DAVID Y. IGE
GOVERNOR

FILE COPY
APR 23 2017

FORD N. FUCHIGAMI
DIRECTOR

Deputy Directors
JADE T. BUTAY
ROSS M. HIGASHI
EDWIN H. SNIFFEN
DARRELL T. YOUNG

IN REPLY REFER TO:

HWY-K 4.170159

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
KAUAI DISTRICT
1720 HALEUKANA STREET
LIHUE, HAWAII 96766

April 10, 2017

RECEIVED
'17 APR 11 A11:37
OFC. OF ENVIRONMENTAL QUALITY CONTROL

TO: SCOTT GLENN, DIRECTOR
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
DEPARTMENT OF HEALTH

FROM: LAWRENCE J. DILL
KAUAI DISTRICT ENGINEER

SUBJECT: KŪHIŌ HIGHWAY, REPLACEMENT OF HANAMĀ'ULU (KAPAIA) STREAM BRIDGE
(KAPAIA BRIDGE REPLACEMENT)
DISTRICT OF LIHUE, ISLAND OF KAUAI
HANAMĀ'ULU AHUPUA'A
FEDERAL AID PROJECT NO. BR-056-1(48)
TAX MAP KEY(S): (4)3-8-002:999 (POR.), 001 (POR.), 012; (4)3-7-001:001 (POR.); (4)3-7-004:009 (POR.); (4)3-8-006:999 (POR.)

The State of Hawai'i Department of Transportation hereby transmits the final environmental assessment and finding of no significant impact (FEA-FONSI) for the Kūhiō Highway, Replacement of Hanamā'ulu (Kapaia) Stream Bridge situated in the Līhu'e District on the island of Kaua'i for publication in the next available edition of the Environmental Notice.

The State of Hawai'i Department of Transportation has included copies of comments and responses that it received during the 30-day public comment period on the draft environmental assessment and anticipated finding of no significant impact (DEA-AFONSI).

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

If there are any questions, please contact Ray McCormick, District Design Engineer at 808-241-3015, or via email at raymond.j.mccormick@hawaii.gov.

FR:es

c: FHWA (Meesa Otani) (w/o attachments)
HWY-DE
Wilson Okamoto Corporation (Milton Arakawa)

17-435

AGENCY
PUBLICATION FORM

Project Name:	Kūhiō Highway, Replacement of Hanamā'ulu (Kapaia) Stream Bridge
Project Short Name:	Kapaia Bridge Replacement
HRS §343-5 Trigger(s):	State lands and funds
Island(s):	Kaua'i
Judicial District(s):	Līhu'e
TMK(s):	Kūhiō Highway right-of-way (por.), TMK: 3-7-001:001 (por.), 3-7-004:009(por.), 3-8-002:001 (por.), 012
Permit(s)/Approval(s):	Section 404 Permit, Compliance with Executive Order 11988, Floodplain Management, Section 7 of the Endangered Species Act, Section 106 of the National Historic Preservation Act, Section 4(f) of the Department of Transportation Act of 1966, Section 401 Water Quality Certification, Community Noise Permit, National Pollutant Discharge Elimination System Permit, Chapter 6E HRS, Stream Channel Alteration Permit, Coastal Zone Management Federal Consistency, Grading and Grubbing Permits, Permit to Perform Work within County Right of Way
Proposing/Determining Agency:	State of Hawai'i Department of Transportation
Contact Name, Email, Telephone, Address	Raymond J. McCormick, P.E. 1720 Haleukana Street Līhu'e, HI 96766 Telephone: (808) 241-3015 Raymond.J.McCormick @hawaii.gov
Accepting Authority:	(for EIS submittals only)
Contact Name, Email, Telephone, Address	
Consultant:	Wilson Okamoto Corporation
Contact Name, Email, Telephone, Address	Milton Arakawa 1907 South Beretania Street, Suite 400 Honolulu, HI 96826 Telephone: (808) 946-2277 marakawa@wilsonokamoto.com

Status (select one)	**Submittal Requirements**
____ DEA-AFNSI	Submit 1) the proposing agency notice of determination/transmittal letter on agency letterhead, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the DEA, and 4) a searchable PDF of the DEA; a 30-day comment period follows from the date of publication in the Notice.
_X__ FEA-FONSI	Submit 1) the proposing agency notice of determination/transmittal letter on agency letterhead, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the FEA, and 4) a searchable PDF of the FEA; no comment period follows from publication in the Notice.
____ FEA-EISPN	Submit 1) the proposing agency notice of determination/transmittal letter on agency letterhead, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the FEA, and 4) a searchable PDF of the FEA; a 30-day comment period follows from the date of publication in the Notice.
____ Act 172-12 EISPN ("Direct to EIS")	Submit 1) the proposing agency notice of determination letter on agency letterhead and 2) this completed OEQC publication form as a Word file; no EA is required and a 30-day comment period follows from the date of publication in the Notice.
____ DEIS	Submit 1) a transmittal letter to the OEQC and to the accepting authority, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the DEIS, 4) a searchable PDF of the DEIS, and 5) a searchable PDF of the distribution list; a 45-day comment period follows from the date of publication in the Notice.
____ FEIS	Submit 1) a transmittal letter to the OEQC and to the accepting authority, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the FEIS, 4) a searchable PDF of the FEIS, and 5) a

	searchable PDF of the distribution list; no comment period follows from publication in the Notice.
____ FEIS Acceptance Determination	The accepting authority simultaneously transmits to both the OEQC and the proposing agency a letter of its determination of acceptance or nonacceptance (pursuant to Section 11-200-23, HAR) of the FEIS; no comment period ensues upon publication in the Notice.
FEIS Statutory Acceptance	Timely statutory acceptance of the FEIS under Section 343-5(c), HRS, is not applicable to agency actions.
____ Supplemental EIS Determination	The accepting authority simultaneously transmits its notice to both the proposing agency and the OEQC that it has reviewed (pursuant to Section 11-200-27, HAR) the previously accepted FEIS and determines that a supplemental EIS is or is not required; no EA is required and no comment period ensues upon publication in the Notice.
____ Withdrawal	Identify the specific document(s) to withdraw and explain in the project summary section.
____ Other	Contact the OEQC if your action is not one of the above items.

Project Summary

Provide a description of the proposed action and purpose and need in 200 words or less.

The State of Hawai'i Department of Transportation (HDOT) proposes to replace the existing Kapaia Bridge that crosses Hanamā'ulu Stream. The replacement bridge will be designed to meet current standards for lane widths and load-carrying capacity. Proposed improvements include two eleven to twelve foot travel lanes for vehicular traffic along with a five to six foot bike lane and a five to six foot concrete sidewalk on each side of the bridge to accommodate bicycle and pedestrian traffic. The existing approaches will also be improved to provide a smooth transition to the new replacement bridge. Alternative 3, a new single-span replacement bridge along the existing alignment with a mauka detour bridge is the proposed preferred alternative.

Final Environmental Assessment – Finding of No Significant Impact

Kūhiō Highway, Replacement of Hanamā‘ulu (Kapaia) Stream Bridge

(Kapaia Bridge Replacement)

District of Līhu‘e, Kaua‘i, Hawai‘i

Source: KPFF Consulting Engineers

Prepared For

STATE OF HAWAI‘I
DEPARTMENT OF TRANSPORTATION

Prepared By

WILSON OKAMOTO CORPORATION

April 2017

FINAL ENVIRONMENTAL ASSESSMENT – FINDING OF NO SIGNIFICANT IMPACT

KŪHIŌ HIGHWAY, REPLACEMENT OF HANAMĀʻULU (KAPAIA) STREAM BRIDGE (KAPAIA BRIDGE REPLACEMENT)

District of Līhuʻe
Island of Kauaʻi, State of Hawaiʻi

Federal Aid Project No. BR-56-01(48)

Prepared For:

State of Hawaiʻi
Department of Transportation
1720 Haleukana Street
Līhuʻe, Hawaiʻi 96766

Prepared By:

Wilson Okamoto Corporation
Engineers and Planners
1907 South Beretania Street, Suite 400
Honolulu, Hawaiʻi 96826
WOC Job No. 7208-01

APRIL 2017

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

Page

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

PREFACE

This Final Environmental Assessment (EA) / Finding of No Significant Impact (FONSI) has been prepared to satisfy the requirements of Chapter 343, Hawai‘i Revised Statutes, and Title 11, Chapter 200, Hawai‘i Administrative Rules (HAR), State Department of Health. The State of Hawai‘i Department of Transportation (HDOT) is proposing to replace the existing Kapaia Bridge in the Līhu‘e District of the Island of Kaua‘i. The project requires the use of State funds; therefore, the project is subject to the State environmental review process.

In addition to State funds, Federal Highway Administration (FHWA) funds will also be used for the construction of the Kapaia Bridge improvements. Separate environmental review documentation will be prepared for the proposed Project to satisfy the requirements of the National Environmental Policy Act (NEPA) of 1969, as amended, (Pub. L. 91-190, 42 U.S. Code 4321-4347), Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA, (40 Code of Federal Regulations 1500-1508), and 23 Code of Federal Regulations Part 771, Environmental Impact and Related Procedures.

The proposed action assessed herein is for the replacement of the existing Kapaia Bridge. The replacement bridge will be designed to meet current standards for lane widths and load-carrying capacity. A smooth transition between the existing road and the new replacement bridge will be made by either widening or replacing the existing approaches. The proposed preferred alternative is Alternative 3, a new single-span replacement bridge along the existing alignment with a mauka detour bridge. This EA is proposing a Finding of No Significant Impact (FONSI) as no significant impacts are anticipated as a result of implementing the proposed project.

This page is intentionally left blank

SUMMARY

Proposing Agency:	State of Hawai‘i, Department of Transportation, Highways Division
Location:	Līhu‘e, Kaua‘i, Hawai‘i
Tax Map Keys (TMKs):	Kūhiō Highway Right-of-Way (por.), 3-7-001:001 (por.), 3-7-004:009 (por.) and (4) 3-8-002:001 (por.)
Recorded Fee Owner:	State of Hawai‘i and Grove Farm Company, Inc.
Existing Use:	A three-span concrete girder bridge supporting the public roadway over the Hanamā‘ulu Stream
State Land Use Classification:	Agricultural, Urban
General Plan Designation:	Residential Community
County Zoning Designation:	Agriculture, Open, R-4
Proposed Action:	The State of Hawai‘i Department of Transportation (HDOT) proposes to replace the existing Kapaia Bridge that crosses Hanamā‘ulu Stream. The replacement bridge will be designed to meet current standards for lane widths and load-carrying capacity. Proposed improvements include two eleven to twelve foot travel lanes for vehicular traffic, one in each direction, along with a five to six foot bike lane and a five to six foot concrete sidewalk on each side of the bridge to accommodate bicycle and pedestrian traffic. The existing approaches will also be improved to provide a smooth transition to the new replacement bridge. Alternative 3, a new single-span replacement bridge along the existing alignment with a mauka detour bridge is the proposed preferred alternative.
Impacts:	In order to address migration of native stream fauna, construction will be phased such that the entire stream is not blocked at one time. In addition, applicable BMPs will be incorporated during the construction phase to prevent degradation of the quality of the water during construction.

The archaeological inventory survey revealed 11 cultural resources in the area. They are of historic and indeterminate age, most likely associated with the sugar plantation and plantation camps. The majority of the sites deal with transportation, whether mechanical, pedestrian or water. All of the cultural resources are classified under Criterion "D". No further historic preservation work is recommended. Sufficient information regarding the location, extent, function, age, and construction methods of these cultural resources has been generated during the archaeological inventory survey investigation to mitigate any adverse effect caused by development activities.

Kapaia Bridge itself is considered eligible for the National Register of Historic Places. However, Kapaia Bridge is located on the principal arterial highway on the island and is in close proximity to Wilcox Medical Center. It provides a crucial transportation link between west, central and east Kaua'i and is currently in substandard condition. The bridge is functionally obsolete with travel lanes and shoulder widths being too narrow to meet current standards. Alternate transportation modes are also not addressed. In addition, the bridge is structurally deficient as it does not meet load-carrying capacity standards and the bridge superstructure is rated in poor condition. Thus, Kapaia Bridge's superstructure, geometry and load-carrying capacity are inadequate making construction of a new bridge a more feasible and prudent use of public funds.

There are potential short term impacts to noise and air quality during the construction period. Construction noise and air quality impacts will be minimized by compliance with applicable Department of Health Rules.

Determination: Finding of No Significant Impact (FONSI)

Parties Consulted During Pre-Assessment:

Federal Agencies
U.S. Army Corps of Engineers (COE)

U.S. Fish and Wildlife Service (FWS)
U.S. Department of Transportation, Federal Highways Administration
National Marine Fisheries Service, Pacific Islands Regional Office

State Agencies
Department of Accounting & General Services
Department of Education (DOE)
Department of Business, Economic Development and Tourism (DBEDT)
- DBEDT, Land Use Commission
- DBEDT, Office of Planning

Department of Health (DOH)
- DOH, Clean Water Branch
- DOH, Environmental Management Division
- DOH, Office of Environmental Quality and Control

Department of Hawaiian Home Lands
Department of Land and Natural Resources (DLNR)
- DLNR, Historic Preservation Division
- DLNR, Land Division

Department of Transportation (DOT)
Office of Hawaiian Affairs

County of Kauaʻi Agencies
Planning Department
Department of Public Works
Transportation Agency
Office of Economic Development
Water Department
Department of Parks and Recreation
Fire Department
Police Department
Housing Agency
Kauaʻi Historic Preservation Commission

Other Interested Parties and Individuals
Kauaʻi Planning & Action Alliance
Historic Hawaiʻi Foundation
Queen Debra Kapule Hawaiian Civic Club
Alu Like, Inc.
Hanalei Hawaiian Civic Club
Kauaʻi Museum
Līhuʻe Business Association
Hanamāʻulu Neighborhood Association
KKCR Community Radio

Royal Order of Kamehameha – Kaumualiʻi Chapter
Kauaʻi Historical Society
Mālama Kauaʻi
Kauaʻi Heritage Center
Hale O Na Aliʻi
Niumalu Canoe Club
Kaumualiʻi Hawaiian Civic Club
Nā Kuleana o Kānaka ʻŌiwi
Ahahui Kiwila Hawaiʻi o Moikeha
Kaʻahumanu Society
Kauaʻi Niʻihau Island Burial Council
Na Kahu Hikinaakalā
Niʻihau/Kauaʻi Ahamoku Ahupuaʻa
Konohiki of Kauaʻi
Mr. Val Ako
Mr. James Burgess
Mr. Butch "Leopold" Durant
Mr. Godwin Esaki
Mr. Roy Goo
Ms. Noelani Josselin
Mr. Nathan Kalama
Kaluhine ʻOhana
Mr. James Alalem
Ms. Sabra Kauka
Ms. Lilian Kiilau
Mr. Lester Matsushima
Ms. Beverly Muraoka
Mr. Charlie Perreira (c/o Waipā Foundation)
Ms. Anne Punohu
Mr. Bob Robinson
Ms. Nani Rogers
Ms. Healani Trembath
Ms. Laraine Moriguchi
Ms. Nina Monasevitch

Draft Environmental Assessment Consultation:

The Draft Environmental Assessment for the Kapaia Bridge Replacement was published in the Office of Environmental Quality Control *Environmental Notice* of January 23, 2017. Publication initiated a 30-day public review period ending on February 22, 2017.

A public informational meeting was held on February 15, 2017 from 6:00 pm to 8:00 pm at the King Kaumualiʻi Elementary School Cafeteria. The

following organizations and individuals were notified by letter or email of the meeting. All written comments and responses are reproduced in Appendix E.

Alan Downer, Ph.D. - State Historic Preservation Division
Kaua‘i Historic Preservation Commission
Grove Farm Company, Inc.
Ms. Kiersten Faulkner - Historic Hawai‘i Foundation
Ms. Liberta Hussey Albao - Queen Debra Kāpule Hawaiian Civic Club
Alu Like, Inc.
Mr. Val Ako
Mr. James Burgess
Mr. Butch “Leopold” Durant
Mr. Godwin Esaki
Mr. Devin Forrest - Hanalei Hawaiian Civic Club
Ms. Jane Kamahaokalani Gray - Kaua‘i Museum
Ms. Pat Griffin - Līhu‘e Business Association
Hanamā‘ulu Neighborhood Association
Ms. Kaiulani Edens-Huff
Mr. Warren Perry
Ms. Noelani Josselin
Mr. Nathan Kalama
Kaluhine ‘‘Ohana
Mr. James Alalem
Kaua‘i Historical Society
Ms. Sabra Kauka
Mr. Keone Kealoha - Malama Kaua‘i
Ms. Kehaulani Kekua - Kaua‘i Heritage Center
Ms. Lillian Kiilau
Ms. Carol Lovell - Hale O Na Ali‘i
Mr. Lester Matsushima
Ms. Beverly Muraoka
Niumalu Canoe Club - Marleny Cotrim, President
Mr. Charlie Perreira - c/o Waipa Foundation
Ms. Sarah Peters, President - Kaumuali‘i Hawaiian Civic Club
Ms. Anne Punohu
Mr. Bob Robinson
Ms. Nani Rogers
Ms. D. Kaliko Santos - Office of Hawaiian Affairs
Ms. Donna Kaliko Santos - Nā Kuleana o Kānaka ‘Ōiwi

Mr. Winifred Smith, President - Ahahui Kiwila Hawai‘i o Moikeha
Ms. Julie Souza, President - Ka‘ahumanu Society
Ms. Healani Trembath
Mr. Keith Yap, Vice Chair - Kaua‘i Ni‘ihau Island Burial Council
Ms. Laraine Moriguchi
Ms. Victoria Wichman - Na Kahu Hikinaakala
David and Nina Monasevitch
Ms. Mahelani Sylva
Mr. Kaimi Hermosura
Mr. Ken Taylor
Ms. Kanani Durant
John and Jolene Ogle
Mr. Mason Moriguchi
Roy and Mia Goo
Joseph Rosa
Larry Arruda

1. INTRODUCTION

1.1 Project Overview

The State of Hawai‘i Department of Transportation (HDOT) is proposing to replace and upgrade the existing Kapaia Bridge located in the Kapaia-Hanamā‘ulu area of the Līhu‘e District of the Island of Kaua‘i, Hawai‘i. See Figure 1. HDOT has jurisdiction of the roadway and bridges on Kūhiō Highway, which along with Kaumuali‘i Highway (Route 50) forms the belt highway on the island of Kaua‘i.

Constructed in 1933, the existing Kapaia Bridge is approximately 30 feet wide and is approximately 157 feet over Hanamā‘ulu Stream. It is a three-span concrete girder bridge supported by two piers that extend into the Hanamā‘ulu Stream area. The existing abutments are supported on concrete piles. The bridge has paneled concrete parapet walls with flat caps and end posts and carries two (2) 11 foot vehicular travel lanes, one in each direction, with 2.5 foot shoulder widths. The operating load rating of the bridge is 15 tons. See Figure 2 and Figure 3.

The proposed project involves replacing the existing bridge with a new concrete girder bridge that would be between 42 feet and 48 feet wide. The bridge would consist of two (2) 11 to 12 foot travel lanes, one in each direction, with a five to six foot bike lane and a five to six foot concrete sidewalk on each side of the bridge. The final dimensions would be determined during the final design phase of the project. In compliance with the State legal load for bridges, the new operating load rating of the bridge would be 44 tons. See Figure 4.

1.2 Project Purpose and Need

The purpose of the proposed project is to address the structural deficiency and functional obsolescence of the existing bridge. The State of Hawai‘i conducts periodic bridge inspections in accordance with applicable federal requirements. Each bridge is given a sufficiency rating which is an overall numerical rating of the level of service that a bridge provides in relation to the roadway it serves. This considers both functional obsolescence and structural deficiencies. The rating is based on a 0 to 100-point scale with 100 representing a bridge fully meeting current design standards. This bridge has a sufficiency rating of 32. (Kai Hawai‘i, Inc., July 2013).

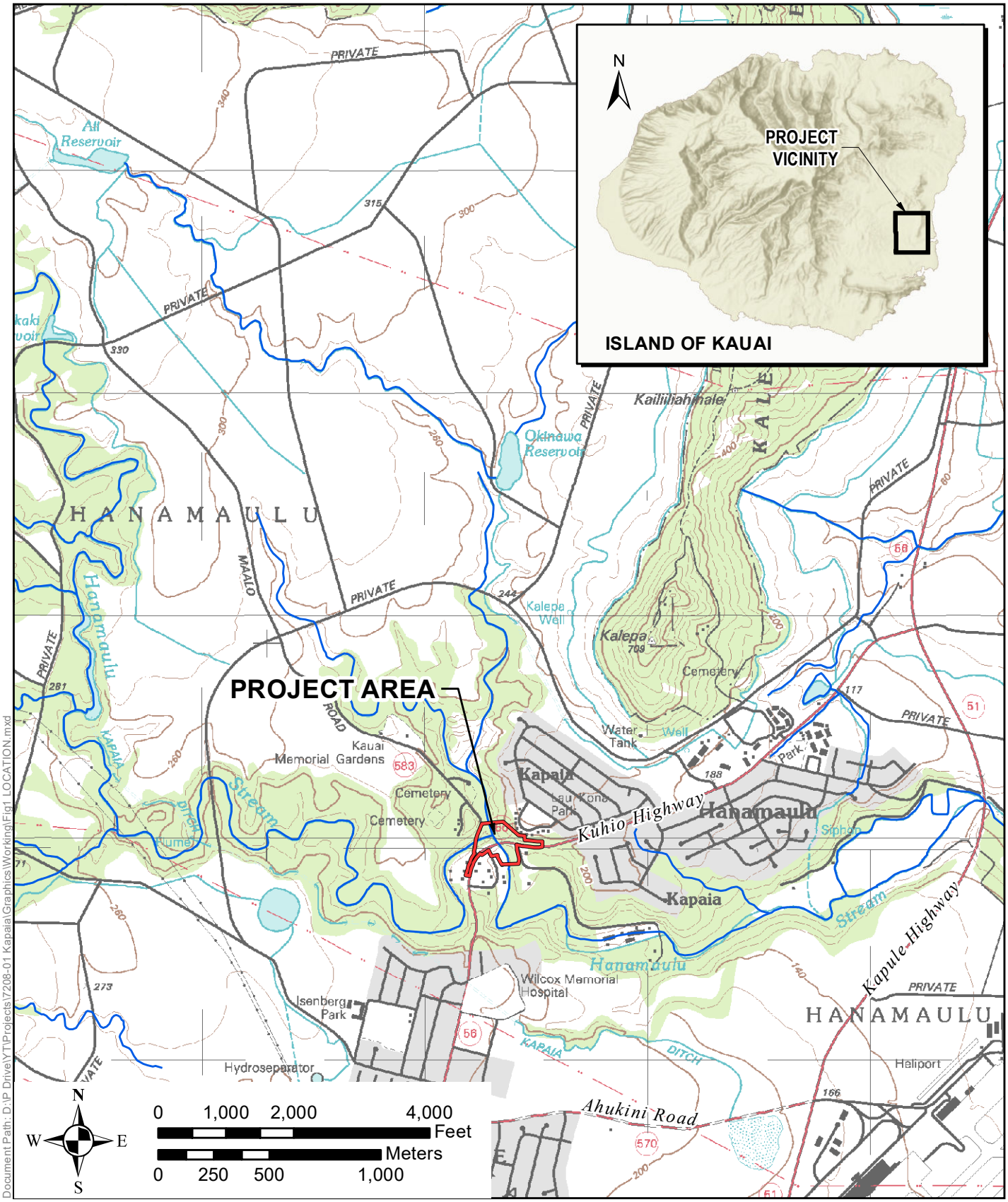
A functionally obsolete bridge is one in which the bridge geometry, load capacity, clearance, or approach road alignment no longer meet the usual criteria for the transportation system that it serves. Kapaia Bridge is considered functionally obsolete due to inadequate load capacity, narrow lane widths and other deficiencies.

An aspect of the functional obsolescence is related to the curving geometry of the channelization across the bridge given that the 27-foot bridge is lacking

shoulders. The bridge was also designed for two-15 ton trucks. The current State legal load for bridges is 44 tons. Thus, the bridge was designed for less than the State legal load.

In addition, the National Bridge Inspection (NBI) standards for the bridge superstructure rated the Kapaia Bridge girders, beams, or arches a “4” or in poor condition with advanced section loss, deterioration or scour. NBI ratings are on a scale of 9 to 0, with 9 being excellent condition and 0 being failed condition and beyond corrective action. The 2013 bridge inspection report noted extensive honeycombing and numerous locations with exposed reinforcement with minor corrosion/section loss of reinforcement observed.

Approximately 17,000 vehicles per day travel across the bridge located on the Kūhiō Highway, between Līhu‘e and Hanamā‘ulu. Kūhiō Highway is the primary two-lane road around the east and north sides of Kaua‘i connecting the communities between Līhu‘e and Princeville. The bridge is also located in close proximity to Wilcox Medical Center, Kaua‘i’s largest hospital. Therefore, this portion of Kūhiō Highway is a crucial part of Kaua‘i’s existing transportation infrastructure.



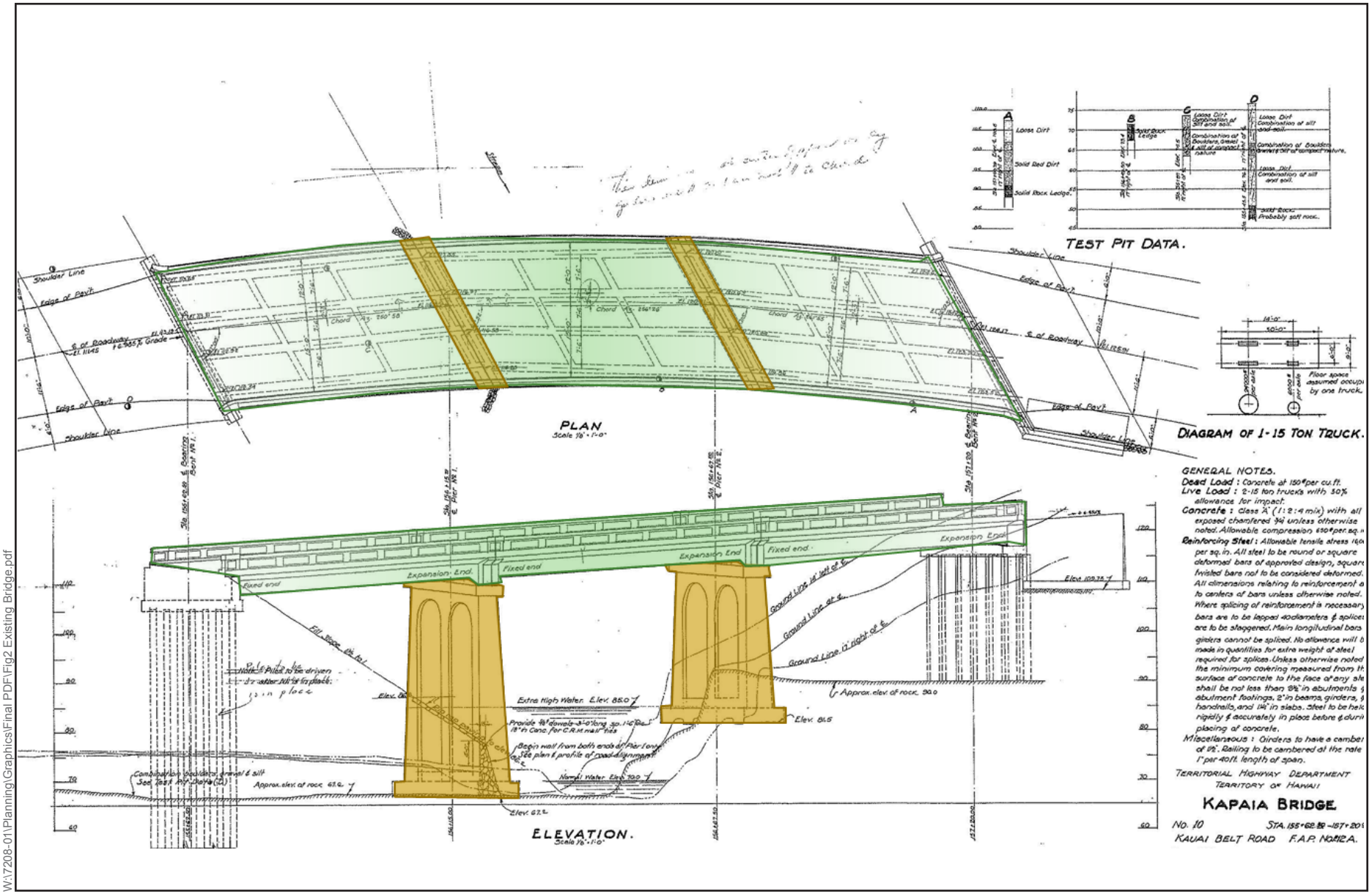
Document Path: D:\P Drive\YT\Projects\7208-01 Kapaia\Graphics\Working\Fig1 LOCATION.mxd

WILSON OKAMOTO CORPORATION

FIGURE 1

LOCATION MAP

KAPAIA BRIDGE REPLACEMENT



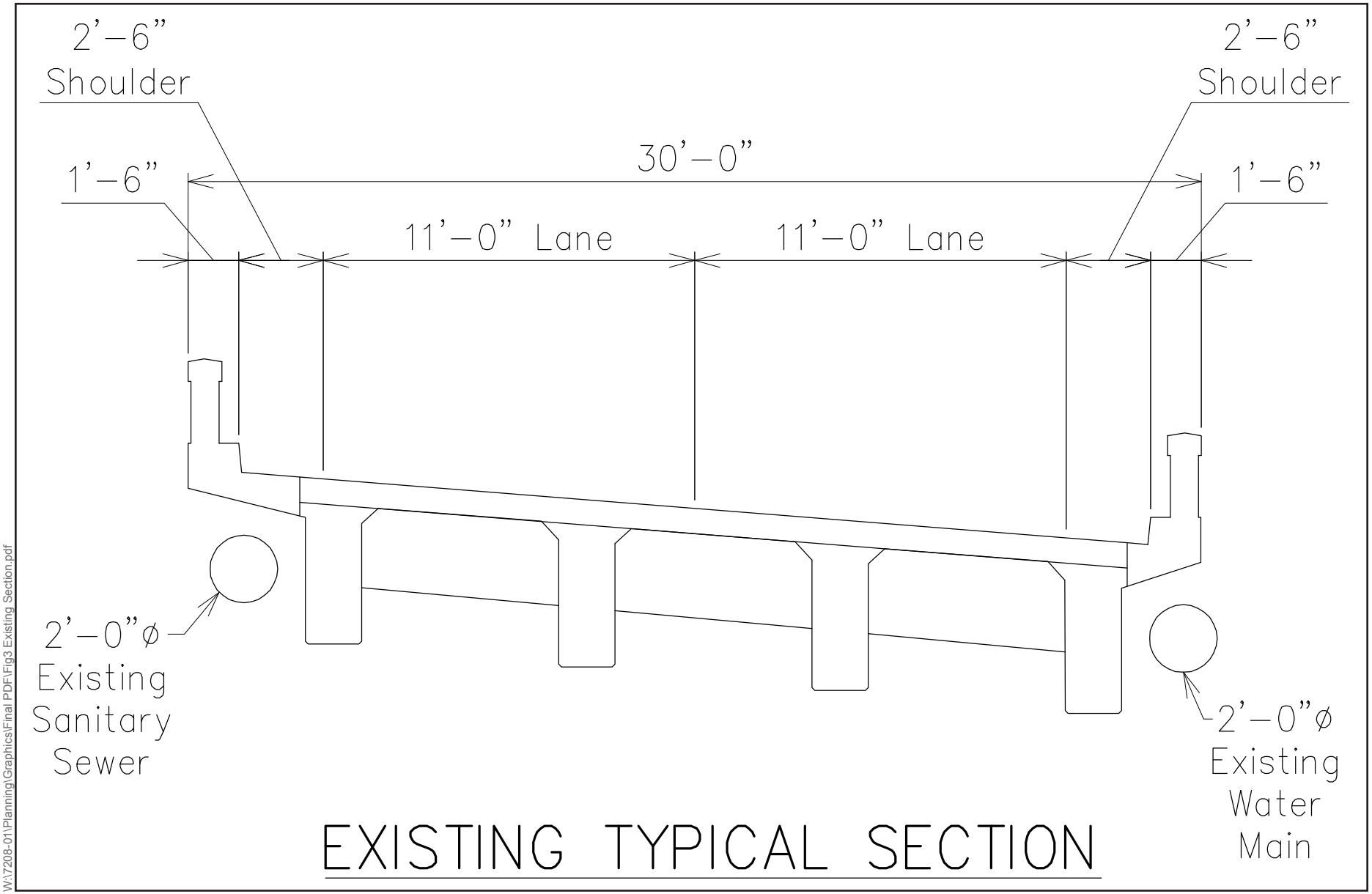
W:\7208-01\Planning\Graphics\Final PDF\Fig2 Existing Bridge.pdf

FIGURE 2

PLANS OF EXISTING BRIDGE

KAPAIA BRIDGE REPLACEMENT

WILSON OKAMOTO CORPORATION



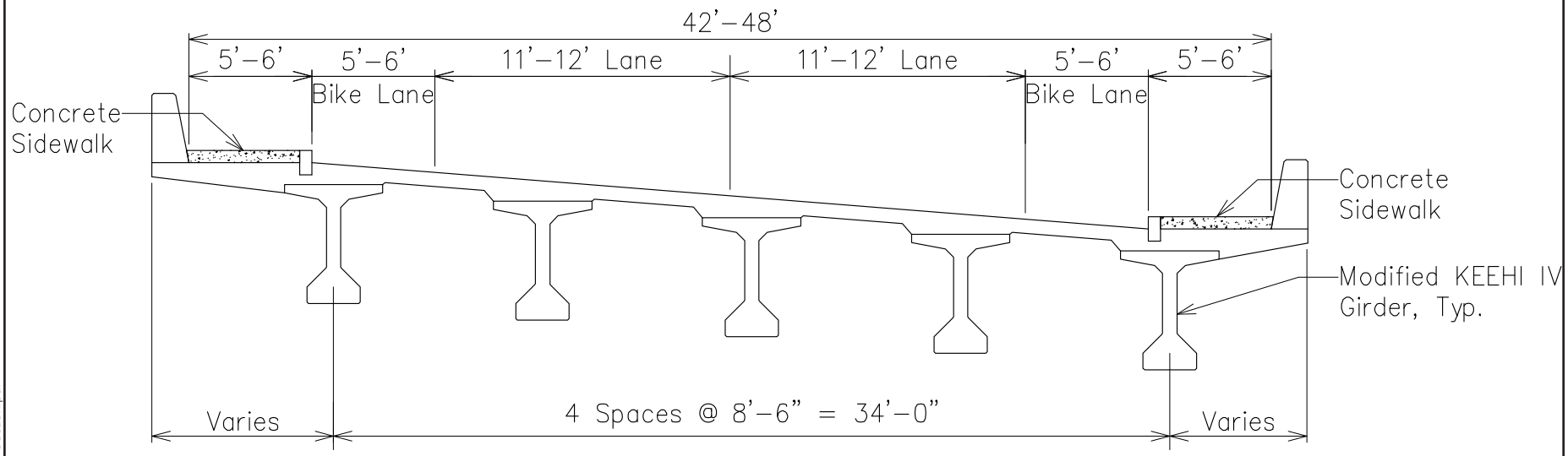
W:\7208-01\Planning\Graphics\Final PDF\Fig3 Existing Section.pdf

FIGURE 3

TYPICAL SECTION OF EXISTING BRIDGE

KAPAIA BRIDGE REPLACEMENT

WILSON OKAMOTO CORPORATION



TYPICAL SECTION

WILSON OKAMOTO CORPORATION

FIGURE 4

TYPICAL SECTION OF PROPOSED BRIDGE

KAPAIA BRIDGE REPLACEMENT

2. PROJECT DESCRIPTION

2.1 Project Location

The Kapaia Bridge carries Kūhiō Highway (Route 56) across Hanamā‘ulu Stream in the Kapaia-Hanamā‘ulu area. The bridge is located along Kūhiō Highway at Mile Post 1.24 between its intersections with Mā‘alo Road to the west and Kapaia Road to the east. The bridge is less than a mile away from the Līhu‘e Town Core and less than half a mile northeast of the Wilcox Medical Center, Kaua‘i’s largest hospital.

2.2 Surrounding Land Uses

According to the Līhu‘e Community Plan, lands in the immediate vicinity of the existing bridge are designated for agricultural and residential uses. Natural open space areas also occur downstream of the project site. Properties surrounding the bridge are privately owned; the property on the mauka side of the bridge is owned by Grove Farm Company, Inc. (TMK (4) 3-8-002:001) while properties on the makai side of the bridge are owned by Kapaia Hillside (TMK (4) 3-7-004:009) and Visionary, LLC (TMK (4) 3-7-001:001).

Various small businesses are located in the vicinity southwest of the existing bridge including an auto repair shop, martial arts studio, rental car outlet, and several retail shops. The Līhu‘e Hongwanji Mission is located approximately 400 feet southwest of the bridge and the Immaculate Conception Catholic Church is located approximately 600 feet to the southeast.

The nearest subdivision is located mauka and approximately 200 feet northeast of the existing bridge, although there are also single family dwelling units located immediately below and makai of the bridge, as close as approximately 75 feet away. Lau Kona Park is the closest park facility located approximately 350 feet northeast of the bridge.

2.3 Project Alternatives

A public informational meeting was held on July 1, 2015 to gather input from the community on a range of reasonable alternatives for the project. The range of alternatives fell under three main concepts: 1) utilizing the existing alignment, 2) creating a new alignment on the makai side of the existing alignment or, 3) sequencing construction on a staged alignment adjacent to the existing alignment. Under each concept, variations in approach and span types were also considered. During the meeting, the community requested that a permanent mauka alignment also be included for consideration. Therefore, a total of eight design alternatives were analyzed for the project along with a “no action” alternative. In addition, five detour options were considered for the design alternatives that could not maintain traffic along the existing alignment during construction.

A second public informational meeting was held on February 15, 2017 during the public comment period of the Draft Environmental Assessment. The purpose was to provide a project update and gather community input. The meeting outlined the various alternatives considered, the advantages and disadvantages of each, the proposed preferred alternative, and anticipated impacts. The proposed preferred alternative replaces and widens the bridge in its existing location with a temporary mauka detour bridge. There were a variety of concerns and comments presented at the meeting and in written comments provided after the meeting. Alternatives are noted in the following section with a discussion on the concerns raised as well as the analysis which involved the selection of the proposed preferred alternative.

2.3.1 Alternative 1: No Action

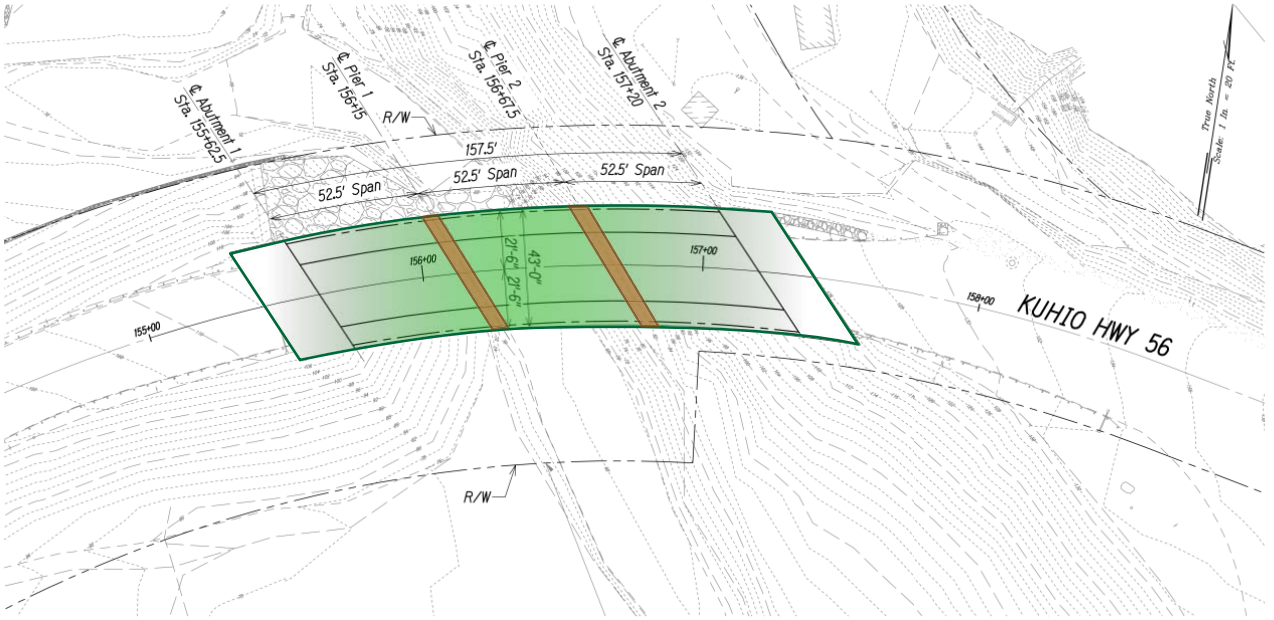
Under the no action alternative, the rehabilitation or replacement of the existing bridge would not be pursued. Environmental impacts would be avoided, construction costs spared, and the need for permits precluded.

The existing structure would remain functionally obsolete as it does not meet current standards for lane and shoulder widths and load carrying capacities. The bridge would also continue to deteriorate and accrue costs for the regular inspection and increasing maintenance required to maximize its useful lifespan. Eventually, the bridge may no longer provide a safe support for vehicle and pedestrian traffic and could face closure or even possible collapse. This portion of Kūhiō Highway that connects Hanamā‘ulu to Līhu‘e could not be utilized and vehicles would need to be rerouted to alternate out-of-direction routes.

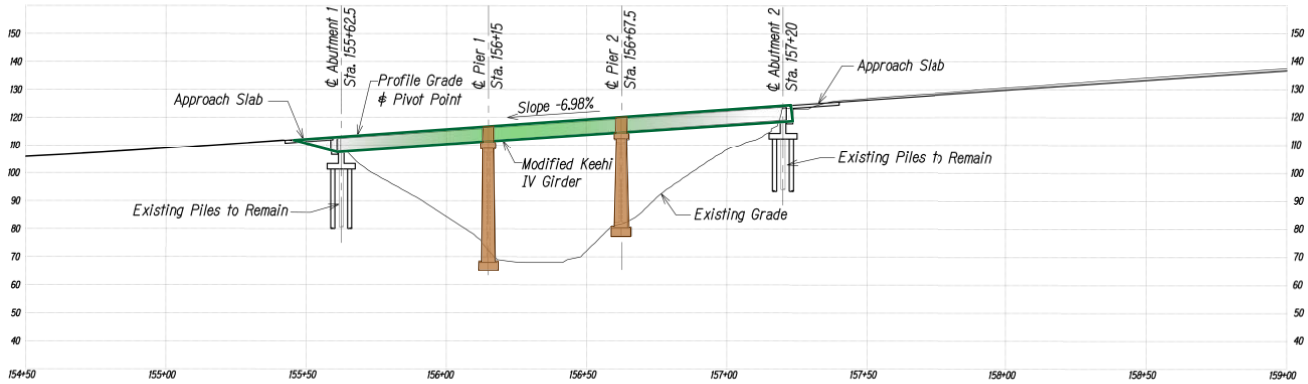
2.3.2 Alternative 2: Widen Existing Bridge

If inspection of the bridge shows that the existing structure could be rehabilitated, the existing bridge could be widened and retrofitted in-place to meet design standards for roadway width and load carrying capacity. The widened bridge would maintain three (3) equal spans and have a total approximate bridge length of 157 feet. No new permanent right-of-way would be required for this alternative. See Figure 5.

The existing bridge is 30 feet 2 inches in width and would be widened by approximately 6 to 9 feet on each side to provide space for an approximate 42 to 48-foot wide roadway with bike and pedestrian facilities and new concrete barriers. Work would involve demolishing the existing overhangs and installing new girders next to the existing exterior girders to support the widened area on each side of the bridge. The existing girders would also be retrofitted to increase the load carrying capacity of the bridge to meet current AASHTO standards. Abutments at each end of the bridge as well as the piers which extend into the Hanamā‘ulu Stream area would also need to be widened.



PLAN - EXISTING ALIGNMENT - WIDEN EXISTING BRIDGE



ELEVATION - EXISTING ALIGNMENT - WIDEN EXISTING BRIDGE

Source: KPFF Consulting Engineers

WILSON OKAMOTO CORPORATION

FIGURE 5

WIDEN EXISTING BRIDGE

KAPAIA BRIDGE REPLACEMENT

A detour may not be necessary for this alternative because traffic could be maintained on the existing bridge during the retrofit and widening. Maintaining traffic on the existing bridge during construction would require work be performed from locations adjacent to or underneath the bridge, including in proximity of Hanamā‘ulu Stream. A detailed analysis would need to be performed to determine if all phases of the rehabilitation could be completed with live traffic on the bridge. Due to the significant structural rehabilitation required, short-duration detours of one to two weeks several times during construction and night or weekend closures may likely be necessary. There are two detour route alternatives that utilize existing roads if road closures should be deemed necessary. These alternatives are discussed in further detail in Section 2.4.

It should be emphasized that selection of this alternative would be dependent upon the results of a bridge inspection to determine if the bridge can be rehabilitated. Estimated construction cost of this alternative is $12,531,037.

2.3.3 Alternative 3: Single-Span Replacement Bridge along Existing Alignment

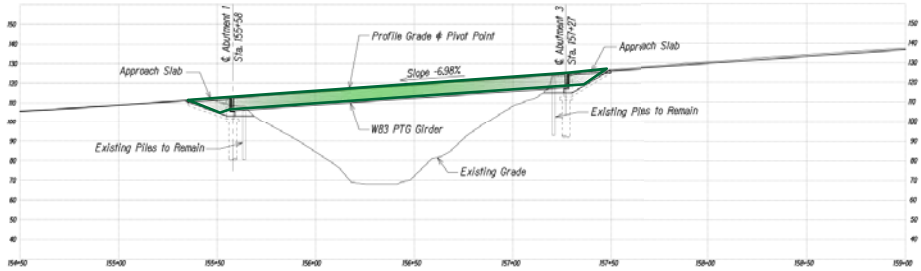
Another alternative would be to demolish the existing bridge and to construct a new single-span replacement bridge on the existing alignment. The new bridge would span approximately 170 feet with no intermediate piers, which would reduce the impact of hydraulics on the bridge and minimize the amount of in-stream work. See Figure 6.

The new bridge would consist of spliced prestressed concrete girders and a cast-in-place concrete deck. A single-span would be achieved by post-tensioning several concrete girder segments together, which would require construction of temporary intermediate piers to stage the girder segments while they are being placed and post-tensioned. Following construction, the temporary intermediate piers would be removed.

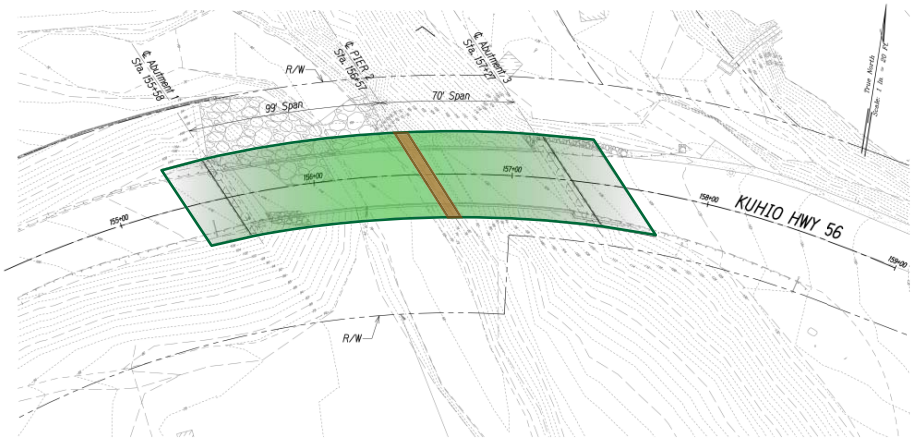
The existing roadway on both approaches to the bridge would also need to be widened in conjunction with the new bridge. To limit the volume of structural fill required, fill walls would be used to retain the soil under the roadway. The height of the retaining walls would be limited to no more than 10 feet in height. However, this may be revised pending further analysis of the soils in the vicinity. New abutments for the replacement bridge would be constructed approximately 5 to 10 feet behind the existing abutments for improved stability. The concrete piles supporting the existing abutments would remain in place to avoid disturbing the soil near the location of the new abutments.

During construction of this alternative, traffic must be detoured while the existing bridge is demolished and a new bridge is built in its place. Detour

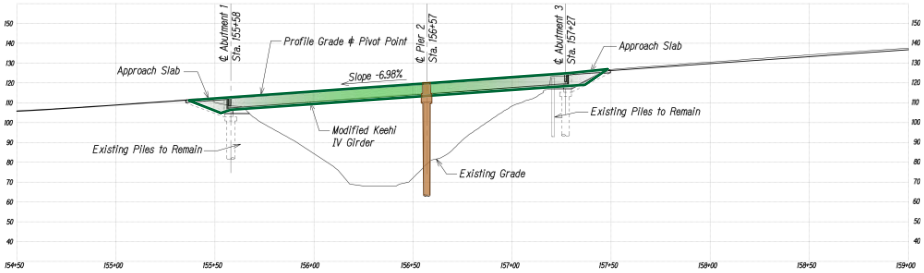
PLAN - EXISTING ALIGNMENT - NEW SINGLE SPAN SPLICED CONCRETE GIRDER BRIDGE



ELEVATION - EXISTING ALIGNMENT - NEW SINGLE SPAN SPLICED CONCRETE GIRDER BRIDGE



PLAN - EXISTING ALIGNMENT - NEW TWO SPAN MODIFIED KEEHI IV GIRDER BRIDGE



ELEVATION - EXISTING ALIGNMENT - NEW TWO SPAN MODIFIED KEEHI IV GIRDER BRIDGE

Source: KPFF Consulting Engineers

D:\P Drive\YT\Projects\7208-01 Kapaia\Graphics\Working

WILSON OKAMOTO CORPORATION

FIGURE 6

EXISTING ALIGNMENT ALTERNATIVES

KAPAIA BRIDGE REPLACEMENT

alternatives cover two different approaches. The first is building a new detour bridge in the vicinity of the existing bridge. The second is to reroute traffic using existing roads. These alternatives are discussed in further detail in Section 2.4.

No new permanent right-of-way would be required. Temporary right-of-way for the detour route could range between 8,500 to 12,000 square feet. Estimated construction cost of this alternative is $11,250,682.

2.3.4 Alternative 4: Two-Span Replacement Bridge along Existing Alignment

A new two-span bridge may also be considered on the existing alignment. This alternative is similar to the previous alternative except that the bridge span would be supported by an intermediate pier that would be located east of Hanamā‘ulu Stream, resulting in a 100-foot eastern span and a 70-foot western span. The bridge would be built using spliced prestressed concrete girders for both spans. See Figure 6.

While the intermediate pier reduces construction complexity associated with utilizing post-tensioned girders, there are other challenges involved with this alternative. In addition to needing large shoring towers, the slope in the area of the intermediate pier makes it difficult to position equipment for its construction. Thus, additional earthwork in the vicinity of the stream may be required to create a roadway to the pier location as well as a working area for the drilling equipment. The potential of scour at the intermediate piers would also need to be investigated during the design phase of this alternative.

The existing roadway on both approaches to the bridge would also need to be widened in conjunction with the new bridge. To limit the volume of structural fill required, fill walls would be used to retain the soil under the roadway. The height of the retaining walls would be limited to no more than 10 feet in height. However, this may be revised pending further analysis of the soils in the vicinity. New abutments for the replacement bridge would be constructed approximately 5 to 10 feet behind the existing abutments for improved stability. The concrete piles supporting the existing abutments would remain in place to avoid disturbing the soil near the location of the new abutments.

Like the previous alternative, traffic must be detoured while the existing bridge is demolished and a new bridge is built in its place. Detour alternatives include a detour bridge in the vicinity of the existing bridge or a bypass route using existing roads. These alternatives are discussed in further detail in Section 2.4.

No new permanent right-of-way would be required for this alternative. Temporary right-of-way for the detour route could range between 8,500 to 12,000 square feet. Estimated construction cost of this alternative is $12,506,224.

2.3.5 Alternative 5: Replacement Bridge Mauka (North) of Existing Alignment

A mauka alignment would involve a new curved bridge that would span over Hanamāʻulu Stream north of the existing bridge. The steeper slopes on the mauka side would make construction of this alternative more difficult, but would allow for a shorter main span consisting of five 100-foot prestressed concrete girders. See Figure 7.

Large amounts of cut and fill and additional right-of-way would be needed to construct this alternative. New approaches on either side of the bridge would be constructed and structural fill walls and an elevated structure would be required.

Significant earthwork would also be needed to allow access for construction equipment to reach the foundation locations. A soil nail wall would extend approximately 200 feet between 5 and 10 feet in height along the edge of the roadway to aid in soil retention. Further geotechnical analysis of this alternative would be required. New abutments would also be needed on the mauka side of the approach fill for the existing bridge.

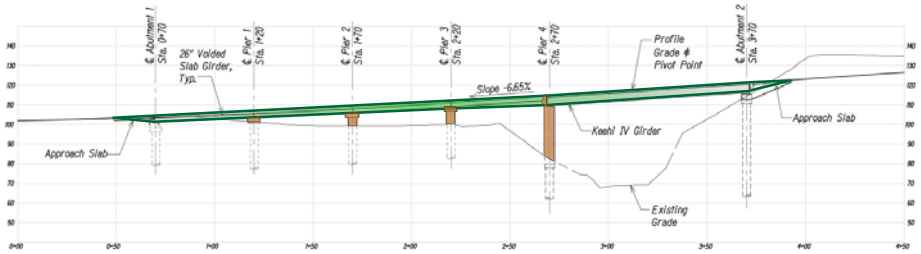
The existing bridge could be used to maintain traffic during construction and would be demolished and removed upon completion of the replacement bridge. However, temporary lane closures may be needed while earthwork is completed adjacent to the existing roadway.

Approximately 5,800 square feet of additional right-of-way would be needed to construct this alternative. In order to allow turning movements required by larger trucks, a mauka alignment would displace the existing Kapaia Sewage Pumping Station at the corner of Māʻalo Road and Kūhiō Highway. Additional land and environmental review for the displaced sewage pumping station would be required. Estimated construction cost for this alternative is $35,430,181. This estimate does not include the cost of displacing the Kapaia Sewage Pumping Station.

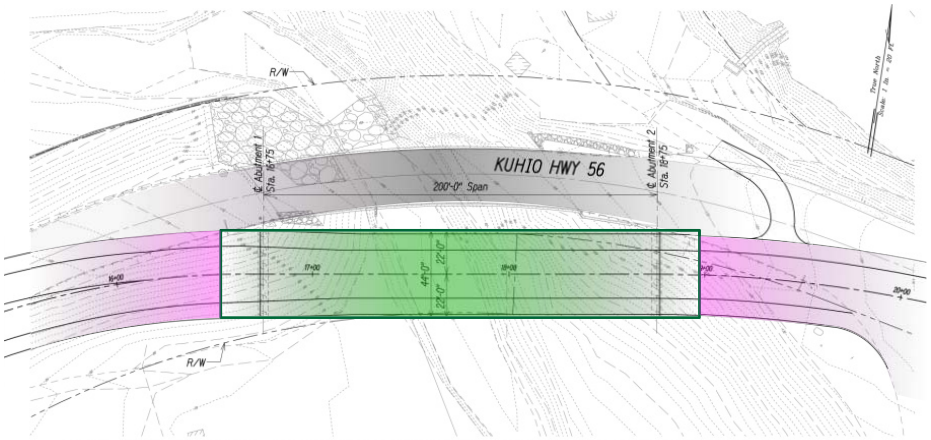
2.3.6 Alternative 6: Single-Span Replacement Bridge Makai (South) of Existing Alignment

This alternative consists of a new single-span bridge constructed on a makai alignment. This would occur south of the existing bridge. See Figure 7.

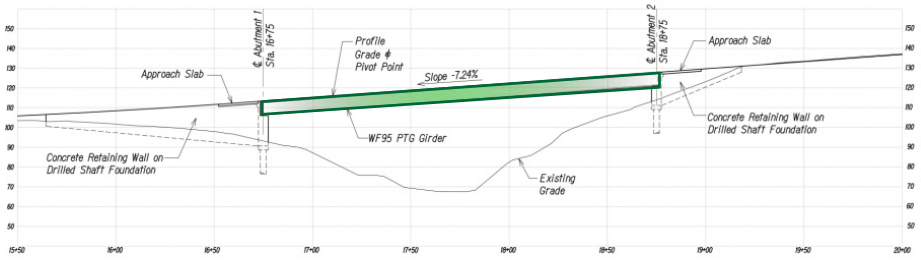
PLAN - NEW ALIGNMENT - KEEHI IV CONCRETE GIRDER



ELEVATION - NEW MAUKA ALIGNMENT - KEEHI IV CONCRETE GIRDER



PLAN - NEW ALIGNMENT - SINGLE SPAN SPLICED CONCRETE GIRDER BRIDGE WITH APPROACH FILL



ELEVATION - NEW ALIGNMENT - SINGLE SPAN SPLICED CONCRETE GIRDER BRIDGE WITH APPROACH FILL

Source: KPFF Consulting Engineers

D:\P Drive\YT\Projects\7208-01 Kapaia\Graphics\Working

WILSON OKAMOTO CORPORATION

FIGURE 7

NEW MAKAI AND MAUKA ALIGNMENT ALTERNATIVES

KAPAIA BRIDGE REPLACEMENT

This alternative involves no intermediate pier which results in no new construction in proximity of the stream. However, the longer main span results in additional construction complexity and cost. This alternative will require either cut and fill walls or approach structures to create new approaches for the new bridge. To limit the volume of structural fill required, fill walls taller than 10 feet in height would be used to retain the soil under the new approach roadway. Further geotechnical analysis would be required.

The makai alignment would eliminate the need for a detour route, because the existing structure could remain in service until the new bridge is complete. However, temporary lane closures may be needed while earthwork is completed adjacent to the existing roadway. Approximately 5,400 square feet of additional right-of-way would be needed to construct this alternative. Estimated construction cost for this alternative is $21,893,959.

2.3.7 Alternative 7: Two-Span Replacement Bridge Makai (South) of Existing Alignment

A new two-span bridge may also be considered makai of the existing alignment. An intermediate pier would be placed on the plateau west of Hanamā‘ulu Stream and 170-foot long prestressed concrete girders would be used at each span. Although the intermediate pier allows for girder erection without the complexity of post-tensioned girders required in the single-span alternatives, access for construction of the intermediate pier foundations would be a challenge and would require construction to occur in proximity of the stream.

The length of the new bridge approaches and amount of fill required would be minimized by maximizing the span length of the prestressed girders. To further limit the volume of structural fill required, fill walls would be used to retain soil under the roadway. However, further geotechnical analysis would be needed to determine the optimum solution.

The west end of the bridge encroaches on the existing roadway making it difficult to maintain traffic on the existing roadway while completing the bridge; however, the bridge could be constructed in two phases. This would allow traffic to be maintained on the south half of the new bridge while the north half was being completed. While this eliminates the need for a separate detour route, the traffic lanes would be narrow and would be very close to the work zone during both stages of construction. Temporary lane closures may be needed while earthwork is completed adjacent to the existing roadway.

Approximately 5,400 square feet of additional right-of-way would be needed to construct this alternative. Estimated construction cost for this alternative is $19,888,520.

2.3.8 Alternative 8: Replacement Bridge Adjacent to Existing Alignment with Staged Construction

A new replacement bridge could also be constructed just south (makai) of and adjacent to the existing alignment. The new structure would be a single-span bridge approximately 175 feet in length and would be constructed in stages near the existing bridge. See Figure 8.

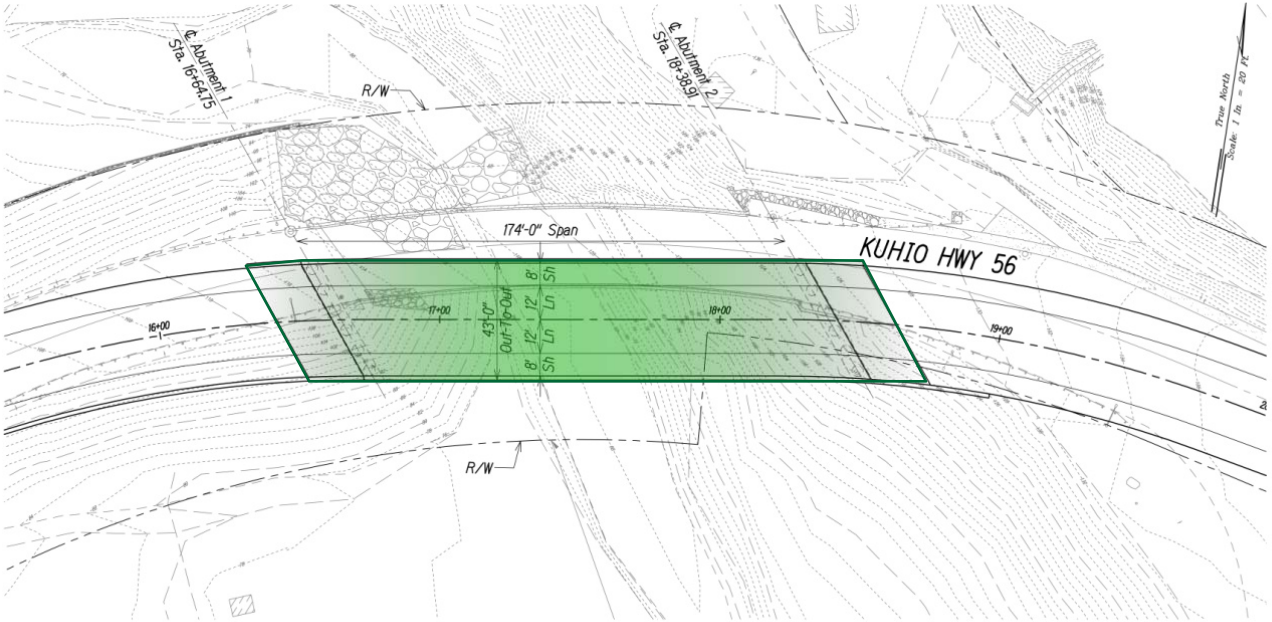
Spliced prestressed concrete girders would be used to span the 175 feet without the use of any intermediate piers. Without intermediate piers, no construction in proximity of the stream would occur and the impact of hydraulics on the bridge would be reduced. However, temporary piers would still be needed to support the bridge during construction and would be removed upon completion of the replacement bridge.

The curvature of the new alignment would create a separation between the existing and proposed alignment allowing for a straight bridge. The profile grade would be maintained to match the existing alignment so the bridge may easily tie back into the existing approaches. Fill walls supporting bridge approaches would be required. Further geotechnical analysis would be needed to determine the optimum solution.

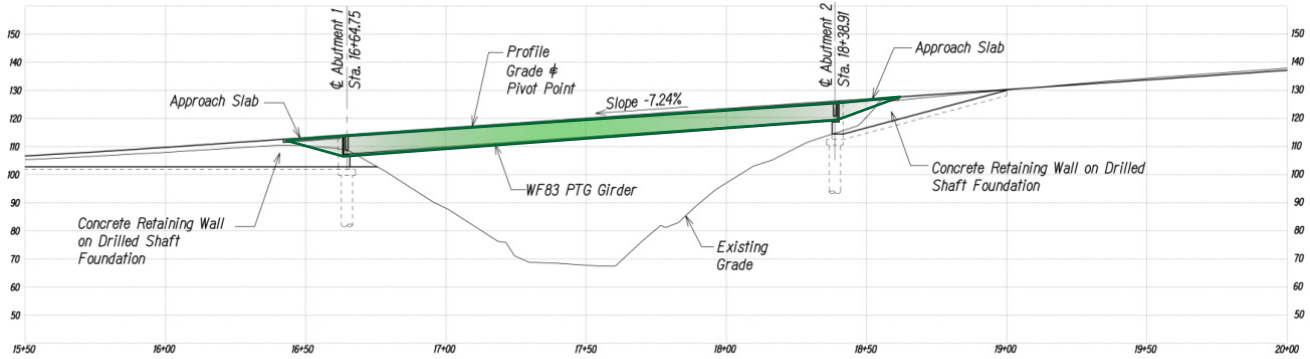
The existing embankment slope makes it difficult to provide access and to position equipment for construction of the abutment foundations for the new bridge and may require additional earthwork. This is especially challenging while maintaining traffic so close to the work zone.

With this alternative, a bypass or detour bridge would not be needed during construction. The new bridge would be built in stages, half at a time, while traffic is maintained in close proximity to the work zones during both phases of construction. However, traffic lanes would be very narrow and would be close to the work zones during both stages of construction thereby increasing the overall project duration.

Approximately 1,200 square feet of additional right-of-way must be acquired for this alternative. Estimated construction cost for this alternative is $17,190,556.



PLAN - STAGED CONSTRUCTION ALIGNMENT - NEW SINGLE SPAN SPLICED CONCRETE GIRDER BRIDGE



ELEVATION - STAGED CONSTRUCTION ALIGNMENT - NEW SINGLE SPAN SPLICED CONCRETE GIRDER BRIDGE

Source: KPFF Consulting Engineers

D:\P Drive\YT\Projects\7208-01 Kapaia\Graphics\Working

WILSON OKAMOTO CORPORATION

FIGURE 8

NEW MAKAI STAGED ALIGNMENT

KAPAIA BRIDGE REPLACEMENT

2.4 Detour Alternatives

The design alternatives that utilize the existing alignment will require detour routes in order to maintain traffic while completing construction. The detour alternatives consist of two main concepts. The first is building a detour bridge in the vicinity of the existing bridge. The second is to reroute traffic using existing roads.

2.4.1 Māʻalo Road Bypass

The Māʻalo Road Bypass would use existing roads to reroute traffic during bridge construction. Traffic would be diverted onto Māʻalo Road and continue approximately one mile to the Cane Haul Road, make a right turn and follow the road for a couple of miles to Laulima Street.

No detour bridge would be required if existing roads are utilized as detours. This would likely result in a shorter construction time. However, for the traveling public, this is an added distance of 3.2 miles which adds approximately 9 minutes of travel time. Emergency response time would also be increased. A traffic study would also be required to see if the detour could handle the 17,000 vehicles per day currently on Kūhiō Highway. An estimated cost of this detour would be $1.4 million.

However, the Cane Haul Road is privately owned so landowner approval would be required. We understand that the road's existing culvert at Hanamāʻulu River has been washed out so additional cost would be required for repairs. While the existing culvert may be repaired in connection with the County's Māʻalo Landfill project, the timing of any improvement or repair is uncertain. Should the traffic study recommend additional improvements to the detour to handle the additional traffic, this would likely require additional funding which is undetermined at this time. Moreover, additional public review of contemplated improvements, especially its impact upon regional traffic, would be required.

2.4.2 Kapule Highway Bypass

Another detour utilizing existing roads involves traffic being rerouted onto Kāpule Highway. Like the Māʻalo Road Bypass alternative, no detour bridge is required and it may shorten construction time. However, the result would be a maximum detour of 4.5 miles and an increase in travel time of approximately 13 minutes which impacts emergency response time to a greater extent. A traffic study would still be needed to assess the impact. An estimated cost of this alternative would be $0.4 million.

Like the Māʻalo Road detour, however, should the traffic study recommend additional improvements, this would likely require additional funding which is undetermined at this time. Enhancements such as intersection

improvements and/or additional turn lanes to public roadways in the vicinity may provide some traffic relief during the period of construction as well as provide additional benefit in the long term. However, depending on the improvements or lack thereof, additional environmental impact is not known. Also, the specific impacts upon adjacent landowners and on regional traffic is not known. Additional public review, especially relating to impacts on regional traffic, would be required.

2.4.3 Temporary Mauka Detour Bridge

The mauka detour alternative involves temporarily realigning the west approach of the bridge with an S-shaped curved roadway. Approximately 200 feet of filled approach would be necessary on the west or Līhu‘e side. The mauka alignment traverses a heavily vegetated area and encroaches more on the riparian covers of the Hanamā‘ulu Stream than the makai detour. A 135-foot straight single-span temporary bridge would span the stream slightly shorter than the makai detour alternative. Approximately 100 feet of cut walls into a steep hillside would be necessary on the east or Kapa‘a side before another tight S-curve reconnects the roadway to the original alignment. See Figure 9.

