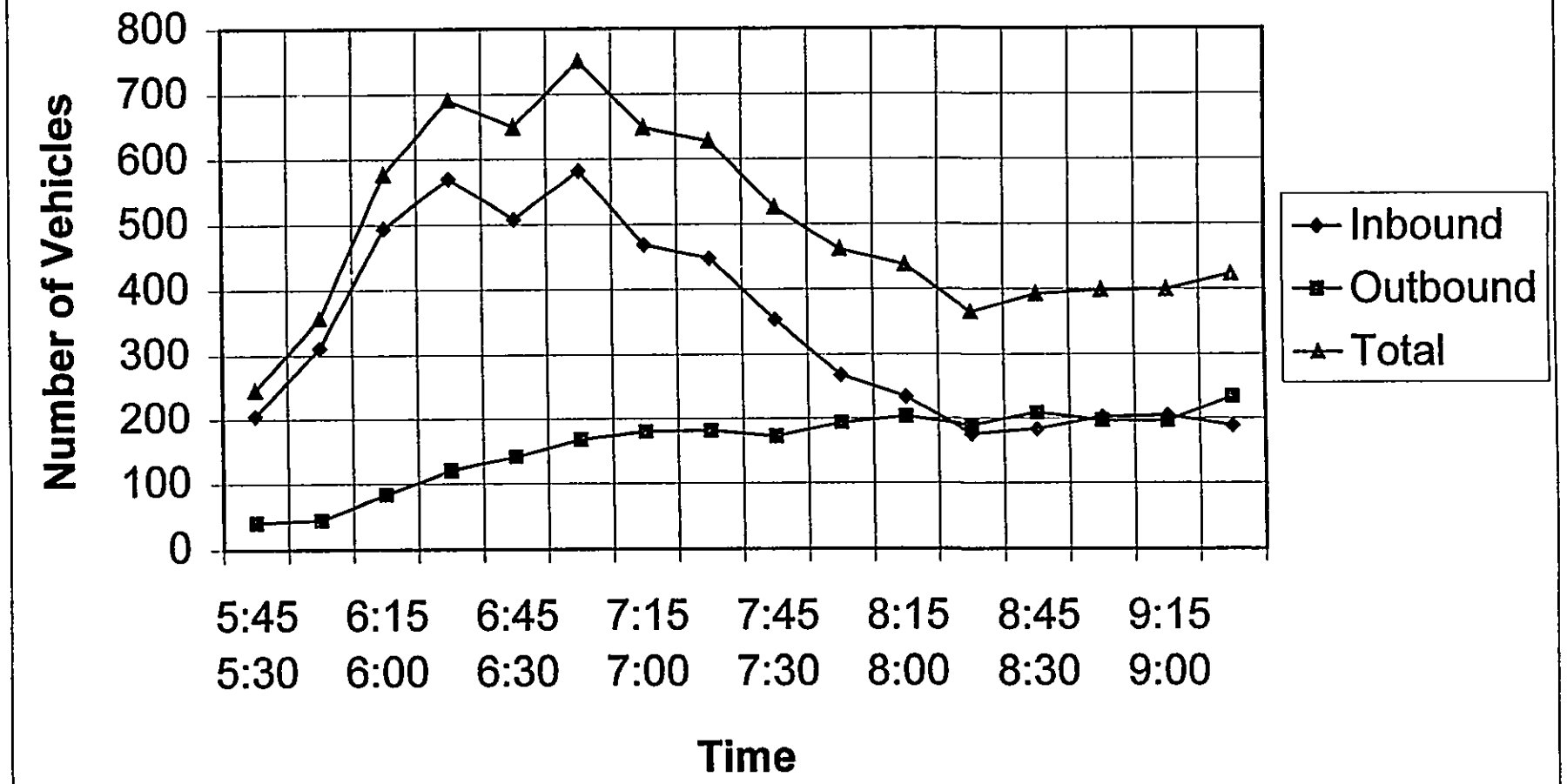
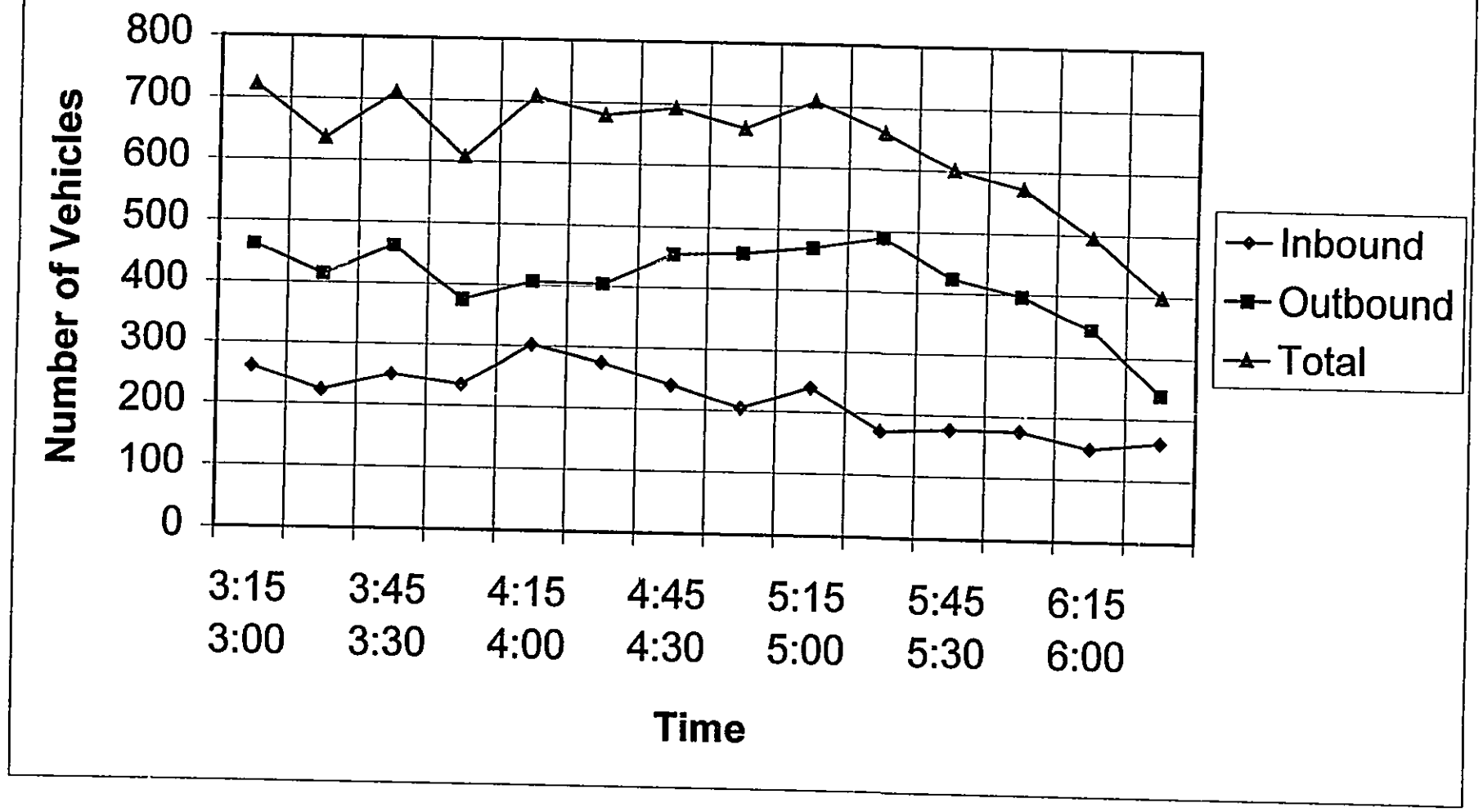


Figure 3.9
Peak Afternoon Commuter Traffic Counts



- In 1977, preparations began to dredge approximately 142,800 tons of material that had accumulated in the stream since the initial dredging activities. Preparations for additional dredging were also proposed in 1989 for the removal of material from the stream between Salt Lake Boulevard and Kamehameha Highway. Water quality data related to these two events were presented in their EIS and EA, respectively.
- A statistical summary of rainfall, streamflow, and water quality data was compiled for water years 1983 through 1989 to determine the effects of the construction of the H-3 Highway. Information from the study pertinent to this project is from the North Halawa Stream area (Appendix E).

Baseline water quality data collected for the 1978 Halawa Stream Maintenance Dredging EIS was derived from Naval Civil Engineering Laboratory studies at two gauging stations. One station was located at the mouth of Halawa Stream, the other was just below Salt Lake Boulevard. The parameters analyzed during the studies included temperature, pH, conductivity, salinity, turbidity, dissolved oxygen, nitrate, ammonia, total organic carbon, metals, total and fecal coliforms, phenols, oil and grease, and solids. A complete listing of analytes and results are presented in Table 1 of Appendix D. Results were compared to standards existing at the time. The greatest analyte of concern was fecal coliform. It was surmised that due to the discharge of sewage effluent from the secondary treatment systems from the Animal Quarantine Station and Halawa Prison, that levels of coliforms (mean of 2,270 colonies per milliliters [cols./mls]) were 20 times over the existing standard (VTN 1978). (It should be noted that these effluent streams were connected to City and County of Honolulu sewers in the early 1980s).

Some exceptions were noted from samples collected at the mouth of Halawa Stream for salinity, dissolved oxygen, total organic carbon, and turbidity. Bottom waters typically had higher saline concentrations, and lower dissolved oxygen and total organic carbon. Turbidity was also twice as high in the bottom layers as in the surface layers (VTN 1978).

The EA for the Halawa Stream Maintenance and Dredging projects reported a tidal range of 2.5 feet, salinity ranging from 35 parts per thousand (ppt) (seawater) to 1 ppt, and wide ranges of temperature, turbidity, and dissolved oxygen levels in the area between Kamehameha Highway and the mouth of the Halawa Stream (DLNR 1989).

Some historical air and water temperature and flow data are available for the Halawa Stream from four existing USGS stream flow gages, three of which are located on the North Halawa Stream (Table 3-7). The USGS, *Water Resources Data Hawaii – Water Year 1996,* indicates that the average stream and air temperatures at USGS Gage Station 16227100, located approximately 3,000 feet upstream from project site near the Salt Lake Blvd. bridge, were 80.4 degrees Fahrenheit (°F) and 78.9°F respectively. USGS Gage Station 16226200 is located on the right bank of North Halawa Stream, approximately 1.7 miles upstream from the confluence with South Halawa Stream. The gage is at an

elevation of 160 feet above mean sea level (msl), and is 0.5 miles north of the Halawa quarry, and 1.7 miles east of Aiea High School. This water-stage recorder has been in operation for 13 years (water years 1984–96) and accounted for an average annual stream discharge of 5.31 cfs with a range from 0.00 to 1,780 cfs for period of record. USGS Gage Station 16226000 is located on the left bank of North Halawa Stream, 2.7 miles from the confluence with South Halawa Stream, and 2.7 miles northeast of the Aiea Post Office. This water-stage recorder is at an elevation of 320 feet above msl and has been in operation for 46 years (water years 1930–32, 1954–96). The average discharge for period of record is 5.42 cfs with a range of 0.00 to 6,650 cfs.

The USGS completed a statistical summary of water-quality parameters collected from station 16226200 on the north fork of Halawa Stream from May 1983 through September 1989 in conjunction with the construction of the H-3 Highway. Specific conductance, pH, nutrients, metals, fecal coliform, physical parameters, total organic carbon, total oil and grease, pesticides, and herbicides were analyzed as part of this project. Results are presented in Table 2 of Appendix D. Analyses indicated the following average results for general parameters: pH of 7.2, specific conductance of 133 microsiemons per centimeter (µS/cm) at 25 degrees Celsius (°C), temperature of 22°C, and turbidity of 63 nephelometric turbidity units (NTU). Of particular interest, the average fecal coliforms at 1,900 cols./100 mls were lower than earlier reports and are consistent with later monitoring data. Additionally, results for analyses of pesticides and herbicides did not indicate any appreciable amounts present (USGS 1992).

Recent Data. The USGS collects water quality data from the Halawa-Stream just below the H-1 freeway. The latest sample data from November 1998 (USGS 1999) provide an indication of recent baseline data for the stream. Specific conductance, pH, nutrients, metals, fecal coliform, physical parameters, total organic carbon, total oil and grease, pesticides, and herbicides were analyzed as part of this project. Results are presented in Table 3 of Appendix A. Analyses indicated the following results for general parameters: pH of 9.1, specific conductance of 304 µS/cm 25°C, temperature of 27.5°C, and turbidity of 1.9 NTU. A parameter of previous interest, fecal coliforms, were present at 1,800 cols/mls, which was consistent with past data collected by the USGS in the north fork of Halawa Stream during the 1983–1989 monitoring period (USGS 1992). Additionally, herbicides and pesticides were not present in appreciable quantities.

For this project, AECOS assessed the conventional parameters listed in at a sampling point (Station 1, which is makai of the inbound lane of the Halawa Bridge) in the Halawa estuary. On October 27 and 28, 1999, samples were collected and analyzed in the field or at a fixed laboratory by the appropriate EPA method. The results of the analyses and calculated and means are presented in Table 3-8. The State of Hawaii water quality criteria includes an assessment of the mean values not to be exceeded more than 10% of the time, and mean values not to be exceeded more than 2% of the time. Water quality appears to comply with

State water quality criteria with the exception of total nitrogen, ammonia nitrogen, total phosphorus, and turbidity. More measurements over time would aide in assessing compliance with the state standards. The complete AECOS report is presented in Appendix A.

Groundwater. Two general types of groundwater generally occur on Oahu; basal and high level dike water. The predominant source of groundwater on Oahu is fresh water in the basal aquifer, which floats on and displaces salt water that saturates the base of the island. The second source of groundwater is fresh water that is contained in vertical dikes, which are present in rift zones. Rainwater is the ultimate source of groundwater; it percolates downward through porous and permeable materials, like basalt. Movement of groundwater is downgradient towards the ocean, and it typically discharges in seeps, springs and streams. Coastal sediments can act to confine groundwater movement within underlying basalts, causing artesian conditions during discharge.

Groundwater quality is naturally the endproduct of geochemical processes, however it can easily be affected by man's activities. Land use practices must take into account groundwater protection efforts. This includes industrial, agricultural and commercial activities as well as drainage patterns and groundwater removal.

The proposed project has a potential affect on surface water resources. These resources are also related to groundwater resources through infiltration affecting quality and quantity. Changes to surface water resources, as part of the proposed project should take this factor into account. The Halawa Stream Bridge project is located in two aquifers designated as Aquifer Code 30201116(12211) / 30201121(12212) and are described as follows (Mink & Lau, 1990):

Aquifer: 3020116 = (location) Oahu, Pearl Harbor, Waimalu, (type) basal, unconfined, flank

Status: (12211) = Currently used, ecologically important, low salinity (250-1000 mg/l Cl-), irreplaceable, high vulnerability to contamination.

Aquifer: 30201121 = (location) Oahu, Pearl Harbor, Waimalu, (type) basal, confined, flank

Status: (12212) = Currently used, ecologically important, low salinity (250-1000 mg/l Cl-), irreplaceable, moderate vulnerability to contamination.

Table 3-7: Halawa Stream Gage Data

Date	Flow (cfs)	Date	Flow (cfs)
Gage 16227100*		**Gage 16226000**	
11/20/95	1.33	10/95	4.52
01/16/96	0.310	11/95	10.5
02/12/96	0.220	12/95	1.69
03/05/96	21.4	01/96	5.96
04/24/96	0.200	02/96	2.29
05/14/96	0.060	03/96	3.02
10/28/96	0.000	04/96	1.87
11/12/96	5.29	05/96	0.047
12/16/96	1.34	06/96	3.61
01/21/97	9.50	07/96	3.13
02/12/97	0.660	08/96	1.62
03/10/97	2.31	09/96	3.24
4/15/97	5.59	**Gage 16226200**	
05/27/97	0.450	10/95	6.12
06/09/97	2.94	11/95	12.8
07/14/97	2.36	12/95	1.55
08/12/97	0.060	01/96	7.24
11/13/97	4.11	02/96	2.62
12/17/97	0.190	03/96	4.22
02/03/98	E.01	04/96	1.91
07/23/98	0.13	05/96	0.028
11/17/98	4.76	06/96	4.96
		07/96	5.00
		08/96	2.19
		09/96	5.18

* Data is provisional and subject to revision
Source: U.S. Geological Survey

Table 3-8: Basic Water Quality Characteristics of the Estuary of Halawa Stream

Constituent	10/27/99 1135 hrs	10/27/99 1425 hrs	10/28/99 0825 hrs	Mean
Temperature (°C)	27.5	28.0	25.9	27.1
DO (mg/l)	5.53	5.72	5.27	5.51
DO Saturated (%)	85	88	79	84
Salinity (ppt)	34	35	35	35
PH	7.94	8.02	8.13	8.03
Turbidity	21.8	12.8	5.54	11.6
TSS (mg/L)	21.8	16	6.3	13
Ammonia (µg N/L)	101	87	27	62
Nitrate+Nitrite (µg N/L)	40	45	10	26
Total N (µg N/L)	447	425	195	333
Total P (µg P/L)	86	48	28	49
Tide	Low/Ebb	Low/Flooded	High/Ebb	--

4. ENVIRONMENTAL CONSEQUENCES

Project-related effects, both detrimental and beneficial include, primary, secondary, and cumulative effects. Primary effects or "direct impacts" are caused by the action and occur at the same time and place. Secondary effects or "indirect impacts" are caused by the action and occur later in time or farther removed in distance, but are still reasonably foreseeable. Cumulative effects refer to impacts on the environment that result from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor, yet collectively significant actions taking place over a period of time.

Effects of the proposed project 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.

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

4.1 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. Soil in the project area contain relatively high levels of silt. It is anticipated that EPA and DOH standards will not be exceeded.

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

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

Construction activities will be conducted in accordance with State of Hawaii and EPA air pollution control regulations. This includes a regular dust-watering program and the covering of trucks during transport and storage of soil. Areas graded and cleared of vegetation also will be revegetated as soon as possible to reduce dust emissions. In the event that anaerobic sediment is removed from the stream, it will also be contained to reduce emissions.

4.2 Biological Resources

4.2.1 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 is also anticipated that aquatic species will not suffer long-term negative effects from increased short-term turbidity because of the already degraded and silted condition of their existing habitat.

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

Mitigation Measures. Erosion control BMPs will be used to control turbidity and decrease negative effects to water quality and stream habitat. Natural drainage flows will be maintained for the duration of the project so as not to effect the movement of fish and other aquatic species upstream and downstream of the project.

4.2.2 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. Construction activities and clearing of the near-stream vegetation will reduce cover and habitat used by various bird species, including the pacific golden plover, wandering tattler, ruddy turnstone and black-crowned night heron. Effects on birds and their habitat are anticipated to be short-term; effects on endangered or threatened species are not expected.

Cumulative Impacts. No other projects (federal, state, county, and community) were identified in the vicinity of the Halawa 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.

Mitigation Measures. During the clearing and construction phase of the project, project activities will cease if any nesting birds are discovered in the area. 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.

4.3 Cultural Resources

Results of consultation with the Island of Oahu Historic Preservation Specialists (Jourdane and Daghes) at the DLNR SHPD and archaeological subconsultant (Dye) indicate that while prehistoric, historic, and traditional sites are known to occur in the vicinity of the bridge replacement project, no sites have been identified within the APE. According to the archaeological survey performed (Appendix B) no additional archaeological survey and no construction monitoring will be required. This conclusion is based on the following:

- The APE is small and previously disturbed.
- None of the recorded sites identified as being potentially within the APE were observed, due to the depth of fill material in the project area.
- There is substantial existing archaeological documentation of the Halawa area.

Based on the existing information no effects on historic properties are expected.

The Halawa 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 SHPD or National Park Service Bulletin 15. The bridge retains reasonable physical integrity, but is not associated with events or persons of historical significance: it 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. However, according to SHPD the historical significance of the pillar monuments located within the median on the north and south-side of the bridge has not been determined. Photos will be

taken of the monuments and sent to SHPD for archival, prior to demolition of the monuments. This solution has been approved by DOT and SHPD.

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

Mitigation Measures. Although no effects on historic properties are expected from the Halawa Stream Bridge replacement due to the large quantities of fill and other twentieth century landscape modifications, 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 SHPD will be contacted. If native Hawaiian remains are encountered, the Oahu Burial Council also will be consulted.

4.4 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.

Limited wetland-type areas exist in the r-o-w under the Halawa Bridge and within 120 feet of the structure. These areas are composed of pickle weed or red mangrove that line the stream. Both alien species are capable of growing in high-saline waters and soils. These wetland-type areas are limited to the edge of the stream, and have not been listed as wetlands in the survey of Hawaiian wetlands (Elliot and Hall 1977). However, according to a wetland delineation survey, conducted by the ACOE for the Navy in December 1999, the areas between the inbound and outbound bridges were identified as a wetland. Additionally, two native species were present in the project area: the beach heliotrope and uhaloa. These plants are wide-ranging indigenous species that are common in disturbed areas.

Proposed construction activities would most likely disturb the wetland-type areas and the native species, but are not expected to cause significant long-term effects. Additionally, the large monkey pod tree, located next to the mauka abutment of the inbound bridge, will most likely need to be removed for construction of the detour bridge and to prevent future damage caused by the tree's root system. Because this has previously been a disturbed area and the subject plants are common to disturbed areas, it is anticipated that wetland-

type vegetation and the native species will again rapidly repopulate and thrive following the completion of the project.

Cumulative Impacts. No other projects (federal, state, county, and community) were identified in the vicinity of the Halawa Stream Bridge replacement project. Therefore, when reviewed against past, present, and reasonably foreseeable future actions, no cumulative effects on the floral resources and wetland- type areas are expected.

Mitigation Measures. Wherever possible, grading and disturbances to vegetation in the area will be minimized or avoided. To the extent possible, areas will be revegetated with endemic, indigenous, and wetland-type 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.

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

4.5 Hazardous Wastes And Materials

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

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

Mitigation Measures. Construction materials, including petroleum products, will be stored in a confined area away from the stream and wetland. Storage containers will be equipped with containment devices to contain spills or releases. All refueling and maintenance activities will take place on paved land, away from the bridge and stream. To the extent possible, equipment will be kept free of pollutants during construction activities. Garbage and waste receptacles will be provided on site for waste containment. 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 onsite 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.

A contingency plan should also be developed in the event that transite (asbestos-containing pipe) is encountered. The following elements should be taken into account in the plan:

- possible location of any transite pipes
- appearance of transite pipe (for identification)
- appropriate mitigation measures to be taken in handling the pipe (including the use of trained and licensed asbestos professionals)

Additionally, in the event that construction activities will take place in the vicinity of the petroleum pipelines near the project site, the owners and operators of the pipelines should be contacted to determine the exact location and proper procedures to work around them.

4.6 Noise

Intermittent elevated noise levels from certain types of construction activities are unavoidable but are expected to be short-term and minor; typical heavy construction equipment noise levels are provided in Table 4-1.

Long-term effects are not expected and noise levels would not exceed the permissible noise exposure levels shown in Table 3-4 or as defined by the State Department of Health. Construction activities would be conducted on weekdays and in daytime hours in accordance with HRS Chapter 342-F-1. As a result, no significant noise impacts are expected from replacement of the Halawa Bridge.

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

Table 4-1: Heavy Construction Equipment Noise Levels at 50 Feet

Equipment Type	Generated Noise Level (dBA)
Bulldozer	88
Backhoe (rubber tire)	80
Front Loader (rubber tire)	80
Dump Truck	75
Concrete Truck	75
Concrete Finisher	80

Equipment Type	Generated Noise Level (dBA)
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)

Mitigation Measures. Short-term construction-related noise impacts are unavoidable, but will be controlled to within acceptable limits by timing and phasing of construction, and ultimately complying with all the terms and conditions set forth in HAR 11-46, 11-42 and HRS 342F. 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. Residential noise impacts are not anticipated.

In the event that work would occur after normal working hours (i.e., at night), appropriate permitting, monitoring, as well as development and implementation of administrative and engineering controls should be employed.

4.7 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 or decrease economic or population growth in the Halawa 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 are no planned construction activities during weekends and holidays.

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

4.8 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

CORRECTION

THE PRECEDING DOCUMENT(S) HAS BEEN REPHOTOGRAPHED TO ASSURE LEGIBILITY
SEE FRAME(S)
IMMEDIATELY FOLLOWING

Equipment Type	Generated Noise Level (dBA)
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)

Mitigation Measures. Short-term construction-related noise impacts are unavoidable, but will be controlled to within acceptable limits by timing and phasing of construction, and ultimately complying with all the terms and conditions set forth in HAR 11-46, 11-42 and HRS 342F. 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. Residential noise impacts are not anticipated.

In the event that work would occur after normal working hours (i.e., at night), appropriate permitting, monitoring, as well as development and implementation of administrative and engineering controls should be employed.

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

4.8 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 phase and construction phases for the bridge and detour road.

The detour road will be completed during the first 2–3 months of the project, traffic will be routed away from the existing inbound bridge along the detour road upon completion. The current posted speed limit of 35 miles per hour will be reduced in the area of the detour road and bridge due to the loss of one outbound lane and to lower the possibility of skidding on the steel bridge during wet weather.

Traffic patterns throughout the course of the proposed 20-27 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 14–18 month period when the detour is in service.

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 and two-lane steel bridge; however, those changes will be alleviated by new signage and a traffic signal system. 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.

Cumulative Impacts. The USS Arizona Memorial commercial bus parking lot, in front of the visitor center adjacent to Kamehameha Highway, is scheduled for repair/rehabilitation in the fall 200/winter 2001.

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. Additionally, a temporary traffic signal system for the detour road will be established, since the Halawa Drive intersection is signalized. A coordination meeting with the U.S. Navy and the Arizona Memorial administration will take place regarding the detour road configuration and possible stagger of construction events.

4.9 Utilities and Infrastructure

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

Excavation activities, demolition 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.

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

Mitigation Measures. Various utilities are located within the project limits. Prior to demolition, the existing utilities on the bridge and overhead lines will be relocated. During demolition, utility lines will be supported, as necessary, and protected from demolition equipment. For utilities attached to the bridge, minimum clearance will be allowed so that maintenance and inspection can be performed. Utilities requiring attachment to the bridge will use stainless steel inserts or bolts to prevent corrosion to the bridge structure.