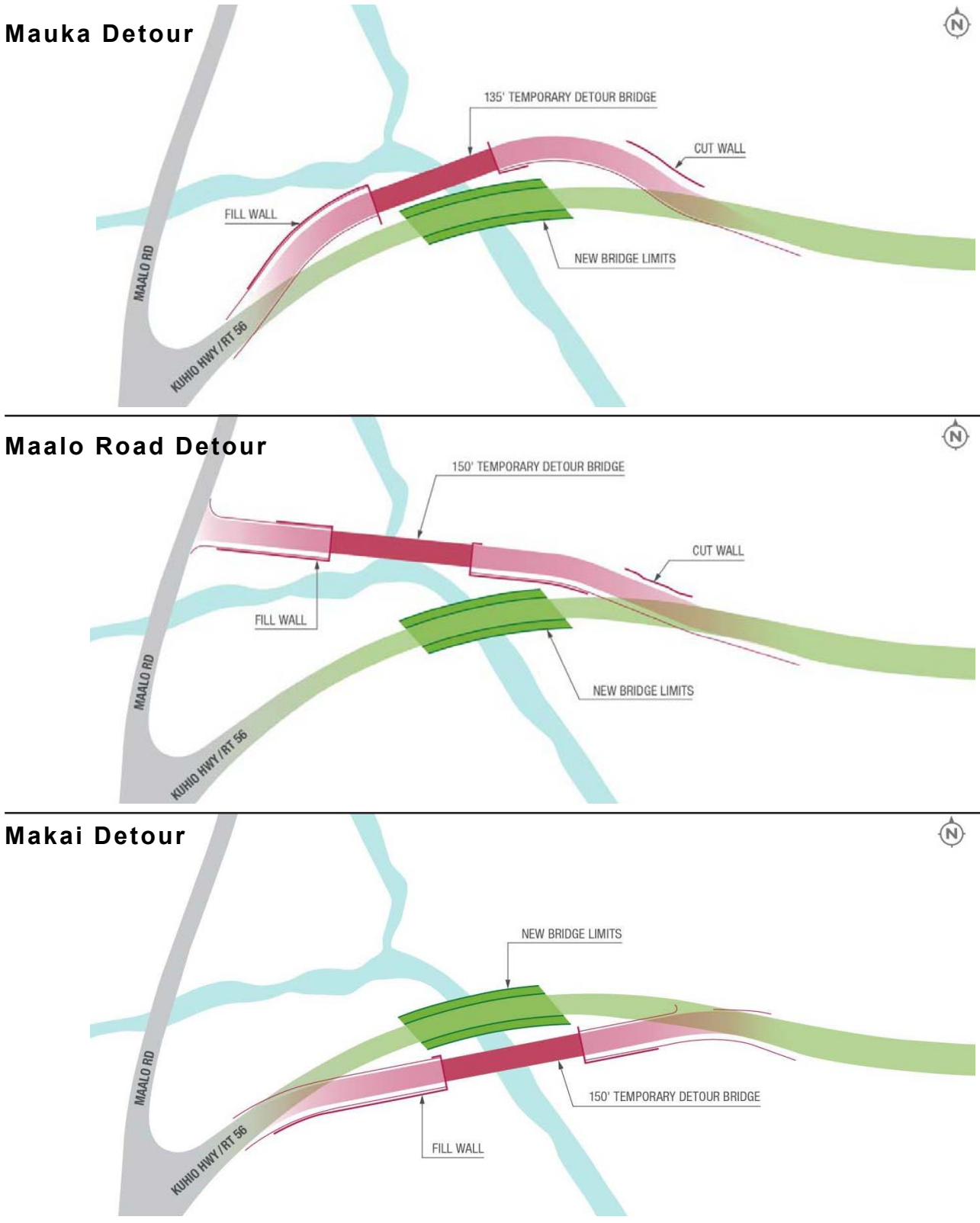
Although a shorter temporary bridge is needed, this alternative requires significantly more cut and fill to provide the footings for the temporary detour route. The west approach of the bridge would also need to be realigned temporarily with an S-curve in the roadway alignment.

Initial estimated cost of the mauka detour was $9.8 million.

A significant portion of the foregoing mauka detour cost estimate derives from cut and fill walls as well as excavation and backfill which is required. This is due to the relatively steeper terrain on the mauka side of the existing bridge. In order to help minimize those costs, a longer two span detour bridge with an intermediate pier was estimated. With a revised design, a revised estimated cost for the mauka detour is $5.3 million.

2.4.4 Temporary Mauka Detour Bridge & Mā‘alo Road

The Mā‘alo Road detour alternative features a traffic pattern change. Traffic would be rerouted off of the Kūhiō Highway to Mā‘alo Road at the existing Y-intersection. East or Kapa‘a bound vehicles would travel over 300 feet to a new detour road that would intersect Mā‘alo Road. The new detour road would extend for 200 feet before spanning Hanamā‘ulu Stream north of the existing bridge. The temporary bridge would be about 150 feet long. Fill walls would be necessary on the east approach as well as a cut wall to tie the road back into the original alignment. Downhill (west or Līhu‘e bound) traffic would encounter a 12 percent slope ending at a stop condition at Mā‘alo Road. See Figure 9.



Source: KPFF Consulting Engineers

D:\P Drive\YT\Projects\7208-01 Kapaia\Graphics\Working

WILSON OKAMOTO CORPORATION

FIGURE 9

DETOUR ALTERNATIVES

KAPAIA BRIDGE REPLACEMENT

The S-shaped roadway could be avoided under this alignment. The detour alignment of this alternative is relatively straight. However, it requires temporary right of way and has the largest impact to private property. The required grade is also relatively steep. The initial estimated cost of this detour was $6.6 million.

Like the mauka detour bridge, the extent of cut and fill walls as well as excavation and backfill can be minimized by installation of a longer two span detour bridge with an intermediate pier. With this revised design, a revised estimated cost for the Temporary Mauka Detour Road & Māʻalo Road is $4.1 million.

2.4.5 Temporary Makai Detour Bridge

The makai detour alternative involves curving the west approach of the bridge into a tighter radius. Approximately 200 feet of filled approach would be necessary on the west side. A 150-foot straight single-span temporary bridge would span the stream. On the east side, approximately 100 feet of fill walls would be necessary before the detour road can connect to the original alignment. See Figure 9.

This alternative would not require any cut walls and will have less fill walls. However, this alternative would encroach on existing residences. It will also require temporary right of way.

Initial estimated cost of the makai detour was $6.6 million.

Temporary right-of-way for the detour route could range between 8,500 to 12,000 square feet.

Like the mauka detour bridge, the extent of cut and fill walls as well as excavation and backfill can be minimized by installation of a longer two span detour bridge with an intermediate pier. With this revised design, a revised estimated cost for the Temporary Makai Detour Bridge is $4.3 million

2.5 Proposed Preferred Alternative

During and after the public meeting, comments were received from the public that reflected the overall concerns of the community with regard to the project. These concerns include the following:

- Safety of the existing bridge
- Inclusion of bike lanes
- Geometric design (curvature)
- Drainage

- Hydraulic efficiency
- Environmental impacts
- Right-of-way acquisition
- Proximity to residential areas
- Impacts to private property
- Construction impacts
- Project costs
- Impacts to historic and cultural resources
- Future traffic demand
- Impacts to surrounding businesses

In identifying the proposed preferred alternative, the various bridge alternatives were evaluated against these community concerns along with economic and technical constraints to implementing the project. A discussion of the analysis is provided below.

The existing bridge is considered to be functionally obsolete and structurally deficient. Under a no action alternative, the condition of the existing bridge would not improve and continued operation of the bridge may result in unsafe conditions or closure of this critical portion of the Kūhiō Highway infrastructure. For this reason, a no action alternative was eliminated from further consideration.

Alternative 2 involves doing additional analysis to determine if the bridge could be rehabilitated. If it could be rehabilitated, the bridge is proposed to be widened and retro-fitted in place to meet current design standards. The outside appearance of the bridge superstructure, deck and railings would also be newly constructed to meet current standards. In addition, the bridge would be strengthened to meet current load-carrying capacity standards. However, since the specific condition of the existing interior of the bridge is uncertain and the latest bridge inspection report rates the bridge superstructure in “poor” condition, there are increased probabilities of higher costs, more frequent maintenance, and a shorter bridge life span. It is also unknown if the existing piers would need additional repair and rehabilitation as well. Therefore, this would not be a feasible alternative.

Alternative 5, a replacement bridge mauka of the existing alignment, would minimize impacts to traffic flow by maintaining traffic along the existing bridge during construction and would move the bridge farther away from nearby makai residences. However, this alternative would cost twice as much, take twice as long to construct, and would have the greatest impact to private property as far as the extent of land acquisition compared to all other alternatives. In addition, the area mauka of the existing bridge consists of steep slopes and heavy vegetation that would require significant earthwork and make construction of this alternative much more difficult. Permanent loss of resources and potential land use in the area associated with land acquisition for right-of-way may result. The Kapaia Sewage Pump Station (SPS) located at the Māʻalo Road and Kūhiō

Highway intersection would also be displaced with a mauka alignment and would require additional environmental review, additional construction cost and land acquisition for its relocation. If impacts to the Sewage Pump Station are avoided by making the curve in the road more severe, large tractor trailer vehicles would then be unable to traverse the curve.

Alternatives 6 and 7, a replacement bridge makai of the existing alignment, could be constructed at a lower cost, in a shorter amount of time, and would be less difficult to construct than a mauka alternative. The geometric design of a makai alignment would also eliminate the curve associated with the existing alignment. However, due to its close proximity, a permanent makai alignment would have the greatest impact to nearby residences not only during construction, but with the continued operation and maintenance of the new bridge. Private property would also be impacted as approximately 5,400 square feet of permanent right-of-way would be needed. Alternative 8 also involves an alignment makai of the existing bridge, however, construction would be staged. This involves narrow traffic lanes and would make maintaining traffic on the bridge difficult during construction. This alternative also would have the greatest impact on nearby residences.

Alternatives 3 and 4, a new replacement bridge along the existing alignment, is not anticipated to result in any long-term adverse effects beyond what currently exists. Alternative 3 is a slight improvement over the current conditions as the use of a single-span bridge would improve hydraulic efficiency in the area and would also cost less to construct than all other alternatives. However, since traffic could not be maintained along the existing alignment during construction, a detour would need to be provided. Given the crucial nature of this portion of roadway to the transportation infrastructure, a bypass route utilizing existing roads would cause unnecessary delays and inconvenience thousands in the traveling public that traverse this portion of Kūhiō Highway daily. Therefore, a temporary detour bridge is considered to be the most feasible detour option as it would minimize impacts to nearby residences and would result in only temporary impacts to the area.

The Māʻalo Road detour and the Kāpule Road detour both utilize existing roadways so the Kapaia Bridge would be closed during the period of construction. Both require additional traffic study to further determine area and regional impacts. Additional intersection and turn lane improvements may be warranted and costs are unknown. Further public review would be required which raises larger regional traffic issues. The makai temporary detour option provides the most direct alignment, but is the alternative in closest proximity toexisting residences which results in more severe impacts. With a longer two span temporary bridge structure, cut and fill can be minimized and construction cost can be lowered to approximately $4.3 million. The Māʻalo Road temporary detour involves the greatest extent of cut and fill walls and the greatest impact to private property. The grade of the roadway also would increase substantially to

12 percent with the downhill (westbound) traffic ending at a stop condition on Māʻalo Road which is not an optimum situation. A longer two span temporary bridge structure lowers the cost of this detour alternative to $4.1 million. A mauka temporary detour which extends from Kūhiō Highway and connects back to Kūhiō Highway will be incrementally farther from the makai side of the bridge and existing residences which minimizes its impact. With a longer two span temporary bridge structure, cut and fill can be minimized and construction cost can be lowered to $5.3 million.

Based on the foregoing analysis, the proposed preferred alternative is Alternative 3, a Single-Span Replacement Bridge Along the Existing Alignment and Temporary Mauka Detour Bridge. Estimated cost for the project includes the $11,250,682 cost for the Single-Span Replacement Bridge Along the Existing Alignment and $5,339,694 for the Temporary Mauka Detour Bridge. The total project cost is estimated at $16,590,376. The proposed preferred alternative provides the best balance between updating the facility to current standards, minimizing short-term and long-term impacts on the neighborhood and region, and reasonable constructability and cost.

3. DESCRIPTION OF THE EXISTING ENVIRONMENT, PROJECT IMPACTS AND MITIGATION MEASURES

The following is a description of the existing environment, assessment of potential impacts and proposed measures to mitigate potential adverse impacts resulting from the proposed Project.

3.1 Climate

Kaua‘i’s climate varies by terrain but is relatively uniform year round with mild temperatures, moderate humidity, and relatively consistent northeasterly trade winds. Regional topography and climatic conditions attribute to a variety of micro-climates found across the island.

Average temperatures in the Hanamā‘ulu area range from an average low in the low 60 degrees Fahrenheit (°F) in the coolest month of January, to an average high in the mid 80°F in the warmest month of August.

Average rainfall distribution in the Hanamā‘ulu area averages around 50 inches per year. Rainfall amounts lessen near the coast and increase at higher elevations with more than 400 inches per year recorded near the summit of Mt. Wai‘ale‘ale. The prevailing wind throughout the year is the northeasterly trade wind. In general, trades are more persistent in the summer than in winter (frequencies average 90 percent and 50 percent, respectively) and stronger in the afternoon than at night. Mean trade wind flow near the project site is approximately 20 miles per hour. (Department of Geography, University of Hawai‘i, 1983).

Over the 20th century, the average temperature of the Earth’s surface has increased due mostly to increasing concentrations of greenhouse gases (GHGs) in the atmosphere. Generally speaking, GHGs include carbon dioxide, methane, nitrous oxide, and chlorofluorocarbons. Small changes in the average temperature of the planet could translate to large and potentially dangerous shifts in climate and weather which may also have far-reaching effects beyond the physical environment. Many islands are especially vulnerable to the risks of climate change because of their small size, low elevation, remote geographical location, and concentration of infrastructure along coastlines. Some of the observed changes in Hawai‘i’s climate have included: an increase in surface temperature; a decrease in rainfall and stream flow; an increase in rain intensity; an increase in sea level and sea surface temperatures; and warmer, more acidic oceans (Fletcher, 2010).

Impacts and Mitigation Measures

No significant impacts on climate in the project area are anticipated as a result of the project. Construction and operation of the proposed project is

not anticipated to affect temperatures, wind, or rainfall levels in the project area.

The potential impact of the project on climate change includes the release of emissions from construction equipment and vehicles during the construction and operation of the project. However, given the limited scope and temporary nature of construction activities, any impacts during construction are anticipated to be negligible. In addition, the contractor will be responsible for complying with State Department of Health (DOH) Administrative Rules, Title 11, Chapter 60-11.1 regarding "Air Pollution Control". In the long-term, emissions from vehicles utilizing the bridge are not anticipated to increase as a result of the project as no additional lanes are being added and capacity is not being increased.

3.2 Geology, Topography and Soils

Geology: Kauaʻi consists essentially of a single shield volcano, Mt. Waiʻaleʻale, which is deeply eroded and partly veneered with much later volcanics. At the top of the shield was a caldera 10 to 12 miles across which is the largest in the Hawaiian Islands.

The eastern flank of the shield collapsed to form the semicircular Līhuʻe basin or depression which is about 7-10 miles wide. Subsequently, the Līhuʻe Basin was filled with post erosional flows of the Kōloa Volcanic Series. There are about 40 vents of the Kōloa Volcanic Series scattered widely over the eastern two-thirds of the island. The project site is located within the Līhuʻe basin.

Topography: The elevation of Kuhio Highway traversing Kapaia Stream ranges from approximately 116 to 122 feet above sea level. Kapaia Bridge is located on a curve and the roadway trends lower as it extends from the Hanamāʻulu side to Līhuʻe. Kūhiō Highway is approximately 100 feet above sea level at its intersection with Māʻalo Road. The roadway elevation is approximately 135 feet above sea level near its intersection with the driveway to the Immaculate Conception Catholic Church. There is a driveway located on the upstream – Hanamāʻulu side of the bridge at the approximately 132 foot elevation which provides access to a single family residential use. From the upstream – Hanamāʻulu side of the bridge, there is a relatively steep embankment up to the Kapaia Hillside area.

The invert of Kapaia Stream at the bridge is located at approximately 68 feet above sea level. Stream banks in the vicinity of the bridge are quite steep ranging from 60% to 145%. There is a retaining wall along the upstream –Līhuʻe stream bank.

Soils: According to the U.S Department of Agriculture Natural Resources Conservation Service, the soil at the project site is classified as Hanalei silty clay, 0 to 2 percent slopes (HnA), Hanalei silty clay, deep water table (HrB), Līhuʻe

silty clay 15 to 25 percent slopes (LhD), Rough Broken Land (rRR). See Figure 10.

Hanalei silty clay, 0 to 2 percent slopes (HnA) is typically located on stream bottoms and flood plains. In a representative profile, the surface layer, about 10 inches thick, is dark gray and very dark gray silty clay that has dark brown and reddish mottles. The subsurface layer is very dark gray and dark gray silty clay about 3 inches thick. The subsoil, about 13 inches thick, is mottled, dark gray and dark grayish brown silty clay loam that has an angular blocky structure. The substratum is stratified alluvium. The soil is strongly acid to very strongly acid in the surface layer and neutral in the subsoil. Permeability is moderate. Runoff is very slow and the erosion hazard is no more than slight.

Hanalei silty clay, deep water table (HrB) has a profile similar to HnA soils except that it has fewer mottles and the water table is at a depth of more than 3 feet.

Līhuʻe silty clay 15 to 25 percent slopes (LhD) belongs to a series of well-drained soils on uplands on the island of Kauaʻi. Runoff is medium and the erosion hazard is moderate.

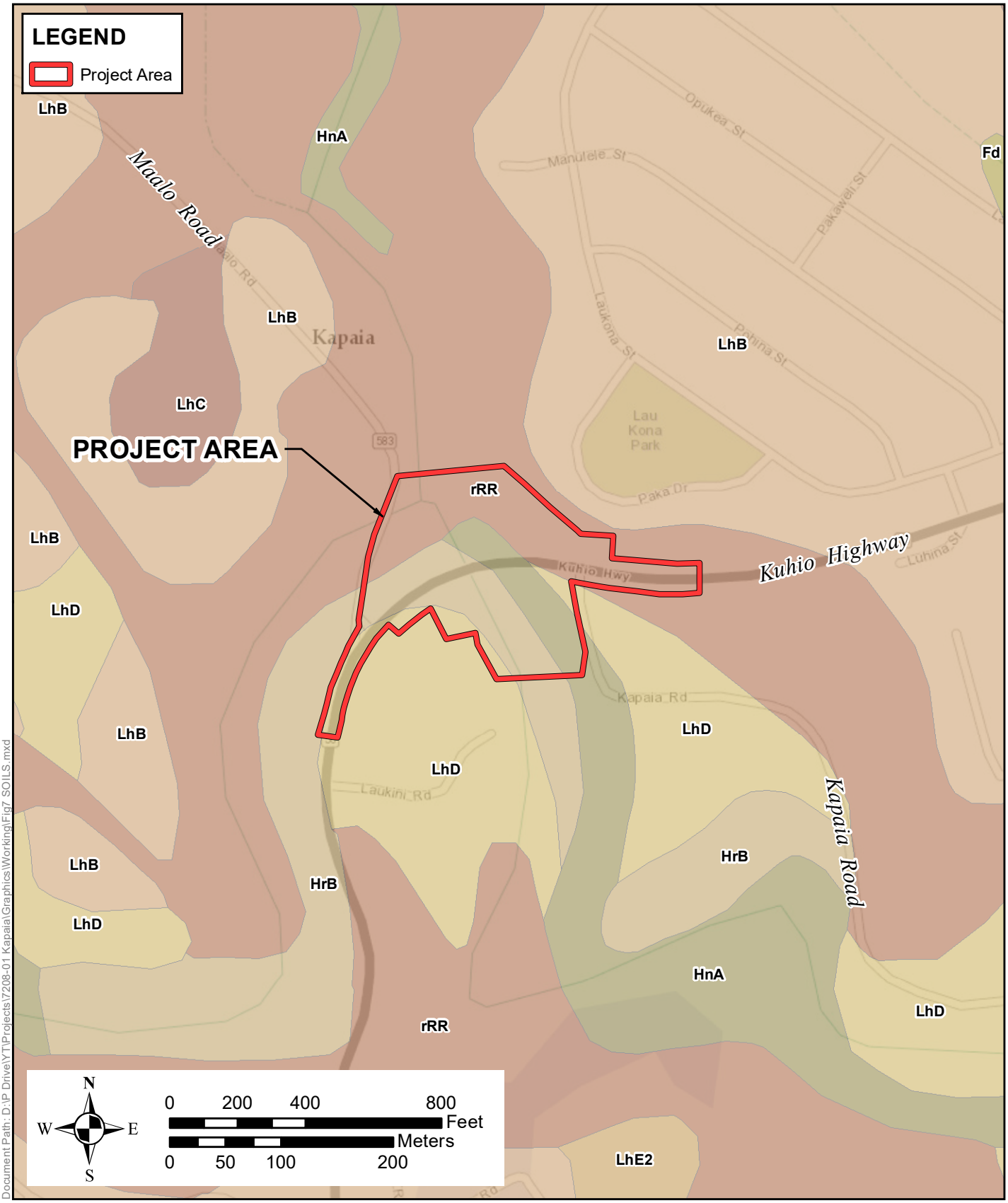
Rough Broken Land (rRR) consists of very steep land broken by numerous intermittent drainage channels. In most places it is not stony. It occurs in gulches and on mountainsides. The slope is 40 to 70 percent. Runoff is rapid and the geologic erosion is active. These soils are variable. They are 20 to more than 60 inches deep over soft, weathered rock. In most places, some weathered rock fragments are mixed with the soil material. Small areas of rock outcrop, stones, and soil slips are common.

The University of Hawaiʻi, Land Study Bureau (LSB) developed the Overall Productivity Rating, which classified soils according to five (5) levels, with “A” representing the class of highest productivity soils and “E” representing the lowest. Most of the project site is classified as “E” with a portion “Not Classified”. See Figure 11.

The State Department of Agriculture’s *Agricultural Lands of Importance in the State of Hawaiʻi* (ALISH) established a classification system for identification of agriculturally important lands. Three classes of lands were established for the State, primarily, but not exclusively, on the basis of soil characteristics. The three classes of ALISH lands are Prime Agricultural Land, Unique Agricultural Land, and Other Important Agricultural Land. Lands not included under this system are “unclassified”. Most of the project site is Not Classified while a small portion is designated as Other Important Agricultural Land. See Figure 12.

Impacts and Mitigation Measures

The permanent bridge constructed on the existing alignment minimizes any changes needed to connect to the existing approach roadway. Fill



WILSON OKAMOTO CORPORATION

FIGURE 10

SOIL CLASSIFICATIONS

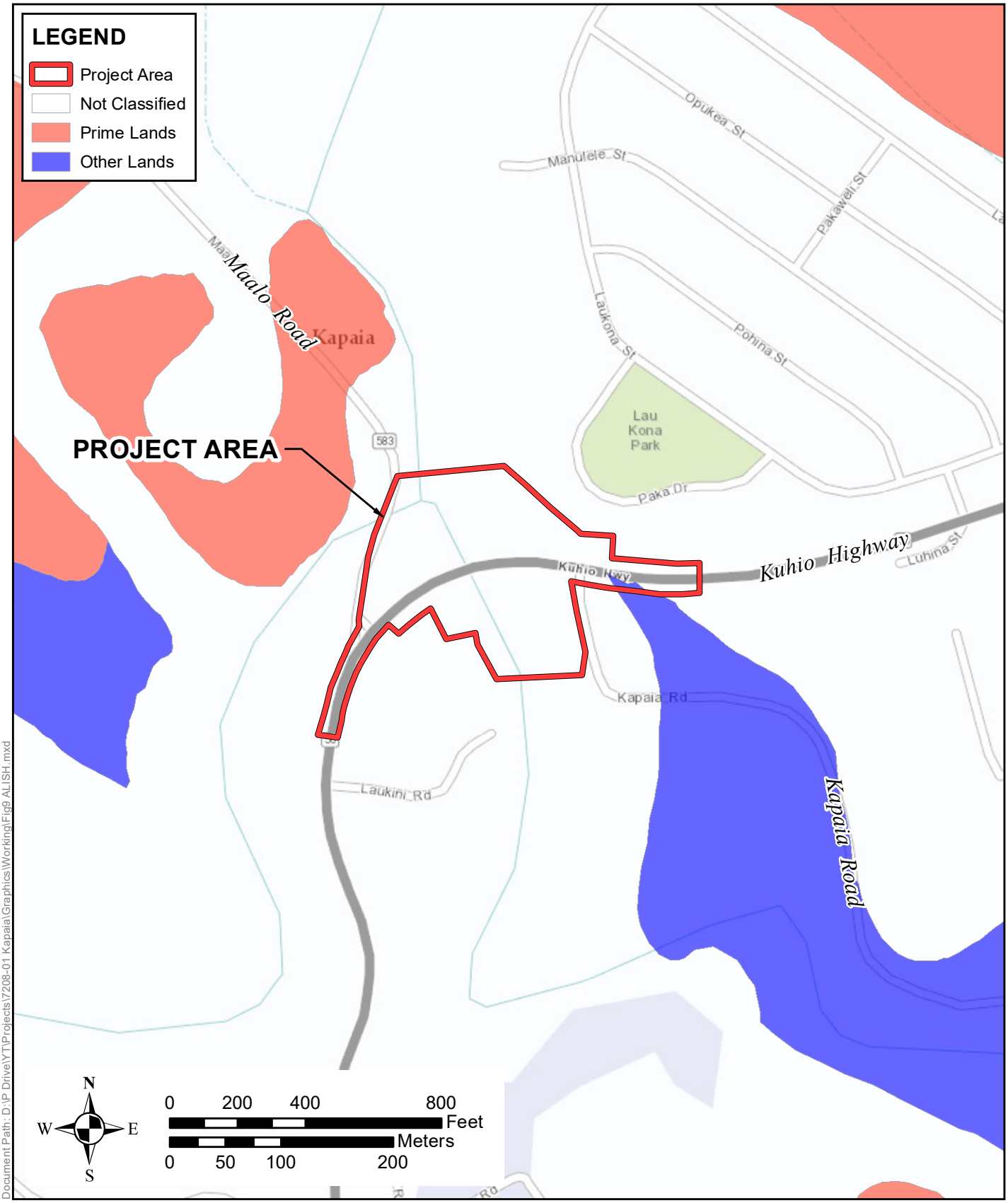
KAPAIA BRIDGE REPLACEMENT

WILSON OKAMOTO CORPORATION

FIGURE 11

LAND STUDY BUREAU DETAILED LAND CLASSIFICATION

KAPAIA BRIDGE REPLACEMENT



WILSON OKAMOTO CORPORATION

FIGURE 12

AGRICULTURAL LANDS OF IMPORTANCE TO THE STATE OF HAWAII

KAPAIA BRIDGE REPLACEMENT

walls will be required to support the bridge approaches.

The mauka temporary bridge would require a fill wall on the Līhu‘e approach. On the Hanamā‘ulu approach, a cut wall is required.

Additional site specific geotechnical analysis will be required prior to final design and location of bridge abutments, bridge piers and retaining walls. With appropriate site specific geotechnical as well as structural oversight, no significant impacts to the geology, topography, and soils are anticipated with the construction and operation of the project.

The Land Study Bureau classifies the land with a relatively low productivity rating and is not being utilized for agricultural use. The proposed action is not anticipated to present adverse effects on agriculture.

3.3 Hydrology

3.3.1 Surface Waters

Hanamā‘ulu Stream (also known as Hanamā‘ulu River) is a continuously flowing stream that discharges into an embayment. It is a third order stream (having two tributaries, each comprised of at least two smaller tributaries), extends approximately 31 miles from near the rim of Kilohana Crater at around 1,148 feet above sea level down to the Pacific Ocean at Hanamā‘ulu Bay. It crosses under Kūhiō Highway approximately 1.5 miles upstream from the mouth. The total area of the Hanamā‘ulu Watershed is approximately 5.2 square miles.

The watershed of the upper reach of Hanamā‘ulu Stream (north and south tributaries) is primarily former sugarcane land that is now either undeveloped or used for diversified agriculture. Like the Wailua watershed to the north and Nāwiliwili to the south, a plantation era irrigation system diverts water from and adds water to, the middle and upper reaches of the stream from both within and outside the Hanamā‘ulu watershed. The Kapaia Stream tributary parallels Mā‘alo Road. It is a shallow, brisk-flowing course confined within a 6 to 10 feet wide channel entering Hanamā‘ulu Stream on the left bank near the 125 foot elevation.

Hanamā‘ulu Stream is in a deeply incised gulch as it passes under Kūhiō Highway. The left bank is over 50 feet high and the right bank is approximately 40 feet high. The stream is well shaded upstream of the bridge where a dense *hau* (*Hibiscus tiliaceus*) thicket covers the Hanamā‘ulu-Kapaia confluence located a few meters upslope from the bridge. Underneath the bridge, the stream bed consists of small boulders and gravel embedded in silt and, at the time of the survey, the stream was a 3 to 6 foot deep pool without visible turbulence. Directly downstream from the bridge, Hanamā‘ulu Stream continues its calm flow, though the stream is less shaded. (AECOS, Inc., May 20, 2013)

The inland waters in the area of the project site are classified as Class 2 waters by the State Department of Health. The objective of Class 2 waters is to protect their use for recreational purposes, the support and propagation of aquatic life, agricultural and industrial water supplies, shipping, and navigation. The uses to be protected in this class of waters are all uses compatible with the protection and propagation of fish, shellfish, and wildlife, and with recreation in and on these waters. These waters shall not act as receiving waters for any discharge which has not received the best degree of treatment or control compatible with the criteria established for this class. No new treated sewage discharges shall be permitted within estuaries. (State of Hawai'i Department of Health, May 27, 2009).

Hanamā'ulu Stream is considered a perennial stream by the Hawai'i Stream Assessment. It is noted that the State Department of Health maintains a *List of Impaired Waters in Hawai'i Prepared under Clean Water Act §303(d)*. Hanamā'ulu Stream is listed as a medium priority stream listed for turbidity.

Impacts and Mitigation Measures

It is anticipated that impacts to surface waters should be mitigated through the implementation of Best Management Practices (BMPs) to prevent degradation of the quality of water during construction.

Potential construction BMPs include, but are not limited to gravel entrance, dust screen, silt fence, retention basin, diversion berm/ditches, and grading procedures to comply with applicable County of Kaua'i provisions on soil erosion and sedimentation control. Other BMPs include:

- Prevent concrete products, oil fuel, and other toxic substances from falling or leaching into the water.
- Properly and promptly dispose of all loosened and excavated soil and debris material from drainage structure work.
- Retain ground cover until the last possible date.
- Stabilize denuded areas by sodding or planting as soon as possible. Replanting should include soil amendments and temporary irrigation. Use high seeding rates to ensure rapid stand establishment.
- Avoid fertilizers and biocides, or apply only during periods of low rainfall to minimize chemical runoff.
- Keep runoff on-site.
- Use brackish or reclaimed water for irrigation and dust control during construction where available.

3.3.2 Water Quality

A Source Water Quality Assessment was prepared for the project by AECOS, Inc. dated April 18, 2013. See Appendix A. The assessment found that water at the

project site is well oxygenated, slightly alkaline stream water without tidal influence. Conductivity is well within the State standard. The stream did not contain much suspended solids during sampling. Turbidity, an indication of the cloudiness of the water, is beneath the 5.0 ntu wet season standard. Nitrogenous nutrient concentrations are generally within levels typical for streams in the Hawaiian Islands. However, total phosphorus concentrations are greatly elevated with readings in excess of State "not to exceed more than 2% of the time criteria." Oil and grease was present in detectable levels. This is a violation of State of Hawai'i standards (HDOH, 2009) that state:

> "All waters shall be free to substances attributable to domestic, industrial, or other controllable sources of pollutants, including…(2) Floating debris, oil, grease, scum, or other floating material."

Impacts and Mitigation Measures

A treatment system to remove particulates generated by project work and any oil and grease encountered should be designed and implemented for this project if dewatering construction effluent is to be discharged into State receiving waters of Hanamā'ulu Stream. It is likely that nutrient levels will decrease as particulates are removed.

It is anticipated that water quality impacts during the short term construction period will be minimal. Best Management Practices will be incorporated to prevent degradation of the quality of the water during construction. See Section 3.3.1 for additional information on best management practices.

3.3.3 Ground Water

The project site is located within the Hanamā'ulu Aquifer System of the Līhu'e Aquifer Sector of the island. Virtually the entire system is mantled with Kōloa Volcanics as the dominant rock type. This has resulted in perched groundwater being widespread in discontinuous aquifers and masks the presence of basal water. Major stream valleys within the Hanamā'ulu Aquifer System contain tongues of alluvium which are not as effective as caprock. Perennial streams also drain high level and perched aquifers. (Department of Water, February 1990).

Impacts and Mitigation Measures

The Safe Drinking Water Act (SDWA) is the principal Federal law that ensures the quality of drinking water. Under the SDWA, the Environmental Protection Agency (EPA) sets standards for drinking water quality and oversees the States, localities, and water suppliers who implement those standards. The SDWA also provides the impetus behind

the development of regulatory protection of principal or sole source aquifers. As identified by the U.S. EPA, Region 9 Ground Water Office, the only two Sole Source Aquifers in the State of Hawai'i are located on the islands of O'ahu and Moloka'i.

No significant impacts to groundwater underlying the project site are anticipated during construction and operation of the proposed facility. Construction activities are not likely to introduce or release to the soil any materials which could adversely affect groundwater.

3.3.4 Coastal Waters

The coastal waters closest to the project site are classified as Class A waters by the State Department of Health. It is the objective of Class A waters that their use for recreational purposes and aesthetic enjoyment be protected. Any other use shall be permitted as long as it is compatible with the protection and propagation of fish, shellfish, and wildlife, and with recreation in and on these waters. These waters shall not act as receiving waters for any discharge which has not received the best degree of treatment or control compatible with the criteria established for this class. (State of Hawai'i Department of Health, May 27, 2009).

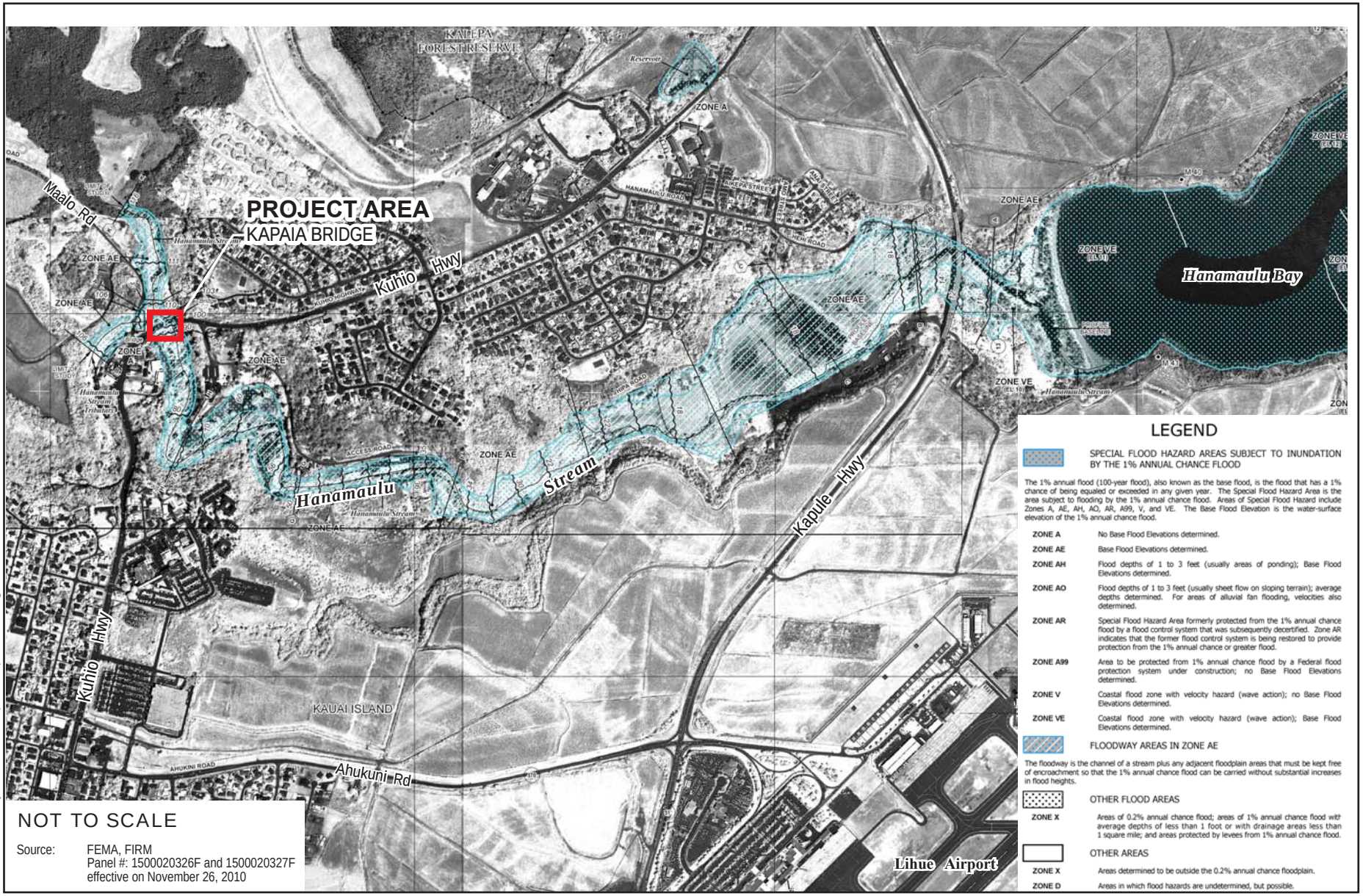
Impacts and Mitigation Measures

It is anticipated that impacts to coastal waters resulting from the project should be negligible. Best Management Practices will be incorporated to prevent degradation of the quality of the water during construction. See Section 3.3.1 for additional information on best management practices.

3.4 Natural Hazards

3.4.1 Flood Hazard

According to the Flood Insurance Rate Map (FIRM) prepared by the Federal Emergency Management Agency (FEMA), the project site is located within Zones AE, AEF, A and X. Zone AE corresponds to the 100-year floodplain. At the project site, the base flood elevation is 100 feet above sea level. Zone AEF defines the floodway which is the channel of the stream plus any adjacent areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increase in flood heights. Zone A is the 100-year flood plain determined by approximate methods. Since no detailed hydraulic analysis is performed, no base flood elevations or depths are shown. Zone X is an area determined to be outside of the 0.2% annual chance floodplain. No base flood elevations or depths are shown in this zone. See Figure 13.



D:\P Drive\Y\Projects\7208-01 Kapaia\Graphics\Working

WILSON OKAMOTO CORPORATION

FIGURE 13

FLOOD INSURANCE RATE MAP

KAPAIA BRIDGE REPLACEMENT

While current trends of a changing climate in Hawai‘i show a decrease in rainfall and stream flow, the amount of rain falling in the very heaviest downpours (defined as the heaviest 1% of all events) has increased (Fletcher, 2010). Intense rain triggers a domino effect of other impacts including flash flooding, mudslides, and debris flows, road and business closure, infrastructure damage, and loss of public services to isolated communities.

Impacts and Mitigation Measures

The proposed project will involve the replacement of the existing structurally deficient bridgewhich will be designed and constructed to accommodate peak flows during a 100-year storm event. There will be a two-foot minimum freeboard from finished deck elevation to the 100-year water surface elevation, which is consistent with current standards for flood elevation. Similarly, the abutments will be situated much higher than ordinary flow making the potential of scour unlikely. Further site specific geotechnical analysis will determine the final location of the bridge abutments for added stability.

The proposed Project improvements will also be designed and constructed in full compliance with the flood plain management requirements of the County. This will include certification by a registered professional engineer that the Project improvements will not result in any increase in base flood elevations during the occurrence of base flood discharges.

3.4.2 Seismic Activity

Earthquakes in the Hawaiian Islands are primarily associated with volcanic eruptions from the expansion or shrinkage of magma reservoirs. Available historical data indicates that the number of major earthquakes occurring on Kaua‘i have been generally fewer and of lower intensity compared to the other Hawaiian islands, especially the Big Island.

The Uniform Building Code (UBC) provides minimum design criteria to address potential for damages due to seismic disturbances. The UBC has six seismic zones (0, 1, 2A, 2B, 3, 4). Zone 0 is the lowest level on the scale defined as no chance of severe ground shaking to Zone 4 which is the highest level with a 10% chance of severe shaking in a 50-year interval. The Big Island is Zone 4. The County of Maui is designated as Zone 2B. Oahu is Zone 2A and the County of Kauai is Zone 1.

Impacts and Mitigation Measures

The proposed project will be designed and constructed to meet the requirements of the latest version of the American Association of State

Highway and Transportation Officials (AASHTO) load-and-resistance factor design (LRFD) to ensure that potential seismic activities do not adversely affect the bridge structure.

The project will not result in indirect or cumulative impacts from potential seismic activities.

3.5 Riparian Vegetation and Stream Biota

A Water Quality and Biological Survey was prepared for the project by AECOS, Inc. dated May 20, 2013. See Appendix B. Regarding botanical survey findings, sixty-nine (69) species of plants were identified. Only one species, *hau* (*Hibiscus tilisaceus*), found near the bridge, is indigenous to the main Hawaiian Island with two additional species: coconut palm (*Cocos nucifera*) and *kukui* (*Aleurites moluccana*), confirmed to be Polynesian introductions prior to Captain Cook's arrival in 1778.

Within the Project areas, the stream banks are heavily vegetated with shrubs, grasses, and other herbaceous plants. The riparian vegetation in the Project areas is composed almost entirely on introduced species and much of the growth occurs on the steep gulch margins. The dominant trees are *hau*, parasol leaf tree (*Macaranga tanarius*), and Java plum (*Syzygium cumini*). Just upstream of the bridge, *hau* has overgrown both the Kapaia tributary and Hanamā'ulu Stream. The right bank beneath the bridge is sloped gently and supports a number of herbaceous plants: white shrimp plant (*Justicia betonica*), *Crassocephalum crepidioides*, *maile honohono* (*Ageratum conzyoides*), and Guinea grass (*Panicum maximum*), all common above stream banks beneath the highway bridge.

Along the stream banks, umbrella sedge (*Cyperus involucratus*), primrose willow (*Ludwigia octovalis*), and numerous ferns (cliff brake, [*Pteris vittata*], *lauae* [*Phymatotosorus grossus*], and swordfern [*Nephrolepis multiflora*]) grow abundantly. Parasol leaf tree is thick along the gulch in several locations. Glycine vine (*Neonotonia wightii*) overgrows trees and shrubs in several areas within the Project area. Downstream from the bridge, bananas (*Musa sp.*) and coconut palms grow near the right stream bank where residents obviously maintain the landscape.

The highway right-of-way is a mix of ruderal weeds and grasses. Guinea grass, swollen finger grass (*Chloris barbata*), natal red top (*Melinis repens*), and buffelgrass (*Cenchrus ciliaris*) grow interspersed with spurges (*Euphorbia hirta* and *E. hypericifolia*), little bell (*Ipomoea triloba*), false mallow (*Malvastrum coromandelianum*), and small hop clover (*Trifolium dubium*). Mexican creeper (*Antigonum leptopus*) grows conspicuously off the makai side of the road.

Aquatic species include introduced thiarid sails (*Melanoides tuberculata* and *Tarebia granifera*) inhabit the streambed in most locations with silt bottom and

are observed occasionally on boulders. The former also known as the red-rimmed melania was identified in all surveyed segments of Hanamā‘ulu Stream. Introduced poeciliid fishes (*Xiphophorus helleri*, *Poecilia reticulata*, and *Gambusia affinis*) are conspicuous in the Project area, with several predatory fish species such as smallmouth bass (*Micropterus dolomieu*) and jeweled cichids (*Hemichromis elongatus*), visible nearby. Bullfrogs (*Lithobates catesbeiana*) frequent the numerous logs and debris accumulated in the area beneath the bridge.

Native *‘o‘opu* (*Gobidae*) may also be present and certainly migrate through the area, though none were observed at the Project site during the survey. Several *‘o‘opu naniha* (*Stenogobius hawaiiensis*) and *‘o‘opu nākea* (*Awaous guamensis*) were seen in the coastal estuary at Hanamā‘ulu Beach Park.

Impacts and Mitigation Measures

The plants observed in the Project area are almost entirely species that have been introduced in the Hawaiian Islands over the last two centuries. These species are widespread in the lowlands of Kaua‘i and have no specific intrinsic value that would be lost due to the Project. None of the plant species recorded is endemic (unique to the Hawaiian Islands) and none is listed as endangered or threatened or proposed for inclusion as a listed species by federal or state agencies. (AECOS, Inc., May 20, 2013).

No aquatic species protected by State of Hawai‘i Administrative Rules, nor federally endangered or threatened species were observed in Hanamā‘ulu Stream within the Project area. The native stream macrofauna are diadromous: eggs are laid in the stream and the larvae that hatch from these eggs move down stream and out into the ocean where they develop for a time before migrating back into fresh water to grow to maturity. Construction will be phased such that at no time will the entire stream be blocked in a manner that would prevent upstream migration of native amphidromous species. Best Management Practices will be incorporated during the construction phase to prevent significant degradation of the quality of the water during construction. (AECOS, Inc., May 20, 2013).

3.6 Air Quality

Air quality refers to the presence or absence of pollutants in the atmosphere. It is the combined result of the natural background and emissions from many pollution sources. The impact of land development activities on air quality in a proposed development’s locale differs by project phase (site preparation, construction, occupancy) and project type.

Based on annual summaries of air quality measurements for particulate (as PM-10) at the State Department of Health’s Līhu‘e monitoring station for the period

2002 through 2006, all values reported were within the State and national ambient air quality standards.

Although very little ambient air quality data is available to characterize existing conditions, the present air quality of the project area appears to be reasonably good. Based on available information, it appears likely that all national air quality standards are currently being met, although occasional exceedances of the more stringent State standards for carbon monoxide near congested roadway intersections.

Impacts and Mitigation Measures

The proposed project will have short-term construction-related impacts in air quality, including the generation of dust and emissions from construction vehicles, equipment, and commuting construction workers. The construction contractor is responsible for complying with State DOH Administrative Rules, Title 11, Chapter 11-60.1 regarding "Air Pollution Control" specifically Section 11-60.1-33 regarding fugitive dust and the prohibition of visible dust emissions at property boundaries.

Mitigation measures to address short-term impacts include controlling the generation of fugitive dust through frequent watering of unpaved areas of exposed soil and planting landscaping as soon as possible on completed areas.

In the long term, it is not anticipated that operation of the project will adversely affect air quality, since no significant increase in traffic attributable to the project is expected.

3.7 Noise

Noise levels In the vicinity of the project site are predominantly attributable to vehicular traffic traveling along Kūhiō Highway. Also contributing to the acoustic environment is noise from the low pitch sounds from wind and birds.

Impacts and Mitigation Measures

Short term noise impacts will be unavoidable during the duration of project construction. Operation of heavy construction equipment such as trucks, compactors, generators, and pavers, will raise ambient noise levels in the project vicinity. Unavoidable construction noise impacts will be mitigated to some degree by complying with the provisions of the State DOH Administrative Rules, Title 11, Chapter 46, "Community Noise Control" regulations which require a noise permit if the noise levels from construction activities are expected to exceed the allowable noise levels stated in the Rules. The hours of permitted construction noise operations

specified in the Rules will be adhered to and enforced. It shall be the contractor's responsibility to minimize noise by properly maintaining noise mufflers and other noise attenuating equipment, and to maintain noise levels within regulatory limits. Potential noise impacts will also be mitigated be performing construction work during daytime hours, as opposed to nighttime work.

There is the potential for cumulative noise impacts if concurrent construction activities in the vicinity of the project should coincide in highly variable and unpredictable situations. In accordance with Title 11, Chapter 46, Community Noise Control, HAR, contractors are responsible to minimize noise by properly maintaining noise mufflers and other noise attenuating equipment, and to maintain noise levels within regulatory limits. In addition, a noise permit is required if the noise levels from construction activities are expected to exceed the allowable noise levels stated in the Rules.

The temporary detour bridge has been proposed on the mauka side of the existing bridge in order to minimize noise impacts upon residents and businesses on the makai side of the bridge. In the long term, the proposed project represents a bridge replacement project which does not increase lane capacity nor is it intended to induce additional traffic and vehicles to utilize the new bridge. Thus, any additional noise impacts resulting from use of the new bridge should be minimal.

3.8 Archaeological and Cultural Resources

A study entitled "*Draft Archaeological Inventory Survey Report for the Replacement of Hanamāʻulu (Kapaia) Stream Bridge, Kūhiō Highway, Approximately Between Mileposts 1.1 and 1.3, Hanamāʻulu Ahupuaʻa, Līhuʻe District, Kauaʻi TMKs: [4] 3-7-001:001, 3-7-004:009, 3-8-002:001, 012, and 999, and 3-8-006:999 por*." was done by Cultural Surveys Hawaiʻi, Inc., dated November 2016. See Appendix C.

The pedestrian survey located 11 cultural resources within the project area. Table 1 lists the identified cultural resources. Figure 14 shows the location in relation to the project site. Subsurface testing was conducted at four of the identified cultural resources and included seven shovel tests.

Table 1
List of Identified Cultural Resources

SIHP # (50-30-)	Site Type	Age
11-2207	Ditch and Terraces	Historic and indeterminate
08-2208	Retaining Wall	Historic

08-2209	Ditch Complex	Historic
08-2210	Road	Historic
08-2211	Terrace and Alignment	Indeterminate
08-2212	Platform – road and bridge landing	Historic
08-2213	Wall	Indeterminate
08-2214	Retaining Wall	Indeterminate
08-2215	Bridge	Historic
08-2216	Ditch	Indeterminate
08-2217	Terrace	Indeterminate

A summary of the identified cultural resources is presented below.

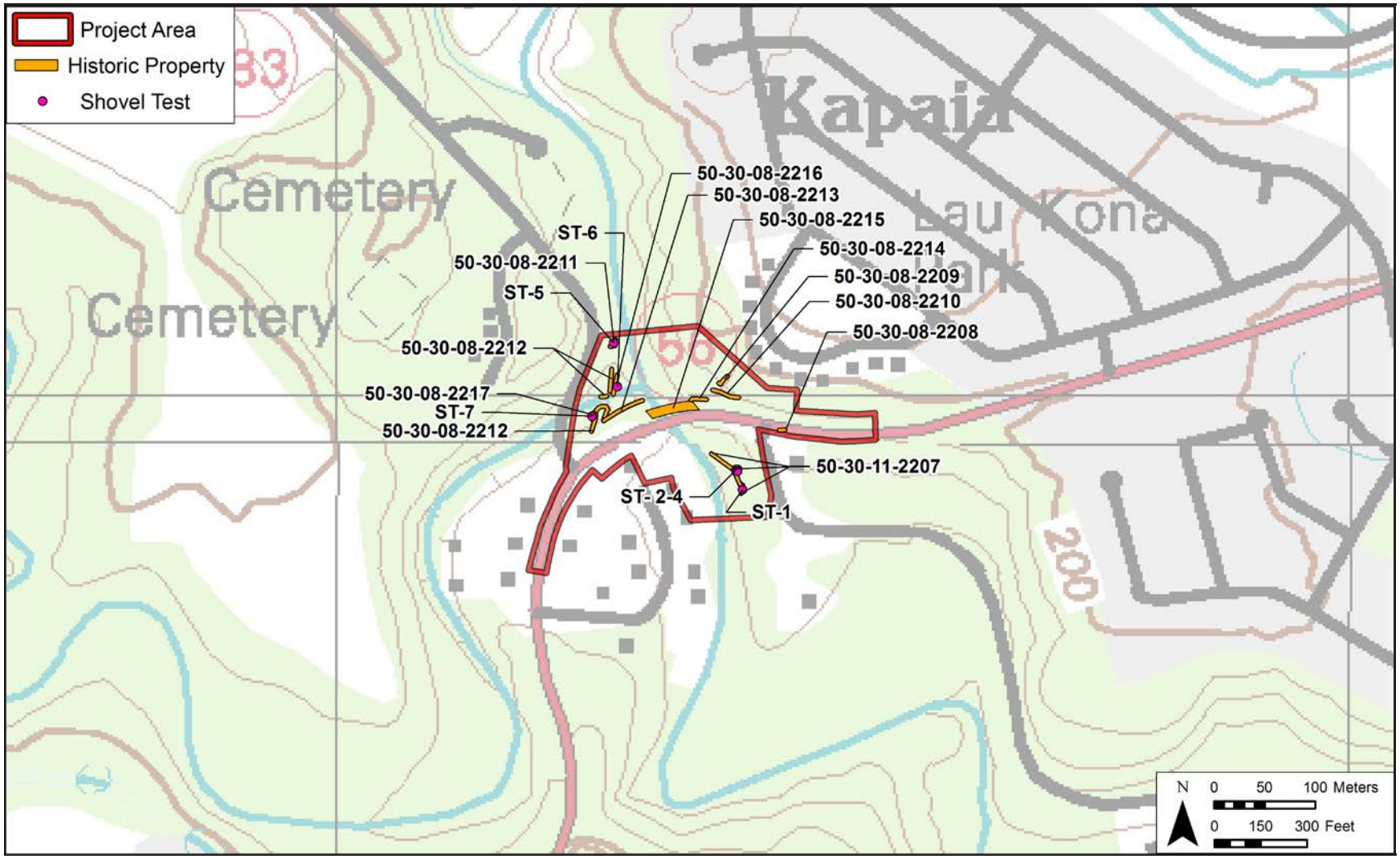
SIHP # 50-30-11-2207

SIHP# -2207 consists of the complex of three features located on the south facing slope between Kapaia Road and Hanamā‘ulu Stream. The overall dimensions for this site are 60 meters northwest/southeast by 15 meters northeast/southwest. This site included a ditch (SIHP# -2207A) and two terraces (SIHP#s -2207B and -2207C).

The interior of the ditch (SIHP# -2207A) measures 2.5 meters wide with depths that vary from 0.10 meter of the eastern end to 0.55 meter on the western end. This feature is located on the east side of the small valley east of Hanamā‘ulu Stream. It is situated on a leveled area to the west of SIHP# -2207B and SIHP# -2207C.

SIHP# -2207B consists of two adjacent agricultural terraces. Terrace 1 is located to the northeast of Terrace 2. Terrace 1 measured 4.9 meters northwest/southeast by 1.8 meters east/west, and is constructed on large sub-angular basalt cobbles and small to medium sub-angular basalt boulders stacked one to two courses high for a maximum height of 0.77 meter. Terrace 2 is located approximately 1 meter southwest of Terrace 1, and it measured 5.5 meters northeast/southwest by 2.8 meters northwest/southeast, with a maximum height of 0.46 meter. Based on visual observation of the terraces, function and age were indeterminate. Shovel testing was also conducted in this area and no significant cultural materials were observed.

SIHP# -2207C consists of two agricultural terraces. Terrace 1 is located in the southeastern end of a large leveled area and Terrace 2 is located on the northwestern end. Terrace 1 was an L-shaped structure although it now looks like a “T”. It measures 3.5 meters northwest/southeast by 2.8 meters northeast/southwest, and it has a maximum height of 0.6 meter. This terrace is constructed of an alignment of large sub-angular basalt cobbles and a large sub-angular basalt boulder running in a northwest to southeast direction. This alignment abuts an alignment of four large sub-angular basalt boulders. Terrace



Source: Cultural Surveys Hawaii

D:\P Drive\YT\Projects\7208-01 Kapaia\Graphics\Working

WILSON OKAMOTO CORPORATION

FIGURE 14

ARCHAEOLOGICAL AND CULTURAL RESOURCES

KAPAIA BRIDGE REPLACEMENT

2, located 2.3 meters northwest of Terrace 1, measures 6.4 meters northwest/southeast by 3.5 meters northeast/southwest. Terrace 2 is constructed on small to large sub-angular and angular basalt cobbles and boulders stacked one to two courses high for a maximum height of 0.51 meter. Due to a large mango tree with its roots within the terrace wall, the construction of the terrace is extremely disturbed.

Based on visual observation of the terraces, function and age were indeterminate. Shovel testing was also conducted in this area and no significant cultural materials were observed.

SIHP # 50-30-08-2208

SIHP# -2208 is a small, stacked stone retaining wall that runs along the north side of the existing Kūhiō Highway. It fronts an existing auto body shop and acts as a retaining wall for a portion of the parking area. The site is 6 meters long, 1.6 meters wide, and it has a maximum height of 0.71 meter. It is constructed on sub-angular basalt boulders and cobbles, one to four courses high. The eastern end of the wall has collapsed. It likely dates from the time when the road bed was graded for Kūhiō Highway or its predecessor.

SIHP # 50-30-08-2209

SIHP# -2209 is a ditch complex that consists of a concrete ditch, a concrete culvert, and an earthen ditch. The concrete ditch runs in a rough north/south then northeast/southwest direction. Located on an extremely steep slope, the concrete ditch starts from the top of the slope where the upper Hanamā‘ulu subdivision is. The ditch measures minimally 10.3 meters northeast/southwest by 1.3 meters northwest/southeast.

The construction of the concrete ditch appears to be made by hand and not by forms. Due to the steepness of the hill, the flow of the water traveled downslope into a concrete box culvert. The culvert is underground on its eastern end but open on its western end. The culvert measures 2.4 meters east/west by 1.3 meters north/south. The culvert appears to be built like a small tunnel and built in five sections.

Water from the concrete ditch enters the northeast end of the culvert. The opening is barely visible and a large sub-angular basalt boulder blocks the water entrance into the culvert. This was most likely done when the ditch was no longer in use. The overall height of the culvert is 1.21 meters and the interior height is 0.75 meter. There is a raised flat earthen surface that abuts the southern end of the culvert, and it measures 6.5 meters east/west by 5.1 meters north/south. The function for this raised leveled area is unknown.

From the culvert, water continued downward through and earthen ditch on the west side of the culvert. Very little remains of the earthen ditch. What is still visible measured 23.8 meters long, with a maximum width of 0.14 meter. The depth of the earthen ditch is shallow, ranging from 0.05 to 0.08 meter.

SIHP # 50-30-08-2210

SIHP# -2210 is an old road on a ledge of a hill abutting Kūhiō Highway on the north side. The area above the ledge is the upper Hanamā‘ulu subdivision. The only visible part of the old road is located along the face of the ledge along Kūhiō Highway. It measures 27 meters long. The width of the road could not be determined due to the buildup of soil on the ledge and the overgrowth of vegetation in the area. The thickness of the profiled pavement varies from 0.10 meter to 0.17 meter. Unlike modern pavement, the pavement in the profile seems to be composed of large sub-angular basalt pebbles and small sub-angular basalt cobbles.

SIHP # 50-30-08-2211

SIHP# -2211A is a stacked stone terrace that measures 4.4 meters long, 1.0 meter wide and 0.28 meter high. It is constructed of sub-angular basalt cobbles and small boulders featuring 1-3 vertical courses. Although there is stacking displayed, there are no real vertical faces. The area retained by the terrace is a high, steep slope. It is unclear whether this slope is natural or part of the spoils from the excavation and construction of the existing Mā‘alo Road that was pushed downslope from the west onto this feature. The area between this feature and Mā‘alo Road (to the west) is now an illegal trash dump. Due to its location and unknown style of construction, determining function and possible age was difficult. A shovel test was performed just east of this feature and no cultural materials were observed.

SIHP# -2211B is a straight alignment of seven sub-angular basalt boulders that measured 2.9 meters long, 0.57 meters wide, and 0.50 meter high. SIHP# -2211B is located approximately 1.5 meters south of SIHP# -2211A. While there is no stacking, the alignment does retain some soil that gently slopes to the east. The age and function of this feature could not be determined. Modern trash has recently been dumped here as well.

SIHP # 50-30-08-2212

SIHP# -2212 consists of two platform sections on either side of Hanamā‘ulu Stream and is believed to be a remnant road and bridge landing. On the north side of the stream, one section of remnant platform was composed of two walls built using two different construction styles. The first wall was more of a retaining wall running roughly in a north/south direction and measuring approximately 17.0 meters in length and 2.3 meters in maximum height. The wall was constructed of

small to large sub-angular basalt boulders stacked up to 11 courses high. Small to large sub-angular basalt cobbles were placed in the spaces between the stacked basalt boulders. Along the eastern side of the wall, there were three areas of collapse. At the south end of the wall, the wall disappeared and little chunks of asphalt were observed clinging to the side of the slope. The wall retains a fairly large leveled areas that consisted on soil and thick vegetation of cat claws and *hau*. Approximately 5 meters to the southwest of the dry-stacked wall on the downslope was another wall that measured 6.0 meters long east/west. 0.60 meters thick, and 2.84 meters high. This east/west running wall was constructed of mortared basalt sub-angular and angular cobbles and boulders. The two differently constructed walls were once connected, helping to form a platform which is located immediately west of SIHP# -2216, a ditch.

A second section of remnant platform was observed on the south side of Hanamā‘ulu Stream, directly across from the first platform remnant. This platform consisted on three connected walls build using two different types pf wall construction. The total length of all three walls combined was 42 meters. The east and west walls of the platform were constructed using the same technique. They were constructed of small to large sub-angular basalt boulders stacked up to 14 courses high, with small to large sub-angular basalt cobbles placed in the spaces between the boulders. The east wall measured 21 meters long, with a maximum height of 2.07 meters. The north wall of the platform was constructed of mortared sub-angular and angular cobbles and boulders. The thickness of this wall measured 0.60 meter and it had a maximum height of 2.3 meters. There were rusty metal pieces on the surface of the northeast and east sides of the north wall. It is unknown what these metal pieces are. There was a large, fairly leveled area located between the walls. This leveled area was higher in elevation than the north wall. At the north end of that leveled area, asphalt was observed on the surface. From the broken pieces observed along the north slope of the leveled area and the intact portion at the edge of the flat area, the asphalt is an extremely thin layer measuring 0.01 meter. Base course comprised of large angular basalt pebbles was also observed on the face of the flat area, measuring 0.05 to 0.07 meter thick. The asphalt and base course were situated in clay soil. This platform is located immediately west of SIHP# -2213, a wall, and immediately east of SIHP# -2217, a terrace.

SIHP # 50-30-08-2213

SIHP# -2213 consists of a 35 meter long wall running in a northeast/southwest direction. The thickness of the wall measured 0.8 meter. The wall was constructed of cut stone and mortar and varies in height from 2.11 meters on the west end to 5.0 meters on the east end. This site parallels Kūhiō Highway. At the eastern end of the wall, the wall is broken, although no chunks of mortared stone were observed on the surface. The distance between the top of the wall and the guardrail along Kūhiō Highway was approximately 5 to 6 meters, although the wall and the highway are at different elevations, with Kūhiō Highway

being higher. The area between the guardrail and the wall steeply sloped to the north and consisted of soil fill and thick vegetation. This site is situated south and west of Hanamaulu Stream, where the stream runs east/west then bends to the south. It is also located north of Kūhiō Highway and east of and directly adjacent to the southern portion of SIHP# -2212.

SIHP # 50-30-08-2214

SIHP# -2214 is a 15 meters long, 0.56 meter high sloped wall located along the north side of Kūhiō Highway just east of the Kapaia Bridge. The wall is built along the base of a steep dirt hill, and is constructed of mortar and large angular basalt cobbles and small angular basalt boulders. Because the wall is constructed into the face of the hill, its thickness could not be determined. The wall appears to serve two purposes based on its location. The first is water control; the wall diverts water directly to the edge of the bridge where it falls into Hanamā‘ulu Stream. The second purpose is to keep water from eroding the base of the hillside when rainwater flows down in this direction.

SIHP # 50-30-08-2215

SIHP# -2215 is the Kapaia Bridge. The bridge measures approximately 47 meters in length in a roughly east/west direction and 9 meters wide, and it has an approximate height of 15 meters above Hanamā‘ulu Stream. On both sides of the bridge are concrete railings that measure 0.25 meter thick and 0.74 meter high from the top of the railing to the road. According to the Historic Bridge Inventory: Island of Kaua‘i (Mason Architects 1989: 149-150):

> The Kapaia Bridge is a common structural type, a concrete tee beam. It is a good example of the early 1930’s period, with paneled railings and no sidewalks….The bridge was a fairly complex engineering project for its period in design and construction, due to the curve it incorporates, both in the horizontal and vertical planes. The curved, paneled parapet walls with the sloped cap give the bridge a graceful and artistic effect. Kapaia Bridge is a distinguished entity because it was one of two Federal aid bridges on Kaua‘i….It is an unusual resource because it is the highest bridge on Kaua‘i.

Below the bridge on the northwest and southwest sides is a large, basalt boulder and mortar retaining wall constructed against the steep slope. It is not mentioned in the bridge inventory report so the age of the wall is unknown. Although historic by design construction and year according to experts, the archaeological inventory survey notes that Kapaia Bridge is more of a historic architectural site than an archaeological site.

SIHP # 50-30-08-2216

SIHP# -2216 is a remnant ditch that measures 17 meters long and 4 meters wide. It is located north and west of Hanamā‘ulu Stream and its origin (to the north) is unknown. The ditch is bermed on the east and west sides and varies in depth from 0.44 to 0.57 meter. At the south end of the ditch is a roughly paved area composed of small to large sub-angular and angular basalt cobbles that gently slopes into Hanamā‘ulu Stream. The ditch is situated on a fairly level area and parallels SIHP# -2212 to the east. A shovel test was excavated in the center of ditch at its south end. No cultural materials were observed.

SIHP # 50-30-08-2217

SIHP# -2217 consists of a remnant terrace measuring 8 meters northeast/southwest by 3.7 meters northwest/southeast. What remains of the site is constructed of small to large sub-angular boulders stacked one to three courses high for a maximum height of 0.71 meter. The leveled area this terrace retains consists of soil and few large sub-angular basalt cobbles and boulders scattered about. The terrace is situated on a level area south of Hanamā‘ulu Stream and just west of the southern platform of SIHP# -2212. Due to its unknown style of construction, determining function and possible age was difficult. In an attempt to gain an understanding of possible function and age, a shovel test was done but no cultural materials were observed.

Impacts and Mitigation Measures

It is known through Land Court Award documentation that there were pre-Contact residents scattered within the current project area. All of the residents were located on the south side of the present Kapaia Bridge.

The results for the archaeological inventory survey are consistent with expectations set forth by background research - that any findings were likely to be historic and that it was unlikely dense cultural resources would be found in the area. There were 11 cultural resources identified during the present investigation. They are of historic and indeterminate age. The identified cultural resources are situated closely around the present Kapaia Bridge.

The located cultural resources are most likely associated with the sugar plantation and plantation camps. The majority of the sites deal with transportation, whether mechanical, pedestrian, or water. It is extremely likely that any structures from pre-Contact times and many of those from various stages of the historic sugar plantation were destroyed.

Due to the terrain in most of the project area, as well as inaccessibility of private property, backhoe trenching could not be conducted during the

archaeological survey. However, shovel tests were performed at select sites. Seven shovel tests were completed near and/or in four of the identified cultural resources. All of the shovel tests followed the same pattern. The number of strata in all of the shovel test units varied from three to four layers. In all shovel tests, Stratum 1 consisted of a modern A horizon. The middle strata generally consisted of previously disturbed layers. In the case of ST-6, previous disturbance was caused by flowing water, and in the cases of ST-1, ST-2, ST-3 and ST-7, previous disturbance was caused by construction. The last stratum in all cases was sterile soil with decomposing bedrock.

Although no pre-Contact cultural materials were observed in any of the shovel test units, there was some evidence of a possible old historic road in ST-1 through ST-3 on the southeast side of the project area. No significant historic cultural material remains and/or concentrated deposits were encountered in a subsurface context on the north side of Kapaia Bridge.

Cultural resource significance is evaluated and expressed as eligibility for listing on the National Register of Historic Places. To be considered eligible for listing on the National Register, a cultural resource must possess integrity of location, design, setting, materials, workmanship, feeling, and/or association and meet one or more of the following broad cultural/historic significance criteria (in accordance with 36 CFR 60.4 and HAR Sec. 13-275-6):

A. Reflects major trends or events in the history of the state or nation.
B. Associated with the lives of persons significant in our past.
C. Excellent example of a site type/work of a master.
D. Has yielded, or may be likely to yield, information important in prehistory or history.

All of the cultural resources found in the archaeological inventory survey are classified under Criterion “D”. The project-specific effect recommendation is “adverse effect”. Under Hawai‘i State historic preservation review legislation, the project’s effect recommendations is “effect, with agreed upon mitigation commitments” (in accordance with HAR Sec. 13-284-7).

The 11 cultural resources documented within the project area will be, or potentially may be, affected by the proposed project. However, no further historic preservation work is recommended. Sufficient information regarding the location, extent, function, age, and construction methods of these cultural resources has been generated during the archaeological inventory survey investigation to mitigate any adverse effect caused by proposed development activities. The 11 cultural resources were

documented with detailed written description, scaled drawings, and photographs, and select sites were tested.

In the unlikely event that previously unidentified cultural resources are encountered during project construction, the project proponents should immediately stop work in the vicinity and contact the SHPD.

3.9 Architectural Resources

According to the State Historic Bridge Inventory & Evaluation, Kapaia Bridge is considered eligible for the National Register of Historic Places under Criterion C, embodying the distinctive characteristics of a type, period, or method of construction, or that represents the work of a master, or that possesses high artistic values, or that represents a significant and distinguishable entity whose components may lack individual distinction. The bridge is a concrete Tee Beam bridge structure. Its railings are concrete solid panel with cap. It is associated with early developments in concrete bridge construction in Hawai‘i and is a good example of a 1920’s reinforced concrete girder bridge.

Kapaia Bridge is not considered unique or the best example of a type, but may become a rare example of a bridge type in the future and reflects characteristics of its bridge type. The State Historic Bridge Inventory Evaluation notes that the curved reinforced concrete girder bridge is in its original location, but in poor condition. The bridge has concrete parapets with flat caps and end posts. Thrie beams were bolted to the end posts, however, the workmanship of the bridge has not been obscured. The bridge’s historic associations and feeling are primarily evident through its geometric styling which was typical of the 1930’s. (State of Hawai‘i Department of Transportation, November 2013).

Impacts and Mitigation Measures

Kapaia Bridge is considered eligible for the National Register of Historic Places, but it is noted that the State Historic Bridge Inventory & Evaluation study did not consider the bridge to be of “high preservation value”. Kapaia Bridge is located on the principal arterial highway on the island which carries approximately 17,000 vehicles per day between Līhu‘e and Hanamā‘ulu. Kaua‘i’s largest hospital is located less than half a mile from the bridge making access and dependability of the bridge of significant importance. The bridge is considered functionally obsolete. Travel lane and shoulder widths are too narrow to meet current standards and alternate transportation modes are not adequately addressed. Thus, the bridge must be widened in order to meet current standards. Moreover, the existing bridge is structurally deficient. The bridge was originally designed for two 15 ton trucks. The current State legal load is 44 tons. Thus, the bridge does not meet State legal load standards. On a scale from 9 (excellent condition) to 0 (failed condition), the 2015 bridge inspection

report rates the bridge superstructure a "4" (poor condition). This is the critical portion of the bridge span which receives the live load.

Thus, preservation of the bridge with repairs and rehabilitation consistent with the Secretary of the Interior's Standards for the Treatment of Historic Properties would likely be more costly, require more frequent maintenance, and result in a shorter life span than new construction. Although Kapaia Bridge is eligible for the National Register of Historic Places, Kapaia Bridge's superstructure, geometry and load-carrying capacity are inadequate making construction of a new bridge a more feasible and prudent use of public funds.

3.10 Views

The Hanamāʻulu Stream area from the project site wending its way to the ocean at Hanamāʻulu Bay has been assessed as an important landform by the Kauaʻi General Plan. Māʻalo Road is designated as a scenic roadway. There are important highway views on Kaumualiʻi Highway between Puhi and the Knudsen Gap in the Poʻipū area. Kūhiō Highway, between Hanamāʻulu and Wailua, presents scenic views along the Kālepa Ridge corridor. Māʻalo Road also provides a scenic corridor to Wailua Falls. While important open space and scenic corridors are largely identified outside the Līhuʻe urban center, the Kauaʻi General Plan calls for directing infill development to the Hanamāʻulu-Līhuʻe-Puhi core.

Impacts and Mitigation Measures

The proposed project is a replacement of an existing bridge which represents an essential transportation link through the Hanamāʻulu - Līhuʻe- Puhi area. The profile of the replacement bridge also will be very similar to the existing bridge. During construction, the temporary bridge will impact views from and toward the project site. After construction, the temporary bridge will be removed and the site restored to as close to pre-construction condition as possible. The proposed project will not significantly affect views in the vicinity.

3.11 Traffic

Kauaʻi is served by two major highways that connect in Līhuʻe at Rice Street. Kaumualiʻi Highway (State Route 50) extends from Līhuʻe serving the southern and western portions of the island to Mānā. Kūhiō Highway (State Route 56) extends from Līhuʻe and ends at Hāʻena on the North Shore. Līhuʻe is the hub which connects the two belt highways. The Kapaia Bridge is located on a well-traveled section of Kūhiō Highway approximately 1.25 miles north from the Rice Street intersection. This section of Kūhiō Highway, between Rice Street and Kapule Street, traverses established residential and business areas. Kapule

Highway serves as a bypass to Līhuʻe Town, connecting the Airport, Nāwiliwili Harbor, and industrial areas with the Wailua-Kapaʻa area. The highways on the east side of the island carry the most traffic, primarily Kūhiō Highway (Highway 56) through Līhuʻe and to the north along the Kapaʻa coast.

Impacts and Mitigation Measures

Traffic along this portion of the highway will be maintained by a two-lane, two-way temporary detour bridge. The temporary detour bridge will be built mauka of the existing bridge before demolition of the existing bridge commences. Abutments for the temporary bridge will need to be built before the temporary bridge can be put in place. After completion of construction for the temporary bridge, construction to replace the existing bridge will begin. Then, after completion of the permanent bridge, the temporary bridge and visible portions of the abutments for the temporary bridge will be removed and the site restored to as close to pre-construction condition as possible.

In the long-term, the permanent bridge improvements will not increase lane capacity and should not cause any significant increase in traffic.

No adverse impacts are anticipated to the existing roadway system as a result of the proposed bridge replacement project.

3.12 Socio-Economic Characteristics

The town of Hanamāʻulu is considered part of the larger Līhuʻe region. The region includes Līhuʻe, Hanamāʻulu, Kapaia, Niumalu, Nāwiliwili, Puakea, and Puhi. The region serves as the main business, government and transportation center of the island. The region contains over 60% of the island's total inventory of retail, office and industrial development. In addition, the Līhuʻe region provides residential communities in close proximity to employment. Roughly 50% of the island's jobs are in the Līhuʻe District. Centers of employment and business include State and County government, Wilcox Hospital, Nāwiliwili Harbor, Līhuʻe Airport, Kauaʻi College at Puhi, Kukui Grove Center, War Memorial Convention Center, and the Vidinha Stadium and Sports Complex. Eighty percent of the island's industrial businesses are also located in the Līhuʻe region. (County of Kauaʻi, November 30, 2000).

The project site is located at the boundary between the Hanamāʻulu and Līhuʻe Census Designated Places (CDP). The following is a comparison of selected socio-economic characteristics of the Hanamāʻulu and Līhuʻe CDPs and the County of Kauaʻi as shown in Table 2.

Table 2
Selected Socio-Economic Characteristics of the
Hanamāʻulu CDP, Līhuʻe CDP and County of Kauaʻi

	Hanamāʻulu CDP	Līhuʻe CDP	County of Kauaʻi
POPULATION			
Population, 2010	3,835	6,455	67,091
AGE			
Persons under 5 years, %, 2010	7.9%	5.3%	6.4%
Persons under 20 years, %, 2010	29.9%	24.5%	24.8%
Persons 65 years and over, %, 2010	15.2%	19.0%	14.9%
Median Age	36.7	44.1	41.3
RACE			
White, %, 2010	9.1%	22.2%	33.0%
Black, %, 2010	0.4%	0.4%	0.4%
American Indian & Alaska Native persons, %, 2010	0.1%	0.2%	0.4%
Asian persons, %, 2010	57.0%	44.4%	31.3%
Native Hawaiian and Other Pacific Islander, %, 2010	8.1%	7.0%	9.0%
Two or More Races	24.6%	24.8%	24.9%
HOUSEHOLDS BY TYPE			
Total Households	1,055	2,333	23,240
Family households (families), %	78.8%	65.2%	69.5%
With own children under 18, %	34.9%	26.0%	27.4%
Husband-wife family, %	48.9%	46.6%	50.1%
With own children under 18, %	20.9%	17.0%	18.5%
Non-family households, %	21.2%	34.8%	30.5%
Households with individuals 65 and over, %	39.2%	39.2%	30.9%
Average Household Size	3.62	2.70	2.84
HOUSING OCCUPANCY			
Total Housing Units	1,107	2,601	29,793
Occupied Units, %	95.3%	89.7%	78.0%
Rental Vacancy Rate, %	6.1%	10.7%	12.3%

ECONOMIC CHARACTERISTICS			
Median Household Income, 2006-2010	$56,373*	$63,960	$62,531
Source: U.S. Census Bureau, December 23, 2011. U.S. Census Bureau, 2006-2010 American Community Survey * American Community Survey margin of error = + or - $10,033.			

Based on 2010 Census figures, the Hanamā‘ulu CDP contains 3,835 persons or 5.7% of the population within the County of Kaua‘i. The Līhu‘e CDP contains 6,455 persons or about 9.6% of the island’s population.

In terms of age distribution, the Hanamā‘ulu CDP has slightly greater percentages of persons under 5 years of age and persons under 20 years of age than the Līhu‘e CDP and the County as a whole. The Līhu‘e CDP has slightly greater percentages of persons 65 years of age or older than the Hanamā‘ulu CDP and the County as a whole. The median age in the Hanamā‘ulu CDP is 36.7 years. In the Līhu‘e CDP, it is 44.1. In the County of Kaua‘i, median age is 41.3.

In terms of race characteristics, there are lower percentages of Whites in the Hanamā‘ulu CDP (9.1%) and Līhu‘e CDP (22.2%) than the County of Kaua‘i as a whole (33.0%). There are higher percentages of persons identified as Asian in the Hanamā‘ulu CDP (57.0%) and Līhu‘e CDP (44.4%) than the County as a whole (31.3%). Native Hawaiian and Other Pacific Islander categories as well as persons identified as Two or More Races did not show significant differences between the Hanamā‘ulu, Līhu‘e and County of Kaua‘i totals.

The Hanamā‘ulu CDP has greater percentages of family households (78.8%) than the Līhu‘e CDP (65.2%) or the County of Kaua‘i as a whole (69.5%). The Hanamā‘ulu CDP also shows greater percentages of family households with their own children under the age of 18 (34.9%) than the Līhu‘e CDP (26.0%) and the County as a whole (27.4%). Average household size is larger in the Hanamā‘ulu CDP (3.62) than the Līhu‘e CDP (2.70) and the County as a whole (2.84).

The percentages of occupied housing units are quite high with Hanamā‘ulu CDP having the highest percentages (95.3%) followed by Līhu‘e CDP (89.7%) and the County of Kaua‘i as a whole (78.0%). Conversely, rental vacancy rates are lowest in Hanamā‘ulu (6.1%) followed by Līhu‘e CDP (10.7%) and the County as a whole (12.3%).

Available income data seems to indicate that median household income may be quite comparable between Hanamā‘ulu, Līhu‘e and the County as a whole. Median household income for the Hanamā‘ulu CDP is reported as $56,373

although the survey margin of error is plus or minus $10,033. Līhu‘e CDP median income is $63,960 while County of Kaua‘i median income is $62,531.

Impacts and Mitigation Measures

In the short term, the project will confer positive economic benefits in the local area. Direct economic benefits will result from construction expenditures both through the purchase of material from local suppliers and through the employment of local labor, thereby stimulating that sector of the economy. Indirect economic benefits may include benefits to local retailing businesses resulting from construction activities.

Construction activities associated with the proposed project will create some short term impacts such as temporary disruption of traffic, unavoidable noise impacts, and air quality impacts from soil excavation and grading activities in the vicinity of the project.

No adverse long-term socio-economic impacts are anticipated with the proposed project. The proposed project is not anticipated to induce growth in the Līhu‘e region nor spur significant increases or changes in travel behavior.

3.12.1 Environmental Justice

Executive Order (EO) 12898 “Federal Actions to Address Environmental Justice in Minority and Low Income Populations“ signed February 11, 1994 by President William Clinton requires Federal agencies to identify and avoid, minimize, or mitigate “disproportionately high and adverse” effects of Federal projects on the health and environment of minority and low income populations.

The U.S. Department of Transportation defines the three fundamental environmental justice principles for the Federal Highway Administration and the Federal Transit Administration as follows:

1) To avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations.
2) To ensure the full and fair participation by all potentially affected communities in the transportation decision making process.
3) To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.

Data from Table 1, “Selected Socio-Economic Characteristics of the Hanamā‘ulu CDP, Līhu‘e CDP and County of Kaua‘i” can be interpreted with regard to the compliance with environmental justice provisions. There are several similar

characteristics when comparing the Hanamaulu CDP, Līhuʻe CDP and the County of Kauaʻi as a whole. Key characteristics which are very similar include:

- Race
  - Native Hawaiian and Other Pacific Islander (%)
  - Two or More Races (%)
- Husband-wife family (%)
- Median family income

Notable differences between the Hanamāʻulu CDP, Līhuʻe CDP and the County of Kauaʻi should also be stated. These include:

- In terms of age distribution, the Hanamāʻulu area is slightly younger than Līhuʻe or the County as a whole. The Līhuʻe area is slightly older than Hanamāʻulu or the County as a whole.
- In terms of race, Whites (33.0%) and Asians (31.3%) comprise relatively even percentages for the County as a whole. However, there are significantly more Asians (44.4%) than Whites (22.2%) in the Līhuʻe CDP. The differences are more pronounced in Hanamāʻulu where Asians comprise 57.0% of the population while Whites comprise 9.1%.
- Percentages of family households are highest in the Hanamāʻulu CDP (78.8%) although the Līhuʻe CDP (65.2%) and County of Kauaʻi as a whole (69.5%) still have relatively high percentages.
- Households with individuals 65 and over are higher in the Hanamāʻulu and Līhuʻe CDPs (39.2%) than the County as a whole (30.9%).
- Average household size is highest for the Hanamāʻulu CDP (3.62) followed by the County of Kauaʻi (2.84) and Līhuʻe CDP (2.70).
- The Hanamāʻulu CDP has a high percentage of occupied units (95.3%) and a low vacancy rate (6.1%). Līhuʻe CDP also has a relatively high percentage of occupied units (89.7%) and low vacancy rate (10.7%). The County of Kauaʻi has 78.0% occupied units and a 12.3 % vacancy rate.

The data suggest that both Hanamāʻulu and Līhuʻe are stable and desirable neighborhoods. In light of the fact that the Līhuʻe region is the center of commerce and government, residential use in the Līhuʻe – Hanamāʻulu – Puhi area is located in close proximity to jobs, recreation and institutions which provides added convenience and reduces commuting time. The predominant race in the Hanamāʻulu and Līhuʻe area is Asian, followed by individuals with two or more races, Whites, and Native Hawaiian and Other Pacific Islander. The Hanamāʻulu neighborhood is a younger family oriented neighborhood whereas Līhuʻe is a slightly older neighborhood in terms of age of its occupants. However, Hanamāʻulu and Līhuʻe have the same percentage of households with individuals 65 and over. This suggests that Hanamāʻulu would tend to have greater percentages of multi-generational households. There are relatively high percentages of occupied units in both Hanamāʻulu and Līhuʻe. Conversely, rental vacancies are low. This would indicate that demand for housing in this

area is quite high. However, median income of the Hanamāʻulu and Līhuʻe CDPs are very similar to the County as a whole.

The Kapaia Bridge Replacement represents a contextual project which is intended to replace aging bridge infrastructure on a portion of the main belt highway on Kauaʻi. It will provide construction jobs and related economic benefits to the island of Kauaʻi. It is not expected that the Kapaia Bridge Replacement project would create a disproportionately high and adverse effect on minority or low income populations.

In terms of public participation, a public informational meeting for the National Historic Preservation Act and the National Environmental Policy Act was held on July 1, 2015. Pre-assessment consultation for the Draft Environmental Assessment was also conducted. Letters soliciting comments were sent on November 15, 2016. The Draft Environmental Assessment was prepared, published and made available for public review between January 23, 2017 to February 22, 2017. A second public informational meeting for the National Historic Preservation Act and the National Environmental Policy Act was held on February 15, 2017.

Residents and businesses may be temporarily inconvenienced during construction. A temporary detour bridge will be installed in place before work on the existing bridge is initiated to ensure continuous vehicular access throughout construction. There are construction related impacts to air quality and noise but no long term impacts relating to these parameters. Kūhiō Highway and the adjoining Kaumualiʻi Highway is the belt highway which links west, central and east Kauaʻi. As such, it is a vital transportation link used by the entire population.

Short term construction impacts will be mitigated to the greatest extent possible. Public participation was solicited, there are no adverse health impacts and environmental impacts have been avoided, minimized and mitigated. Therefore, there will be no disproportionate impact to minority and low-income populations.

3.13 Schools

There are 6 public schools, 1 private school, and 1 college serving the Līhuʻe – Hanamāʻulu – Puhi area. Kauaʻi High School provides public high school education from the 9th to 12th grade. Current enrollment is approximately 1,249 students. It is located at 3577 Lala Road in Līhuʻe approximately 3.5 miles from the Kapaia Bridge project site. Chiefess Kamakahelei Middle School is located in the Puhi area on 4431 Nuhou Street approximately 2.6 miles from the project site. Its current enrollment is 1,074 students in grades 6-8.

Kaumualiʻi Elementary School is located on 4380 Hanamāʻulu Road slightly less than one mile from the project site. There are 574 students in grades 1-5. Elsie

H. Wilcox Elementary School is located on 4319 Hardy Street in Līhuʻe. It has an enrollment of 931 students and is located about 1.4 miles from the project site.

Kawaikini Public Charter School is located at 3-1821 Kaumualiʻi Highway near Kukui Grove Shopping Center. This school services Kindergarten to 12th grade and is about 2 miles from the project site. Kauaʻi Community College (KCC) is a two-year public community college and is the only college on the island of Kauaʻi. KCC is one of the ten University of Hawaiʻi campuses offering higher education courses in business, technology, hospitality, health, early childhood education and liberal arts. It is located at 3-1901 Kaumualiʻi Highway in Puhi about 3 miles from the project site and has an enrollment of 1284 students. Island School is a private school offering education from Kindergarten to 12th grade. It is located at 3-1875 Kaumualiʻi Highway behind the University of Hawaiʻi's KCC campus in Puhi about 3 miles from the project site and has an enrollment of 251 students.

Impacts and Mitigation Measures

It is noted that the Kapaia Bridge provides an important transportation link to a number of public and private schools which are located in close proximity to the Kapaia Bridge. Thus, there is a significant need to have reliable roadway access. Although the existing bridge will be removed necessitating closure, there will be a temporary detour bridge erected before work on the existing bridge commences. Short term construction inconveniences will be minimized, to the greatest extent possible. In the long term, the Kapaia Bridge will provide a reliable and safe crossing along this major transportation lifeline within the Līhuʻe – Hanamāʻulu area.

3.14 Religious Centers

The Līhuʻe Hongwanji Mission is a Shin Buddhist Temple established in 1900 and located at 3-3530 Kūhiō Highway approximately 400 feet from the project site. The Immaculate Conception Catholic Church is a parish of the Roman Catholic Church of Hawaiʻi and is located at 4453 Kapaia Road approximately 600 feet from the project site.

Other religious centers in the vicinity just over one-half of a mile from the project site include King's Chapel Hanamāʻulu located at 3-3975 Kūhiō Highway and the Church of Jesus Christ of Latter-day Saints located at 4580 Ehiku Street.

Impacts and Mitigation Measures

The Kapaia Bridge provides an important transportation link to religious centers located in close proximity to the Kapaia Bridge. The temporary bridge would maintain access to these centers during construction. In the long term, the new facility will provide reliable bridge access at

Hanamāʻulu Stream. Religious centers are not anticipated to be adversely affected by the proposed action.

3.15 Civil Defense

There are six designated emergency shelters in the Līhuʻe – Hanamāʻulu – Puhi area. These include Chiefess Kamakahelei Middle School, Kaumualiʻi Elementary School, Wilcox Elementary School, Kauaʻi High School, Kauaʻi Community College, and Kauaʻi War Memorial Convention Hall.

Impacts and Mitigation Measures

During construction, the temporary bridge would still maintain access through this critical area. In the long term, although the project would not provide additional traffic lane capacity, evacuation access could be considered incrementally more reliable. The project would not affect operational capabilities of the shelters for their intended purposes.

3.16 Police, Fire, Emergency, and Medical Services

The County of Kauaʻi Police Department is headquartered at 3990 Kaana Street in Līhuʻe. The Department has approximately 150 sworn personnel and 50 non-sworn civilian support staff. The Līhuʻe District patrol provides services for the area extending mauka to makai from the Tree Tunnel at Maluhia Road in Poʻipū to Kukui Street in Kapaʻa Town, a distance of about 16 miles.

Fire protection in the Līhuʻe area is provided by the County of Kauaʻi Fire Department Līhuʻe Station which is located at 4450 Rice Street. This station is located approximately 1.7 miles from the Kapaia Bridge.

Emergency ambulance services on Kauaʻi are provided by American Medical Response. This is stationed along 3277 Palai Street slightly more than one mile from the project site.

Wilcox Medical Center and Kauaʻi Medical Clinic are located at 3-3420 Kūhiō Highway less than one-half mile from the project site. Wilcox Medical Center is the largest medical facility on Kauaʻi and is a state-of-the-art acute care facility with a full suite of services offering 30 specialties and programs including cardiology, emergency, family practice, gastroenterology, health management, internal medicine, neurology, OB/GYN, oncology, orthopedics, pediatrics, and urology. Its 20-bed emergency department is the first neighbor island facility to obtain a Level III Trauma designation. The hospital also has four birthing suites, seven intensive care beds and 20 same-day surgery beds. It is noted that Straub Clinic & Hospital, Kapiʻolani Medical Center for Women and Children, Pali Momi Medical Center, and Wilcox Memorial Medical Center have merged to form Hawaiʻi Pacific Health. As part of the Wilcox Medical Center network, there are

also medical clinics in Līhuʻe, ʻEleʻele, Kapaʻa, and Kōloa. The health care network provides a variety of comprehensive inpatient, outpatient and same-day services to the island of Kauaʻi.

Impacts and Mitigation Measures

The project involves the replacement of a deteriorating bridge at Hanamāʻulu Stream. Given its proximity to Kauaʻi's largest medical facility and because police, fire, emergency and medical response times can be crucial, a temporary detour bridge will be fully operational before work on the permanent bridge is initiated. In the long term, the new facility will provide reliable bridge access at Hanamāʻulu Stream. Police, fire, emergency and medical services are not anticipated to be adversely affected by the proposed action.

3.17 Recreational Facilities

There are many varied recreational opportunities available in the Līhuʻe – Hanamāʻulu region. Public recreational facilities in relatively close proximity to the subject project include Lau Kona Park which is a 2.59 acre neighborhood park containing a playground and basketball court located approximately .75 mile from the project site by car. Isenberg Park is a 9.2 acre neighborhood park located approximately 1 mile from the project site. Available facilities include a lighted softball field, comfort station, practice football field, and playground equipment. Līhuʻe County Park, a neighborhood park, comprises 3.3 acres and is located in Līhuʻe Town approximately 1.4 miles from the project site. Little League and Pony League baseball fields, soccer field and comfort station facilities are available. Hanamāʻulu Beach Park is a 6.5 acre park located near the mouth of Hanamāʻulu Stream approximately 1.5 miles from the project site. The beach park contains pavilions, comfort stations, playground equipment and picnicking and camping. Nāwiliwili Beach Park is a 6.3 acre park located near Nāwiliwili Harbor. It is located approximately 3 miles from the project site and provides playground, volleyball, picnicking facilities and a comfort station. Vidinha Stadium and Sports Complex comprises 34 acres and serves a County-wide population. The athletic complex has a baseball field, lighted football field, track, soccer fields, and restrooms. It is located approximately 2.5 miles from the project site. Ahukini Recreation Pier State Park is located approximately 3.5 miles from the project site. This is a facility which provides for ocean pier fishing and crab netting.

Impacts and Mitigation Measures

Construction and operation of the project will not impact recreational facilities in the region as development of the Project will not require or curtail the use of any public park or recreational facility. A temporary

bypass bridge will be installed before construction on the existing bridge is initiated in order to ensure continuous vehicular access throughout construction.

3.18 Solid Waste Disposal

The County of Kauaʻi collects municipal solid waste once a week from single family households using rear-load collection vehicles. The County also collects refuse from commercial establishments who are charged a collection fee. Alternatively, there are private haulers which service commercial businesses. The County also operates four transfer stations located in Hanapēpē, Līhuʻe, Kapaʻa, and Hanalei.

The Kekaha Landfill services the entire island. It is owned by the County of Kauaʻi and staffed, in part, by County employees. Landfill operations and monitoring services are contracted to Waste Management, Inc. (County of Kauaʻi Department of Public Works – Solid Waste Division, September 2009).

Impacts and Mitigation Measures

No significant impacts to solid waste disposal are anticipated from the construction and operation of the proposed project. During construction of the project, a trash management and recycling program will be developed and implemented to minimize impacts to the Kekaha Landfill. The temporary detour bridge will provide access for refuse collection vehicles and self-haulers so that there should not be an interruption in service.

Following construction, the Project will generate little, if any, solid waste, and therefore will not adversely impact the Kekaha Landfill.

3.19 Water and Wastewater

The County Department of Water (DOW) operates and maintains the municipal water system.

The County of Kauaʻi Department of Public Works Division of Wastewater Management operates four wastewater systems serving Waimea, Hanapēpē-ʻEleʻele, Līhuʻe-Hanamāʻulu, and the Kūhiō Highway corridor between Wailua and Kapaʻa. The subject project is part of the Līhuʻe-Hanamāʻulu service area. A 12 inch ductile iron gravity sewer line is strapped to Kapaia Bridge. This flows to the County sewage pump station located at the corner of Māʻalo Road and Kūhiō Highway.

Impacts and Mitigation Measures

Detailed construction plans will be transmitted to the DOW and DPW Division of Wastewater Management for review and comments. All bridge improvements will be coordinated with the DOW and DPW Division of Wastewater Management so as to ensure minimal impacts to neighboring properties and existing water and wastewater service in the vicinity of the project site. Access to the Kapaia Sewer Pump Station for DPW staff will be maintained during the period of construction. No significant impacts are anticipated to water or wastewater service as a result of the proposed bridge improvement project.

3.20 Drainage

The proposed project involves the replacement of the existing three-span bridge with a new single-span bridge. The existing bridge is more than adequately sized to handle peak runoff.

Impacts and Mitigation Measures

The proposed bridge will be adequately sized to handle peak runoff from the 100-year 24-hour storm. There will be a two-foot minimum freeboard from finished deck elevation to the 100-year water surface elevation.

The existing intermediate piers would be eliminated to maintain full channel capacity during higher than normal flows that may be attributed to climate change. The elimination of the intermediate piers would also prevent the potential for scour and reduce the probability of obstructions forming that could restrict flows.

Erosion control measures and Best Management Practices (BMPs) will be implemented during construction to prevent degradation of the quality of water during construction.

3.21 Electricity and Telephone Services

Electrical, telephone and cable television (CATV) services are provided by the Kauaʻi Island Utility Cooperative (KIUC), Hawaiian Telcom, and Oceanic Time Warner Cable, respectively.

There are existing overhead utility lines in the Kūhiō Highway corridor in the vicinity of the project site.

Impacts and Mitigation Measures

No significant impacts on the existing electrical and telephone systems are anticipated as a result of the construction and operation of the proposed project. Coordination will be undertaken with KIUC, Hawaiian Telcom and Oceanic Time Warner Cable to ensure that functions of the utilities are not impacted or impeded. A Utility Agreement between Hawaiian Telcom, KIUC and the County will need to be executed, should the project improvements require relocation of existing utility poles and overhead utility lines.

4. RELATIONSHIP TO LAND USE PLANS, POLICIES AND CONTROLS

The project's consistency with relevant State and County land use plans, policies and controls is discussed below.

4.1 Hawai'i State Plan

The Hawai'i State Plan, embodied in Chapter 226, HRS, serves as a guide for goals, objectives, policies and priorities for the State. The State Plan provides a basis for determining priorities, allocating limited resources, and improving coordination of State and County plans, policies, programs, projects and regulatory activities. The proposed project is consistent with the following State Plan objectives and policies.

Sec. 226-11 Objectives and policies for the physical environment – land-based, shoreline, and marine resources.

(a) Planning for the State's physical environment with regard to land-based shoreline, and marine resources shall be directed towards achievement of the following objectives:

- *Prudent use of Hawai'i's land-based, shoreline, and marine resources.*
- *Effective protection of Hawai'i's unique and fragile environmental resources.*

(b) To achieve the land-based, shoreline, and marine resources objectives, it shall be the policy of this State to:

(3) Take into account the physical attributes of areas when planning and designing activities and facilities.

(4) Manage natural resources and environs to encourage their beneficial and multiple use without generating costly or irreparable environmental damage.

(6) Encourage the protection of rare or endangered plant and animal species and habitats native to Hawai'i.

(8) Pursue compatible relationships among activities, facilities, and natural resources.

Discussion

Construction activities will involve land disturbing activities such as grubbing, clearing, grading, and excavation. However, various mitigation measures will be incorporated into the project's construction plans to minimize soil disturbance and potential short-term erosion and siltation impacts during construction. Excavation and grading activities associated with construction of the proposed project will be regulated by the County's grading ordinances.

A Department of the Army (DOA) Nationwide Permit, pursuant to Section 404 of the Clean Water Act and a Water Quality Certification (WQC), issued by the State Department of Health (DOH) pursuant to Section 401 of the Clean Water Act will be required for construction work in waters of the U.S. For such work in Hanamā‘ulu Stream, which is non-tidal at the project site, waters of the U.S. is defined as portions of the stream bed and banks below the ordinary high water mark (OHWM). In conjunction with the Section 404 permit and WQC, a best management practices (BMP) plan will be prepared for construction activities within the project site. Erosion and sediment control measures will be instituted in accordance with a site specific assessment and incorporate appropriate structural and/or non-structural BMPs such as appropriately stockpiling materials on-site to prevent runoff, covering or stabilizing topsoil stockpiles, using sediment basins and traps, and re-establishing vegetation or landscaping as early as possible on completed areas.

Sec. 226-17 Objectives and policies for facility systems – transportation.

(a) Planning for the State's facility systems with regard to transportation shall be directed towards the achievement of the following objectives:

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

(b) To achieve the transportation objectives, it shall be the policy of this State to:

(10) Encourage the design and development of transportation systems sensitive to the needs of affected communities and the quality of Hawaii's natural environment.

Discussion:

The HDOT administers a program to modify or replace functionally or structurally deficient bridges to achieve current State of Hawai‘i standards

for transportation facilities as specified by the Statewide Uniform Design Manual for Streets and Highways (October, 1980), as supplemented by the current American Association of State Highway and Transportation Officials' (AASHTO) Policy on Geometric Design of Highways and Streets (6th Edition, 2011), and AASHTO's Standard Specifications for Highway Bridges (17th Edition, 2002). In conjunction with this program, the HDOT conducts periodic inspections of all of its bridges in compliance with National Bridge Inspection Standards (Code of Federal Regulations (CFR) 23 Highways - Part 650, Subpart C). The latest bridge inspection report for Kapaia Bridge, dated July 8, 2015, rates the bridge superstructure a "4", poor condition. The bridge was originally designed for two-15 ton trucks. The current State legal load is 44 tons. Thus, the bridge was designed for less than the State legal load.

The bridge is considered functionally obsolete. Travel lane and shoulder widths are too narrow to meet current standards and alternate transportation modes are not adequately addressed. Thus, the bridge must be widened in order to meet current standards.

Construction activities will involve land disturbing activities such as grubbing, clearing, grading, and excavation. Various mitigation measures will be incorporated into the project's construction plans to minimize soil disturbance and potential short-term erosion and siltation impacts during construction. Excavation and grading activities associated with construction of the proposed project will be regulated by the County's grading ordinances.

A Department of the Army (DOA) Nationwide Permit, pursuant to Section 404 of the Clean Water Act and a Water Quality Certification (WQC), issued by the State Department of Health (DOH) pursuant to Section 401 of the Clean Water Act will be required for construction work in waters of the U.S. For such work in Kapi'a Stream, which is non-tidal at the project site, waters of the U.S. is defined as portions of the stream bed and banks below the ordinary high water mark (OHWM). In conjunction with the Section 404 permit and WQC, a best management practices (BMP) plan will be prepared for construction activities within the project site. Erosion and sediment control measures will be instituted in accordance with a site specific assessment and will incorporate appropriate structural and/or non-structural BMPs such as appropriately stockpiling materials on-site to prevent runoff, covering or stabilizing topsoil stockpiles, using sediment basins and traps, and re-establishing vegetation or landscaping as early as possible on completed areas.

4.2 State Land Use District

Chapter 205, Hawai‘i Revised Statutes, relating to the Land Use Commission (LUC), establishes four (4) major land use districts in which all lands in the state are placed. These districts are designated as “Urban”, “Rural”, “Agricultural”, and “Conservation”. The project is located within the State “Agricultural” District with a small portion within the Urban District. See Figure 15. The proposed project is consistent with the Agricultural and Urban District classifications since roadways are a permissible use within these Districts.

4.3 Statewide Pedestrian Master Plan

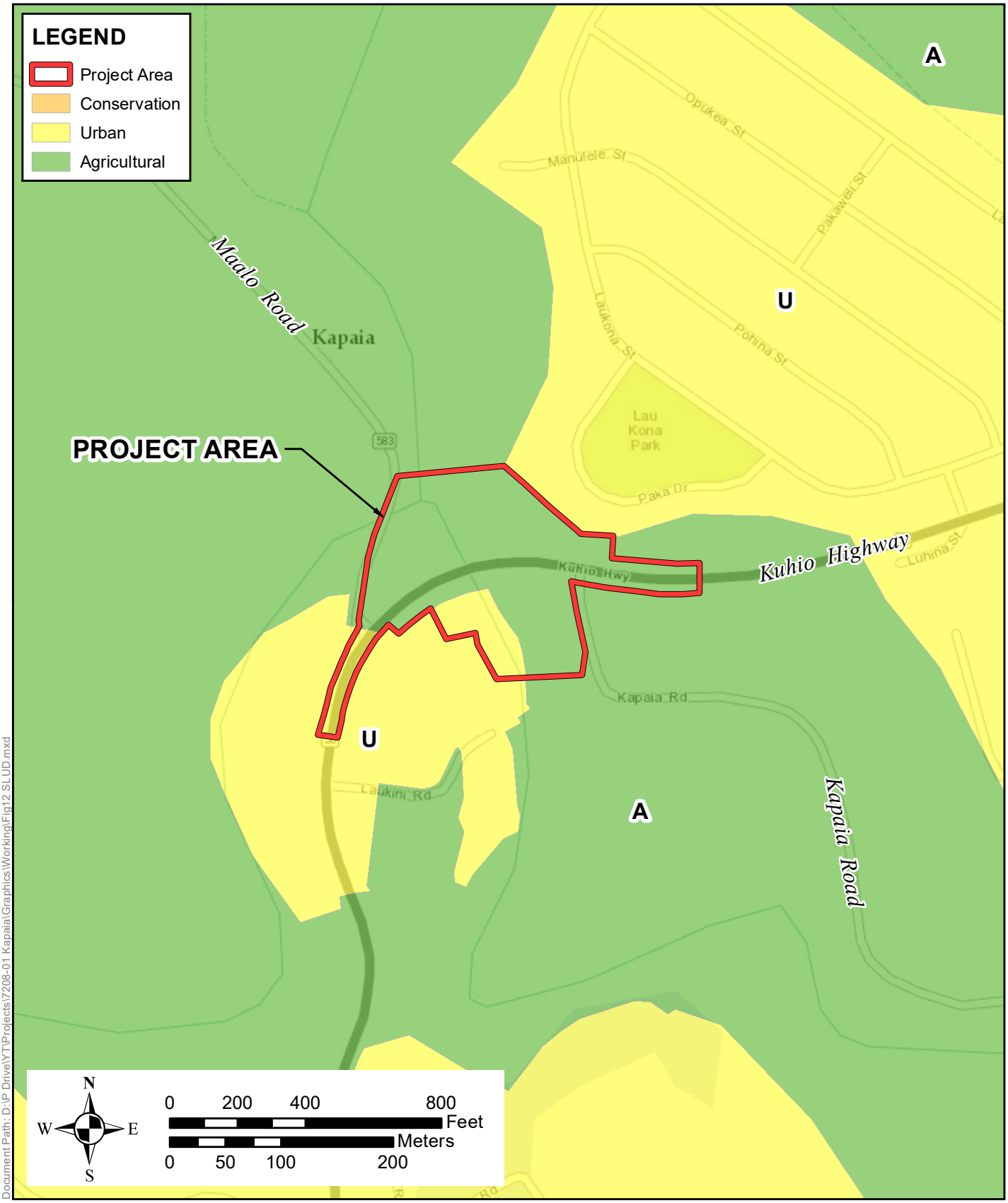
The purpose of the Statewide Pedestrian Master Plan is to improve pedestrian safety and enhance pedestrian mobility on state highways. The need for the plan comes from the high level of pedestrian fatalities in Hawai‘i, as identified in the Hawai‘i Strategic Highway Safety Plan, 2007 thru 2012. Six areas of concern were identified in the County of Kaua‘i considering factors of connectivity, accessibility, pedestrian-oriented populations, and safety. One of these six areas is the portion of Kūhiō Highway, between Wilcox Medical Center and Hanamā‘ulu Road due to a lack of adequate crosswalks and sidewalks, a bridge with narrow shoulders, and the high speeds at which vehicles have been observed to travel along this section of the highway.

A list of project solutions was recommended for the areas of concern identified across the state. The projects were then prioritized based on several evaluation criteria. The section of Kūhiō Highway between Wilcox Medical Center and Hanamā‘ulu Road was ranked fifth among a total of 31 areas of concern statewide. The recommendation for this portion of the highway was to improve pedestrian connections by replacing eroded sidewalks, closing sidewalk gaps, and replacing the footbridge along Kūhiō Highway from Wilcox Medical Center to Hanamā‘ulu Road.

The proposed project is consistent with the Statewide Pedestrian Master Plan as it will contribute to improving pedestrian connections in the area by providing pedestrian facilities on each side of the bridge.

4.4 Bike Plan Hawai‘i Master Plan

The overall goal of Bike Plan Hawai‘i is to establish bicycling as a safe and convenient mode of transportation for residents and visitors throughout the state. To realize the overall goal of the plan, Bike Plan Hawai‘i identifies five tactical areas (objectives) in which improvements can be made. The project is consistent with the following objectives and recommending actions:



Document Path: D:\P Drive\YT\Projects\7208-01 Kapaia\Graphics\Working\Fig12 SLUD.mxd

WILSON OKAMOTO CORPORATION

FIGURE 15

STATE LAND USE DISTRICTS

KAPAIA BRIDGE REPLACEMENT

Objective:

(A) Plan and design new and improved transportation facilities to accommodate and encourage use by bicyclists of all skill levels.

Recommending Actions:

(1) Design roadway projects with adequate space for bicyclists

(2) Expand and improve each island's network of safe, convenient, and integrated bikeways for both utilitarian and recreational travel.

(3) Adopt nationally recognized design guidelines and standards for bicycle facilities.

Discussion:

Currently there are no bicycle facilities on the existing bridge and the shoulders are too narrow to accommodate the safe crossing of bicyclists. The proposed project will include a designated bike lane on each side of the new replacement bridge. The proposed bike lanes will be approximately five to six feet wide and is consistent with the recommended width for a bike lane which is a minimum of 4 feet.

4.5 County of Kaua'i General Plan

The County of Kaua'i General Plan (November 2000) provides broad policy statements to guide land use regulations, new developments and facilities, and planning for County facilities and services. Relevant sections of the General Plan and their consistency with the proposed Project are as follows:

General Plan Land Use Map and Policies: The Project Site is located within the Līhu'e Planning District of the General Plan. The policies relating to the Līhu'e District are found in the Land Use Map and text statements of the General Plan.

The preliminary planning district vision notes that the Līhu'e Planning District is the "heart" of Kaua'i. This includes the communities of Līhu'e, Hanamā'ulu, Kapaia, Niumalu, Nāwiliwili, Puakea, and Puhi. It is the hub of the island's transportation system, its government center, and its commercial center. On the General Plan Land Use Map, large portions of Līhu'e are designated as the Urban Center. The General Plan intends to have new development extending north to Hanamā'ulu Valley and south to Puhi.

However, the stream valleys which cover the Līhu'e Plain, such as Hanamā'ulu Valley and Hulē'ia Valley, are considered important watercourses and flood plains.

The two highways which encircle Kaua'i are noted in the General Plan. Extending west, Kaumuali'i Highway is a four-lane parkway, divided by a landscaped median. Extending west from Rice Street, Kūhiō Highway begins as a four-lane commercial street through Līhu'e Town, then transitions to two lanes

through Kapaia and Hanamā‘ulu. Kūhiō Highway then changes to a three-lane highway north of the junction with Kapule Highway. Although development is directed to the Hanamā‘ulu – Līhu‘e – Puhi core, the County has maintained open space and important highway views between Puhi and Knudsen Gap and in the Kālepa Ridge corridor.

In the immediate vicinity of the Kapaia Bridge project site, the Līhu‘e Planning District Land Use Map designates the linear area along Kūhiō Highway through the Hanamā‘ulu area as “Residential”. Areas mauka of the road are designated as “Agriculture” while areas makai of the road adjacent to Hanamā‘ulu Stream are designated “Open”. Adjacent areas toward Līhu‘e Town are designated “Urban Center” and “Residential”. See Figure 16.

The General Plan policy for the “Residential” designation is as follows (Section 5.4.3.1 Policy):

(a) Lands included within the Residential Community designation shall be used predominantly for low- to high- density housing in towns and other residential areas. Density shall be one to 20 units per acre. Residential Community areas may also be used for commercial and industrial businesses, government facilities, and institutions.

(b) High- density residential use of 10 units per acre or more shall be confined to areas served by wastewater collection and treatment facilities and major roads.

(c) The location of non-residential uses shall be established through zoning. The intent is to provide convenient shopping and services to improve the livability of the various residential communities.

Selected General Plan policies for the “Agriculture” designation are noted as follows: (Section 5.2.1 Policy)

(a) Lands included within the Agriculture designation shall be predominantly used for or held in reserve to be used in the future for agricultural activities. These activities include the breeding, planting, nourishing and caring for, gathering, and processing of any animal or plant organism, including aquatic animals and plants, for the purpose of producing food or material for non-food products; the commercial growing of flowers or other ornamental plants; the commercial growing of forest products; and the commercial breeding and caring for domestic animals and pets.

(b) The primary intent of the Agriculture designation is to conserve land and water resources in order to:

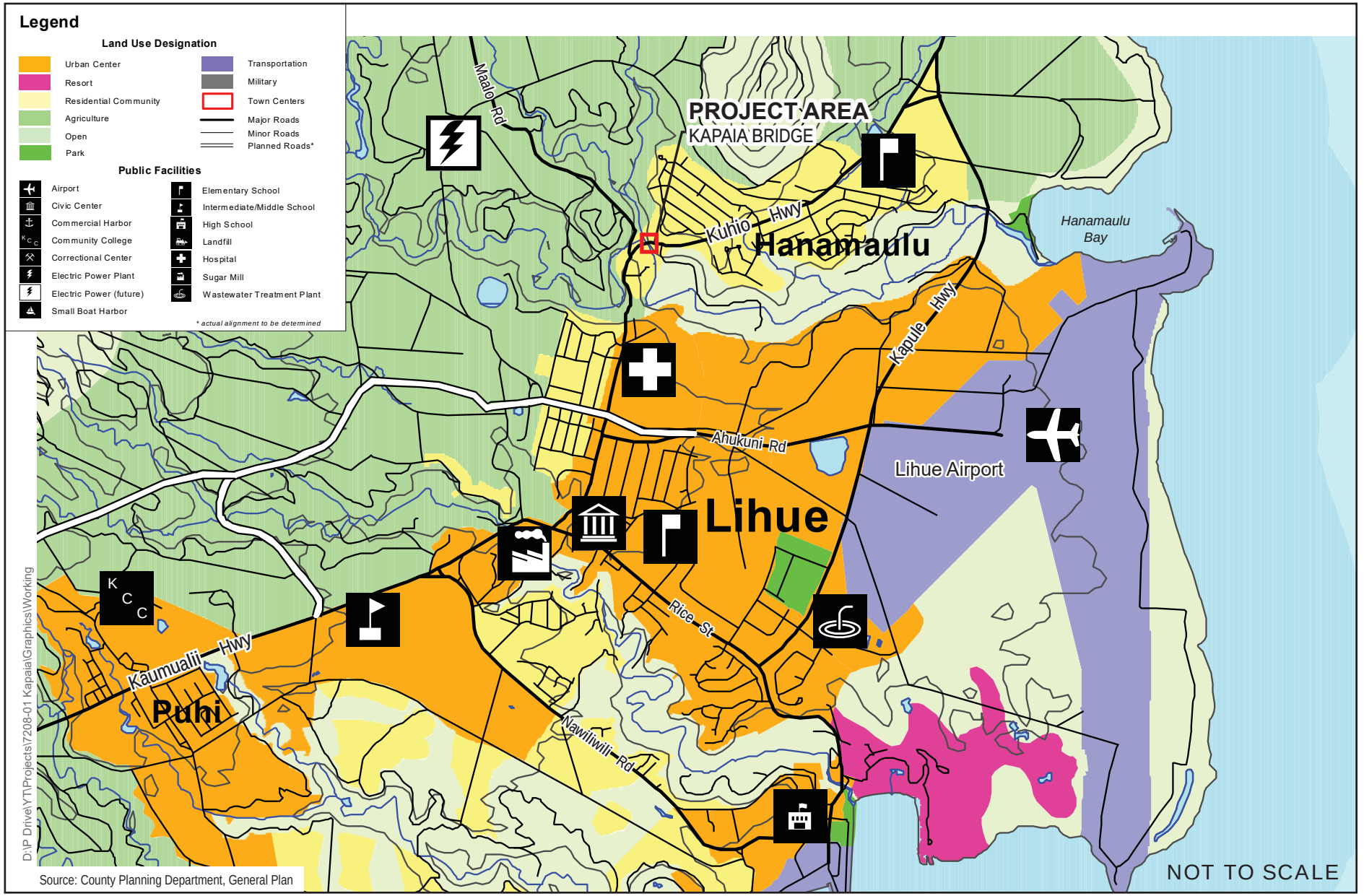


FIGURE 16

KAUAI GENERAL PLAN

KAPAIA BRIDGE REPLACEMENT

WILSON OKAMOTO CORPORATION

(1) insure an excellent resource base for existing and potential agricultural uses;

(2) assure a sufficient supply of land available for sale or lease at a cost that is economically feasible for agricultural enterprise; and

(3) promote and preserve open agricultural lands as a key element of Kaua'i's rural character and lifestyle, essential to its image as "The Garden Island" and to the continued viability and development of Kaua'i's visitor industry.

The General Plan policy for the "Open" designation is as follows (Section 5.3.1 Policy):

(a) The intent of the Open designation is to preserve, maintain or improve the natural characteristics of non-urban land and water areas that:

(1) are of significant value to the public as scenic or recreation resources;

(2) perform essential physical and ecologic functions important to the welfare of surrounding lands, waters, and biological resources;

(3) have the potential to create or exacerbate soil erosion or flooding on adjacent lands;

(4) are potentially susceptible to natural hazards such as flood, hurricane, tsunami, coastal erosion, landslide or subsidence; or

(5) form a cultural, historic or archaeological resources of significant public value.

(b) Lands designated Open shall include: important landforms such as mountains, coastal bluffs, cinder cones, and stream valleys; native plant and wildlife habitat; areas of predominantly steep slopes (20 percent or greater); beaches and coastal areas susceptible to coastal erosion or hurricane, tsunami, or storm wave inundation; wetlands and flood plains; important scenic resources; and known natural, historic and archaeological resources. Open shall also include parks, golf courses, and other areas committed to outdoor recreation.

(c) Lands designated Open shall remain predominantly free of development involving buildings, paving and other construction. With the exception of kuleanas and other small lots of record, any construction that is permitted shall be clearly incidental to the use and character of the surrounding lands.

The General Plan policy for the "Urban Center" designation is as follows (Section 5.4.1.1 Policy):

(a) Lands included within the Urban Center designation shall be centers of government, commerce and transportation that serve the entire county or a large region. Uses may include shopping centers, government offices, churches and other institutions, office complexes, and industrial facilities. Residential or resort uses may also be located within the Urban Center designation, where compatible.

The Līhu'e Planning District Heritage Resources map designates the project site and adjacent areas of Hanamā'ulu Stream as an "Important Land Form". Mā'alo Road is designated as a "Scenic Roadway Corridor". Kūhiō Highway, from its intersection with Kapule Highway to Wailua, and Kapule Highway are also designated as "Scenic Roadway Corridors". See Figure 17.

Selected General Plan policies related to "Important Land Form" are noted as follows (Section 3.1.1.1 Policy):

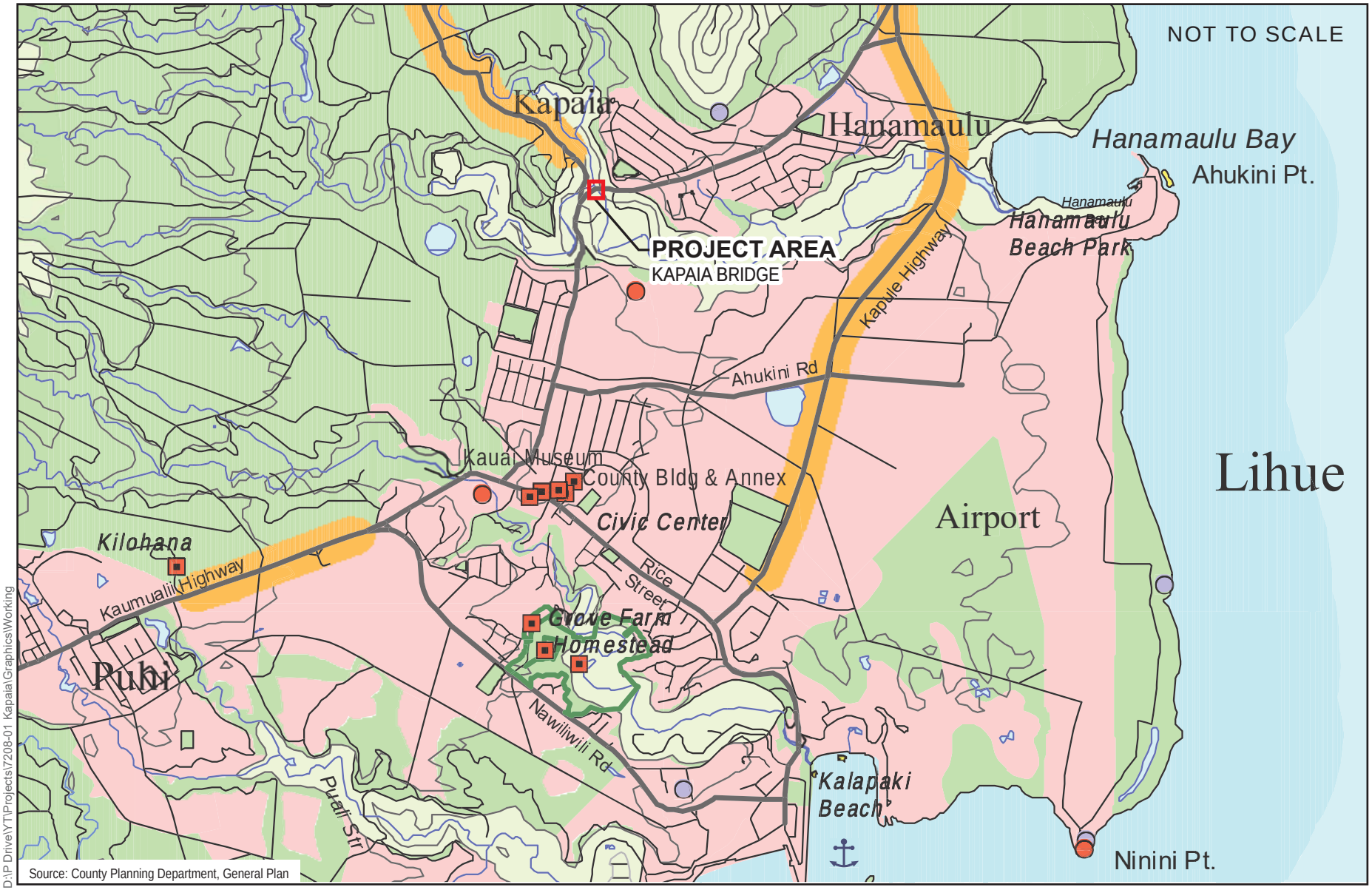
(a) The Heritage Resources Map depicts natural, cultural and scenic resources that are important to the County of Kaua'i and that are intended to be conserved. The mapping of important landforms, streams, and other physical elements represents the general location of the resource. The mapping of historic and archaeological sites, other features and Scenic Roadway Corridors is intended to be representational, not precise.

(b) Important landforms shall be designated as "Open" on the GP Land Use Map and shall be zoned accordingly, in order to protect steep slopes and streams from erosion and to protect landforms from development that might affect scenic views.

The General Plan policy for the "Scenic Roadway Corridor" designation is as follows (Section 5.5.1 Policy):

(a) The purpose of designating Scenic Roadway Corridors is to conserve open space, scenic features, and views within and along Kaua'i's most heavily-traveled routes. The policy of conservation recognizes the legitimate desire of private landowners to make economic use of their lands. The intent of this policy is to establish basic principles for roadway design and land use within these roadway corridors and to provide a basis for County action to establish programs and regulations to implement them.

(b) Scenic Roadway Corridors are primarily designated in areas between towns where the surrounding lands are primarily designated Agriculture



WILSON OKAMOTO CORPORATION

FIGURE 17

LIHUE PLANNING DISTRICT HERITAGE RESOURCES

KAPAIA BRIDGE REPLACEMENT

and Open. Where a Scenic Roadway Corridor is designated within a town or adjoins an area planned for urban use, the primary intent is to promote setbacks, landscaping, and views of scenic features. Scenic Roadway Corridors are intended to provide design guidance but not to restrict the principal land uses of urban areas.

Selected General Plan policies from the "Policy for Roadway Design" are noted as follows (Section 5.5.1.1):

(a) In planning, designing and constructing highway and road improvements, transportation agencies shall balance conservation of the area's natural, historic and scenic qualities with transportation objectives. In some cases, it will be preferable to accept a lesser design speed or capacity in order to maintain the rural character and appearance of the Garden Island.

(d) Maintain the unique features of historic bridges, striking a balance between safety needs and preserving historic and scenic character.

(e) Design new bridges and bridge improvements to afford scenic views.

Comment: The proposed project is a bridge replacement which will maintain the same two-way, two-lane capacity through this section of Kūhiō Highway which extends along the largely residential towns of Kapaia and Hanamā'ulu. It is an essential transportation link between Līhu'e, Kapaia and Hanamā'ulu. In a larger context, it is part of the Kaumuali'i Highway and Kūhiō Highway system which forms the belt road around most of the island of Kaua'i. The project updates the structural aspects of the bridge so that it meets current structural codes. However, the proposed project respects the existing low density residential character of its immediate surroundings. The proposed project retains the historic character of the bridge and keeps the same profile and views which existed for many years. The proposed project complements the important landform values of Hanamā'ulu Stream and the agricultural values of lands mauka in Hanamā'ulu Valley.

4.6 Līhu'e Community Plan

The Līhu'e Community Plan (LCP) seeks to implement a vision for the Līhu'e District as a place with connected, walkable, and vibrant communities that reflect a unique identity and sense of place. The plan sets forth policies and recommendations for each of the three major communities (Līhu'e, Puhi, and Hanamā'ulu), as well as the district villages and neighborhoods that characterize the district (Nāwiliwili, Kapaia, Nūhou, Kalapakī, Pū'ali, Kīpū, Niumalu, and Kālepa). The Plan (page 73) notes that the Kapaia area "does see pedestrian activity, with a concentration of civic uses (Immaculate Conception Church and the Buddhist Temple) and pedestrians traveling along the highway to Wilcox

Hospital." A discussion of the Project's consistency with the policies and guidelines of the Līhu'e Community Plan is provided below.

Land Use

Policies:

- *Maintain existing development intensity in Kapaia, Niumalu, and Kīpū.*

Discussion:

The new replacement bridge will maintain the two-way, two-lane capacity of the existing bridge. Therefore, the proposed project is not anticipated to increase the existing development intensity in the surrounding area.

Heritage Resources

Policies:

- *Maintain and protect the stream valleys that cross the Līhu'e Plain, such as Hanamā'ulu Valley and Hulē'ia Valley, as important watercourses and floodplains.*
- *Protect riparian areas and stream quality by limiting development, grazing, and other activities that impact water quality.*
- *Preserve important archaeological sites and historic sites within the Līhu'e District as identified in Chapter 3 and on the Heritage Resources Map in the General Plan.*

Discussion:

The LCP and the Heritage Resources Map in the General Plan identifies the Hanamā'ulu Stream as an important land form that should be preserved. The replacement bridge will be maintained on the existing alignment and feature a single-span bridge with no intermediate piers replacing the existing three-span bridge with two intermediate piers. Therefore, the elimination of the intermediate piers should minimize the impacts to the stream. It is anticipated that impacts to surface waters and water quality would be mitigated through the implementation of Best Management Practices (BMPs) to prevent degradation of the quality of water during construction.

Before construction of the replacement bridge commences, a temporary detour bridge would be constructed in the heavily vegetated area mauka of the existing bridge. Upon completion of the project, the temporary bridge would be removed and the site restored and revegetated to as close to pre-construction condition as possible. Construction of the project would be phased so that the entire stream is not blocked at any time. Due to the temporary nature of the project and implementation of BMPs, impacts to the riparian zone are anticipated to be minimal.

Policies for Līhu'e District Communities

Policies for Kapaia:

- *Provide improved pedestrian safety and amenities.*

Discussion:

The proposed replacement bridge will include a five to six foot wide concrete sidewalk and a five to six foot wide bicycle lane on each side of the bridge allowing for safer crossings by pedestrians and bicyclists. Connections to these facilities in the future would improve the overall pedestrian and bicycle network in the area.

4.7 County Comprehensive Zoning Ordinance

The County's Comprehensive Zoning Ordinance (CZO) establishes procedures for the division of the County into land use districts, and creates regulations for the types, size, placement, and control of structures within various zoning district classifications. The CZO also delineates the respective types of permitted uses and the development that can take place in those zoning districts.

The zoning designation in the immediate vicinity of the Project Site is Agriculture District (A), Open District (O), and R-4 Residential District as shown on Figure 18.

4.8 Hawai'i Coastal Zone Management Program

The National Coastal Zone Management Program (CZM) Program was created through passage of the Coastal Zone Management Act of 1972. Hawai'i's CZM Program, adopted as Chapter 205A, HRS, provides a basis for protecting, restoring and responsibly developing coastal communities and resources. A discussion of the Project's consistency with the objectives and policies of the CZM Program is provided below.

(1) Recreational Resources

Objective:

(A) Provide coastal recreational opportunities accessible to the public.

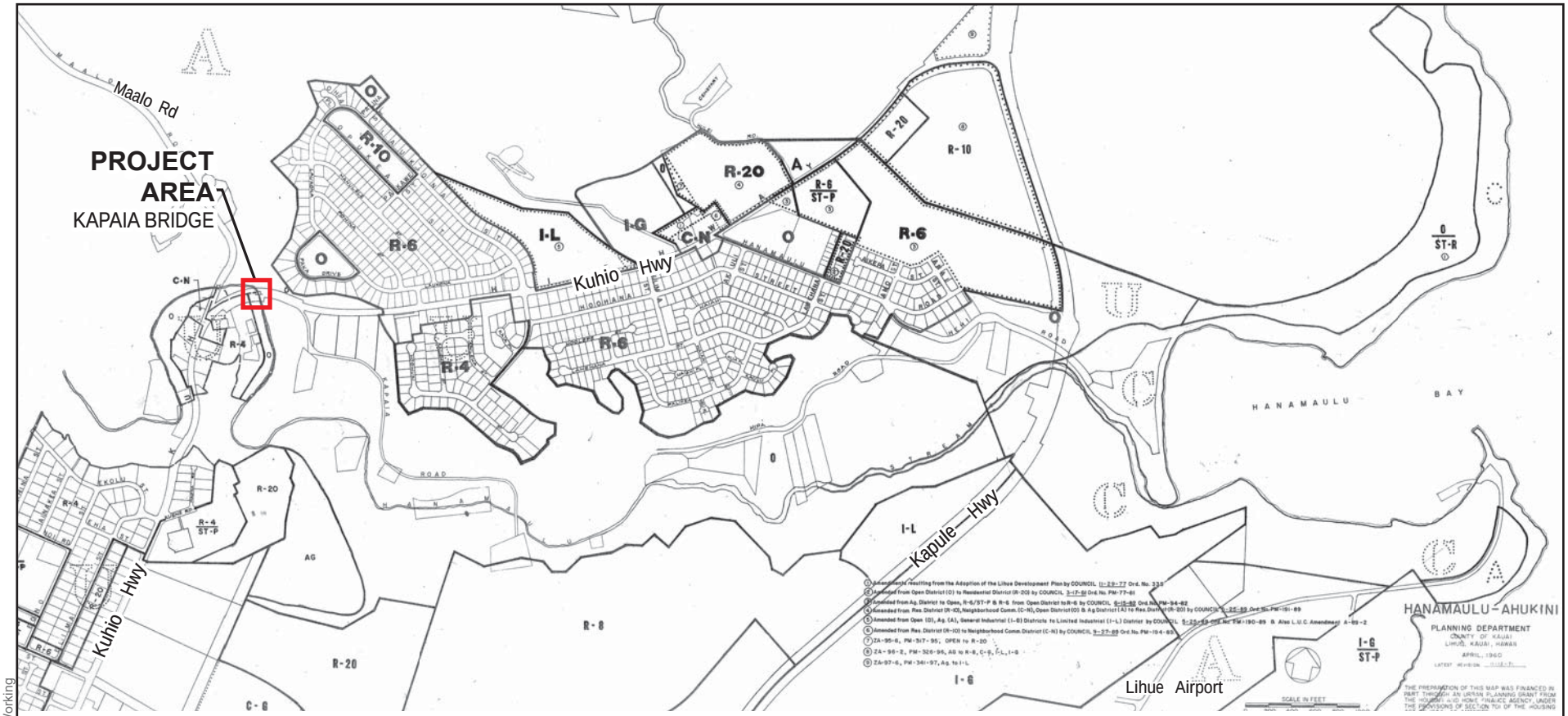
Policies

(A) Improve coordination and funding of coastal recreational planning and management; and

(B) Provide adequate, accessible, and diverse recreational opportunities in the coastal zone management area by:

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

(ii) *Requiring replacement of coastal resources having significant recreational value, including but not limited to surfing sites, fishponds, and sand beaches, when such*



ZONING DISTRICTS

RESIDENTIAL DISTRICT
- R-1 (1 unit/ac)
- R-2 (2 units/ac)
- R-4 (4 units/ac)
- R-6 (6 units/ac)
- R-10 (10 units/ac)
- R-20 (20 units/ac)

RESORT DISTRICT
- RR-10 — 10 units/ac, 20 hotel rms/ac
- RR-20 — 20 units/ac, 40 hotel rms/ac

COMMERCIAL DISTRICT
- C - N Neighborhood
- C - G General

INDUSTRIAL DISTRICT
- I - L Limited
- I - G General

AGRICULTURE DISTRICT A

OPEN DISTRICT O

SPECIAL TREATMENT DISTRICT
- ST - P Public
- ST - C Cultural: Historic
- ST - E Scenic: Ecological

SPECIAL PLANNING AREA ----

PROJECT DISTRICT P D

STATE LAND USE DISTRICTS
- U Urban
- R Rural
- A Agricultural
- C Conservation

Source: County of Kauai, Planning Department

D:\P Drive\YT\Projects\7208-01 Kapaia\Graphics\Working

WILSON OKAMOTO CORPORATION

FIGURE 18

COUNTY OF KAUAI ZONING MAP

KAPAIA BRIDGE REPLACEMENT

resources will be unavoidably damaged by development; or requiring reasonable monetary compensation to the state for recreation when replacement is not feasible or desirable;

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

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

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

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

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

(viii) Encouraging reasonable dedication of shoreline areas with recreational value for public use as part of discretionary approvals or permits by the land use commission, board of land and natural resources, and county authorities; and crediting such dedication against the requirements of section 46-6.

Potential water quality impacts to near shore coastal waters during construction of the project will be mitigated by adherence to State and County water quality regulations governing grading, excavation and stockpiling. A NPDES General Permit for Storm Water Associated with Construction Activity administered by the State DOH will be required to control storm water discharges. Mitigation measures will be instituted in accordance with site-specific assessments, incorporating appropriate structural and-or non-structural BMPs such as silt fences, diversion berm/ditches and minimizing time of exposure between construction and re-vegetation. After completion of construction, the proposed project should not result in any adverse effects to recreational resources in the region.

(2) Historic Resources

Objective:

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

Policies:

(A) Identify and analyze significant archaeological resources;

(B) Maximize information retention through preservation of remains and artifacts or salvage operations; and

(C) Support state goals for protection, restoration, interpretation, and display of historic resources.

It is noted that the bridge will be replaced in the existing location. The temporary bridge will be routed on the mauka side of the existing bridge. Upon completion of the permanent bridge, the temporary bridge will be removed.

The archaeological inventory survey revealed 11 cultural resources in the area. They are of historic and indeterminate age, most likely associated with the sugar plantation and plantation camps. The majority of the sites deal with transportation, whether mechanical, pedestrian or water. All of the cultural resources are classified under Criterion "D". No further historic preservation work is recommended. Sufficient information regarding the location, extent, function, age, and construction methods of these cultural resources has been generated during the archaeological inventory survey investigation to mitigate any adverse effect caused by development activities.

Kapaia Bridge itself is considered eligible for the National Register of Historic Places. However, Kapaia Bridge is located on the principal arterial highway on the island and is adjacent to Wilcox Memorial Hospital. The bridge is also functionally obsolete with travel lanes and shoulder widths being too narrow to meet standards. Alternate transportation modes are also not addressed. The bridge is structurally deficient. It does not meet load-carrying capacity standards and the bridge superstructure is rated in poor condition. Thus, Kapaia Bridge's superstructure, geometry and load-carrying capacity are inadequate making construction of a new bridge a more feasible and prudent use of public funds.

Should any previously unidentified burial, archaeological or historic sites be found during the course of construction of the proposed Project, the Applicant will stop work in the immediate vicinity and the SHPD will be notified immediately to determine appropriate mitigation measures.

(3) <u>Scenic and Open Space Resources</u>

<u>Objective:</u>

(A) Protect, preserve, and where desirable, restore or improve the quality of coastal scenic and open space resources.

<u>Policies:</u>

(A) Identify valued scenic resources in the coastal zone management area;

(B) Ensure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural landforms and existing public views to and along the shoreline;
(C) Preserve, maintain, and, where desirable, improve and restore shoreline open space and scenic resources; and
(D) Encourage those developments which are not coastal dependent to locate in inland areas.

The proposed bridge replaces a bridge approximately 80 years old which has been determined to be functionally obsolete and structurally deficient. The replacement bridge would be in the same location as the existing bridge and would maintain generally the same profile. The intent is to build a bridge which would complement the historic nature and rural context of the region. The mauka detour bridge will be removed when the permanent bridge is completed. The proposed project will not cause any significant adverse view impacts.

(4) Coastal Ecosystems

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

Policies:
(A) Exercise an overall conservation ethic, and practice stewardship in the protection, use, and development of marine and coastal resources;
(B) Improve the technical basis for natural resource management;
(C) Preserve valuable coastal ecosystems, including reefs, of significant biological or economic importance;
(D) Minimize disruption or degradation of coastal water ecosystems by effective regulation of stream diversions, channelization, and similar land and water uses, recognizing competing water needs; and
(E) Promote water quantity and quality planning and management practices that reflect the tolerance of fresh water and marine ecosystems and maintain and enhance water quality through the development and implementation of point and nonpoint source water pollution control measures.

Potential water quality impacts to the nearshore waters during construction of the Project will be mitigated by adherence to State and County water quality regulations governing grading, excavation and stockpiling. Best management practices will be incorporated during construction to mitigate impacts to water quality. These include, but are not limited to gravel entrance, dust screen, silt fence, retention basin, diversion berm/ditches, and grading procedures which comply with County grading provisions. In addition, a Section 404 permit from

the U.S. Army Corps of Engineers, a Section 401 Water Quality Certification from the Department of Health, Coastal Zone Management Federal Consistency from the Office of Planning and a Stream Channel Alteration Permit from the Department of Land and Natural Resources are required.

(5) Economic Uses

Objective:

(A) Provide public or private facilities and improvements important to the State's economy in suitable locations.

Policies:

(A) Concentrate coastal dependent development in appropriate areas;

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

(C) Direct the location and expansion of coastal dependent developments to areas presently designated and used for such developments and permit reasonable long-term growth at such areas, and permit coastal dependent development outside of presently designated areas when:

(i) Use of presently designated locations is not feasible;

(ii) Adverse environmental effects are minimized; and

(iii) The development is important to the State's economy.

The proposed project will facilitate the safe transport of residents, visitors and goods which assures the continuation of the essential link on the Kaumualiʻi Highway and Kūhiō Highway, thereby positively affecting the economic viability of the region. The Kapaia Bridge also is a key link between Līhuʻe and Kapaia-Hanamāʻulu. In this regard, the proposed project is significant in maintaining and enhancing the island's and region's long-term economic stability.

(6) Coastal Hazards

Objectives:

(A) Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence, and pollution.

Policies:

(A) Develop and communicate adequate information about storm wave, tsunami, flood, erosion, subsidence, and point and nonpoint source pollution hazards;

(B) Control development in areas subject to storm wave, tsunami, flood, erosion, hurricane, wind, subsidence, and point and nonpoint pollution hazards;

(C) Ensure that developments comply with requirements of the Federal Flood Insurance Program;
(D) Prevent coastal flooding from inland projects.

The proposed project will provide required drainage capacity which will reduce hazard to life and property. In addition, the new bridge should provide a safer and more reliable facility which will serve the community for many years into the future. The proposed project would not result in adverse effects relating to tsunami, storm waves, erosion, subsidence, and pollution.

(7) Managing Development

Objective:
(A) Improve the development review process, communication, and public participation in the management of coastal resource and hazards.

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

Government agencies, organizations, and the general public are being notified of the proposed Project and provided an opportunity to comment on the Project through this environmental review process. Further, it is noted that public informational meetings were previously held on the proposed project in July 2015 and February 2017.

(8) Public Participation

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

Policies:
(A) Promote public involvement in coastal zone management processes;
(B) Disseminate information on coastal management issues by means of educational materials, published reports, staff contact, and public

workshops for persons and organizations concerned with coastal issues, developments, and government activities; and

(C) *Organize workshops, policy dialogues, and site-specific mediations to respond to coastal issues and conflicts.*

As noted above, government agencies, organizations, and the general public are being notified of the proposed Project and provided an opportunity to comment on the Project through this environmental review process. Further, it is noted that public informational meetings were previously held on the proposed project in July 2015 and February 2017.

(9) Beach Protection

Objective:

(A) Protect beaches for public use and recreation.

Policies:

(A) Locate new structures inland from the shoreline setback to conserve open space, minimize interference with natural shoreline processes, and minimize loss of improvements due to erosion;

(B) Prohibit construction of private erosion-protection structures seaward of the shoreline, except when they result in improved aesthetic and engineering solutions to erosion at the sites and do not interfere with existing recreational and waterline activities; and

(C) Minimize the construction of public erosion-protection structures seaward of the shoreline.

The proposed project involves the replacement of an existing bridge which is located approximately 1.6 miles from the shoreline. The new bridge is being proposed in the same location as the existing bridge. A temporary detour bridge is being built mauka of the existing bridge. The project will not affect existing beaches nor affect any public use and recreation resources in the Hanamā‘ulu region.