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.

4.10 Visual

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

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

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

4.11 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.

Results from aquifer research (Mink, 1990) and consultation with Hillary Hecht, Hydrogeologist with the U.S. EPA, Region IX, Groundwater Office, indicate that the aquifers in the proposed project area are listed as currently in use, ecologically important, of low salinity and are not listed as a source of drinking water. Additionally, construction BMPs and a monitoring plan have been developed under the DOH 401 WQC for this proposed project to prevent polluted discharge. Based on this information and the proximity of the proposed project to Pearl Harbor and the underground injection control (UIC) line (in the State of Hawaii, this delineates areas available for underground injection purposes), no adverse impacts to the Sole Source Aquifer are expected. However, since the proposed project is located within the southern Oahu Basal Aquifer (SOBA) Sole Source Aquifer designation and has received federal financial assistance, under provisions of the Safe Drinking Water Act, Section 1424(e), EPA is charged with review of the DEA.

The Halawa Stream drainage will be temporarily affected during the grading activities for the project. The existing drainage conditions will be retained throughout the duration of the construction activities since the Acrow panel bridge spans the stream and is well above grade.

Due to the heavily silted condition of the stream bottom, short-term turbidity will be increased and water quality will be reduced downstream of the bridge during the demolition of the existing bridge and the construction and removal of the 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.

Even though the project area is near the Pearl Harbor East Loch, based on existing water quality conditions and construction Best Management Practices (BMPs) to be implemented, there are no anticipated long-term impacts for coastal waters. Increased sediment from the proposed project may temporarily affect water quality in the nearshore area, but this is expected to be short-term in nature.

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

Mitigation Measures. Extensive monitoring of the stream water will be conducted throughout the duration of the project. Construction activities are also scheduled in early

spring through the summer months to avoid heavy rains and hurricanes that may cause construction related delays and additional effects on water quality.

During the construction phase of the project, the contractor will implement temporary erosion control BMPs. This may include, 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 will span 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 State of Hawaii Standard Specifications for Road and Bridge Construction.

5. DETERMINATION, FINDINGS, AND REASONS FOR SUPPORTING DETERMINATION

To determine whether the proposed action may have a significant impact on the environment, the project and its expected consequences, both primary and secondary, and the cumulative as well as short and long term effects have been evaluated. Based on the studies performed and research evaluated, a finding of no significant impact is anticipated and summarized below.

5.1 Significance Criteria

According to the Department of Health Rules (11-200-12), an applicant or agency must determine whether an action may have a significant impact on the environment, including all phases of the project, its expected consequences both primary and secondary, its cumulative impact with other projects, and its short and long term effects. In making the determination, the Rules establish "Significance Criteria" to be used as a basis for *identifying whether significant environmental impact will occur. According to the Rules, an* action shall be determined to have a significant impact on the environment if it meets one of the following criteria.

Involves an irrevocable commitment to, loss or destruction of any natural or cultural resources. The proposed project will not impact scenic views of the ocean or any ridge lines in the area. Long-term effects are not expected and the overall visual qualities of the bridge area will not change. Timing and phasing of the proposed project will allow for revegetation and landscaping to take place prior to completion of the entire project.

An archaeological assessment and field reconnaissance study for the project determined that no significant or historical sites are known to exist within the projects area of potential effect (APE). The pillar monuments, which are of unknown historical significance, will be temporarily moved, to avoid any damage due to construction. Should any archaeologically significant artifacts, bones, or other indicators of previous onsite activity be uncovered during the construction, work will be halted and their treatment will be in strict compliance with the requirements of the Department of Land and Natural Resources.

Curtails the range of beneficial uses of the environment. The Halawa Stream Bridge was originally constructed in 1933 and will remain within the State right-of-way. The bridge replacement will be beneficial in that it will meet current day safety and design standards, including wider shoulders, designed in accordance with the ADA for pedestrian traffic.

Conflicts with the State's long-term environmental policies or goals and guidelines as expressed in Chapter 344, HRS; and any revisions thereof and amendments thereto, court decisions, or executive orders. The proposed development is consistent

with the State Environmental Policies established in Chapter 344 of the Hawaii Revised Statues.

Substantially affects the economic or social welfare of the community or state. The proposed project, after completion, will have a positive impact on the Ewa District population through increased safety of traffic motorist and pedestrians. The 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 are no planned construction activities during weekends and holidays. The proposed improvements are consistent the existing Central Oahu's Sustainable Communities Plan and Special provisions for the Primary Urban Center. Surrounding land use patterns will not be negatively or significantly altered, nor will unplanned population growth or its distribution be stimulated.

Substantially affects public health. Although public health may be minimally affected by the short-term construction related impacts, (i.e. air, noise, traffic, and water quality), these should be insignificant, when weighed against motorist safety associated with transportation infrastructures. Mitigation measures will be used to address impacts that could potentially affect public health.

Involves substantial secondary impacts, such as population changes or effects on public facilities. The replacement of the bridge will not have any secondary impacts associated with public growth or the need for public facilities.

Involves a substantial degradation of environmental quality. The proposed project will utilize the existing state right-of-way corridor between the inbound and outbound lanes for the widening of the bridge. There are no anticipated impacts that would degrade environmental quality.

Is individually limited, but cumulatively has considerable effect on the environment, or involves a commitment for larger actions. The project is consistent with the existing and planned Central Oahu's Sustainable Communities Plan and is not anticipated to have a cumulative effect on the environment based on the review against past, present and reasonably foreseeable future actions in the area.

Substantially affects a rare, threatened, or endangered species or its habitat. Field surveys of Flora and Fauna indicate that there are no endangered plant or animal species located within this project area. Federal agency records concur with our findings, adding no federally endangered, threatened, or candidate species, significant wetlands, or other Federal trust resources occur at the proposed project site.

Detrimentally affects air or water quality or ambient noise levels. The project will have appropriate Federal, State and City and County land use permits, Construction Best Management Practices (BMPs), water quality monitoring plans, and Pollution Prevention Contingency Plans to prevent, reduce, or mitigate any possible impact to these resources.

Affects or is likely to suffer damage by being located in an environmentally sensitive area, such as flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, freshwater, or coastal waters. The flood hazards in this area are undetermined per FEMA updated Flood Insurance Rate Map (FIRM), 1990. The proposed project site is not located in a tsunami inundation zone; however, flooding associated with a tsunami is possible.

Substantially affects scenic vistas and view planes identified in county or state plans or studies. Disruption of the existing visual quality will be short-term and minor as a result of construction activities. Long-term effects are not expected as the overall height of the bridge will remain at 15-feet above mean sea level; visual qualities of the bridge area will not change significantly.

Requires substantial energy consumption. Construction of the proposed project will not require substantial energy consumption.

5.2 Determination

On the basis of the above criteria and the discussion of impacts and mitigative measures contained in this document, it is anticipated that the proposed project will not have a significant negative effect on the environment.

6. CONSULTATIONS MADE DURING THE ENVIRONMENTAL ASSESSMENT PROCESS

Table 6-1 identifies the environmental companies that contributed to this EA and the agencies, citizen groups, and individuals either consulted in the development of the EA or were provided a copy for review, copies of letters of correspondence are located in Appendix F. Pursuant to HRS Chapter 343 and the Title 11-200-9.

Table 6-1: Contributors to the EA

Company	Role
Earth Tech, Inc.	Lead consultant for EA process
Phillip Bruner, BYU, Hawaii	Avifauna and mammal survey
Art Whistler, Isle Botanical	Botanical and wetland survey
Rick Guinther, AECOS	Aquatic survey
Thomas Dye, International Archaeological Research Institute	Archaeological survey.

Agencies, Citizen Groups, and Individuals Consulted on the EA

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

U.S. Geological Survey, Water Resources Division

State Agencies

Department of Agriculture

Department of Business, Economic Development and Tourism, Land Use Commission

Department of Health, Environmental Management Division, and Water Resources 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

City and County of Honolulu Agencies

City Council, District II

Department of Land Utilization – Planning and Permitting

Fire Department

Police Department

Department of Design and Construction

Community Groups and Individuals

#18 Aliamanu, Salt Lake/Foster Village Neighborhood Board

#20 Aiea Neighborhood Board

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Appendix A
Biological Resources

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

Prep. for

Earth Tech, Inc.

by

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INTRODUCTION

This report gives the findings of a field survey of property involved in the proposed Halawa Bridge Replacement Project, Oahu, Hawaii. The survey was conducted between 5 October and 14 October 1999. Figure One shows the location of the project.

The objectives of the survey and report are:

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

2- Note the sources of supplemental information about the species found in similar habitats and localities on Oahu.

3- Call attention to any native or migratory species, particularly those that are listed as threatened or endangered.

GENERAL SITE DESCRIPTION

This site is located in a highly urbanized environment. Housing, military installations and the Arizona Memorial facility surround the bridge. Plant communities adjacent to the stream and along the Pearl Harbor waterfront include introduced species such as: Mangrove, Kiawe, and Pickleweed (Batis sp.). Most of the shoreline is covered by vegetation. At low tide I noted a few small patches of open shoreline suitable for wading birds. There was ample evidence of recreational fishing and crabing on both the makai and mauka sides of the bridge. In addition, illegal dumping (ie. vacuum cleaner, car parts, grocery carts, cans, etc.) clutter the shoreline and stream.

FIELD METHODS

The site was examined between 5 and 14 October. Surveys were made at different times of the day and at low and high tide. All species seen or heard were recorded. Mammal observations were based on sightings only. Extra attention was devoted to native and migratory birds that were discovered on the survey.

Scientific names used in this report follow Pyle 1997 and Honacki et al. 1982.

RESULTS AND DISCUSSION

Birds:

Table One reports the introduced species recorded on the survey. This list does not include all the species that could potentially occur in the area. A more exhaustive accounting of introduced birds can be found in a variety of sources: Pratt et al. 1987, Hawaii Audubon Society 1993, Pyle 1993, Pyle 1996. No native terrestrial species would be expected at this site.

Two migratory shorebirds were observed on the survey: Pacific Golden-Plover (Pluvialis fulva) and Wandering Tattler (Heteroscelus incanus). These species are common winter migrants in the central Pacific. Three plover were seen foraging on lawns near the Arizona Memorial facility. Much is known about this species activity here in Hawaii (Johnson et al. 1981, 1989, 1993). Wandering Tattler forage

along streams, beaches and rocky intertidal habitats. One was seen on a small rocky area makai of the bridge. Ruddy Turnstone (Arenaria interpres) another common migrant, was not recorded but likely occurs in this area. These migratory species are not threatened or endangered.

This field survey recorded one native waterbird, the Black-crowned Night Heron (Nycticorax nycticorax). Two juveniles were seen perched on low mangroves on the makai side of the bridge. This species is not endangered or threatened. They take a wide spectrum of prey and utilize natural and man-made wetlands. The endangered Black-necked Stilt (Himantopus mexicanus) would be less likely to forage in this area due to the water depth and limited areas for wading.

Mammals:

One feral (?) cat (Felix catus) and two Small Indian Mongoose (Herpestes auropunctatus) were seen during the survey. The endangered Hawaiian Bat (Lasiurus cinereus semotus) was not found. I know of no recent records for this species at this location. Rats and mice likely occur on or near the site but were not observed on the survey.

CONCLUSIONS AND RECOMMENDATIONS

The site of the proposed bridge replacement is a highly urbanized environment with limited opportunities for wildlife. Human activity also impacts the quality of the habitat at this location. The presence of a native waterbird, the Black-crowned Night Heron, was not unexpected.

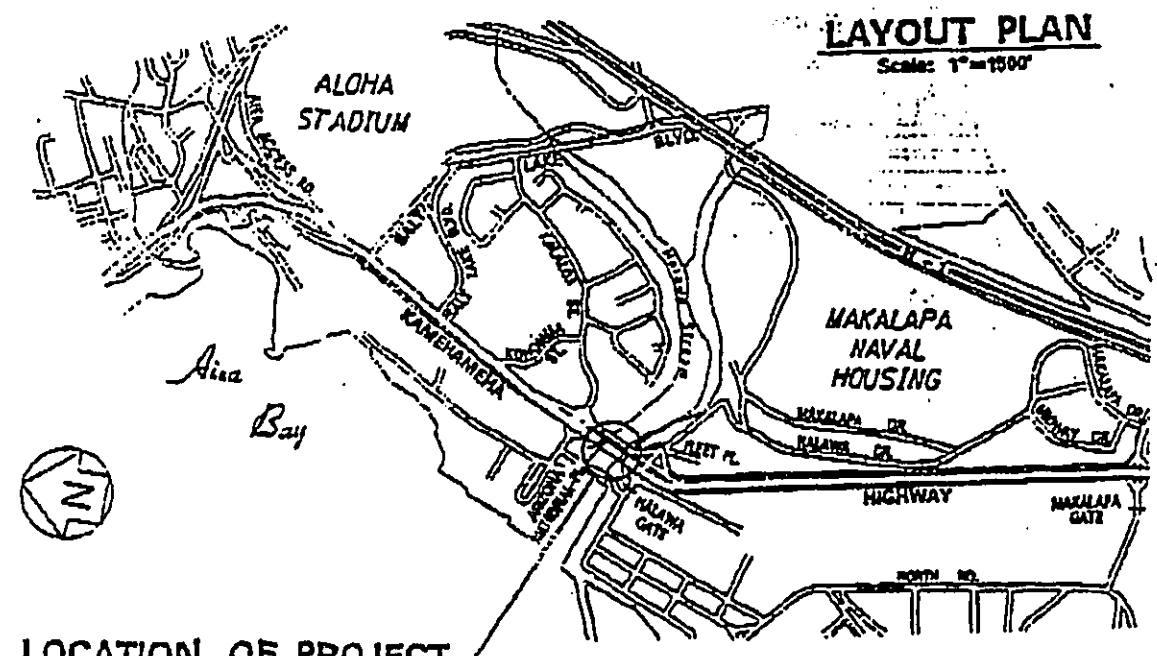
They forage in a wide variety of habitats including urban areas (ie. Ala Wai canal).

The only migratory shorebirds recorded were the Pacific Golden-Plover and Wandering Tattler. None of these migrants are threatened or endangered.

The list of introduced species of birds noted on the survey were those commonly found in this region of Oahu. No unexpected species were found.

Feral cat and the Small Indian Mongoose were the only mammals recorded. The endangered Hawaiian Hoary Bat was not observed and I know of no records for this species at this location.

The proposed bridge replacement project will temporarily disrupt the vegetation and wildlife in and around the bridge. This should pose no measurable impact on the native waterbird and migratory populations in this region of Oahu.



LOCATION OF PROJECT

Fig. 1. Halawa Bridge, location of the faunal survey.

TABLE 1

List of introduced species recorded at the proposed Halawa Bridge Replacement Project, Oahu, Hawaii.

COMMON NAME	SCIENTIFIC NAME
Spotted Dove	Streptopelia chinensis
Zebra Dove	Geopelia striata
Common Myna	Acridotheres tristis
Northern Cardinal	Cardinalis cardinalis
Red-crested Cardinal	Paroaria coronata
Red-vented Bulbul	Pycnonotus cafer
Japanese White-eye	Zosterops japonicus
House Finch	Carpodacus mexicanus
House Sparrow	Passer domesticus

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Biological reconnaissance survey of Halawa Stream mouth for Kamehameha Highway widening Project[1]

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Introduction

This report describes natural environments at the mouth of Halawa Stream in the vicinity of the Arizona Memorial and Kamehameha Highway, East Loch, Pearl Harbor, Island of O`ahu. The purpose of the report is to assess biological and water quality impacts of a proposed lane addition to the Kamehameha Highway bridge over Halawa Stream and address concerns that workers might have working around potentially contaminated water. The project is located within the highway right-of-way adjacent to the bus parking lot for the Arizona Memorial and crosses over the estuary of Halawa Stream. A reconnaissance survey of the site was conducted by *AECOS* biologists Eric Guinther and Rodger Douglas on October 27-28, 1999. Water quality samples were collected and biological observations made on the estuary segment between the Arizona Memorial and a significant bend upstream.

Stream Description

North Halawa Stream drains a relatively large, amphitheater-headed valley transecting the leeward face of Ko`olau mountain on O`ahu (Figure 1). The valley opens on the north side of Red Hill. It is comparable in size to nearby Moanalua Valley, but somewhat smaller than the large valleys of Kalihi, Nu`uanu, and Manoa located behind the central part of Honolulu. It's stream arises from multiple branches draining the very crest of the mountain, in an area unknown to most O`ahu residents until the opening of the trans-Ko`olau freeway (H-3) through the

[1] Report prepared for EarthTech, Inc. for their project: "Halawa Bridge Widening Environmental Assessment." This report will become part of the public record.

valley. A long, narrow valley to the east, opening on the south side of Red Hill is drained by South Halawa Stream. South Halawa Stream joins North Halawa Stream in the general area of the highway interchange between Moanalua Freeway (State Route 78) and H-3. Below the confluence, Halawa Stream flows under the Aloha Stadium parking lot into an estuary that opens onto East Loch of Pearl Harbor.

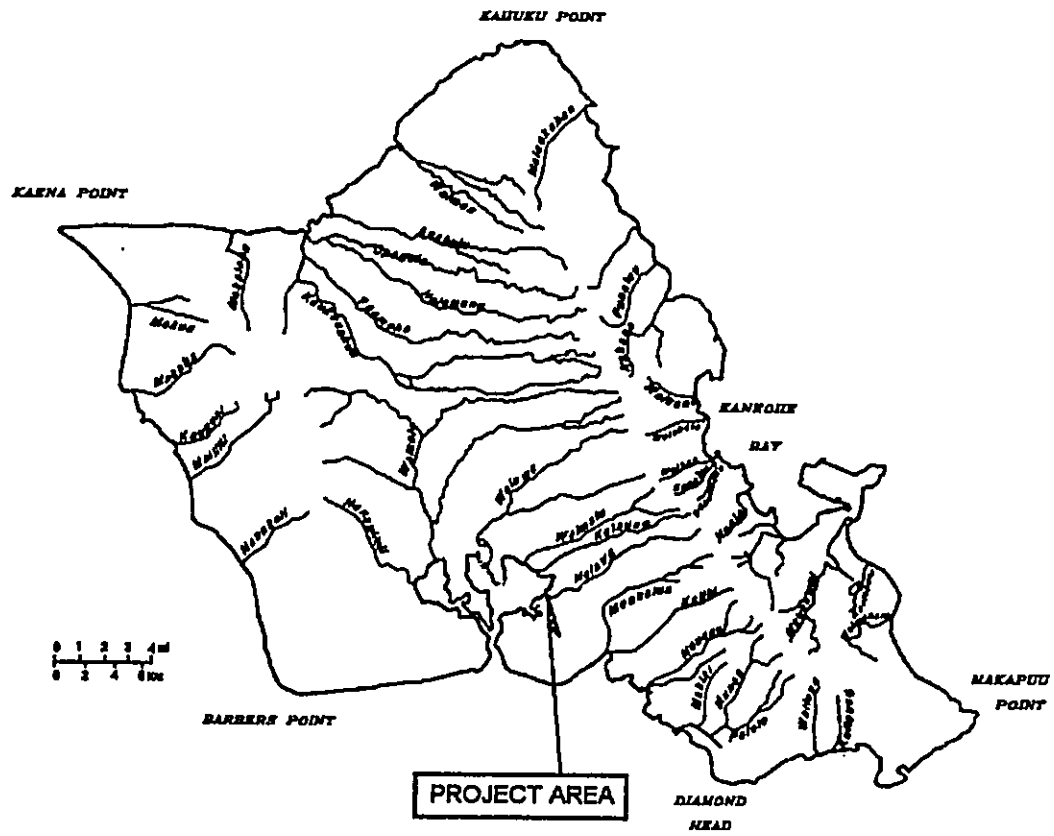

Figure 1. Location of Halawa Stream on O`ahu

This stream system is shown on the USGS topographic maps (7.5-Minute Series, Kaneohe, Waipahu, and Pearl Harbor quadrangles, 1980-81) as continuous flowing at all elevations except the segment between about 40 m (130 ft) and 55 m (180 ft) (see *AECOS*, 1999). The stream is inventoried as a perennial stream, State code number 3-4-02 (Hawaii Cooperative Park Service Unit, 1990). Total acreage of the Halawa watershed is 3821 ha (9,442 acres; Geographic Decision Systems International & Dashiell, 1994)

The stream in the project area is to 30 to 40 m (100 to 130 ft) across and clearly tidal. Stream flow, *per se*, was not evident during the visits. However, areas of rock

strewn mud flats on either side of the channel (but most particularly on the north side under the highway viaducts) were exposed at low tide and submerged at high tide. The shoreline is mostly fill material in the immediate project area, with numerous functional and abandoned old pipes and drains located along the shore. Downstream (west) from the viaducts, red mangrove (*Rhizophora mangle*) forms several groves that occupy most of the shoreline, with pickelweed (*Batis maritimus*) covering the ground along the inland mangrove border and at the shore between the trees. At the mouth of the stream, concrete bulkheads line the shore. Upstream of the highway viaducts the channel widens to some 90 m (300 ft) across. The riparian zone is mostly steep banks of lateritic soils supporting scattered trees and weedy herbaceous species such as `uhaloa (*Waltheria indica*), false *alena* (*Boerhavia coccinea*), little bell (*Ipomoea triloba*), plushgrass (*Chloris radiata*), and Guinea grass (*Panicum maximum*). A single cotton plant (*Gossypium* sp.) was observed in the project area. Riparian trees and shrubs present in this area include numerous *kiawe* (*Prosopis pallida*) and lesser numbers of *koa-haole* (*Leucaena leucocephala*), *milo* (*Thespesia populnea*), *klu* (*Acacia farnesiana*), *`opiuma* (*Pithecellobium dulce*), Indian fleabane (*Pluchea indica*), pink shower tree (*Cassia grandis*), monkeypod (*Samanea saman*), and Christmasberry (*Schinus terebinthifolius*). Many of these trees and shrubs are typical of dry, coastal areas on O`ahu and none is limited to riparian habitats, although Indian fleabane is a typical indicator species of coastal wetlands. Substantial amounts of litter and flotsam, including a stripped automobile, are present beneath the highway viaducts. Stream banks are mostly soil, and vary from only a meter or so above high tide to over 10 meters on the south shore upstream of the project area. The dominant wind pattern would tend to move flotsam scavenged from the banks at high tide, out into East Loch.

Water Quality

A single water quality sampling station (Figure 2) was selected in the project area and visited on October 27 and 28, 1999. It was decided that in this estuarine environment, sampling in relation to tidal state was more valuable in assessing water quality than sampling at three separate locations at essentially the same tidal state. Some parameters were measured by field meter (see Table 1) and others in samples collected in appropriate containers and taken to the *AECOS* Inc. laboratory on Windward O`ahu. The single sampling station was located beneath the outbound lane viaduct of Kamehameha highway just of the right (north) bank. This location was selected in preference over a station below the inbound bridge (i.e., the immediate project area) because of the closer access to "deeper" water of the estuary beneath the outbound viaduct.

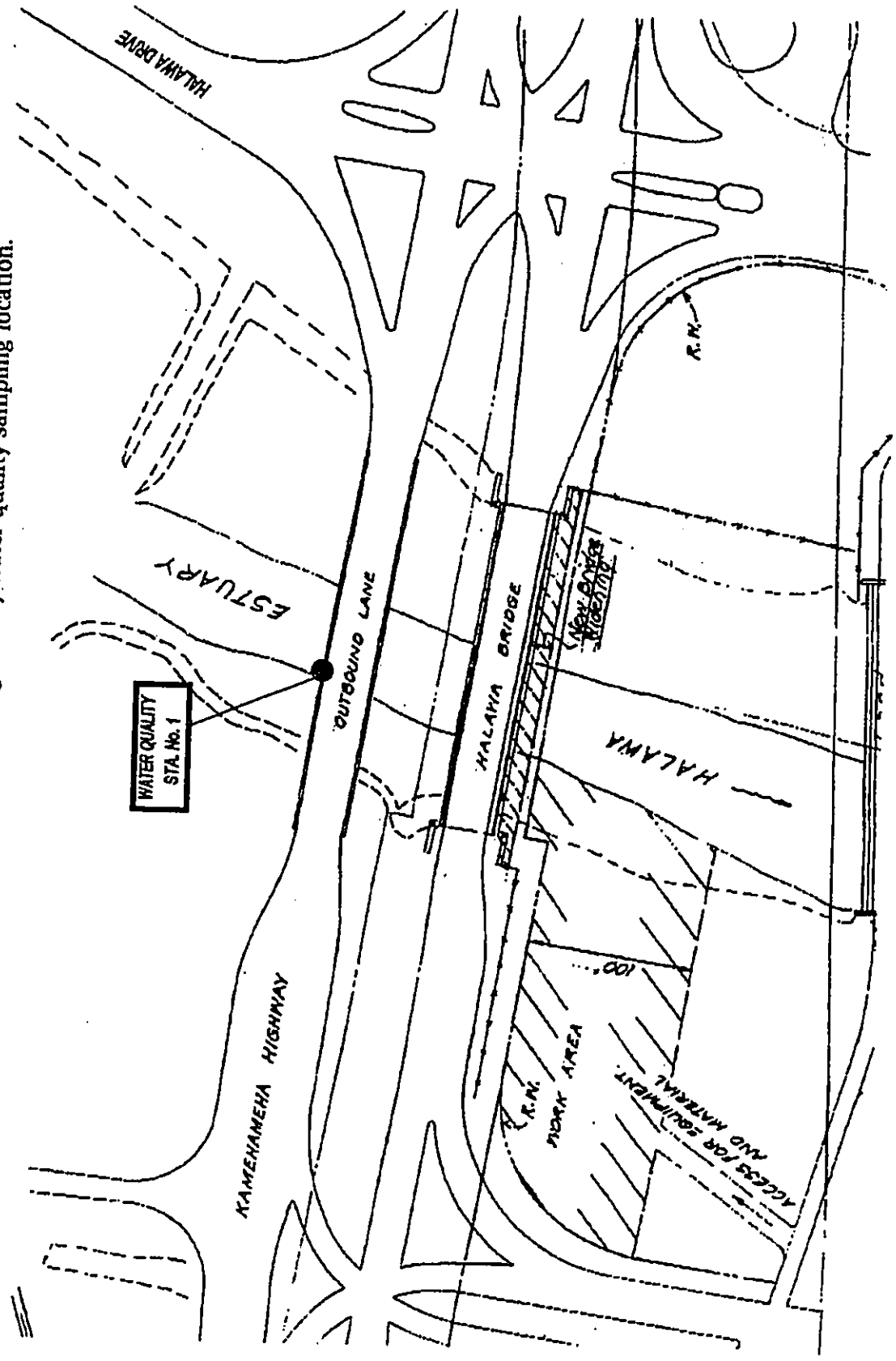

Figure 2. Halawa Bridge project site showing estuary water quality sampling location.