(10) Marine Resources

Objective:

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

Policies:

(A) Ensure that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial;

(B) Coordinate the management of marine and coastal resources and activities to improve effectiveness and efficiency;

(C) Assert and articulate the interests of the State as a partner with federal agencies in the sound management of ocean resources within the United States exclusive economic zone;

(D) Promote research, study, and understanding of ocean processes, marine life, and other ocean resources in order to acquire and inventory information necessary to understand how ocean development activities relate to and impact upon ocean and coastal resources; and

(E) *Encourage research and development of new, innovative technologies for exploring, using, or protecting marine and coastal resources.*

In order to address migration of native stream fauna, construction will be phased such that the entire stream is not blocked at one time. In addition, applicable BMPs will be incorporated during the construction phase to prevent degradation of the quality of the water during construction. With the implementation of the foregoing measures, the proposed project is not anticipated to have any adverse impact on marine and coastal resources.

4.9 County Special Management Area

The Hawai‘i Coastal Zone Management (CZM) Act (Chapter 205, HRS) is the basis of the Hawai‘i CZM Program as discussed in the previous section. In addition to providing for Federal Consistency Review, the Act establishes objectives, policies and guidelines upon which all counties within the State have structured specific legislation which designated Special Management Areas (SMA). Any development located within the SMA requires a County-issued SMA permit, which on Kaua‘i is administered by the County Planning Department. The proposed Project is located outside of the County’s SMA.

4.10 Permits and Approvals

The following is a list of permits and approvals which may be required prior to construction of the proposed project:

<u>Federal</u>

U.S. Corps of Engineers

- Section 404 Permit

Federal Emergency Management Agency

- Compliance with Executive Order 11988, Floodplain Management

Federal Highways Administration

- Section 7 of the Endangered Species Act
- Section 106 of the National Historic Preservation Act
- Section 4(f) of the Department of Transportation Act of 1966

State of Hawai‘i

Department of Health

- Section 401 Water Quality Certification
- Community Noise Permit
- National Pollutant Discharge Elimination System (Stormwater Associated with Construction)

Department of Land and Natural Resources

- Chapter 6E, HRS Historic Preservation
- Stream Channel Alteration Permit

Office of Planning

- Coastal Zone Management Federal Consistency

County of Kaua‘i

- Grubbing and Grading Permits
- Permit to Perform Work within County Right of Way

This page is intentionally left blank

5. DETERMINATION

Based on the significance criteria set forth in Chapter 200, Title 11, State of Hawai‘i Department of Health Administrative Rules, it is determined that the proposed Project will not have a significant effect on the environment, and that a Finding of No Significant Impact (FONSI) has been filed with the State Office of Environmental Quality Control following the public consultation period. The reasons supporting this determination are described below according to these significance criteria.

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

Development of the proposed Project will require an irrevocable commitment of energy, labor, capital, and materials for construction. Land has been utilized for roadway and drainage purposes for decades and will continue to be used for those purposes for an indefinite period of time.

None of the plants recorded in the biological survey are endemic and none are listed as endangered or threatened or proposed for inclusion as a listed species by federal or state agencies. No aquatic species protected by State of Hawai‘i Administrative Rules, nor federally endangered or threatened species were observed in Hanamā‘ulu Stream within the Project area. Hanamā‘ulu Stream will not be totally blocked at any one time during the construction phase in order to allow for migration of native amphidromous fauna. Best Management Practices will be incorporated during the construction phase to prevent significant degradation of the quality of the water during construction.

The archaeological inventory survey revealed 11 cultural resources in the area. They are of historic and indeterminate age, most likely associated with the sugar plantation and plantation camps. The majority of the sites deal with transportation, whether mechanical, pedestrian or water. All of the cultural resources are classified under Criterion “D”. No further historic preservation work is recommended. Sufficient information regarding the location, extent, function, age, and construction methods of these cultural resources has been generated during the archaeological inventory survey investigation to mitigate any adverse effect caused by development activities.

Kapaia Bridge itself is considered eligible for the National Register of Historic Places. However, Kapaia Bridge is located on the principal arterial highway on the island and is adjacent to Wilcox Memorial Hospital. The bridge is also functionally obsolete with travel lanes and shoulder widths being too narrow to meet standards. Alternate transportation modes are also not addressed. The bridge is also structurally deficient. It does not meet load-carrying capacity standards and the bridge superstructure is rated in poor condition. Thus, Kapaia Bridge’s superstructure, geometry and load-carrying capacity are inadequate

making construction of a new bridge a more feasible and prudent use of public funds.

Should any previously unidentified burial, archaeological or historic sites be found during the course of construction, the Contractor will stop work in the immediate vicinity and the SHPD will be notified immediately to determine appropriate mitigation measures.

There is no reported ongoing traditional gathering or hunting practices occurring within the Project area itself. The Project has been in use as a bridge since 1933. Access to traditional resources will not be affected by the replacement bridge. It is anticipated that the proposed Project will have no adverse impact on traditional cultural properties or practices, gathering rights, or access. However, there is ongoing Section 106 consultation with Native Hawaiian organizations and other organizations and individuals on this issue.

2) Curtails the range of beneficial uses of the environment;

The intention of the proposed Project is to commit the Project Site to the proposed use over the long-term. Beneficial uses of the Project Site and environment would not be curtailed since the site had been utilized for roadway and drainage uses for approximately 80 years.

3) 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 project does not conflict with long-term environmental policies, goals, and guidelines of the State of Hawai‘i. As presented in this EA, the project's potential adverse impacts are associated only with short-term construction-related activities and can be mitigated through adherence to standard construction mitigation practices.

4) Substantially affects the economic, social welfare, or cultural practices of the community or State;

In the short term, the Project will confer positive benefits in the local area. Direct economic benefits will result from construction expenditures both through the purchase of material from local suppliers and through the employment of local labor, thereby stimulating that sector of the economy. Indirect economic benefits may include benefits to local retailing businesses resulting from construction activities.

There are no significant adverse long term socio-economic impacts anticipated with the proposed Project. The proposed Project is not expected to increase traffic or induce growth in the Hanamā‘ulu region.

There is no reported ongoing traditional gathering or hunting practices occurring within the Bridge project area. The proposed Project is not anticipated to have an adverse impact on traditional cultural properties or practices, gathering rights, or access.

5) Substantially affects public health;

An efficient roadway and drainage system supports the public health of residents and visitors to Kaua‘i. The proposed project provides a reliable roadway facility which also accommodates the 100-year 24-hour storm.

6) Involves substantial secondary impacts, such as population changes or effects on public facilities;

No secondary effects are anticipated with the construction and operation of the proposed project. The proposed project is not anticipated to induce growth beyond that which is anticipated for the region and should not have a major influence on future population and land use patterns in Līhu‘e, Kapaia and Hanamā‘ulu. Rather, the facility is proposed to fulfill an essential community need to provide safe and convenient access.

7) Involves a substantial degradation of environmental quality

The proposed Project is not anticipated to involve a substantial degradation of environmental quality.

There are potential short-term impacts to noise, air quality, water quality, stream biota, and traffic in the immediate project vicinity. With the incorporation of mitigation measures during the construction period, the project will not result in long-term degradation to environmental quality.

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

No cumulative effects are anticipated, inasmuch as the proposed project involves the contextual replacement of an existing bridge with no increase in laneage or travel capacity. There is no commitment to a larger action.

9) Substantially affects a rare, threatened or endangered species, or its habitat;

None of the plants recorded in the biological survey are endemic and none are listed as endangered or threatened or proposed for inclusion as a listed species by federal or state agencies. No aquatic species protected by State of Hawai‘i Administrative Rules, nor federally endangered or threatened species were observed in Hanamā‘ulu Stream within the Project area. Best management

practices implemented during construction will help to mitigate possible adverse water quality impacts. The entire stream will not be blocked at any one time to allow for migration of diadromous native Hawaiian stream fauna. The project will not adversely affect any rare, threatened or endangered species, or its habitat.

10) Detrimentally affects air and water quality or ambient noise levels;

Operation of construction equipment would temporarily elevate ambient noise and concentrations of exhaust emissions in the immediate vicinity of the project site. Construction will occur only during daylight weekday hours. Operation of the proposed project will have no significant long-term impact on air quality or ambient noise levels in the vicinity.

Potential water quality impacts to Hanamā‘ulu Stream during construction of the Project will be mitigated by adherence to Federal, State and County water quality regulations governing grading, excavation and stockpiling. Appropriate best management practices will be implemented to prevent significant degradation of water quality.

Mitigation measures will be instituted incorporating appropriate structural and/or non-structural BMPs such as silt fences, diversion berm/ditches and minimizing time of exposure between construction and re-vegetation.

Following construction, the Project improvements will produce no adverse effects from storm runoff to adjacent and downstream areas.

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

According to the FIRM prepared by FEMA, the Project Site is located within Zones AE, AEF, A and X. Zone AE corresponds to the 100-year floodplain. At the project site, the base flood elevation is 100 feet above sea level. Zone AEF defines the floodway which is the channel of the stream plus any adjacent areas that must be kept free of encroachment so the 1% annual chance flood can be carried without substantial increase in flood heights. Zone A is an area which corresponds to the 100-year floodplain that is determined in Flood Insurance studies by approximate methods. Because detailed analyses are not performed in these areas, no depths or base flood elevations are shown within these zones. Zone X is an area determined to be outside of the 0.2% annual chance floodplain. No base flood elevations or depths are shown in this zone.

Applicable BMPs will mitigate against potential effects to coastal waters during construction. Compliance with Kaua‘i County Code provisions related to grading, Section 404 Corps Permit, Section 401 Water Quality Certification, Coastal Zone

Management Federal Consistency and Stream Channel Alteration Permit would be required.

The project should not adversely impact beaches, erosion-prone areas, geologically hazardous land, or fresh water.

12) Substantially affects scenic vistas and viewplanes identified in county or state plans or studies;

The temporary detour bridge which will provide access around the existing bridge will be removed when the permanent bridge is completed. The new bridge is a replacement of the existing bridge and will have a very similar profile to the existing bridge. The proposed bridge will not cause any significant adverse view impacts.

13) Requires substantial energy consumption;

Construction and operation of the proposed Project will not require substantial increases in energy consumption.

This page is intentionally left blank

6. CONSULTATION

6.1 Pre-Assessment Consultation

The following agencies and organizations were consulted during the preparation of the Draft EA. Those who formally replied are indicated by an asterisk (*). All written comments received during the early consultation period of the Draft EA and responses are reproduced in Appendix D.

Federal

* U.S. Army Corps of Engineers (COE)
U.S. Fish and Wildlife Service (FWS)
U.S. Department of Transportation, Federal Highways Administration
National Marine Fisheries Service, Pacific Islands Regional Office

State of Hawai‘i

Department of Accounting & General Services
Department of Education (DOE)
Department of Business, Economic Development and Tourism (DBEDT)
DBEDT, Land Use Commission
DBEDT, Office of Planning
* Department of Hawaiian Home Lands
Department of Health (DOH)
DOH, Clean Water Branch
* DOH, Environmental Management Division
DOH, Office of Environmental Quality and Control
Department of Land and Natural Resources (DLNR)
DLNR, Historic Preservation Division
DLNR, Land Division
Department of Transportation (DOT)
Office of Hawaiian Affairs

County of Kaua‘i

Planning Department
Department of Public Works
* Transportation Agency
Office of Economic Development
Water Department
Department of Parks and Recreation
Fire Department
Police Department
Housing Agency
Kaua‘i Historic Preservation Commission

Others

Kaua‘i Planning & Action Alliance
Historic Hawai‘i Foundation

Queen Debra Kapule Hawaiian Civic Club
Alu Like, Inc.
Hanalei Hawaiian Civic Club
Kaua‘i Museum
Līhu‘e Business Association
Hanamā‘ulu Neighborhood Association
KKCR Community Radio
Royal Order of Kamehameha – Kaumuali‘i Chapter
Kaua‘i Historical Society
Mālama Kaua‘i
Kaua‘i Heritage Center
Hale O Na Ali‘i
Niumalu Canoe Club
Kaumuali‘i Hawaiian Civic Club
Nā Kuleana o Kānaka ‘Ōiwi
Ahahui Kiwila Hawai‘i o Moikeha
Ka‘ahumanu Society
Kaua‘i Ni‘ihau Island Burial Council
Na Kahu Hikinaakalā
Ni‘ihau/Kaua‘i Ahamoku Ahupua‘a
Konohiki of Kaua‘i
Mr. Val Ako
Mr. James Burgess
* Mr. Butch “Leopold” Durant
Mr. Godwin Esaki
* Mr. Roy Goo
Ms. Noelani Josselin
Mr. Nathan Kalama
Kaluhine ‘‘Ohana
Mr. James Alalem
* Ms. Sabra Kauka
Ms. Lilian Kiilau
Mr. Lester Matsushima
Ms. Beverly Muraoka
Mr. Charlie Perreira (c/o Waipā Foundation)
Ms. Anne Punohu
Mr. Bob Robinson
Ms. Nani Rogers
Ms. Healani Trembath
* Ms. Laraine Moriguchi
* Ms. Nina Monasevitch

6.2 Draft Environmental Assessment Consultation

The Draft Environmental Assessment for the Kapaia Bridge Replacement was published in the Office of Environmental Quality Control *Environmental Notice* of

January 23, 2017. Publication initiated a 30-day public review period ending on February 22, 2017.

A public informational meeting was held on February 15, 2017 from 6:00 pm to 8:00 pm at the King Kaumualiʻi Elementary School Cafeteria. The following organizations and individuals were notified by letter or email of the meeting. All written comments and responses are reproduced in Appendix E.

Alan Downer, Ph.D. - State Historic Preservation Division
Kauaʻi Historic Preservation Commission
Grove Farm Company, Inc.
Ms. Kiersten Faulkner - Historic Hawaiʻi Foundation
Ms. Liberta Hussey Albao - Queen Debra Kāpule Hawaiian Civic Club
Alu Like, Inc.
Mr. Val Ako
Mr. James Burgess
Mr. Butch “Leopold” Durant
Mr. Godwin Esaki
Mr. Devin Forrest - Hanalei Hawaiian Civic Club
Ms. Jane Kamahaokalani Gray - Kauaʻi Museum
Ms. Pat Griffin - Līhuʻe Business Association
Hanamāʻulu Neighborhood Association
Ms. Kaiulani Edens-Huff
Mr. Warren Perry
Ms. Noelani Josselin
Mr. Nathan Kalama
Kaluhine ‘‘Ohana
Mr. James Alalem
Kauaʻi Historical Society
Ms. Sabra Kauka
Mr. Keone Kealoha - Malama Kauaʻi
Ms. Kehaulani Kekua - Kauaʻi Heritage Center
Ms. Lillian Kiilau
Ms. Carol Lovell - Hale O Na Aliʻi
Mr. Lester Matsushima
Ms. Beverly Muraoka
Niumalu Canoe Club - Marleny Cotrim, President
Mr. Charlie Perreira - c/o Waipa Foundation
Ms. Sarah Peters, President - Kaumualiʻi Hawaiian Civic Club
Ms. Anne Punohu
Mr. Bob Robinson
Ms. Nani Rogers
Ms. D. Kaliko Santos - Office of Hawaiian Affairs
Ms. Donna Kaliko Santos - Nā Kuleana o Kānaka ʻŌiwi
Mr. Winifred Smith, President - Ahahui Kiwila Hawaiʻi o Moikeha
Ms. Julie Souza, President - Kaʻahumanu Society

Ms. Healani Trembath
Mr. Keith Yap, Vice Chair - Kaua‘i Ni‘ihau Island Burial Council
Ms. Laraine Moriguchi
Ms. Victoria Wichman - Na Kahu Hikinaakala
David and Nina Monasevitch
Ms. Mahelani Sylva
Mr. Kaimi Hermosura
Mr. Ken Taylor
Ms. Kanani Durant
John and Jolene Ogle
Mr. Mason Moriguchi
Roy and Mia Goo
Joseph Rosa
Larry Arruda

7. REFERENCES

AECOS, Inc., *Source Water Quality Assessment Kapaia Bridge Replacement Hanamāʻulu Stream, Līhuʻe, Kauaʻi*, April 18, 2013

AECOS, Inc., *Water Quality and Biological Surveys for the Kapaia Bridge Replacement Project Līhuʻe, Kauaʻi*, May 20, 2013.

Big Island of Hawaiʻi, Department of Transportation Highways Division, Bridge Maintenance Section, *Biennial Bridge Inspection Reports Hanamāʻulu Stream (Kapaia) Bridge, Bridge No. 007000560400123, Kauaʻi, Hawaiʻi*, prepared for State of Hawaiʻi Department of Transportation Highways Division, July 8, 2015.

County of Kauaʻi, *The General Plan for the County of Kauaʻi*, Ordinance No. 753, November 30, 2000.

County of Kauaʻi Department of Public Works – Solid Waste Division, County of Kauaʻi Integrated Solid Waste Management Plan, Prepared by R.W. Beck, September 2009.

Cultural Surveys Hawaiʻi, Inc., *Archaeological Inventory Survey Report for the Replacement of Hanamāʻulu (Kapaia) Stream Bridge, Kūhiō Highway, Approximately Between Mileposts 1.1 and 1.3, Hanamāʻulu Ahupuaʻa, Līhuʻe District, Kauaʻi TMKs: [4] 3-7-001:001, 3-7-004:009, 3-8-002:001, :012, and :999, and 3-8-006:999 pors.*, October 2013.

Department of Geography, University of Hawaii, *Atlas of Hawaiʻi,* Second Edition, 1983.

Department of Water, County of Kauaʻi, *Kauaʻi Water Use and Development Plan*, Prepared for Department of Water, County of Kauaʻi and Commission on Water Resource Management, State of Hawaiʻi Department of Land and Natural Resources, Prepared by R. M. Towill Corporation, February 1990.

Fletcher, C. (2010). *Hawaiʻi's Changing Climate* (Briefing Sheet, 2010). Retrieved from http://www.soest.hawaii.edu/coasts/publications/ClimateBrief_low.pdf

George A.L. Yuen & Associates, Inc., Commission on Water Resource Management Department of Land and Natural Resources State of Hawaiʻi, *Water Resources Protection Plan Volumes I & II*, June 1990.

Hawaiʻi Cooperative Park Service Unit, Western Region Natural Resources and Research Division, National Park Service, *Hawaiʻi Stream Assessment*, Prepared for Commission on Water Resource Management, December 1990.

Hawai‘i - National Flood Insurance Program, *Hawai‘i Flood Hazard Assessment Tool*, gis.hawaiinfip.org/fhat/.

Kai Hawai‘i, *Biennial Bridge Inspection Report Hanamā‘ulu Stream (Kapaia) Bridge, Bridge No. 007000560400123, Kaua‘i, Hawai‘i*, prepared for State of Hawai‘i Department of Transportation Highways Division, July 2013.

Land Study Bureau, University of Hawai‘i, *Detailed Land Classification – Island of Maui*, L.S.B. Bulletin No. 7, May 1967.

Nagamine Okawa Engineers Inc., *Biennial Bridge Inspection Report Hanamā‘ulu Stream Bridge, Bridge No. 007000560400123, Kaua‘i, Hawai‘i*, prepared for State of Hawai‘i Department of Transportation Highways Division, June 2005.

State of Hawai‘i Department of Agriculture, *Agricultural Lands of Importance to the State of Hawai‘i*, adopted by the Board of Agriculture, January 28, 1977.

State of Hawai‘i Department of Health, *Hawai‘i Administrative Rules Title 11 Department of Health Chapter 54. Water Quality Standards*, amended and compiled May 27, 2009.

State of Hawai‘i Department of Health, *Hawai‘i Administrative Rules Title 11 Department of Health Chapter 60.1, Air Pollution Control*, amended and compiled September 16, 2003.

State of Hawai‘i Department of Health, *List of Impaired Waters in Hawai‘i Prepared under Clean Water Act §303(d)*, http://www.state.hi.us/doh/eh/epo/wqm/303dpcfinal.pdf.

State of Hawai‘i Department of Transportation Highways Division, State Historic Bridge Inventory & Evaluation, prepared by MKE Associates LLC, Fung Associates, LLC, November 2013.

U.S. Census Bureau, *Hawai‘i Quick Facts from the U.S. Census Bureau*, December 23, 2011, http://quickfacts.census.gov/qfd/states/15000.html.

U.S. Census Bureau, *2006-2010 American Community Survey*, last revised January 17, 2012, http://quickfacts.census.gov/qfd/states/15000.html.

U.S. Department of Agriculture Soil Conservation Service in cooperation with the University of Hawai‘i Agricultural Experiment Station, *Soil Survey of the Islands of Kaua‘i, O‘ahu, Maui, Moloka‘i, and Lāna‘i, State of Hawaii*, Issued August 1972.

APPENDIX A

Source Water Quality Assessment, Kapaia Bridge Replacement, Hanamā‘ulu Stream, Līhu‘e, Kaua‘i

AECOS, Inc.

April 18, 2013

Source Water Quality Assessment
Kapaia Bridge Replacement
Hanamā'ulu Stream, Līhue, Kaua'i.

April 18, 2013 **Draft** AECOS No. 1266

Chad Linebaugh
AECOS, Inc.
45-939 Kamehameha Highway, No. 104
Kāne'ohe, Hawai'i 96744
Phone: (808) 234-7770 Fax: (808) 234-7775 Email: aecos@aecos.com

Introduction

In March 2013, *AECOS*, Inc. biologists collected water quality samples from Hanamā'ulu Stream on the Island of Kaua'i (Fig 1). The Kapaia Bridge on Kūhio Highway —located in Līhue near the highway's intersection with Maalo Road —is scheduled to be replaced (the "Project"). Project work may require a National Pollution Discharge Elimination System (NPDES) permit for dewatering of construction effluent into jurisdictional waters. *AECOS*, Inc. was contracted by Wilson Okamoto Corporation[1] to assess source water quality at the proposed Project site. This report details findings from the March 21, 2013 sampling event.

Hanamā'ulu Stream

Hanamā'ulu Stream arises from a complex system of perennial flows on the eastern slope of Kilohana Crater. The watershed, like others in the region, is highly modified with numerous flumes, ditches, and reservoirs reflecting the historical agricultural use that once dominated the region. Hanamā'ulu, the most significant stream in the watershed reaches a confluence just upstream from the Project, continues east flowing south of the Kalepa Ridge and the Kapaia and Hanamā'ulu neighborhoods before reaching Hanamā'ulu Bay, its coastal outlet into the Pacific Ocean. The watershed is 34.8 km^2 (13.4 m^2) with a total stream length of nearly 50 km (31 mi).

[1] This document will be incorporated into the Environmental Assessment (EA) for the project and become part of the public record.

Figure 1. The location of the project site on the Island of Kaua'i.

Hanamā'ulu Stream is classified by the State of Hawai'i as a perennial stream [2-2-012]. The stream appears on the Hawai'i Department of Health list of impaired waters in Hawai'i (HDOH, 2012) prepared under Clean Water Act §303(d). The listing indicates that water quality within the stream may not meet all state water quality standards for streams (Table 5). Specifically, Hanamā'ulu Stream is listed as impaired for turbidity during both the wet (Nov. thru April) and dry (May to Oct.) seasons.

Methods

On March 21, 2013, *AECOS* field technicians took field measurements and collected water samples from Hanamā'ulu Stream beneath the Project site. Stream water appeared slightly turbid with moderate stream flow. The location

of the water quality station is depicted in Fig. 2. The station is located beneath the bridge proposed for replacement at: Longitude - 159° 21.897' W; Latitude - 21° 59.514' N.

Temperature and dissolved oxygen (DO) were measured directly from stream waters using a YSI 550A meter. Values for pH were also obtained from *in situ* measurements using a Hanna pHep meter. Samples for conductivity, turbidity, total suspended solids (TSS), nutrients (NH_3, NO_3-NO_2, TN, TP), oil and grease, pesticides, polychlorinated biphenyl compounds (PCBs), and herbicides were collected in appropriate plastic or glass containers, placed on ice, and delivered to the *AECOS* Inc. laboratory for analyses (*AECOS* Log No. 29010). Water samples were analyzed according to the methods listed in Table 1.

Table 1. Methods and references for all tested parameters.

Analysis	Method	Reference
Temperature	SM 2550 B	SM (1998)
pH	SM 4500 H^+	SM (1998)
Dissolved Oxygen	SM 4500-O G	SM (1998)
Conductivity	SM 2510B	SM (1998)
Turbidity	EPA 180.1 Rev 2.0	USEPA (1993)
Total Suspended Solids	SM 2540 D	SM (1998)
Ammonia	SM4500 NH_3 B/C	SM (1998)
Nitrate + Nitrite	SM 4500 NO_3-E	SM (1998)
Total Nitrogen	SM 4500 NO_3-E N Org B	SM (1998)
Total Phosphorus	SM 4500 P B/E	SM (1998)
Pesticides and PCBs	EPA 608	USEPA (1993)
Herbicides	EPA 8151A	USEPA (1996)
Oil & Grease	EPA 1664 A	USEPA (1999)

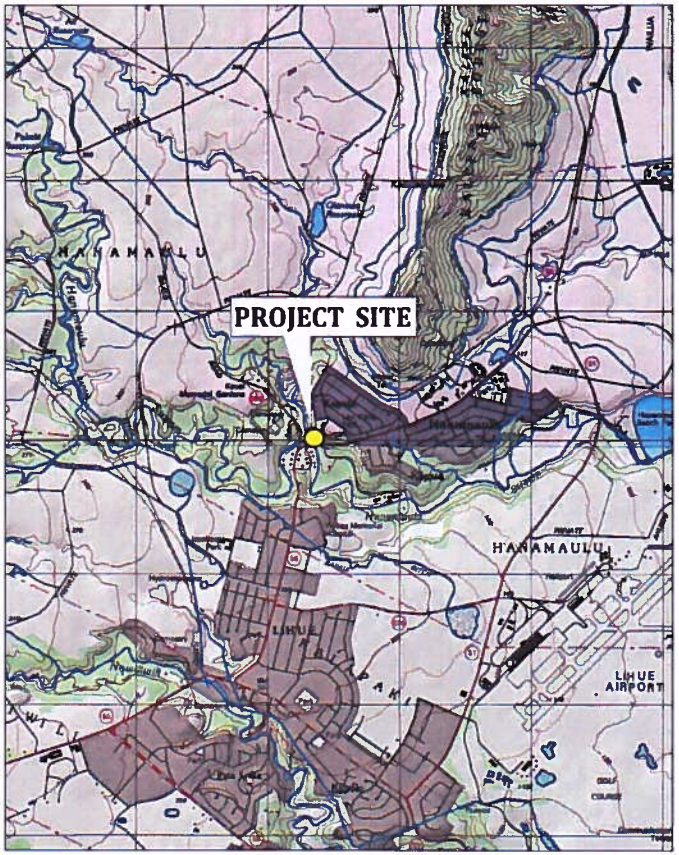


Figure 2. Location of the source water quality station (Sta. Bridge) at the Project site.

Results

The laboratory data sheets and quality assurance/quality control (QA/QC) for all analyses from the March 21, 2013 sampling event are given in Appendix A. Table 2 presents the results of field measurements and laboratory analysis of basic water quality parameters. Table 3 presents the results of toxic water quality parameters that could be anticipated to be present in stream water given current and historical land use in the watershed.

Table 2. Results of standard water quality monitoring parameters.

Station	Temp. (°C)	pH –	D.O. (mg/l)	D.O. saturation (%)	Salinity (ppt)	Cond. (µmhos/cm)
Bridge	20.4	7.73	8.66	96	<1	136

	TSS (mg/l)	Turb. (ntu)	NH_3 (µg N/l)	NO_3+NO_2 (µg N/l)	Total N (µg N/l)	Total P (µg P/l)
Bridge	1.7	2.90	<100	150	<500	330

Table 3. Results of analysis of toxic water quality parameters.

Parameter compound	units	det. limit	Station: Bridge
Oil & Grease	(mg /l)	1 mg/l	1.0
Pesticides &PCBs			
Alpha-BHC	(µg /l)	0.1	nd
Gamma-BHC	(µg /l)	0.1	nd
Beta-BHC	(µg /l)	0.1	nd
Heptachlor	(µg /l)	0.1	nd
Delta-BHC	(µg /l)	0.1	nd
Aldrin	(µg /l)	0.1	nd
Heptachlor epoxide	(µg /l)	0.1	nd
Endosulfan I	(µg /l)	0.1	nd
Dieldrin	(µg /l)	0.1	nd
4,4'-DDE	(µg /l)	0.1	nd
Endrin	(µg /l)	0.1	nd
Endrin aldehyde	(µg /l)	0.1	nd
4,4'-DDD	(µg /l)	0.1	nd
Endosulfan II	(µg /l)	0.1	nd
4,4'-DDT	(µg /l)	0.1	nd
Endosulfan sulfate	(µg /l)	0.1	nd
Methoxychlor	(µg /l)	0.1	nd
Chlordane	(µg /l)	1	nd
Toxaphene	(µg /l)	2	nd
Endrin ketone	(µg /l)	0.1	nd
Herbicides			
Dalapon	(µg /l)	13	nd
Dicamba	(µg /l)	0.5	nd
MCPP	(µg /l)	500	nd
MCPA	(µg /l)	500	nd
Dichlorprop	(µg /l)	5.0	nd
2,4-D	(µg /l)	5.0	nd
2,4,5-TP(Silvex)	(µg /l)	0.5	nd
2,4,5-T	(µg /l)	0.5	nd
2,4-DB	(µg /l)	5.0	nd
Dinoseb	(µg /l)	2.5	nd

Assessment

The water at the Project site is well oxygenated, slightly alkaline stream water without tidal influence. Conductivity is well within the State standard (Table 5). The stream did not contain much suspended solids during sampling and turbidity, an indication of the cloudiness of the water, is beneath the 5.0 ntu wet season standard. Nitrogenous nutrient concentrations are generally within

levels typical for streams in the Hawaiian Islands. However, total phosphorus concentrations are greatly elevated with readings in excess of State "not to exceed more than 2% of the time criteria."

The fact that oil and grease was present in detectable levels is a violation of the State of Hawai'i standards (HDOH, 2009) that state:

> *All waters shall be free of substances attributable to domestic, industrial, or other controllable sources of pollutants, including ...(2) Floating debris, oil, grease, scum, or other floating material.*

A treatment system to remove particulates generated by project work and any oil and grease encountered should be designed and implemented for this project if dewatering construction effluent is to be discharged into State receiving waters of Hanamā'ulu Stream. It is likely that nutrient levels will decrease as particulates are removed. Sediment control devices and well designed Best Management Practices (BMP's) will also be needed to prevent degrading water quality.

Table 5. State of Hawai'i water quality criteria for streams for wet (Nov. 1-Apr. 30) and dry (May 1-Oct. 31) seasons from HAR §11-54-05.2(b) (HDOH, 2009).

Parameter	Total Nitrogen (µg N/l)	Nitrate + Nitrite (µg N/l)	Total Phosphorus (µg P/l)	Turbidity (NTU)	Total Suspended Solids (mg/l)
Geometric mean not to exceed given value					
(dry season)	180 0	30 0	30 0	2 0	10 0
(wet season)	250 0	70 0	50 0	5 0	20 0
Not to exceed more than 10% of the time					
(dry season)	380 0	90 0	60 0	5 5	30 0
(wet season)	520 0	180 0	100 0	15 0	50 0
Not to exceed more than 2% of the time					
(dry season)	600 0	170 0	80 0	10 0	55 0
(wet season)	800 0	300 0	150 0	25 0	80 0

- pH – shall not deviate more than 0.5 units from ambient and not be lower than 5.5 nor higher than 8.0.
- Dissolved oxygen – not less than 80% saturation.
- Temperature – shall not vary more than 1 °C from ambient.
- Conductivity – not more than 300 micromhos/cm.

References

Hawai'i Department of Health (HDOH). 2009. Hawai'i Administrative Rules, Title 11, Department of Health, Chapter 54: Water Quality Standards. 92 pp.

____. 2012. State of Hawaii Water Quality Monitoring and Assessment Report: Integrated Report to U.S. Environmental Protection Agency and the U.S. Congress Pursuant to Sections §303(d) and §305(b), Clean Water Act (P.L.97-117). 98pp.

Standard Methods (SM). 1998. Standard Methods for the Examination of Water and Wastewater. 20th Edition. 1998. (Greenberg, Clesceri, and Eaton, eds.). APHA, AWWA, & WEF. 1220 pp.

U.S. Environmental Protection Agency (USEPA). 1993. Methods for the Determination of Inorganic Substances in Environmental Samples. EPA 600/R-93/100.

____ 1996. Method 8151A. Revision 1. Chlorinated Herbicides by GC Using Methylation or Pentafluorobenzylation Derivatization. Available online at URL: http://www.epa.gov/osw/hazard/testmethods/sw846/pdfs/8151a.pdf Last accessed on April 19, 2012.

____ 1999. Analytical Methods - Method 1664, Revision A: N-Hexane Extractable Material (HEM; Oil and Grease) and Silica Gel Treated N-Hexane Extractable Material (SGT-HEM; Non-polar Material) by Extraction and Gravimetry. EPA-821-R-98-002; . Available online at URL: http://water.epa.gov/scitech/methods/cwa/oil/1664.cfm Last accessed on April 19, 2012.

APPENDIX B

Water Quality and Biological Surveys for the Kapaia Bridge Replacement Project, Līhu‘e, Kaua‘i

AECOS, Inc.

May 20, 2013

AECOS No. 1266B

Water quality and biological surveys for the Kapaia Bridge Replacement Project Līhu'e, Kaua'i

Prepared by:

AECOS Inc.
45-939 Kamehameha Hwy, Suite 104
Kāne'ohe, Hawai'i 96744-3221

May 20, 2013

Water quality and biological surveys for the Kapaia Bridge Replacement Project, Līhu'e, Kaua'i

May 20, 2013 **DRAFT** *AECOS* No. 1266B

Chad Linebaugh
AECOS, Inc.
45-939 Kamehameha Hwy, Suite 104
Kāne'ohe , Hawai'i 96744
Phone: (808) 234-7770 Fax: (808) 234-7775 Email: aecos@aecos.com

Introduction

The Kapaia Bridge Replacement Project ("Project") proposes to replace an existing Kūhio Highway bridge over Hanamā'ulu Stream in Līhu'e on the Island of Kaua'i (Fig. 1). *AECOS*, Inc. was contracted by Wilson Okamoto Corporation[1] to assess water quality and ascertain biological resources of Hanamā'ulu Stream in the Project area. For these purposes, a field survey of the area was undertaken by *AECOS* biologists on March 21, 2013. The survey included the lower and estuarine reaches of Hanamā'ulu Stream from near the 38-m (125-ft) elevation to the stream coastal outlet at Hanamā'ulu Beach Park.

Hanamā'ulu and Kapaia Streams

Hanamā'ulu Stream (aka Hanamā'ulu River) is included in the Hawai'i Stream Assessment (Hawaii Cooperative Park Service Unit, 1990), which purports to list all perennial streams[2]. The stream is described as a continuously flowing stream that discharges into an embayment. Hanamā'ulu Stream, a third order stream (having two tributaries, each comprised of at least two smaller tributaries), extends approximately 49.7 km (30.9 mi) from near the rim of Kilohana Crater at around 350 m (1148 ft) above sea level (ASL) down to the Pacific Ocean at Hanamā'ulu Bay. It crosses under Kūhio Highway (State Route 56) approximately 2.4 km (1.5 mi) upstream from the mouth. The total area of the Hanamā'ulu watershed (DLNR-DAR watershed code No. 2-2-012) is

[1] Report prepared for environmental entitlements to become part of the public record.
[2] A perennial stream has year-round, continuous flow in at least part of its bed; flow need not be continuous from upper reaches to the sea.

estimated at 13.4 km² (5.2 mi²; Parham et al, 2008). The Project site is at an elevation of approximately 27 m (90 ft) ASL.

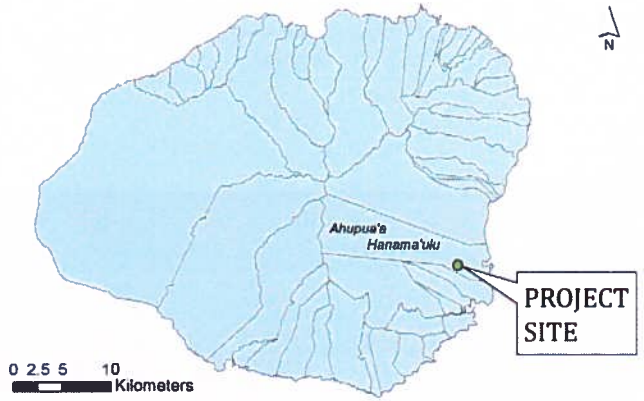


Figure 1. Location of the Project on the Island of Kaua'i.

The watershed of the upper reach of Hanamā'ulu Stream (north and south tributaries) is primarily former sugarcane land that is now either undeveloped or used for diversified agriculture. Like the Wailua watershed to the north and Nāwiliwili to the south, a plantation-era irrigation system diverts water from, and adds water to, the middle and upper reaches of the stream from both within and outside the Hanamā'ulu watershed. A tributary (herein as Kapaia Stream) that parallels Mā'alo Road is a shallow, brisk-flowing course confined within a 2- to 3-m (6- to 10-ft) wide channel entering Hanamā'ulu Stream on the left[3] bank near the 38-m (125-ft) elevation.

Hanamā'ulu Stream is in a deeply incised gulch as it passes under Kūhio Highway. The left bank is over 15 m (50 ft) high and the right bank is approximately 12 m (40 ft) high. The stream is well shaded upstream of the bridge where a dense *hau* (*Hibiscus tiliaceus*) thicket covers the Hanamā'ulu-

[3] By definition, on the left side as determined by looking in the direction of flow (downstream).

Kapaia confluence located a few meters upslope from the bridge (Fig 2). Underneath the bridge, the stream bed consists of small boulders and gravel embedded in silt and, at the time of the survey, the stream was a 1- to 2-m (3- to 6-ft) deep pool without visible turbulence. Directly downstream from the bridge, Hanamā'ulu Stream continues its calm flow, though the stream is less shaded (see cover photo).

Figure 2. Stream confluence just upstream from Kūhio Highway Bridge of Hanamā'ulu Stream (center left) and Kapaia Stream (top right) which drains the Mā'alo area.

Survey Methods

AECOS, Inc. biologists surveyed Hanamā'ulu Stream on March 21, 2013 to evaluate water quality and identify riparian vegetation and aquatic species within the Project area. The survey also included observations upstream from the Project near Kauai Gardens Memorial Cemetery at approximately 38 m (125 ft) ASL and in the coastal estuary at Hanamā'ulu Beach Park (Fig 3).

Figure 3. Coastal estuary of Hanamā'ulu Stream.

Water Quality Survey

AECOS biologists conducted field measurements and collected water samples at three stations: "Kapaia Stream", "Hanama'ulu Upstream," and "Downstream" (see Fig. 4). The first two stations were located near the upstream edge of the Project area and the third station was located near the downstream terminus of the Project. At each of the stations, biologists made *in situ* measurements (temperature, pH, and dissolved oxygen) and collected samples for laboratory analyses (conductivity, turbidity, total suspended solids, nitrate+nitrite, total nitrogen, and total phosphorus). The samples were collected in plastic bottles that, if not containing preservative, were pre-rinsed with the water to be sampled. The samples were placed on ice and taken to the *AECOS* Laboratory in Kāne'ohe for analysis (*AECOS* Laboratory Log No. 29011). Table 1 lists the analytical methods used for each water quality parameter monitored.

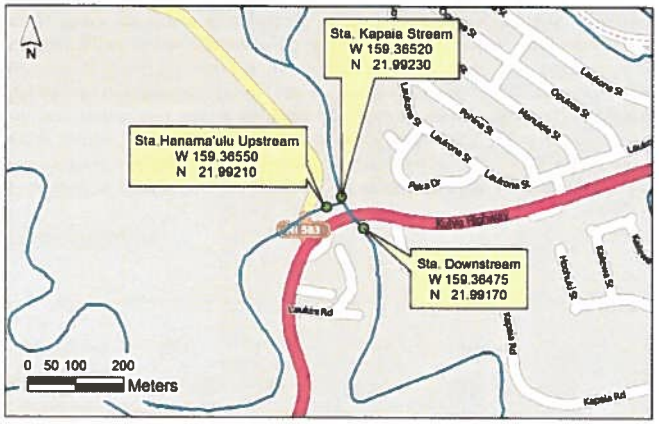


Figure 4. Water quality sampling stations near the Project site (coordinates in decimal degrees; Datum WGS84).

Biological Survey

The biologists covered the survey area on foot and, as they were encountered, noted plant species along and above the stream banks. As the survey progressed, notes were made on the relative abundances of each species (e.g. rare, common, abundant). Biologists also made observations and used hand nets to collect aquatic organisms from the stream for close examination. Similar to the botanical survey, the biologists made notes on the relative abundances of each aquatic species observed. Additional observations were made from other points along Hanamā'ulu Stream beyond the Project area to assess the potential for migration of native amphidromous[4] animals and the distribution of naturalized organisms throughout the stream.

[4] Meaning species that move between fresh and salt water as part of their life cycle.

Table 1. Analytical methods used for March 21, 2013 water quality analysis of Hanamā'ulu Stream.

Analysis	Method	Reference
Temperature	thermister calibrated to NBS. Cert. thermometer/ SM 2550 B	SM (1998)
Conductivity	SM 2510-B	SM (1998)
pH	SM 4500 H+	SM (1998)
Dissolved Oxygen	SM 4500-O G	SM (1998)
Turbidity	EPA 180.1 Rev 2.0	USEPA (1993)
Total Suspended Solids	SM 2540 D	SM (1998)
Nitrate + Nitrite	EPA 353.2 Rev 2.0	USEPA (1993)
Total Nitrogen	persulfate digestion/ EPA 353.2	Grasshoff et al. (1986)/ USEPA (1993)
Total Phosphorus	persulfate digestion/ EPA 365.1 Rev 2.0	Grasshoff et al. (1986)/USEPA (1993)

Results

Water Quality

Water quality results for the March 21, 2013 sampling event are presented in Table 2. Stream temperatures were cool, ranging from 20.2 to 22.7°C at the three stations. Measured pH revealed slightly alkaline stream waters at all stations. Dissolved oxygen (DO) varied from 8.11 to 8.72 mg/L representing from 94% to 96% saturation at measured ambient temperatures. Conductivity levels varied only 23 µmhos/cm, from 140 at Sta. Hanamaulu Upstream to a low of 117 at nearby Sta. Kapaia Stream.

Particulate levels on March 21, as measured by total suspended solids concentrations ranged from a low of 1.1 mg/l at Sta. Downstream to a high of 1.6 mg/L found at stations Kapaia Stream and Hanama'ulu Upstream. Turbidity, a measure of the cloudiness of the water, was greatest in Sta. Kapaia Stream, reading 4.17 ntu. Stations Hanamaulu Upstream and Downstream recorded values of 2.62 and 3.08 ntu, respectively. Nutrients (NO_3+NO_2, Total N, and

Total P) were quite variable throughout the sampling area. Sta. Kapaia Stream recorded the highest total nitrogen and the lowest nitrate+nitrite concentration. Total phosphorus was not detected at any of the sampled stations.

Table 2. Physical and chemical water quality characteristics of Hanamā'ulu Stream from March 21, 2013 sampling event.

Station	Temp. (°C)	pH	DO (mg/l)	DO sat. (%)	Conductivity (µmhos/cm)
Hanama'ulu Upstream	20.2	7.68	8.72	96	140
Kapaia Stream	22.7	7.76	8.11	94	117
Downstream	20.8	7.71	8.55	96	132

	Turbidity (ntu)	TSS (mg/l)	NO_3+NO_2 (µg N/l)	Total N (µg N/l)	Total P (µg P/l)
Hanama'ulu Upstream	2.62	1.6	122	175	<3
Kapaia Stream	4.17	1.6	76	303	<3
Downstream	3.08	1.1	110	158	<3

Botanical Survey

A checklist of plants recorded from within the vicinity of Kūhio Highway Bridge is presented in Appendix A. Entries are arranged alphabetically under plant family names (standard practice). Included in the list are scientific name, common name, and status (whether indigenous [Ind], endemic [End], early Polynesian introduction [Pol], non-native naturalized [Nat], or non-native ornamental [Orn]) for each species observed in the Project area. In addition to identifying the plants present, qualitative estimates of plant abundance were made. These are coded as explained in the legend to Appendix A. Sixty-nine species of plants were identified. Only one species, *hau* (*Hibiscus tiliaceus*),

found near the bridge, is indigenous to the main Hawaiian Island with two additional species: coconut palm (*Cocos nucifera*) and *kukui* (*Aleurites moluccana*), confirmed to be Polynesian introductions prior to Captain Cook's arrival in 1778.

Within the Project area, the stream banks are heavily vegetated with shrubs, grasses, and other herbaceous plants. The riparian vegetation in the Project area is composed almost entirely of introduced species and much of the growth occurs on the steep gulch margins. The dominant trees are *hau*, parasol leaf tree (*Macaranga tanarius*), and Java plum (*Syzygium cumini*). Just upstream from the bridge slated for work, *hau* has overgrown both the Kapaia tributary and Hanamā'ulu Stream. The right bank beneath the bridge is sloped gently and supports a number of herbaceous plants: white shrimp plant (*Justicia betonica*), *Crassocephalum crepidioides, maile honohono* (*Ageratum conzyoides*) and Guinea grass (*Panicum maximum*), all common above stream banks beneath the highway bridge.

Along the stream banks, umbrella sedge (*Cyperus involucratus*), primrose willow (*Ludwigia octovalvis*), and numerous ferns (cliff brake [*Pteris vittata*], *lauae* [*Phymatosorus grossus*], and swordfern [*Nephrolepis multiflora*]) grow abundantly. Parasol leaf tree is thick along the gulch in several locations. Glycine vine (*Neonotonia wightii*) overgrows trees and shrubs in several areas within the Project area. Downstream from the bridge, bananas (*Musa* sp.) and coconut palms grow near the right stream bank where residents obviously maintain the landscape.

The highway right-of-way is a mix of ruderal weeds and grasses. Guinea grass, swollen finger grass (*Chloris barbata*), natal red top (*Melinis repens*), and buffelgrass (*Cenchrus ciliaris*) grow interspersed with spurges (*Euphorbia hirta* and *E. hypericifolia*), little bell (*Ipomoea triloba*), false mallow (*Malvastrum coromandelianum*), and small hop clover (*Trifolium dubium*). Mexican creeper (*Antigonum leptopus*) grows conspicuously off the *makai* side of the road.

Aquatic Species

Table 3 is a listing of aquatic animals identified by *AECOS* biologists in Hanamā'ulu Stream from the March 21, 2013 survey and includes those previously reported from the watershed (Parham et al, 2008). Introduced thiarid snails (*Melanoides tuberculata* and *Tarebia granifera*) inhabit the streambed in most locations with silt bottom and are observed occasionally on boulders. The former, also known as the red-rimmed melania was identified in all surveyed segments of Hanamā'ulu Stream. Introduced poeciliid fishes

Table 3. List of aquatic species observed in Hanamā'ulu Stream and tributary. Abundance codes are presented for *AECOS* surveys only.

PHYLUM, CLASS, ORDER, FAMILY *Genus species*	Common name	Abundance	Status	Location Code
	INVERTEBRATES			
MOLLUSCA,GASTROPODA BASOMMATOPHORA CORBICULIDAE				
Corbicula fluminea Müller	Asiatic flume clam	C	Nat	1,2,3
MOLLUSCA,GASTROPODA NEOTAENIOGLOSSA THIARIDAE				
Melanoides tuberculata Muller	red-rimmed melania	C	Nat	1,2,34
Tarebia granifera Lamarck	quilted melania	R	Nat	1
ARTHROPODA,INSECTA ODONATA COENAGRIONIDAE				
Ischnura ramburii Selys	Rambur's forktail	R	Nat	1,2
ARTHROPODA, MALACOSTRACA, DECAPODA ATYIDAE				
Atyoida bisulcata J.W. Randall	*'opae kuahiwi*; mountain 'opae	---	End	4
GRAPSIDAE				
Metopograpsus messor Forksal	*'alamihi*	---	Ind	3
	FISHES		--	
CHORDATA, ACTINOPTERYGII CENTRARCHIDAE			--	
Lepomis macrochirus Rafinesque	bluegill	---	Nat	4
Micropterus dolomieu Lacepède	smallmouth bass	R	Nat	1
Micropterus salmoides Lacepède	largemouth bass	---	Nat	4
CICHLIDAE				
Hemichromis elongatus Guichenot in Duméril	jeweled cichlid	R	Nat	1
Oreochromis mossambicus Gunther	Mozambique tilapia	O	Nat	1,3

Table 2. (continued).

PHYLUM, CLASS, ORDER, FAMILY *Genus species*	Common name	Abundance	Status	Location Code
CICHLIDAE (continued)				
Sarotherodon melanotheron Rupell	blackchin tilapia	O	Nat	1,3
CLARIIDAE				
Clarias fuscus Lacepède	dojo; oriental catfish	---	Nat	4
CYPRINIDAE				
Cyprinus carpio Linnaeus	common carp	---	Nat	4
ELEOTRIDAE				
Eleotris sandwicensis Vaillant and Sauvage	*'o'opu 'akupa*	R	**End**	3
GOBIIDAE				
Awaous guamensis Valenciennes in Cuvier and Valenciennes	*'o'opu nākea*	O	**End**	3
Gnatholepis anjerensis Bleeker	eyebar goby	R	**Ind**	3
Stenogobius hawaiiensis Watson	*'o'opu naniha*	R	**End**	3
KUHLIDAE				
Kuhlia xenura Jordan&Gilbert	*'āholehole*; flagtail	U	**End.**	3
MUGILIDAE				
Mugil cephalus Linneaus	*'ama'ama*; striped mullet	R	**Ind.**	3
POECILIIDAE				
Gambusia affinis Baird and Girard	mosquitofish	O	Nat	1,2,4
Poecilia reticulata Peters	guppy; rainbow fish	C	Nat	1,2,4
Poecilia sp.	indet. mollies	A	Nat	3
Xiphophorus hellerii Heckel	swordtail	O	Nat	1,2
	AMPHIBIANS			
CHORDATA, AMPHIBIA				
ANURA				
RANIDAE				
Lithobates catesbeianus Shaw	American bullfrog	R	Nat	1
	BIRDS			
VERTEBRATA, AVES				
ARDEIDAE				
Gallinula chloropus sandvicensis Streets	*alae 'ula*; Hawaiian Common Gallinule	R	**End**	3

Table 2. (continued).

KEY TO SYMBOLS USED:

Abundance categories:
- R – Rare – only one or two individuals observed.
- U – Uncommon – several to a dozen individuals observed.
- O – Occasional – seen irregularly in small numbers
- C – Common -observed everywhere, although generally not in large numbers.
- A – Abundant – observed in large numbers and widely distributed.

Status categories:
- **End** – Endemic – species found only in Hawaii
- **Ind.** – Indigenous – species found in Hawaii and elsewhere
- Nat. – Naturalized – species introduced to Hawaii intentionally, or accidentally.

Location codes:
- 1 – observed at Project site on March 21, 2013
- 2 – observed on March 21, 2013 in Kapaia Stream at 38-m (125-ft) elevation
- 3 – observed in Hanamā'ulu Stream estuary on March 21, 2013
- 4 –reported present in watershed (Parham et al, 2008)

(*Xiphophorus helleri*, *Poecilia reticulata*, and *Gambusia affinis*) are conspicuous in the Project area, with several predatory fish species such as smallmouth bass (*Micropterus dolomieu*) and jeweled cichlids (*Hemichromis elongatus*), visible nearby. Bullfrogs (*Lithobates catesbeiana*) frequent the numerous logs and debris accumulated in the area beneath the bridge.

Native *'o'opu* (Gobiidae) may also be present and certainly migrate through the area, though none was observed at the Project site during our survey. Several *'o'opu naniha* (*Stenogobius hawaiiensis*) and *'o'opu nākea* (*Awaous guamensis*) were seen in the coastal estuary at Hanamā'ulu Beach Park.

Assessment

Water Quality

According to state water quality standards, Hanamā'ulu Stream is classified as a Class 2, inland water body that discharges into the Pacific Ocean in an area defined as a Class A embayment (HDOH, 2009). Hanamā'ulu Stream is listed on the Hawai'i Department of Health (HDOH) 2012 list of impaired waters in Hawai'i, prepared under Clean Water Act §303(d) (HDOH, 2012). The HDOH listing indicates that Hanamā'ulu Stream may not meet Hawai'i water quality standards for turbidity in the wet or dry season. The stream has been assigned a low priority for Total Maximum Daily Load (TMDL) study.

State water quality standards pertaining to streams are given in Table 4. The criteria for temperature and pH are based on deviations from ambient conditions (not applicable in this case). Criteria for DO saturation is a minimum value and for conductivity is based on a not-to-exceed value. Criteria for turbidity, TSS, and nutrients are based on having geometric mean values for comparison to the standards.

Table 4. Selected state of Hawai'i water quality criteria for streams (HAR §11-54-5.2; HDOH, 2009).

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)	250.0 *180.0*	520.0 *380.0*	800.0 *600.0*
Nitrate+Nitrite (µg N/l)	70.0 *30.0*	180.0 *90.0*	300.0 *170.0*
Total Phosphorus (µg P/l)	50.0 *30.0*	100.0 *60.0*	150.0 *80.0*
Total Suspended Solids (mg/l)	20.0 *10.0*	50.0 *30.0*	80.0 *55.0*
Turbidity (NTU)	5.0 *2.0*	15.0 *5.5*	25.0 *10.0*

Top value is for "wet" season - November 1 through April 30.
Bottom value is for "dry" season - May 1 through October 31.
Other "standards":
- pH units shall not deviate more than 0.5 units from ambient and not lower than 5.5 nor higher than 8.0.
- Dissolved oxygen shall not decrease below 80% of saturation.
- Temperature shall not vary more than 1C° from ambient conditions.
- Specific conductance - not more than 300 µmhos/cm.

The purpose of the water quality measurements presented in this report is to characterize the existing aquatic environments, not to establish compliance with water quality standards. In fact, the criteria for nutrient measurements, TSS, and turbidity are based on making comparisons with geometric mean values, so a minimum of three separate sampling events per station would be

required to generate the proper statistic for this comparison. Ideally, multiple samplings would encompass a "typical" range of conditions for the location.

The standards may be used, together with "baseline" data collected from a series of preconstruction sampling events, to develop decision rules as part of the data quality objectives (DQO) process in an applicable monitoring and assessment program (AMAP) developed in accordance with the required Clean Water Act, Section 401 Water Quality Certification.

It is not expected that the Kapaia Bridge Replacement Project will have a long term negative impact on water quality of Hanamā'ulu Stream. Water quality impacts generated by construction should be minimal if effective best management practices (BMPs) are employed. Construction plans should incorporate BMPs to prevent degradation of the water of Hanamā'ulu Stream and estuary. An AMAP should be developed to monitor the effectiveness of the BMPs.

Botanical Resources

The plants observed in the Project area are almost entirely species that have been introduced in the Hawaiian Islands over last two centuries. These species are widespread in the lowlands of Kaua'i and have no specific intrinsic value that would be lost due to the Project. None of the plant species recorded is endemic (unique to the Hawaiian Islands) and none is listed as endangered or threatened or proposed for inclusion as a listed species by federal or state agencies (USFWS, 2013).

Aquatic Resources

No aquatic species protected by State of Hawai'i Administrative Rules (DLNR, 1998), nor federally endangered or threatened species (USFWS, 2013) were observed in Hanamā'ulu Stream within the Project area. The native stream macrofauna are diadromous: eggs are laid in the stream and the larvae that hatch from these eggs move down stream and out into the ocean where they develop for a time before migrating back into fresh water to grow to maturity (Ford and Kinzie, 1982; Kinzie, 1988). Construction should be phased such that at no time is the entire stream bed blocked in a manner that would prevent upstream migration of native amphidromous species. Construction BMPs developed to prevent degradation of the water of Hanamā'ulu Stream are essential to protect aquatic biota.

References

Ford, J. I. and R. A. Kinzie III. 1982. Life crawls upstream. *Nat. Hist.*, 91: 61-67.

Grasshoff, K., M. Ehrhardt, and K. Kremling (eds). 1999. Methods of Seawater Analysis (3rd ed). Wiley-VHC. 419 pp.

Hawaii Cooperative Park Service Unit. 1990. Hawaii stream assessment. A preliminary appraisal of Hawaii's stream resources. Prep. for State of Hawaii, Commission on Water Resource Management. National Park Service, Hawaii Cooperative Park Service Unit, Rept. No. R84: 294 pp.

Hawai'i Department of Health (HDOH). 2009. Hawai'i Administrative Rules, Title 11, Department of Health, Chapter 54, Water Quality Standards. State of Hawai'i, Department of Health. 92 pp.

_____. 2012. Draft 2012 State of Hawaii Water Quality Monitoring and Assessment Report: Integrated Report to the U.S. Environmental Protection Agency and The U.S. Congress Pursuant To Sections §303(D) and §305(B), Clean Water Act (P.L. 97-117). 98 pp.

Hawai'i Department of Land and Natural Resources (DLNR). 1998. Indigenous Wildlife, Endangered and Threatened Wildlife and Plants, and Introduced Wild Birds. State of Hawai'i. Administrative Rule §13-134-1 through §13-134-10.

Kinzie, R. A. III. 1988. Habitat utilization by Hawaiian stream fishes with reference to community structure in oceanic stream islands. *Environ. Biol. of Fishes*, 22: 179-192.

Parham, J. E., G. R. Higashi, E. K. Lapp, D. G. K. Kuamo'o, R. T. Nishimoto, S. Hau, J. M. Fitzsimmons, D. A. Polhemus and W. S. Devick. 2008. Atlas of Hawaiian Watersheds and their Aquatic Resources. Bishop Museum and Division of Aquatic Resources. 614 pp.

Standard Methods. 1998. Standard Methods for the Examination of Water and Wastewater, 20th Edition. 1998. (Greenberg, Clesceri, and Eaton, eds.). APHA, AWWA, & WEF. 1220 pp.

U. S. Environmental Protection Agency (USEPA). 1993. Methods for the Determination of Inorganic Substances in Environmental Samples. EPA 600/R-93/100.

U. S. Fish and Wildlife Service (USFWS). 2012. USFWS Threatened and Endangered Species System (TESS). Available online at URL: http://ecos.fws.gov/tess_public/; last accessed April 27, 2013.

Appendix A

List of plant species identified from the Project site.
March 21, 2013

Family *Genus species*	Common Name	Status	Abundance	Notes
	FERNS and FERN ALLIES			
NEPHROLEPIDACEAE				
Nephrolepis multiflora (Roxb.) F.M. Jarrett ex C.V. Morton	sword fern	Nat	O	<1>
POLYPODIACEAE				
Phymatosorus grossus (Langsd. & Fisch.) Brownlie	*lauae*	Nat	O	<1>
PTERIDACEAE				
Adiantum cf. *raddianum* C. Presl	maidenhair fern	Nat	R	<1>
Pteris vittata L.	cliff brake	Nat	R	<1>
THELYPTERIDACEAE				
Christella dentata (Forssk.) Brownsey & Jermy	oak fern	Nat	O	<1>
	FLOWERING PLANTS			
	DICOTYLEDONS			
ACANTHACEAE				
Thunbergia fragrans Roxb.	sweet clock vine	Nat	O	<2,3,4>
APIACEAE				
Ciclspermum leptophyllum (Pers.) Sprague	fir-leaved celery	Nat	O	<4>
ASTERACEAE (COMPOSITAE)				
Ageratum conyzoides L.	*maile honohono*	Nat	O	<2,4>
Bidens pilosa L.	Spanish needle	Nat	R	<4>
Conyza bonariensis (L.) Cronq.	hairy horseweed	Nat	U	<2,4>
Crassocephalum crepidioides (Benth.) S. Moore	---	Nat	O	<2,4>
Eclipta prostrata(L.) L.	false daisy	Nat	R	<1,3>
Emilia fosbergi Nicolson	Flora's paintbrush	Nat	R	<4>
Pluchea carolinensis (Jacq.) G. Don	sourbush	Nat	C	<1,2,3,4>
Spagneticola trilobata (L.) Pruski	wedelia	Nat	U	<1,3,4>
Synedrella nodiflora (L.) J. Gaertn.	nodeweed	Nat	R	<4>
Youngia japonica (L.) D.C.	oriental hawksbeard	Nat	R	<3>
CONVOLVULACEAE				
Ipomoea obscura (L.) Ker-Gawl.	---	Nat.	U	<4>
Ipomoea triloba L.	little bell	Nat.	U	<4>
Merremia tuberosa (L.) Rendle	woodrose	Nat	O	<1,2,4>
CUCURBITACEAE				
Momordica charantia L.	wild bitter melon	Nat	R	<2>
EUPHORBIACEAE				
Aleurites moluccana (L.) Willd	*kukui*	**Pol**	R	<2>
Euphorbia cyathophora J.A. Murray	wild poinsettia	Nat	R	<4>
Euphorbia hirta L.	garden spurge	Nat	U	<4>

Family *Genus species*	Common Name	Status	Abundance	Notes
EUPHORBIACEAE (continued)				
Euphorbia hypercifolia L.	graceful spurge	Nat	U	<4>
Macaranga tanarius (L.) Müll. Arg	parasol leaf tree	Nat	AA	<1,2,3,4>
Phyllanthus debilis Klein ex Willd.	*niuri*	Nat	R	<1,2,4>
FABACEAE				
Cassia sp.	indet. cassia	Nat	R	<4>
Chamaecrista nictitans (L.) Moench	partridge pea	Nat	O	<4>
Crotalaria incana L.	fuzzy rattlepod	Nat	O	<2>
Desmanthis pernambucanus (L.) Thellung	virgate mimosa	Nat	R	<3>
Desmodium incanum DC	Spanish clover	Nat	R	<4>
Indigofera hendecaphylla Jacq.	creeping indigo	Nat	R	<4>
Indigofera suffruticosa Mill.	indigo	Nat	R	<4>
Lablab purpureus (L.) Sweet	hyacinth bean	Nat	O	<4>
Leucaena leucocephala (Lam.) deWit	*koa haole*	Nat	O	<1,2,4>
Macroptilium atropurpureum (DC) Urb.	---	Nat	R	<4>
Mimosa pudica L.	sensitive plant	Nat	R	<4>
Neonotonia wightii (Wight & Arnott) Lackey	glycine	Nat	C	<1,2,3,4>
Trifolium dubium Sibth.	small hop-clover	Nat	R	<4>
LAMIACEAE				
Hyptis pectinata (L.) Poit.	comb hyptis	Nat	O	<1,2,3>
LYTHRACEAE				
Cuphea carthagenensis (Jacq.) Macbr.	tarweed	Nat	R	<4>
MALVACEAE				
Abutilon grandifolium (Willd.) Sweet	hairy abutilon	Nat	R	<4>
Hibiscus tiliaceus L.	*hau*	**Ind**	AA	<1,2,3,4>
Malvastrum coromandelianum (L.) Garcke	false mallow	Nat	U	<4>
Sida spinosa L.	prickly sida	Nat	U	<4>
MYRTACEAE				
Syzygium cumini (L.) Skeels.	Java plum	Nat	C	<3>
ONAGRACEAE				
Ludwigia octovalvis (Jacq.) P.H. Raven	primrose willow	Nat	O	<1,2,3>
PLANTAGINACEAE				
Plantago lanceolata L.	nrw-leaf plantain	Nat	R	<4>
POLYGALACEAE				
Antigonum leptopus Hook.&Arnott	Mexican creeper	Nat	O	<4>
RUBIACEAE				
Paederia foetida L.	*maile pilau*	Nat	U	<1,2>
Spermacoce assurgens Ruiz. & Pav.	buttonweed	Nat	R	<4>

Family *Genus species*	Common Name	Status	Abundance	Notes
URTICACEAE				
Pilea microphylla (L.) Liebm.	artillery plant	Nat	R	<2,4>
VERBENACEAE				
Stachytarpheta cayennensis (Rich.) Vahl	vervain	Nat	O	<1,4>
Verbena litoralis Kunth	*ōwī*	Nat	O	<1>
MONOCOTYLEDONES				
ARACEAE				
Epipremnum pinnatum (L.) Engl.	pothos, taro vine	Nat	R	<1,4>
ARECACEAE				
Cocos nucifera L.	coconut palm	**Pol**	R	<2>
COMMELINACEAE				
Commelina diffusa N.L. Burm.	*honohono*	Nat.	O	<1,2,3>
CYPERACEAE				
Cyperus involucratus Rottb.	*'ahu'awa haole*; umbrella sedge	Nat	C	<1,2,3>
MUSACEAE				
Musa hybrid	banana	Orn	R	<2>
POACEAE (GRAMINEAE)				
Axonopus fissifolius (Raddi) Kuhlm.	nrw-lvd. carpetgrass	Nat	C	<4>
Cenchrus ciliaris L.	buffel grass	Nat	R	<4>
Chloris barbata (L.) Sw.	swollen fingergrass	Nat	C	<4>
Melinis minutiflora P. Beauv.	molasses grass	Nat	O	<2,4>
Melinis repens (Willd.) Zizka	natal redtop	Nat	R	<4>
Oplismenus hirtellus (L.) P. Beauv.	basketgrass	Nat	O	<4>
Panicum maximum Jacq.	Guinea grass	Nat	A	<1,2,4>
Paspalum conjugatum Bergius	Hilo grass	Nat	O	<1,4>
Urochloa mutica (Forssk.) Nguyen	California grass	Nat	U	<1,2

Legend to Appendix A

Status = distributional status
- **End** = endemic; native to Hawai'i and found naturally nowhere else.
- **Ind** = indigenous; native to Hawai'i, but not unique to the Hawaiian Islands.
- Nat = naturalized, exotic, plant introduced to the Hawaiian Islands since the arrival of Cook Expedition in 1778, and well-established outside of cultivation.
- Orn = exotic, ornamental or cultivated crop; plant not naturalized (not well-established outside of cultivation, at least at this location).
- **Pol** = Polynesian introduction; brought to the Hawaiian Islands before 1778.

Abundance = occurrence ratings for plants on property in March 2008
- R - Rare - encountered only rarely.
- U - Uncommon - encountered occasionally.
- O - Occasional - seen regularly, but not typically abundant.
- C - Common - seen regularly in most environments; abundant in some places.

APPENDIX A – Legend (continued)

A - Abundant - found almost everywhere; may be locally dominant.
AA - Abundant - very abundant and dominant; a defining vegetation type.

Notes:
<1> Located in stream channel beneath or adjacent to bridge
<2> Located in stream channel downstream of bridge
<3> Located in stream channel upstream of bridge
<4> Located along roadside of bridge outside of stream channel

APPENDIX C

Draft Archaeological Inventory Survey for the Replacement of Hanamā‘ulu (Kapaia) Stream Bridge, Kūhiō Highway, Approximately Between Mileposts 1.1 and 1.3, Hanamā‘ulu Ahupua‘a, Līhu‘e District, Kaua‘i TMKs: [4] 3-7-001:001, 3-7-004::009, 3-8-002:001, 012, and 999, and 3-8-006:999 por.

Cultural Surveys Hawai‘i, Inc.

November 2016

Draft

Archaeological Inventory Survey Report for the Replacement of Hanamā'ulu (Kapaia) Stream Bridge, Kūhiō Highway, Approximately Between Mileposts 1.1 and 1.3, Hanamā'ulu Ahupua'a, Līhu'e District, Kaua'i TMKs: [4] 3-7-001:001, 3-7-004:009, 3-8-002:001, 012, and 999, and 3-8-006:999 por.

Federal Aid Project No. BR-056-1(48)

Prepared for
Wilson Okamoto Corporation

Prepared by
Missy Kamai, B.A.,
Kelly L. Burke, M.Sc.,
and
Hallett H. Hammatt, Ph.D.

Cultural Surveys Hawai'i, Inc.
Kailua, Hawai'i
(Job Code: HANAMAULU 2)

November 2016

O'ahu Office
P.O. Box 1114
Kailua, Hawai'i 96734
Ph.: (808) 262-9972
Fax: (808) 262-4950

www.culturalsurveys.com

Maui Office
1860 Main St.
Wailuku, Hawai'i 96793
Ph.: (808) 242-9882
Fax: (808) 244-1994

Management Summary

Reference	Archaeological Inventory Survey Report for the Replacement of Hanamā'ulu (Kapaia) Stream Bridge, Kūhiō Highway, Approximately Between Mileposts 1.1 and 1.3, Hanamā'ulu Ahupua'a, Līhu'e District, Kaua'i, TMKs: [4] 3-7-001:001, 3-7-004:009, 3-8-002:001, 012, and 999, and 3-8-006:999 por. (Kamai et al. 2016)
Date	November 2016
Project Numbers	Cultural Surveys Hawai'i, Inc. (CSH) Job Code: HANAMAULU 2; Federal Aid Project No.: BR-056-1(48)
Investigation Permit Number	Investigation fieldwork was performed under Hawai'i State Historic Preservation Division (SHPD) fieldwork permit number 13-06, issued per Hawai'i Administrative Rules (HAR) §13-282.
Project Location	The project area is located along Kūhiō Highway, approximately between mileposts 1.1 and 1.3 and encompasses Hanamā'ulu (Kapaia) Stream Bridge, District of Līhu'e, Kaua'i Island. The area is depicted on the 1996 Lihue and Kapaa U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle.
Land Jurisdiction	State of Hawai'i Department of Transportation (HDOT)
Agencies	HDOT and the SHPD
Project Funding	Federal, Federal Aid Project No. BR-056-1(48)
Project Description	The proposed project involves the replacement of Hanamā'ulu (Kapaia) Stream Bridge on Kūhiō Highway. The bridge replacement project includes construction of a temporary bridge structure and a temporary detour route for Kūhiō Highway traffic, demolition of the existing bridge structure, and construction of a new Hanamā'ulu (Kapaia) Stream Bridge. Minimally, land disturbing activities included grubbing and grading, excavations for subsurface utilities, and drilling for bridge support.
Project Acreage	Approximately 8.2 acres (3.3 hectares)
Area of Potential Effect (APE)	The APE for the current investigation is defined as the entire 8.2-acre project area.
Historic Preservation Regulatory Context	Due to federal funding for construction of this project, this project is a federal undertaking requiring compliance with Section 106 of the National Historic Preservation Act (NHPA), the National Environmental Policy Act (NEPA), and the Federal Department of Transportation Act (DTA). As an HDOT project on a state highway, the project is subject to Hawai'i State environmental and historic preservation review legislation (Hawai'i Revised Statutes [HRS] §6E-8 and HAR §13-275). This report was also prepared to fulfill the requirements of HAR §13-276, which governs standards for archaeological inventory surveys and reports. It is intended

	for review and acceptance by the SHPD and HDOT.
Fieldwork Effort	CSH archaeologists Gerald Ida, B.A., and Missy Kamai, B.A., under the supervision of Hallett H. Hammatt, Ph.D., (Principal Investigator) conducted the investigation's fieldwork from 25 February 25 through 13 March 2013, requiring approximately 17 person-days.
Cultural Resources[1]/ Historic Properties[2] Identified and Recommended Eligibility to the National Registers of Historic Places[3]	A total of 11 cultural resources/historic properties were identified within the project area and assigned State Inventory of Historic Places (SIHP) numbers: SIHP # 50-30-11-2207: ditch and terraces; recommended eligible under Significance Criterion D SIHP # 50-30-08-2208: retaining wall; recommended eligible under Significance Criterion D SIHP # 50-30-08-2209: ditch complex; recommended eligible under Significance Criterion D SIHP # 50-30-08-2210: road; recommended eligible under Significance Criterion D SIHP # 50-30-08-2211: terrace and alignment; recommended eligible under Significance Criterion D SIHP # 50-30-08-2212: platform – road and bridge landing; recommended eligible under Significance Criterion D SIHP # 50-30-08-2213: wall; recommended eligible under Significance Criterion D SIHP # 50-30-08-2214: retaining wall; recommended eligible under Significance Criterion D SIHP # 50-30-08-2215: bridge (Hanamā'ulu [Kapaia] Stream Bridge); recommended eligible under Significance Criterion D SIHP # 50-30-08-2216: ditch; recommended eligible under Significance Criterion D SIHP # 50-30-08-2217: terrace; recommended eligible under Significance Criterion D
Effect Recommendation	CSH's archaeological-specific effect recommendation is "adverse effect" (in accordance with 36 CFR 800.5); "effect, with proposed mitigation commitments" (in accordance with HAR §13-275-7).
Mitigation Recommendation	No further historic preservation work is recommended. Sufficient information regarding the location, extent, function, age, and construction methods of these cultural resources has been generated during the current AIS investigation to mitigate any adverse effect caused by proposed development activities. The 11 cultural resources were documented with detailed written descriptions, scaled drawings, and photographs, and select sites were tested. In the unlikely event that previously unidentified cultural resources are encountered during project construction, the project proponents should immediately stop work in the vicinity and contact the SHPD.

[1] In historic preservation parlance, cultural resources are the physical remains and/or geographic locations that reflect the activity, heritage, and/or beliefs of ethnic groups, local communities, states, and/or nations. Generally, they are at least 50 years old (although there are exceptions) and include: buildings and structures; groupings of buildings or structures (historic districts); certain objects; archaeological artifacts, features, sites, and/or deposits; groupings of archaeological sites (archaeological districts); and in some instances, natural landscape features and/or geographic locations of cultural significance.

[2] Historic properties, as defined under federal historic preservation legislation, are cultural resources that are at least 50 years old (with exceptions) and have been determined eligible for inclusion in the National Register of Historic Places based on their integrity and historic/cultural significance in terms of established significance criteria. Determinations of eligibility are generally made by a federal agency official in consultation with the SHPD. Under federal legislation, a project's (undertaking's) potential effect on historic properties must be evaluated and potentially mitigated. Under Hawai'i State historic preservation legislation, historic properties are defined as any cultural resources that are 50 years old, regardless of their historic/cultural significance under state law, and a project's effect and potential mitigation measures are evaluated based on the project's potential impact to "significant" historic properties (those historic properties determined eligible, based on their integrity and historic/cultural significance in terms of established significance criteria, for inclusion in the Hawai'i Register of Historic Places). Determinations of eligibility to the Hawai'i Register result when a state agency official's historic property "significance assessment" is approved by the SHPD, or when the SHPD itself makes an eligibility determination for a historic property.

[3] Cultural resource significance is evaluated and expressed as eligibility for listing on the National Register. To be considered eligible for listing on the National Register a cultural resource should possess integrity of location, design, setting, materials, workmanship, feeling, and/or association and meet one or more of the following broad cultural/historic significance criteria: "A" reflects major trends or events in the history of the state or nation; "B" is associated with the lives of persons significant in our past; "C" is an excellent example of a site type/work of a master; and "D" has yielded or may be likely to yield information important in prehistory or history.

Table of Contents

List of Figures

List of Tables

Section 1 Introduction

1.1 Project Background and Description

At the request of Wilson Okamoto Corporation, Cultural Surveys Hawai'i, Inc. (CSH) conducted an archaeological inventory survey for the proposed Replacement of Hanamā'ulu (Kapaia) Stream Bridge project, Kūhiō Highway, approximately between mileposts 1.1 and 1.3, Hanamā'ulu, Līhu'e, Kaua'i, TMKs: [4] 3-7-001:001, 3-7-004:009, 3-8-002:001, 012, and 999, and 3-8-006:999 por. This area is depicted on the 1996 Lihue and Kapaa U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle (Figure 1), tax map plat (Figure 2), and a 2005 aerial photograph (Figure 3).

The proposed project involves the replacement of Hanamā'ulu (Kapaia) Stream Bridge on Kūhiō Highway. The bridge replacement project includes construction of a temporary bridge structure and a temporary detour route for Kūhiō Highway traffic, demolition of the existing bridge structure, and construction of a new Hanamā'ulu (Kapaia) Stream Bridge. Minimally, land disturbing activities include grubbing and grading, excavations for subsurface utilities, and drilling for bridge support.

The project's land jurisdiction falls under the Hawai'i Department of Transportation (HDOT). The project area consists of approximately 8.2 acres within and immediately adjacent to the Hanamā'ulu (Kapaia) Stream Bridge (see Figure 3). Based on available information, the bridge improvements will not impose additional adverse visual, auditory, or other environmental impact to any known cultural resources including standing architecture located in the project area's vicinity. Accordingly, the project's area of potential effect (APE) extends no further than the project area's approximately 8.2-acre footprint.

1.2 Historic Preservation Regulatory Framework and Document Purpose

This archaeological inventory survey investigation is designed to comply with both Federal and Hawai'i State historic preservation legislation. Due to federal funding for construction of this project, this project is a federal undertaking requiring compliance with Section 106 of the National Historic Preservation Act (NHPA), the National Environmental Policy Act (NEPA), and the Federal Department of Transportation Act (DTA). As an HDOT project on a state highway, the project is subject to Hawai'i State environmental and historic preservation review legislation (Hawai'i Revised Statutes [HRS] §6E-8 and Hawai'i Administrative Rules [HAR] §13-275). This report was also prepared to fulfill the requirements of HAR §13-276, which governs standards for archaeological inventory surveys and reports. It is intended for review and acceptance by the State Historic Preservation Division (SHPD) and HDOT. A companion cultural impact assessment report is also being completed for this project by CSH (Genz et al. 2013) and is intended to support the project's environmental review process (HRS §343).

Generally, under both Hawai'i State and Federal historic preservation legislation, archaeological inventory surveys are designed to identify, document, and make significance

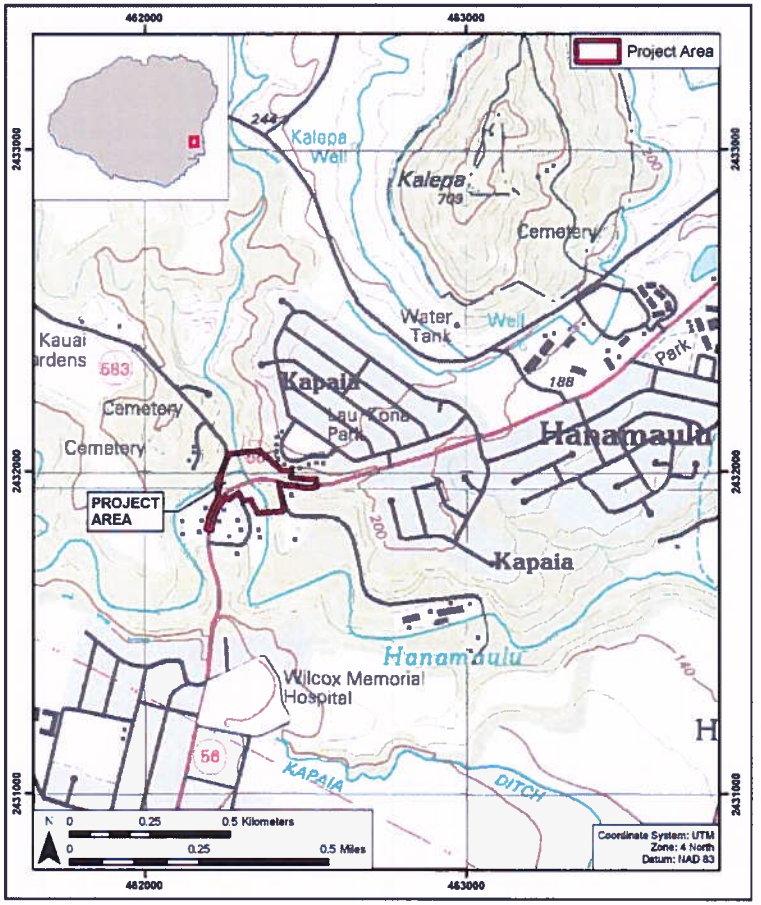


Figure 1. 1996 Lihue and Kapaa USGS topographic quadrangle showing the Hanamā'ulu (Kapaia) Stream Bridge Replacement project area

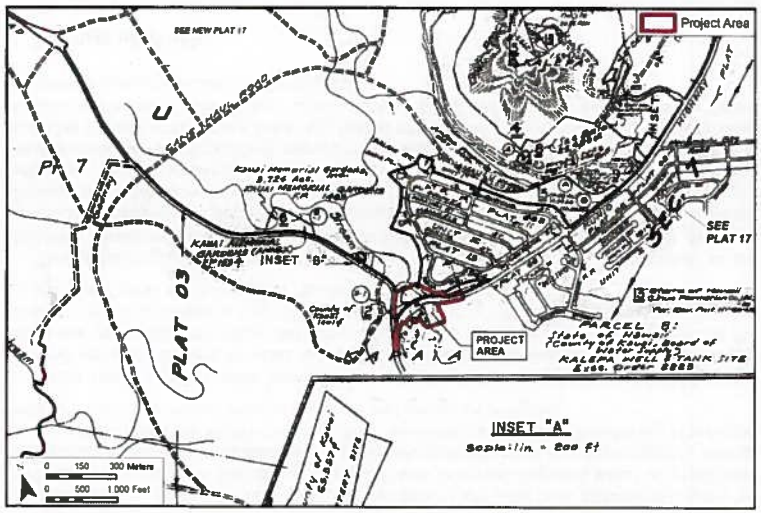


Figure 2. Portion of Tax Map Key (TMK) [4] 3-8-002 showing the Hanamā'ulu (Kapaia) Stream Bridge Replacement project area (Hawai'i TMK Service 2009)

Figure 3. 2005 aerial photograph (Google Earth) showing the Hanamā'ulu (Kapaia) Stream Bridge Replacement project area

recommendations for historic properties. As discussed in the following paragraphs, there are important distinctions between the Federal and Hawai'i State definitions of historic properties. To eliminate any confusion these different definitions might cause, CSH has opted in this document to use the more generic term "cultural resources," as defined below, in its discussion of the cultural remains within the current project area.

In historic preservation parlance, cultural resources are the physical remains and/or geographic locations that reflect the activity, heritage, and/or beliefs of ethnic groups, local communities, states, and/or nations. Generally, they are at least 50 years old, although there are exceptions, and include buildings and structures; groupings of buildings or structures (historic districts); certain objects; archaeological artifacts, features, sites, and/or deposits; groupings of archaeological sites (archaeological districts); and, in some instances, natural landscape features and/or geographic locations of cultural significance.

Historic properties, as defined under federal historic preservation legislation, are cultural resources that are at least 50 years old (with exceptions) and have been determined eligible for inclusion in the National Register of Historic Places (National Register) based on established significance criteria. Determinations of eligibility are generally made by a federal agency official in consultation with the SHPD. Under Federal legislation, a project's (undertaking's) potential effect on historic properties must be evaluated and potentially mitigated.

Under Hawai'i State historic preservation legislation, historic properties are defined as any cultural resources that are 50 years old, regardless of their historic/cultural significance under State law, and a project's effect and potential mitigation measures are evaluated based on the project's potential impact to "significant" historic properties (those historic properties assessed as significant under the five State of Hawai'i significance criteria).

This archaeological inventory survey was prepared in consideration of the Secretary of the Interior's *Standards and Guidelines for Archaeology and Historic Preservation* and was conducted to identify and document historic properties within the project area and make National Register eligibility recommendations for the project area's cultural resources. The investigation includes an undertaking-specific effect recommendation and treatment/mitigation recommendations for the cultural resources recommended National Register-eligible. It is also intended to support the project's state and federal historic preservation review and project-related historic preservation consultation among stake-holding federal and state agencies, Native Hawaiian organizations, and community groups.

1.3 Scope of Work

The following archaeological inventory survey scope of work was designed to satisfy the Hawai'i State requirements for archaeological inventory surveys per HAR §13-276 and §13-275/284:

1. Detailed historic and archaeological background research, including a search of historic maps, aerial photographs, written records, Land Commission Award (LCA) documents, and the reports from prior archaeological investigations. This research will focus on the specific project area's past land use, with general background on the pre- and post-Contact settlement patterns of the *ahupua'a* (traditional large land division) and district.

This background information will be used to compile a predictive model for the types and locations of cultural resources that could be expected within the project area.

2. A complete (100%) systematic pedestrian inspection of the project area to identify any potential surface cultural resources. Documentation will include photographs, scale drawing, and, if warranted, limited controlled excavation of select sites and/or features. Based on the project area's environment and the results of the background research, subsurface testing with a combination of hand and backhoe excavation may be used to identify and document subsurface cultural resources that would not be located by surface pedestrian inspection. Appropriate samples from these excavations will be analyzed for cultural and chronological information. All subsurface cultural resources identified will be documented to the extent possible, including geographic extent, content, function/derivation, age, interrelationships, and significance.
3. As appropriate, consultation with knowledgeable individuals regarding the project area's history, past land use, and the function and age of the cultural resources documented within the project area.
4. As appropriate, laboratory work to process and gather relevant environmental and/or archaeological information from collected samples.
5. Preparation of an inventory survey report, which includes the following:
   a) A project description;
   b) A section of a USGS topographic quadrangle showing the project area boundaries and the location of all recorded cultural resources;
   c) Historical and archaeological background sections summarizing prehistoric and historic land use of the project area and its vicinity;
   d) Descriptions of all cultural resources, including selected photographs, scale drawings, and discussions of age, function, laboratory results, and significance, per the requirements of HAR §13-276. Each cultural resource will be assigned a Hawai'i State Inventory of Historic Places (SIHP) number;
   e) If appropriate, a section concerning cultural consultations (per the requirements of HAR §13-276-5[g] and HAR §13-275/284-8[a][2]);
   f) A summary of cultural resource categories, integrity, and significance based upon the five State of Hawai'i significance criteria;
   g) A project effect recommendation; and
   h) Treatment recommendations to mitigate the project's adverse effect on any cultural resources identified in the project area that are assessed as significant.

This scope of work included full coordination with the SHPD and the HDOT relating to archaeological matters. This coordination took place after consent of the owner or representatives.

1.4 Environmental Setting

1.4.1 Natural Environment

The project area extends from the coastline to approximately 1.7 kilometers (km) (1 mile) inland in Hanamā'ulu Ahupua'a, located on the southeast side of Kaua'i. Rising from near sea level to 160 feet (ft) above mean sea level, the project area lies within the Līhu'e depression or basin. The area's topography is generally level, with a few shallow, intermittent, unnamed drainages closer to the coast.

Of the area's volcanic history, Macdonald et al. (1983) noted the following:

> Lava flows of the Koloa Series cover about half the surface of the eastern part of the island. They form the entire floor of the Līhu'e basin, except for two small *kipuka* of Waimea Canyon rocks (Aaohoaka hill and Pu'u Pilo), that protrude through them west of the gap through which the Wailua River crosses the Kālepa-Nounou Ridge. . . . The greatest exposed thickness of Koloa lavas is 650 meters, in the east wall of Hanalei Valley; but they may be even thicker in the Līhu'e Basin and along the southern edge of the island, where their base is not exposed. [MacDonald et al. 1983:460–461]

Where Kūhiō Highway crosses Hanamā'ulu Gulch (1.5 km north of Līhu'e), the upper 7.5 m of lava rests on an ancient soil zone 2 m thick, which grades downward into much-decomposed Koloa lava at least 10 m thick. Even in a favorable climate, such deep weathering must have required a very long time (MacDonald et al. 1983:463).

According to the U.S. Department of Agriculture (USDA) Soil Survey Geographic (SSURGO) database (2001) and soil survey data gathered by Foote et al. (1972), the project area's soils consist of Hanalei silty clay (HnA and HrB), Lihue silty clay (LhD), and rough broken land (rRR) (Figure 4). Hanalei silty clay series soils are described as follows:

> Somewhat poorly drained to poorly drained soils on bottom lands on the islands of Kauai and Oahu. These soils developed in alluvium derived from basic igneous rock. . . . These soils are used for taro, pasture, sugarcane, and vegetables. The natural vegetation consists of paragrass, sensitiveplant, honohono, Java plum, and guava. [Foote et al. 1972:38]

Lihue silty clay (LhD) soils consist of the following:

> Well-drained soils on uplands on the island of Kauai, These soils developed in material weathered from basic igneous rock. . . . This soils is used for pasture, woodland, and wildlife habitat. Small areas are used for pinapple and sugarcane. [Foote et al. 1972:82–83]

Rough broken land soils (rRR) consist of the following:

> Very steep land broken by numerous intermittent drainage channels. In most places it is not stony. It occurs in gulches and on mountainsides on all the islands except Oahu. . . . These soils are variable. They are 20 to more than 60 inches deep over soft, weathered rock. In most places some weathered rock fragments

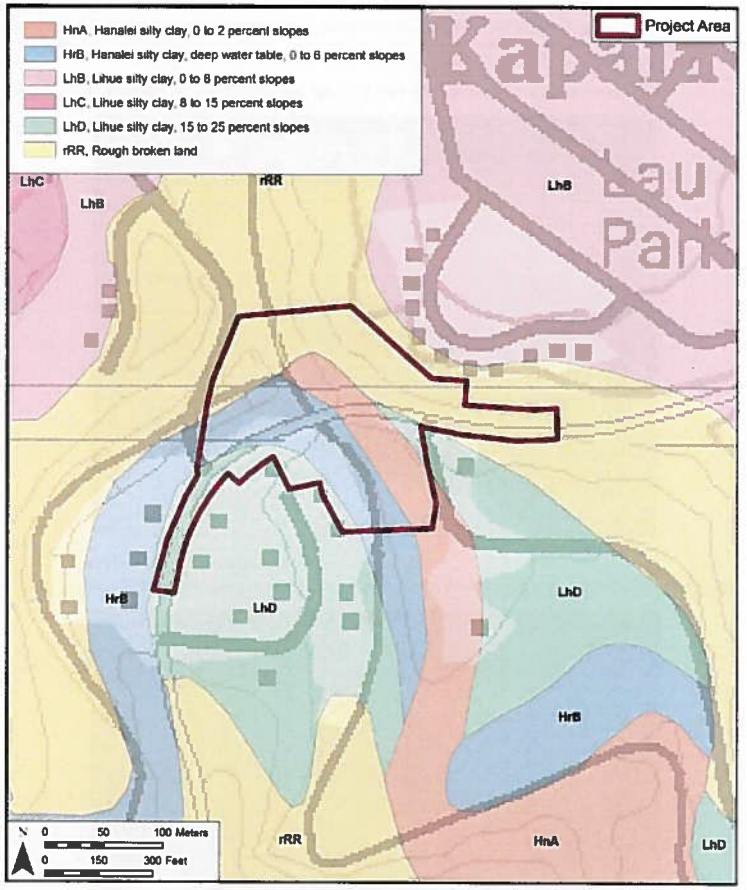


Figure 4. Overlay of *Soil Survey of the State of Hawaii* (Foote et al. 1972), indicating sediment types within and surrounding the current project area (source: USDA SSURGO Database 2001; base map: 1996 Līhu'e and Kapa'a U.S. Geological Survey 7.5-minute quadrangle)

> are mixed with the soils material. . . . This land type is used primarily for watershed and wildlife habitat. In places it is used for pasture and woodland. The dominant natural vegetation in the drier areas consists of guava, lantana, Natal redtop, bermudagrass, koa haole, and molassesgrass. Pukeawe, aalii, and sweet vernalgrass are common at the higher elevations. [Foote et al. 1972:119]

1.4.2 Built Environment

The built environment of the project area includes the existing Hanamā'ulu (Kapaia) Stream Bridge, roadways and associated road infrastructure, utility lines, and residential and commercial structures (Figure 5 through Figure 10).

Figure 5. Photograph showing Hanamā'ulu Stream in the foreground and plantation houses in the background, view to northwest

Figure 6. Photograph showing Hanamā'ulu (Kapaia) Stream Bridge, view to north

Figure 7. Photograph of a portion of the *mauka* (inland) side of the project area; view to north

Figure 8. Photograph of a portion of the *mauka* side of the project area showing tributary; view to west

Figure 9. Photograph showing tributary (left) flowing into Hanamā'ulu Stream (right), view to north

Figure 10. Photograph of Hanamā'ulu (Kapaia) Stream Bridge, view to southwest

Section 2 Methods

2.1 Fieldwork

CSH archaeologists Gerald Ida, B.A., and Nancine "Missy" Kamai, B.A., under the general supervision of Hallett H. Hammatt, Ph.D. (principal investigator), conducted the investigation's fieldwork from 25 February through 13 March 2012, requiring 17 person-days. Investigation fieldwork was performed under SHPD fieldwork permit number 13-06, issued per HAR §13-282.

To facilitate navigation within the project area, the project boundary was uploaded as a shape file into a hand-held Garmin GPS unit (horizontal accuracy between 3 and 6 m).

The survey area for the current investigation included the entire approximately 8.2-acre footprint; however, there were limitations to which portions of the project area received 100% pedestrian inspection. The natural topography within the project area precluded inspection of some areas due to safety and logistical concerns.

2.2 Background Research

Historical research included a review of previous archaeological studies on file at the SHPD library at their O'ahu Office in Kapolei; studies of documents at Hamilton Library of the University of Hawai'i at Mānoa, the Hawai'i State Archives, the Hawaii Sugar Planters Association, the Bishop Museum Archives, the Kaua'i Historical Society, and the CSH library; and a study of maps at the Survey Division of the Department of Accounting and General Services. Nineteenth century Land Commission Award (LCA) claim records were accessed via the Internet from the Māhele database prepared by Waihona 'Aina Corporation (Waihona 'Aina 2000) and the Papakilo database prepared by the Office of Hawaiian Affairs (OHA) (OHA 2011).

2.3 Cultural Resource Evaluation for National/Hawai'i Register Eligibility

Cultural resource significance is evaluated and expressed as eligibility for listing on the National Register of Historic Places. To be considered eligible for listing on the National Register, a cultural resource must possess integrity of location, design, setting, materials, workmanship, feeling, or association and meet one or more of the following broad cultural/historic significance criteria: "A" reflects major trends or events in the history of the state or nation; "B" is associated with the lives of persons significant in our past; "C" is an excellent example of a site type/work of a master; "D" has yielded or may be likely to yield information important to prehistory or history. For this report, cultural resource integrity and significance were considered based on the guidance provided in National Register Bulletin #15, "How to Apply the National Register Criteria for Evaluation."

Section 3 Background Research

3.1 Cultural and Historical Background

The *ahupua'a* (traditional land division) of Hanamā'ulu is a very old, permanently inhabited and intensively used land division in pre-Contact Hawai'i. The coastal zone of Hanamā'ulu was the locus for permanent habitation, *heiau* (pre-Christian place of worship), and numerous trails. Houses, gardens, and pastures were spaced throughout the floodplain of the Hanamā'ulu River. The dryland areas (*kula*) contained native forest and were cultivated with crops of *wauke*, sweet potatoes, and gourds. Legends and historic documentation elaborate on many of these landscape features. A more detailed discussion of the history of this *ahupua'a* can be found in Creed et al. (2006).

3.1.1 Legendary References

The name Hanamā'ulu is referenced in numerous legends and oral traditions, some of them very old, that hint at life as it was. In a number of myths, the *ahupua'a* is mentioned in the naming of the winds (*makani*). In a chant in the legend of Hi'iaka, the sister of the Hawaiian volcano goddess Pele, the names of the districts and associated winds of Kaua'i are chanted. A portion of this chant lists the winds (from south to north) of Nāwiliwili, Kalapakī, Ahukini, Līhu'e, Kapaia, and Hanamā'ulu, which are all *ahupua'a* or *'ili* (small land division within an *ahupua'a*) names.

He Heone ka makani o Nawiliwili,
He Waimua ka makani o Kalapaki,
He Ehukai ka makani o Ahukini,
He Pahola ke kiu ho'o kii makani lele kula o Lihue,
He Kuliahiu ka makani o Kapaia,
He Hooluakamehe ka makani o Hanamaulu.
[Poepoe 1908]

Many references to Hanamā'ulu are made in the "Legend of Kawelo." Kawelo-lei-makua, called Kawelo, was born at Hanamā'ulu. After having become the paramount chief of Kaua'i, he returned to Hanamā'ulu, where he lived with his parents and his wife, Kanewahineikiaoha (Fornander 1918:5(1):62, 70). The hero of this legend lived in the last half of the seventeenth and the early decades of the eighteenth century (Hommon 1976:135).

During the 1920s, William Hyde Rice, a life-long resident of Kaua'i, recorded Hawaiian lore of the island that was later collected in the book, *Hawaiian Legends* (1923). In that volume, Hanamā'ulu is named three times. Two other place names in the vicinity of the project area—Ninini (to the south of the project area) and Ahukini (to the east and north)—are mentioned once each. In the story of "The Goddess Pele:"

> Two brothers of Pele who had come from foreign lands, saw Lohiau's body lying as a stone where the lava flow had overtaken him. Pity welled up in their hearts and they brought Lohiau to life again. One of these brothers made his own body

> into a canoe and carried the unfortunate Lohiau to Kauai, where he was put ashore at Ahukini.
>
> Coming to Hanamaulu, Lohiau found all the houses but one closed. In that one were two old men, one of whom recognized him and asked him to enter. The men were making tapa, which they expected to carry soon to Kapaa, where games were being held in honor of Kaleiapaoa and his bride, Hiiaka. [Rice 1923:16]

The suggestion of inhospitality at Hanamā'ulu recorded by Rice ("Lohiau found all the houses but one closed") is reminiscent of the Hawaiian proverb *No Hanamā'ulu ka ipu puehu,* or "the quickly emptied container belongs to Hanamā'ulu" (Pukui 1983:252), which implies the food containers of Hanamā'ulu were often bare—a plausible reason for the local residents to be stingy.

Not only a name for a *heiau,* Ahukini is also a land division name in Hanamā'ulu, according to a collection of "Kaua'i Place Names."

> *Ahukini, oia ka inoa nui o ka' aina a hiki Hanama'ulu.*
> Ahukini is the overall name of the land next to Hanama'ulu.
> [Kelsey n.d.]

Another *heiau* mentioned in legend is Kalauokamanu, which means the "tip of the endpiece of the canoe." It was located in Hanamā'ulu near the mill. Human sacrifice was conducted at this *heiau,* and travelers would pass by the temple quickly, holding their noses to avoid the great stench coming from the dead bodies (Wichman 1998:62). According to a study by Lahainaluna School students:

> Kalauokamani [Kalauokamanu] was another heiau. It was named for a real woman and this is a little story pertaining to it:
>
> Two men came from Kauai, Uukanipo and Kaipoleimanu. While they lived at Kahikimaiaea, they heard of the beauty of Kalauokamani and went in search of her until they arrived in the upland of Wailua. Kalauokamani was dead but her spirit saw the men, followed after them and asked, 'Where are you going?' They answered, 'To see Kalauokamani to be our wife.' The spirit said, 'There is no woman, for she is dead.' The spirit again warned them, 'Do not go up this way but go down below. There is the woman for you, Moeapakii. Do not go up this way lest you smell the stench of the body of the woman [you seek] for she lies unburied.'
>
> The men insisted on going up on the upper side of Wailua and they did smell the stench of the woman and both died. They stand at Kaohokaualu to this day. Both had turned to stone. [Lahainaluna Students 1885 in HEN 1:218]

As a whole, these legends, as well as others, contain a number of recurrent threads. Canoe landings are mentioned frequently and would have been easy in the protected bay environments of Hanamā'ulu; they were probably very common. Whether arriving by canoe or land, travelers did not find much sustenance here on their way through, either due to lack of resources, the tight-fisted nature of the residents, or both. A number of references to *kapa* manufacturing provide evidence that the area may have been known for the production of fine *kapa* or tapa, the

traditional material used for clothing, mats, and sails prior to contact with western cultures. Finally, it is likely Hanamā'ulu was the residence of some *ali'i*-status (chiefly) individuals, as suggested in the legend of Kawelo and the presence of a number of *heiau,* including the large Kalauokamanu.

3.1.2 Early Missionary Accounts and Survey Expeditions

The first written accounts of the lifestyle on Kaua'i are from travelers, missionaries, and surveying expeditions. Missionary accounts from the first half of the nineteenth century provide the majority of the early written records for this portion of Kaua'i, and in some ways they confirm and expand upon what can be gathered from oral tradition.

Historic documentation records the changing of the name of the district in which the *ahupua'a* of Hanamā'ulu is located. In earlier days, the *ahupua'a* was considered to be in the *moku* (district) of Puna, but is today in the judicial district of Līhu'e (meaning "cold chill," or "goose-flesh").

> The name, Lihue, applied in a larger sense, included the districts of what are now Kawaihau and Lihue, reaching from Anahola to the Gap, being made so by law in about the year 1861, according to early court records, but some years later divided into the present two districts. The large district was also known as the Puna district, and is found on early maps as such. It was August thirteenth, 1880, that the district was divided into two, by act of Legislature with King Kalākaua's signature. . . . Lihue, in a local sense, and from which the name of the district was derived meant only that little portion of land upon which the present village, as consisting of bank, post office and store, now stands. [Rice 1914:46]

Ethel Damon, in *Koamalu* (her history of the Rice family of Kaua'i), repeated the scenic description of Līhu'e given by Reverend Hiram Bingham in his book, *A Residence of Twenty-One Years in the Sandwich Islands,* published in 1847:

> In 1824, when walking around the island from Waimea to counsel the people after the wreck of *The Cleopatra's Barge*, Rev. Hiram Bingham crossed from Hanapepe, as has been seen, over the old upland trail back of Kilohana, and wrote of it as 'a country of good land, mostly open, unoccupied and covered with grass, sprinkled with trees, and watered with lively streams that descend from the forest-covered mountains and wind their way along ravines to the sea,—a much finer country than the western part of the island.' [Damon 1931:401]

William DeWitt Alexander, son of Waioli missionary William P. Alexander, traveling from Kōloa to the north shore of Kaua'i in 1849 recorded some descriptive notes of Hanamā'ulu:

> A few miles further on we crossed the picturesque valley of Hanamaulu. This valley is prettily bordered by groves of Kukui, koa, & hala trees, and is well cultivated with taro. A fine stream flows through the midst of it, which makes a remarkable bend at this place like a horse shoe. We then traveled along the seashore at the foot of a range of hills through groves of hau, & among hills of sand. It was now after dark, but the moon shone brightly, and there was no

> difficulty in finding our way. About eight o-clock we arrived at the banks of the Wailua river. [Alexander 1933 in Kauai Historical Society 1991:121]

One of the last vestiges of the pre-cash crop landscape is depicted in the diary entry for the Rice family's arrival on Kaua'i in 1854. During the second half of the nineteenth century, western settlers and entrepreneurs set their sights on southeast Kaua'i. Ethel Damon, in *Koamalu*, described the Līhu'e landscape at the time of the family's arrival at Nāwiliwili Bay:

> From the deck of their river craft in 1854 Mrs. Rice and the children could plainly see above the rocky shore and ruins of Kuhiau, the old heiau, or temple, and nearby on the bluff the flaming blossoms of a great wili-wili tree among koa trees which ten grew almost down to the water's edge. [Damon 1931:17–18]

These early accounts speak of hills of native forest and taro cultivation. They do not mention intensive inland agriculture as oral tradition suggests, but some are from cursory visits; land claim documents during the Māhele do document such land use.

3.1.3 The Māhele Claims

Legal documentation created by the Māhele (1848–1853) provides invaluable and numerous accounts of land use in the mid-1800s. Unprecedented details about land use and land transfer between both royalty and commoners reveal intensive agricultural use.

To try to maintain sovereignty over the land, the Mōī (King) Kauikeaouli (Kamehameha III), between 1846 and 1848 supervised the Māhele—the division of Hawaiian lands—that transformed the land system in Hawai'i from collective to private ownership. Modeled after western concepts, Crown Lands were reserved for the king and the royal house, Konohiki Lands were claimed by *ali'i* (royalty; chief) and their *konohiki* (headman of an *ahupua'a* under the chief), and Government Lands were set aside to generate revenue for the government. In 1850, these three categories of land were subject to the rights of the *maka'āinana* (commoners) and other tenants (naturalized foreigners, non-Hawaiians born in the Islands, or long-term resident foreigners), who could make claims for their habitation and agricultural plots, known as *kuleana* (native land rights) parcels (Chinen 1958:8–15).

Under the Kuleana Act of 1850, the *maka'āinana* were required to file their claims with the Board of Commissioners to Quiet Land Titles (Land Commission) within a specified time period in order to apply for fee-simple title to their lands. The claim could only be filed after the claimant arranged and paid for a survey and two witnesses testified that they knew the claimant and the boundaries of the land, knew that the claimant had lived on the land since 1939, and knew that no one had challenged the claim. Then, the *maka'āinana* could present their claims to the Land Commission to receive their Land Commission Award (LCA) (Kame'eleihiwa 1992).

Not everyone who was eligible to apply for *kuleana* lands did so and not all of those claims were awarded. Some claimants failed to follow through and come before the Land Commission, some did not produce two witnesses, and some did not get their land surveyed. In addition, some *maka'āinana* may have been reluctant to claim *'āina* (land) that had been traditionally controlled by their *ali'i*, some may have not been familiar with the concept of private land ownership, and some may have not known about the Māhele, the process of making claims (which required a survey), or the strict deadline for making claims. Further, the Land Commission was comprised

largely of foreign missionaries, so the small number of claimants and awards may reflect only those *maka'āinana* who were in good standing with the church. Significantly, the surveying of the land was not standardized (Kame'eleihiwa 1992:296–297).

A total of 14,195 claims were filed and 8,421 awards were approved, averaging 3 acres each, equaling about 29% of the 29,220 adult Native Hawaiian males living at the time of the Māhele (Kame'eleihiwa 1992:295). Out of the potential 2,500,000 acres of Crown and Government lands, 28,658 acres of land were awarded to the *maka'āinana*, less than 1% of the total acreage of Hawai'i (Kame'eleihiwa 1992:295). The small number of *kuleana* awards and their small size prevented the *maka'āinana* from maintaining their independent subsistence, often forcing them to abandon their newly acquired property (Chinen 1958:32).

Although many Hawaiians did not submit or follow through on claims for their lands, the distribution and written testimonies of LCAs can provide insight into patterns of residence and agriculture. Many of these patterns probably had existed for centuries. By examining the patterns of *kuleana* LCA parcels in the vicinity of the project area, insight can be gained as to the likely intensity and nature of Hawaiian activity in the area at the time.

In 1848, the Crown, the Hawaiian government, and the *ali'i* received their land titles. Victoria Kamāmalu was awarded the *ahupua'a* of Hanamā'ulu as part of a *konohiki* award, LCA 7713, *'Āpana* (Lot) 2 (Waihona 'Aina 2000). Since the *ali'i* and *konohiki* were not required to record the use of their large land awards, the surrounding smaller *kuleana* awards of the *maka'āinana* can be used to understand the land use of this area of Hanamā'ulu.

The *maka'āinana* received their *kuleana* awards (individual land parcels) in 1850 and thereafter. A total of 20 *kuleana* parcels were intended for Hanamā'ulu Ahupua'a. Five of the parcels (LCAs 2659*K, 3370, 3392B, 3641, and 5640B) were not awarded due to undocumented circumstances. Table 1 provides a comprehensive listing of land claims in Hanamā'ulu Ahupua'a with descriptions of the awards.

Four *kuleana* parcels were located in the vicinity of the project area: LCAs 3371, 3423, 3647, and 5089, with portions of LCA 5089 located within the project area (Figure 11). LCA 5089 was awarded to Kuhaimoana, but this land was returned to the *konohiki* after the claimant had passed away. This parcel is notable for its intensive cultivation, including two *lo'i* (irrigated taro patch), one *wauke* (paper mulberry tree), six *noni* (Indian mulberry tree), one *'ulu* (breadfruit tree), one orange tree, and two *koa kou* trees. This *kuleana* award is reprinted in full in Appendix A (OHA 2011 and Waihona 'Aina 2000).

Nearly every LCA contained an *'auwai* (ditch) necessary for *lo'i* cultivation. The claims for LCAs throughout Hanamā'ulu reveal that Hawaiian *hale* (houses), *lo'i*, and *kula* lands (lands used for dryland agriculture or pasture) were located along both sides of Hanamā'ulu River, extending from the shore up to the village of Kapaia. The *lo'i* and *kula* lands were often included together in one *'āpana*, with house sites belonging to separate *'āpana* slightly removed from the floodplain. Overall, the LCA documentation indicates a wide range of indigenous Hawaiian subsistence activities being practiced in and around Hanamā'ulu Stream, which likely included the project area (Waihona 'Aina 2000).

Table 1 LCAs in Hanamā'ulu Ahupua'a (bold entries were located near the current project area)

LCA #	Claimant	'Ili	Acres	Description
2659*K	Kanoa, Paulo	Kikiaola	–	Three *'āpana*; not awarded
3271	Lalahilimoku	Kuha, Puaka Village	1	Five *lo'i*, two *'āpana* (one awarded), one *hale*
3370	Nachu	Kapaia	–	One *'āpana*; not awarded
3371	**Nachu**	**Kapaia**	**1.25**	**One *'āpana*, ten *lo'i*, one royal patent, one *hale*, one *kula*; bordered a stream and *pali* (cliff)**
3392B	Kala	Opae	–	One *'āpana* (not awarded), three *lo'i*; bordered a stream and *pali*
3423	**Paka**	**Peaiki or Opeaiki**	**1.5**	**Two *'āpana* (one awarded), eight *lo'i*, one *kula*, one *hale*, one royal patent, one spring/well; bordered a *pali***
3426	Pelekane	Kapuhala, Kahoewa	1	Two *'āpana* (one awarded), four *lo'i*, one *kula*, one *hale*, one royal patent; *kō'ele pō'alima* (small land unit farmed by a tenant for the chief); bordered the sea/shore/dunes, an *'auwai*/ditch, a wall/fence, and a stream
3558	Keke	Hoewa, Waiaoao, Hoena	1	Three *'āpana* (one awarded), three *lo'i*, one *kula*, one *hale*, one royal patent; *kō'ele pō'alima*; bordered an *'auwai*/ditch, a road/path, and a *pali*

LCA #	Claimant	'Ili	Acres	Description
3600	Keolanui	Palaha	1.75	One *'āpana* (awarded), seven *lo'i*, one *hale*, one royal patent; *kō'ele pō'alima*; bordered Hanamā'ulu Stream and a *pali*
3640	Kumakahaohao	Limawela, Kamakahanahana	1	Four *'āpana* (one awarded), four *lo'i*, one *kula*, one *hale*, one royal patent, *'auwai*/ditch, road/path, and the stream/river bordering
3641	Kuhaimoana	Kapaia	–	Two *'āpana* (not awarded), six *lo'i*, one *kula*, one *hale* lot, *'auwai*/ditch; not awarded
3644	Kaualupa	Hanamā'ulu	1.25	Two *'āpana* (one awarded), five *lo'i*, one *hale*, one royal patent; bordered an *'auwai*/ditch and a *pali*
3647	**Kapuahi**	**Waieo and ku of Papuaa**	**4**	**Three *'āpana* (one awarded), 31 *lo'i*, one *kula*, one *hale*, one royal patent, *'auwai*/ditch, spring/well, stream/river, one *hau* tree**
3648	Kala, Gapeliela	Unknown	1.25	One *'āpana*, three *lo'i*, one *kula*, one royal patent
3649	Kamalo	Noni	1.75	One *'āpana*, five *lo'i*, one *kula*, one *hale*, one royal patent, *'auwai*/ditch; bordered the stream/river
3650	Kaluhiwaha	Kaaukai, Pukakolu Village	36 fathoms in length by 31 wide	Two *'āpana* (one awarded), five *lo'i*, one *kula*, one *hale* lot, one royal patent; *kō'ele pō'alima*; bordered an *'auwai*/ditch and the stream/river

LCA #	Claimant	*'Ili*	Acres	Description
3653	Kolii	Maulili, Kamakaihanahana Village	1	Two *'āpana* (one awarded), four *lo'i*, one *kula*, one *hale* lot, one royal patent, *'auwai*/ditch, road/path, and *pali* bordering
3657	Niho	Limawela	1	One *'āpana*, four *lo'i*, one *kula*, one royal patent, *'auwai*/ditch bordered the stream/ river
5089	**Kuhaimoana and Nahuiekoa, wahine**	**Unknown**	**Unknown**	**One *'āpana*, two *lo'i*, one royal patent, *wauke*, six *noni*, one *'ulu*, one orange, two *koa/kou*** **Claimant died: land was returned to the *konohiki***
5640B	Kumakahaohao	Kamakahanahana, Limawela	–	Four *lo'i*, one *kula*, *'auwai*/ditch; bordered Hanamā'ulu Stream; not awarded

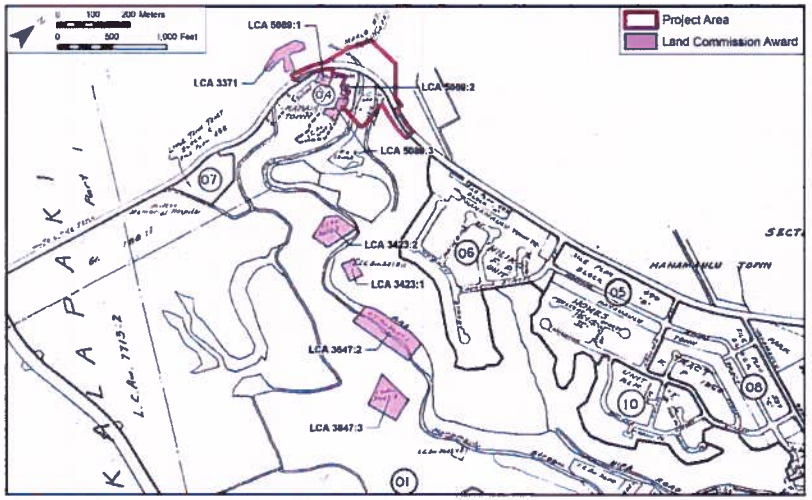


Figure 11 Locations of *kuleana* LCAs in the vicinity of the current project area

3.1.4 Transition to Cash Crops and Exportable Products

In early accounts there is mention of rich lands in Hanamā'ulu, but little mention of industry, suggesting the land may only have been cultivated for local subsistence. Oral traditions reporting that these lands were not necessarily ones of abundance are consistent with these later observations. When the first non-Hawaiian sailing vessels began arriving in Hawai'i (post-1794), pigs, sweet potatoes, and salt, among other items, were traded with these ships. It is likely that at this time agricultural production in Hanamā'ulu began to grow beyond traditional subsistence patterns.

Cutting and shipping sandalwood to Asia was probably the first real "industry" seen from a western perspective. An indirect reference to the sandalwood trade in the Līhu'e area via Ethel Damon recorded that Chief Forester C.S. Judd had told an early settler, Richard Isenberg, that Mount Kālepa had formerly been covered with sandalwood (Damon 1931:913).

By 1842, missionaries had moved into the area and had established five schools. Some of these missionaries attempted to introduce cotton as the first intensive cash crop, but were unsuccessful (Damon 1931). Sugar, however, caught on. The sugarcane plantation at Līhu'e was first established in 1849 by Henry A. Pierce, Judge Wm. Little Lee (the chairman of the Land Commission), and Charles Reed Bishop (who formed Henry A. Pierce and Company) (Damon 1931:409). The first 3,000 acres were purchased in Nawiliwili and an additional 300 acres were purchased in Ahukini in 1866. The Līhu'e Plantation became the most modern plantation at that time in all Hawai'i. It featured a steam-powered mill built in 1853, the first use of steam power on a Hawaiian sugar plantation, and the 10-mile-long Hanamā'ulu Ditch built in 1856 by plantation manager William H. Rice, the first large-scale irrigation project for any of the sugar plantations (Moffatt and Fitzpatrick 1995:103).

The success of the Lihue Plantation allowed it to continue to expand. When the owner of Hanamā'ulu Ahupua'a, Victoria Kamāmalu, died in 1870, all 9,177 acres in the *ahupua'a* were purchased by Paul Isenberg (manager of Lihue Plantation from 1862–1878) (Damon 1931:742–747). By 1872, the plantation owned 17,000 acres in Hanamā'ulu. A total of 30,000 leased acres in Wailua were added in 1878. The extent of the sugarcane fields near the turn of the nineteenth century can be seen in an 1878 Hawaiian Government Survey map (Figure 12). In this map, there are not yet sugarcane fields depicted in the current project area; however, well before 1910, the project area came under heavy alteration accompanying the cultivation of sugarcane (Figure 13).

The expansion of Lihue Plantation's sugarcane cultivation would accelerate throughout the entire area in the early decades of the twentieth century, and sugarcane cultivation would transform nearly the entirety of the traditional landscape of Hanamā'ulu into plantation landscape. By 1931, Lihue Plantation had 6,712 acres in cane. Condé and Best's map of Lihue Plantation in 1941 shows the extent of the lands making up the Lihue Plantation as well as the heavy historic use throughout the area (Figure 14).

A 1963 USGS topographic quadrangle (Figure 15) and a 1977/1978 orthophoto (Figure 16) show increased development and urbanization near the project area.

Figure 12. 1878 Hawaiian Government Survey map of Kaua'i clearly showing sugarcane fields in the vicinity of the current project area

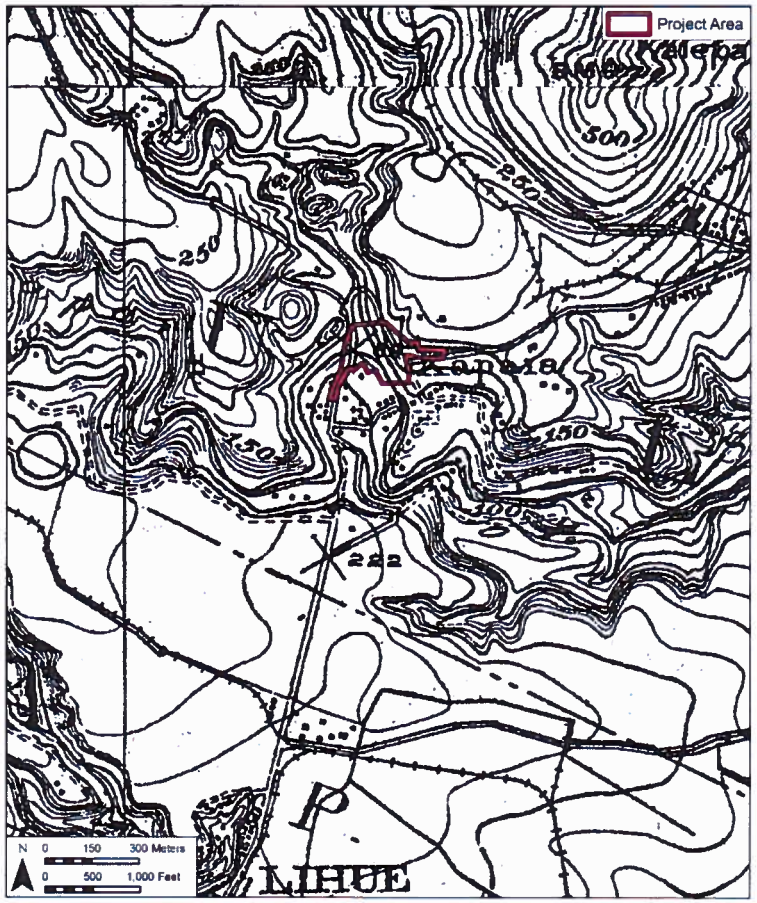


Figure 13. Portion of 1910 Lihue USGS topographic quadrangle, showing development around the current project area

Figure 14. 1941 Lihue Plantation Company map showing intensive sugarcane cultivation nearly to the shoreline, and the project area in the middle of it (Conde and Best 1973:168)

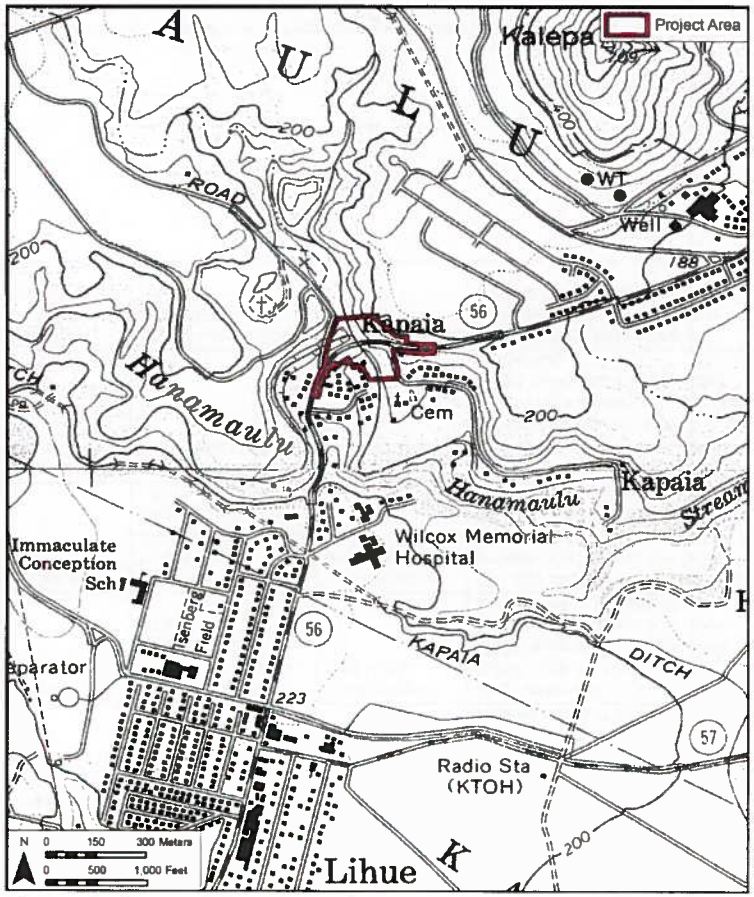


Figure 15. Portion of 1963 USGS topographic quadrangle showing increased development and urbanization near the project area

Figure 16. 1977/1978 USGS orthophoto showing urbanization of the vicinity of the project area

3.2 Previous Archaeological Research

Few previous archaeological studies have been conducted in the vicinity of the current project area. These studies are summarized in Table 2, their locations are provided on Figure 17, and they are described in the following paragraphs.

Table 2. Previous Archaeological Studies Conducted within the Vicinity of the Current Project Area

Source	Location	Nature of Study	Results
Thrum 1906	Island-wide	*Heiau* study	Lists one *heiau* (Kalauokamanu Heiau) near the current project area
Bennett 1931	Island-wide	Archaeology of Kaua'i	Lists one site near the current project area: Site 102, Kalauokamanu Heiau
McMahon 1990	Three parcels in Nāwiliwili, Kalapakī, and Hanamā'ulu Ahupua'a	Archaeological field check	Three historic residential sites (SIHP #s 50-30-11-9390, -9401, -9402) documented in Nāwiliwili and Kalapakī Ahupua'a; no sites documented in Hanamā'ulu
Walker et al. 1991	Lands in Hanamā'ulu, Kalapakī, Nāwiliwili, Niumalu, and Wailua Ahupua'a	Archaeological inventory survey	Ten sites identified (SIHP #s -1838 through -1847 (prefix 50-30-08 [Wailua Ahupua'a] or 50-30-11 [Hanama'ulu Ahupua'a]): three pre-Contact, seven historic
Dega and Powell 2003	Kūhiō Hwy along the east side of Kaua'i	Archaeological monitoring	Identified ten archaeological sites, only one of which was located in Hanamā'ulu Ahupua'a: SIHP # 50-30-08-885, a historic-era irrigation tunnel associated with sugarcane production.
Dye and Jourdane 2006	Kalepa Grove Farm, Hanamā'ulu Ahupua'a	Archaeological assessment	Human burials and cultural deposits similar to those already found at Kalepa Ridge could be present

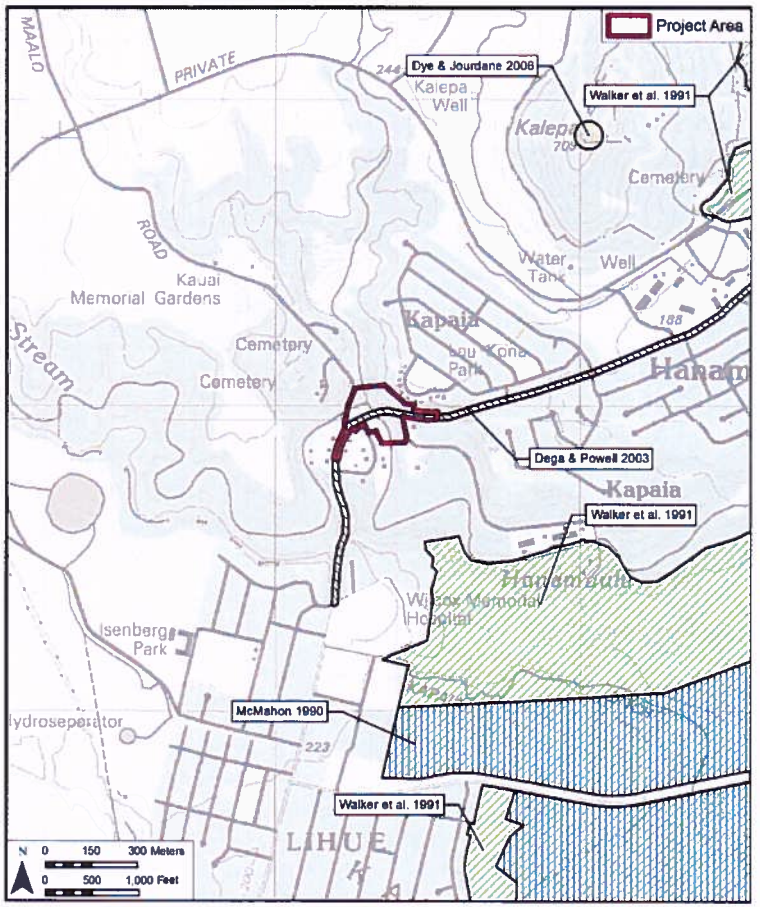


Figure 17. Portion of 1996 Lihue and Kapaa USGS topographic quadrangle showing previous archaeology studies conducted near the current project area

3.2.1 Thrum (1906)

Thomas Thrum, the publisher of the *Hawaiian Almanac*, gathered lists of *heiau* on all islands. For the *ahupua'a* of Hanamā'ulu , he noted one *heiau*—Kalauokamanu, "A large walled heiau that stood above the present mill; destroyed about 1855. Of pookanaka class" (Thrum 1906:40). This site is located approximately 0.8 km northeast of the current project area.

3.2.2 Bennett (1931)

The first comprehensive archaeological survey on the island of Kaua'i was undertaken by Wendell Clark Bennett; his work was published in 1931. Bennett used Thrum's *heiau* list for reference and recorded additional sites he found. For Hanamā'ulu, Bennett (1931) lists one *heiau*, Site 102—Kalauokamanu Heiau. He had no further information on the *heiau*.

Ethel Damon provided additional information on the *heiau*:

> Within the ahupua'a of Hanamaulu was a large walled heiau called Ka-lau-o-ka-manu of the poo-kanaka type, or one in which human sacrifices were offered; but in the almost unconscious days of transition, when popular interest in such thing was still asleep, most of the stones from this enclosure were taken to make firm the foundation of the Hanamaulu sugar mill. [Damon 1931:397]

A 1934 *Garden Island Press* newspaper account also provided additional information on the location of the *heiau*:

> Another *heiau* located in Hanamā'ulu is Kalauokamanu. This was situated just west of the Līhu'e Plantation Yard and adjacent to a cane haul road. It is said to be of the *pookanaka* class and was destroyed in 1855. [*Garden Island Press* 1934 in Corbin 2002:14]

3.2.3 McMahon 1990

In 1990, the Historic Preservation Program of the Department of Land and Natural Resources conducted a brief walk-through field check of three parcels of land in Nāwiliwili, Kalapakī, and Hanamā'ulu Ahupua'a for a possible new Kaua'i judiciary building (McMahon 1990). Three historic residential sites (SIHP #s 50-30-11-9390, -9401, -9402) were recorded. SIHP #s -9390 and -9401 were previously identified and located in Nāwiliwili Ahupua'a. SIHP # -9402 was located in Kalapakī Ahupua'a. No sites were documented in Hanamā'ulu Ahupua'a.

3.2.4 Walker et al. 1991

In 1990, Paul H. Rosendahl, Ph.D., Inc., conducted an archaeological inventory survey in lands in Hanamā'ulu, Kalapakī, Nāwiliwili, Niumalu, and Wailua Ahupua'a. The investigation identified ten sites: SIHP #s -1838 (pre-Contact cultural deposits), -1839 (pre-Contact wall and terrace), -1840 (retaining wall), -1841 (road), -1842 (wall), -1843 (concrete foundation, road, and concrete wall), -1844 (historic cemetery), -1845 (railroad bridge), -1846 (concrete bridge), and -1847 (river valley—possible pre-Contact agriculture) (site prefixes are 50-30-80 [Wailua Ahupua'a] or 50-30-11 [Hanama'ulu Ahupua'a]). SIHP # -1839 provided a radiocarbon date of AD 1170-1400 (Walker et al. 1991:72). As one would expect, the three pre-Contact sites were in

areas never cultivated for sugarcane. Two of the three sites were located along the shoreline and the third was in the river valley. No structural remains were located in the river valley, but subsurface remains of traditional agricultural activities may continue to exist.

3.2.5 Dega and Powell 2003

In 2003, Scientific Consultant Services, Inc., conducted archaeological monitoring along Kūhiō Highway in eastern Kaua'i (Dega and Powell 2003). A total of ten archaeological sites were identified in their project area: SIHP #s 50-30-08-868 (traditional Hawaiian and historic burials), -871 (traditional Hawaiian and historic burials), -872 (traditional Hawaiian burials), -884 (traditional Hawaiian cultural layer with artifacts and charcoal; historic artifacts and railroad bedding), -885 (historic irrigation ditch), -886 (pre-Contact hearth, historic ditch, traditional Hawaiian burial), -887 (traditional Hawaiian cultural layer with charcoal), -1711 (pre-Contact hearth), -1848 (pre-Contact post holes and hearth), and -1849 (pre-Contact cultural layer). Only one of these sites, SIHP # -885, was located in Hanamā'ulu Ahupua'a.

3.2.6 Dye and Jourdane 2006

T.S. Dye and colleagues conducted an archaeological assessment for the proposed Cingular Wireless Kalepa Grove Farm Cell Site (Dye and Jourdane 2006). Based on existing historical literature and previous archaeological documents, it was deemed possible that human burials and cultural deposits might be present, similar to those found at Kalepa Ridge.

3.2.7 Settlement Pattern Summary and Predictive Model

Creed et al. (2006) provide a detailed synthesis of the settlement patterns and prehistory of the *ahupua'a* of Hanamā'ulu. This synthesis includes extensive research on how the *ahupua'a* fits into the settlement patterns of Kaua'i as a whole. The synthesis presented here is derived from that presented in Creed et al. (2006). If further information about the area is desired, the reader is recommended to use this earlier report for reference.

The archaeological record of early Hawaiian occupation in the Līhu'e District indicates a date range of ca. AD 1100 to 1650 for pre-Contact Hawaiian habitation (Walker et al. 1991). As pointed out by Franklin and Walker (1994:17), two important *ahupua'a* and large rivers lie on either side of Hanamā'ulu lands. The first, Wailua Ahupua'a, is home of the royal chiefs and lies immediately to the north. The other, Hulē'ia River Valley and the *ahupua'a* of Ha'ikū lie to the south beyond Nāwiliwili and Niumalu. Thus Hanamā'ulu Ahupua'a would be expected to have less varied pre-Contact resources than their more dominant neighbors, which had greater populations along large river valleys.

Hanamā'ulu, however, would hardly be devoid of pre-Contact structures as legends assign considerable importance to the region. They portray Hanamā'ulu as the birth and death place of Kawelo, a late seventeenth-century paramount chief. They reference paths crossing Hanamā'ulu as well as frequent canoe landings, and they speak of a number of *heiau* including the large Kalauokamanu, where human sacrifice was conducted. Based on Māhele records, archeological surveys, and ethno-historical accounts, the population in Hanamā'ulu was concentrated in a stream valley and near the shore. The *kula* lands were used for *wauke* and other dryland crops.

The large amount of *kula* land and the importance of the sugar industry in Hanamā'ulu dramatically altered land use patterns, perhaps more so than in prestigious traditional *ahupua'a* like Wailua and Ha'ikū. Many people moved away from the river valleys to make a living through cash crop agriculture. As a result, Hanamā'ulu should have a very high number of cultural resources, both relatively and absolutely, related to sugar plantations.

The explosion of the sugar industry in Hawai'i fundamentally transformed the *ahupua'a* of Hanamā'ulu. The pattern of plantation land use (e.g., plowing, rock removal) generally obliterates most traces of pre-historic and early historic land use. Nearly all prehistoric structures were almost certainly destroyed and if archaeological remains are to be encountered they will likely be historic in nature. Structure remnants are highly unlikely as many pre-Contact structures such as *heiau* were disassembled and their stones incorporated into historic structures.

Traces of the plantation are much more likely to be encountered. If plantation remnants are found, they will probably be almost exclusively below surface. Artifacts that could be found include low density lost or abandoned items, small historic structures, abandoned machinery, and remnants of roadways.

Section 4 Results of Fieldwork

Fieldwork for this project was conducted from 25 February through 13 March 2013. The fieldwork and associated documentation was accomplished by CSH archaeologists Gerald Ida, B.A., and Missy Kamai, B.A., under the supervision of Hallett H. Hammatt, Ph.D. (Principal Investigator). Fieldwork required approximately 17 person-days to complete.

The pedestrian survey located 11 cultural resources within the project area (Table 3 and Figure 18 through Figure 20). All 11 cultural resources were designated with SIHP numbers. Some cultural resources contained multiple features. Detailed descriptions of each cultural resource are presented in Section 4.1.

Subsurface testing was conducted at four of the identified cultural resources and included seven shovel tests (Figure 21). The shovel tests were performed in an attempt to ascertain function and age of certain sites. Detailed results of the shovel tests are presented in Section 4.2.

Table 3. List of identified cultural resources

SIHP # (50-30-)	Site Type	Age
11-2207	Ditch and terraces	Historic and indeterminate
08-2208	Retaining wall	Historic
08-2209	Ditch complex	Historic
08-2210	Road	Historic
08-2211	Terrace and alignment	Indeterminate
08-2212	Platform – road and bridge landing	Historic
08-2213	Wall	Indeterminate
08-2214	Retaining wall	Indeterminate
08-2215	Bridge	Historic
08-2216	Ditch	Indeterminate
08-2217	Terrace	Indeterminate

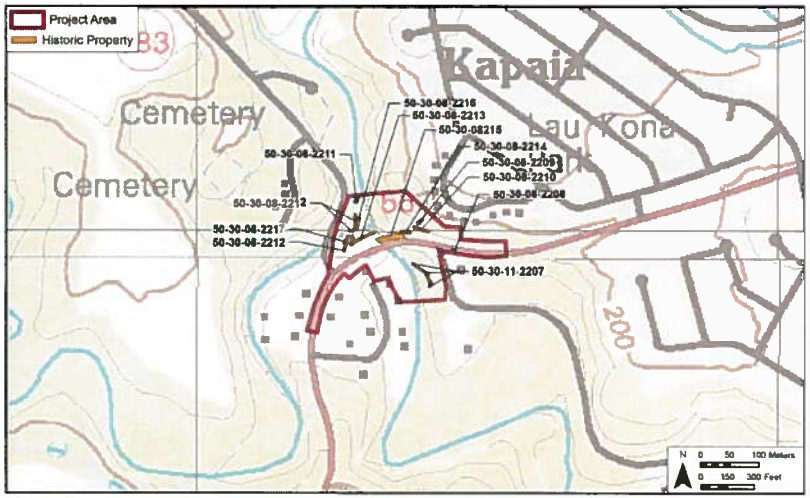


Figure 18. Portion of 1996 Lihue and Kapaa USGS topographic quadrangle depicting locations of archaeological cultural resources identified during the current project

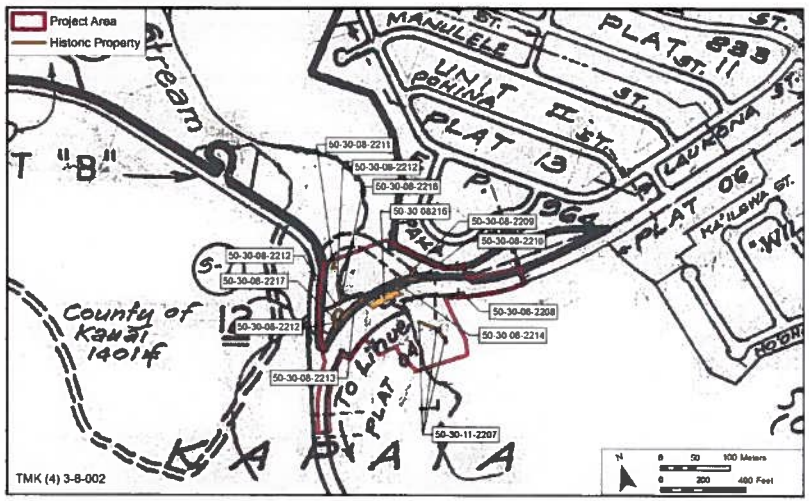


Figure 19. TMK: [4] 3-8-002 depicting locations of archaeological cultural resources identified during the current project, overlaid on a map showing Hanamā'ulu (Kapaa) Stream Bridge Replacement project area (Hawai'i TMK Service 2009)

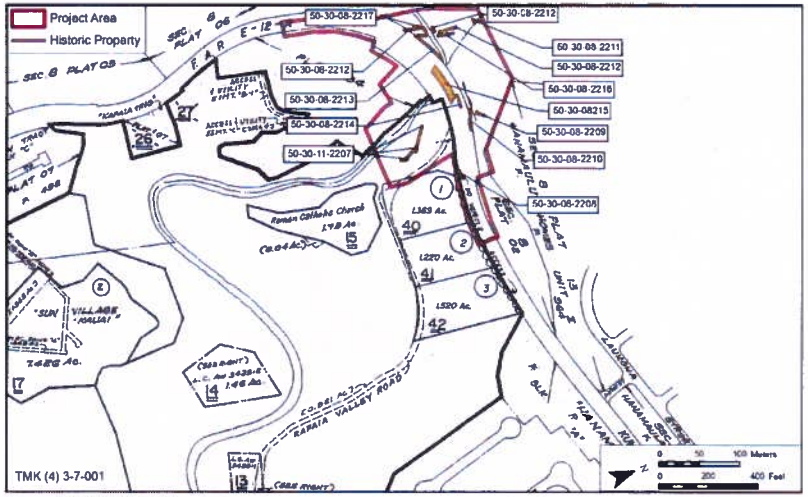


Figure 20. TMK: [4] 3-7-001 depicting locations of archaeological cultural resources identified during the current project area (Hawai'i TMK Service 2009)

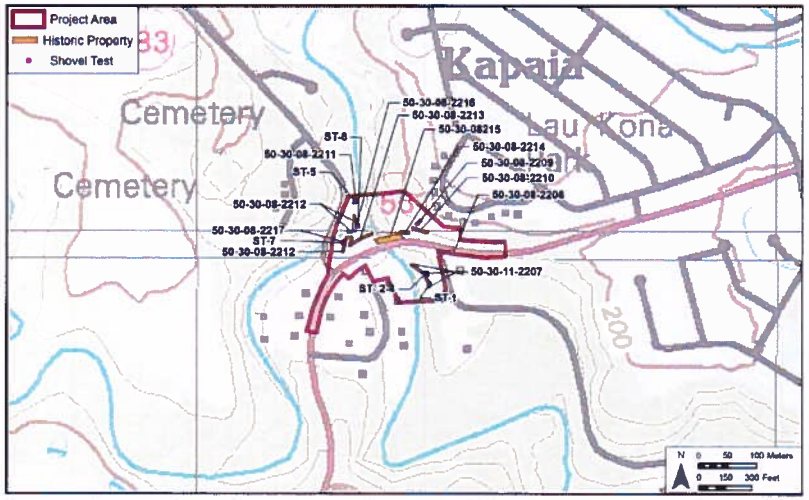


Figure 21. Portion of 1996 Līhu'e and Kapaa USGS topographic quadrangle depicting locations of shovel tests in relation to cultural resources

4.1 Cultural Resource Descriptions

4.1.1 SIHP # 50-30-11-2207

SITE TYPE:	Ditch and terraces
FUNCTION:	Water control
NO. OF FEATURES:	3
DIMENSIONS:	60 x 15 m
AGE:	Historic
CONDITION:	Remnant

SITE DESCRIPTION:

SIHP # -2207 consists of a complex of three features located on the south facing slope between Kapaia Road and Hanamā'ulu Stream (Figure 22 through Figure 24). The overall dimensions for this site are 60 m northwest/southeast by 15 m northeast/southwest. This site included a ditch (SIHP # -2207A) and two terraces (SIHP #s -2207B and -2207C). Vegetation observed in and around the area consisted of mango trees, shrimp plant, coconut trees, java plum, and unidentified plants.