The state of the tide differed during each sampling event as follows. The late morning sampling event of October 27 corresponded to the latter part of an ebbing tide, following a high tide (higher high water or HHW) of 2.4 ft at 6:03 (am) and preceding a low water (HLW) of 0.4 ft at 13:09 at Honolulu Harbor. A tidal delay for East Loch relative to Honolulu Harbor is expected, but this information is unavailable. The second (afternoon) sample, collected at 14:25, occurred during a rising or flooding tide. The sample event on October 28 followed by 1.5 hour or more the HHW of 2.3 ft at 06:59 (predicted at Honolulu Harbor).

Table 1. Analytical methods and instruments used for the October 27-28, 1999 sampling in Halawa Estuary, O`ahu.

Analyses List	Method	Reference	Instrument
Ammonia	alkaline phenol	Koroleff in Grasshoff et al. (1986)	Technicon AutoAnalyzer II
Dissolved Oxygen	EPA 360.1	EPA (1979)	YSI Model 58 DO meter
Nitrate + Nitrite	EPA 353.2	EPA (1993)	Technicon AutoAnalyzer II
pH	EPA 150.1	EPA (1979)	Orion SA 250 pH meter / Ross combination electrode
Salinity (field)	refractive index	—	handheld, temperature compensating refractometer
Temperature	thermister calibrated to NBS cert. Thermometer (EPA 170.1)	EPA (1979)	YSI Model 58 DO meter
Total Nitrogen	persulfate digestion /EPA 353.2	D'Elia et al. (1977) / EPA (1993)	Technicon AutoAnalyzer II
Total Phosphorus	persulfate digestion /EPA 365.1	Koroleff in Grasshoff et al. (1986) / EPA (1993)	Technicon AutoAnalyzer II
Total Suspended Solids	Method 2540D (EPA 160.2)	Standard Methods 18th Edition (1992); EPA (1979)	Mettler H31 balance
Turbidity	Method 2130B (EPA 180.1)	Standard Methods 18th Edition (1992); EPA (1993)	Hach 2100P Turbidimeter

D'Elia, C.F., P.A. Stendler, & N. Corwin. 1977. *Limnol. Oceanogr.* 22(4): 760-764.
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Standard Methods. 1992. Standard Methods for the Examination of Water and Wastewater. 18th Edition. 1992. (Greenberg, Clesceri, and Eaton, eds.). APHA, AWWA, & WEF. 1100 p.

The results of the water quality analyses are shown in Table 2. Temperature values were somewhat variable over the sampling period and appeared to correlate with time; i.e., low temperature in the early morning hours increasing with time at least up until early afternoon. Dissolved oxygen (DO) concentrations followed the same

pattern and likely represents increased photosynthetic activity in the water column due to increased insolation and temperature levels as the day progresses. Changes in pH were probably largely a function of salinity with the lowest pH (7.94) occurring at the lowest salinity (34 ‰). The lowest salinity value was obtained during an ebbing (outgoing) tide, sampled close to the low tide level. The small difference in salinity between tidal states reflects the low outflow from Halawa Stream.

Table 2. Water quality characteristics of the estuary of Halawa Stream sampled on October 27-28, 1999 .

	Time sampled	Temp. (°C)	DO (mg/l)	DO Sat. (%)	Salinity (o/oo)	pH (pH units)	TIDE
10-27-99							
Sta. 1	1135	27.5	5.53	85	34	7.94	Low / Ebb
Sta. 1	1425	28.0	5.72	88	35	8.02	Low / Flood
10-28-99							
Sta. 1	0825	25.9	5.27	79	35	8.13	High / Ebb
	means	**27.1**	**5.51**	**84**	**35**	**8.03**	

		Turbidity (ntu)	TSS (mg/l)	Ammonia (µg N/l)	Nitrate + nitrite (µg N/l)	Total N (µg N/l)	Total P (µg P/l)
10-27-99							
Sta. 1	1135	21.8	21.8	101	40	447	86
Sta. 1	1425	12.8	16	87	45	425	48
10-28-99							
Sta. 1	0825	5.54	6.3	27	10	195	28
	geometric means	**11.6**	**13**	**62**	**26**	**333**	**49**

Measurements made of particulate concentrations (turbidity and TSS) were quite variable. This situation is common in shallow, silty areas near stream mouths, which are subject to wind and wave action and, on occasion, dense populations of phytoplankton. Similarly, ammonia and nitrate + nitrite concentrations demonstrated a four-fold change in concentration over the two day period. Ammonia, which is an intermediary breakdown product of organic nitrogen and often associated with particulate matter, seemed to correlate well with changes in the particulate levels. At the same time, nitrate-nitrite levels appeared to be somewhat independent of changes in particulate concentrations. Total nitrogen and total phosphorus were also quite variable between sample events. Winds were

strong on October 27, 1999 and likely accounted for the high and variable particulate and total nutrient levels recorded on this date.

Water quality at Station 1 at the mouth of Halawa Stream appears, by these measurements, to be in compliance with the State water quality criteria for Pearl Harbor estuarine waters with the following exceptions: turbidity, ammonia, nitrate + nitrite, and total nitrogen were in excess of the geometric mean criteria. All other measured parameters indicate compliance with State criteria, although many more measurements over time would be required to establish these facts.

Table 3. State of Hawaii water quality criteria for Pearl Harbor estuary (HAR §11-54-05.2)

Parameter	Geometric Mean value not to exceed this value	Value not to be exceeded more than 10% of the time	Value not to be exceeded more than 2% of the time
Total Nitrogen (µg N/l)	300.0	550.0	750.0
Ammonia Nitrogen (µg N/l)	10.0	20.0	30.0
Nitrate + Nitrite (µg N/l)	15.0	40.0	70.0
Total Phosphorus (µg P/l)	60.0 -	130.0 -	200.0 -
Chlorophyll a (µg/l)	3.50	10.0	20.0
Turbidity (ntu)	4.0 -	8.0 -	15.0

Other "standards":
- pH units shall not deviate more than 0.5 units from ambient conditions and shall not be lower than 6.8 nor higher than 8.8.
- Dissolved oxygen shall not decrease below 60% of saturation.
- Temperature shall not vary more than 1 C° from ambient conditions.
- Salinity shall not vary more than ten percent from ambient conditions.

Aquatic Biota

A taxonomic listing of aquatic organisms observed and/or collected in Halawa Estuary is given as Table 4. Poor water clarity limited observations to shallow areas

Table 4. Checklist of aquatic biota observed or reported from Halawa Estuary.

Species	Common name	Status	QC Code	Abundance
ALGAE				
CHLOROPHYTA	(green algae)			
BRYOPSIDACEAE				
Bryopsis sp.		?nat.	10	L
AQUATIC PLANTS				
SPERMATOPSIDA, DICOTYLEDONS	(seed plants)			
BATIDACEA				
Batis maritima L.	*'akulikuli-kai*, pickelweed	nat.	10	A
RHIZOPHORACEAE				
Rhizophora mangle L.	red mangrove	nat.	10	A
INVERTEBRATES				
ANNELIDA, POLYCHAETA	(worms)			
SERPULIDAE				
?Salmacina dysteri (Huxley)	tube worm	?nat	10	U
MOLLUSCA, GASTROPODA	(mollusks)			
LITTORINIDAE				
Littorina scabra (L.)		ind.	10	U
MOLLUSCA, PULMONATA				
SIPHONARIIDAE				
Siphonaria normalis Gould	false limpet	ind	10	R
MOLLUSCA, BIVALVIA				
OSTREIDAE				
Crassostrea sp.	edible oyster	nat	10	U
ARTHROPODA, CIRRIPEDIA				
BALANIDAE				
Balanus sp.	acorn barnacle	ind.	20	U
ARTHROPODA, MYSIDACEA				
indet				
indet.	mysid shrimp	?ind.	20	A
ARTHROPODA, DECAPODA				
PALAEMONIDAE				
Palaemon debilis	glass shrimp	ind.	21	A
Microbrachium lar (Fabricius)	Pacific island prawn	nat	20	?
PORTUNIDAE				
Thalamita integra	blue-pincher crab	ind.	10	C

Table 3 (continued)

Species	Common name	Status	QC Code	Abundance
ARTHROPODA, INSECTA				
COLEOPTERA, ?SCIRTIDAE				
indet.	marsh beetle	nat	21	P
VERTEBRATES				
VERTEBRATA, PICES	fishes			
CICHLIDAE				
?Oreochromis sp.	ukw. tilapia	nat	10	C
GOBIIDAE				
Bathygobius fuscus (Ruppell)	brown goby	ind.	10	P
MUGILIDAE				
Mugil cf. *cephalus* L.	mullet	ind.	10	C
POECILIIDAE				
Poecilia mexicana (Steindachner)	Mexican mollie	nat	10	A
SPHYRAENIDAE				
Sphyraena barracuda (Walbaum)	barracuda	ind.	10	C
SYNODIDAE				
Saurida sp.	lizard fish	?ind.	10	U

KEY TO SYMBOLS USED:
Status:
nat. - naturalized. An introduced or exotic species.
ind. - indigenous. A native species also found elsewhere in the Pacific.
end. - endemic - A native species found only in the Hawaiian Islands.
QC Code:
10 - Observed and identified in the field on October 27-28, 1999.
20 - Collected; identified in the laboratory; specimen(s) not saved.
21 - Collected; identified in the laboratory; voucher specimen(s) saved.
Abundance at survey locations:
P - present; not common, but unable to assess abundance.
L – Common in a limited area.
R - rare; only one or two individuals seen.
U - uncommon; several individuals seen, in some habitat places visited.
C - common; numerous individuals seen, or seen in most habitat places visited.
A - abundant; numerous in most habitat places visited

close to the shore and many other fishes and invertebrates likely inhabit the estuary beyond those reported here. Two of the plants observed at the shore can be considered wetland species: pickleweed and red mangrove. Their presence roughly defines the extent of wetlands beneath the viaducts. These introduced species are both common coastal shore plants around bays on O`ahu, tolerating tidal submergence in sea water. Both are wetland indicator species, occurring only in

coastal wetlands and tidal estuaries (Indian fleabane is also a wetland indicator that grows on banks beside wetlands). Only one macroalgae or seaweed, a species of *Bryopsis*, was observed. Turbid, brackish water and slow water motion are conditions not tolerated by most species of macroalgae.

A variety of invertebrates, including intertidal species such as the mangrove littorinid (*Littorina scabra*), serpulid worm (?*Salmacina dysteri.*), false limpet (*Siphonaria normalis*), acorn barnacle (*Balanus* sp.), oyster (*Crassostrea* sp.), and shore crab (*Metopograpsus thukuhar*) were observed as generally abundant along the shore and in the intertidal zone. However, shells of oysters and tests of barnacles, while conspicuous on most hard surfaces, were remains of non-living organisms. Presumably, these species live in the estuary during dry seasons when salinity swings downward do not occur as neither can tolerate fresh water submersion for any extended period. Other typical invertebrates in this environment are glass shrimp (*Palaemon debilis*) and blue-pincher crabs (*Thalamita integra*). A sponge was observed on pilings of the footbridge. Swarms of a small planktonic shrimp (Mysidacea) were noted in the shallow water beneath the footbridge on October 27.

The fishes observed in the project area are all either marine forms which invade brackish waters or fresh water forms that are highly tolerant of salt water (tilapia and mollie). In addition to those listed in Table 3, small schools of unidentified fish similar to a silverside or `iao (Atherinidae) were observed. Poor water clarity made observations difficult except for right along the shores. Thus, the fauna here is generally unique for freshwater stream environments, but very typical of estuarine areas throughout Pearl Harbor. One fisherman was observed during the field visits and he was tossing a net from the footbridge, presumably hoping to catch mullet.

Although their observations are reported for only one location on South Halawa Stream where that tributary is intermittent, Timbol and Maciolek (1978) recorded only one aquatic organisms (the crayfish, *Procambarus clarki*). State DLNR surveys (last done in 1989), did not provide sufficient data to rank Halawa Stream for aquatic resource value. However, it is given a low "limited" ranking in the summary section of the Hawaii Stream Assessment (Hawaii Cooperative Park Service Unit, 1990). Results summarized in the State report simply indicate one exotic species present (perhaps the crayfish). *AECOS* Inc. (1999) lists 14 animal species (2 fishes) and 7 algae species found in Halawa Stream based primarily on field observations made at the upper end of the urban corridor through which the stream flows. Only the Mexican mollie was common in both stream and estuary (this report). Conditions in the two areas are very different. Information about the stream above the estuary is of some relevance in assessing impacts of a project on the estuary

because native diadromous species (such as `o`opu and hihiwai) would have to migrate through the estuary as juveniles or larval forms to populate upper reaches of the stream. No native diadromous species are reported from Halawa Stream.

Assessment

No rare, threatened, or endangered species (as listed by USFWS, 1994) are known from aquatic environments in the project area, and the estuarine habitat is of marginal resource value. Some fishing probably occurs from the footbridge. Native species might be supported in the upper reaches of Halawa Stream with somewhat higher and more regular water flow, but restoration of downstream stream segments, now compromised by channelization, would also be required. The project is not anticipated to have any adverse impact on Halawa Stream fauna, either at the project location or upstream of the project.

In general, much of Halawa Stream retains a natural character. However, the lower reach is highly modified (channelized) and subject to runoff from an urbanized watershed. A recent survey of the stream at the upper boundary of the urbanized portion found the aquatic flora and fauna uninteresting (*AECOS*, 1999) from a resource conservation perspective.

Water quality characteristics of Halawa Stream as determined on March 10, 1999 and October 27-28, 1999 are generally good (although far from excellent) when compared with appropriate State of Hawaii, water quality criteria (DOH, 1992).

Health and Safety Precautions

Stagnant waters to which warm blooded animals (mongoose, dog, cat, or rat) have access may be contaminated with urine or feces which may contain pathogens. These pathogens may remain viable (infectious) in the water for an extended period of time. The health risk to humans associated with such waters is generally greatest where known sewage contamination exists. In the absence of known or suspected sources of fecal contamination, risks are clearly reduced, but not altogether eliminated. Health problems and pathogens can be avoided by following simple precautions during work around Halawa Stream:

1) Any injuries which break the skin should not be exposed to water from the estuary. Any open wounds received on site should be quickly cleaned and treated with topical antibiotic. Any serious wound requires a physician's attention. Soils also harbor infectious agents.

2) Contact with the estuary water should be minimized by wearing proper clothing. For in-water work (immersion or sustained contact), rubberized gear (boots, waders, etc.) should be worn.

3) Persons with open wounds or sores should not expose these skin breaks to the water.

4) Clean or potable water should be on hand to wash out cuts, eyes, or the mouth in the event that any of these come in contact with stream water through immersion or splashing. Hands should be rinsed with clean water after immersion, and kept out of mouth, eyes, and food until thoroughly washed with soap and water. Antibacterial soaps could be made available for hand washing.

5) Any illness which comes on within a day or a few weeks of exposure — infections around a cut, fever (even for a short period), GI distress, diarrhea — should be attended to by a physician, and the information provided that contact with a stagnant body of water was made. Symptoms of many of the diseases listed resemble those experienced with influenza (flu). Persistent gastric distress may require laboratory analysis of a stool sample to ascertain the cause.

A considerable amount of discarded trash and flotsam is present under the highway viaducts. Bridge workers' impression of the wholesomeness of the estuary would be substantially bolstered were this area cleaned up and maintained during the period of construction on the highway bridge.

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Appendix B
Cultural Resources

International Archaeological Research Institute, Inc.

PREHISTORIC & HISTORIC INVESTIGATIONS • CULTURAL RESOURCES ASSESSMENTS & PLANNING • PALEOENVIRONMENTAL STUDIES

November 1, 1999

Karl B. Bromwell, M.P.H.
Project Scientist
Earth Tech, Inc.
700 Bishop Street, Suite 900
Honolulu, HI 96813
fax (808) 523-8950

Dear Mr. Bromwell:

Re: Completion of Archaeological Resources Survey, Hālawa Bridge Replacement EA, Hālawa, `Ewa, O`ahu; TMK: 9-9-01:1, 9-9-02:04, 9-9-03:26, 29, and 56.

This letter is to inform you of the successful completion of the archaeological resources survey undertaken as part of the Hālawa Bridge Replacement EA. A background literature search revealed there are no known historic sites within the area to be impacted by the bridge replacement. Three small fishponds in the project area vicinity appear on a map of Hālawa *ahupua`a* land use during the mid-19th century *māhele*-era (Klieger 1995:61)[1], but physical remains of the fishponds were not subsequently recorded. A pedestrian field survey determined that the presence of large quantities of fill and other 20th century landscape modifications within the project area impedes the detection of, and likely destroyed the integrity of historic sites that might have been present in the project area. We have therefore concluded that the proposed Hālawa Bridge replacement will have "no effect" on historic sites because no historic sites are present.

The project area is located near the mouth of Hālawa Stream in a developed portion of Honolulu comprising fill lands[2] at the edge of Pearl Harbor's East Loch (Figure 1).

A background search of the archaeological literature and records of the State Historic Preservation Division of the Department of Land and Natural Resources, including maps of site locations, was completed. Three known sites are present within 1500 feet of the project area. Makalapa Crater (Site 101 in McAllister 1933:102)[3], a former fresh-water pond, is

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[1] Klieger, P. Christiaan (1995) *Nā Maka o Hālawa. A History of Hālawa Ahupua`a, O`ahu.* Hawaii Historic Preservation Report 95-1. Anthropology Department, B. P. Bishop Museum, Honolulu.

[2] Foote, Donald E., et al. (1972) *Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii.* United States Department of Agriculture, Soil Conservation Service in cooperation with The University of Hawaii Agricultural Experiment Station. U.S. Government Printing Office, Washington, D.C.

[3] McAllister, J. Gilbert (1933) *Archaeology of Oahu.* Bernice P. Bishop Museum Bulletin 104. Bishop Museum Press, Honolulu.

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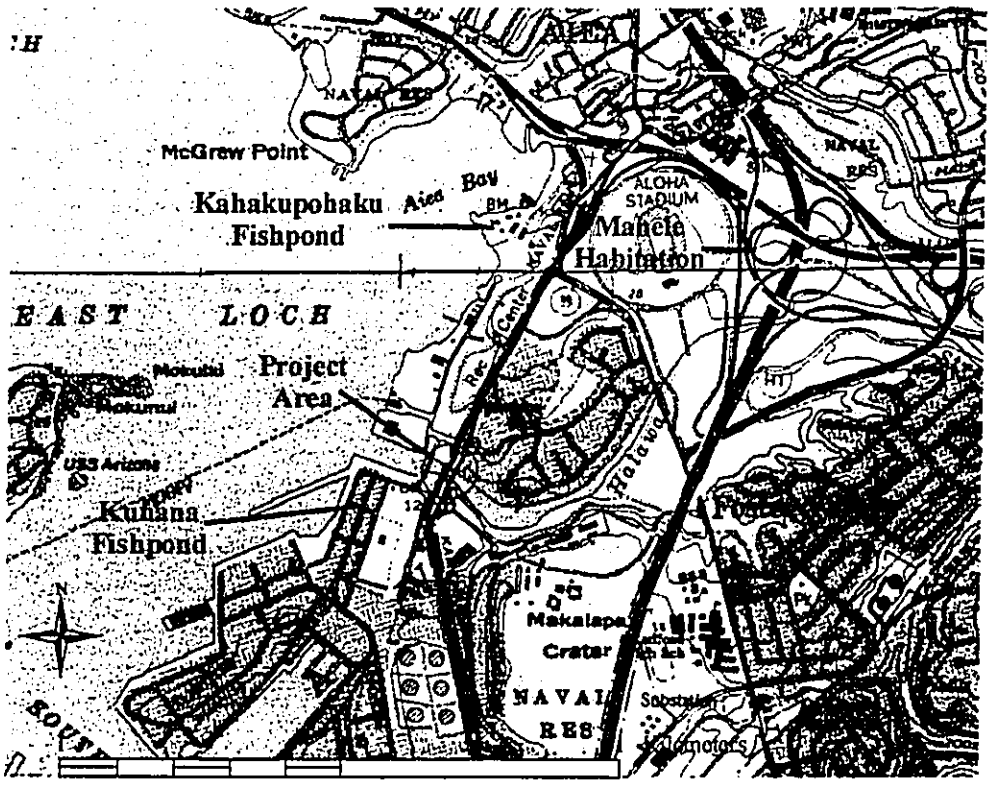

Figure 1. The project area in relation to known historic sites and land use.

located approximately 1200 feet *mauka* of the project area. Kahakupohaku fishpond (Site 104 in McAllister 1933:102), formerly "a small pond of 3 acres with a semi-circular wall of evenly-spaced basalt 1050 feet long, 5 feet wide, 3.5 feet high without outlet gates" (McAllister 1933:102) is located approximately 1500 feet to the north/northeast. Loko Kunana and Loko Muliwai (Site 102 in McAllister 1933:102), between Hālawa and Kuahua Island, were two fishponds located approximately 1000 feet *makai* of the project area, on the Honolulu side of Hālawa Stream.

Settlement patterns around the time of the *māhele* land division in 1848, as determined in part by *kuleana* (land claim) awards during the Land Commission deliberations, indicate little habitation in the immediate vicinity of the project area (Klieger 1995). Few awards for property were granted near the mouth of the Hālawa Stream; these include fishponds (*pu`uone*), taro pondfields (*lo`i*), and scattered housesites (Klieger 1995:54). The greatest concentration of *kuleana* awards within the Hālawa *ahupua`a* was centered farther upstream, within and immediately southeast of the present-day Aloha

Stadium (Klieger 1995, Fig. 18: p 61), an area surveyed by Deborah Cluff[4], who recorded historic-era graves and a possible *heiau*. According to a map included with the Klieger report, consisting of a reconstruction of the Hālawa *ahupua`a* on the basis of the *māhele* records, three small fishponds were located along the edges of Hālawa Stream in the vicinity of the project area (1995: Fig. 18: p 61). The three ponds, all of which measure less than 50 m in diameter, include Pu`uone Kaulailoa on the Honolulu side of the stream, Wai Alua, on the Wai`anae side, and an unnamed pond adjacent to Wai Alua. Of these, *kuleana* award information exists only for Pu`uone Kaulailoa (LCA 2043.1), whose claimant Kawaha, applied for the award from Kamalanai during the reign of Kamehameha II (1819-1823) (Klieger 1995:63). The land adjacent to the stream, not in pond production, is labeled "pasture" (1995:61). On the basis of the subject property's location along Hālawa Stream and *māhele*-era land use patterns in the vicinity, *loko* (fishponds) constitute the predominant site type to be anticipated during a field survey.

The fieldwork portion of the project was accomplished by IARII archaeologists, Mike Desilets, MA and Tina Mangieri, MA, who conducted a pedestrian survey of the approximately 3 acres along Hālawa Stream to be impacted by the bridge replacement. Particular attention was paid to the stream banks and the stratigraphic sequence they revealed. The ground surface on the *makai* side of the bridge is characterized by an embankment of grasses and pickleweed, with mangrove extending into the stream. The *mauka* side of the bridge included a narrow, grassy, strip of land bounded by concrete along the north side of the stream, with a wider area of scrub growth on the south side. Observation of the ground surface throughout the project area revealed an absence of historic sites.

The survey was initiated at the wooden footbridge, approximately 200 feet *makai* of the inbound lanes of Kamehameha Highway, and extended approximately 150 feet *mauka* of the highway bridges. Vegetation along the stream banks and into the stream proper is dominated by mangrove (*Rhizophora mangle*), interspersed with dense areas of *`Akulikuli-Kai*, known commonly as pickleweed (*Batis maritima* L.), particularly along the Honolulu side of the stream. The vegetation, where thick, measurably reduced surface visibility. The stream banks range in width from approximately 3 to 15 m, with a uniformly narrower bank along the Wai`anae side. The banks attain a maximum height of 2.5-3 m, from a minimum height of 30 cm. A concrete channel lines the stream along the Wai`anae side, *mauka* of the outbound bridge. Where the absence of concrete permitted a view of the stream bank stratigraphy, only fill deposits were revealed. Large drainage pipes encased in a mortared cobble foundation are interspersed throughout the concrete-lined portion of the stream channel. A semi-subterranean cast iron pipe, approximately 6 inches in diameter, crosses the width of the stream bank on the Honolulu side. A second cast iron pipe, approximately two

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[4] Cluff, Deborah F. (1970) *The Archaeological Survey of a Portion of Halawa Interchange, FAP No. I-HI-I (41), Halawa, Oahu Island.* Hawaii State Archaeological Journal 70-1. Prepared for Department of Transportation, Highways Division, State of Hawaii. Department of Land and Natural Resources, Division of State Parks, Outdoor Recreation and Historic Sites, State of Hawaii, Honolulu.

feet in diameter, lies within the bank parallel with Hālawa Stream on the *makai*, Honolulu, side. The presence of the concrete and pipes, within the fill deposits, attests to the degree of recent disturbance of, and modification to, the landscape within the project area.

Numerous marine shells are present along the lower banks of the stream. The presence of these shells is due to the natural ebb and flow of the tide, and its accompanying shellfish larder, within this estuary environment, and is not attributable to the presence of traditional Hawaiian cultural deposits.

Evidence for the three small fishponds noted on the Klieger map (1995:61) as potentially within the project area was not observed. Rather, the depth of the fill, up to 3 m, renders the observation of fishpond deposits difficult, if not impossible. These fill deposits, combined with the presence of additional recent disturbance in the form of subterranean pipes and a concrete channel lining and the absence of surface features, lead us to conclude that historic period activities would have destroyed sites that might have been present.

In sum, despite the historical record of three small fishponds in the project area vicinity, as revealed during a background literature and records review, subsequent field survey identified no cultural deposits at the bridge replacement location. While fishponds might be anticipated, given land records from the *Mahele*, and the location of the project area along the banks of Hālawa Stream, no evidence of such sites was found. Rather, 20th century landscape modifications, including the presence of large quantities of fill material along the banks of the stream, several subterranean drainage pipes, and a concrete channel lining, have likely destroyed historic sites.

Thank you for the opportunity to complete the Hālawa Bridge Replacement Archaeological Resources Survey. Please do not hesitate to contact me if you have any questions.

Sincerely,

Thomas S. Dye

Thomas S. Dye
Senior Archaeologist

Appendix C
Flora and Wetlands

Art Whistler Ph.D.
ISLE BOTANICA Publishers and Botanical Consultants
2814 Kalawao St., Honolulu, Hawaii. 96822 PH/FAX (808) 945-9334 E-Mail: whistler@hawaii.edu

12 October 1999

Karl Bromwell
Project Scientist
Earth Tech Inc.
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Honolulu, Hawaii 96813

LETTER REPORT
Halawa Bridge Botanical Assessment
PO: 99P-G063-LB20

A botanical survey was conducted on 29 September 1999 at the Halawa bridge site located between the Arizona Memorial parking lot and the Halawa gate entrance to the Pearl Harbor Naval Base. The site consists of edges of the Halawa Stream approximately 120 ft upstream and downstream from the two current bridges that span the narrow waterway.

The eastern end of the north side of the site consists mostly of barren soil (Fig. 1) between the edge of the stream on the south side and a housing complex to the north, with only scattered patches of weedy alien herbaceous species, including *Cenchrus ciliaris* (Buffel grass), *Chloris barbata* (inflated fingergrass), and *Boerhavia coccinea*. The area between the two bridges is dominated by a large *Samanea saman* (monkeypod) tree, with a ground cover comprising mostly *Panicum maximum* (Guinea grass) and *Asystasia gangetica* (Chinese violet). *Rhizophora mangle* (red mangrove) trees line the edge of the stream. The area west of the bridge is a narrow zone between the stream side and the parking lot for the Arizona Memorial, and is dominated by large *Prosopis pallida* (kiawe, mesquite) trees away from the stream and a zone of red mangrove trees along the stream. Just inland of the mangroves is a narrow zone of *Batis maritima* (pickleweed; Fig. 2), an alien, succulent, halophytic ("salt-loving") plant that often forms large patches along estuaries.

The eastern end of the south side of the stream is an area dominated by alien vegetation between the stream side and a lawn underneath large shade trees. This area is covered with a kiawe forest comprising relatively small trees (Fig. 3). The ground cover is dominated by Guinea grass, *Coccinea grandis* (ivy gourd), and higher up on the slope, Guinea grass and *Digitaria insularis* (sour grass). Red mangrove trees cover much of the edge of the water along this area (Fig. 4). A small patch of pickleweed is situated on the shore at the east end, probably more than 120 ft from the bridges. The area between the bridges on the southern stream bank is dominated by scattered kiawe trees, large patches of *Pluchea indica* (Indian pluchea), and an even larger patch of pickleweed. The area at the southwest corner of the site is dominated by scattered trees of *Thespesia populnea* (milo), *Acacia farnesiana* (klu), and *Schinus terebinthifolius* (Christmas berry), koa haole, a thicket of Indian pluchea, and a large patch of pickleweed (Fig. 5). A large

patch of Guinea grass is found at the very west end, next to grove of red mangrove trees lining the stream side.

A total of 43 species were recorded at the site (see attached checklist). Of these, only two are native species, *Heliotropium curassavicum* (beach heliotrope) and *Waltheria indica* (uhaloa), both of them wide-ranging indigenous species. Beach heliotrope is common in sunny disturbed coastal habitats in Hawaii, and uhaloa is common in a variety of disturbed Hawaiian habitats. One species on the list, a tree sapling, could not be identified because it was so young, but is probably an ornamental tree.

No native vegetation exists at the site. The only area of concern would be wetlands, which at the site consist of several patches of pickleweed, and the thickets of red mangrove that line the stream side in some places. The species dominating these are alien species in Hawaii, and the area they cover is quite small. The area of wetland vegetation is so small that it was not mentioned in the definitive survey of Hawaiian wetlands—*Wetlands and Wetland Vegetation* (Elliot and Hall 1977). It would be advisable to avoid these areas if possible. The area inland of the two bridges has very little of this wetland vegetation, other than the small patch of pickleweed and the narrow zone of red mangrove mentioned above in the second and third paragraphs.

In summary, there is no botanical problems with using some of the area at the site for storing construction equipment and dredge material, especially on the north and south sides of the stream inland from the bridges.

Art Whistler

Art Whistler
Isle Botanica

PLANT SPECIES CHECKLIST

The following is a checklist of the vascular plants inventoried during the field studies on the Halawa Bridge replacement site. The plants are divided into two groups, Monocots and Dicots. Within these groups, the species are presented taxonomically by family, with each family, and each species in the family, in alphabetical order. The taxonomy and nomenclature follows Wagner *et al.* (1990). In most cases, common English and/or Hawaiian names listed here have been taken from St. John (1973) or Porter (1972). For each species, the following information is provided:

1. Scientific name with author citation.
2. Common English and/or Hawaiian name, when known.
3. Biogeographic status. The following symbols are used:
   I = indigenous (native to Hawai'i as well as other geographic areas).
   P = Polynesian introduction (introduced to Hawai'i by Polynesians before the advent of the Europeans).
   X = Introduced or alien (not native, introduced to Hawai'i, either accidentally or intentionally, after the advent of the Europeans).

Species	Common Names	Status	
MONOCOTS			
POACEAE (Grass Family)			
Cenchrus ciliaris L.	Buffel grass	X	locally abundant
Chloris barbata (L.) Sw.	swollen fingergrass	X	common
Cynodon dactylon (L.) Pers.	Bermuda grass	X	abundant in lawn
Digitaria insularis (L.) Mez ex Ekman	sour grass	X	common
Eleusine indica (L.) Gaertn.	goose grass	X	uncommon
Eragrostis pectinacea (Michx.) Nees	Carolina lovegrass	X	uncommon
Panicum maximum Jacq.	Guinea grass	X	common
Paspalum conjugatum Bergius	Hilo grass	X	abundant in lawn
Paspalum vaginatum Sw.	seashore paspalum	X	uncommon
DICOTS			
ACANTHACEAE (Acanthus Family)			
Asystasia gangetica (L.) T. Anderson	Chinese violet	X	common
AMARANTHACEAE (Amaranth Family)			
Amaranthus spinosus L.	spiny amaranth	X	uncommon
Amaranthus viridis L.	slender amaranth	X	uncommon
ANACARDIACEAE (Mango Family)			
Schinus terebinthifolius Raddi	Christmas berry	X	occasional
ASTERACEAE (Sunflower Family)			
Pluchea x *fosbergii* Cooperr. & Galang	hybrid pluchea	X	occasional
Pluchea indica (L.) Less.	Indian pluchea	X	common
Sonchus oleraceus L.	sow thistle	X	uncommon

Species	Common Names	Status	
BATACEAE (Saltwort Family)			
Batis maritima L.	pickleweed	X	locally abundant
BORAGINACEAE (Heliotrope Family)			
Heliotropium curassavicum L.	seaside heliotrope	I	uncommon
CASUARINACEAE (Ironwood Family)			
Casuarina equisetifolia L.	ironwood	X	uncommon
CHENOPODIACEAE (Goosefoot Family)			
Atriplex semibaccata R. Br.	Australian saltbush	X	uncommon
CONVOLVULACEAE (Morning-Glory Family)			
Ipomoea obscura (L.) Ker-Gawl.	bindweed	X	occasional
Merremia aegyptia (L.) Urb.	hairy merremia	X?	occasional
Merremia tuberosa (L.) Rendle	wood rose	X	uncommon
CUCURBITACEAE (Gourd Family)			
Coccinea grandis (L.) Voigt	ivy gourd	X	common
EUPHORBIACEAE (Spurge Family)			
Chamaesyce hirta (L.) Millsp.	garden spurge		uncommon
FABACEAE (Pea Family)			
Acacia farnesiana (L.) Willd.	klu	X	uncommon
Desmanthus virgatus (L.) Willd.	virgate mimosa	X	occasional
Indigofera spicata Forssk.	creeping indigo	X	occasional
Leucaena leucocephala (Lam.) de Wit	koa haole, ekoa	X	occasional
Pithecellobium dulce (Roxb.) Benth.	ʻopiuma, Manila tamarind	X	occasional
Prosopis pallida (Humb. & Bonpl.ex Willd.) Kunth	kiawe, mesquite	X	common
Samanea saman (Jacq.) Merr.	monkeypod	X	uncommon
MALVACEAE (Mallow Family)			
Abutilon grandifolium (Willd.) Sweet	hairy abutilon	X	uncommon
Gossypium hirsutum L.	upland cotton	X	uncommon
Malvastrum coromandelianum (L.) Garcke	false mallow	X	occasional
Sida ciliaris L.	-----	X	occasional
Sida fallax Walp.	ʻilima	I	uncommon
Sida spinosa L.	prickly sida	X	occasional
Thespesia populnea (L.) Sol ex Corr.	milo	P	occasional
NYCTAGINACEAE (Four-o'-Clock Family)			
Boerhavia coccinea Mill.	-----	X	occasional
RHIZOPHORACEAE (Mangrove Family)			
Rhizophora mangle L.	red mangrove	X	locally abundant
STERCULIACEAE (Cocoa Family)			
Waltheria indica L.	ʻuhaloa	I	occasional
Indeterminate Family			
Indeterminate species.	-----	X	rare, only one found

Fig. 1. Mostly barren soil on the northeast corner of the site.

Fig. 2. A patch of pickleweed between the Arizona Memorial parking lot fence and a patch of red mangrove at the northwest corner of the site.

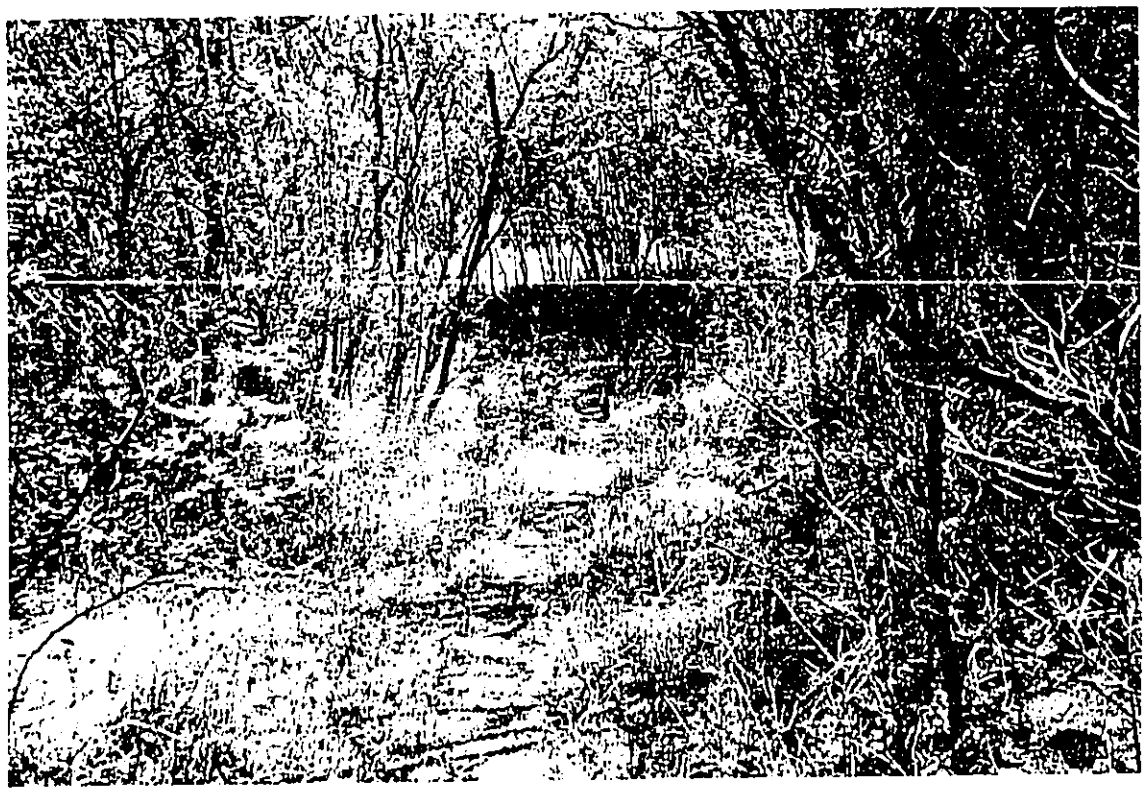


Fig. 3. Grove of small kiawe trees on the southeast bank of the site.

Fig. 4. Red mangrove trees below kiawe trees on the streambank at the southeast corner of the site.

Fig. 5. Patch of pickleweed (foreground) with red mangrove in the background, at the southwest corner of the site.

Appendix D
Visual (Site Photographs)

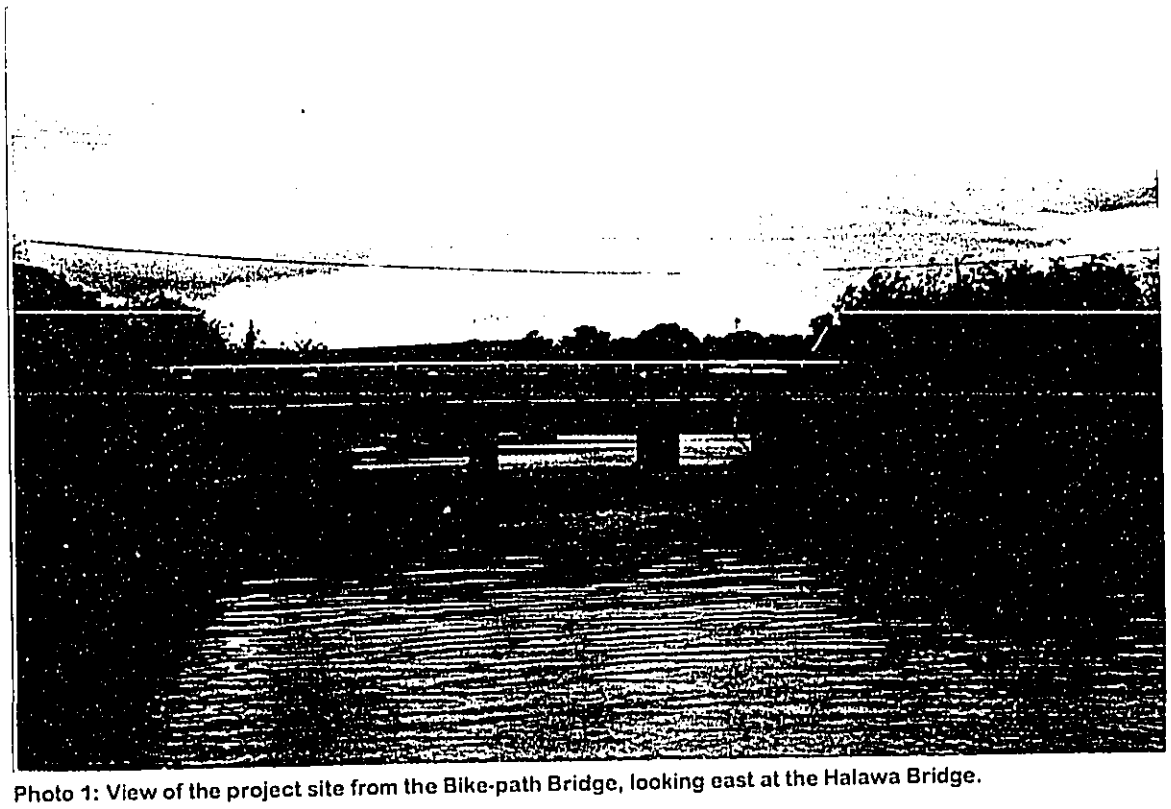


Photo 1: View of the project site from the Bike-path Bridge, looking east at the Halawa Bridge.

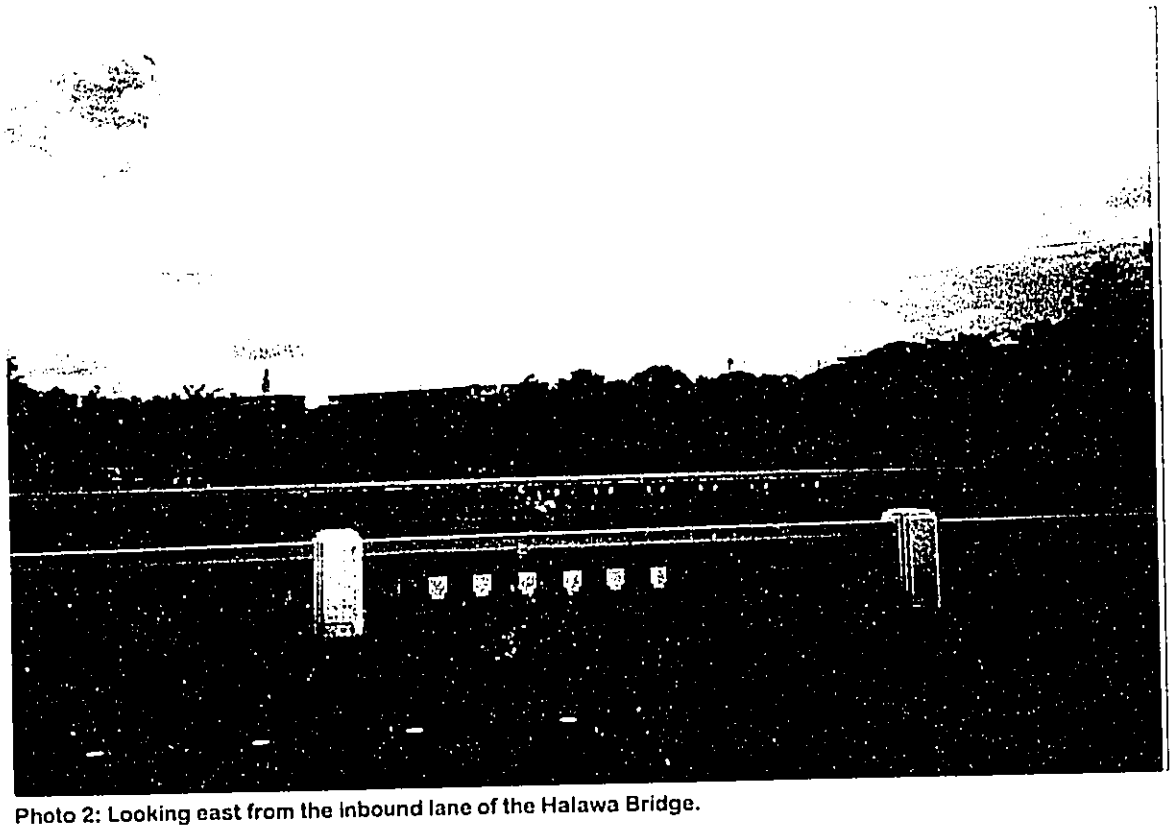


Photo 2: Looking east from the inbound lane of the Halawa Bridge.

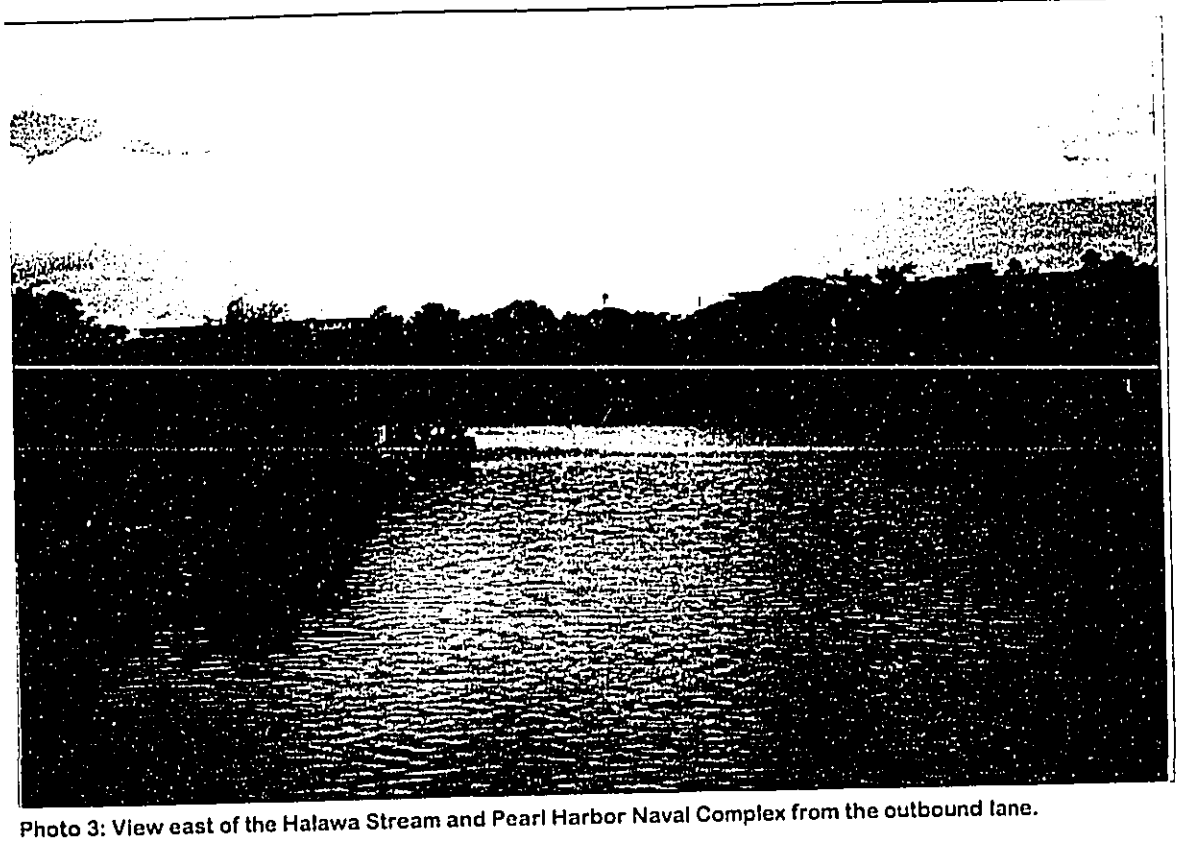


Photo 3: View east of the Halawa Stream and Pearl Harbor Naval Complex from the outbound lane.

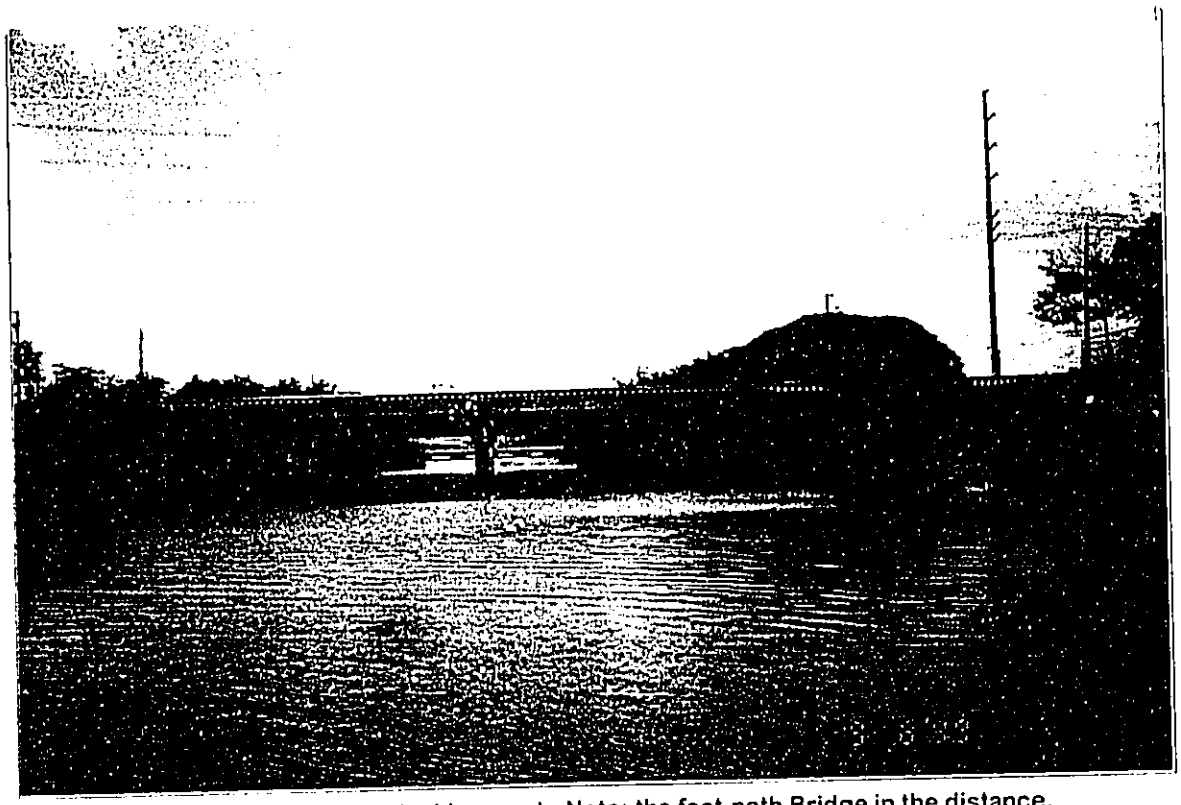


Photo 4: View of the project site looking west. Note: the foot-path Bridge in the distance.