SIHP # -2207A consists of a 59 m northwest/southeast by 5 m northeast/southwest remnant ditch (Figure 25). The interior of the ditch measured 2.5 m wide with depths that vary from 0.10 m on the eastern end to 0.55 m on the western end. The remnant ditch is constructed of a linear depressed area with a built-up earthen berm on the west edge of the ditch (Figure 26), with few sub-angular basalt cobbles and boulders on the east edge (Figure 27). The water would have flowed in a northwest/southeast direction and was mostly like a branch off waterway originating from Hanamā'ulu Stream. This feature is located on the east side of a small valley east of Hanamā'ulu Stream. It is situated on a leveled area to the west of SIHP # -2207B and SIHP # -2207C.

SIHP # -2207B consists of two adjacent agricultural terraces. Terrace 1 is located to the northeast of Terrace 2. Both terraces are remnant structures. Terrace 1 (Figure 28 and Figure 29) measured 4.9 m northwest/southeast by 1.8 m east/west, and is constructed of large sub-angular basalt cobbles and small to medium sub-angular basalt boulders stacked one to two courses high for a maximum height of 0.77 m. The small leveled area consists of soil and leaf litter, with small coral pebbles and cobbles and modern trash scattered around. Terrace 2 (Figure 30) is located approximately 1 m southwest of Terrace 1, and it measured 5.5 m northeast/southwest by 2.8 m northwest/southeast, with a maximum height of 0.46 m. The leveled area consists of soil with leaf litter, small coral pebbles and cobbles, and modern trash scattered around. Both terraces are situated just east of SIHP # -2207A and west of a steep slope, just below Kapaia Road. No cultural materials were observed on the surface in this area. Based on visual observation of the terraces, function and age were indeterminate. In an attempt to gain an understanding of possible function and age, shovel testing was conducted between the two terraces. No significant cultural materials were observed during excavation of the shovel test (see Section 4.2.1 Shovel Test 1 for a detailed description of the shovel test).

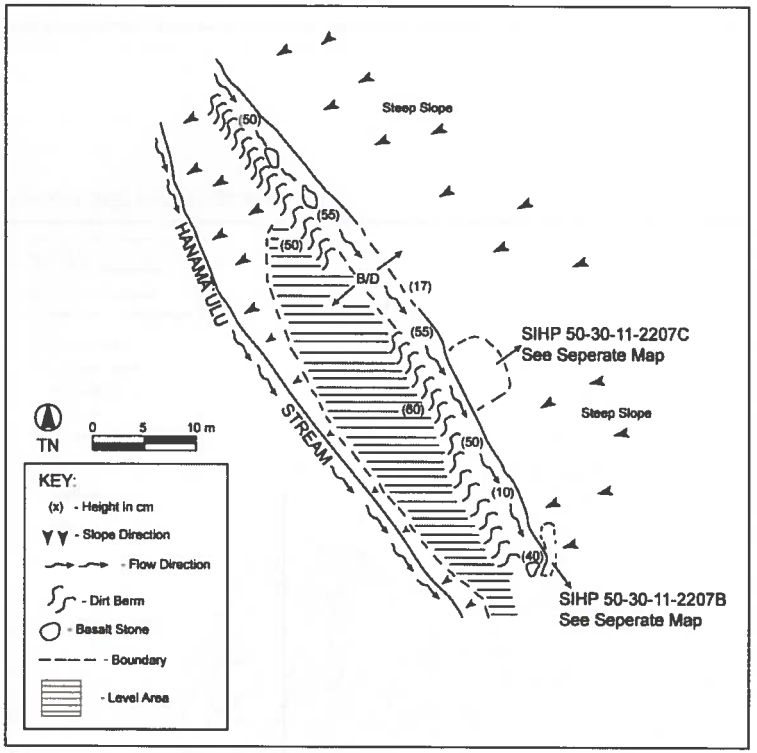


Figure 22. SIHP # -2207A, plan map

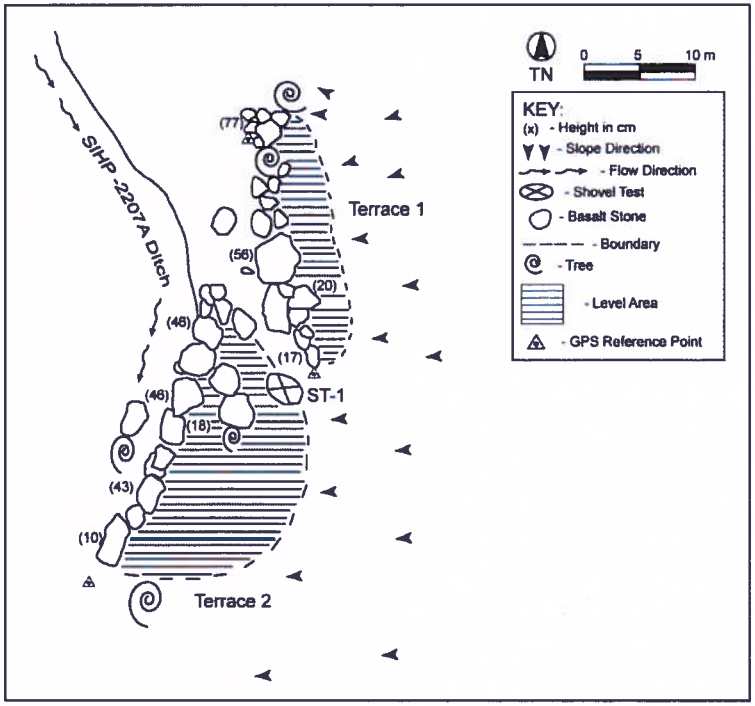


Figure 23. SIHP # -2207B, plan map

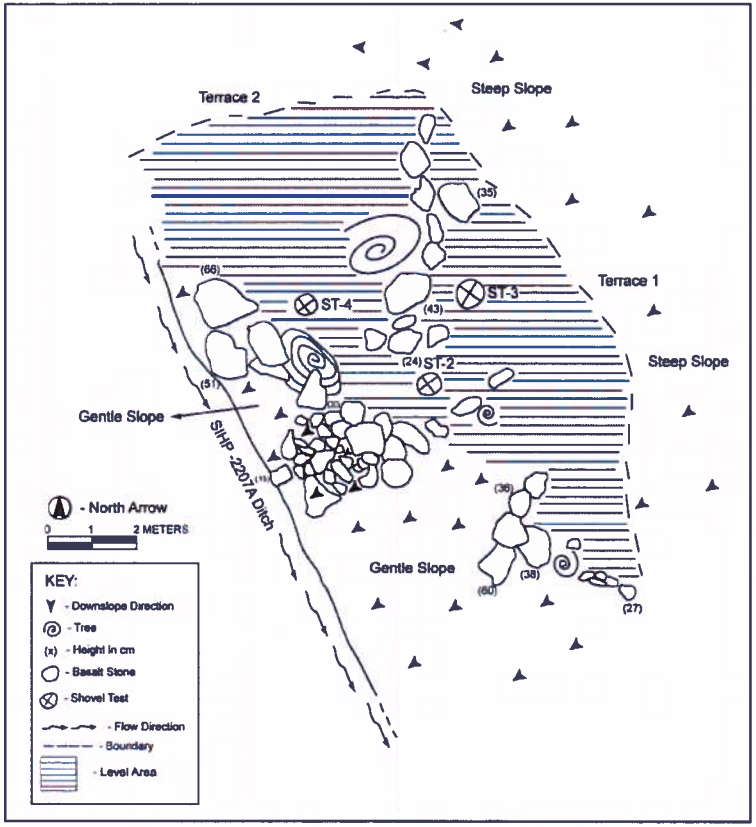


Figure 24. SIHP # -2207C, plan map

Figure 25. SIHP # -2207A, ditch, view to northwest

Figure 26. SIHP # -2207A, berm on west edge of ditch, view to southeast

Figure 27. SIHP # -2207A, basalt cobbles and boulders on east edge of ditch, view to east/southeast

Figure 28. SIHP # 2207B, Terrace 1, view to northeast

Figure 29. SIHP # -2207B, Terrace 1, view to southeast

Figure 30. SIHP # -2207B, Terrace 2, view to southwest

SIHP # -2207C consists of two agricultural terraces. Terrace 1 is located on the southeastern end of a large leveled area (Figure 31), and Terrace 2 is located on the northwestern end (Figure 32). Terrace 1 was an L-shaped terrace, although it now looks like a "T." It measures 3.5 m northwest/southeast by 2.8 m northeast/southwest, and it has a maximum height of 0.6 m. This terrace is constructed of an alignment of large sub-angular basalt cobbles and a single large sub-angular basalt boulder running in a northwest to southeast direction. This alignment abuts an alignment of four large sub-angular basalt boulders. The leveled area consists of soil with leaf litter and modern trash scattered around. Terrace 2, located 2.3 m northwest of Terrace 1, measures 6.4 m northwest/southeast by 3.5 m northeast/southwest. Terrace 2 is constructed of small to large sub-angular and angular basalt cobbles and boulders stacked one to two courses high for a maximum height of 0.51 m. Due to a large mango tree with its roots within the terrace wall, the construction of the terrace is extremely disturbed. The leveled area of the terrace consists of soil with leaf litter and a few pieces of modern trash scattered around. There is an alignment of small to large sub-angular basalt boulders also on the leveled area of Terrace 2. The alignment measures 5.3 m in length (north/south) and has a maximum height of 0.43 m. The function of this alignment is unclear. SIHP # -2207C is situated on a large leveled area just east of SIHP # -2207A and north of SIHP # -2207B. A large steep slope is present to the east, just below Kapaia Road. Based on visual observation of the terraces, function and age were indeterminate. In an attempt to gain an understanding of possible function and age, three shovel tests (Shovel Tests 2–4) were excavated between the two terraces. No significant cultural materials were observed during excavation of the shovel test (see Sections 4.2.2 through 4.2.4 for detailed descriptions of the shovel tests).

Figure 31. SIHP # -2207C, Terrace 1, view to east

Figure 32. SIHP # -2207C, Terrace 2, view to northwest

4.1.2 SIHP # 50-30-08-2208

SITE TYPE:	Retaining wall
FUNCTION:	Slope retention
NO. OF FEATURES	1
DIMENSIONS:	6.0 by 1.6 m
AGE:	Historic
CONDITION:	Remnant

SITE DESCRIPTION:

SIHP # -2208 is a small, stacked stone retaining wall that runs along the north side of the existing Kūhiō Highway (Figure 33 through Figure 36). It fronts an existing business, Affordable Auto Body & Touch Up Paint (a.k.a. Ken Silva's Auto Body), and acts as a retaining wall for a portion of a parking area. The site is 6.0 m long, 1.6 m wide, it has a maximum height of 0.71 m. It is constructed of sub-angular basalt boulders and cobbles, one to four courses high. The eastern end of the wall has collapsed, with stones sliding down the slope, but the cut bank where the collapse occurred is still observable. It likely dates from the time when the road bed was graded for Kūhiō Highway or its predecessor. There are long and narrow pieces of rusty metal on the ground adjacent to the north side of the retaining wall. These are likely not part of the site, but were subsequently placed there, possibly from the auto body shop. This site is surrounded by mowed grass.

Figure 33. SIHP # -2208, retaining wall, view to southwest

Figure 34. SIHP # -2208, retaining wall, view to south

Figure 35. SIHP # -2208, retaining wall, view to west

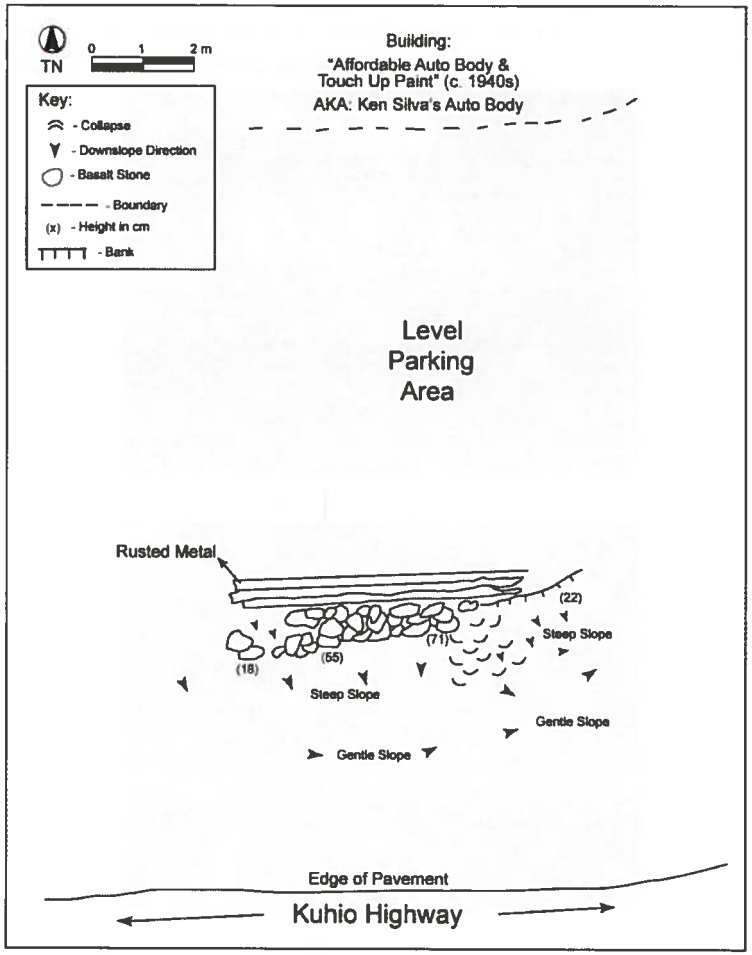


Figure 36. SIHP # -2208, plan map

4.1.3 SIHP # 50-30-08-2209

SITE TYPE:	Ditch complex
FUNCTION:	Water control
NO. OF FEATURES:	1
DIMENSIONS:	28 by 20 m
AGE:	Historic
CONDITION:	Good

SITE DESCRIPTION:

SIHP # -2209 is a ditch complex that consists of a concrete ditch, a concrete culvert, and an earthen ditch (Figure 43 through Figure 45). The concrete ditch runs in a rough north/south then northeast/southwest direction (Figure 37). Located on an extremely steep slope, the concrete ditch starts from the top of the slope where the upper Hanamā'ulu subdivision is. The ditch measured minimally 10.3 m northeast/southwest by 1.3 m northwest/southeast (not all of the ditch could be measured due to safety concerns for the steepness of the slope). The depth of the concrete ditch varied from 0.07 m to 0.21 m.

The construction of this concrete ditch appears to be made by hand and not by forms. Due to the steepness of the hill, the flow of the water traveled downslope (southwest) into a concrete box culvert (Figure 38 and Figure 39). Unlike modern box culverts, which are completely buried under the surface, this culvert is situated partly underground on its eastern end but completely open on the western end (Figure 40). The culvert measures 2.4 m east/west by 1.3 m north/south. As mentioned before, the culvert is constructed of concrete. It appears to be built like a small short tunnel. The culvert is built in five sections, most likely formed first then placed in its current location. The first section, the north wall, measured 1.52 m in length and 0.17 m thick, based on what was observed at the opening of the culvert. The second section, the south wall, measured 2.4 m in length and 0.25 m thick. The third section, the southeast wall, measured 0.90 m in length, and the fourth section, the east wall, measured 0.45 m long. Because the east exterior surface looks different from the interior, the thickness for the third and fourth sections could not be determined. The last and fifth section is the top, which measured 2.4 m long by 1.3 m wide, with a thickness of 0.29 m.

Water from the concrete ditch enters the northeast end of the culvert. There is an opening that is barely visible now. From the interior of the culvert, a large sub-angular basalt boulder blocks the water entrance into the culvert. This was most likely done when the ditch was no longer in use. Also, from the interior of the culvert at the north end of the fourth section, a mortared basalt cobble wall was observed. Very little of the cobble wall was visible due to the large boulder in the culvert's entrance. The overall height of the culvert is 1.21 m and the interior height is 0.75 m. There is a raised flat earthen surface that abuts the southern end of the culvert, and it measures 6.5 m east/west by 5.1 m north/south. The function for this raised leveled area is unknown. From the culvert, water continued downward through an earthen ditch on the west side of the culvert. Very little remains of the earthen ditch (Figure 41 and Figure 42). What is still visible measured 23.8 m long, with a maximum width of 0.14 m. The depth of the earthen ditch

is shallow, ranging from 0.05 to 0.08 m. The entire ditch complex is situated on a ledge along a hillside between the upper Hanamā'ulu subdivision at the top of the hill and Kūhiō Highway at the bottom of the hill. The ledge where this site sits is on an old road (SIHP # -2209, see description in Section 4.1.4); the presence of road pavement was observed along the south face of the ledge area.

Figure 37. SIHP # -2209, concrete ditch, upward view to north

Figure 38. SIHP # -2209, concrete box culvert, view to north

Figure 39. SIHP # -2209, concrete box culvert, view to northeast

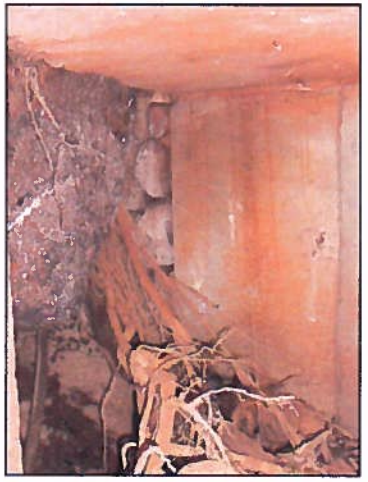


Figure 40. SIHP # -2209, concrete box culvert interior view

Figure 41. SIHP # -2209, remnant of earthern ditch, view to east

Figure 42. SIHP # -2209, remnant of earthern ditch, view to west

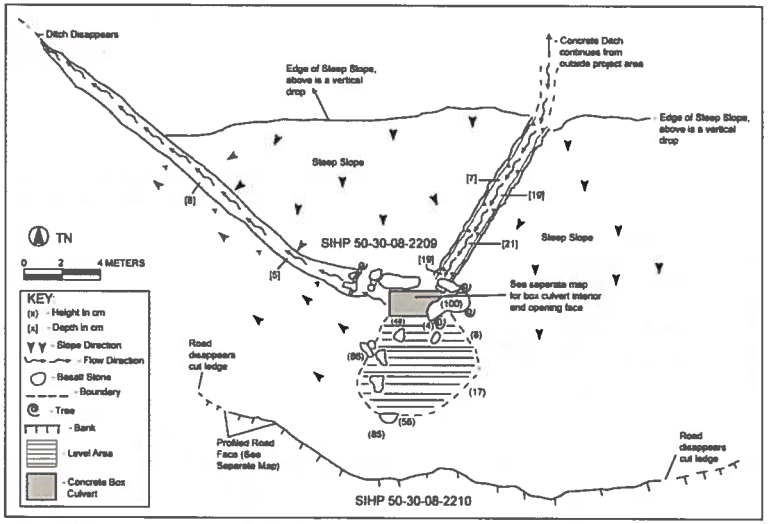


Figure 43. SIHP #s -2209 and -2210, plan map

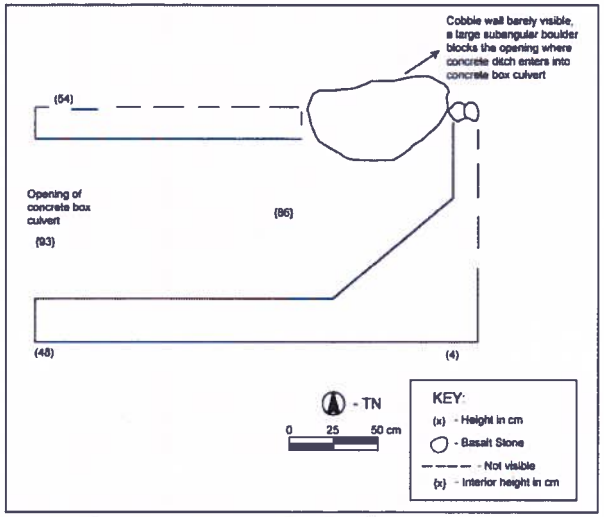


Figure 44. SIHP # -2209, plan view of concrete box culvert (depicted without lid)

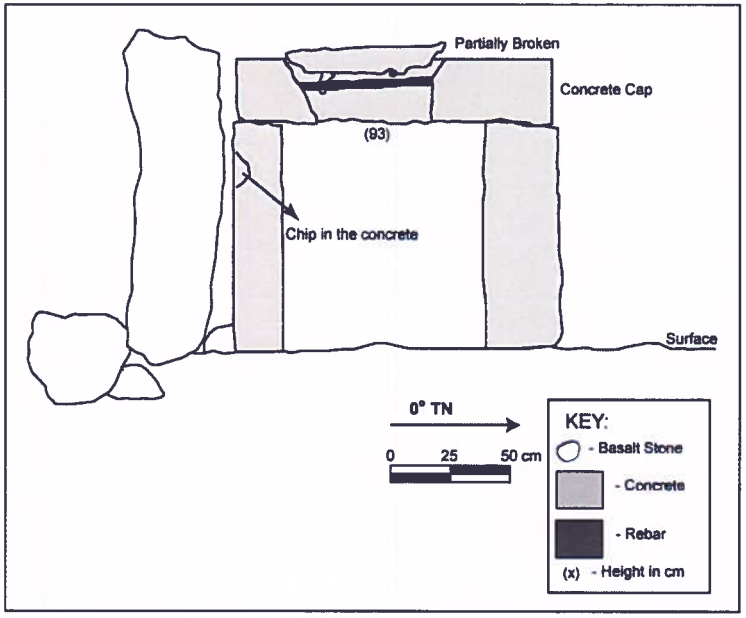


Figure 45. SIHP # -2209, profile of opening of concrete box culvert

4.1.4 SIHP # 50-30-08-2210

SITE TYPE:	Road
FUNCTION:	Transportation
NO. OF FEATURES:	1
DIMENSIONS:	27 m long
AGE:	Historic
CONDITION:	Poor

SITE DESCRIPTION:

SIHP # -2210 is an old road on a ledge of a hill abutting Kūhiō Highway on the north side (see Figure 43 and Figure 46 through Figure 48). The area above the ledge is the upper Hanamā'ulu subdivision. The only visible part of the old road is located along the face of the ledge along Kūhiō Highway; it measures 27 m long. The width of the road could not be determined due to the buildup of soil on the ledge and the overgrowth of vegetation in the area. A 2.3-m long section profile was drawn to show what the face of the road pavement looks like (Figure 49). The profile section is located on the north/northeast side of a driveway to a private property just along the north side of Kūhiō Highway. This is the location where the road visibly starts. The road follows the curve of Kūhiō Highway and then disappears into the side of the hill. The thickness of the profiled pavement varies from 0.10 m to 0.17 m (Figure 59). Unlike modern pavement, the pavement in the profile seems to be composed of large sub-angular basalt pebbles and small sub-angular basalt cobbles. The pavement is situated on clay soil material and decomposing bedrock. A few large sub-angular basalt boulders were observed in the face of the profile (Figure 58).

Figure 46. SIHP # -2210, old road, located on a raised ledge, view to northwest

Figure 47. SIHP # -2210, old road, located on a raised ledge, view to north

Figure 48. SIHP # -2210, old road, close-up of road surface, view to north

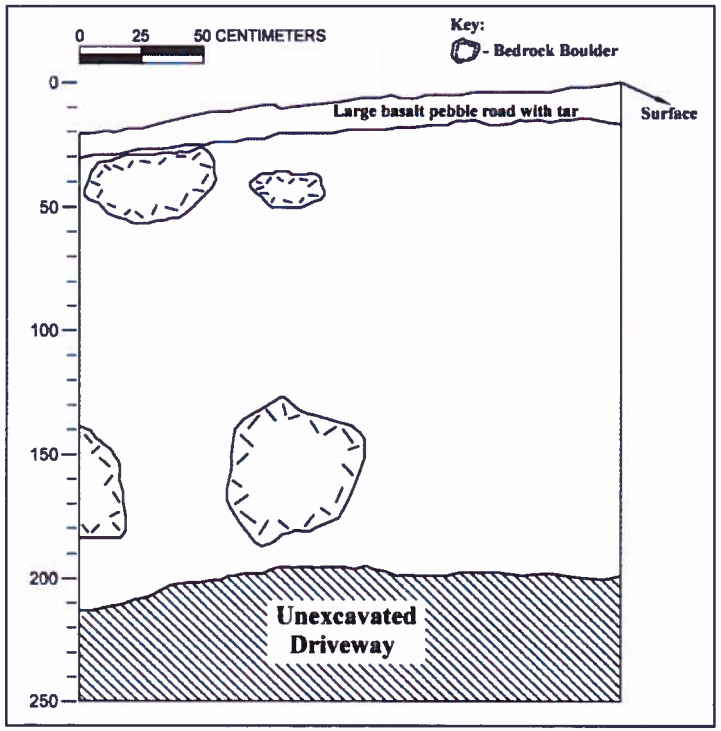


Figure 49. SIHP # -2210, profile of the old road

4.1.5 SIHP # 50-30-08-2211

SITE TYPE: Terrace and alignment

FUNCTION: Indeterminate

NO. OF FEATURES: 2

DIMENSIONS: Terrace: 4.4 m long and 1.0 m wide; alignment: 4.4 m long

AGE: Indeterminate

CONDITION: Terrace: poor; alignment: good

SITE DESCRIPTION:

SIHP # -2211A is a stacked stone terrace that measures 4.4 m long, 1.0 m wide, and 0.28 m high (Figure 50 through Figure 52). It is constructed of sub-angular basalt cobbles and small boulders featuring 1–3 vertical courses. Although there is stacking displayed, there are no real vertical faces. The area retained by the terrace is a high, steep slope. It is unclear whether this slope is natural or part of the spoils from the excavation and construction of the existing Maalo Road that was pushed downslope from the west onto this feature. The area between this feature and Maalo Road (to the west) is now an illegal trash dump with refrigerators, washing machines, televisions, Christmas trees, clothing, dead animals, and abundant household garbage (Figure 53). Some of this trash has made its way downslope to the vicinity of this site, but is obviously not associated with it. Vegetation in the area included java plum, *koa haole*, mango tree, and cat claws. Due to its location and unknown style of construction, determining function and possible age was difficult. In an attempt to gain an understanding of possible function and age, a shovel test (Shovel Test 5) was excavated just east of this feature. No cultural materials were observed during excavation (see Section 4.2.5 for a detailed description of the shovel test).

SIHP # -2211B is a straight alignment of seven sub-angular basalt boulders that measured 2.9 m long, 0.57 m wide, and 0.50 m high (Figure 54 through Figure 56). SIHP # -2211B is located approximately 1.5 m south of SIHP # -2211A. While there is no stacking, the alignment does retain some soil that gently slopes to the east. The age and function of this feature could not be determined. Vegetation in the area included java plum and mango tree. See the description of SIHP # -2211A concerning the modern trash dump as it applies here, too. Figure 57 is a plan view map of SIHP # -2211.

Figure 50. SIHP # -2211A, terrace, view to west

Figure 51. SIHP # -2211A, terrace, view to east

Figure 52. SIHP # -2211A, terrace, view to north

Figure 53. Illegal dumping ground near SIHP # -2211, view to northwest

Figure 54. SIHP # -2211B, alignment, view to northwest

Figure 55. SIHP # -2211B, alignment, view to north

Figure 56. SIHP # -2211B, alignment, view to northeast

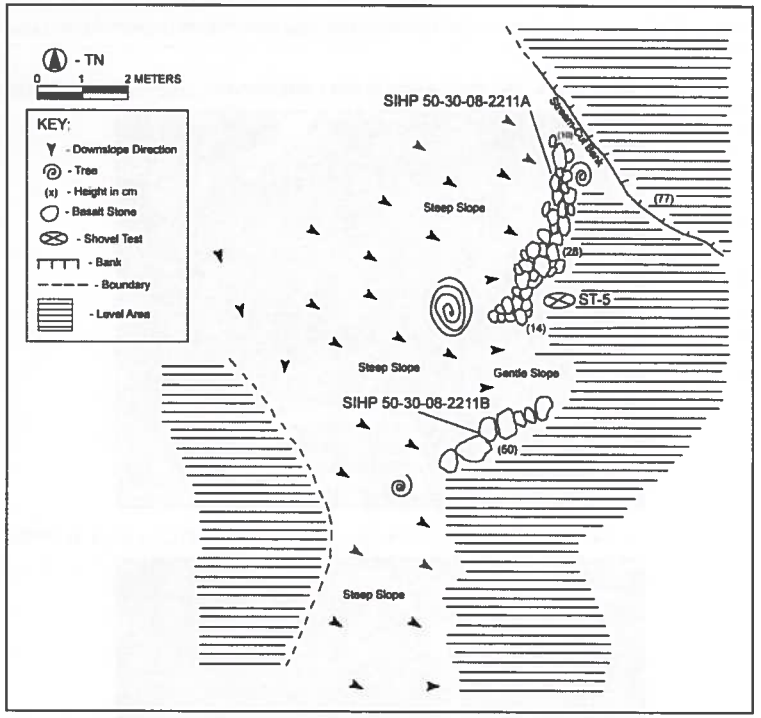


Figure 57. SIHP #s -2211A and -2211B, plan map

4.1.6 SIHP # 50-30-08-2212

SITE TYPE:	Platform – road and bridge landing
FUNCTION:	Transportation
NO. OF FEATURES:	1
DIMENSIONS:	55 by 10 m
AGE:	Historic
CONDITION:	Good, remnant

SITE DESCRIPTION:

SIHP # -2212 consists of two platform sections on either side of Hanamā'ulu Stream and is believed to be a remnant road and bridge landing. On the north side of the stream, one section of remnant platform was composed of two walls built using two different construction styles. The first wall was more of a retaining wall running roughly in a north/south direction and measuring approximately 17.0 m in length and 2.3 m in maximum height (Figure 58). The wall was constructed of small to large sub-angular basalt boulders stacked up to 11 courses high. Small to large sub-angular basalt cobbles were placed in the spaces between the stacked basalt boulders. Along the eastern side of the wall, there were three areas of collapse. At the south end of the wall, the wall disappeared and little chunks of asphalt were observed clinging to the side of the slope. The wall retains a fairly large leveled area that consisted of soil and thick vegetation of cat claws and *hau*. Approximately 5 m to the southwest of the dry-stacked wall on the downslope was another wall that measured 6.0 m long east/west, 0.60 m thick, and 2.84 m high. This east/west running wall was constructed of mortared basalt sub-angular and angular cobbles and boulders (Figure 59). The two differently constructed walls were once connected, helping to form a platform. This platform is located immediately west of SIHP # -2216, a ditch.

A second section of remnant platform was observed on the south side of Hanamā'ulu Stream, directly across from the first platform remnant. This platform consisted of three connected walls built using two different types of wall construction. The total length of all three walls combined was 42 m. The east and west walls of the platform were constructed using the same technique. They were constructed of small to large sub-angular basalt boulders stacked up to 14 courses high, with small to large sub-angular basalt cobbles placed in the spaces between the boulders. The east wall measured 12 m in length, with a maximum height of 2.92 m (Figure 60), and the west wall measured 21 m long, with a maximum height of 2.07 m (Figure 61). The north wall of the platform was constructed of mortared sub-angular and angular cobbles and boulders (Figure 62). The thickness of this wall measured 0.60 m, and it had a maximum height of 2.3 m. There were rusty metal pieces on the surface of the northeast and east sides of the north wall (Figure 63 and Figure 64). It is unknown what these metal parts are. There was a large, fairly leveled area located between the walls. This leveled area was higher in elevation than the north wall. At the north end of that leveled area, asphalt was observed on the surface. From the broken pieces observed along the north slope of the leveled area and the intact portion at the edge of the flat area, the asphalt is an extremely thin layer measuring 0.01 m (Figure 65). Base course comprised of large angular basalt pebbles was also observed on the face of the flat area, measuring 0.05 to

0.07 m thick. The asphalt and base course were situated on clay soil. This platform is located immediately west of SIHP # -2213, a wall, and immediately east of SIHP # -2217, a terrace. Figure 66 is a plan view map depicting several of these sites.

Figure 58. SIHP # -2212, dry stacked wall of northern platform, view to northwest

Figure 59. SIHP # -2212, mortared basalt wall of northern platform, view to north

Figure 60. SIHP # -2212, east wall of southern platform, view to west

Figure 61. SIHP # -2212, west wall of southern platform, view to north

Figure 62. SIHP # -2212, north wall of southern platform, view to west

Figure 63. Rusty metal pieces of unknown origin and function on top of southern platform

Figure 64. Rusty metal pieces of unknown origin and function on top of southern platform

Figure 65. SIHP # -2212, profile of pavement from southern platform, view to south

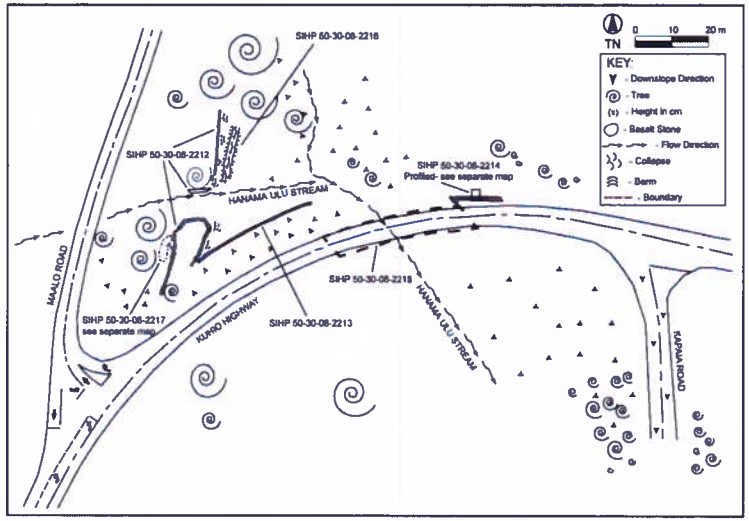


Figure 66. SIHP #s -2212 through -2217, plan map

4.1.7 SIHP # 50-30-08-2213

SITE TYPE:	Wall
FUNCTION:	Slope retention
NO. OF FEATURES:	1
DIMENSIONS:	35 m long, 0.8 m thick, and 5 m high
AGE:	Indeterminate
CONDITION:	Excellent

SITE DESCRIPTION:

SIHP # -2213 consists of a 35-m long wall running in a northeast/southwest direction. The thickness of the wall measured 0.8 m. The wall was constructed of cut stone and mortar and varies in height from 2.11 m on the west end to 5.0 m on the east end (Figure 67). This site parallels Kūhiō Highway. At the eastern end of the wall, the wall is broken, although no chunks of mortared cut stone were observed on the surface (Figure 68). The distance between the top of the wall and the guardrail along Kūhiō Highway was approximately 5 to 6 m, although the wall and the highway are at different elevations, with Kūhiō Highway being higher. The area between the guardrail and the wall steeply sloped to the north and consisted of soil fill and thick vegetation. This site was situated south and west of Hanamā'ulu Stream, where the stream runs east/west then bends to the south. It is also located north of Kūhiō Highway and east of and directly adjacent to the southern portion of SIHP # -2212 (see Figure 66).

Figure 67. SIHP # -2213, view of cut stone and mortar wall, view to southeast

Figure 68. SIHP # -2213, cut stone and mortar wall, broken end, upward view

4.1.8 SIHP # 50-30-08-2214

SITE TYPE:	Retaining wall
FUNCTION:	Water control
NO. OF FEATURES:	1
DIMENSIONS:	15 m long and 0.56 m high
AGE:	Indeterminate
CONDITION:	Excellent

SITE DESCRIPTION:

SIHP # -2214 is a 15-m long, 0.56-m high, sloped wall located along the north side of Kūhiō Highway just east of Hanamā'ulu (Kapaia) Stream Bridge (see Figure 66, Figure 69, and Figure 70). The wall is built along the base of a steep dirt hill, and is constructed of mortar and large angular basalt cobbles and small angular basalt boulders. Because the wall is constructed into the face of the hill, its thickness could not be determined. The wall appears to serve two purposes based on its location. The first is water control; the wall diverts water directly to the edge of the bridge where it falls into Hanamā'ulu Stream. The second purpose is to keep water from eroding the base of the hillside when rainwater flows down in this direction. Two 2-m profiles were drawn for this site. The first is an overview of the hillside with the wall and the second profile focuses on the wall itself and what it looks like (Figure 71).

Figure 69. SIHP # -2214, retaining wall, view to north

Figure 70. SIHP # -2214, retaining wall, view to west

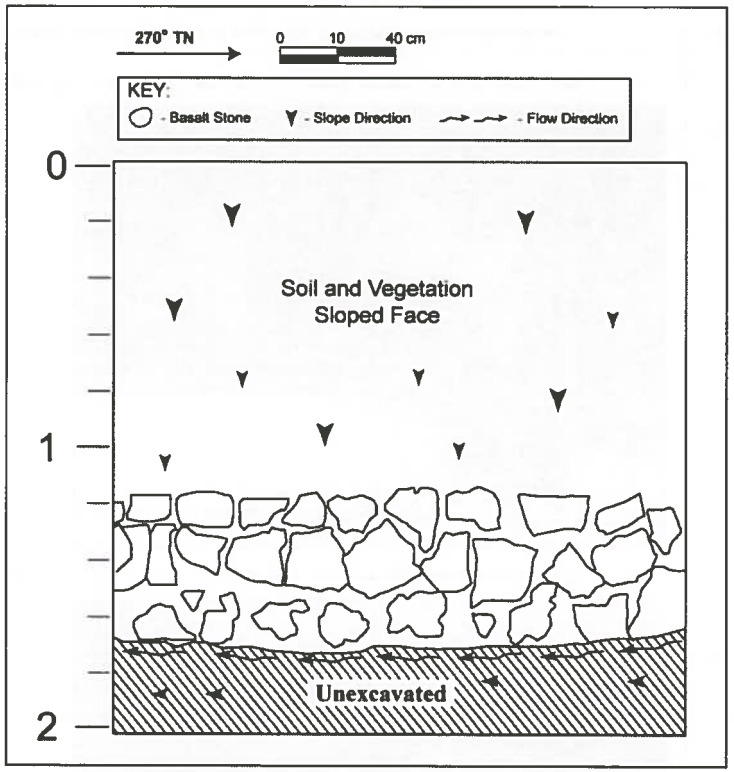


Figure 71. SIHP # -2214, profile of retaining wall

4.1.9 SIHP # 50-30-08-2215

SITE TYPE:	Bridge
FUNCTION:	Transportation
NO. OF FEATURES:	1
DIMENSIONS:	48 m long, 16 m wide, and 160 m high
AGE:	Historic
CONDITION:	Excellent

SITE DESCRIPTION:

SIHP # -2215 is Hanamā'ulu (Kapia) Stream Bridge (see Figure 66 and Figure 72 through Figure 78). The bridge measures approximately 48 m in length in a roughly east/west direction and 16 m wide, and it has an approximate height of 160 m above Hanamā'ulu Stream. On both sides of the bridge are concrete railings that measure 0.25 m thick and 0.74 m high from the top of the railing to the road. According to the Historic Bridge Inventory: Island of Kauai (Mason Architects 1989:149--150):

> The Kapaia Bridge is a common structural type, a concrete tee beam. It is a good example of the early 1930s period, with paneled railings and no sidewalks. . . . The bridge was a fairly complex engineering project for its period in design and construction, due to the curve it incorporates, both in the horizontal and vertical planes. The curved, paneled parapet walls with the sloped cap give the bridge a graceful and artistic effect. Kapaia Bridge is a distinguished entity because it was one of the first two Federal aid bridges on Kauai. . . . It is an unusual resource because it is the highest bridge on Kauai.

Below the bridge on the northwest and southwest sides is a large, basalt boulder and mortar retaining wall constructed against the steep slope. It is not mentioned in the bridge inventory report so the age of the wall is unknown. Although historic by design construction and year according to experts, Hanamā'ulu (Kapia) Stream Bridge is more of a historic architectural site than an archaeological site.

Figure 72. SIHP # -2215, Hanamā'ulu (Kapia) Stream Bridge, view to north

Figure 73. SIHP # -2215, Hanamā'ulu (Kapia) Stream Bridge, view to north

Figure 74. SIHP # -2215, Hanamā'ulu (Kapia) Stream Bridge, view to northwest

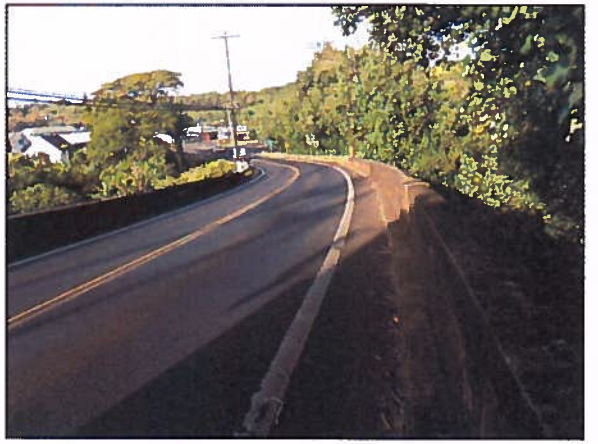


Figure 75. SIHP # -2215, Hanamā'ulu (Kapia) Stream Bridge, view to west

Figure 76. SIHP # -2215, Hanamā'ulu (Kapia) Stream Bridge, showing curve in bridge construction, view to east

Figure 77. SIHP # -2215, Hanamā'ulu (Kapia) Stream Bridge, showing no sidewalk and tapered railing, view to west

Figure 78. SIHP # -2215, Hanamā'ulu (Kapia) Stream Bridge, showing no sidewalk and panel railing, view to west

4.1.10 SIHP # 50-30-08-2216

SITE TYPE:	Ditch
FUNCTION:	Water control
NO. OF FEATURES:	1
DIMENSIONS:	17 m long and 4 m wide
AGE:	Indeterminate
CONDITION:	Remnant

SITE DESCRIPTION:

SIHP # -2216 is a remnant ditch that measures 17 m long and 4 m wide (Figure 79). It is located north and west of Hanamā'ulu Stream and its origin (to the north) is unknown. The ditch is bermed on the east and west sides and varies in depth from 0.44 to 0.57 m. At the south end of the ditch is a roughly paved area composed of small to large sub-angular and angular basalt cobbles that gently slopes into Hanamā'ulu Stream (Figure 80). The ditch is situated on a fairly level area and parallels SIHP # -2212 to the east (see Figure 66). A shovel test (Shovel Test 6) was excavated in the center of the ditch at its south end. No cultural materials were observed during excavation (see Section 4.2.6 for a detailed description of the shovel test).

Figure 79. SIHP # -2216, ditch overgrown with *hau*, earthern berms barely visible on either side, view to north

Figure 80. SIHP # -2216, cobble and boulder paved area, Hanamā'ulu Stream is visible on the right, view to north

4.1.11 SIHP # 50-30-08-2217

SITE TYPE:	Terrace
FUNCTION:	Indeterminate
NO. OF FEATURES:	1
DIMENSIONS:	8.0 m long and 3.7 m wide
AGE:	Indeterminate
CONDITION:	Remnant

SITE DESCRIPTION:

SIHP # -2217 consists of a remnant terrace measuring 8.0 m northeast/southwest by 3.7 m northwest/southeast (see Figure 66 and Figure 81 through Figure 84). What remains of this site is constructed of small to large sub-angular boulders stacked one to three courses high for a maximum height of 0.71 m. The leveled area this terrace retains consists of soil and few large sub-angular basalt cobbles and boulders scattered about. The terrace is situated on a level area south of Hanamā'ulu Stream and just west of the southern platform of SIHP # -2212. Due to its unknown style of construction, determining function and possible age was difficult. In an attempt to gain an understanding of possible function and age, a shovel test (Shovel Test 7) was excavated in the interior of the terrace. No cultural materials were observed during excavation (see Section 4.2.7 for a detailed description of the shovel test).

Figure 81. SIHP # -2217, terrace, view to east

Figure 82. SIHP # -2217, terrace, view to southeast

Figure 83. SIHP # -2217, terrace, view to west

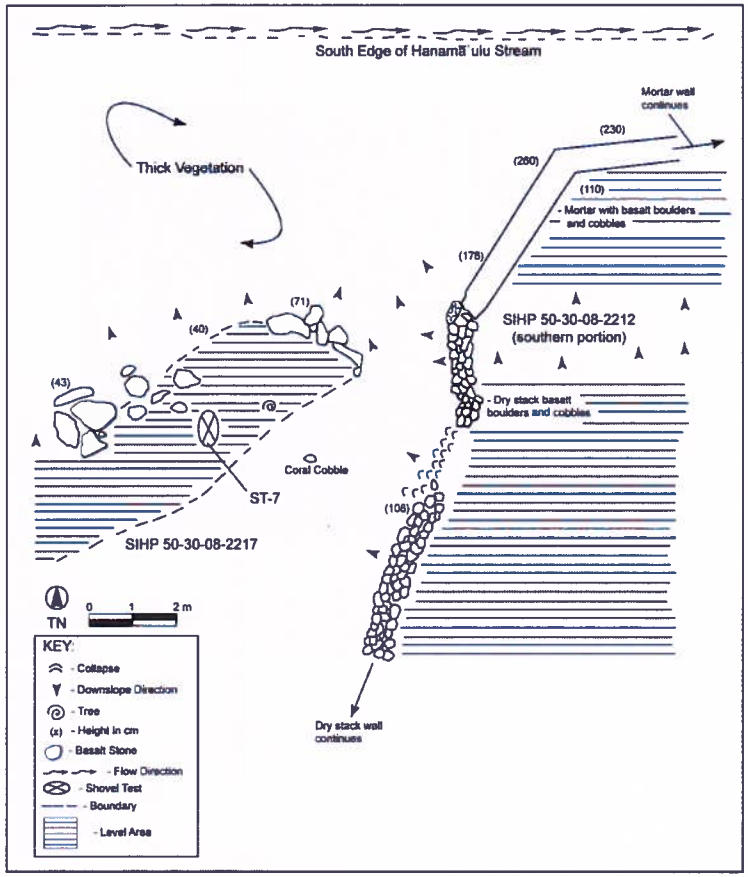


Figure 84. SIHP # -2217, plan map

4.2 Subsurface Testing

4.2.1 Shovel Test 1

Shovel Test 1 (ST-1) was excavated between the two terraces of SIHP # -2207B, on the southwest end of Terrace 1 and just to the east of Terrace 2 (see Figure 23 and Figure 85). The shovel test measured 0.68 m in length, 0.50 m in width, and 0.45 m deep (Figure 86). The stratigraphy of ST-1 consists of four layers, a modern A horizon, two possible road construction material layers, and a layer of sterile soil (Figure 87). No significant cultural materials were observed during excavation.

Figure 85. Location of of ST-1 within SIHP # -2207B, view to north

Figure 86. ST-1, photograph of northeast wall profile

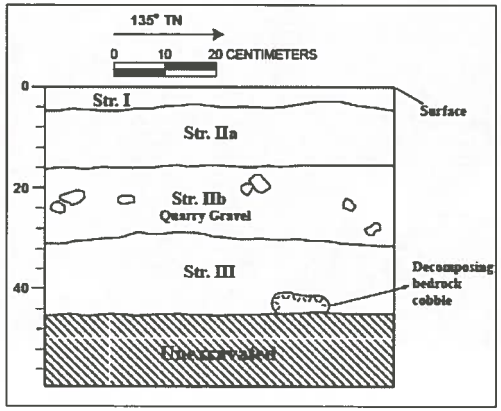


Figure 87. ST-1, northeast wall profile

ST-1 Stratigraphy

Stratum I: 0–5 cmbs	Modern A horizon; 10YR 3/3, dark brown; sandy clay loam; moderate grade; crumb type; moist, loose consistence; no cementation; plastic; terrigenous sediment origin; clear boundary; smooth topography; few fine to medium roots; modern bottle glass observed on surface (not collected)
Stratum IIa: 3–16 cmbs	Fill; 2.5YR 3/3, dark reddish brown; sandy clay; moderate medium size; crumb type; firm, moist consistence; strong cementation; plastic; mixed sediment origin; clear boundary; smooth topography; few fine to medium roots; contained small to large quarried coral pebbles; possibly related to an old road
Stratum IIb: 16–31 cmbs	Fill; 5YR 3/3, dark reddish brown; clay loam; moderate grade; medium size; crumb type; friable moist consistence; strong cementation; plastic; terrigenous sediment origin; clear boundary; smooth topography; few fine to medium roots; contained small to medium size gravel; possibly related to an old road
Stratum III: 29–45 cmbs	Natural; 2.5YR 3/3, dark reddish brown; silty clay; moderate grade; medium size; crumb type; friable moist consistence; strong cementation; plastic; terrigenous sediment origin; few fine roots; contained no cultural materials; decomposing bedrock present in profile

4.2.2 Shovel Test 2

Shovel Test 2 (ST-2) was excavated south of the rock alignment on the east side of SIHP # -2207C, Terrace 2 (see Figure 24 and Figure 88). The shovel test measured 0.60 m in length, 0.50 m in width, and 0.30 m deep (Figure 89). The stratigraphy of ST-2 consists of three layers, a modern A horizon, a possible old road surface remnant, and a layer of sterile soil (Figure 90). No significant cultural materials were observed during excavation.

Figure 88. Location of ST-2 within SIHP # -2207C, Terrace 2 area, view to southeast

Figure 89. ST-2, photograph of south wall profile

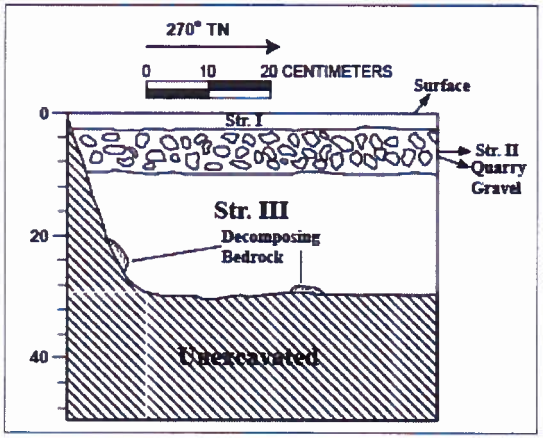


Figure 90. ST-2, south wall profile

ST-2 Stratigraphy

Stratum I: 0–3 cmbs	Modern A horizon; 10YR 2/2, very dark brown; sandy loam; weak grade; fine to medium size, granular type; loose, moist consistence; no cementation; slightly plastic; terrigenous sediment origin; clear boundary; smooth topography; few fine roots; modern trash consisting of plastic and plastic sheeting observed on surface (not collected)
Stratum II: 3–10 cmbs	Fill; 5YR 3/2, dark reddish brown; sandy loam; weak grade; medium size; crumb type; very friable, moist consistence; weak cementation; plastic; mixed sediment origin; clear boundary; smooth topography; common fine to medium roots; contained metal and glass fragments, bottle glass, and branch coral (not collected); approx. 80% of the layer was of quarry gravel, possibly an old road surface
Stratum III: 10–30 cmbs	Natural; 2.5YR 3/2, dusky red; silty clay; moderate grade; medium size; crumb type; friable, moist consistence; strong cementation; plastic; terrigenous sediment origin; few fine to medium roots; contained no cultural materials; decomposing bedrock present in profile

4.2.3 Shovel Test 3

Shovel Test 3 (ST-3) was excavated east of the rock alignment on the east side of SIHP # -2207C, Terrace 2 (see Figure 24 and Figure 91). The shovel test measured 0.69 m long, 0.65 m wide, and 0.30 m deep (Figure 92). The stratigraphy of ST-3 consists of three layers, a modern A horizon, a remnant of a possible old road surface, and a layer of sterile soil (Figure 93). No cultural materials were observed during excavation.

Figure 91. Location of ST-3 within SIHP # -2207C area, view to northwest

Figure 92. ST-3, photograph of north wall profile

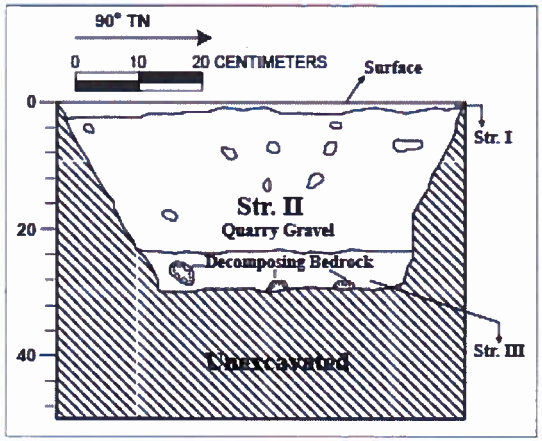


Figure 93. ST-3, north wall profile

ST-3 Stratigraphy

Stratum I: 0–3 cmbs	Modern A horizon; 10YR 2/2, very dark brown; sandy loam; weak grade; fine to medium size; granular type; loose, moist consistence; no cementation; slightly plastic; terrigenous sediment origin; clear boundary; smooth topography; few fine roots; contained some quarry gravel on the surface
Stratum II: 1–24 cmbs	Fill; 5YR 3/2, dark reddish brown; sandy loam; weak grade; medium size; crumb type; very friable, moist consistence; weak cementation; slightly plastic; terrigenous sediment origin; diffuse boundary; smooth topography; common fine to medium roots; contained two unidentified marine shell fragments; approx. 10%–15% of the layer was quarry gravel, possibly a remnant of an old road surface
Stratum III: 24–30 cmbs	Natural; 2.5YR 3/3, dark reddish brown; silty clay; moderate grade; medium size; crumb type; friable, moist consistence; strong cementation; plastic; terrigenous sediment origin; few fine to medium roots; contained no cultural materials; decomposing bedrock present in profile

4.2.4 Shovel Test 4

Shovel Test 4 (ST-4) was excavated in the interior of SIHP # -2207C, Terrace 2, between the terrace and the alignment (see Figure 24 and Figure 94). The shovel test measured 0.59 m long, 0.50 m wide, and 0.26 m deep (Figure 95). The stratigraphy of ST-4 consists of three stratigraphic layers, a modern A horizon, a fill layer, and a layer of sterile soil (Figure 96). No significant cultural materials were observed during excavation.

Figure 94. Location of ST-4 within the SIHP # -2207C, Terrace 2 area, view to west

Figure 95. ST-4, photograph of south wall profile

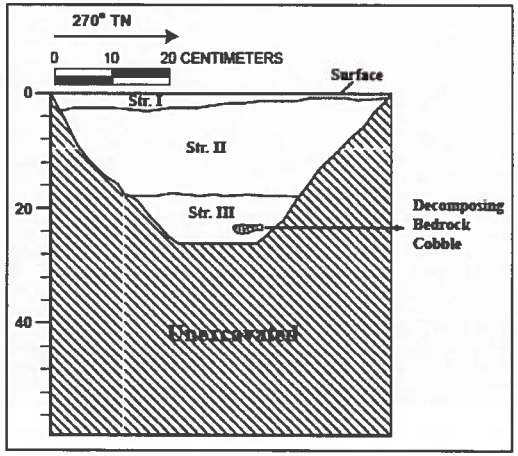


Figure 96. ST-4, south wall profile

ST-4 Stratigraphy

Stratum I: 0–3 cmbs	Modern A horizon; 10YR 2/2, very dark brown; sandy loam; weak grade; fine to medium size; granular type; loose, moist consistence; no cementation; slightly plastic; terrigenous sediment origin; clear boundary; smooth topography; few fine roots; contains very little quarry gravel on the surface
Stratum II: 1–18 cmbs	Fill; 5YR 3/2, dark reddish brown; sandy loam; moderate grade; medium size; crumb type; very friable, moist consistence; weak cementation; slightly plastic; terrigenous sediment origin; diffuse boundary; smooth topography; common fine to medium roots; contained bottle glass fragments (not collected)
Stratum III: 18–26 cmbs	Natural; 2.5YR 3/3, dusky red; silty clay; moderate grade; medium size; crumb type; friable, moist consistence; strong cementation; plastic; terrigenous sediment origin; few fine to medium roots; contained no cultural materials; decomposing bedrock present in profile

4.2.5 Shovel Test 5

Shovel Test 5 (ST-5) was excavated just east of SIHP # -2211A (see Figure 57 and Figure 97). The shovel test measured 0.61 m long, 0.46 m wide, and 0.32 m deep (Figure 98). The stratigraphy of ST-5 consists of three stratigraphic layers, all of which were culturally sterile (Figure 99). No cultural materials were observed during excavation of this shovel test.

Figure 97. Location of ST-5 near SIHP # -2211A, view to west

Figure 98. ST-5, photograph of south wall profile

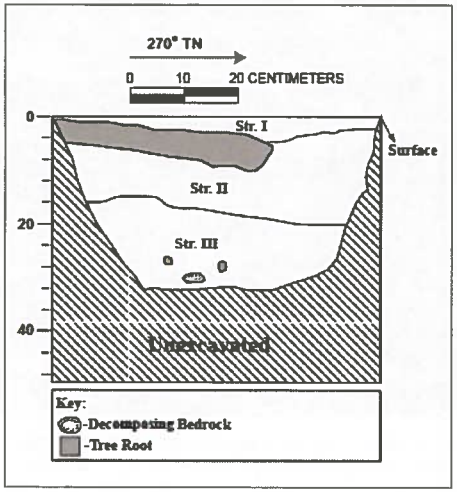


Figure 99. ST-5, south wall profile

ST-5 Profile south wall

Stratum I: 0–4 cmbs	Modern A horizon; 10YR 2/2, very dark brown; sandy clay; weak grade; coarse size; crumb type; loose, moist consistence; weak cementation; slightly plastic; terrigenous sediment origin; diffuse boundary; wavy topography; few fine to medium roots; contained no cultural materials
Stratum II: 2–20 cmbs	Natural; 7.5YR 2.5/3, very dark brown; clay loam; moderate grade; medium size; crumb type; friable, moist consistence; weak cementation; plastic; terrigenous sediment origin; clear boundary; wavy topography; few fine to medium roots; contained no cultural materials
Stratum III: 15–32 cmbs	Natural; 5YR 3/3, dark reddish brown; silty clay; moderate grade; medium size; crumb type; firm, moist consistence; strong cementation; plastic; terrigenous sediment origin; few fine to medium roots; contained no cultural materials; decomposing bedrock present in profile

4.2.6 Shovel Test 6

Shovel Test 6 (ST-6) was excavated in the center of the SIHP # -2216 ditch on the south end (Figure 100). The shovel test dimensions measured 0.50 m long, 0.45 m wide, and 0.63 m deep (Figure 101). The stratigraphy of ST-6 consists of four stratigraphic layers, all of which were culturally sterile (Figure 102). No cultural materials were observed during excavation.

Figure 100. Location of ST-6 in the middle of SIHP # -2216, view to west

Figure 101. ST-6, photograph of west wall profile

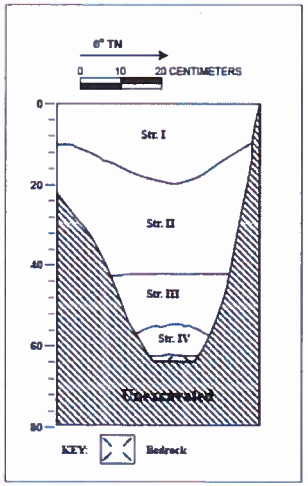


Figure 102. ST-6, west wall profile

ST-6 Stratigraphy

Stratum I: 0–20 cmbs	Modern A horizon; 7.5YR 2.5/2, very dark brown; silty clay loam; moderate grade; medium size; crumb type; friable, moist consistence; weak cementation; plastic; terrigenous sediment origin; clear boundary; wavy topography; common fine to medium roots; contained no cultural materials
Stratum II: 10–43 cmbs	Natural; 5YR3/3, dark reddish brown; clay loam; moderate grade; medium size; crumb type; friable, moist consistence; weak cementation; slightly plastic; terrigenous sediment origin; abrupt boundary; smooth topography; few fine to medium roots; contained no cultural materials
Stratum III: 43–58 cmbs	Natural; 5YR 4/3, reddish brown; clay; moderate grade; very coarse size; blocky type; very friable moist consistence; strong cementation; slightly plastic; terrigenous sediment origin; abrupt boundary; wavy topography; contained no cultural materials
Stratum IV: 55–63 cmbs	Natural; 2.5YR 3/3, dark reddish brown; sandy clay; weak grade; medium size; crumb type; very friable moist consistence; weak cementation; slightly plastic; terrigenous sediment origin; abrupt boundary; wavy topography; contained no cultural materials; decomposing bedrock present in profile

4.2.7 Shovel Test 7

Shovel Test 7 (ST-7) was excavated in the interior of the SIHP # -2217 terrace (see Figure 84 and Figure 103). The shovel test measured 0.57 m long, 0.47 m wide, and 0.51 m deep (Figure 104). The stratigraphy of ST-7 consists of three stratigraphic layers, two of which are modern deposits and the last is natural and culturally sterile (Figure 105). No cultural materials were observed during excavation.

Figure 103. Location of ST-7 within SIHP # -2217, view to northwest

Figure 104. ST-7, photograph of west wall profile

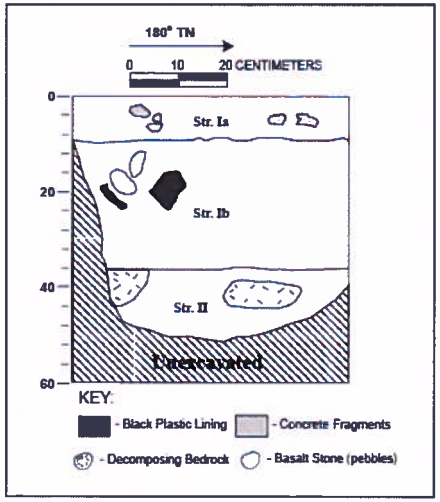


Figure 105. ST-7, east wall profile

ST-7 Stratigraphy

Stratum Ia: 0–9 cmbs	Fill/modern A horizon; 7.5YR 2.5/2, very dark brown; silty clay loam; moderate grade; medium size; crumb type; very friable, moist consistence; weak cementation; plastic; terrigenous sediment origin; diffuse boundary; smooth topography; few medium roots; contained concrete fragments (not collected)
Stratum Ib: 9–36 cmbs	Fill; 2.5YR 2.5/3, dark reddish brown; silty clay loam; moderate grade; medium size; crumb type; friable, moist consistence; weak cementation; plastic; terrigenous sediment origin; diffuse boundary; smooth topography; contained medium-size rounded pebbles and black plastic lining
Stratum II: 26–51 cmbs	Natural; 2.5YR 3/3, dark reddish brown; clay loam; moderate grade; medium to coarse size; crumb type; friable, moist consistence; strong cementation; slightly plastic; terrigenous sediment origin; contained no cultural materials; decomposing bedrock present in profile

Section 5 Summary and Interpretation

It is known through LCA documentation that there were pre-Contact residents scattered within the current project area. All of the residents were located on the south side of the present Hanamā'ulu (Kapaia) Stream Bridge.

The results for this archaeological inventory survey are consistent with expectations set forth by background research—that any findings were likely to be historic and that it was unlikely dense cultural resources would be found in the area. There were 11 cultural resources identified during the present investigation. They are of historic and indeterminate age. The identified cultural resources are situated closely around the present Hanamā'ulu (Kapaia) Stream Bridge.

The located cultural resources are most likely associated with the sugar plantation and plantation camps. The majority of the sites deal with transportation, whether mechanical, pedestrian, or water. It is extremely likely that any structures from pre-Contact times and many of those from various stages of the historic sugar plantation were destroyed.

Due to the terrain in most of the project area, as well as inaccessibility of private property, backhoe trenching could not be conducted during this archaeological survey. However, shovel tests were performed at select sites. Seven shovel tests were completed near and/or in four of the identified cultural resources. All of the shovel test results followed the same pattern. The number of strata in all of the shovel test units varied from three to four layers. In all shovel tests, Stratum I consisted of a modern A horizon. The middle strata generally consisted of previously disturbed layers. In the case of ST-6, previous disturbance was caused by flowing water, and in the cases of ST-1, ST-2, ST-3, and ST-7, previous disturbance was caused by construction. The last stratum in all cases was sterile soil with decomposing bedrock.

Although no pre-Contact cultural materials were observed in any of the shovel test units, there was some evidence of a possible old historic road in ST-1 through ST-3 on the southeast side of the project area. No significant historic cultural material remains and/or concentrated deposits were encountered in a subsurface context on the north side of Hanamā'ulu (Kapaia) Stream Bridge.

Section 6 Significance Assessments

Cultural resource significance is evaluated and expressed as eligibility for listing on the National Register of Historic Places. To be considered eligible for listing on the National Register, a cultural resource must possess integrity of location, design, setting, materials, workmanship, feeling, and/or association and meet one or more of the following broad cultural/historic significance criteria (in accordance with 36 CFR 60.4 and HAR §13-275-6):

A. Reflects major trends or events in the history of the state or nation.

B. Associated with the lives of persons significant in our past.

C. Excellent example of a site type/work of a master.

D. Has yielded, or may be likely to yield, information important in prehistory or history.

Eleven cultural resources were identified within the current project area. Table 4 lists the cultural resources along with their significance/eligibility assessments (based on the guidance and definitions from National Register Bulletin #15) and mitigation recommendations. These significance recommendations are included in this AISR for the review and concurrence of the SHPD.

Table 4. Description of cultural resources encountered within the current project area

SIHP #	Description	Significance/ Eligibility	Integrity (Yes/No)							Mitigation Recommendation
		National Register	Location	Design	Setting	Materials	Workmanship	Feeling	Association	
50-30-11-2207	Ditch and terraces	D	Y	Y	N	Y	Y	N	N	No further work
50-30-08-2208	Retaining wall	D	Y	Y	Y	Y	Y	N	N	No further work
50-30-08-2209	Ditch complex	D	Y	Y	N	Y	Y	N	N	No further work
50-30-08-2210	Road	D	Y	N	N	Y	Y	N	N	No further work
50-30-08-2211	Terrace and alignment	D	Y	N	N	Y	N	N	N	No further work

SIHP #	Description	Significance/ Eligibility	Integrity (Yes/No)							Mitigation Recommendation
		National Register	Location	Design	Setting	Materials	Workmanship	Feeling	Association	
50-30-08-2212	Platform – road and bridge landing	D	Y	Y	Y	Y	Y	N	N	No further work
50-30-08-2213	Wall	D	Y	Y	Y	Y	Y	N	N	No further work
50-30-08-2214	Retaining wall	D	Y	Y	Y	Y	Y	N	N	No further work
50-30-08-2215	Bridge	D	Y	Y	Y	Y	Y	N	N	No further work
50-30-08-2216	Ditch	D	Y	N	N	Y	Y	N	N	No further work
50-30-08-2217	Terrace	D	Y	N	N	Y	N	N	N	No further work

Section 7 Project Effect and Mitigation Recommendations

In accordance with federal regulations (36 CFR 800.5), CSH's project-specific effect recommendation is "adverse effect." Under Hawai'i State historic preservation review legislation, the project's effect recommendation is "effect, with agreed upon mitigation commitments" (in accordance with HAR §13-284-7).

The 11 cultural resources documented within the project area will be, or potentially may be, affected by the proposed project. However, no further historic preservation work is recommended. Sufficient information regarding the location, extent, function, age, and construction methods of these cultural resources has been generated during the current AIS investigation to mitigate any adverse effect caused by proposed development activities. The 11 cultural resources were documented with detailed written descriptions, scaled drawings, and photographs, and select sites were tested.

In the unlikely event that previously unidentified cultural resources are encountered during project construction, the project proponents should immediately stop work in the vicinity and contact the SHPD.

Section 8 References Cited

Alexander, William Patterson
1933 *A Tour of Kauai in 1849. Private Journal of William DeWitt Alexander.* Kaua'i Historical Society Paper #57. Reprinted in *The Kauai Papers*, 1991. Kaua'i Historical Society, Līhu'e, Kaua'i.

Bennett, Wendell C.
1931 *The Archaeology of Kaua'i.* Bishop Museum Bulletin No. 80. Bernice Pauahi Bishop Museum, Honolulu.

Bingham, Hiram
1847 *A Residence of Twenty-One Years in the Sandwich Islands.* Convers, New York.

Chinen, Jon J.
1958 *The Great Mahele: Hawaii's Land Division of 1848.* University of Hawaii Press, Honolulu.

Condé, Jesse C., and Gerald M. Best
1973 *Sugar Trains, Narrow Gauge Rails of Hawai'i.* Glenwood Publishers, Felton, California.

Creed, Victoria S., Loren Zulick, Gerald K. Ida, David W. Shideler, and Hallett H. Hammatt
2006 *Archaeological Assessment of the Proposed Līhu'e Airport Expansion Area, Hanamā'ulu and Kalapakī Ahupua'a, Līhu'e District, Island of Kaua'i (TMK 3-5-01: 5, 6, 8, 9, 109, 111, and 158 and 3-7-02: Por. 1).* Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Damon, Ethel M.
1931 *Koamalu.* 2 volumes. Privately printed at the Honolulu Star-Bulletin Press, Honolulu.