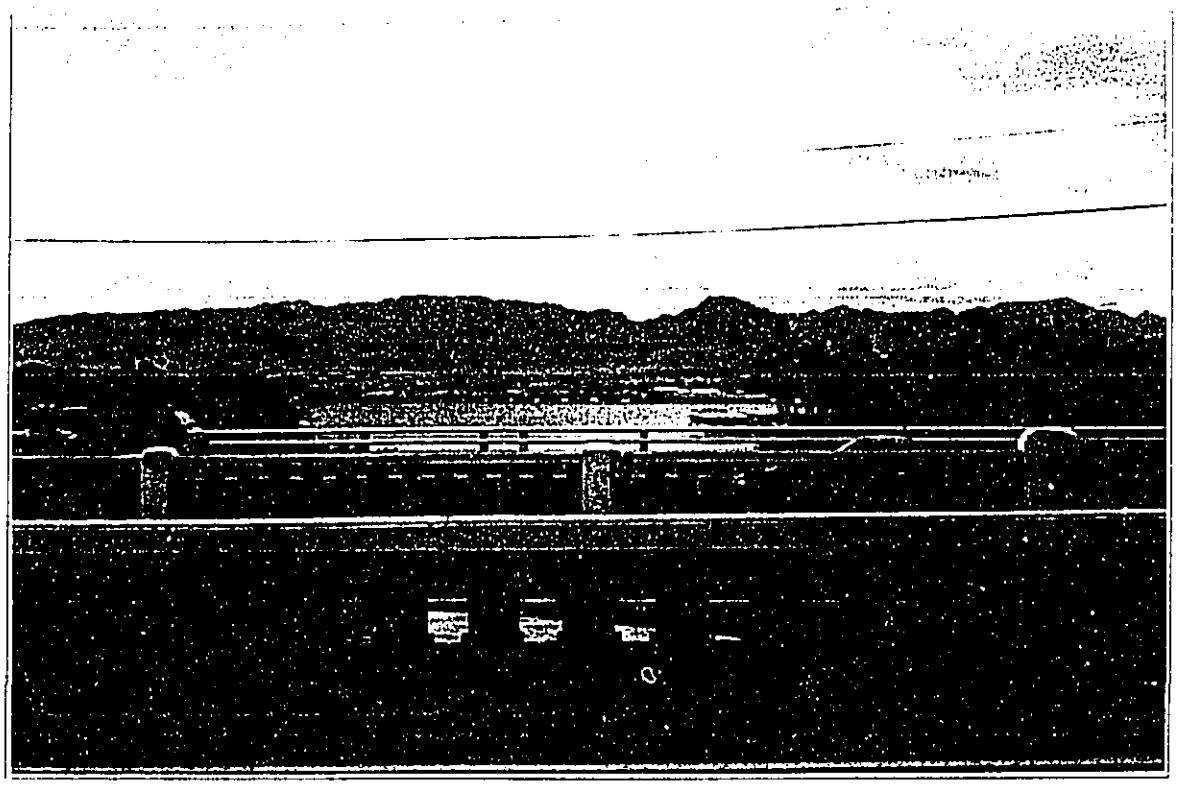


Photo 5: looking west from the outbound lane of the Halawa Bridge.

Photo 6: The view west from the inbound lane of the Halawa Bridge.

Photo 7: Inbound lane approach (looking north).

Photo 8: Inbound lane approach (looking south).

Photo 9: Inbound lane exit (looking south).

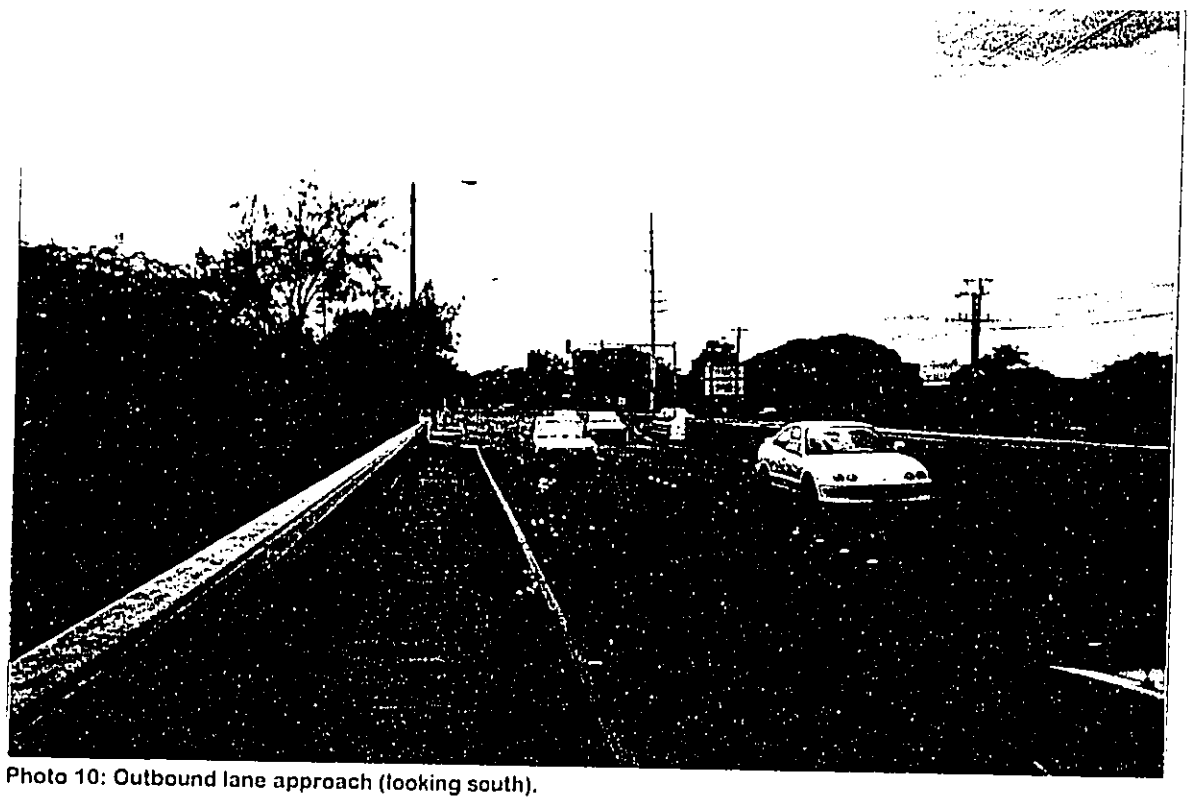
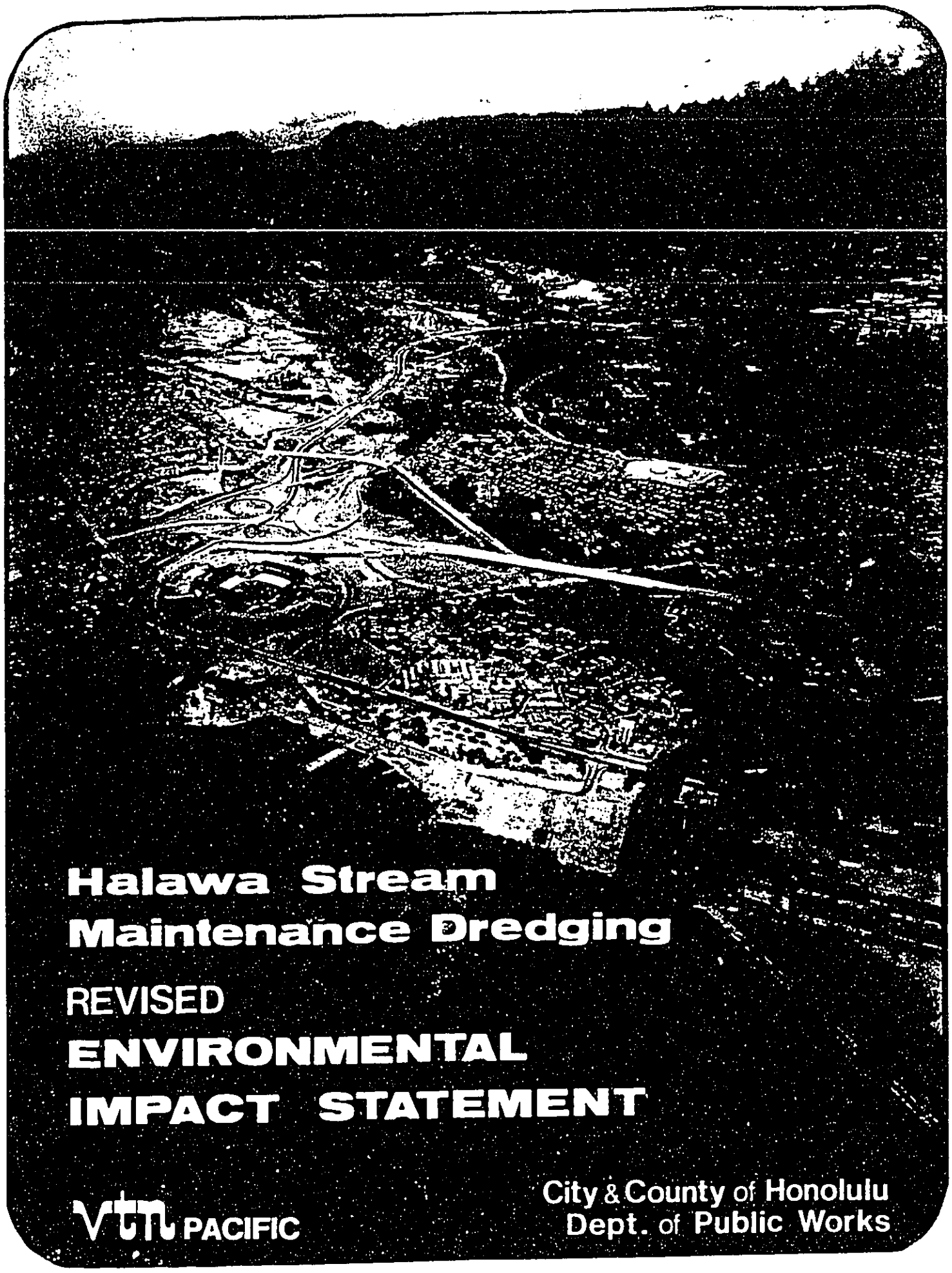


Photo 10: Outbound lane approach (looking south).

Photo 11: Outbound lane approach (looking north).

Photo 12: Outbound lane exit looking north).

Appendix E
Water Resources



Halawa Stream Maintenance Dredging

REVISED

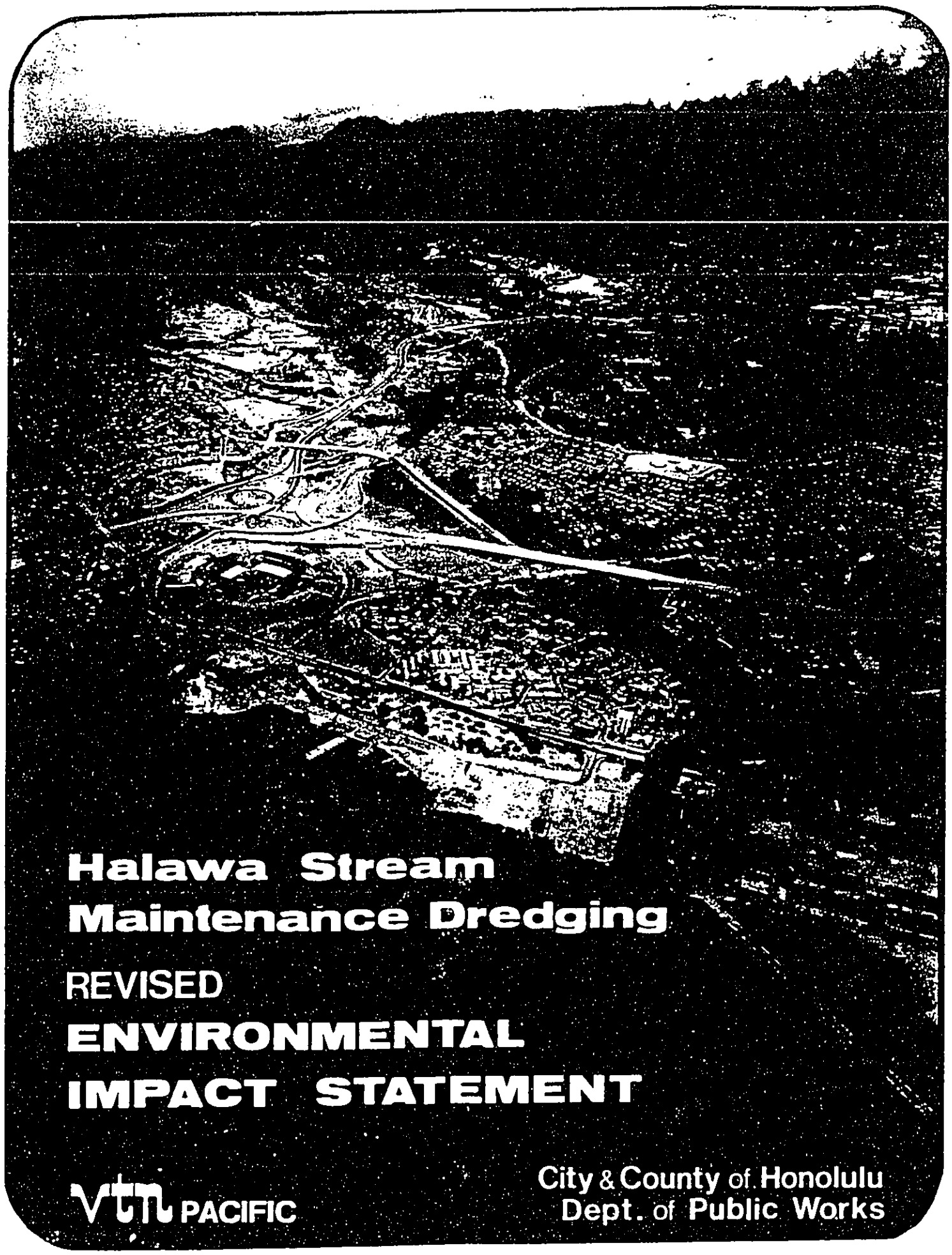
ENVIRONMENTAL IMPACT STATEMENT

VTN PACIFIC

City & County of Honolulu
Dept. of Public Works

CORRECTION

THE PRECEDING DOCUMENT(S) HAS BEEN REPHOTOGRAPHED TO ASSURE LEGIBILITY
SEE FRAME(S)
IMMEDIATELY FOLLOWING



Halawa Stream Maintenance Dredging

REVISED

ENVIRONMENTAL IMPACT STATEMENT

VTN PACIFIC

City & County of Honolulu
Dept. of Public Works

Table 3 Halawa Stream Water Quality [a]

Parameter [b,c]	(unit)		Stream Mouth SEO1 Range	Mean	Upper Estuary TTO7 Range	Mean	DOH Standard SEO1	TTO7
Temperature	(°C)	S	23.0-28.9	(26.2)	19.0-32.7	(25.6)	Δ1.5°	Δ 1.5°
PH		S	7.7-8.4	(8.1)	6.9-9.6	(8.1)	7.0-8.5	6.5-8.5
Turbidity	(JTU)	B	2.2-25.0	(6.7)	1.4-190.0	(27.4)	Δ20%	Δ10%
Clarity	(meters)	S	1.0-3.0	(2.0)	no data			
Salinity	(ppt)	B	33.8-36.4	(35.2)	.07-26.8	(16.1)		
Diss. Oxygen	(my/l)	B	0.9-5.0	(3.3)	3.0-18.8	(10.3)	4.5	5.0
T: Phosphorus	(ppm)	B	DL-.098	(.040)	DL-.491	(.206)	.030	.20
T. Kjeldahl N	(ppm)	S	DL-.083	(-)	DL-1.303	(.465)	.20	
Nitrate	(ppm)	B	DL-.062	(.028)	DL-.450	(.061)		
Nitrite	(ppm)	B	DL-.025	(.010)	DL-.013	(.006)		
Ammonia	(ppm)	B	.005-.028	(.015)	DL-1.125	(.293)		
T. Organic C	(ppm)	S	DL-17.0	(7.3)	DL-8.0	(4.4)		
Manganese	(ppm)	S	DL-.20	(-)	DL-.16	(.08)		
Magnesium	(ppm)	B	1400	(-)	990	(-)		
Potassium	(ppm)		no data		210	(-)		
Zinc	(ppm)	B	DL-.02	(.02)	DL-.02	(-)		
Iron	(ppm)		no data		DL-28.5	(8.48)		
T. Coliform	(MFC/100ml)	S	2-170	(-)	80-52,000	(2,650)		1,000
Fecal Colif.	(MFC/100ml)	S	2-110	(40)	140-4,400	(2,270)	400	200
Phenols	(ppb)	S	DL-2.4	(-)	DL-36.2	(35.0)		
Oil & Grease	(ppm)		no data		268.2	(-)		
Chlorides	(ppm)	S	20,000	(20,000)	37-14,580	(5,221)		
Settleable Solids	(ppm)		no data		DL-200	(32)		
T. Susp. Solids	(ppm)	S	5	(-)	8-340	(68)		
T. Residue	(ppm)		no data		140-27,730	(5,260)		

Notes

a. Data from NCEL, 1973b, presented as range of values and mean value, in parentheses; a (-) notation indicates too few readings above the detection limit (see below) to compute a mean.

b. "DL" refers to a reading below the detection limit of the instrument. These limits where noted, are as follows (in ppm): Tot. P, .005; Tot. KN, .05; Nitrate, .002-.005; Nitrite, .001; Amonia, .005; TOC, .5:

STATISTICAL SUMMARY OF HYDROLOGIC AND WATER-QUALITY DATA FROM THE NORTH HALAWA, HAIKU, AND KAMOOALII DRAINAGE BASINS, OAHU, HAWAII, WATER YEARS 1983-89

U.S. GEOLOGICAL SURVEY
Water-Resources Investigations Report 92-4049

Prepared in cooperation with the
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION

Table 11.--Statistical summary of selected water-quality data collected at station 2262, North Halawa Stream near Honolulu, from May 1983 to September 1989

[µS/cm @ 25°C, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligram per liter; µg/L, microgram per liter; <, less than; *, calculated value; e, estimated using log-probability regression; tot., total; 0.7 µm-MF, 0.7 micron membrane filter; cols./100 mL, colonies per 100 milliliters; ft^3/s, cubic foot per second; °C, degrees Celsius; NTU, nephelometric turbidity unit; --, no data]

Property or constituent	Number of samples	Maximum	Minimum	Average	Percentage of samples that were less than or equal to those shown: 95	75	50 (Median)	25	5
INORGANIC									
Field measurements									
Specific conductance (µS/cm @ 25°C)	36	220	48	133	216	162	138	110	49
pH (units)	36	8.2	6.2	--	8.0	7.4	7.2	6.9	6.5
Major ions (mg/L)									
Hardness, total (as $CaCO_3$)	9	49	5.0	27	49	40	30	15	5
Calcium, dissolved	9	8.8	0.8	4.6	8.8	6.6	4.9	2.5	0.8
Magnesium, dissolved	9	6.5	0.8	3.8	6.5	5.7	4.4	2.0	0.8
Sodium, dissolved	9	15	6.2	10	15	14	12	6.8	6.2
*Sodium, percent	9	69	40	47	69	48	45	42	40
*Sodium adsorption ratio	9	1.0	0.8	0.9	1.0	0.9	0.9	0.8	0.8
Potassium, dissolved	9	1.4	0.5	0.9	1.4	1.0	0.9	0.8	0.5
Alkalinity (as $CaCO_3$)	9	49	3	27	49	40	29	15	3
Sulfate, dissolved	9	8.0	3.5	5.7	8.0	7.4	5.0	4.8	3.5
Chloride, dissolved	9	18	8.4	14	18	18	17	11	8.4
Fluoride, dissolved	9	0.2	<0.1	--	0.2	0.1	<0.1	<0.1	<0.1
Silica, dissolved	9	21	6.2	15	21	21	20	7.9	6.2
Nutrients (mg/L)									
Nitrogen, nitrite plus nitrate, total (as N)	14	0.10	<0.10	--	0.10	<0.10	<0.10	<0.10	<0.10
Nitrogen, ammonia plus organic, total (as N)	15	2.8	<0.2	e0.8	2.8	0.8	0.5	<0.2	<0.2
Phosphorus, total (as P)	15	0.13	<0.010	e0.037	0.13	0.060	0.030	0.010	<0.010
Metals (µg/L)									
Aluminum, total recoverable	9	62,000	50	13,000	62,000	28,000	170	70	50
Aluminum, dissolved	9	240	30	100	240	170	70	40	30
Arsenic, total	8	1	<1	--	1	<1	<1	<1	<1
Arsenic, dissolved	9	1	<1	--	1	<1	<1	<1	<1
Barium, total recoverable	9	<100	<100	--	<100	<100	<100	<100	<100
Barium, dissolved	9	6	<2	e4	6	6	2	<2	<2
Beryllium, total recoverable	9	<10	<10	--	<10	<10	<10	<10	<10
Beryllium, dissolved	9	0.8	<0.5	--	0.8	<0.5	<0.5	<0.5	<0.5
Cadmium, total recoverable	9	1	<1	--	1	<1	<1	<1	<1
Cadmium, dissolved	9	2.0	<1.0	--	2.0	<1.0	<1.0	<1.0	<1.0
Chromium, total recoverable	9	250	<10	e50	250	10	1	<10	<10
Chromium, dissolved	9	4	<1	--	4	1	<1	<1	<1
Cobalt, total recoverable	9	20	<1	e6	20	10	1	<1	<1
Cobalt, dissolved	9	<3	<3	--	<3	<3	<3	<3	<3
Copper, total recoverable	9	65	1	16	65	33	5	3	1
Copper, dissolved	9	14	<1	e4	14	6	2	1	1
Iron, total recoverable	9	59,000	20	13,000	59,000	26,000	440	60	20
Iron, dissolved	9	190	24	82	190	150	40	40	20
Lead, total recoverable	9	11	<1	--	11	1	<5	<2	<1
Lead, dissolved	9	5	<1	--	5	<5	<5	<1	<1
Lithium, total recoverable	9	<10	<10	--	<10	<10	<10	<10	<10
Lithium, dissolved	9	6	<4	--	6	<4	<4	<4	<4
Manganese, total recoverable	9	1,300	<10	e230	1,300	40	20	20	<10
Manganese, dissolved	9	25	<1	e9	25	12	10	4	3
Mercury, total recoverable	9	0.2	<0.1	e0.1	0.2	0.1	0.1	<0.1	<0.1
Mercury, dissolved	9	0.2	<0.1	--	0.2	<0.1	<0.1	<0.1	<0.1
Molybdenum, tot. recoverable	9	5	<1	--	5	2	<1	<1	<1
Molybdenum, dissolved	9	<10	<10	--	<10	<10	<10	<10	<10

Table 11.--Statistical summary of selected water-quality data collected at station 2262, North Halawa Stream near Honolulu, from May 1983 to September 1989--Continued

Property or constituent	Number of samples	Maximum	Minimum	Average	Percentage of samples that were less than or equal to those shown: 95	75	50 (Median)	25	5
Metals (µg/L)--continued									
Nickel, total recoverable	9	100	<1	e25	100	13	4	3	<1
Nickel, dissolved	9	2	<1	e1	2	1	1	<1	<1
Selenium, total	8	<1	<1	--	<1	<1	<1	<1	<1
Selenium, dissolved	9	<1	<1	--	<1	<1	<1	<1	<1
Silver, total recoverable	9	<1	<1	--	<1	<1	<1	<1	<1
Silver, dissolved	9	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<1.0
Strontium, dissolved	9	50	4	30	50	40	30	20	4
Vanadium, dissolved	9	<6	<6	--	<6	<6	<6	<6	<6
Zinc, total recoverable	9	270	<10	e70	270	80	50	20	<10
Zinc, dissolved	9	20	<3	e7	20	9	5	4	4
BIOLOGICAL									
Fecal coliform 0.7 µm-MF (cols./100 mL)	15	8,500	16	1,900	8,500	2,400	240	88	16
PHYSICAL PROPERTIES									
Discharge, instantaneous, stream (ft^3/s)	35	207	0.03	17	152	12	1.8	0.19	0.03
Pressure, air (mm of Hg)	23	761	751	758	761	760	758	757	751
Temperature, air (°C)	7	26.0	21.0	24.0	26.0	25.0	24.5	23.0	21.0
Temperature, water (°C)	36	25.5	19.0	22.0	24.7	23.0	22.0	21.1	19.4
Turbidity (NTU)	24	550	0.2	63	490	58	1.7	0.65	0.25
Oxygen dissolved (mg/L)	24	8.8	6.7	8.0	8.8	8.4	7.9	7.7	6.8
*Oxygen dissolved, percent	23	99	79	91	99	97	91	88	80
Solids, residue at 180°C, dissolved (mg/L)	9	101	31	68	101	87	75	45	31
Solids, residue at 105°C, suspended (mg/L)	16	684	<1	e113	684	25	5	<2	<1
*Solids, sum of constituents, dissolved (mg/L)	9	104	33	72	104	94	83	50	33
ORGANIC									
Carbon, organic, total (mg/L)	9	89	0.6	14	89	12	2.4	1.0	0.6
Oil and grease, total recoverable, gravimetric (mg/L)	9	5	<1	--	5	<1.0	<1	<1	<1
Pesticides and herbicides (total recoverable, µg/L)									
Malathion	9	0.01	<0.01	--	<0.01	<0.01	<0.01	<0.01	<0.01
Diazinon	9	0.01	<0.01	--	<0.01	<0.01	<0.01	<0.01	<0.01
Silvex	9	0.01	<0.01	--	<0.01	<0.01	<0.01	<0.01	<0.01

Other organic constituents analyzed but not detected

Organic (total recoverable)	Number of samples	Detection limit (µg/L)	Organic (total recoverable)	Number of samples	Detection limit (µg/L)
Aldrin	9	0.01	Methoxychlor	9	0.01
Chlordane	9	0.1	Methyl parathion	9	0.01
DDD	9	0.01	Methyl trithion	9	0.01
DDE	9	0.01	Mirex	9	0.01
DDT	9	0.01	Parathion	9	0.01
Dieldrin	9	0.01	Perthane	9	0.1
Endosulfan	9	0.01	Polychlorinated biphenyls	9	0.1
Endrin	9	0.01	Polychlorinated naphthalenes	9	0.1
Ethion	9	0.01	Toxaphene	9	1
Ethyl trithion	9	0.01	2,4-D	9	0.01
Heptachlor	9	0.01	2,4-DP	9	0.01
Heptachlor epoxide	9	0.01	2,4,5-T	9	0.01
Lindane	9	0.01			

United States Department of the Interior

U.S. GEOLOGICAL SURVEY

Water Resources Division
677 Ala Moana Blvd., Suite 415
Honolulu, HI 96813

September 30, 1999

Mr. Karl Bromwell
Earthtec
700 Bishop Street, Suite 900
Honolulu, HI 96813

Dear Mr Bromwell:

Enclosed are the results you requested. Data for samples collected after September 30 1998 is provisional and subject to revision until published in our annual data report for water year 1999.