Dega, Michael and James Powell
2003 *Archaeological Monitoring During Phase I of the Kaua'i Rural Fiber Optic Duct Lines Project, Kaua'i Island, Hawai'i.* Scientific Consulting Services, Honolulu.

Dickey, Lyle
1917 *Stories of Wailua.* Published in six consecutive installments beginning 29 June 2015. *Garden Island*, Lihu'e, Kaua'i, Hawai'i.

Dye, Thomas S. and Elaine Rogers Jourdane
2006 *Archaeological Assessment for the Proposed Cingular Wireless Kalepa Grove Farm Cell Site No. KAUIHI0121, Hanama'ulu, Lihu'e, Kaua'i Island, Hawai'i, TMK:(4)3-8-002:005 por.* T.S. Dye & Colleagues, Archaeologists, Inc., Honolulu.

Foote, Donald E., E.L. Hill, S. Nakamura, and F. Stephens
1972 *Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai and Lanai.* State of Hawaii, U.S. Dept. of Agriculture, U.S. Government Printing Office, Washington, D.C.

Fornander, Abraham
1918 *Fornander's Collection of Hawaiian Antiquities and Folklore.* Vol. V, Part I. Bishop Museum Press, Honolulu.

Franklin, Leta J. and Alan T. Walker
1994 *Additional Archaeological Inventory Survey, Molokoa Lands Project Area, Lands of Hanama'ulu and Kalapakī, Lihu'e District, Island of Kauai.* Paul H. Rosendahl, Ph.D., Inc., Hilo, Hawai'i.

Genz, Joesph H., Nicole Ishihara, Mahealani Liborio, and Hallett H. Hammatt
2013 *Draft Cultural Impact Assessment for the Replacement of Hanamā'ulu Stream (Kapaia) Bridge Project, Kūhiō Highway, Approximately between Milepost 1.1 and 1.3, Hanamā'ulu Ahupua'a, Līhu'e District (Puna Moku), Kaua'i Island, TMK [4] 3-7-001:001 por., 3-7-004:009 por., 3-8-002:001 por., 3-8-002:012 por., 3-8-002:999 por., & 3-8-006:999 por.* Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Google Earth
2005 Aerial photographs of Hawai'i. Google Inc., Mountain View, California. Available online at www.google.com/earth.html.

Handy, E.S. Craighill
1940 *The Hawaiian Planter, Volume 1.* Bishop Museum Bulletin No. 161. Bernice Pauahi Bishop Museum, Honolulu.

Hawai'i TMK Service
2009 Tax Map Key [4] 3-7-001, 3-8-002. Hawai'i TMK Service, Honolulu.

Hawaiian Government Survey
1878 Map of Kaua'i. Hawai'i Land Survey Division, Department of Accounting and General Services, Honolulu.

HEN (Hawaiian Ethnological Notes)
1885 *Record of a tour of Kauai (heiaus and fishing grounds), Wailua, September 14, 1885.* Translated by Mary Pukui. Lahainaluna Students Contributions, No. 19. Hms. Misc. 43 in Hawaiian Ethnological Notes (HEN) 1:217–22. Bishop Museum Archives, Honolulu.

Hommon, Robert J.
1976 The Formation of Primitive States in Pre-Contact Hawai'i. Ph.D. Dissertation, University of Arizona, Tucson.

Kaua'i Historical Society
1991 *The Kauai Papers.* Kaua'i Historical Society, Līhu'e, Kaua'i, Hawai'i.

Kame'eleihiwa, Lilikala
1992 *Native Land and Foreign Desires: Pehea LA E Pono Ai? How Shall We Live in Harmony?* Bishop Museum Press, Honolulu.

Kelsey, Theodore
n.d. Kaua'i Place Names. Unpublished manuscript, Kelsey Collection, Hawai'i State Archives, Honolulu.

Macdonald, G.A., A.T. Abbott, and Frank L. Peterson
1983 *Volcanoes in the Sea.* Second edition. University of Hawaii Press, Honolulu.

Mason Architects
1989 *Historic Bridge Inventory: Island of Kauai.* Mason Architects, Inc., Honolulu.

McMahon, Nancy
1990 *Archaeological Fieldcheck of Three Parcels in Lihue Judiciary District: Possible Locations for a New Kaua'i Judiciary Building, Nawiliwili, Kalapakī, and Hanamā'ulu, Kaua'i.* Historic Preservation Program, State of Hawai'i, Honolulu.

Moffat, Riley M. and Gary L. Fitzpatrick
1995 *Surveying the Māhele: Mapping the Hawaiian Land Revolution* (Palapala'aina Vol. 2). Editions Limited, Honolulu.

OHA (Office of Hawaiian Affairs)
2011 Papakilo Database at www.papakilodatabase.com (accessed 8 May 2013).

Poepoe, Joseph M.
1908 Ka Moolelo Kaaoohiiaka-I-Ka-Poli-O-Pele. *Ku'oko'a* 24 April.

Pukui, Mary Kawena
1983 *'Ōlelo No'eau: Hawaiian Proverbs and Poetical Sayings.* Bishop Museum Special Publication No. 71. Bishop Museum Press, Honolulu.

Rice, Mary A. Girvin
1914 History of Lihue. Typescript of a talk presented 17 December 1914 to the Kauai Historical Society. Reprinted in *The Kauai Papers.* Kauai Historical Society, Līhu'e, Kaua'i, Hawai'i.

Rice, William Hyde
1923 *Hawaiian Legends.* Bernice Pauahi Bishop Museum, Honolulu.

Thrum, Thomas G.
1906 Heiaus and Heiau Sites throughout the Hawaiian Islands. In *The Hawaiian Almanac and Annual for 1907.* Thos. G. Thrum, Honolulu.

USDA (U.S. Department of Agriculture)
2001 Soil Survey Geographic (SSURGO) database. U.S. Department of Agriculture, Natural Resources Conservation Service. Fort Worth, Texas. http://www.ncgc.nrcs.usda.gov/products/datasets/ssurgo/.

U.S. Geological Survey
1910 Lihue USGS 7.5-minute topographic quadrangle. USGS Information Services, Denver, Colorado.

1963 Lihue and Kapaa USGS 7.5-minute topographic quadrangles. USGS Information Services, Denver, Colorado.

1996 Lihue and Kapaa USGS 7.5-minute topographic quadrangles. USGS Information Services, Denver, Colorado.

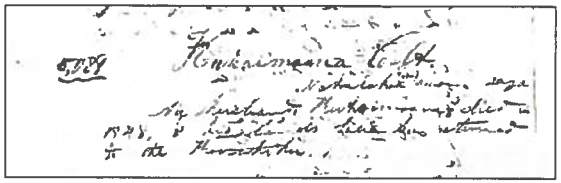
1977/1978 USGS Orthophoto, Līhu'e and Kapa'a Quadrangles. USGS Information Services, Denver, Colorado.

Waihona 'Aina Corporation
2000 *The Māhele Database.* Available online at www.waihona.com (accessed 8 May 2013).

Walker, Alan T., Lehua Kalima, and Susan T. Goodfellow
1991 *Archaeological Inventory Survey Lihue Puhi Hanamaulu Master Plan, Lands of Hanamaulu, Kalapaki, Nawiliwili, and Wailua, Lihue District, Island of Kauai (TMK 4-3-2; 4-3-3; 4-3-9).* Paul H. Rosendahl, Ph.D., Inc., Hilo, Hawai'i.

Wichman, Frederick B.
1998 *Kaua'i: Ancient Place-Names and Their Stories.* University of Hawai'i Press, Honolulu.

Appendix A LCA 5089 Documents



LCA 5089 Foreign Testimony document for Kuhaimoana (Papakilo Database)

Waihona 'Aina

Review Cart & Checkout

Document Delivery

Mahele Database Documents
Number: 05089

Claim Number:	05089		
Claimant:	Kuhaimoana		
Other claimant:	Nahulekoa, wahine		
Other name:			
Island:	Kauai		
District:	Koolau		
Ahupuaa:	Anahola, Hanamaulu		
Ili:			
Apana:	1	Awarded:	1
Loi:	2	FR:	
Plus:		NR:	131v9
Mala Taro:		FT:	197v12
Kula:		NT:	
House lot:		RP:	4159
Kihapai/Pakanu:		Number of Royal Patents:	1
Salt lands:		Koele/Poalima:	No
Wauke:	1	Loko:	No
Olona:		Lokoia:	No
Noni:	6	Fishing Rights:	No
Hala:		Sea/Shore/Dunes:	No
Sweet Potatoes:		Auwai/Ditch:	No
Irish Potatoes:		Other Edifice:	No
Bananas:		Spring/Well:	No
Breadfruit:	1	Pigpen:	No
Coconut:		Road/Path:	No
Coffee:		Burial/Graveyard:	No

Māhele Database Document for Kuhaimoana page 1 (Waihona 'Aina)

Oranges:	1	Wall/Fence:	No
Bitter Melon/Gourd:		Stream/Muliwai/River:	No
Sugar Cane:		Pali:	No
Tobacco:		Disease:	No
Koa/Kou Trees:	2	Claimant Died:	Yes
Other Plants:		Other Trees:	
Other Mammals:	No	Miscellaneous:	See claim 3641 for documentation for Hanamaulu; Award 5089 listed for Hanamaulu; testimony for Anahola, but says land returned to konohiki!

No. 5089, Kuhaimoana, Anahola, Kauai, January 12, 1848
N.R. 131v9

The Land Commissioners, greetings: I hereby state my claim for land in the land of Anahola, island of Kauai. There are two lo`i, six mala of noni, one mala of wauke, and the planted trees: 2 kou, 1 orange and 1 breadfruit.
KUHAIMOANA X

F.T. 197v12
No. 5089, Kuhaimoana, Claimant

Nahulekoa (wahine), sworn says, My husband Kuhaimooana died in 1848, & his lands have been returned to the Konohiki.

No. 3641, Kuhaimoana, Kapaia, Kauai, January 14, 1848
N.R. 82v9
[should be 5089]

Greetings to the Land Commissioners, I, Kuhaimoana, a Hawaiian subject living at Kapaia on the Island of Kauai, hereby state my claim for land. I have seven lo`i, lying from the east to the northeast, with a small kula adjoining on the northwest. I received these from Paulo Kanoa.
KUHAIMOANA

F.T. 153v13
No. 3641, Kuhaimoana

Māhele Database Document for Kuhaimoana page 2 (Waihona 'Aina)

Kailihania, sworn says, I know the land of claimant. It lies in Hanamaulu, & lies in two pieces as follows:

No. 1. contans six lois in the ili Kapaia
No. 2. house lot & is in the same ili.

No. 1:
Mauka by a loi called Hoku
Wailua by auwai of Hanamaulu
Makai by kula
K. [Kalapaki or Kona] by kula.

No. 2:
Mauka, land of H.A. Peirce & Co.
Wailua, land of H.A. Peirce & Co.
Makai, land of H.A. Peirce & Co.
Nawiliwili, land of H.A. Peirce & Co.

Claimant had his land from Deo in the days of Kaikioewa, & has held it ever since & witness has never heard of any dispute about the claim.

Keo, sworn, verifies the testimony of the former witness & says his testimony is all true.

N.T. 174v13
No. 3641, Kuhaimoana

Kailihania, sworn, he has seen claimant's land in the ili of Kapaia. Five lois lying together, one loi makai.

Mauka, loi
Wailua, Hanamaulu ditch
Makai, pasture
Kona, pasture.

Kahaimoana's house lot: Mauka and all around, Goverment pasture.

Living there has been since Keo to Kaikioewa and he has been without fault to the present time.

Keo, sworn, he was present, he heard Kailihania's report. It is true.

[No. 5089; R.P. 4159; Hanamaulu Puna; 3 ap.; 3 roods 17 rods; See also 3641 in Numerical index refers to 3691 but 3691 is in Kaanapali Maui; note award in Hanamaulu to Kuhaimoana is award 5089; R.P. 4159]

Māhele Database Document for Kuhaimoana page 3 (Waihona 'Aina)

APPENDIX D

Pre-Assessment Consultation Comment and Response Letters

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

RECEIVED
2016 DEC 27 PM 12:54
DOT HWYS DIV
KAUAI DISTRICT

December 20, 2016

SUBJECT: Preliminary Jurisdictional Determination for Replacement of Hanamaulu Stream Kapaia Bridge (Route 56), Lihue, Island of Kauai, HI, DA File No. POH-2016-00247

Raymond McCormick
Hawaii Department of Transportation
Highways Division, Kauai District Office
1720 Haleukana Stree
Lihue, Hawaii 96766

Dear Mr. McCormick:

The U.S. Army Corps of Engineers, Honolulu District (Corps), is in receipt of your letter dated December 1, 2016 for the Replacement of Hanamaulu Stream Kapaia Bridge (Route 56), located in Lihue, Island of Kauai, HI. Your project has been assigned Department of the Army (DA) file number POH-2016-00247. Please reference this number in all future correspondence concerning this determination. The project area reviewed by the Corps and addressed in this letter and accompanying documentation is shown in Enclosure 1.

We have completed review of your submittal pursuant to Section 404 of the Clean Water Act (Section 404) and Section 10 of the Rivers and Harbors Act of 1899 (Section 10). Section 404 requires authorization prior to the discharge and/or placement of dredged or fill material into waters of the U.S., including adjacent wetlands. Section 10 requires authorization prior to installing structures or conducting work in, over, under, and affecting navigable waters.

Based on our review of your submittal, we have preliminarily determined that the Hanamaulu Stream may be a water of the U.S. under the regulatory jurisdiction of the Corps. In accordance with Section 404, a Department of the Army (DA) permit will be required for any activity resulting in the discharge and/or placement of dredged of fill material into the Hanamaulu Stream.

Based on our review of your submittal, we have preliminarily determined that the proposed project may qualify for a Nationwide Permit (NWP) #14, Linear Transportation Projects. The terms and conditions for this NWP can be found on the Honolulu Regulatory Branch website:
http://www.poh.usace.army.mil/Missions/Regulatory/Permits/Types-of-Permits/.

This letter contains a preliminary jurisdictional determination (JD), which is a written indication that wetlands and waterways within your project area may be waters of the U.S. (Enclosure 2). For the purpose of calculating impacts, compensatory mitigation requirements, and other resource protection measures, a permit decision made on the basis of a preliminary JD will treat all waters and wetlands that would be affected by the permitted activity on the site as if they are jurisdictional waters of the U.S. If you concur with the findings of the preliminary JD, please sign it and return it to the following address within two weeks. If you believe the preliminary JD is inaccurate, you may request an approved JD, which is an official determination regarding the presence or absence of waters of the United States by submitting a letter to the address below. Please reference the DA File Number and provide any information valuable for the reevaluation of your jurisdictional determination.

Honolulu District
U.S. Army Corps of Engineers
Regulatory Office, Building 230
Fort Shafter, Hawaii 96858-5440

This determination has been conducted to identify the limits of the Corps' Clean Water Act jurisdiction for the particular site identified in this request. This determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985. If you or your tenant are USDA program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service prior to starting work.

Thank you for your cooperation with the Honolulu District Regulatory Program. Should you have any questions related to this determination, please contact this office at 808-835-4303 or via e-mail at CEPOH-RO@usace.army.mil. You are encouraged to provide comments on your experience with the Honolulu District Regulatory Office by accessing our web-based customer survey form at http://corpsmapu.usace.army.mil/cm_apex/f?p=136:4:0.

Sincerely,

MCELWAIN.TUNI S.W.1239553008

Tunis W. McElwain
Chief, Regulatory Office

Enclosure(s)

US Army Corps of Engineers, Honolulu District

PRELIMINARY JURISDICTIONAL DETERMINATION FORM

File Number: POH-2016-00247
Project Title: Replacement of Hanamaulu Stream Kapaia Bridge (Route 56), Lihue, Island of Kauai, HI
Subject: PRELIMINARY JURISDICTIONAL DETERMINATION FORM

This preliminary jurisdictional determination (JD) finds that there "*may be*" waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

A. REPORT COMPLETION DATE FOR PRELIMINARY JURSDICTIONAL DETERMINATION: 15 December 2016

B. NAME AND ADDRESS OF PERSON REQUESTING PRELIMINARY JD:
Raymond McCormick
Hawaii Department of Transportation
Highways Division, Kauai District Office
1720 Haleukana Stree
Lihue, Hawaii 96766

C. DISTRICT OFFICE: Honolulu District, CEPOH-RO
FILE NAME: Replacement of Hanamaulu Stream Kapaia Bridge (Route 56), Lihue, Island of Kauai, HI
FILE NUMBER: POH-2016-00247

D. PROJECT LOCATION(S), BACKGROUND INFORMATION, AND WATERS:
State or Territory: Hawaii
City: Lihue
County: Island of Kauai
Center Coordinates of Site: 21.9919, -159.3651
Name of nearest waterbody: Hanamaulu
Identify the amount of waters in the review area:
- ☒ Non-wetland waters: 0.02 acres.
  Cowardin Classification: R2UB- Riverine
- ☐ Wetlands: 0 acres
  Cowardin Classification:
- ☐ Other:

Name of any water bodies on the site that have been identified as Section 10 waters:
Tidal:
Non-Tidal:

E. REVIEW PERFORMED FOR SITE EVALUATION:
- ☒ Office (Desk) Determination. Date: 15 December 2016
- ☐ Field Determination. Date(s):

F. EXPLANATION OF PRELIMINARY AND APPROVED JURISDICTIONAL DETERMINATIONS:

1. The Corps of Engineers believes that there may be jurisdictional waters of the United States on the subject site, and the permit applicant or other affected party who requested this preliminary JD is hereby advised of his or her option to request and obtain an approved jurisdictional determination (JD) for that site. Nevertheless, the permit applicant or other person who requested this preliminary JD has declined to exercise the option to obtain an approved JD in this instance and at this time.

2. In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "pre-construction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an approved JD for the activity, the permit applicant is hereby made aware of the following: (1) the permit applicant has elected to seek a permit authorization based on a preliminary JD, which does not make an official determination of jurisdictional waters; (2) that the applicant has the option to request an approved JD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an approved JD could possibly result in less compensatory mitigation being required or different special conditions; (3) that the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) that the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) that undertaking any activity in reliance upon the subject permit authorization without requesting an approved JD constitutes the applicant's acceptance of the use of the preliminary JD, but that either form of JD will be processed as soon as is practicable; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a preliminary JD constitutes agreement that all wetlands and other water bodies on the site affected in any way by that activity are jurisdictional waters of the United States, and precludes any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an approved JD or a preliminary JD, that JD will be processed as soon as is practicable. Further, an approved JD, a proffered individual permit (and all terms and conditions contained therein), or individual

permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331, and that in any administrative appeal, jurisdictional issues can be raised (see 33 C.F.R. 331.5(a)(2)). If, during that administrative appeal, it becomes necessary to make an official determination whether CWA jurisdiction exists over a site, or to provide an official delineation of jurisdictional waters on the site, the Corps will provide an approved JD to accomplish that result, as soon as is practicable.

G. SUPPORTING DATA:

Data reviewed for preliminary JD (check all that apply - checked items should be included in case file and, where checked and requested, appropriately reference sources below):

☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: Map and plans submitted 12 December 2016
☐ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
  ☐ Office concurs with data sheets/delineation report.
  ☐ Office does not concur with data sheets/delineation report.
☐ Data sheets prepared by the Corps: .
☐ Corps navigable waters' study:
☐ U.S. Geological Survey Hydrologic Atlas:
  ☐ USGS NHD data.
  ☐ USGS 8 and 12 digit HUC maps.
☐ U.S. Geological Survey map(s). Cite quad name:
☒ USDA Natural Resources Conservation Service Soil Survey. Citation: http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm 15 December 2016
☒ National wetlands inventory map(s). Cite name: https://www.fws.gov/wetlands/Data/Mapper.html 15 December 2016
☐ State/Local wetland inventory map(s): .
☐ FEMA/FIRM maps
☐ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
☒ Photographs: ☒ Aerial (Name & Date): GoogleEarthPro 16 Dec 2013
  or ☐ Other (Name & Date): .
☐ Previous determination(s). File no. and date of response letter:
☐ Other information (please specify):

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

MCELWAIN.TUNIS.W.1239553008

Rebecca Frager
Regulatory Project Manager

Raymond McCormick
Hawaii Department of Transportation

Signature and date of person requesting preliminary JD

DAVID Y. IGE
GOVERNOR

FORD N. FUCHIGAMI
DIRECTOR

Deputy Directors
JADE T. BUTAY
ROSS M. HIGASHI
EDWIN H. SNIFFEN
DARRELL T. YOUNG

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
KAUAI DISTRICT
1720 HALEUKANA STREET
LIHUE, HAWAII 96766

IN REPLY REFER TO
HWY-K 4.170007

January 9, 2017

Mr. Tunis W. McElwain
Chief, Regulatory Office
Department of the Army
U.S. Army Corps of Engineers
Honolulu District
Fort Shafter, Hawai'i 96858-5440

Dear Mr. McElwain:

Subject: Pre-Assessment Consultation
Draft Environmental Assessment (EA)
Kapaia Bridge Replacement
Hanamā'ulu, Island of Kaua'i, Hawai'i
TMK (4) 3-8-02:999 (por.), 001 (por.), 012; (4) 3-7-01:001 (por.); (4) 3-7-04:009 (por.); (4) 3-8-06:999 (por.)

Thank you for your letter dated December 20, 2016 (POH-2016-00247) regarding the subject project. We offer the following responses to your letter.

We appreciate the information provided on the applicability of Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. The information on the preliminary determination and possible applicability of Nationwide Permit #14 are particularly helpful. However, at this juncture, we are still in the preliminary environmental review stage of the project. When we are further along in the design process, we intend to work cooperatively with your office in providing the requisite permit application submittals.

Your December 20 letter, along with this response letter, will be included in the forthcoming Draft EA. We appreciate your participation in the pre-assessment consultation review process.

Should you have any questions regarding this matter, please call Ray McCormick of our Kaua'i District Office at (808) 241-3015, or via email at raymond.j.mccormick@hawaii.gov.

Sincerely,

LAWRENCE J. DILL, P.E.
District Engineer

FR/ms

c: HWY-DE, Milton Arakawa, Wilson Okamoto Corporation

DAVID Y. IGE
GOVERNOR
STATE OF HAWAII

SHAN S. TSUTSUI
LT. GOVERNOR
STATE OF HAWAII

JOBIE M. K. MASAGATANI
CHAIRMAN
HAWAIIAN HOMES COMMISSION

WILLIAM J. AILA, JR.
DEPUTY TO THE CHAIRMAN

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P. O. BOX 1879
HONOLULU, HAWAII 96805

December 5, 2016

2016 DEC -9 P 2:05
DOT HWYS DIST
KAUAI DISTRICT

Hawaii Department of Transportation
Highways Division, Kauai District Office
Attention: Mr. Raymond J. McCormick
1720 Haleukana Street
Lihue, HI 96766

Dear Mr. McCormick:

Subject: Kuhio Highway (Route 56) - Replacement of Hanamaulu Stream (Kapaia) Bridge; District of Lihue, Island of Kauai; Federal-Aid Project No. BR-056-1(48)

The Department of Hawaiian Home Lands acknowledges receiving the request for comments on the above-cited project. After reviewing the materials submitted, due to its lack of proximity to Hawaiian Home Lands, we do not anticipate any impacts to our lands or beneficiaries from the project.

However, we highly encourage all agencies to consult with Hawaiian Homestead community associations and other (N)native Hawaiian organizations when preparing environmental assessments in order to better assess potential impacts to cultural and natural resources, access and other rights of Native Hawaiians.

Mahalo for the opportunity to provide comments. If you have any questions, please call Bob Freitas, Planner at 620-9484 or contact via email at robert.c.freitasjr@hawaii.gov.

Sincerely,

M. Kaleo Manuel
Acting Planning Program Manager

DAVID Y. IGE
GOVERNOR

FORD N. FUCHIGAMI
DIRECTOR

Deputy Directors
JADE T. BUTAY
ROSS M. HIGASHI
EDWIN H. SNIFFEN
DARRELL T. YOUNG

IN REPLY REFER TO
HWY-K 4.170006

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
KAUAI DISTRICT
1720 HALEUKANA STREET
LIHUE, HAWAII 96766

January 9, 2017

TO: M. KALEO MANUEL
ACTING PLANNING PROGRAM MANAGER
DEPARTMENT OF HAWAIIAN HOME LANDS

FROM: LAWRENCE J. DILL, KAUAI DISTRICT ENGINEER

SUBJECT: KUHIO HIGHWAY, REPLACEMENT OF HANAMAULU (KAPAIA) STREAM BRIDGE, DISTRICT OF LĪHU'E, ISLAND OF KAUA'I
HANAMAULU AHUPUAA
FEDERAL AID PROJECT NO. BR-056-1(48)
TAX MAP KEY(S): (4)3-8-002:999 (POR.), 001 (POR.), 012; (4)3-7-001:001 (POR.); (4)3-7-004:009 (POR.); (4)3-8-006:999 (POR.)

Thank you for your letter dated December 5, 2016 regarding the subject project. We appreciate the information that the Department of Hawaiian Home Lands does not anticipate any impacts to your lands or beneficiaries from the project.

We appreciate your advice regarding consultation with Hawaiian Homestead communities and other Native Hawaiian organizations. Since the project intends to utilize Federal funding, we have initiated Section 106 consultation with Native Hawaiian organizations and other interested individuals. This process is currently ongoing.

Your letter, along with this response, will be included in the forthcoming Draft EA. We appreciate your participation in the pre-assessment consultation review process.

Should you have any questions, please call Ray McCormick, District Design Engineer at 808-241-3015, or via email at raymond.j.mccormick@hawaii.gov.

FR:ms

c: HWY-DE, Wilson Okamoto Corporation (Milton Arakawa)

From: Raymond.J.McCormick@hawaii.gov
To: Fred.Reyes@hawaii.gov; Milton Arakawa
Subject: Fw: County Transportation Agency - Kuhio Highway (Route 56) - Replacement of Hanamā'ulu Stream (Kapaia) Bridge. Federal Aid Project No. BR-056-1(48)
Date: Tuesday, December 13, 2016 3:21:08 PM

Raymond J. McCormick, P.E.
Hawaii Department of Transportation, Highways Division
District Design Engineer, Kauai
1720 Haleukana Street
Lihue, Hawaii 96766
Phone 808-241-3015

----- Forwarded by Raymond J McCormick/HWY/HIDOT on 12/13/2016 03:20 PM -----

From: Jeremy Lee <jlee@kauai.gov>
To: "Raymond J McCormick@hawaii.gov" <Raymond J McCormick@hawaii.gov>,
Cc: Celia Mahikoa <cmahikoa@kauai.gov>
Date: 12/13/2016 02:56 PM
Subject: County Transportation Agency - Kuhio Highway (Route 56) - Replacement of Hanamā'ulu Stream (Kapaia) Bridge
Federal Aid Project No. BR-056-1(48)

Ray,
Thanks for the opportunity to comment on the subject project.
The CTA does not have any comments.

Jeremy Kalawaia Lee
Program Specialist III
County Transportation Agency
3220 Hoolako Street
Lihue, Hawaii 96766
808-246-8112
jlee@kauai.gov
Please consider the environment before printing this email

DAVID Y. IGE
GOVERNOR

FORD N. FUCHIGAMI
DIRECTOR

Deputy Directors
JADE T. BUTAY
ROSS M. HIGASHI
EDWIN H. SNIFFEN
DARRELL T. YOUNG

IN REPLY REFER TO:
HWY-K 4.170008

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
KAUAI DISTRICT
1720 HALEUKANA STREET
LIHUE, HAWAII 96766

January 9, 2017

Mr. Jeremy Kalawaia Lee
Program Specialist III
County Transportation Agency
3220 Ho'olako Street
Lihu'e, Hawai'i 96766

Dear Mr. Lee:

Subject: Pre-Assessment Consultation
Draft Environmental Assessment (EA)
Kapaia Bridge Replacement
Hanamā'ulu, Island of Kaua'i, Hawai'i
TMK (4) 3-8-02:999 (por.), 001 (por.), 012; (4) 3-7-01:001 (por.);
(4) 3-7-04:009 (por.); (4) 3-8-06:999 (por.)

Thank you for your email dated December 13, 2016 regarding the subject project. We appreciate the information that the County Transportation Agency does not have any comments on the project.

Your December 13 email, along with this response letter, will be included in the forthcoming Draft EA. We appreciate your participation in the pre-assessment consultation review process.

Should you have any questions regarding this matter, please call Ray McCormick of our Kaua'i District Office at (808) 241-3015, or via email at raymond.j.mccormick@hawaii.gov.

Sincerely,

LAWRENCE J. DILL, P.E.
District Engineer

FR/ms

c: HWY-DE, Milton Arakawa, Wilson Okamoto Corporation

DAVID Y. IGE
GOVERNOR OF HAWAII

VIRGINIA PRESSLER, M.D.
DIRECTOR OF HEALTH

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

In reply, please refer to
File:
EPO 16-401

December 21, 2016

Mr. Raymond J. McCormick
Hawaii Department of Transportation
Highways Division, Kauai District Office
1720 Haleukana Street
Lihue, Hawaii 96766
Email: Raymond.j.mccormick@hawaii.gov

Dear Mr. McCormick:

SUBJECT: Early Consultation for Preparation of an Environmental Assessment (EC EA) for Kuhio Highway (Route 56) – Replacement of Hanamaulu Stream (Kapaia) Bridge, Lihue, Kauai

The Department of Health (DOH), Environmental Planning Office (EPO), acknowledges receipt of your EC EA to our office on December 5, 2016.

In the development and implementation of all projects, EPO strongly recommends regular review of State and Federal environmental health land use guidance. State standard comments and available strategies to support sustainable and healthy design are provided at: http://health.hawaii.gov/epo/landuse. Projects are required to adhere to all applicable standard comments.

EPO has recently updated the environmental Geographic Information System (GIS) website page. It now compiles various maps and viewers from our environmental health programs. The eGIS website page is continually updated so please visit it regularly at: http://health.hawaii.gov/epo/egis.

EPO also encourages you to examine and utilize the Hawaii Environmental Health Portal at: https://eha-cloud.doh.hawaii.gov. This site provides links to our e-Permitting Portal, Environmental Health Warehouse, Groundwater Contamination Viewer, Hawaii Emergency Response Exchange, Hawaii State and Local Emission Inventory System, Water Pollution Control Viewer, Water Quality Data, Warnings, Advisories and Postings.

We suggest you review the requirements of the Clean Water Branch (HAR, Section 11-54-1.1, -3, 4-8) and/or the National Pollutant Discharge Elimination System (NPDES) permit (HAR, Chapter 11-55) at: http://health.hawaii.gov/cwb. If you have any questions, please contact the Clean Water Branch, Engineering Section at (808) 586-4309 or cleanwaterbranch@doh.hawaii.gov. If your project involves waters of the U.S., it is highly recommended that you contact the Army Corps of Engineers, Regulatory Branch at: (808) 835-4303.

You may also wish to review the draft Office of Environmental Quality Control (OEQC) viewer at: http://eha-web.doh.hawaii.gov/oeqc-viewer. This viewer geographically shows where some previous Hawaii Environmental Policy Act (HEPA) (Hawaii Revised Statutes, Chapter 343) documents have been prepared.

In order to better protect public health and the environment, the U.S. Environmental Protection Agency (EPA) has developed a new environmental justice (EJ) mapping and screening tool called EJSCREEN. It is based on nationally consistent data and combines environmental and demographic indicators in maps and reports. EPO encourages you to explore, launch and utilize this powerful tool in planning your project. The EPA EJSCREEN tool is available at: http://www.epa.gov/ejscreen.

The Department of Health encourages the application of sustainability strategies and principles early in the planning, review and funding of projects. We also request that you consider conducting a Health Impact Assessment (HIA). More information is available on line at:

- World Health Organization (WHO) HIA information: http://www.who.int/hia/en
- U.S. Centers for Disease Control (CDC) HIA information: https://www.cdc.gov/healthyplaces/hia.htm
- U.S. Environmental Protection Agency (EPA) HIA information: https://www.epa.gov/healthresearch/health-impact-assessments

We request that you utilize all of this information on your proposed project to increase sustainable, innovative, inspirational, transparent and healthy design. Thank you for the opportunity to comment.

We request a written or electronic response confirming your receipt of this DOH EPO comment letter. You may mail your response directly to EPO at 919 Ala Moana Blvd., Suite 312, Honolulu, Hawaii 96814. However, we would prefer an electronic reply to DOH.EPO@doh.hawaii.gov. We hope that our letter(s) and your response(s) will be included in the final document. If you have any questions, please contact me by calling (808) 586-4337.

Mahalo nui loa,

Laura Leialoha Phillips McIntyre, AICP
Program Manager, Environmental Planning Office

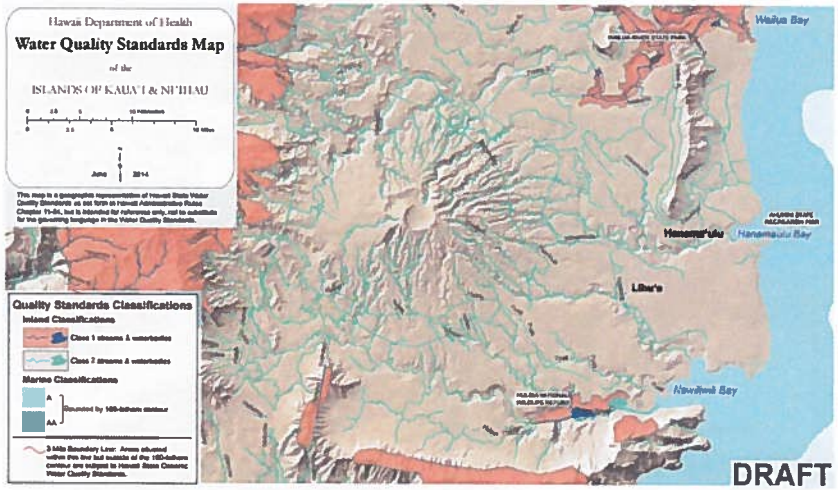
LM:nn

Attachment 1: Environmental Health Management Web App Snipit of Project Area: http://health.hawaii.gov/epo/egis
Attachment 2: Clean Water Branch: Water Quality Standards Map - Kauai
Attachment 3: Wastewater Branch: Act 120 Cesspool Tax Credit Web App Snipit of Project Area
Attachment 4: Wastewater Branch: Recycled Water Use Map of Project Area
Attachment 5: Historic Sugarcane Map of Project Area
Attachment 6: U.S. EPA EJSCREEN Report for Project Area

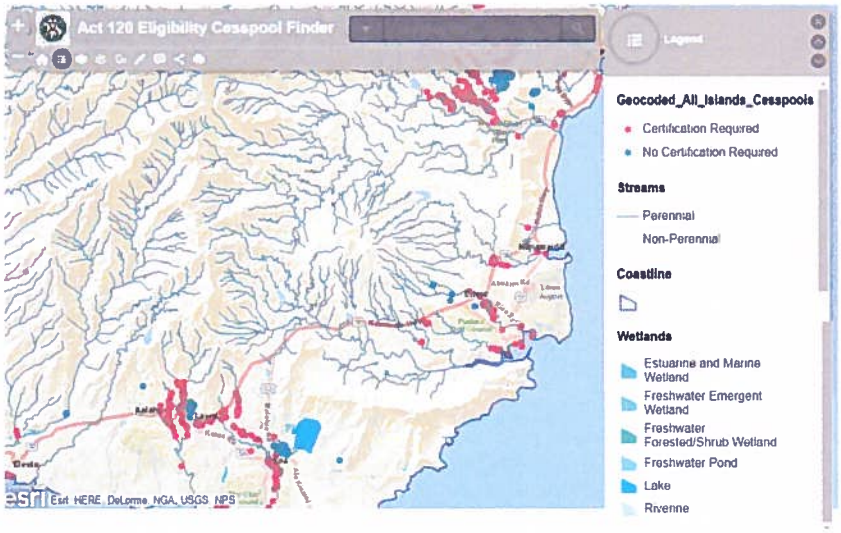
c: DOH: DDEH, EMD, DHO Kauai, CWB {via email only}

Attachment 1: Environmental Health Management Web App Snipit of Project Area: http://health.hawaii.gov/epo/eqis

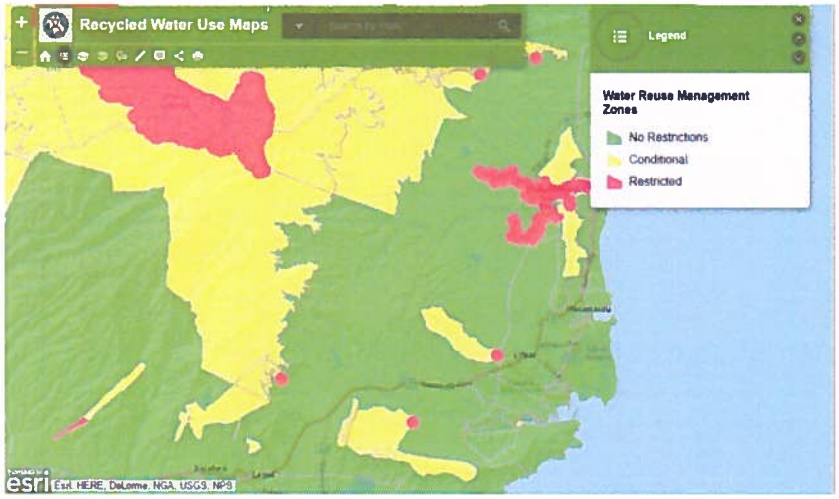
Attachment 2: Clean Water Branch: Water Quality Standards Map – Kauai



Attachment 3: Wastewater Branch: Act 120 Cesspool Tax Credit Web App Snpit of Project Area



Attachment 4: Wastewater Branch: Recycled Water Use Map of Project Area



Attachment 5: Historic Sugarcane Map of Project Area

Attachment 6: U.S. EPA EJSCREEN Report for Project Area

EPA EJSCREEN Report (Version 2016)

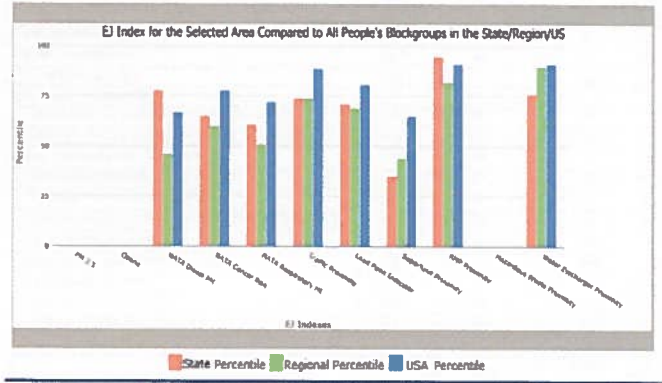
1 mile Ring Centered at 21.992548,-159.365487, HAWAII, EPA Region 9

Approximate Population: 6,147

Input Area (sq. miles): 3.14

Kapaia Bridge Repacement

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	N/A	N/A	N/A
EJ Index for Ozone	N/A	N/A	N/A
EJ Index for NATA* Diesel PM	78	48	67
EJ Index for NATA* Air Toxics Cancer Risk	85	80	78
EJ Index for NATA* Respiratory Hazard Index	61	61	72
EJ Index for Traffic Proximity and Volume	74	74	89
EJ Index for Lead Paint Indicator	71	89	81
EJ Index for Superfund Proximity	35	44	85
EJ Index for RMP Proximity	95	82	91
EJ Index for Hazardous Waste Proximity*	N/A	N/A	N/A
EJ Index for Water Discharger Proximity	76	90	91



This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and the values what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

December 08, 201

1/3

EPA United States Environmental Protection Agency

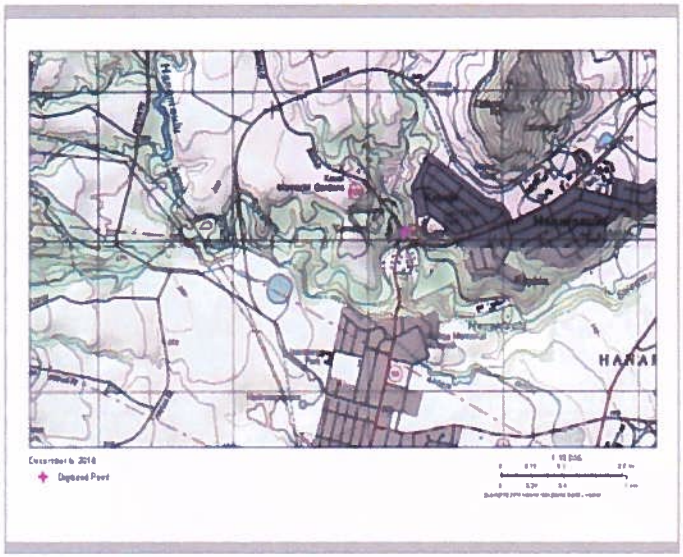
EJSCREEN Report (Version 2016)

1 mile Ring Centered at 21.992549,-159.365487, HAWAII, EPA Region 9

Approximate Population: 6,147

Input Area (sq. miles): 3.14

Kapaia Bridge Repacement



Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	0
National Pollutant Discharge Elimination System (NPDES)	0

EPA United States Environmental Protection Agency

EJSCREEN Report (Version 2016)

1 mile Ring Centered at 21.992549,-159.365487, HAWAII, EPA Region 9

Approximate Population: 6,147

Input Area (sq. miles): 3.14

Kapaia Bridge Repacement

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in µg/m³)	N/A	N/A	N/A	9.37	N/A	9.32	N/A
Ozone (ppb)	N/A	N/A	N/A	51	N/A	47.4	N/A
NATA* Diesel PM (µg/m³)	0.141	0.149	69	0.978	<50th	0.937	<50th
NATA* Cancer Risk (lifetime risk per million)	28	34	21	43	<50th	40	<50th
NATA* Respiratory Hazard Index	0.69	1	29	2	<50th	1.8	<50th
Traffic Proximity and Volume (daily traffic count/distance to road)	650	990	68	1100	60	590	79
Lead Paint Indicator (% Pre-1960 Housing)	0.15	0.16	59	0.24	51	0.3	44
Superfund Proximity (site count/km distance)	0	0.098	29	0.15	13	0.13	16
RMP Proximity (facility count/km distance)	0.7	0.19	94	0.57	77	0.43	82
Hazardous Waste Proximity* (facility count/km distance)	N/A	0.14	N/A	0.14	N/A	0.11	N/A
Water Discharger Proximity (facility count/km distance)	0.34	0.34	67	0.2	88	0.31	77
Demographic Indicators							
Demographic Index	61%	52%	77	47%	70	36%	82
Minority Population	88%	77%	64	58%	79	37%	89
Low Income Population	34%	28%	71	36%	52	35%	54
Linguistically Isolated Population	7%	6%	71	9%	55	5%	78
Population With Less Than High School Education	19%	9%	86	17%	61	14%	72
Population Under 5 years of age	5%	6%	43	7%	39	6%	43
Population over 64 years of age	17%	15%	60	13%	76	14%	71

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

+ The hazardous waste environmental indicator and the corresponding EJ index will appear as N/A if there are no hazardous waste facilities within 50 km of a selected location.

For additional information, see: www.epa.gov/environmentaljustice

EJSCREEN is a screening tool for pre-decisional use only. It can help identify areas that may warrant additional consideration, analysis, or outreach. It does not provide a basis for decision-making, but it may help identify potential areas of EJ concern. Users should keep in mind that screening tools are subject to substantial uncertainty in their demographic and environmental data, particularly when looking at small geographic areas. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports. This screening tool does not provide data on every environmental impact and demographic factor that may be relevant to a particular location. EJSCREEN outputs should be supplemented with additional information and local knowledge before taking any action to address potential EJ concerns.

DAVID Y. IGE
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
KAUAI DISTRICT
1720 HALEUKANA STREET
LIHUE, HAWAII 96766

FORD N. FUCHIGAMI
DIRECTOR

Deputy Directors
JADE T. BUTAY
ROSS M. HIGASHI
EDWIN H. SNIFFEN
DARRELL T. YOUNG

IN REPLY REFER TO:
HWY-K 4.170005

January 9, 2017

TO: LAURA LEIALOHA PHILLIPS McINTYRE
PROGRAM MANAGER, ENVIRONMENTAL PLANNING OFFICE
DEPARTMENT OF HEALTH

FROM: LAWRENCE J. DILL, KAUAI DISTRICT ENGINEER

SUBJECT: KUHIO HIGHWAY, REPLACEMENT OF HANAMAULU (KAPAIA) STREAM BRIDGE, DISTRICT OF LĪHU'E, ISLAND OF KAUA'I
HANAMAULU AHUPUAA
FEDERAL AID PROJECT NO. BR-056-1(48)
TAX MAP KEY(S): (4)3-8-002:999 (POR.), 001 (POR.), 012; (4)3-7-001:001 (POR.); (4)3-7-004:009 (POR.); (4)3-8-006:999 (POR.)

Thank you for your letter dated December 21, 2016 (File: EPO 16-401) regarding the subject project. We offer the following responses to your letter.

We appreciate your recommendation to review the standard comments and available strategies to support sustainable and healthy design and acknowledge that adherence to all applicable standard comments are required.

In addition, we appreciate the information on the updated environmental Geographic Information System webpage site as well as the Hawai'i Environmental Health Portal.

We also intend to contact the Clean Water Branch regarding applicable permit requirements under their jurisdiction.

Your letter, along with this response, will be included in the forthcoming Draft EA. We appreciate your participation in the pre-assessment consultation review process.

Should you have any questions, please call Ray McCormick, District Design Engineer at 808-241-3015, or via email at raymond.j.mccormick@hawaii.gov.

FR:ms

c: HWY-DE, Wilson Okamoto Corporation (Milton Arakawa)

Leopold Durant
P.O. Box 62
Hanamaulu, HI 96715

December 12, 2016

Hawaii Department of Transportation
Highways Division, Kauai District Office
1720 Haleukana Street
Lihue, Hawaii 96766
Attention: Mr. Raymond J. McCormick

Dear Mr. McCormick,

I am responding to the State of Hawaii Department of Transportation(HDOT) proposal to replace/reconstruct the existing Hanamaulu Stream Bridge in Kapaia, Kauai, Hawaii. It is my understanding that Federal and State funds are intended to be utilized for the construction of this project and HDOT is anticipating a categorical exclusion to fulfill Federal Environmental review requirements. However, in accordance with the categorical exclusion requirement under 23 CFR Part 771,

> "(a) Categorical exclusions (CEs) are actions which meet the definition contained in 40 CFR 1508.4, and, based on past experience with similar actions, do not involve significant environmental impacts. They are actions which: do not induce significant impacts to planned growth or land use for the area; do not require the relocation of significant numbers of people; do not have a significant impact on any natural, cultural, recreational, historic or other resource; do not involve significant air, noise, or water quality impacts; do not have significant impacts on travel patterns; or do not otherwise, either individually or cumulatively, have any significant environmental impacts.(23 CFR Part 771)."

A categorical exclusion for this project would be in direct conflict with my current land use. According to the kama'āina testimonies, original land survey, boundary references, and pre-existing land use for this area, the project would take place on the lo'i (wetland ponds), kula (dry land agricultural complexes), pahale (house sites), iwi (burial sites), and other natural, cultural, recreational, and historic resources.

I am amongst the kama'āina who continue to maintain these land surveys that are defined in the original land survey documents by my active use and governance of the location. It is my understanding that the proposed project does not hold a survey that is consistent with the kama'āina testimonies, original land surveys, boundary references and pre-existing land use for the project area. Moreover, the current bridge that is proposed to be replaced/reconstructed did not hold a survey consistent with the original land records which resulted in a significant impact to the land use for the area. An attempt to seek a categorical exclusion under Federal law would be in direct violation of government process. I am willing to further consult about this proposed project. If you have any questions, please don't hesitate to contact me at (808)245-3747.

Mahalo,

Leopold Butch Durant

DAVID Y. IGE
GOVERNOR

FORD N. FUCHIGAMI
DIRECTOR

Deputy Directors
JADE T. BUTAY
ROSS M. HIGASHI
EDWIN H. SNIFFEN
DARRELL T. YOUNG

IN REPLY REFER TO:
HWY-K 4.170003

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
KAUAI DISTRICT
1720 HALEUKANA STREET
LIHUE, HAWAII 96766

January 9, 2017

Mr. Leopold Durant
P.O. Box 62
Hanamā'ulu, Kaua'i 96715

Subject: Pre-Assessment Consultation
Draft Environmental Assessment (EA)
Kapaia Bridge Replacement
Hanamā'ulu, Island of Kaua'i, Hawai'i
TMK (4) 3-8-02:999 (por.), 001 (por.), 012; (4) 3-7-01:001 (por.);
(4) 3-7-04:009 (por.); (4) 3-8-06:999 (por.)

Dear Mr. Durant:

Thank you for your letter dated December 12, 2016 regarding the subject project. The following responds to your letter.

Regarding your comments on the categorical exclusion, please note that due to this project utilizing Federal funds for its construction, requirements of the National Environmental Policy Act (NEPA) will be adhered to. As an initial step in fulfilling NEPA requirements, we are proceeding with preparing an Environmental Assessment (EA) in accordance with Chapter 343, Hawai'i Revised Statutes. The EA is a document to determine whether a proposed action may have a significant environmental effect. It examines a wide range of factors which may include ecological, aesthetic, historic, cultural, economic, social, and health effects as well as primary, secondary, or cumulative effects. Once the State environmental review process is completed, we will need to decide how the Federal environmental review process will be complied with. Depending on the conclusions of the State environmental process, a categorical exclusion is an option to complete the Federal process.

As far as land survey issues, additional information and documentation is needed if there may be a difference between the existing land survey documents for the project and Kama'āina testimonies, original land surveys, boundary references and pre-existing land use. We intend to consult further with you to discuss these issues.

Your letter, along with this response, will be included in the forthcoming Draft EA. We appreciate your participation in the pre-assessment consultation review process.

Sincerely,

LAWRENCE J. DILL, P.E.
District Engineer

FR/ms

c: Milton Arakawa, Wilson Okamoto Corporation

From: Roy Goo, Pharm.D.
To: raymond.l.mccormick@hawaii.gov
Cc: Milton Arakawa; lawrenceml.dill@hawaii.gov
Subject: Comments on Replacement of Kapaia Bridge
Date: Saturday, November 19, 2016 5:28:55 AM

Dear Mr. Mccormick,

My neighbor Laraine Moriguchi shared with me the new alignment and detour options for the replacement bridge. My wife and I just completed construction of our new home on the base of the makai side of the bridge and were assured by Mr. Donald Smith that a makai alignment/ expansion of the bridge would not be considered. We are strongly against any makai detour or makai alignment of the bridge.

Mahalo for your consideration,

Roy

DAVID Y. IGE
GOVERNOR

FORD N. FUCHIGAMI
DIRECTOR

Deputy Directors
JADE T. BUTAY
ROSS M. HIGASHI
EDWIN H. SNIFFEN
DARRELL T. YOUNG

IN REPLY REFER TO
HWY-K 4.170001

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
KAUAI DISTRICT
1720 HALEUKANA STREET
LIHUE, HAWAII 96766

January 9, 2017

Mr. Roy Goo, Pharm.D.
roygoo@hawaii.edu

Dear Mr. Goo:

Subject: Pre-Assessment Consultation
Draft Environmental Assessment (EA)
Kapaia Bridge Replacement
Līhu'e, Island of Kaua'i, Hawai'i
TMK (4) 3-8-02:999 (por.), 001 (por.), 012; (4) 3-7-01:001 (por.);
(4) 3-7-04:009 (por.); (4) 3-8-06:999 (por.)

Thank you for your email dated November 19, 2016 regarding the subject project. We offer the following responses to your letter.

We understand your concern regarding a makai detour or makai alignment of the bridge, especially in view of the fact that your recently constructed home is close to the base of the makai side of the bridge.

We have reviewed possible mauka alignment alternatives to cross Hanamā'ulu Stream. A permanent mauka bridge alternative from Kūhiō Highway connecting back to Kūhiō Highway will be significantly costlier to construct than the other alternatives. It would also take nearly twice as long to construct, and would have the greatest impact to private property as far as the extent of land acquisition. In addition, the area mauka of the existing bridge consists of steep slopes and heavy vegetation that would require significant earthwork and make construction of this alternative more difficult. The County's Kapaia Sewage Pump Station located at the Mā'alo Road and Kūhiō Highway intersection would also be displaced with a mauka alignment which would result in additional environmental review, additional construction costs, and land acquisition for its relocation. If impacts to the Sewage Pump Station are avoided by making the highway curve tighter, large tractor trailers would then be unable to traverse the curve. This is unacceptable for Kūhiō Highway, the major north-south corridor route for Kauai.

The preferred alternative is to build a new single span bridge in its current location, in which case the existing large concrete piers extending into the stream would be removed, and the new abutments located further back from the stream. The new bridge will be wider than existing by approximately 8 feet on each side. Kūhiō Highway will still remain a two lane two-way roadway with wider shoulders to meet current safety standards.

A temporary bypass bridge could be constructed on the mauka side of the existing bridge to be removed. This bypass bridge would be constructed first, then work would commence on demolishing the existing bridge and constructing the permanent bridge. When the permanent bridge is completed, the temporary bridge would be removed.

Your comments of November 19, 2016, along with this response letter, will be included in the forthcoming Draft EA. We appreciate your participation in the pre-assessment consultation review process.

Should you have any questions regarding this matter, please call Ray McCormick, of our Kaua'i District Office at (808) 241-3015, or via email at raymond.j.mccormick@hawaii.gov.

Sincerely,

LAWRENCE J. DILL, P.E.
District Engineer

FR/ms

c: Milton Arakawa, Wilson Okamoto Corporation

From: Fred.Reyes@hawaii.gov
To: Milton Arakawa
Cc: Raymond.J.McCormick@hawaii.gov
Subject: Fw: Kuhio Highway (Route 56)-Replacement of Hanamauku Stream (Kapaia) Bridge
Date: Thursday, November 17, 2016 3:29:56 PM

Milton,

Please archive/preserve emailed comments from pre-consultation letter recipients. Would copy of email messages such as the one below, be incorporated into one of the EA's Appendices?

Fred Reyes, P.E., CE IV
Hawaii Dept. of Transportation
Highways Division, Kauai District
1720 Haleukana Street
Lihue, HI 96766
Ph: 808-241-3017 Cell: 808-634-0972
Fax 808-241-3011
fred.reyes@hawaii.gov

----- Forwarded by Fred Reyes/HWY/HIDOT on 11/17/2016 03:27 PM -----

sabrakauka@aol.com
11/17/2016 02:49 PM

To Raymond J McCormick@hawaii.gov,
cc <Larry J Dill@hawaii.gov>, <Fred Reyes@hawaii.gov>
Subject Kuhio Highway (Route 56)-Replacement of Hanamauku Stream (Kapaia) Bridge

Aloha Raymond,
I received Larry Dill's letter today re. replacing the Kapaia Bridge.

It has to be done and as expensive as it is, we have to do the best job we can for the longest period of time. That means that this new bridge will last long past our lifetimes.

I'll talk to a few of my friends and hope to get back to you on the detour alternatives. I expect that you'll be holding informational sessions for the public, particularly those who live in Hanama'ulu.

All best,
Sabra

DAVID Y. IGE
GOVERNOR

FORD N. FUCHIGAMI
DIRECTOR

Deputy Directors
JADE T. BUTAY
ROSS M. HIGASHI
EDWIN H. SNIFFEN
DARRELL T. YOUNG

IN REPLY REFER TO:
HWY-K 4.170009

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
KAUAI DISTRICT
1720 HALEUKANA STREET
LIHUE, HAWAII 96766

January 9, 2017

Ms. Sabra Kauka
sabrakauka@aol.com

Dear Ms. Kauka:

Subject: Pre-Assessment Consultation
Draft Environmental Assessment (EA)
Kapaia Bridge Replacement
Hanamā'ulu, Island of Kaua'i, Hawai'i
TMK (4) 3-8-02:999 (por.), 001 (por.), 012; (4) 3-7-01:001 (por.);
(4) 3-7-04:009 (por.); (4) 3-8-06:999 (por.)

Thank you for your email dated November 17, 2016 regarding the subject project. We offer the following responses to your letter.

The preferred alternative is to build a new single span bridge in its current location, in which case the existing large concrete piers extending into the stream would be removed, and the new abutments located further back from the stream. The new bridge will be wider than existing by approximately 8 feet on each side. Kuhio Highway will still remain a two lane two-way roadway with wider shoulders to meet current safety standards.

A temporary bypass bridge could be constructed on the mauka side of the existing bridge to be removed. This bypass bridge would be constructed first, then work
would commence on constructing the permanent bridge. When the permanent bridge is completed, the temporary bridge would be removed.

Your November 17 email, along with this response letter, will be included in the forthcoming Draft EA. We appreciate your participation in the pre-assessment consultation review process.

Should you have any questions regarding this matter, please call Ray McCormick of our Kaua'i District Office at (808) 241-3015, or via email at raymond.j.mccormick@hawaii.gov.

Sincerely,

LAWRENCE J. DILL, P.E.
District Engineer

FR/ms

C: HWY-DE, Milton Arakawa, Wilson Okamoto Corporation

David and Nina Monasevitch
4457 Laukini Rd
Lihue, HI, 96766
808-246-4457

December 13, 2016

Hawaii Department of Transportation
Highways Division, Kaua'i District Office
1720 Haleukana Street
Lihu'e, HI 96766
Raymond.J.McCormick@hawaii.gov
ATTENTION: Mr. Raymond J. McCormick

Dear Mr. McCormick,

This is a response to Mr. Larry Dill's inquiry as to our input regarding the alternatives to the replacement of the existing Hanama'ulu River* Bridge in Kapaia, Kaua'i, Hawai'i.

We cannot and will not support any of the proposed alternatives unless and until there is a proper Federal Environmental Assessment. There appears to be a cavalier disregard to impacts on natural resources, cultural resources, historical resources and land use. A comprehensive Federal EA for each of the alternatives needs to be researched. Restoration costs to the riparian environment need to be addressed, too. Once that is completed, we can reasonably decide on how to best choose an alternative.

We insist that the Federal Environmental Assessment process be implemented. It will be useful to assess the impacts from the original bridge in the assessment, as well, in order to assist in the restoration of the Hanama'ulu River.

Respectfully,

David and Nina Monasevitch

* Unless we are wrong, by definition, it's a river, not a stream.

DAVID Y. IGE
GOVERNOR

FORD N. FUCHIGAMI
DIRECTOR

Deputy Directors
JADE T. BUTAY
ROSS M. HIGASHI
EDWIN H. SNIFFEN
DARRELL T. YOUNG

IN REPLY REFER TO:
HWY-K 4.170002

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
KAUAI DISTRICT
1720 HALEUKANA STREET
LIHUE, HAWAII 96766

January 9, 2017

David and Nina Monasevitch
4457 Laukini Road
Lihu'e, Kaua'i 96766

Dear Mr. & Ms. Monasevitch:

Subject: Pre-Assessment Consultation
Draft Environmental Assessment (EA)
Kapaia Bridge Replacement
Hanamā'ulu, Island of Kaua'i, Hawai'i
TMK (4) 3-8-02:999 (por.), 001 (por.), 012; (4) 3-7-01:001 (por.);
(4) 3-7-04:009 (por.); (4) 3-8-06:999 (por.)

Thank you for your letter dated December 13, 2016 regarding the subject project. We offer the following responses to your letter.

Regarding your comments on a Federal Environmental Assessment, please note that due to this project utilizing Federal funds for its construction, requirements of the National Environmental Policy Act (NEPA) will be adhered to. As an initial step in fulfilling NEPA requirements, we are proceeding with preparing a State Environmental Assessment (EA) in accordance with Chapter 343, Hawai'i Revised Statutes. The Draft EA includes review of all of the proposed alternatives and determines whether a proposed action may have a significant environmental effect. It examines a wide range of factors which may include ecological, aesthetic, historic, cultural, economic, social, and health effects as well as primary, secondary, or cumulative effects, including the riparian environment of Hanamaulu Stream and its banks in the vicinity of the bridge.

Your letter of December 13, 2016, along with this response letter, will be included in the forthcoming Draft EA. We appreciate your participation in the pre-assessment consultation review process.

Should you have any questions regarding this matter, please call Ray McCormick of our Kaua'i District Office at (808) 241-3015, or via email at raymond.j.mccormick@hawaii.gov.

Sincerely,

LAWRENCE J. DILL, P.E.
District Engineer

FR/ms

c: Milton Arakawa, Wilson Okamoto Corporation

From: Raymond.J.McCormick@hawaii.gov
To: Milton Arakawa
Subject: Fw: Kuhio Highway (Route 56) Replacement of Hanamaulu Stream (Kapaia) Bridge District of Lihue, Island of Kauai Federal-Aid Project No. BR-056-1 (48)
Date: Tuesday, December 27, 2016 9:22:59 AM

Raymond J. McCormick, P.E.
Hawaii Department of Transportation, Highways Division
District Design Engineer, Kauai
1720 Haleukana Street
Lihue, Hawaii 96766
Phone 808-241-3015

----- Forwarded by Raymond J McCormick/HWY/H!DOT on 12/27/2016 09:22 AM -----

From: Laraine Moriguchi <lmkauai@yahoo.com>
To: "Raymond J McCormick@hawaii.gov" <Raymond.J.McCormick@hawaii.gov>,
Cc: "Fred Reyes@hawaii.gov" <Fred.Reyes@hawaii.gov>
Date: 12/26/2016 09:10 PM
Subject: Kuhio Highway (Route 56) Replacement of Hanamaulu Stream (Kapaia) Bridge District of Lihue, Island of Kauai Federal-Aid Project No. BR-058-1 (48)

Comments on alignment configuration alternatives:

I prefer creating a new alignment on the mauka side of the existing bridge because any other alignment would negatively impact existing businesses and residences.

Furthermore, I would like to suggest that the **Maalo Road detour (Figure 4) be considered as a new alignment** for the following reasons:

1. Would totally eliminate negative impact to existing residences.
2. Would slow traffic and eliminate the dangerous blind curve through Kapaia.
3. Would create a safer traffic flow through Kapaia, thus revive the thriving town that unfairly died when the"new" bridge was built in 1933.
4. Would provide infrastructure alternatives for future growth of mauka Kapaia (proposed site for landfill, adolescent substance abuse treatment center, mauka bypass road; opportunity for state to improve area surrounding the spectacular Wailua Falls, a tourist destination worthy of more caring attention and creative development.

Thank you for considering my comments and suggestions.

Sincerely,
Laraine Moriguchi
2829 Kanani St.
Lihu'e, HI 96766

DAVID Y. IGE
GOVERNOR

FORD N. FUCHIGAMI
DIRECTOR

Deputy Directors
JADE T. BUTAY
ROSS M. HIGASHI
EDWIN H. SNIFFEN
DARRELL T. YOUNG

IN REPLY REFER TO:
HWY-K 4.170010

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
KAUAI DISTRICT
1720 HALEUKANA STREET
LIHUE, HAWAII 96766

January 9, 2017

Ms. Laraine Moriguchi
2829 Kanani Street
Līhu'e, Kaua'i 96766
lmkauai@yahoo.com

Dear Ms. Moriguchi:

Subject: Pre-Assessment Consultation
Draft Environmental Assessment (EA)
Kapaia Bridge Replacement
Līhu'e, Island of Kaua'i, Hawai'i
TMK (4) 3-8-02:999 (por.), 001 (por.), 012; (4) 3-7-01:001 (por.); (4) 3-7-04:009 (por.); (4) 3-8-06:999 (por.)

Thank you for your email dated December 26, 2016 regarding the subject project. We offer the following responses to your comments.

We understand your concern regarding a makai detour or makai alignment of the bridge as it would negatively impact nearby homes and businesses.

We have reviewed possible mauka alignment alternatives to cross Hanamā'ulu Stream. A permanent mauka bridge alternative from Kūhiō Highway connecting back to Kūhiō Highway will be significantly costlier to construct than the other alternatives. It would also take nearly twice as long to construct, and would have the greatest impact to private property as far as the extent of land acquisition. In addition, the area mauka of the existing bridge consists of steep slopes and heavy vegetation that would require significant earthwork and make construction of this alternative more difficult. The County's Kapaia Sewage Pump Station located at the Mā'alo Road and Kūhiō Highway intersection would also be displaced with a mauka alignment which would result in additional environmental review, additional construction costs, and land acquisition for its relocation. If impacts to the Sewage Pump Station are avoided by making the highway curve tighter, large tractor trailers would then be unable to traverse the curve. This is unacceptable for Kūhiō Highway, the major north-south corridor route for Kauai.

As you know, we have considered a Mā'alo Road detour alignment but this has not been selected as a preferred detour. It does involve a traffic pattern change. Fill and cut walls are necessary because of the substantial elevation changes. The grade of the roadway would increase substantially to 12 percent with the downhill (westbound) traffic ending at a stop condition which is not an optimal condition. If the Mā'alo Road alignment is considered as a permanent condition, this would have a negative impact on through traffic in the long term. Additional traffic analysis and public input would be necessary on possible implications for land use in the region.

The preferred alternative is to build a new single span bridge in its current location, in which case the existing large concrete piers extending into the stream would be removed, and the new abutments located further back from the stream. The new bridge will be wider than existing by approximately 8 feet on each side. Kuhio Highway will still remain a two lane two-way roadway with wider shoulders to meet current safety standards.

A temporary bypass bridge could be constructed on the mauka side of the existing bridge to be removed. This bypass bridge would be constructed first, then work would commence on constructing the permanent bridge. When the permanent bridge is completed, the temporary bridge would be removed.

Your December 26 comments, along with this response letter, will be included in the forthcoming Draft EA. We appreciate your participation in the pre-assessment consultation review process.

Should you have any questions regarding this matter, please call Ray McCormick, of our Kaua'i District Office at (808) 241-3015, or via email at raymond.j.mccormick@hawaii.gov.

Sincerely,

LAWRENCE J. DILL, P.E.
District Engineer

FR/ms

c: HWY-DE, Milton Arakawa, Wilson Okamoto Corporation

APPENDIX E

Draft Environmental Assessment Consultation Comment and Response Letters

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

January 31, 2017

2017 FEB -3 PM 1:45
DOT HIGHWAYS DIV
KAUAI DISTRICT

State of Hawaii
Department of Transportation, Highways Division
Kauai District Office
Attention: Mr. Raymond McCormick
1720 Haleukana Street
Lihue, Hawaii 96766

Dear Mr. McCormick:

SUBJECT: Pre-Assessment Consultation for the Kuhio Highway (Route 56); Replacement of Hanamaulu Stream (Kapaia) Bridge

Thank you for the opportunity to review and comment on the subject matter. In addition to the comments previously sent you on January 5, 2017, enclosed are comments from the Commission on Water Resource Management on the subject matter. Should you have any questions, please feel free to call Lydia Morikawa at 587-0410. Thank you.

Sincerely,

Russell Y. Tsuji
Land Administrator

Enclosure(s)
cc: Central Files

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

RECEIVED
LAND DIVISION
2017 JAN 30 PM 3:03
DEPT. OF LAND & NATURAL RESOURCES STATE OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

December 7, 2016

MEMORANDUM

RECEIVED
COMMISSION ON WATER
RESOURCE MANAGEMENT
2016 DEC -9 AM 8:12

TO: **DLNR Agencies:**
X Div. of Aquatic Resources
__ Div. of Boating & Ocean Recreation
FR: X Engineering Division
__ Div. of Forestry & Wildlife
__ Div. of State Parks
X Commission on Water Resource Management
X Office of Conservation & Coastal Lands
X Land Division – Kauai District
X Historic Preservation

TO:
FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Pre-Assessment Consultation for the Kuhio Highway (Route 56); Replacement of Hanamaulu Stream (Kapaia) Bridge
LOCATION: Lihue, Island of Kauai; TMK: (4) 3-7-001:001(por.), 3-7-004:009 (por.); 3-8-002:999 (por.), 001 (por.), 012; and 3-8-006:999 (por.)
APPLICANT: State Department of Transportation

Transmitted for your review and comment is information on the above referenced project. We would appreciate your comments on this project. Please submit any comments by **January 4, 2017.**

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Lydia Morikawa at 587-0410. Thank you.

Attachments

( ) We have no objections.
( ) We have no comments.
(x) Comments are attached.

Signed: /s/ Jeffrey T. Pearson, P.E.
Print Name: Deputy Director
Date: January 25, 2017

cc: Central Files

RED. 4537.2 / 14387.

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON

WILLIAM D. BALFOUR, JR.
KAMANA BEAMER, PH.D.
MICHAEL G. BUCK
NEIL J. HANNAHS
MILTON D. PAVAO
VIRGINIA PRESSLER, M.D.

JEFFREY T. PEARSON, P.E.
DEPUTY DIRECTOR

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P.O. BOX 621
HONOLULU, HAWAII 96809

January 25, 2017

REF: RFD.4537.2

TO: Mr. Russell Tsuji, Administrator
State of Hawaii, DLNR Land Division Oahu, DLNR-LD

FROM: Jeffrey T. Pearson, P.E., Deputy Director
Commission on Water Resource Management

SUBJECT: Pre-Assessment Consultation for the Kuhio Highway (Route 56); Replacement of Hanamaulu Stream (Kapaia) Bridge

FILE NO.: RFD 4537.2
TMK NO.: (4) 3-7-001:001 (por.), 3-7-004:009 (por.); 3-8-002:999 (por.), 001 (por.), 012; and 3-8-006:999 (por.)

Thank you for the opportunity to review the subject document. The Commission on Water Resource Management (CWRM) is the agency responsible for administering the State Water Code (Code). Under the Code, all waters of the State are held in trust for the benefit of the citizens of the State, therefore all water use is subject to legally protected water rights. CWRM strongly promotes the efficient use of Hawaii's water resources through conservation measures and appropriate resource management. For more information, please refer to the State Water Code, Chapter 174C, Hawaii Revised Statutes, and Hawaii Administrative Rules, Chapters 13-167 to 13-171. These documents are available via the Internet at http://dlnr.hawaii.gov/cwrm.