If you have any questions, please feel free to call me at (808)522-8290.

Sincerely,

Barry Hill
Assistant District Chief

Enclosures

DISTRICT CODE 15 UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY PROCESS DATE 9-29-99

16227100 - HALAWA STR BELOW HI, OAHU

WATER-QUALITY DATA

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	TEMPERATURE AIR (DEG C) (00020)	BAROMETRIC PRESSURE (MM OF HG) (00025)	AGENCY COLLECTING SAMPLE (CODE NUMBER) (00027)	AGENCY ANALYZING SAMPLE (CODE NUMBER) (00028)	WEATHER (WMO CODE NUMBER) (00041)	DISCHARGE, INST. CUBIC FEET PER SECOND (00061)	TURBIDITY (NTU) (00076)	SPECIFIC CONDUCTANCE (US/CM) (00095)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN DEMAND, CHEMICAL (HIGH LEVEL) (MG/L) (00340)
NOV 1995 20...	1141	31.5	28.5	760	1028	80020	1.00	1.33	.60	410	9.4	--
JAN 1996 16...	1035	25.0	26.0	770	1028	80020	1.00	.310	.70	520	11	--
FEB 12...	1400	28.0	24.0	760	1028	80020	.000	.220	1.0	716	10	--
MAR 05...	0955	20.0	21.0	760	1028	80020	.000	21.4	4.5	300	11	--
APR 24...	0935	29.5	26.5	770	1028	80020	.000	.200	2.0	500	11	--
MAY 14...	0915	28.0	28.5	770	1028	80020	2.00	.060	1.5	730	12	--
OCT 28...	0930	--	--	--	1028	1028	.000	.000	--	--	--	--
NOV 12...	0930	24.5	24.5	760	1028	80020	--	5.29	2.7	300	9.8	--
DEC 16...	0950	19.5	--	760	1028	80020	--	1.34	1.1	575	12	--
JAN 1997 21...	0920	23.0	24.5	760	1028	80020	--	9.50	38	370	10	--
FEB 12...	1345	29.5	27.0	760	1028	80020	--	.660	.40	720	12	--
MAR 10...	0945	26.0	26.0	760	1028	80020	.000	2.31	4.0	463	12	--
APR 15...	0905	24.0	25.0	770	1028	80020	.000	5.59	26	347	10	--
MAY 27...	0915	29.5	26.0	760	1028	80020	1.00	.450	.8	656	11	--
JUN 09...	0945	29.5	28.0	760	1028	80020	.000	2.94	3.1	308	11	--
JUL 14...	0905	28.5	25.5	760	1028	80020	.000	2.36	.5	389	11	--
AUG 12...	0945	30.0	26.0	--	1028	1028	--	.060	--	664	14	--
NOV 13...	0855	23.0	25.5	760	1028	80020	1.00	4.11	4.6	195	10	--
DEC 17...	0925	22.5	24.0	770	1028	80020	--	.190	.7	503	12	--
FEB 1998 03...	0955	24.0	22.0	770	1028	80020	--	E.01	2.0	770	12	--
JUL 23...	0920	23.5	25.5	765	1028	80020	--	.13	1.5	912	9.7	--
NOV 17...	1415	27.5	26.5	760	1028	80020	1.00	4.76	1.9	173	10	<10

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DISTRICT CODE 15 UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY PROCESS DATE 9-29-99
16227100 - HALAWA STR BELOW H1, OAHU

WATER-QUALITY DATA

DATE	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	PH WATER WHOLE LAB (STAND-ARD UNITS) (00403)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L) (00530)	OIL AND GREASE, TOTAL RECOV. GRAVI-METRIC (MG/L) (00556)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)
NOV 1995												
20...	9.3	--	--	--	--	--	--	--	--	--	--	--
JAN 1996												
16...	9.0	--	--	--	--	--	--	--	--	--	--	--
FEB												
12...	9.5	9.2	18	<1	--	.50	<.050	.030	6.3	27	15	73
MAR												
05...	8.7	--	--	--	--	--	--	--	--	--	--	--
APR												
24...	9.2	--	--	--	--	--	--	--	--	--	--	--
MAY												
14...	9.1	--	8	--	--	.50	.130	.060	--	--	--	--
OCT												
28...	--	--	--	--	--	--	--	--	--	--	--	--
NOV												
12...	8.6	--	--	--	--	--	--	--	--	--	--	--
DEC												
16...	8.6	8.8	8	<1	--	.20	.120	<.010	4.1	31	22	48
JAN 1997												
21...	8.5	8.2	15	<1	--	.20	.190	<.010	4.6	19	13	31
FEB												
12...	9.4	--	--	--	--	--	--	--	--	--	--	--
MAR												
10...	8.9	--	--	--	--	--	--	--	--	--	--	--
APR												
15...	8.4	--	5	--	--	.30	<.050	.070	--	--	--	--
MAY												
27...	9.6	--	--	--	--	--	--	--	--	--	--	--
JUN												
09...	9.2	8.8	9	<1	--	.6	<.05	.04	1.4	19	10	26
JUL												
14...	9.2	--	--	--	--	--	--	--	--	--	--	--
AUG												
12...	9.6	--	--	--	--	--	--	--	--	--	--	--
NOV												
13...	9.0	--	--	--	--	--	--	--	--	--	--	--
DEC												
17...	9.1	--	8	--	--	.5	<.05	.02	--	--	--	--
FEB 1998												
03...	8.7	--	4	--	--	.5	<.05	<.01	--	--	--	--
JUL												
23...	8.9	--	--	--	--	--	--	--	--	--	--	--
NOV												
17...	9.1	--	4	<1	.03	.2	<.05	.02	2.9	--	--	--

DISTRICT CODE 15 UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY PROCESS DATE 9-29-99

16227100 - HALAWA STR BELOW H1, OAHU

WATER-QUALITY DATA

DATE	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	ARSENIC TOTAL (UG/L AS AS) (01002)	BARIUM, DISSOLVED (UG/L AS BA) (01005)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA) (01007)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE) (01012)	CADMIUM WATER UNFLTRD TOTAL (UG/L AS CD) (01027)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR) (01034)	COBALT, DISSOLVED (UG/L AS CO) (01035)
NOV 1995 20...	--	--	--	--	--	--	--	--	--	--	--	--
JAN 1996 16...	--	--	--	--	--	--	--	--	--	--	--	--
FEB 12...	3.5	160	33	.20	22	<1	6	<100	<10	<1	<1	<3
MAR 05...	--	--	--	--	--	--	--	--	--	--	--	--
APR 24...	--	--	--	--	--	--	--	--	--	--	--	--
MAY 14...	--	--	--	--	--	--	--	--	--	--	--	--
OCT 28...	--	--	--	--	--	--	--	--	--	--	--	--
NOV 12...	--	--	--	--	--	--	--	--	--	--	--	--
DEC 16...	2.0	94	29	<.10	22	<1	7.0	<100	<10	<1	<1	<3.0
JAN 1997 21...	1.8	48	21	<.10	22	<1	4.0	<100	<10	<1	5	<3.0
FEB 12...	--	--	--	--	--	--	--	--	--	--	--	--
MAR 10...	--	--	--	--	--	--	--	--	--	--	--	--
APR 15...	--	--	--	--	--	--	--	--	--	--	--	--
MAY 27...	--	--	--	--	--	--	--	--	--	--	--	--
JUN 09...	1.8	41	14	<.1	17	<1	4	<100	<10	<1	<1.0	<3
JUL 14...	--	--	--	--	--	--	--	--	--	--	--	--
AUG 12...	--	--	--	--	--	--	--	--	--	--	--	--
NOV 13...	--	--	--	--	--	--	--	--	--	--	--	--
DEC 17...	--	--	--	--	--	--	--	--	--	--	--	--
FEB 1998 03...	--	--	--	--	--	--	--	--	--	--	--	--
JUL 23...	--	--	--	--	--	--	--	--	--	--	--	--
NOV 17...	--	17	5.8	--	--	--	--	--	--	--	--	--

DISTRICT CODE 15 UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY PROCESS DATE 9-29-99
16227100 - HALAWA STR BELOW HI, OAHU

WATER-QUALITY DATA

DATE	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO) (01037)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU) (01042)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB) (01051)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN) (01055)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	MOLYB-DENUM, TOTAL RECOV-ERABLE (UG/L AS MO) (01062)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	SILVER, DIS-SOLVED (UG/L AS AG) (01075)
NOV 1995 20...	--	--	--	--	--	--	--	--	--	--	--	--
JAN 1996 16...	--	--	--	--	--	--	--	--	--	--	--	--
FEB 12...	<1	6	150	27	<1	20	<1	<10	<1	1	1	<1.0
MAR 05...	--	--	--	--	--	--	--	--	--	--	--	--
APR 24...	--	--	--	--	--	--	--	--	--	--	--	--
MAY 14...	--	--	--	--	--	--	--	--	--	--	--	--
OCT 28...	--	--	--	--	--	--	--	--	--	--	--	--
NOV 12...	--	--	--	--	--	--	--	--	--	--	--	--
DEC 16...	<1	2	170	13	<1	20	8.0	<10	<1	<1.0	1	<1.0
JAN 1997 21...	<1	3	1600	37	<1	30	9.0	<10	<1	<1.0	2	<1.0
FEB 12...	--	--	--	--	--	--	--	--	--	--	--	--
MAR 10...	--	--	--	--	--	--	--	--	--	--	--	--
APR 15...	--	--	--	--	--	--	--	--	--	--	--	--
MAY 27...	--	--	--	--	--	--	--	--	--	--	--	--
JUN 09...	<1	3	320	57	<1	40	12	<10	<1.0	<1	2	<1
JUL 14...	--	--	--	--	--	--	--	--	--	--	--	--
AUG 12...	--	--	--	--	--	--	--	--	--	--	--	--
NOV 13...	--	--	--	--	--	--	--	--	--	--	--	--
DEC 17...	--	--	--	--	--	--	--	--	--	--	--	--
FEB 1998 03...	--	--	--	--	--	--	--	--	--	--	--	--
JUL 23...	--	--	--	--	--	--	--	--	--	--	--	--
NOV 17...	--	--	--	--	--	--	--	--	--	--	--	--

DISTRICT CODE 15

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY
16227100 - HALAWA STR BELOW H1, OAHU

PROCESS DATE 9-29-99

WATER-QUALITY DATA

DATE	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG) (01077)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)	VANA-DIUM, DIS-SOLVED (UG/L AS V) (01085)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	ALUM-INUM, TOTAL RECOV-ERABLE (UG/L AS AL) (01105)	ALUM-INUM, DIS-SOLVED (UG/L AS AL) (01106)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	LITHIUM TOTAL RECOV-ERABLE (UG/L AS LI) (01132)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SELE-NIUM, TOTAL (UG/L AS SE) (01147)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	CHLOR-PYRIFOS TOTAL RECOVER (UG/L) (38932)
NOV 1995												
20...	--	--	--	--	--	--	--	--	--	--	--	--
JAN 1996												
16...	--	--	--	--	--	--	--	--	--	--	--	--
FEB												
12...	<1	230	14	<10	110	20	<4	<10	<1	<1	600	<.010
MAR												
05...	--	--	--	--	--	--	--	--	--	--	--	--
APR												
24...	--	--	--	--	--	--	--	--	--	--	--	--
MAY												
14...	--	--	--	--	--	--	--	--	--	--	K4000	--
OCT												
28...	--	--	--	--	--	--	--	--	--	--	--	--
NOV												
12...	--	--	--	--	--	--	--	--	--	--	--	--
DEC												
16...	<1	250	<6	<10	130	<5.0	<4	<10	<1	<1	5700	<.010
JAN 1997												
21...	<1	130	<6	<10	1500	19	<4	<10	<1	<1	6800	<.010
FEB												
12...	--	--	--	--	--	--	--	--	--	--	--	--
MAR												
10...	--	--	--	--	--	--	--	--	--	--	--	--
APR												
15...	--	--	--	--	--	--	--	--	--	--	2800	--
MAY												
27...	--	--	--	--	--	--	--	--	--	--	--	--
JUN												
09...	<1	110	<6	<10	240	27.1	<4	<10	<1	<1	5200	--
JUL												
14...	--	--	--	--	--	--	--	--	--	--	--	--
AUG												
12...	--	--	--	--	--	--	--	--	--	--	--	--
NOV												
13...	--	--	--	--	--	--	--	--	--	--	--	--
DEC												
17...	--	--	--	--	--	--	--	--	--	--	2800	--
FEB 1998												
03...	--	--	--	--	--	--	--	--	--	--	1800	--
JUL												
23...	--	--	--	--	--	--	--	--	--	--	--	--
NOV												
17...	--	--	--	--	--	--	--	--	--	--	--	--

DISTRICT CODE 15 UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY PROCESS DATE 9-29-99
16227100 - HALAWA STR BELOW H1, OAHU

WATER-QUALITY DATA

DATE	DISUL-FOTON UNFILT RECOVER (UG/L) (39011)	PHORATE TOTAL (UG/L) (39023)	PER-THANE TOTAL (UG/L) (39034)	DEF TOTAL (UG/L) (39040)	PCNS UNFILT RECOVER (UG/L) (39250)	ALDRIN, TOTAL (UG/L) (39330)	LINDANE TOTAL (UG/L) (39340)	CHLOR-DANE, TECH-NICAL TOTAL (UG/L) (39350)	P,P'-DDD UNFILT RECOVER (UG/L) (39360)	P,P'-DDE, TOTAL (UG/L) (39365)	P,P'-DDT UNFILT RECOVER (UG/L) (39370)	DI-ELDRIN TOTAL (UG/L) (39380)
NOV 1995 20...	--	--	--	--	--	--	--	--	--	--	--	--
JAN 1996 16...	--	--	--	--	--	--	--	--	--	--	--	--
FEB 12...	<.010	<.010	<.100	<.010	<.100	<.010	<.010	<.100	<.010	<.010	<.010	<.010
MAR 05...	--	--	--	--	--	--	--	--	--	--	--	--
APR 24...	--	--	--	--	--	--	--	--	--	--	--	--
MAY 14...	--	--	--	--	--	--	--	--	--	--	--	--
OCT 28...	--	--	--	--	--	--	--	--	--	--	--	--
NOV 12...	--	--	--	--	--	--	--	--	--	--	--	--
DEC 16...	--	--	<.100	<.010	<.100	<.010	<.010	<.100	<.010	<.010	<.010	<.010
JAN 1997 21...	<.050	<.050	<.100	<.010	<.100	<.010	<.010	<.100	<.010	<.010	<.010	<.010
FEB 12...	--	--	--	--	--	--	--	--	--	--	--	--
MAR 10...	--	--	--	--	--	--	--	--	--	--	--	--
APR 15...	--	--	--	--	--	--	--	--	--	--	--	--
MAY 27...	--	--	--	--	--	--	--	--	--	--	--	--
JUN 09...	--	--	--	--	--	--	--	--	--	--	--	--
JUL 14...	--	--	--	--	--	--	--	--	--	--	--	--
AUG 12...	--	--	--	--	--	--	--	--	--	--	--	--
NOV 13...	--	--	--	--	--	--	--	--	--	--	--	--
DEC 17...	--	--	--	--	--	--	--	--	--	--	--	--
FEB 1998 03...	--	--	--	--	--	--	--	--	--	--	--	--
JUL 23...	--	--	--	--	--	--	--	--	--	--	--	--
NOV 17...	--	--	--	--	--	--	--	--	--	--	--	--

1

DISTRICT CODE 15 UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY PROCESS DATE 9-29-99
16227100 - HALAWA STR BELOW H1, OAHU

WATER-QUALITY DATA

DATE	ENDO-SULFAN I TOTAL (UG/L) (39388)	ENDRIN WATER UNFLTRD REC (UG/L) (39390)	ETHION, TOTAL (UG/L) (39398)	TOX-APHENE, TOTAL (UG/L) (39400)	HEPTA-CHLOR, TOTAL (UG/L) (39410)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L) (39420)	METH-OXY-CHLOR, TOTAL (UG/L) (39480)	PCB, TOTAL (UG/L) (39516)	MALA-THION, TOTAL (UG/L) (39530)	PARA-THION, TOTAL (UG/L) (39540)	DI-AZINON, TOTAL (UG/L) (39570)	METHYL PARA-THION, TOTAL (UG/L) (39600)
NOV 1995 20...	--	--	--	--	--	--	--	--	--	--	--	--
JAN 1996 16...	--	--	--	--	--	--	--	--	--	--	--	--
FEB 12...	<.010	<.010	<.010	<1.00	<.010	<.010	<.010	<.100	<.010	<.010	.020	<.010
MAR 05...	--	--	--	--	--	--	--	--	--	--	--	--
APR 24...	--	--	--	--	--	--	--	--	--	--	--	--
MAY 14...	--	--	--	--	--	--	--	--	--	--	--	--
OCT 28...	--	--	--	--	--	--	--	--	--	--	--	--
NOV 12...	--	--	--	--	--	--	--	--	--	--	--	--
DEC 16...	<.010	<.010	<.010	<1.00	<.010	<.010	<.010	<.100	<.010	<.010	<.010	<.010
JAN 1997 21...	<.010	<.010	<.010	<1.00	<.010	<.010	<.010	<.100	<.010	<.010	<.010	<.010
FEB 12...	--	--	--	--	--	--	--	--	--	--	--	--
MAR 10...	--	--	--	--	--	--	--	--	--	--	--	--
APR 15...	--	--	--	--	--	--	--	--	--	--	--	--
MAY 27...	--	--	--	--	--	--	--	--	--	--	--	--
JUN 09...	--	--	--	--	--	--	--	--	--	--	--	--
JUL 14...	--	--	--	--	--	--	--	--	--	--	--	--
AUG 12...	--	--	--	--	--	--	--	--	--	--	--	--
NOV 13...	--	--	--	--	--	--	--	--	--	--	--	--
DEC 17...	--	--	--	--	--	--	--	--	--	--	--	--
FEB 1998 03...	--	--	--	--	--	--	--	--	--	--	--	--
JUL 23...	--	--	--	--	--	--	--	--	--	--	--	--
NOV 17...	--	--	--	--	--	--	--	--	--	--	--	--

DISTRICT CODE 15

UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY
16227100 - HALAWA STR BELOW H1, OAHU

PROCESS DATE 9-29-99

WATER-QUALITY DATA

DATE	2,4-D, TOTAL (UG/L) (39730)	2,4,5-T TOTAL (UG/L) (39740)	MIREX, TOTAL (UG/L) (39755)	SILVEX, TOTAL (UG/L) (39760)	TOTAL TRI-THION (UG/L) (39786)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG) (71900)	ELEV. OF LAND SURFACE DATUM (FT. ABOVE NGVD) (72000)	2,4-DP TOTAL (UG/L) (82183)	SAM-PLING METHOD, CODES (82398)	FONOFOS (DY-FONATE) WATER WHOLE TOT.REC (UG/L) (82614)
NOV 1995 20...	--	--	--	--	--	--	--	20.0	--	70.0	--
JAN 1996 16...	--	--	--	--	--	--	--	20.0	--	70.0	--
FEB 12...	<.010	<.010	<.010	<.010	<.010	369	<.10	20.0	<.010	70.0	<.010
MAR 05...	--	--	--	--	--	--	--	20.0	--	10.0	--
APR 24...	--	--	--	--	--	--	--	20.0	--	70.0	--
MAY 14...	--	--	--	--	--	--	--	20.0	--	70.0	--
OCT 28...	--	--	--	--	--	--	--	20.0	--	--	--
NOV 12...	--	--	--	--	--	--	--	20.0	--	--	--
DEC 16...	<.010	<.010	<.010	<.010	<.010	307	.20	20.0	<.010	--	<.010
JAN 1997 21...	<.010	<.010	<.010	<.010	<.010	206	<.10	20.0	<.010	--	<.010
FEB 12...	--	--	--	--	--	--	--	20.0	--	--	--
MAR 10...	--	--	--	--	--	--	--	20.0	--	70.0	--
APR 15...	--	--	--	--	--	--	--	20.0	--	10.0	--
MAY 27...	--	--	--	--	--	--	--	20.0	--	70.0	--
JUN 09...	--	--	--	--	--	184	<.1	20.0	--	70.0	--
JUL 14...	--	--	--	--	--	--	--	20.0	--	70.0	--
AUG 12...	--	--	--	--	--	--	--	20.0	--	--	--
NOV 13...	--	--	--	--	--	--	--	20.0	--	70.0	--
DEC 17...	--	--	--	--	--	--	--	20.0	--	--	--
FEB 1998 03...	--	--	--	--	--	--	--	20.0	--	--	--
JUL 23...	--	--	--	--	--	--	--	20.0	--	--	--
NOV 17...	--	--	--	--	--	--	--	20.0	--	10.0	--

DISTRICT CODE 15 UNITED STATES DEPARTMENT OF INTERIOR - GEOLOGICAL SURVEY PROCESS DATE 9-29-99
16227100 - HALAWA STR BELOW H1, OAHU

WATER-QUALITY DATA

DATE	SAMPLER TYPE (CODE) (84164)	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM) (90095)	ANC UNFLTRD TIT 4.5 LAB (MG/L AS CACO3) (90410)	SET NUMBER SCHED-ULE 1304 (NO.) (99801)	SET NUMBER SCHED-ULE 1319 (NO.) (99804)	SET NUMBER SCHED-ULE 1324 (NO.) (99806)	SAMPLE VOLUME SCHED-ULE 1324 (ML) (99865)	SAMPLE VOLUME SCHED-ULE 1319 (ML) (99868)	JULIAN DATE IN-BOTTLE DIGEST-ION DDD (99870)	9990501 9990502 9990503 9990504 9990505 9990506 9990507 (99905)	SAMPLE VOLUME SCHED-ULE 1304 (NO.) (99946)
NOV 1995											
20...	8010.0	--	--	--	--	--	--	--	--	--	--
JAN 1996											
16...	8010.0	--	--	--	--	--	--	--	--	--	--
FEB											
12...	8010.0	677	54	2878.00	2872.00	2873.00	803	803	52	160	--
MAR											
05...	3044.0	--	--	--	--	--	--	--	--	--	--
APR											
24...	8010.0	--	--	--	--	--	--	--	--	--	--
MAY											
14...	8010.0	--	--	--	--	--	--	--	--	--	--
OCT											
28...	--	--	--	--	--	--	--	--	--	--	--
NOV											
12...	--	--	--	--	--	--	--	--	--	--	--
DEC											
16...	--	567	104	3906.00	3900.00	3901.00	792	792	360	--	818
JAN 1997											
21...	--	370	85	3964.00	3960.00	3961.00	895	895	28	--	846
FEB											
12...	--	--	--	--	--	--	--	--	--	--	--
MAR											
10...	8010.0	--	--	--	--	--	--	--	--	--	--
APR											
15...	8010.0	--	--	--	--	--	--	--	--	--	--
MAY											
27...	8010.0	--	--	--	--	--	--	--	--	--	--
JUN											
09...	8010.0	304	72	--	--	--	--	--	168	--	--
JUL											
14...	8010.0	--	--	--	--	--	--	--	--	--	--
AUG											
12...	--	--	--	--	--	--	--	--	--	--	--
NOV											
13...	8010.0	--	--	--	--	--	--	--	--	--	--
DEC											
17...	--	--	--	--	--	--	--	--	--	--	--
FEB 1998											
03...	--	--	--	--	--	--	--	--	--	--	--
JUL											
23...	--	--	--	--	--	--	--	--	--	--	--
NOV											
17...	8010.0	--	--	--	--	--	--	--	--	--	--

Appendix F
Correspondence

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

IN REPLY REFER TO
HWY-DD
2.5469

SEP 23 1999

Mr. Edwin Kakesako, Realty Specialist
Department of Real Property Management
Commander, Pacific Division
Naval Facilities Engineering Command
Pearl Harbor, Hawaii 96860-3134

Dear Mr. Kakesako:

Subject: Kamehameha Highway, Halawa Stream Bridge (Inbound) Replacement, Extension of License No. N6274299RP0024 for Right-of-Entry

The Department of Transportation has contracted a consultant to do an Environmental Assessment for the subject project. An extension of the Right-of-Entry license that had expired in March 1999, is requested for the Department and its consultant on Navy property directly adjacent to Halawa Stream Bridge for a period of 60 days.

The Department does not contemplate using Navy property for anything more than walking directly across the property that is adjacent to the bridge. Visual surveys of the area will also be completed for the environmental assessment. If any other use of the premises is made, the Navy will be contacted and the appropriate procedures will commence accordingly.

If you have any questions regarding this request, please call Christine Yamasaki at 692-7572. In response to this request, please reply to the attention of Christine Yamasaki, Project Manager and reference HWY-DD 2.5469 as noted above.

Very truly yours,

KAZU HAYASHIDA
Director of Transportation

c: Earthtech (Karl Bromwell)

11/22/99 10:21 FAX 808 692 7590 DOT-DESIGN SECTION 002

RECEIVED
NOV 22 1999
DEPARTMENT OF TRANSPORTATION HIGHWAY-DD

DEPARTMENT OF THE NAVY
PACIFIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
(MAKALAPA, HI)
PEARL HARBOR, HAWAII 96860-7300

99 NOV 20 P4:27

11011
Ser RPH2415/4035
16 NOV 1999

Ms. Christine Yamasaki, Project Manager
Department of Transportation
State of Hawai'i
869 Punchbowl Street
Honolulu, HI 96813-5097

Dear Ms. Yamasaki:

In reply to your transmittal memorandum of November 8, 1999, the enclosed Amendment No. 1 covering a 60-day extension of License N6274299RP00024 for an environmental survey of Navy property in the vicinity of Halawa Bridge, Kamehameha Highway through December 31, 1999 has been executed on behalf of the Navy.

Please note that the special provisions of the license have been changed to require four (4) days advance coordination of the planned environmental survey agenda with:

Naval Station Security Department at 473-2156
Navy Region Hawaii Mr. Dick Nagashima at 471-1170 extension 266
National Park Service Facility Manager Ms. Merry Petrossian at 422-2771 extension 135

Your cooperation in this matter will be appreciated. If you have any questions, our point of contact is Mr. Edwin Kakesako at 474-5927/471-3217, by facsimile transmission at 474-4890 or by electronic mail at kakesakoes@efdpac.navfac.navy.mil.

Sincerely,

J. M. KILIAN
Head
Real Property Management Department

Encl:
(1) Amendment No. 1 to License N6274299RP00024 (dup orig)

Copy to:
Facility Manager, U.S. Arizona Memorial
National Park Service
United States Department of the Interior
1 Arizona Memorial Place
Honolulu, HI 96818

NOV 22 '99 10:31 808 692 7590 PAGE.02

AMENDMENT NO. 1 TO
LICENSE N6274299RP00024

License N6274299RP00024 covering State of Hawaii, Department of Transportation, Highways Division use of three (3) parcels of land at Halawa Bridge, Kamehameha Highway at Naval Station, Pearl Harbor is hereby amended as follows, effective on 1 November 1999:

Item 1 (Naval Activity): Delete in its entirety and replace with the following:

"Naval Region, Hawaii, Pearl Harbor"

Item 2 (Dates Covered): Delete the expiration date and replace with the following:

"31 DEC 1999"

Special Provision 12c(a): Delete in its entirety and replace with the following:

"(a) Naval Station Security Department 473-2156."

Special Provision 12c: Add the following:

"(c) Naval Region, Hawaii, Dick Nagashima, at 471-1170 ext 266."

Except as herein amended, all conditions and provisions of this license remain in full force and effect.

FOR THE DEPARTMENT OF THE NAVY	FOR THE LICENSEE
By J. Michael Kilay	By Kazu Hayashida
MICHAEL KILAY Head, Real Property Management Department Pacific Division, Naval Facilities Engineering Command Real Estate Contracting Officer	
(Name/Title)	Kazu Hayashida Director of Transportation (Name/Title)
16 Nov 1999 (Date)	November 4, 1999 (Date)

DUPLICATE ORIGINAL

700 Bishop Street, Suite 900, Honolulu, Hawaii 96813

Mr. Grant Tanimoto
Aliamanu/Salt Lake/Foster Village Neighborhood Board
3447 Ala Haukulu Street
Honolulu, HI 96818

6 October 1999

Dear Mr. Tanimoto:

The Department of Transportation (DOT) has contracted Earth Tech to conduct an Environmental Assessment for the Halawa Stream Bridge Inbound Replacement Project. The purpose of this project is to provide a safer facility for motorists using Kamehameha Highway by replacing a bridge that does not meet todays standards. The new structure will be wider, provide sidewalks for pedestrian traffic, plan for a future bike lane, have bridge railings which meet current design standards, will meet seismic design criteria, and will be designed to accommodate present day vehicular loadings.

Telephone
808.523.8874
Facsimile
808.523.8950

The proposed Halawa Stream Bridge Inbound Replacement Project will be located on the inbound (makai) side of the Kamehameha Highway, near the Arizona Memorial. A portion of the existing inbound bridge, which was constructed in 1933, will be removed. The portion that will remain was built around 1970 during the Halawa Stream Bridge Widening Project. A detour road and a temporary detour bridge will be constructed in the median area.

DOT-HD and Earth Tech are currently planning to offer the community the opportunity to have an informational meeting while the final EA is being drafted, before sending it to OEQC. This way the public, if interested in an informational meeting, will have the opportunity to review the draft document and to prepare questions and address any concerns to the DOT-HD. At this time, a notice will be advertised in the "MidWeek" and the semi-monthly bulletin of the OEQC.

If you have any immediate questions please contact Karl Bromwell, the Earth Tech Project Manager, at 523-8874.

Sincerely,

Karl B. Bromwell

Karl Bromwell
Project Manager

EARTH TECH

700 Bishop Street, Suite 900, Honolulu, Hawaii 96813

Ms. Kat Brady
Life of the Land
76 N. King St. Ste. 203
Honolulu, HI 96817

6 October 1999

Dear Ms. Brady:

The Department of Transportation Highways Division (DOT-HD) has contracted Earth Tech to conduct an Environmental Assessment for the Halawa Stream Bridge Inbound Replacement Project. The purpose of this project is to provide a safer facility for motorists using Kamehameha Highway by replacing a bridge that does not meet todays standards. The new structure will be wider, provide sidewalks for pedestrian traffic, plan for future bike lane, have bridge railings which meet current design standards, will meet seismic design criteria, and will be designed to accommodate present day vehicular loadings.

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Facsimile
808.523.8950

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If you have any immediate questions please contact Karl Bromwell, the Earth Tech Project Manager, at 523-8874.

Sincerely,

Karl B. Bromwell

Karl Bromwell
Project Manager

EARTH TECH

700 Bishop Street, Suite 900, Honolulu, Hawaii 96813

Mr. Jeff Mikulina
Sierra Club
PO Box 2577
Honolulu, HI 96803

6 October 1999

Dear Mr. Mikulina:

The Department of Transportation (DOT) has contracted Earth Tech to conduct an Environmental Assessment for the Halawa Stream Bridge Inbound Replacement Project. The purpose of this project is to provide a safer facility for motorists using Kamehameha Highway by replacing a bridge that does not meet todays standards. The new structure will be wider, provide sidewalks for pedestrian traffic, plan for a future bike lane, have bridge railings which meet current design standards, will meet seismic design criteria, and will be designed to accommodate present day vehicular loadings.

Telephone
808.523.8874
Facsimile
808.523.8950

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If you have any immediate questions please contact Karl Bromwell, the Earth Tech Project Manager, at 523-8874.

Sincerely,

Karl Bromwell
Project Manager

EARTH TECH

700 Bishop Street, Suite 900, Honolulu, Hawaii 96813

Mr. William Clark
Aiea Neighborhood Board
98-1020 Kaonohi Street
Aiea, HI 96701

6 October 1999

Dear Mr. Clark:

The Department of Transportation (DOT) has contracted Earth Tech to conduct an Environmental Assessment for the Halawa Stream Bridge Inbound Replacement Project. The purpose of this project is to provide a safer facility for motorists using Kamehameha Highway by replacing a bridge that does not meet todays standards. The new structure will be wider, provide sidewalks for pedestrian traffic, plan for a future bike lane, have bridge railings which meet current design standards, will meet seismic design criteria, and will be designed to accommodate present day vehicular loadings.

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808.523.8950

The proposed Halawa Stream Bridge Inbound Replacement Project will be located on the inbound (makai) side of the Kamehameha Highway, near the Arizona Memorial. A portion of the existing inbound bridge, which was constructed in 1933, will be removed. The portion that will remain was built around 1970 during the Halawa Stream Bridge Widening Project. A detour road and a temporary detour bridge will be constructed in the median area.

DOT-HD and Earth Tech are currently planning to offer the community the opportunity to have an informational meeting while the final EA is being drafted, before sending it to OEQC. This way the public, if interested in an informational meeting, will have the opportunity to review the draft document and to prepare questions and address any concerns to the DOT-HD. At this time, a notice will be advertised in the "MidWeek" and the semi-monthly bulletin of the OEQC.
If you have any immediate questions please contact Karl Bromwell, the Earth Tech Project Manager, at 523-8874.

Sincerely,

Karl Bromwell
Project Manager

EARTH TECH

700 Bishop Street, Suite 900, Honolulu, Hawaii 96813

Telephone 808 523 8874
Facsimile 808 523 8950

13 December 1999

State Historic Preservation Department
Don Hibbard, Administrator
601 Kamokila Blvd. Rm. 555,
Kapolei, Hawaii 96707

Subject: Review of Archaeological Resources Survey, for Halawa Stream Bridge (Inbound) Replacement EA.

Dear: Mr. Hibbard

Please find enclosed for your review the Archaeological Resources Survey performed in October by International Archaeological Research Institute Inc. The survey was done in support of an Environmental Assessment of the Halawa Stream Bridge (Inbound) Replacement Project, prepared by Earth Tech. for the State Department of Transportation, Highways Division.

This survey has been sent in advance of the completed EA, per the suggestion of Elaine Jourdane, during a telephone conversation.

If you have any questions please call me at 523-8874.

Very truly yours,

Karl Bromwell

Karl Bromwell
Project Manager

encl.

EARTH TECH

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

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

TIMOTHY E. JOHNS, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES
JAMES E. KAMELO

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

February 29, 2000

Karl B. Bromwell
Project Manager
Earth Tech
700 Bishop Street, Suite 900
Honolulu, Hawaii 96813

LOG NO: 24959
DOC NO: 0002EJ20

Dear Mr. Bromwell:

SUBJECT: Chapter 6E-8 Historic Preservation Review -- Draft Environmental Assessment (DEA) for the Halawa Stream Bridge (Inbound) Replacement, Kamehameha Highway
Halawa, 'Ewa, O'ahu
TMK: 9-9-003

Thank you for the opportunity to review the DEA for the Halawa Stream Bridge replacement project. We received the DEA on February 14, 2000, via U. S. mail. We note that the proposed action is subject to regulatory review under Chapter 6E-8 (Hawaii Revised Statutes) and Section 106 of the National Historic Preservation Act.

This project proposes to replace portions of the inbound lane of the existing Halawa Stream bridge in order to meet current live load and seismic requirements. According to the DEA, although the bridge is over 50 years in age, it does not meet the criteria for eligibility on the Hawaii or National Register of Historic Places. However, the historical significance of the pillar monument located in the center of the bridge (between the inbound and outbound lanes) has not been determined and may have historical significance. According to the DEA, the center area including the railings and the monument, will not be affected by this project.

An archaeological survey of the area of potential effect (APE) for the bridge project shows that the entire project area has been previously disturbed during the construction of the existing bridge and from previous dredging of the stream. No historic sites were found during the survey and the presence of fill material along the stream bank and lining of the stream channel make it unlikely that historic sites remain.

Karl B. Bromwell
Page Two

Because it is unlikely that historic sites will be affected by the proposed modifications we believe that "no historic properties will be affected" by this project.

In compliance with Section 106, we request that in the unlikely event that historic sites, including human burials, are uncovered during routine construction activities all work in the vicinity must stop and the State Historic Preservation Division be contacted, in addition to your initiating NAGPRA actions.

Should you have any questions about archaeology please call Sara Collins at 692-8026 or Elaine Jourdane at 692-8027. Should you have any questions about architecture, please call Tonia Moy at 692-8030.

Aloha,

DON HIBBARD, Administrator
State Historic Preservation Division

EJ:jk

700 Bishop Street, Suite 900, Honolulu, Hawaii 96813

Telephone
808.523.8874

Facsimile
808.523.8950

March 29, 2000

Don Hibbard, Administrator
Department of Land and Natural Resources
Historic Preservation Division
601 Kamokila Bl. Room 555
Kapolei, HI 96707

Subject: **Draft Environmental Assessment for Halawa Stream Bridge Inbound Replacement, District of Ewa, Oahu, Federal Aid Project No. BR-099-0-1(19)**

Dear Reviewers:

Thank you for your letter regarding the draft EA (DEA) for the proposed bridge replacement project. The final EA (FEA) has been amended to reflect your comments. We appreciate your efforts in reviewing the document and provide the following response to both your written comments and a phone conversation between Karl Bromwell and Ms. Moy on 3-17-00:

- Response to comment regarding the undetermined historical significance of the pillar monument and the center area including the railings and the monument, not being affected by this project:

  The inbound portion of the bridge is being widened toward the state right-of-way (mauka). Most of the bridge and railings on the mauka side of the bridge will be demolished. The new bridge railings will meet current safety design standards and vehicular collision force of test level 4 (TL-4). Two pillar monuments are in the r-o-w, both are of unknown historical significance. In order to avoid any damage to the monuments during construction, the DOT has agreed to temporarily remove both monuments and store them safely away. They will be returned after the completion of the construction.

- Response to comment regarding contacting the State Historic Preservation Division, in addition to initiating NAGPRA actions:

  Complied, text was added to section 3.3 Cultural Resources, of the FEA.

If there are any additional questions or comments regarding the report or proposed project, please call Mr. Karl Bromwell at 523-8874.

Very truly yours,

Earth Tech, Inc.
Karl B. Bromwell, M.P.H.
Project Manager

EARTH TECH
A TYCO INTERNATIONAL LTD COMPANY

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
2.7142

February 4, 2000

Ms. Genevieve Salmonson, Director
Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Dear Ms. Salmonson:

Subject: Draft Environmental Assessment (DEA) for Halawa Stream Bridge Inbound Replacement, TMK 9-9-02 and 9-9-03, District of Ewa, Oahu, Hawaii, Federal-Aid Project No. BR-099-0-1(19)

The Department of Transportation, Highway Design Branch has reviewed the draft environmental assessment for the subject project, and anticipates a Finding of No Significant Impact (FONSI) determination. Please publish a notice of availability for this project in the February 23, 2000, OEQC Environmental Notice.

We have enclosed a completed OEQC Publication Form, four copies of the draft EA, and the project summary on disk. Please call Christine Yamasaki at 692-7572 if you have any questions and reference HWY-DD 2.7142 as noted above.

Very truly yours,

PERICLES MANTHOS
Administrator
Highways Division

Enclosure

BENJAMIN J. CAYETANO
GOVERNOR

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

GENEVIEVE SALMONSON
DIRECTOR

March 13, 2000

Pericles Manthos
Department of Transportation
Highways Division
601 Kamokila Blvd., Room 688
Kapolei, HI 96707

Attn: Christine Yamasaki

Dear Mr. Manthos:

Subject: Draft Environmental Assessment (EA) for Halawa Stream Bridge Replacement

We have the following comments:

1. Significant impact: An analysis of significant impact of this project is not included in the draft EA. In the final EA include a discussion of findings and reasons, according to the significance criteria listed in HAR 11-200-12, that supports your forthcoming determination, either a Finding of No Significant Impact (FONSI) or EIS preparation notice. You may use the enclosed sample as a guideline.

2. Alternate bridge design: An alternate design is one in which the pedestrian/bikeway is an attachment to the main body of the bridge and physically separated from the lanes for motor traffic. This design would require a smaller shoulder, reduce the overall width of the bridge and provide additional protection for foot and bike traffic. Has such a design been considered? In the final EA discuss the reasons for its rejection, along with any other design alternatives and reasons they have not been selected.

If you have any questions call Nancy Heinrich at 586-4185.

Sincerely,

GENEVIEVE SALMONSON
Director

Enc.

c: Karl Bromwell

700 Bishop Street, Suite 900, Honolulu, Hawaii 96813

Telephone
808 523-8874

Facsimile
808 523 8950

March 29, 2000

Genevieve Salmonson
Director
Office of Environmental Quality Control
235 South Beretania Street Suite 702
Honolulu, Hawaii, 96813

Subject: **Draft Environmental Assessment for Halawa Stream Bridge Inbound Replacement, District of Ewa, Oahu, Federal Aid Project No. BR-099-0-1(19)**

Dear Reviewer:

Thank you for your letter regarding the draft EA (DEA) for the proposed bridge replacement project. The final EA (FEA) has been amended to reflect your comments. We appreciate your efforts in reviewing the document and provide the following response your comments:

1. Regarding Significant Impact:

   Complied, an analysis of significant impacts has been added to the FEA. The text with an anticipated determination Finding of No Significant Impact (FONSI), can be found in section 5: Determination, Findings and Reasons for Supporting Determination.

2. Regarding alternative bridge design:

   The comment has been addressed in the FEA, section 2.4 Alternatives to the Proposed Plan. The alternate design suggested by OEQC, was not considered because Kamehameha Highway is classified as an urban arterial and according to Federal design standards, shoulders on urban arterials shall have a minimum width of 6-feet. However Halawa Stream Bridge is considered a "long bridge" and can have minimum shoulder widths of 4-feet. The current shoulder widths on Kamehameha Highway do not meet this requirement and need to be widened. Therefore rehabilitation of the existing bridge was chosen. Additionally, the majority of the novice bike traffic use the existing wood bridge, on the makai side of Halawa Stream Bridge, as it aligns somewhat with the existing Pearl Harbor Bikepath.

If there are any additional questions or comments regarding the report or proposed project, please call Mr. Karl Bromwell at 523-8874.

Very truly yours,

Earth Tech, Inc.

Karl B. Bromwell

Karl B. Bromwell, M.P.H.
Project Manager

EARTH TECH

A TYCO INTERNATIONAL LTD COMPANY

EARTH TECH

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

Mail Code WTR-9

February 4, 2000

Karl Bromwell
EARTHTECH
Honolulu, HI

OPTIONAL FORM 99 (7-90)
FAX TRANSMITTAL

To Karl Bromwell	From Hillary Hecht
Dept./Agency	Phone # 415 744-1890
Fax #	Fax #

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

Re: Halawa Stream Bridge Replacement Project

Mr. Bromwell:

Thank you for your fax of 2 February 2000 providing information about the mentioned project. The project is located within the SOBA Sole Source Aquifer designation. Under provisions of the Safe Drinking Water Act, Section 1424(e), EPA is charged with review of projects that receive federal financial assistance and are located in Sole Source Aquifer areas. This program is designed by Congress to assure that projects receiving federal financial assistance are constructed to prevent contamination of drinking water resources.

I am requesting additional information about the proposed project as follows.

1) Please confirm that the project involves federal financial assistance and indicate which federal agency is providing it.
If federal financial assistance is involved then;
2) Do any of the applicable environmental permits mentioned in your fax address construction phase stormwater runoff?

3) Does the long term project design account for any operational phase stormwater drainage provisions?

4) Your fax mentioned two aquifer identifications per Mink, 1990. Is the project is located within either of these aquifer designation areas? Please be specific.

5) If available, please provide a project location map of larger scale then in your mentioned fax.

When I receive this additional information, I will be better able to determine whether the project will adversely impact the Sole Source Aquifer.

If you have questions, do not hesitate to contact me at (415) 744-1890.

Sincerely,

Hillary Hecht
Hydrogeologist
Ground Water Office

[illegible] Bishop Street, Suite 900, Honolulu, Hawaii [illegible]

March 29, 2000

Hillary Hecht, Hydrogeologist
Groundwater Office
USEPA Region IX
75 Hawthorne Street
San Francisco, Ca 94108

Subject: **Draft Environmental Assessment for Halawa Stream Bridge Inbound Replacement, District of Ewa, Oahu, Federal Aid Project No. BR-099-0-1(19)**

Dear Mr. Hecht:

Thank you for your letters requesting additional information regarding the Halawa Bridge Replacement Project. Additionally, we appreciate your efforts in reviewing the draft EA (DEA). Please find below the following response to your written comments.

1. The State of Hawaii Department of Transportation, Highways Division (DOT-HD) and the Federal Highway Administration (FHWA) are jointly funding the project through the Statewide Transportation Improvement Program (see section 2.3 of the DEA).

2. Yes, although a NPDES Construction Permit is not required (size of affected area < 3 acres), a NPDES Construction Dewatering Permit is. This permit, the Clean Water Branch (CWB)-NOI Form G address construction phase stormwater runoff along with dewatering issues. The permit requires BMPs be prepared addressing the prevention or reduction of runoff and pollution of state waters through erosion and sediment controls The Department of Health (DOH) Section 401 Water Quality Certification (WQC) also requires the preparation of BMP-Pollution Prevention Plan along with a Water Quality Monitoring Plan to be implemented during construction. (These plans can be attached as an e-mail if required)

3. The Halawa Bridge widening project will not require any additional stormwater drainage provisions. The existing and functional stormwater approaches and culverts will remain in place. The existing drainage pattern in the vicinity of the bridge will remain the same after construction of the proposed bridge . The proposed deck grades will be superrelevated similar to the existing condition to direct runoff into existing inlets. Currently, there is an existing inlet situated on each side of the bridge approaches. Runoff intercepted by the existing inlets is then discharged directly back into Halawa Stream via existing lined spillway or culvert.

EARTH TECH

A [illegible] COMPANY

4. According to the Water Resources Research Center Map (faxed 8 1/2 x 14 Figures 1, 2 and 3) The Project is located within both these designated aquifers. I would like to reiterate that according to the description, these aquifers are not listed as a source of drinking water and the UIC line (State of Hawaii uses to delineate areas available for underground injection purposes) has been drawn basically to follow Kamehameha Hwy, which divides the bridge.

5. Hopefully the current figures within the DEA and the figures being sent with Aquifer information are a large enough scale for your purpose. If not please specify at what scale you require, so we might be able to generate this for you.

If there are any additional questions or comments regarding the report or proposed project, please call Mr. Karl Bromwell at 523-8874.

Very truly yours,

Earth Tech, Inc.

Karl B. Bromwell, M.P.H.
Project Manager

EARTH TECH

APR 07 '00 09:58 1 415 744 1873 PAGE 01

04/07/00 FRI 12:54 FAX 1 415 744 1873 EPA R9 WMD 001

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

Mail Code WTR-9

April 7, 2000

Karl Bromwell
EARTHTECH
700 Bishop Street, Suite 900
Honolulu, HI
96813

Re: Halawa Stream Bridge Replacement Project

Mr. Bromwell:

Thank you for your fax of 30 March 2000 providing additional information about the mentioned project. The project is located within the SOBA Sole Source Aquifer designation. Under provisions of the Safe Drinking Water Act, Section 1424(e), EPA is charged with review of projects that receive federal financial assistance and are located in Sole Source Aquifer areas. This program is designed by Congress to assure that projects receiving federal financial assistance are constructed to prevent contamination of drinking water resources.

Based on the information provided in the mentioned fax, it appears unlikely that the project will significantly impact the Sole Source Aquifer. Therefore, EPA approves of federal financial assistance for this project under provisions of the Safe Drinking Water Act, Section 1424(e).

If you have questions, do not hesitate to contact me at (415) 744-1890.

Sincerely,

Hillary Hecht
Hydrogeologist
Ground Water Office

FIRE DEPARTMENT

CITY AND COUNTY OF HONOLULU

3375 KOAPAKA STREET SUITE 425
HONOLULU HAWAII 96819-1869

JEREMY HARRIS
MAYOR

ATTILIO K. LEONARDI
FIRE CHIEF

JOHN CLARK
DEPUTY FIRE CHIEF

February 16, 2000

Mr. Karl B. Bromwell, M.P.H.
Project Manager
Earth Tech
700 Bishop Street, Suite 900
Honolulu, Hawaii 96813

Dear Mr. Bromwell:

Subject: Draft Environmental Assessment for Halawa Stream Bridge
Inbound Replacement
District of Ewa, Oahu
Federal Aid Project No. BR-099-0-1(19)

We received your letter dated February 7, 2000, regarding the Draft Environmental Assessment for the Halawa Stream Bridge Inbound Replacement project.

The Honolulu Fire Department requests that you comply with the following:

1. Maintain fire apparatus access throughout the construction site for the duration of the project.

2. Notify the Fire Communication Center (523-4411) of any interruption in the existing fire hydrant system during the project.

Should you have any questions, please call Battalion Chief Kenneth Silva of our Fire Prevention Bureau at 831-7778.

Sincerely,

ATTILIO K. LEONARDI
Fire Chief

AKL/KS:jo

700 Bishop Street, Suite 900, Honolulu, Hawaii 96813

Telephone
808.523.8874

Facsimile
808.523.8950

March 29, 2000

Attilio K. Leonardi, Fire Chief
City and County of Honolulu
Fire Department
3375 Koapaka Street, Suite H425
Honolulu, Hawaii 96819-1869

Subject: **Draft Environmental Assessment for Halawa Stream Bridge Inbound Replacement, District of Ewa, Oahu,
Federal Aid Project No. BR-099-0-1(19)**

Dear Reviewer:

Thank you for your letter regarding the draft EA (DEA) for the proposed bridge replacement project. The final EA (FEA) has been amended to reflect your comments. We appreciate your efforts in reviewing the document and provide the following response to your comments:

- Your comments have been addressed in section 3.13 Utilities and Infrastructure. Fire apparatus access will be maintained throughout the construction site for the duration of the project. The Fire Communication Center will be notified if there is any interruption in the existing fire hydrant system during the project.

If there are any additional questions or comments regarding the report or proposed project, please call Mr. Karl Bromwell at 523-8874.

Very truly yours,

Earth Tech, Inc.

Karl B. Bromwell

Karl B. Bromwell, M.P.H.
Project Manager

EARTH TECH

A TYCO INTERNATIONAL LTD. COMPANY

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

REPLY TO ATTENTION OF

February 24, 2000

Civil Works Technical Branch

Mr. Karl Bromwell
Earth Tech
700 Bishop Street, Suite 900
Honolulu, Hawaii 96813

Dear Mr. Bromwell:

Thank you for the opportunity to review and comment on the Draft Environmental Assessment (DEA) for the Halawa Stream Bridge Replacement Project, Ewa, Oahu (TMK 9-9-2 and 9-9-3). The following comments are provided in accordance with Corps of Engineers authorities to provide flood hazard information and to issue Department of the Army (DA) permits.

a. Based on the information provided, a DA permit will be required for the proposed work. For further information, please contact Ms. Lolly Silva of our Regulatory Branch staff at (808) 438-7023 and refer to file number 200000096.

b. The flood hazard information provided on page 39 of the DEA is correct.

Sincerely,

James Pennaz

James Pennaz, P.E.
Chief, Civil Works
Technical Branch

700 Bishop Street, Suite 900, Honolulu, Hawaii 96813

Telephone 808.523.8874
Facsimile 808.525.8450

March 29, 2000

James Pennaz, P.E.
Chief, Civil Works
Technical Branch
Department of the Army
U.S. Army Engineer District Honolulu
Ft. Shafter, Hawaii 96858-5440

Subject: **Draft Environmental Assessment for Halawa Stream Bridge Inbound Replacement, District of Ewa, Oahu, Federal Aid Project No. BR-099-0-1(19)**

Dear Reviewer:

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

- We have been in contact with Ms. Lolly Silva and are currently working on acquiring the appropriate permits for the proposed work at Halawa Stream Bridge.

If there are any additional questions or comments regarding the report or proposed project, please call Mr. Karl Bromwell at 523-8874.

Very truly yours,

Earth Tech, Inc.

Karl B Bromwell

Karl B. Bromwell
Project Manager

EARTH TECH
A EXCEL INTERNATIONAL LTD. COMPANY

DEPARTMENT OF DESIGN AND CONSTRUCTION

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 11TH FLOOR
HONOLULU, HAWAII 96813
PHONE: (808) 523-4564 • FAX: (808) 523-4567
WEB SITE ADDRESS: www.co.honolulu.hi.us

JEREMY HARRIS
MAYOR

GARY Q.L. YEE, AIA
DIRECTOR

ROLAND D. LIBBY, JR., AIA
DEPUTY DIRECTOR

March 1, 2000

DCP 2000-170

Mr. Karl Bromwell, Project Manager
Earth Tech
700 Bishop Street, Suite 900
Honolulu, Hawaii 96813

Dear Mr. Bromwell:

Subject: Draft Environmental Assessment
Halawa Stream Bridge Inbound

Thank you for the opportunity to review the subject draft environmental assessment. Our Department has no comments.

If there are any questions, please contact Gregory Hee at 527-6977.

Very truly yours,

FOR GARY Q.L. YEE, AIA
Director

700 Bishop Street, Suite 900, Honolulu, Hawaii 96813

Telephone
808.521.8874

Facsimile
808.521.8950

March 29, 2000

Gary Q.L. Yee, AIA
Director
Department of Design and Construction
650 South King Street, 11th Floor
Honolulu, Hawaii 96813

Subject: **Draft Environmental Assessment for Halawa Stream Bridge Inbound Replacement, District of Ewa, Oahu, Federal Aid Project No. BR-099-0-1(19)**

Dear Reviewer:

Thank you for your letter regarding the draft EA (DEA) for the proposed bridge replacement project. We appreciate your efforts in reviewing the document. Your letter will be included in the final EA (FEA) for the proposed project.

If there are any additional questions or comments regarding the report or proposed project, please call Mr. Karl Bromwell at 523-8874.

Very truly yours,

Earth Tech, Inc.

Karl B. Bromwell

Karl B. Bromwell, M.P.H.
Project Manager

EARTH TECH

A TYCO INTERNATIONAL LTD COMPANY

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Ecoregion
300 Ala Moana Boulevard, Room 3-122
Box 50088
Honolulu, Hawaii 96850

In Reply Refer To: FAK

MAR - 6 2000

Mr. Karl Bromwell
Earth Tech
700 Bishop Street, Suite 900
Honolulu, HI 96813

Re: Draft Environmental Assessment for Halawa Stream Bridge (Inbound) Replacement, Halawa, Oahu, Hawaii

Dear Mr. Bromwell:

The U.S. Fish and Wildlife Service (Service) has reviewed the Draft Environmental Assessment (DEA) for the Halawa Stream Bridge (Inbound) Replacement, Halawa, Oahu, Hawaii. The project sponsor is the Highways Division of the State of Hawaii Department of Transportation. The proposed project includes demolition of the existing bridge, and construction of three 12-foot travel lanes, two 5-foot shoulders, one 2-foot shoulder, a 6-foot sidewalk for pedestrian access, and a temporary two-lane detour bridge to accommodate traffic during demolition and construction. The demolition and construction phases will require temporary, limited stream channelization and backfilling around prefabricated culverts. The Service offers the following comments for your consideration.

We have reviewed the information provided in the DEA and in our own files. To the best of our knowledge, no Federally endangered, threatened, or candidate species, significant wetlands, or other Federal trust resources occur at the immediate project site, nor at any point immediately near the proposed project site. Although migratory shorebirds such as the Pacific golden plover (*Pluvialis fulva*), black-crowned night heron (*Nycticorax nycticorax hoactli*), and wandering tattler (*Heteroscelus incanus*) may occur the vicinity of the proposed project, we do not anticipate any project-related impacts to these species.

The Service supports best management practices and other measures to minimize damage to the stream and marine environments below the proposed project site. Specifically, we support the reduction of potential turbidity due to construction with the use of effective silt containment devices surrounding the work site, and re-vegetation of cleared ground with native plants as soon as possible after clearing. The Service recommends that the following measures be incorporated into the project to further minimize the degradation of water quality and impacts to fish and wildlife resources:

a. No project-related materials should be stockpiled in the stream environment;

b. All project-related equipment placed in water should be free of pollutants;

c. No contamination of the downstream environments (trash or debris disposal, etc.) should result from project-related activities; and

d. A contingency plan to control petroleum products accidentally spilled during the project should be developed. Absorbent pads and containment booms should be stored on-site to facilitate clean-up of petroleum spills.

The Service believes the incorporation of these measures into the project will greatly minimize the potential for project-related adverse impacts to fish and wildlife resources. We appreciate the opportunity to comment on the proposed project. If you have questions regarding these comments, please contact Fish and Wildlife Biologist James Kwon by telephone at 808/541-3441 or by facsimile transmission at 808/541-3470.

Sincerely,

Paul Henson
Field Supervisor
Ecological Services

CC: NMFS-PAO, Honolulu
USEPA-Region IX, Honolulu
DAR, Hawaii
CZMP, Hawaii
CWB, Hawaii
CWRM, Hawaii

700 Bishop Street, Suite 900, Honolulu, Hawaii 96813

Telephone
808.523.8874

Facsimile
808.523.8950

March 29, 2000

Paul Henson, Field Supervisor
Ecological Services
Fish and Wildlife Services
300 Ala Moana Blvd., Room 3-122
Box 50088
Honolulu, Hawaii 96850

Subject: **Draft Environmental Assessment for Halawa Stream Bridge Inbound Replacement, District of Ewa, Oahu, Federal Aid Project No. BR-099-0-1(19)**

Dear Reviewer:

Thank you for your letter regarding the draft EA (DEA) for the proposed bridge replacement project. The final EA (FEA) has been amended to reflect your comments. We appreciate your efforts in reviewing the document and provide the following response to your comments:

- Comments a. through d. are addressed as part of the site-specific Best Management Practices Plan and Water Quality Monitoring Plan. Pollution prevention measures are also incorporated as part of the permit application process for Corps of Engineers 404 Permit, 401 Water Quality Certification, National Pollutant Discharge Elimination System Dewatering Permit, and State Stream Channel Alteration Permit.

If there are any additional questions or comments regarding the report or proposed project, please call Mr. Karl Bromwell at 523-8874.

Very truly yours,

Earth Tech, Inc.

Karl B. Bromwell

Karl B. Bromwell, M.P.H.
Project Manager

EARTH TECH

A TYCO INTERNATIONAL LTD. COMPANY

DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET • HONOLULU, HAWAII 96813
TELEPHONE (808) 523-4414 • FAX (808) 527-6743 • INTERNET www.co.honolulu.hi.us/planning

JEREMY HARRIS
MAYOR

RANDALL K. FUJIKI, AIA
DIRECTOR

ARTHUR C. CHIEF
DEPUTY DIRECTOR

2000/CLOG-766(DT)

March 6, 2000

Karl B. Bromwell, M.P.H.
Project Manager
Earth Tech, Inc.
700 Bishop Street, Suite 900
Honolulu, Hawaii 96813

Dear Mr. Bromwell:

Draft Environmental Assessment (EA)
Halawa Stream Bridge Inbound Replacement

Thank you for the opportunity to review the above Draft EA. We have the following comments:

1. The EA incorrectly states that the project is not within the Special Management Area (SMA). The project is within the SMA, but we were unable to determine whether the entire project area is within the SMA. The final EA should be corrected to state that the project is within the SMA and that a Special Management Area Use Permit (SMP) will be required. Also, the extent of the project within the SMA (i.e., entirely within, partially) needs to be determined.

2. As the project is within the SMA, a "Coastal View" section should be added to the EA in order to satisfy Chapter 25, Revised Ordinances of Honolulu requirements. This section must include the coastal views from surrounding public viewpoints and from the project area to the ocean.

3. The existing measurements of the bridge (width, length, height, etc.) should be mentioned in the final EA.

4. What is the height of the new bridge? Also, what is the distance of the new bridge to the ocean?

5. The tax map keys should be included in the EA.

Please call Ms. Dana Teramoto at 523-4648 if you have any questions regarding this letter.

Sincerely yours,

for RANDALL K. FUJIKI, AIA
Director of Planning
and Permitting

RKF:am

halawabr.cjt

700 Bishop Street, Suite 900, Honolulu, Hawaii 96813

Telephone
808.523.8874

Facsimile
808.523.8950

March 29, 2000

Randall K. Fujiki, AIA
Director
City and County of Honolulu
Department of Planning and Permitting
650 South King Street
Honolulu, Hawaii 96813

Subject: **Draft Environmental Assessment for Halawa Stream Bridge Inbound Replacement, District of Ewa, Oahu, Federal Aid Project No. BR-099-0-1(19)**

Dear Reviewer:

Thank you for your letter regarding the Draft EA (DEA) for the proposed bridge replacement project. The Final EA (FEA) has been amended to reflect your comments and clarification of the proposed widening project mauka (toward the outbound lane) within the State right-of-way, (see attached right-of-way plan from State DOT). We appreciate your efforts in reviewing the document and provide the following response to both your written comments and phone conversations between Karl Bromwell and Ms. Teramoto.

1. As the bridge currently stands it is partially in the Special Management Area (SMA) and will be identified as such in section 1.2.5 of the FEA. However, for several reasons we were under the impression that our project was exempt from the SMA permit. Foremost being that according to Chapter 25-1.3 of the Revised Ordinance of Honolulu (ROH) "Development" does not include: (B) the repair or maintenance of roads and highways within existing right-of-ways and (F) repair, maintenance or interior alterations to existing structures. In addition as per section 25-3.2, review guidelines, the development will not have any substantial, adverse environmental or ecological effect except as such adverse effect is minimized to the extent practicable (see attached Best Management Practices Pollution Prevention Plan with attached Water Quality monitoring Plan) and clearly outweighed by public health and safety, or compelling public interest. Please see the Halawa DEA page 17, section 2.2 Proposed Action regarding the bridge being upgraded to meet present day HL-93 design vehicular live load and railings that meet vehicular collision force of test level 4.

2. If, as noted in previous response, this project is granted a SMA exemption by Department of Planning and Permitting (DPP), then the "coastal view" requirement of Chapter 25 ROH, need not be satisfied.

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3. Complied, text regarding the existing measurements of the bridge have been added to section 3.4 of the FEA. Attached is a figure plan from the DOT, it is basically the same as Figure 2.5 in the DEA. The new bridge will be approximately 11-feet wider (57 feet) than the existing bridge (46 feet). The bridge will be widened mauka, into the median area and the state right-of-way.

4. Complied, text regarding the height above mean sea level and distance from shoreline have been added to FEA. The existing bridge is and the replacement bridge will remain at 15-feet above mean sea level and is approximately 1,000 feet from the Pearl Harbor shoreline.

5. As discussed with Ms. Teramoto, figure 3.2 is sufficient.

If there are any additional questions or comments regarding the report or proposed project, please call Mr. Karl Bromwell at 523-8874.

Very truly yours,

Earth Tech, Inc.

Karl B. Bromwell

Karl B. Bromwell, M.P.H.
Project Manager

Requested Attachments:
- Halawa bridge figure plan from DOT
- Right-of-way plan from DOT
- BMPs
- Water Quality Monitoring Plan

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POLICE DEPARTMENT

CITY AND COUNTY OF HONOLULU

301 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96813 - AREA CODE (808) 529-3111
http://www.honolulupd.org
www.co.honolulu.hi.us

JEREMY HARRIS
MAYOR

LEE D. DONOHUE
CHIEF

MICHAEL CARVALLO
ROBERT GU
DEPUTY CHIEFS

OUR REFERENCE CS-DL

March 8, 2000

Mr. Karl B. Bromwell, M.P.H.
Project Manager, Earth Tech
700 Bishop Street, Suite 900
Honolulu, Hawaii 96813

Dear Mr. Bromwell:

Subject: Draft Environmental Assessment for Halawa Stream Bridge Inbound Replacement, District of Ewa, Oahu
Federal Aid Project No. BR-099-0-1(19)

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

Complaints relative to traffic congestion are inevitable and will have a major impact on calls for police service to the area during the construction phase of this project.

If there are any questions, please call me at 529-3255 or Captain Stephen Kim of District 3 at 455-9055.

Sincerely,

LEE D. DONOHUE
Chief of Police

By
EUGENE UEMURA
Assistant Chief
Support Services Bureau

700 Bishop Street, Suite 900, Honolulu, Hawaii 96813

Telephone 808.523.8874

Facsimile 808.523.8950

March 29, 2000

Lee D. Donohue, Chief of Police
City & County of Honolulu
Police Department
801 South Beretania Street
Honolulu, HI 96813

Subject: **Draft Environmental Assessment for Halawa Stream Bridge Inbound Replacement, District of Ewa, Oahu,
Federal Aid Project No. BR-099-0-1(19)**

Dear Reviewer:

Thank you for your letter regarding the draft EA (DEA) for the proposed bridge replacement project. We appreciate your efforts in reviewing the document. Your letter will be included in the final (FEA) for the proposed project.

If there are any additional questions or comments regarding the report or proposed project, please call Mr. Karl Bromwell at 523-8874.

Very truly yours,

Earth Tech, Inc.

Karl B. Bromwell

Karl B. Bromwell, M.P.H.
Project Manager

EARTH TECH
A AECOM INTERNATIONAL LTD COMPANY

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

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

BRUCE S. ANDERSON, Ph.D., M.P.H.
DIRECTOR OF HEALTH

In reply, please refer to
File:

March 9, 2000 00-027/epo

Mr. Karl B. Bromwell, M.P.H.
Project Manager
Earth Tech
700 Bishop Street, Suite 900
Honolulu, Hawaii 96813

Dear Mr. Bromwell:

Subject: Draft Environmental Assessment (DEA)
Halawa Stream Bridge Inbound Replacement
Kamehameha Highway
District of Ewa, Oahu
Federal Aid Project No. BR-099-0-1(19)

Thank you for allowing us to review and comment on the subject project. We have the following comments to offer:

Noise Concerns

1. Activities associated with the construction phase of the project must comply with the Department of Health's Administrative Rules, Chapter 11-46, "Community Noise Control."

   a. The contractor must obtain a noise permit if the noise levels from the construction activities are expected to exceed the allowable levels of the rules as stated in Section 11-46-6(a).

   b. Construction equipment and on-site vehicles requiring an exhaust of gas or air must be equipped with mufflers as stated in Section 11-46-6(b)(1)(A).

   c. The contractor must comply with the requirements pertaining to construction activities as specified in the rules and the conditions issued with the permit as stated in Section 11-46-7(d)(4).

2. Heavy vehicles travelling to and from the project site must comply with the provisions of the Administrative Rules, Chapter 11-42, "Vehicular Noise Control for Oahu."

Should there be any questions on this matter, please call Mr. Jerry Haruno, Environmental Health Program Manager of the Noise, Radiation and Indoor Air Quality Branch at 586-4701.

Sincerely,

GARY GILL
Deputy Director for
Environmental Health

c: NR&IAQB
OEQC

700 Bishop Street, Suite 900, Honolulu, Hawaii 96813

Telephone
808.523.8874

Facsimile
808.523.8944

March 29, 2000

Gary Gill, Deputy Director
For Environmental Health
Department of Health
P.O. Box 3378
Honolulu, Hawaii 96801

Subject: **Draft Environmental Assessment for Halawa Stream Bridge Inbound Replacement, District of Ewa, Oahu, Federal Aid Project No. BR-099-0-1(19)**

Dear Reviewer:

Thank you for your letter regarding the draft EA (DEA) for the proposed bridge replacement project. The final EA (FEA) has been amended to reflect your comments. We appreciate your efforts in reviewing the document and provide the following response to your comments:

- As described in section 3.9 Noise, if construction activities are expected to exceed the allowable noise levels, appropriate permits will be acquired and all construction will comply with Hawaii Administrative Rules, Chapter 11-46 and 11-42.

If there are any additional questions or comments regarding the report or proposed project, please call Mr. Karl Bromwell at 523-8874.

Very truly yours,

Earth Tech, Inc.

Karl B Bromwell

Karl B. Bromwell, M.P.H.
Project Manager

EARTH TECH

A TYCO INTERNATIONAL LTD COMPANY

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96843

March 17, 2000

Mr. Karl Bromwell
Earth Tech
700 Bishop Street, Suite 900
Honolulu, Hawaii 96813

Dear Mr. Bromwell:

Subject: Your Letter of February 7, 2000 Regarding the Draft Environmental Assessment for the Halawa Stream Bridge Inbound Replacement Project, Halawa, Oahu, TMK: 9-9-02: 04, 9-9-03: 26, 29 and 56

Thank you for the opportunity to review and comment on the Draft Environmental Assessment for the proposed bridge replacement project.

We have no comments to offer as there are no water utilities within the project limits.

If you have any questions, please contact Kathryn Kami at 527-5221.

Very truly yours,

CLIFFORD S. JAMILE
Manager and Chief Engineer

700 Bishop Street, Suite 900, Honolulu, Hawaii 96813

Telephone
808 523-8874

Facsimile
808 524-8450

March 29, 2000

Clifford S. Jamille
Manager and Chief Engineer
Board of Water Supply
City and County of Honolulu
630 South Beretania Street
Honolulu, HI 96843

Subject: **Draft Environmental Assessment for Halawa Stream Bridge Inbound Replacement, District of Ewa, Oahu, Federal Aid Project No. BR-099-0-1(19)**

Dear Reviewer:

Thank you for your letter regarding the draft EA (DEA) for the proposed bridge replacement project. We appreciate your efforts in reviewing the document. Your letter will be included in the final EA (FEA) for the proposed project.

If there are any additional questions or comments regarding the report or proposed project, please call Mr. Karl Bromwell at 523-8874.

Very truly yours,

Earth Tech, Inc.

Karl B. Bromwell

Karl B. Bromwell, M.P.H.
Project Manager

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CORRECTION

THE PRECEDING DOCUMENT(S) HAS BEEN REPHOTOGRAPHED TO ASSURE LEGIBILITY
SEE FRAME(S)
IMMEDIATELY FOLLOWING

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96843

March 17, 2000

Mr. Karl Bromwell
Earth Tech
700 Bishop Street, Suite 900
Honolulu, Hawaii 96813

Dear Mr. Bromwell:

Subject: Your Letter of February 7, 2000 Regarding the Draft Environmental Assessment for the Halawa Stream Bridge Inbound Replacement Project, Halawa, Oahu, TMK: 9-9-02: 04, 9-9-03: 26, 29 and 56

Thank you for the opportunity to review and comment on the Draft Environmental Assessment for the proposed bridge replacement project.

We have no comments to offer as there are no water utilities within the project limits.

If you have any questions, please contact Kathryn Kami at 527-5221.

Very truly yours,

CLIFFORD S. JAMILE
Manager and Chief Engineer

700 Bishop Street, Suite 900, Honolulu, Hawaii 96813

Telephone
808 523-8874

Facsimile
808 523-8950

March 29, 2000

Clifford S. Jamille
Manager and Chief Engineer
Board of Water Supply
City and County of Honolulu
630 South Beretania Street
Honolulu, HI 96843

Subject: **Draft Environmental Assessment for Halawa Stream Bridge Inbound Replacement, District of Ewa, Oahu, Federal Aid Project No. BR-099-0-1(19)**

Dear Reviewer:

Thank you for your letter regarding the draft EA (DEA) for the proposed bridge replacement project. We appreciate your efforts in reviewing the document. Your letter will be included in the final EA (FEA) for the proposed project.

If there are any additional questions or comments regarding the report or proposed project, please call Mr. Karl Bromwell at 523-8874.

Very truly yours,

Earth Tech, Inc.

Karl B. Bromwell

Karl B. Bromwell, M.P.H.
Project Manager

EARTH TECH

A TYCO INTERNATIONAL LTD. COMPANY

United States Department of the Interior

NATIONAL PARK SERVICE
USS Arizona Memorial
1 Arizona Memorial Place
Honolulu, Hawaii 96818

IN REPLY REFER TO

L7621

March 22, 2000

Mr. Karl Bromwell
Earth Tech
700 Bishop Street, Suite 900
Honolulu, Hawaii 96813

Dear Mr. Bromwell:

We have reviewed the Draft Environmental Assessment for the Halawa Stream Bridge Replacement project and have the following comments:

Page 78: Section 4.8 Mitigation Measures – regarding the possible baseyarding of equipment in the southern most end of the Arizona Memorial parking lot. Due to the limited capacity of our parking lots and the high demand for the use of these lots by the visiting public, the baseyarding of equipment in the USS Arizona Memorial parking lots will not be possible. We suggest that you contact Navy regarding the feasibility of the overflow dirt lot adjacent to the Bowfin Submarine museum or the area immediately adjacent to the old ferry landing. Also for your information, the USS Arizona Memorial commercial bus parking lot in front of the visitor center adjacent to Kamehameha Highway is scheduled for repair/rehabilitation in the fall 2000/winter 2001.

If you have any questions regarding these comments, please contact me at (808) 422-2771, ext. 114.

Sincerely,

Kathleen J. Billings

Kathleen J. Billings
Superintendent

cc: Randy Miyashiro, Navy Region Hawaii

700 Bishop Street, Suite 900, Honolulu, Hawaii 96813

Telephone 808.524.8874

Facsimile 808.524.8950

March 29, 2000

Kathleen Billings, Superintendent
USS Arizona Memorial
1 Arizona Memorial Place
Honolulu, Hawaii 96818

Subject: **Draft Environmental Assessment for Halawa Stream Bridge Inbound Replacement, District of Ewa, Oahu, Federal Aid Project No. BR-099-0-1(19)**

Dear Reviewer:

Thank you for your letter regarding the draft EA (DEA) for the proposed bridge replacement project. The final (FEA) has been amended to reflect your comments. We appreciate your efforts in reviewing the document and provide the following response to your comments:

- The statement regarding the possible baseyarding of equipment in your parking area has been removed.
- Thank you for the information regarding the pending work on the repair of the parking area near Halawa Bridge and for the suggestion about the contacting the Navy regarding the feasibility of baseyarding equipment, we are looking into this option.

If there are any additional questions or comments regarding the report or proposed project, please call Mr. Karl Bromwell at 523-8874.

Very truly yours,

Earth Tech, Inc.

Karl B. Bromwell

Karl B. Bromwell, M.P.H.
Project Manager

EARTH TECH

A TYCO INTERNATIONAL LTD COMPANY

DEPARTMENT OF THE NAVY
COMMANDER
NAVY REGION HAWAII
517 RUSSELL AVENUE
PEARL HARBOR, HAWAII 96860-4884

IN REPLY REFER TO:
5090
Ser N465/ 16664
23 March 2000

Mr. Karl Bromwell
Earth Tech
700 Bishop Street, Suite 900
Honolulu, HI 96813

Dear Mr. Bromwell:

Subj: DRAFT ENVIRONMENTAL ASSESSMENT FOR HALAWA STREAM BRIDGE INBOUND REPLACEMENT, DISTRICT OF EWA, OAHU FEDERAL AID PROJECT NO. BR-099-0-1(19)

Thank you for your letter of February 17, 2000 soliciting the Navy's comments on the environmental assessment (EA) for the Halawa Stream Bridge replacement project. As requested, the Navy has completed its review of the EA and our comments and recommendations are attached.

The Navy's point of contact for this matter is Mr. Randy Miyashiro. Should you require additional information, he can be contacted at 471-1171 extension 233.

Sincerely,

C. K. Yokota

C. K. YOKOTA
REC Engineer
Regional Environmental Department
By direction of the Commander

Encl:
(1) Navy Comments on Subject EA

24 March, 2000

Organization/Code: Commander, Navy Region Hawaii
Project Title: DEA for Halawa Stream Bridge Inbound Replacement

No.	Page	Section/ Para. No.	Comment
1.	32	Section 3.3 3rd Para.	Delete last sentence in paragraph regarding location of site records for review. The Navy does not mind disclosing location of archaeological sites that are available in the public record (i.e. fishponds). However some data provided to the SHPD were provided during development of studies and plans and are not for public release under FOIA as mentioned.
2.	35	Section 3.5	Pearl Harbor has had a jurisdictional wetland delineation survey completed by the ACOE in December 1999. They identified the areas between the inbound and outbound bridges as a wetland.
3.	73	Section 4.3	The Pearl Harbor National Historic Landmark should be mentioned here or in Section 3.3. Although your project is not expected to impact the historic character of the Landmark, the APE extends into the Landmark. Note: The Landmark boundary runs along the Pearl Harbor fence line on the makai side of Kamehameha Highway through the project site.)
4.			

700 Bishop Street, Suite 900, Honolulu, Hawaii 96813

Telephone
808.523.8874

Facsimile
808.524.8950

March 29, 2000

Commander
Navy Region Hawaii
517 Russell Avenue
Pearl Harbor, Hawaii 96860-4884

Subject: **Draft Environmental Assessment for Halawa Stream Bridge Inbound Replacement, District of Ewa, Oahu, Federal Aid Project No. BR-099-0-1(19)**

Dear Reviewer:

Thank you for your letter regarding the draft EA (DEA) for the proposed bridge replacement project. The final (FEA) has been amended to reflect your comments. We appreciate your efforts in reviewing the document and provide the following response to your comments:

1. Complied, the sentence in section 3.3 regarding location of archaeological site records for review has been removed.

2. Complied, section 3.5 has been updated to reflect the identified areas between the inbound and outbound bridges as wetland, per the ACOE wetland delineation survey of December 1999.

3. Complied, in section 4.3 the Pearl Harbor National Historic Landmark has been mentioned as being a part of the APE.

If there are any additional questions or comments regarding the report or proposed project, please call Mr. Karl Bromwell at 523-8874.

Very truly yours,

Earth Tech, Inc.

Karl B. Bromwell

Karl B. Bromwell, M.P.H.
Project Manager

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