Our comments related to water resources are checked off below.

- ☐ 1. We recommend coordination with the county to incorporate this project into the county's Water Use and Development Plan. Please contact the respective Planning Department and/or Department of Water Supply for further information.
- ☐ 2. We recommend coordination with the Engineering Division of the State Department of Land and Natural Resources to incorporate this project into the State Water Projects Plan.
- ☐ 3. We recommend coordination with the Hawaii Department of Agriculture (HDOA) to incorporate the reclassification of agricultural zoned land and the redistribution of agricultural resources into the State's Agricultural Water Use and Development Plan (AWUDP). Please contact the HDOA for more information.
- ☐ 4. We recommend that water efficient fixtures be installed and water efficient practices implemented throughout the development to reduce the increased demand on the area's freshwater resources. Reducing the water usage of a home or building may earn credit towards Leadership in Energy and Environmental Design (LEED) certification. More information on LEED certification is available at http://www.usgbc.org/leed. A listing of fixtures certified by the EAP as having high water efficiency can be found at http://www.epa.gov/watersense.
- ☐ 5. We recommend the use of best management practices (BMP) for stormwater management to minimize the impact of the project to the existing area's hydrology while maintaining on-site infiltration and preventing polluted runoff from storm events. Stormwater management BMPs may earn credit toward LEED certification. More information on stormwater BMPs can be found at http://planning.hawaii.gov/czm/initiatives/low-impact-development/
- ☐ 6. We recommend the use of alternative water sources, wherever practicable.
- ☐ 7. We recommend participating in the Hawaii Green Business Program, that assists and recognizes businesses that strive to operate in an environmentally and socially responsible manner. The program description can be found online at http://energy.hawaii.gov/green-business-program.

- ☐ 8. We recommend adopting landscape irrigation conservation best management practices endorsed by the Landscape Industry Council of Hawaii. These practices can be found online at http://www.hawaiiscape.com/wp-content/uploads/2013/04/LICH_Irrigation_Conservation_BMPs.pdf.
- ☐ 9. There may be the potential for ground or surface water degradation/contamination and recommend that approvals for this project be conditioned upon a review by the State Department of Health and the developer's acceptance of any resulting requirements related to water quality.
- ☐ 10. The proposed water supply source for the project is located in a designated water management area, and a Water Use Permit is required prior to use of water. The Water Use Permit may be conditioned on the requirement to use dual line water supply systems for new industrial and commercial developments.
- ☐ 11. A Well Construction Permit(s) is (are) are required before the commencement of any well construction work.
- ☐ 12. A Pump Installation Permit(s) is (are) required before ground water is developed as a source of supply for the project.
- ☐ 13. There is (are) well(s) located on or adjacent to this project. If wells are not planned to be used and will be affected by any new construction, they must be properly abandoned and sealed. A permit for well abandonment must be obtained.
- ☐ 14. Ground-water withdrawals from this project may affect streamflows, which may require an instream flow standard amendment.
- ☒ 15. A Stream Channel Alteration Permit(s) is (are) required before any alteration can be made to the bed and/or banks of a steam channel.
- ☐ 16. A Stream Diversion Works Permit(s) is (are) required before any stream diversion works is constructed or altered.
- ☐ 17. A Petition to Amend the Interim Instream Flow Standard is required for any new or expanded diversion(s) of surface water.
- ☐ 18. The planned source of water for this project has not been identified in this report. Therefore, we cannot determine what permits or petitions are required from our office, or whether there are potential impacts to water resources.

☐ OTHER:

If you have any questions, please contact Dean Uyeno of the Commission staff at 587-0234.

DAVID Y. IGE
GOVERNOR

FORD N. FUCHIGAMI
DIRECTOR

Deputy Directors
JADE T. BUTAY
ROSS M. HIGASHI
EDWIN H. SNIFFEN
DARRELL T. YOUNG

IN REPLY REFER TO:

HWY-K 4.170158

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
KAUAI DISTRICT
1720 HALEUKANA STREET
LIHUE, HAWAII 96766

April 7, 2017

TO: RUSSELL Y. TSUJI
LAND ADMINISRATOR
DEPARTMENT OF LAND AND NATURAL RESOURCES

FROM: LAWRENCE J. DILL, KAUAI DISTRICT ENGINEER

SUBJECT: KŪHIŌ HIGHWAY, REPLACEMENT OF HANAMĀ'ULU (KAPAIA) STREAM BRIDGE, DISTRICT OF LĪHU'E, ISLAND OF KAUA'I
HANAMĀ'ULU AHUPUA'A
FEDERAL AID PROJECT NO. BR-56-01(48)
TAX MAP KEYS: (4) 3-8-002:999 (POR.), 001 (POR.); (4) 3-7-001:001 (POR.); (4)3-7-004:009 (POR.)

Thank you for your letter dated January 31, 2017 regarding the subject Draft EA. We would like to take this opportunity to provide a response.

We appreciate the comment from the Commission on Water Resource Management (CWRM) regarding the possible applicability of a Stream Channel Alteration Permit (SCAP). We will coordinate with the CWRM on possible applicability of a SCAP and intend to comply with applicable regulations.

Your letter, along with this response, will be reproduced and included in the forthcoming Final EA. We appreciate your participation in the Draft EA review process.

Should you have any questions, please call Ray McCormick, District Design Engineer at (808) 241-3015, or via email at raymond.j.mccormick@hawaii.gov.

FR:es

c: HWY-DE
Wilson Okamoto Corporation (Milton Arakawa)

DAVID Y. IGE
GOVERNOR OF HAWAII

VIRGINIA PRESSLER, M.D.
DIRECTOR OF HEALTH

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

In reply, please refer to:
File:
EPO 17-023

January 30, 2017

Mr. Milton Arakawa
Wilson Okamoto Corporation
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826
Email: marakawa@wilsonokamoto.com

Dear Mr. Arakawa:

SUBJECT: Draft Environmental Assessment (DEA) for Kapaia Bridge Replacement, Lihue, Kauai
TMK: 3-7-001:001 (por.), 3-7-004:009 (por.), 3-8-002:001 (por.), 012

The Department of Health (DOH), Environmental Planning Office (EPO), acknowledges receipt of your DEA to our office via the OEQC link:
http://oeqc.doh.hawaii.gov/Shared%20Documents/EA_and_EIS_Online_Library/Kauai/2010s/2017-01-23-KA-5B-DEA-Kapaia-Bridge-Replacement.pdf

We understand from the OEQC publication form project summary that *"The State of Hawai'i Department of Transportation (HOOT) proposes to replace the existing Kapaia Bridge that crosses Hanama'ulu Stream. The replacement bridge will be designed to meet current standards for lane widths and loadcarrying capacity. Proposed improvements include two twelve foot travel lanes for vehicular traffic along with an eight foot shoulder lane on each side of the bridge to accommodate pedestrian traffic. The existing approaches will also be improved to provide a smooth transition to the new replacement bridge. Alternative 3, a new single-span replacement bridge along the existing alignment with a mauka detour bridge is the preferred alternative."*

In the development and implementation of all projects, EPO strongly recommends regular review of State and Federal environmental health land use guidance. State standard comments and available strategies to support sustainable and healthy design are provided at: http://health.hawaii.gov/epo/landuse. Projects are required to adhere to all applicable standard comments.

EPO has recently updated the environmental Geographic Information System (GIS) website page. It now compiles various maps and viewers from our environmental health programs. The eGIS website page is continually updated so please visit it regularly at: http://health.hawaii.gov/epo/egis.

EPO also encourages you to examine and utilize the Hawaii Environmental Health Portal at: https://eha-cloud.doh.hawaii.gov. This site provides links to our e-Permitting Portal, Environmental Health Warehouse, Groundwater Contamination Viewer, Hawaii Emergency Response Exchange, Hawaii State and Local Emission Inventory System, Water Pollution Control Viewer, Water Quality Data, Warnings, Advisories and Postings.

We suggest you review the requirements of the Clean Water Branch (HAR, Section 11-54-1.1, -3, 4-8) and/or the National Pollutant Discharge Elimination System (NPDES) permit (HAR, Chapter 11-55) at: http://health.hawaii.gov/cwb. If you have any questions, please contact the Clean Water Branch, Engineering Section at (808) 586-4309 or cleanwaterbranch@doh.hawaii.gov. If your project involves waters of the U.S., it is highly recommended that you contact the Army Corps of Engineers, Regulatory Branch at: (808) 835-4303.

You may also wish to review the draft Office of Environmental Quality Control (OEQC) viewer at: http://eha-web.doh.hawaii.gov/oeqc-viewer. This viewer geographically shows where some previous Hawaii Environmental Policy Act (HEPA) (Hawaii Revised Statutes, Chapter 343) documents have been prepared.

In order to better protect public health and the environment, the U.S. Environmental Protection Agency (EPA) has developed a new environmental justice (EJ) mapping and screening tool called EJSCREEN. It is based on nationally consistent data and combines environmental and demographic indicators in maps and reports. EPO encourages you to explore, launch and utilize this powerful tool in planning your project. The EPA EJSCREEN tool is available at: http://www.epa.gov/ejscreen.

We request that you utilize all of this information on your proposed project to increase sustainable, innovative, inspirational, transparent and healthy design. Thank you for the opportunity to comment.

Mahalo nui loa,

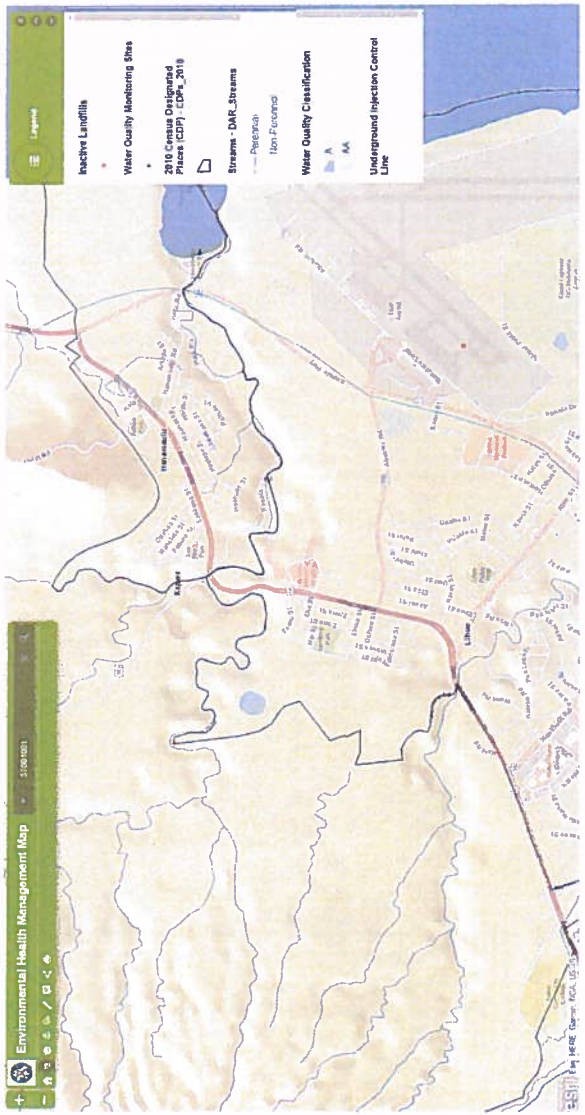
Laura Leialoha Phillips McIntyre, AICP
Program Manager, Environmental Planning Office

LM:nn

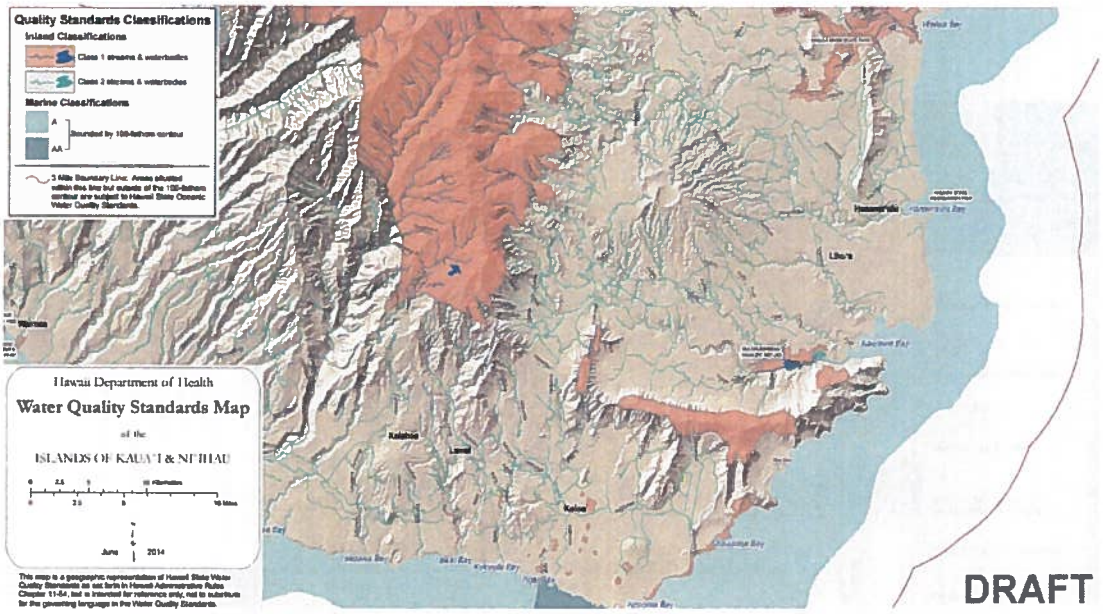
Attachment 1: Environmental Health Management Web App Snipit of Project Area: http://health.hawaii.gov/epo/egis
Attachment 2: Clean Water Branch: Water Quality Standards Map - Kauai
Attachment 3: Wastewater Branch: Recycled Water Use Map of Project Area
Attachment 4: U.S. EPA EJSCREEN Report for Project Area

c: Raymond J. McCormick, P.E., DOT (via email: Raymond.J.McCormick@hawaii.gov)
DOH: DHO Kauai, CWB (via email only)

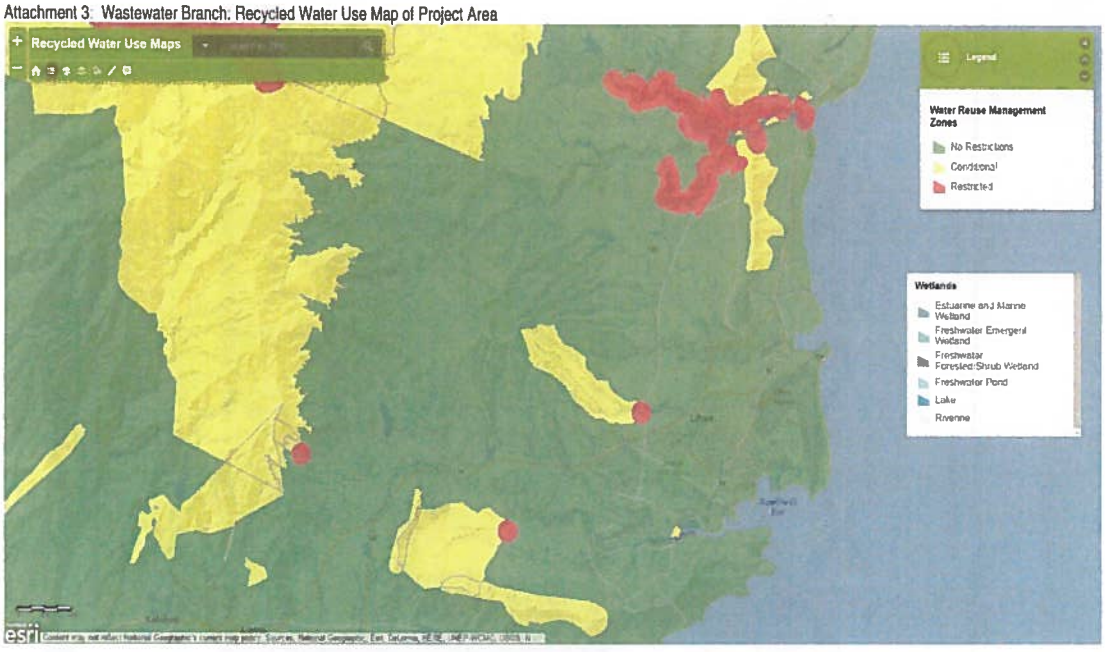
Attachment 1: Environmental Health Management Web App Snipit of Project Area: http://health.hawaii.gov/epo/egis



Attachment 2: Clean Water Branch: Water Quality Standards Map - Kauai



Attachment 3: Wastewater Branch: Recycled Water Use Map of Project Area



Attachment 4: U.S. EPA EJSCREEN Report for Project Area

EJSCREEN Report (Version 2016)

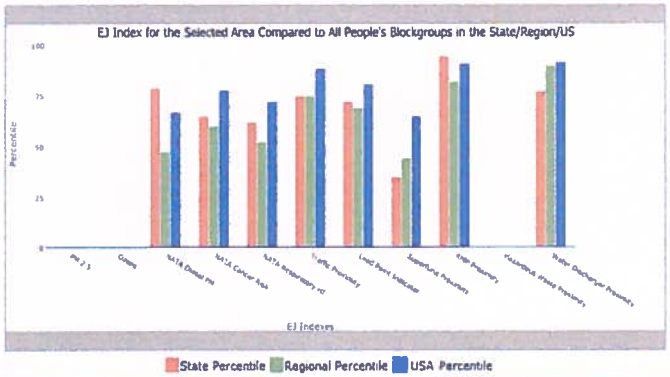
1 mile Ring Centered at 21.992211,-159.366303, HAWAII, EPA Region 9

Approximate Population: 6,756

Input Area (sq. miles): 3.14

Kapala Bridge Replacement

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	N/A	N/A	N/A
EJ Index for Ozone	N/A	N/A	N/A
EJ Index for NATA* Diesel PM	79	47	67
EJ Index for NATA* Air Toxics Cancer Risk	65	60	78
EJ Index for NATA* Respiratory Hazard Index	62	52	72
EJ Index for Traffic Proximity and Volume	75	75	89
EJ Index for Lead Paint Indicator	72	69	81
EJ Index for Superfund Proximity	35	44	65
EJ Index for RMP Proximity	95	82	91
EJ Index for Hazardous Waste Proximity*	N/A	N/A	N/A
EJ Index for Water Discharger Proximity	77	90	92



This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

EJSCREEN Report (Version 2016)

1 mile Ring Centered at 21.992211,-159.366303, HAWAII, EPA Region 9

Approximate Population: 6,756

Input Area (sq. miles): 3.14

Kapala Bridge Replacement

Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	0
National Pollutant Discharge Elimination System (NPDES)	0

EPA United States Environmental Protection Agency

EJSCREEN Report (Version 2016)

1 mile Ring Centered at 21.992211,-159.366303, HAWAII, EPA Region 9

Approximate Population: 6,758

Input Area (sq. miles): 3.14

Kapaia Bridge Replacement

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in µg/m³)	N/A	N/A	N/A	9.37	N/A	9.32	N/A
Ozone (ppb)	N/A	N/A	N/A	51	N/A	47.4	N/A
NATA* Diesel PM (µg/m³)	0.148	0.149	71	0.978	<50th	0.937	<50th
NATA* Cancer Risk (lifetime risk per million)	27	34	22	43	<50th	40	<50th
NATA* Respiratory Hazard Index	0.7	1	31	2	<50th	1.8	<50th
Traffic Proximity and Volume (daily traffic count/distance to road)	570	990	69	1100	61	690	80
Lead Paint Indicator (% Pre-1960 Housing)	0.16	0.16	60	0.24	52	0.3	45
Superfund Proximity (site count/km distance)	0	0.098	29	0.15	13	0.13	16
RMP Proximity (facility count/km distance)	0.72	0.19	94	0.57	77	0.43	82
Hazardous Waste Proximity+ (facility count/km distance)	N/A	0.14	N/A	0.14	N/A	0.11	N/A
Water Discharger Proximity (facility count/km distance)	0.36	0.34	67	0.2	87	0.31	78
Demographic Indicators							
Demographic Index	61%	52%	77	47%	70	36%	82
Minority Population	87%	77%	61	58%	78	37%	88
Low Income Population	35%	26%	72	36%	53	35%	56
Linguistically Isolated Population	8%	6%	68	9%	52	5%	76
Population With Less Than High School Education	18%	9%	86	17%	80	14%	72
Population Under 5 years of age	5%	6%	43	7%	40	6%	44
Population over 64 years of age	17%	15%	59	13%	76	14%	70

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

+ The hazardous waste environmental indicator and the corresponding EJ index will appear as N/A if there are no hazardous waste facilities within 50 km of a selected location.

For additional information, see: www.epa.gov/environmentaljustice

EJSCREEN is a screening tool for pre-decisional use only. It can help identify areas that may warrant additional consideration, analysis, or outreach. It does not provide a basis for decision-making, but it may help identify potential areas of EJ concern. Users should keep in mind that screening tools are subject to substantial uncertainty in their demographic and environmental data, particularly when looking at small geographic areas. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports. This screening tool does not provide data on every environmental impact and demographic factor that may be relevant to a particular location. EJSCREEN outputs should be supplemented with additional information and local knowledge before taking any action to address potential EJ concerns.

January 30, 2017 3/3

DAVID Y. IGE
GOVERNOR

FORD N. FUCHIGAMI
DIRECTOR

Deputy Directors
JADE T. BUTAY
ROSS M. HIGASHI
EDWIN H. SNIFFEN
DARRELL T. YOUNG

IN REPLY REFER TO:

HWY-K 4.170143

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
KAUAI DISTRICT
1720 HALEUKANA STREET
LIHUE, HAWAII 96766

March 31, 2017

TO: LAURA LEIALOHA PHILLIPS McINTYRE
PROGRAM MANAGER, ENVIRONMENTAL PLANNING OFFICE
DEPARTMENT OF HEALTH

FROM: LAWRENCE J. DILL, KAUAI DISTRICT ENGINEER

SUBJECT: KŪHIŌ HIGHWAY, REPLACEMENT OF HANAMĀʻULU (KAPAIA) STREAM BRIDGE, DISTRICT OF LĪHUʻE, ISLAND OF KAUAʻI
HANAMĀʻULU AHUPUAʻA
FEDERAL AID PROJECT NO. BR-056-1(48)
TAX MAP KEYS: (4) 3-8-002:999 (POR.), 001 (POR.); (4) 3-7-001:001 (POR.); (4)3-7-004:009 (POR.)

Thank you for your letter dated January 30, 2017 regarding the subject Draft EA (Environmental Assessment). We would like to take this opportunity to provide a response.

We appreciate your recommendation to review the DOH's (Department of Health) Standard Comments on your website. We intend to adhere to all applicable comments. Thank you also for the information on the recent update of the environmental Geographic Information System website page as well as information on the Hawai'i Environmental Health Portal.

We intend to contact the Clean Water Branch and the Army Corps of Engineers, Regulatory Branch regarding applicable permit requirements under their respective jurisdictions.

We appreciate your reference to the Office of Environmental Quality Control viewer where past Hawai'i environmental review documents can be found. We also appreciate your pointing out the new environmental justice (EJ) mapping and screening tool called EJSCREEN on the U.S. Environmental Protection Agency's website. The foregoing information will be useful in helping us to design and construct a better project.

Your letter, along with this response, will be reproduced and included in the forthcoming Final EA. We appreciate your participation in the Draft EA review process.

Should you have any questions, please call Ray McCormick, District Design Engineer at 808-241-3015, or via email at raymond.j.mccormick@hawaii.gov.

FR:es

c: HWY-DE, Wilson Okamoto Corporation (Milton Arakawa)

DAVID Y. IGE
GOVERNOR OF HAWAII

VIRGINIA PRESSLER, M.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
KAUAI DISTRICT HEALTH OFFICE
3040 UMI STREET
LIHUE, HAWAII 96766

JANET M. BERREMAN, M.D., M.P.H.
DISTRICT HEALTH OFFICER

January 26, 2017

Mr. Raymond J. McCormick
Hawaii Department of Transportation
Highways Division, Kauai District Office
1720 Haleukana Street
Lihue HI, 96766
Email: Raymond.j.mccormick@hawaii.gov

Dear Mr. McCormick:

SUBJECT: **Draft Environmental Assessment**
Project: **Kapaia Bridge Replacement**
Applicant: **Hawaii State Department of Transportation- Highways Division**

Based on our review, we offer the following environmental health concerns for your consideration, which should be addressed and included in this document.

1. Noise will be generated during the construction phase of this project. The applicable maximum permissible sound levels as stated in Title 11, Hawaii Administrative Rules (HAR), Chapter 11-46, "Community Noise Control", shall not be exceeded unless a noise permit is obtained from the State Department of Health (DOH).

2. Temporary fugitive dust emissions could be emitted when the project site is prepared for construction and when construction activities occur. In accordance with Title 11, HAR, Chapter 11-60.1 "Air Pollution Control", effective air pollution control measures shall be provided to prevent or minimize any fugitive dust emissions caused by construction work from affecting the surrounding areas. This includes the off-site roadways used to enter/exit the project. The control measures include but are not limited to the use of water wagons, sprinkler systems, dust fences, etc.

3. The construction waste that will be generated by the project shall be disposed of at a solid waste disposal facility that complies with the applicable provisions of Title 11, HAR, Chapter 11-58.1 "Solid Waste Management Control", the open burning of any of these wastes on or off site prohibited.

4. The Department of Health, Clean Water Branch (CWB) has reviewed the subject document and offers these comments on your project. Please note that our review is based solely on the information provided in the subject document and its compliance with HAR, Chapters 11-54 and 11-55. You may be responsible for fulfilling additional requirements related to our program. We recommend that you also read our standard comments on our website at http://www.hawaii.gov/health/environmental/env-planning/landuse/CWB-standardcomment.pdf.

   I. Any project and its potential impacts to State waters must meet the following criteria:

      a. Antidegradation policy (HAR, Section 11-54-1.1), which requires that the existing uses and the level of water quality necessary to protect the existing uses of the receiving State water be maintained and protected.

      b. Designated uses (HAR, Section 11-54-3), as determined by the classification of the receiving State waters.

      c. Water quality criteria (HAR, Sections 11-54-4 through 11-54-8).

   II. Please call the Army Corps of Engineers at (808) 438-9258 to see if this project requires a Department of the Army (DA) permit. Permits may be required for work performed in, over, and under navigable waters of the United States. Projects requiring a DA permit also require a Section 401 Water Quality Certification (WQC) from our office.

   III. You are required to obtain a National Pollutant Discharge Elimination System (NPDES) permit for discharges of wastewater, including storm water runoff, into State surface waters (HAR, Chapter 11-55). For the following types of discharges into Class A or Class 2 State waters, you may apply for NPDES general permit coverage by submitting a Notice of Intent (NOI) form:

      a. Storm water associated with industrial activities, as defined in Title 40, Code of Federal Regulations, Sections 122.26(b)(14)(i) through 122.26(b)(14)(ix) and 122.26(b)(14)(xi).

      b. Storm water associated with construction activities, including clearing, grading, and excavation, that result in the disturbance of equal to or greater than one (1) acre of total land area. The total land area includes a contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under a larger common plan of development or sale. **An NPDES permit is required before the start of the construction activities.**

c. Treated effluent from leaking underground storage tank remedial activities.

d. Once through cooling water less than one (1) million gallons per day.

e. Hydrotesting water.

f. Construction dewatering effluent

g. Treated effluent from petroleum bulk stations and terminals.

h. Treated effluent from well drilling activities.

i. Treated effluent from recycled water distribution systems.

j. Storm water from a small municipal separate storm sewer system.

k. Circulation water from decorative ponds or tanks.

5. You must submit a separate NOI form for each type of discharge at least 30 days prior to the start of the discharge activity, except when applying for coverage for discharges of storm water associated with construction activity. For this type of discharge, the NOI must be submitted 30 before to the start of construction activities. The NOI forms may be picked up at our office or downloaded from our website at: http://www.hawaii.gov/health/environmental/water/cleanwater/forms/genl-index.html.

6. For types of wastewater not listed in Item 3 above or wastewater discharging into Class 1 or Class AA waters, you must obtain an NPDES individual permit. An application for an NPDES individual permit must be submitted at least 180 days before the commencement of the discharge. The NPDES application forms may be picked up at our office or downloaded from our website at http://www.hawaii.gov/health/environmental/water/cleanwater/forms/indiv-index.html.

7. You must also submit a copy of the NOI or NPDES permit application to the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD), or demonstrate to the satisfaction of the CWB that SHPD has or is in the process of evaluating your project. Please submit a copy of your request for review by SHPD or SHPD's determination letter for the project along with your NOI or NPDES permit application, as applicable.

8. Please, note that all discharges related to the project construction or operation activities, whether or not NPDES permit coverage and/or Section 401 WQC are required, must comply with the State's Water Quality Standards. Noncompliance with water quality requirements contained in HAR, Chapter 11-54 and/or permitting requirements, specified in HAR, Chapter 11-55 may be subject to penalties of $25,000 per day per violation.

If you have any questions, please visit our website at http://www.hawaii.gov/health/environmental/water/cleanwater/index.html, or contact the Engineering Section, CWB, at (808) 586-4309.

Should you have any questions, please call me at 241-3323.

Sincerely,

Gerald N Takamura

Gerald N. Takamura, Chief
District Environmental Health Program Kaua'i

GNT: DTT

Cc: Laura McIntyre, Environmental Planning Office

DAVID Y. IGE
GOVERNOR

FORD N. FUCHIGAMI
DIRECTOR

Deputy Directors
JADE T. BUTAY
ROSS M. HIGASHI
EDWIN H. SNIFFEN
DARRELL T. YOUNG

IN REPLY REFER TO:
HWY-K 4.170144

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
KAUAI DISTRICT
1720 HALEUKANA STREET
LIHUE, HAWAII 96766

March 31, 2017

TO: GERALD N. TAKAMURA
CHIEF
DISTRICT ENVIRONMENTAL HEALTH PROGRAM KAUAI
DEPARTMENT OF HEALTH

FROM: LAWRENCE J. DILL, KAUAI DISTRICT ENGINEER

SUBJECT: KŪHIŌ HIGHWAY, REPLACEMENT OF HANAMĀʻULU (KAPAIA) STREAM BRIDGE, DISTRICT OF LĪHUʻE, ISLAND OF KAUAʻI
HANAMĀʻULU AHUPUAʻA
FEDERAL AID PROJECT NO. BR-056-1(48)
TAX MAP KEYS: (4) 3-8-002:999 (POR.), 001 (POR.); (4) 3-7-001:001 (POR.); (4)3-7-004:009 (POR.)

Thank you for your letter dated January 26, 2017 regarding the subject Draft (Environmental Assessment) EA. We would like to take this opportunity to provide a response.

1. We acknowledge the applicable maximum permissible sound levels noted in Chapter 11-46, HAR, "Community Noise Control". During the construction phase, the contractor shall be responsible for obtaining a noise permit if maximum permissible sound levels will be exceeded. In the long term, any additional noise impacts resulting from use of the new bridge should be minimal.

2. During construction, the contractor will also be responsible for complying with Title 11, HAR, Chapter 11-60.1 "Air Pollution Control" by implementing appropriate dust control measures. We acknowledge that dust control shall also include any off-site roadways used to enter/exit the project site.

3. During construction of the project, a trash management and recycling program will be developed and implemented to minimize impacts to the Kekaha Landfill. There will be no open burning of waste associated with this project.

4. We appreciate the information provided on Section 401 Water Quality Certification (WQC) and National Pollutant Discharge Elimination System (NPDES) permits. We intend to work cooperatively with the Department of Health in providing the requisite application submittals. We will also be in contact with the Army Corps of Engineers and intend to work with them toward fulfilling applicable regulatory requirements. We acknowledge that all discharges related to the project construction or operation activities, whether or not NPDES permit coverage and/or Section 401 WQC are required, must comply with the State's Water Quality Standards.

Your letter, along with this response, will be reproduced and included in the forthcoming Final EA. We appreciate your participation in the Draft EA review process.

Should you have any questions, please call Ray McCormick, District Design Engineer at 808-241-3015, or via email at raymond.j.mccormick@hawaii.gov.

FR:es

c: HWY-DE, Wilson Okamoto Corporation (Milton Arakawa)

OFFICE OF
ENVIRONMENTAL QUALITY CONTROL

DEPARTMENT OF HEALTH | 235 South Beretania Street, Suite 702, Honolulu, HI 96813 | oeqchawaii@doh.hawaii.gov

DAVID Y. IGE
GOVERNOR

SCOTT GLENN
DIRECTOR

(808) 586-4185

March 3, 2017

Lawrence J. Dill
Kaua'i District Engineer
Highways Division
Department of Transportation
State of Hawai'i
1720 Haleukana Street
Līhu'e, HI 96766

Attn: Raymond McCormick, P.E.

Dear Mr. Dill,

Subject: Draft Environmental Assessment (EA) for Kapaia Bridge Replacement

The Office of Environmental Quality Control (OEQC) has reviewed the Draft EA for the subject project, and offers the following comments:

We note that Page S-1 of the document's "Summary" section incorrectly lists the Department of Transportation, Highways Division as both Proposing Agency and Approving Agency. Chapter 343, Hawai'i Revised Statutes and the implementing rules, Chapter 11-200, Hawai'i Administrative Rules, establish two distinct paths through the environmental review system, one for agencies and another for applicants. The subject project is an "Agency Action;" accordingly, the Department of Transportation's (DOT) role in this case is the Proposing Agency. If the action had been proposed by a private party applying for a discretionary approval by the DOT, then the DOT's role would be as the Approving Agency. Thus, these terms are mutually exclusive.

Additionally, the OEQC recommends considering climate change for this and all future projects. Climate change is accompanied by dangerous conditions such as extreme rainfall, flooding, and streambank erosion. The Draft EA acknowledges the project area is located within a floodway and floodplain, and asserts 1) the project will be designed to meet the current standards for flood elevation (p. 3-10) and 2) will be adequately sized to handle peak runoff from the 100-year 24-hour storm (p.3-36). In the Final EA, please detail any impacts our changing climate may have on the project and identify relevant mitigation measures. In particular, climate change may result in more stormwater runoff and higher flood levels than those indicated in the draft. More information can be found at https://www3.epa.gov/climatechange/impacts/islands.html.

Thank you for the opportunity to comment on the Draft EA. We look forward to a response that will also be included in the Final EA. If you have any questions, please contact our office at (808) 586-4185.

Sincerely,

Tom Eisen

Scott Glenn, Director

cc: Wilson Okamoto Corp

17-331

DAVID Y. IGE
GOVERNOR

FORD N. FUCHIGAMI
DIRECTOR

Deputy Directors
JADE T. BUTAY
ROSS M. HIGASHI
EDWIN H. SNIFFEN
DARRELL T. YOUNG

IN REPLY REFER TO:

HWY-K 4.170145

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
KAUAI DISTRICT
1720 HALEUKANA STREET
LIHUE, HAWAII 96766

March 31, 2017

TO: SCOTT GLENN
DIRECTOR
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

FROM: LAWRENCE J. DILL, KAUAI DISTRICT ENGINEER

SUBJECT: KŪHIŌ HIGHWAY, REPLACEMENT OF HANAMĀ'ULU (KAPAIA) STREAM BRIDGE, DISTRICT OF LĪHU'E, ISLAND OF KAUA'I
HANAMĀ'ULU AHUPUA'A
FEDERAL AID PROJECT NO. BR-056-1(48)
TAX MAP KEYS: (4) 3-8-002:999 (POR.), 001 (POR.); (4) 3-7-001:001 (POR.); (4)3-7-004:009 (POR.)

Thank you for your letter dated March 3, 2017 regarding the subject Draft EA (Environmental Assessment). We would like to take this opportunity to provide a response.

We appreciate you pointing out the correction needed in the document's "Summary" section to list the Department of Transportation Highways Division as the Proposing Agency. We will make the change in the Final EA.

Thank you for the recommendation to consider climate change on this and all future projects. We will discuss climate change effects in the Final EA. We believe that the project should not be adversely impacted by climate change effects, such as higher than normal stream flows and increased flooding from heavier downpours. It is noted that the project improvements will be designed and constructed in full compliance with the flood plain requirements of the County. Moreover, the bridge abutments will be situated well above the ordinary high water level making the potential of scour unlikely. The hydraulic efficiency of the bridge would also be improved by removal of the two existing bridge piers.

Your letter, along with this response, will be reproduced and included in the forthcoming Final EA. We appreciate your participation in the Draft EA review process.

Should you have any questions, please call Ray McCormick, District Design Engineer at 808-241-3015, or via email at raymond.j.mccormick@hawaii.gov.

FR:es

c: HWY-DE, Wilson Okamoto Corporation (Milton Arakawa)

Bernard P. Carvalho, Jr.
Mayor

Wallace G. Rezentes, Jr.
Managing Director

Lyle Tabata
Acting County Engineer

DEPARTMENT OF PUBLIC WORKS
County of Kaua'i, State of Hawai'i
4444 Rice Street, Suite 275, Lihu'e, Hawai'i 96766
TEL (808) 241-4992 FAX (808) 241-6604

February 22, 2017

Raymond J. McCormick, P.E.
1720 Haleukana Street
Līhu'e III 96766

Subject Draft Environmental Assessment
Kūhi'ō Highway, Replacement of Hanamā'ulu (Kapaia) Stream Bridge
District of Līhu'e, Island of Kaua'i, Hanamā'ulu Ahupua'a
Federal Aid Project No. BR-05601(48)

Dear Mr. McCormick:

We have reviewed the Draft Environmental Assessment (DEA) that was provided via email dated February 8, 2017, and we have the following comments:

1. Page S-1; Proposed Action:
   - The proposed action states that the "proposed improvements include two twelve foot travel lanes for vehicular traffic along with an eight foot shoulder lane on each side of the bridge to accommodate pedestrian traffic." The County of Kaua'i requests that the project include sidewalks on both sides of the bridge, or at the very least a sidewalk on one side with appropriate means for pedestrians to cross the highway. The County's Līhu'e Community Plan (LCP) describes pedestrian traffic in the Kapaia area on page 73: "This area does see pedestrian activity, with a concentration of civic uses (Immaculate Conception Church and the Buddhist Temple) and pedestrians traveling along the highway to Wilcox Hospital." Page 177 of the LCP states, "Pedestrian safety can be improved through traffic calming measures and pedestrian improvements such as crosswalks and sidewalks across the Kapaia Bridge." While eight foot paved shoulders would be an improvement for pedestrians compared to the existing two foot paved shoulders, curbed concrete sidewalks are a much better facility for pedestrians in the long term. Since the new bridge is likely to be in service for close to 100 years, curbed sidewalks are preferred; and sidewalks connecting from the bridge to Līhu'e Town and Hanamā'ulu Town are likely to be constructed during the service life of the bridge. A minimum sidewalk width of five feet (measured from the back of curb) is recommended. The preferred bridge sidewalk width is 7 feet, measured from the face of curb to the railing, given that bridge sidewalks are

typically monolithic without a separate curb and the railing narrows the effective width of the sidewalk.
   - The LCP also discusses the current lack of bicycle facilities in this area. The proposed shoulders provide space for bicyclists, and could be marked as bike lanes once there is a sufficient length of usable shoulder in the area to designate bike lanes. In order to minimize bridge width after the introduction of sidewalks to the bridge, the shoulders could be narrowed from eight feet to six feet, or possibly even five feet.
   - The proposed action should also describe some of the benefits of paved shoulders for motor vehicles, or at least state that wider paved shoulders are recommended for highways of this traffic volume by highway design standards.
2. Section 2.5. Preferred Alternative.
   - The DEA states that the preferred alternative is Alternative 3, a Single-Span Replacement Bridge Along the Existing Alignment and Temporary Mauka Detour Bridge.We agree with the alternative of a single span replacement bridge along the existing alignment. However, due to the significant cost of the temporary mauka detour bridge ($9.8 million), we have two suggestions regarding detour routes.
     - Section 2.4.1 describes the Mā'alo Road Bypass, using Mā'alo Road and an existing cane haul road mauka of Hanamā'ulu Town. While this detour would require a long detour (3.2 miles), the estimated cost is $1.4 million, which is significantly less than the $9.8 million for the temporary mauka detour bridge. Given this significant savings, we believe that further study of this detour alternative may be appropriate, while considering the following issues:
       - A traffic study would indeed be necessary regarding the existing 17,000 vehicles per day on Kūhiō Highway. The traffic study would likely show that a significant portion of the existing volume would probably divert to Kāpule Highway, especially outside of the peak hours of traffic.
       - The cane haul road's existing culvert at Hanamā'ulu Stream has been washed out. Therefore, the $1.4 million cost estimate for this detour might need to be increased.
       - The County of Kaua'i has future plans for a landfill in the Mā'alo Road area. This location has not yet been finalized, and the exact timing of landfill construction is unknown at this time. However, it is likely that access to the landfill would involve reconstruction of portions of the cane haul road. Therefore, the $1.4 million cost estimate for this detour might be able to be decreased, if the new landfill is in place prior to reconstruction of the Kūhiō Highway bridge.
     - Section 2.4.2 describes the Kāpule Highway Bypass detour option, which would close the Kūhiō Highway Bridge for the time period necessary to construct the new bridge, directing all traffic to Kāpule Highway. We understand that this detour option was not selected due to the long detour (4.5 miles) and the concerns about the traffic impacts of having only one road connecting across Hanamā'ulu Stream. Because this detour option has an estimated cost of only $0.4 million compared to the $9.8 million cost for the temporary mauka detour bridge, we recommend that this detour alternative be studied further, while considering the following issues:

- The DEA suggests that the construction period for the replacement bridge is approximately 12 months if using the Kāpule Highway bypass. Consideration should be given to various solutions to reduce the construction time frame:
  - Extended work hours; the public might accept extended work hours for a shorter duration, instead of a longer duration of construction and traffic delays.
  - Creative construction methods to reduce construction time, such as use of precast materials as much as possible and use of accelerated curing for concrete.
  - Contractor incentives.
- Intersection reconfigurations along the detour route should be evaluated. As an added benefit, some of these enhancements would be beneficial for long term management of traffic congestion after the bridge is reopened. The following changes should be considered:
  - Kūhiō Highway/Kāpule Highway Intersection: Construct two southbound through lanes on Kūhiō Highway, with long approach lanes for storage at the signalized intersections; two departure lanes would continue for a short distance southbound on Kāpule Highway and then taper back to one lane. In addition, customize signal timing to accommodate the change in traffic patterns. As an alternative, consider converting this intersection to be a roundabout, with multiple lanes on some approaches to increase capacity.
  - Kāpule Highway/Ahukini Road Intersection: Construct two northbound through lanes on Kāpule Highway and two eastbound left turn lanes on Ahukini Road. These lanes would feed into two northbound departure lanes on Kāpule Highway, tapering back to one lane northbound. In addition, customize signal timing to accommodate the change in traffic patterns. As an alternative, consider converting this intersection to be a roundabout with multiple lanes on some approaches to increase capacity.
  - Kāpule Highway/Rice Street Intersection: Construct a roundabout at this intersection, as is currently being evaluated as part of the Hokuala development (formerly Kaua'i Lagoons).
  - Ahukini Road: Due to the fact that Ahukini Road has many existing street connections in Līhu'e Town to disperse the additional traffic, physical changes might be unnecessary. Consider adding westbound left turn lanes from Ahukini Road to Palai Street, Elua Street, and Akahi Street. Consider customizing signal timing at the intersection of Ahukini Road and Kūhiō Highway to accommodate the change in traffic patterns.
- Implement Transportation Demand Management (TDM) measures in the greater Līhu'e area, for example:
  - General public relations efforts encouraging carpooling and trip-chaining, and discouraging unnecessary trips.
  - Encourage use of school buses by school children, perhaps waiving school bus fees for affected residents during the closure.
  - Encourage use of transit buses by residents, workers, and visitors, especially in Hanamā'ulu and all communities to the north, perhaps by increasing bus service and/or providing reduced cost or complimentary bus passes for some users during the closure.
  - Work with major employers to encourage teleworking where feasible, and/or to stagger the start and end of work shifts, in order to reduce the peak travel demand.
- Consider a staged bridge construction that allows one lane of the Kūhiō Highway Bridge to remain open, reversing the flow of traffic on the bridge to accommodate the peak direction of travel. Outside of peak hours, flow in the southbound direction is likely to create the least amount of congestion.

3. Section 3.18 Water and Wastewater.
   - We acknowledge that the DEA identifies the presence of the 12-inch sewer main on the existing bridge, and the proximity of the Kapaia Sewage Pump Station (SPS) within the project area. We concur with the need for consultation during design of the project, and recommend avoiding any alternative that would require relocation of the Kapaia SPS. The project design shall ensure that continuous sewer service to the community is maintained throughout the duration of the project, and shall provide for any necessary temporary sewer mains, bypass pumping or other provisions in order to maintain continuous sewer service. Additionally, access for DPW staff to the Kapaia SPS shall be maintained during the project.
4. Section 3.4.1. Flood Hazard.
   - The Kapaia Stream Bridge lies within Zone AEF on Flood Insurance Rate Map (FIRM) Panel 326F. Zone AEF is the floodway area of Zone AE. A registered professional engineer will need to certify that the work will not cause an increase in the base flood elevation during the occurrence of the base flood discharge. Certification of no-rise will be also required for any temporary bridge that is constructed within the floodway.

Thank you for the opportunity to review and comment on the DEA for this project. We wish to remain on your mailing list to continue participating in the environmental review process. If you have any questions or need additional information, please contact Michael Moule, Engineering Division at (808) 241-4891.

Sincerely,

LYLE TABATA
Acting County Engineer

MM/SI

Copy to: Milton Arakawa, Wilson Okamoto Corporation
(1907 South Beretania Street, Suite 400, Honolulu, HI 96826)
Design and Permitting
Michael Moule, Chief, Engineering Division
Lee Steinmetz, Transportation Planner
Ed Tschupp; Chief, Wastewater Management Division

DAVID Y. IGE
GOVERNOR

FORD N. FUCHIGAMI
DIRECTOR

Deputy Directors
JADE T. BUTAY
ROSS M. HIGASHI
EDWIN H. SNIFFEN
DARRELL T. YOUNG

IN REPLY REFER TO:

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
KAUAI DISTRICT
1720 HALEUKANA STREET
LIHUE, HAWAII 96766

HWY-K 4.170149

March 31, 2017

Mr. Lyle Tabata
Acting County Engineer
Department of Public Works
County of Kaua'i
4444 Rice Street, Suite 275
Līhu'e, Hawai'i 96766

Subject: Kūhiō Highway, Replacement of Hanamā'ulu (Kapaia) Stream Bridge, District of Līhu'e, Island of Kaua'i
Hanamā'ulu Ahupua'a
Federal Aid Project No. BR-056-1(48)
Tax Map Keys: (4) 3-8-002:999 (por.), 001 (por.); (4) 3-7-001:001 (por.); (4) 3-7-004:009 (por.)

Dear Mr. Tabata:

Thank you for your comments on the Kapaia Bridge Replacement project. We have reviewed your comments and would like to provide a response.

We agree with your comments on the need to incorporate bicycle and pedestrian facilities as part of the proposed project. We propose to include a 5-6 foot wide concrete sidewalk and a 5-6 foot wide bike lane on both sides of the bridge. These are proposed to be adjacent to two 11-12 foot wide travel lanes. The DOT's Pedestrian Master Plan calls for improving pedestrian connections between Wilcox Memorial Hospital and Hanamā'ulu Road. Bike Plan Hawai'i also calls for a signed shared roadway on Kūhiō Highway between Rice Street and Hanamā'ulu. We believe the current bridge project is an effort to incrementally implement these plans.

You have noted that due to the significant cost of the temporary mauka detour bridge, there are two suggestions for detour routes. You have noted that the Mā'alo Road Bypass, using Mā'alo Road and an existing cane haul road mauka of Hanamā'ulu Town would cost significantly less than a mauka detour. As you have noted, a traffic study would be required and a significant portion of the traffic will likely be diverted to Kāpule Highway. You have noted that the cane haul road's existing culvert has been washed out which may serve to increase the cost estimate. However, the County may also reconstruct portions of the cane haul road in conjunction with the Mā'alo Landfill project. This could serve to decrease the cost estimate.

With regard to the Kāpule Bypass detour option, you have recommended that this should be studied further. Since the estimated construction for the replacement bridge is 12 months if using the Kāpule Bypass, other suggestions were made to attempt to further decrease the construction time. These may include extended work hours, creative construction methods and contractor incentives. You have noted that other intersection reconfigurations could also be evaluated. These may include changes to the Kūhiō Highway/Kāpule Highway intersection, the Kāpule Highway/Ahukini Road intersection, Kāpule Highway/Rice Street intersection and adding turn lanes along several side streets which intersect with Ahukini Road. You have also suggested a number of Transportation Demand Management (TDM) measures in the greater Līhu'e area. You have also suggested a staged bridge construction that would allow one lane of the Kūhiō Highway Bridge to remain open, reversing the flow of traffic on the bridge to accommodate the peak direction of travel.

We note that there are a variety of interesting concepts presented. We concur that both the Mā'alo Road detour and the Kāpule Highway detour will require further traffic study. Should the traffic study recommend additional improvements, this would likely require additional funding which is undetermined at this time. Enhancements such as intersection improvements and/or additional turn lanes to public roadways in the vicinity may provide some traffic relief during the period of construction as well as provide additional benefit in the long term. However, depending on the improvements or the lack thereof, additional environmental impact is not known at this time. Also, specific impacts upon adjacent landowners and on regional traffic is not known. Additional public review, especially relating to impacts on regional traffic, would be required.

With regard to the Mā'alo Road detour, the Cane Haul Road portion is privately owned so landowner approval would be required. We understand that the road's existing culvert at Hanamā'ulu River has been washed out so additional cost would be required for repairs. While the existing culvert may be repaired in connection with the County's Mā'alo Landfill project, the timing of any improvement or repair is uncertain.

However, we will review methods to decrease construction time. We concur that a decrease in the period of construction is beneficial for all parties concerned and believe this can be discussed regardless of the alternative chosen.

We concur that intersection reconfigurations along the detour route should be evaluated. You have noted that these enhancements would be beneficial for long term management of traffic congestion after the bridge is opened. Some of the improvements may also require further analysis and public review.

Transportation Demand Management measures are also another way to help alleviate some traffic congestion. These are excellent ideas which can be pursued regardless of the alternative chosen.

Staged bridge construction was considered as one of the alternatives. Traffic could be maintained on the existing bridge while the southern half of the new bridge is constructed. Traffic would subsequently be moved to the southern half of the bridge while the northern half of the new bridge is constructed. While this eliminates the need for a separate detour route, the traffic lanes would be narrow and would be very close to work zones during both stages of construction. Also, construction of the abutment foundation will be a challenge because they are located on the existing embankment slope. At these locations, the slope must be benched to provide access for equipment to construct the foundations. Because of these disadvantages, staged construction was not selected as the preferred alternative.

You have raised a number of pertinent points for consideration. In our study of alternatives, we believe that the proposed Single-Span Replacement Bridge Along the Existing Alignment and the Temporary Mauka Detour Bridge provides the best balance between updating the facility to current standards, minimizing short-term and long-term impacts on the neighborhood and region, and reasonable constructability and cost. Pursuant to your comment on the high cost of the temporary mauka bridge, we have reevaluated the original design. A significant portion of the mauka detour cost estimate derives from cut and fill walls as well as extensive excavation and backfill. This is due to the steeper terrain on the mauka side of the existing bridge. In order to help minimize these costs, a longer two span detour bridge with an intermediate pier is proposed. With this revision, an estimated cost for the mauka detour is $5.3 million which is significantly lower than the original estimate of $9.8 million.

It is noted that the use of Mā'alo Road or Kāpule Highway as a temporary detour has been considered. However, we believe that a significant point is that further disruption of traffic within the Kapa'a-Wailua-Hanamā'ulu-Līhu'e corridor, even if it is temporary, will affect commuter and area traffic which many people already consider congested. Thus, we believe that the proposed preferred alternative would generally maintain existing traffic conditions without further deterioration due to the construction of the project.

Should Kapaia Bridge be closed during construction, this will also inconvenience nearby residents, businesses as well as schools and routine medical services. Emergency response time to and from Wilcox Memorial Hospital would also be negatively affected. Thus, we believe that the proposed preferred alternative of a single span replacement bridge along the existing alignment with construction of a temporary mauka bypass bridge to provide traffic continuity during the period of construction offered the best balance with the foregoing factors taken into consideration.

With regard to wastewater, you have recommended avoiding any alternative that would require relocation of the Kapaia Sewer Pump Station. You have noted that the project shall ensure that continuous sewer service to the community is maintained during the duration of the project and that access for DPW staff to the Kapaia SPS be maintained during the project. We acknowledge that the project will not require relocation of the Kapaia SPS. Continuous sewer service will be maintained during the duration of the project and we will provide access for DPW staff to the Kapaia SPS.

Mr. Lyle Tabata
March 31, 2017
Page 2

HWY-K 4.170149

You have noted that the Kapaia Stream Bridge lies within Zone AEF on Flood Insurance Rate Map (FIRM) Panel 326F. We will work with County staff to ensure that the proposed project will not cause an increase in base flood elevation during the occurrence of the base flood discharge as well as applicable provisions regarding no-rise certification for any temporary bridge.

We appreciate your interest in this project and will coordinate with the County as we proceed through the environmental review process. Your letter, along with this response, will be reproduced and included in the forthcoming Final EA. We appreciate your participation in the Section 106 and Draft EA review process.

Sincerely,

Lawrence J. Dill, P.E.
District Engineer

FR:es

c: HWY-DE, Wilson Okamoto Corporation (Milton Arakawa)

Mr. Raymond McCormick
State of Hawai'i Department of Transportation
Highways Division
Kaua'i District Office
1720 Haleukana Street
Līhu'e, HI 96766

SUBJECT: **KŪHIŌ HIGHWAY, REPLACEMENT OF HANAMĀ'ULU (KAPAIA) STREAM BRIDGE, DISTRICT OF LĪHU'E, ISLAND OF KAUA'I**
Federal Aid Project No. BR-056-1(048)
Public Informational Meeting for
National Historic Preservation Act Section 106, National Environmental Policy Act, and Chapter 343 Hawai'i Revised Statutes Consultation
Wednesday, February 15, 2017

I prefer the Makai Alternative, although it will affect some business & private homes. However, progress is necessary, but feel that a load on the bridge is my concern - Large trucks are passing thru Hanamaulu instead of Kapule Hwy. Training of the drivers & certain those not to travel thru Hanamaulu Town — Trucks going past Līhue should use Kapule, Rice and up Hanamaulu Road not going thru Līhue Town because of the road size and Traffic.

The plan many years ago (1950) was to by-pass Hanamaulu and have Lane from Kapule Rice & Nawiliwili. "No" large Truck or Trailers should be in Hanamaulu Town or Līhue Town — period !! Only to deliver products geared for those town. Not passing thru —

(include additional sheets as necessary)

PLEASE PRINT: Name: Lester T. Matsushima Phone: 808-652-1733
Organization: None
Address: 4407 Amo St. Lihue HI 96766
Email:

Please submit comments by **Wednesday, February 22, 2017**, or email raymond.j.mccormick@hawaii.gov

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
KAUAI DISTRICT
1720 HALEUKANA STREET
LIHUE, HAWAII 96766

HWY-K 4.170148

March 31, 2017

Mr. Lester Matsushima
4407 Amo Street
Līhu'e, Hawai'i 96766

Subject: Kūhiō Highway, Replacement of Hanamā'ulu (Kapaia) Stream Bridge, District of Līhu'e, Island of Kaua'i
Hanamā'ulu Ahupua'a
Federal Aid Project No. BR-056-1(48)
Tax Map Keys: (4) 3-8-002:999 (por.), 001 (por.); (4) 3-7-001:001 (por.); (4) 3-7-004:009 (por.)

Dear Mr. Matsushima:

Thank you for your participation at the February 15, 2017 informational meeting and subsequent written comments for the Kapaia Bridge Replacement project. We have reviewed your comments and would like to provide a response.

The proposed preferred alternative calls for a single span replacement bridge along the existing alignment with construction of a temporary mauka bypass bridge to provide traffic continuity during the period of construction. Your stated preference is a permanent replacement bridge makai of the existing bridge.

It is noted that there are existing residences on the makai side of the bridge as well as on the mauka side. One of the reasons for the selection of the single span replacement bridge along the existing alignment is to try to maintain a respectful distance from both sides without unduly impacting either side.

The proposed preferred alternative also includes the temporary mauka detour bridge. It is our opinion that a temporary detour is necessary in order to not further disrupt existing regional and area traffic. A temporary detour on the makai side of the existing bridge would impact several landowners while a mauka detour would impact one landowner. Moreover, a makai detour would result in greater impacts to residences makai of the bridge while residences mauka of the bridge are in Hanamā'ulu on the top of an existing bluff. Thus, a mauka temporary detour is preferred.

You have also expressed a concern regarding the load on the bridge as well as excessive truck traffic passing through Hanamā'ulu. We emphasize that all new bridges will be built to conform to current bridge loading standards.

As far as truck traffic, Kūhiō Highway as well as Kāpule Highway both handle a fair amount of truck traffic. Both are considered arterial roadways. As Kaua'i has grown over the years, traffic has increased and with it, traffic congestion. While we understand the concern with truck traffic traversing through the Hanamā'ulu area, it is difficult to limit or prohibit truck traffic.

Your letter, along with this response, will be reproduced and included in the forthcoming Final (Environmental Assessment) EA. We appreciate your participation in the Section 106 and Draft EA review process.

Sincerely,

Lawrence J. Dill, P.E.
District Engineer

FR:es

c: HWY-DE, Wilson Okamoto Corporation (Milton Arakawa)

From: Glenn Mickens [mailto:glennruth2030@gmail.com]
Sent: Monday, February 20, 2017 2:21 PM
To: McCormick, Raymond J <raymond.j.mccormick@hawaii.gov>
Subject: My reply to your questionair

Aloha Ray:
Sure great to have you back on Kauai. I could not make the meeting on the 15th but Ken Taylor gave me the information about the Kapaia bridge replacement.

First, I am not an engineer and have no idea how badly this Kapaia bridge needs replacing. But I do have complete confidence and trust in Ray McCormick and Larry Dill as advisors and engineers and if they say that this bridge needs replacing then I am confident that it does.

It appears that their best and most economical replacement choice would be the new single-span Bridge costing $25,152,000---the New Makai Alignment.

My one main concern with approving of this project is knowing that a bid was given to the Acrow Co. as well as to other companies---Acrow bridges on Kauai being at least 10 times cheaper to build and install than the cement type.

The Olohena Bridge and the Kilauea Bridge cement replacements cost the tax payers 10 times--$4.8 million and about $13 million over what the Acrow bridges would have cost. AND the replacement times for Acrow would have been a few days compared to months for the other.

Acrow has at least 4 bridges on Kauai, the one over the Wailua River being the largest in the state. Even if they take more maintenance than the cement type, the savings would be far greater and economical than the other. AND they are state and Fed approved in contrast to what some opponents have said in the past.

Again, I will be in favor of replacing this bridge ONLY if I know that the Acrow Co got to bid on the contract, and, if low bid got the job.

Sincerely,
Glenn Mickens
5920 Kini Pl
Kapaa, HI 96746
822 0998

DAVID Y. IGE
GOVERNOR

FORD N. FUCHIGAMI
DIRECTOR

Deputy Directors
JADE T. BUTAY
ROSS M. HIGASHI
EDWIN H. SNIFFEN
DARRELL T. YOUNG

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
KAUAI DISTRICT
1720 HALELUKANA STREET
LIHUE, HAWAII 96766

IN REPLY REFER TO:
HWY-K 4.170147

March 31, 2017

Mr. Glenn Mickens
5920 Kini Place
Kapa'a, Hawai'i 96746

Subject: Kūhiō Highway, Replacement of Hanamā'ulu (Kapaia) Stream Bridge, District of Līhu'e, Island of Kaua'i
Hanamā'ulu Ahupua'a
Federal Aid Project No. BR-056-1(48)
Tax Map Keys: (4) 3-8-002:999 (por.), 001 (por.); (4) 3-7-001:001 (por.); (4) 3-7-001:001 (por); (4) 3-7-004:009 (por).)

Dear Mr. Mickens:

Thank you for your comments on the Kapaia Bridge Replacement project. We have reviewed your comments and would like to provide a response.

The proposed preferred alternative calls for a single span replacement bridge along the existing alignment with construction of a temporary mauka bypass bridge to provide traffic continuity during the period of construction. Your stated preference is a permanent replacement bridge makai of the existing bridge.

It is noted that there are existing residences on the makai side of the bridge as well as on the mauka side. One of the reasons for the selection of the single span replacement bridge along the existing alignment is to try to maintain a respectful distance from both sides without unduly impacting either side.

However, your main concern was that you believe that a bid should be given to Acrow Company as well as to other companies since Acrow bridges are significantly less costly to build and install than the cement type. As you know, the Acrow Company is one maker of steel panel bridges. There are other manufacturers of bridges of this type as well, who may be interested in providing a bid. Thus, an assurance that a particular company may be selected cannot be given at this time.

As part of the proposed preferred alternative, we envision that the temporary mauka detour bridge will likely be a type of steel panel bridge. We concur that a temporary steel panel bridge would be cheaper and faster to construct than a concrete bridge. Initial estimated cost of the mauka detour was $9.8 million. We note that a significant portion of the mauka detour cost estimate derives from cut and fill walls as well as excavation and backfill which is required. This is due to the relatively steeper terrain on the mauka side of the existing bridge. In order to help minimize those costs, a longer two span detour bridge with an intermediate pier was estimated. With a revised design, a revised estimated cost for the mauka detour is $5.3 million.

While steel panel bridges are cheaper and faster to construct, there are also some disadvantages which should be taken into consideration. While steel is a strong and flexible material, one disadvantage is that steel is susceptible to corrosion when exposed to air, water, and humidity. Steel must be painted periodically involving additional maintenance. Should such maintenance not occur over the long term, steel's strength can be severely compromised. Steel also has a relatively small resistance to fire and extreme heat compared to concrete. While steel itself is incombustible, its strength is reduced tremendously at high temperatures. Thus, at this point in time, we have felt that it is prudent to utilize steel panel bridges for temporary bridge scenarios rather than as a permanent bridge.

Your letter, along with this response, will be reproduced and included in the forthcoming Final (Environmental Assessment) EA. We appreciate your participation in the Section 106 and Draft EA review process.

Sincerely,

Lawrence J. Dill, P.E.
District Engineer

FR:es

c: HWY-DE, Wilson Okamoto Corporation (Milton Arakawa)

DAVID Y. IGE
GOVERNOR

FORD N. FUCHIGAMI
DIRECTOR

Deputy Directors
JADE T. BUTAY
ROSS M. HIGASHI
EDWIN H. SNIFFEN
DARRELL T. YOUNG

IN REPLY REFER TO:
HWY-K 4.170147

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
KAUAI DISTRICT
1720 HALEUKANA STREET
LIHUE, HAWAII 96766

March 31, 2017

Mr. Glenn Mickens
5920 Kini Place
Kapa'a, Hawai'i 96746

Subject: Kūhiō Highway, Replacement of Hanamā'ulu (Kapaia) Stream Bridge, District of Līhu'e, Island of Kaua'i
Hanamā'ulu Ahupua'a
Federal Aid Project No. BR-056-1(48)
Tax Map Keys: (4) 3-8-002:999 (por.), 001 (por.); (4) 3-7-001:001 (por.); (4) 3-7-001:001 (por); (4) 3-7-004:009 (por).)

Dear Mr. Mickens:

Thank you for your comments on the Kapaia Bridge Replacement project. We have reviewed your comments and would like to provide a response.

The proposed preferred alternative calls for a single span replacement bridge along the existing alignment with construction of a temporary mauka bypass bridge to provide traffic continuity during the period of construction. Your stated preference is a permanent replacement bridge makai of the existing bridge.

It is noted that there are existing residences on the makai side of the bridge as well as on the mauka side. One of the reasons for the selection of the single span replacement bridge along the existing alignment is to try to maintain a respectful distance from both sides without unduly impacting either side.

However, your main concern was that you believe that a bid should be given to Acrow Company as well as to other companies since Acrow bridges are significantly less costly to build and install than the cement type. As you know, the Acrow Company is one maker of steel panel bridges. There are other manufacturers of bridges of this type as well, who may be interested in providing a bid. Thus, an assurance that a particular company may be selected cannot be given at this time.

As part of the proposed preferred alternative, we envision that the temporary mauka detour bridge will likely be a type of steel panel bridge. We concur that a temporary steel panel bridge would be cheaper and faster to construct than a concrete bridge. Initial estimated cost of the mauka detour was $9.8 million. We note that a significant portion of the mauka detour cost estimate derives from cut and fill walls as well as excavation and backfill which is required. This is due to the relatively steeper terrain on the mauka side of the existing bridge. In order to help minimize those costs, a longer two span detour bridge with an intermediate pier was estimated. With a revised design, a revised estimated cost for the mauka detour is $5.3 million.

While steel panel bridges are cheaper and faster to construct, there are also some disadvantages which should be taken into consideration. While steel is a strong and flexible material, one disadvantage is that steel is susceptible to corrosion when exposed to air, water, and humidity. Steel must be painted periodically involving additional maintenance. Should such maintenance not occur over the long term, steel's strength can be severely compromised. Steel also has a relatively small resistance to fire and extreme heat compared to concrete. While steel itself is incombustible, its strength is reduced tremendously at high temperatures. Thus, at this point in time, we have felt that it is prudent to utilize steel panel bridges for temporary bridge scenarios rather than as a permanent bridge.

Your letter, along with this response, will be reproduced and included in the forthcoming Final (Environmental Assessment) EA. We appreciate your participation in the Section 106 and Draft EA review process.

Sincerely,

Lawrence J. Dill, P.E.
District Engineer

FR:es

c: HWY-DE, Wilson Okamoto Corporation (Milton Arakawa)

To: Mr. Raymond McCormick
Department of Transportation
Highways Division-Kaua'I District
1720 Haleukana St.
Lihu'e, HI 96766
raymond.j.mccormick@hawaii.gov

RE: National Historic Preservation Act, Section 106 Consultation
Kuhio Hwy, Replacement of Kapaia Stream Bridge

Dear Mr. McCormick:

Thank you for your excellent effort to inform and engage the public on the replacement of the Kapaia Stream Bridge.

Question: Does the 41 million for mauka new bridge include relocating the sewer pump station?

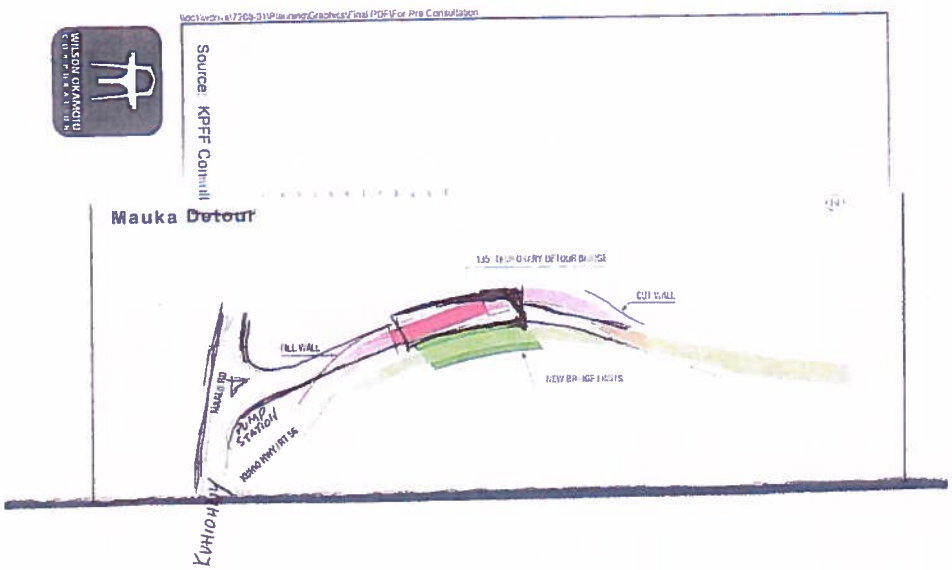
1. Why was a mauka new bridge adjacent to the existing not chosen for the permanent new bridge? A mauka bridge would eliminate the cost of building a detour bridge. Furthermore, a mauka bridge could be aligned with Kuhio Highway to eliminate the blind curve through Kapaia Town.
2. Is the small bridge a few yards up Maalo Rd. strong enough to bear the weight of all the tractor trailers that travel over it daily?

Request:

1. I would like to see a detailed alignment plan of the highway on both approaches (Hanama'ulu and Lihu'e) to the bridge, especially showing the turn off to Maalo Rd.
2. If widening the bridge provides a sidewalk, I would like to see your plan on how the bridge sidewalk will connect to the sidewalks in Hanama'ulu and Lihu'e. I would also like to know when the completed sidewalk project will take place.

Thank you for taking the time to consider the above questions and requests.

Sincerely,
Laraine Moriguchi
2829 Kanani St.
Lihu'e, HI 96766
savekapaiaswingingbridge@yahoo.com



SUGGESTED MAUKA NEW BRIDGE ALIGNED TO KUHIO HIGHWAY ABOVE SEWER PUMP STATION.

- WILL PROVIDE ROOM FOR PEDESTRIAN/BIKE WAY BWEEN HANAMAʻULU & LIHUÉ
- SAFER THAN EXISTING ALIGNMENT

DAVID Y. IGE
GOVERNOR

FORD N. FUCHIGAMI
DIRECTOR

Deputy Directors
JADE T. BUTAY
ROSS M. HIGASHI
EDWIN H. SNIFFEN
DARRELL T. YOUNG

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
KAUAI DISTRICT
1720 HALEUKANA STREET
LIHUE, HAWAII 96766

IN REPLY REFER TO:

HWY-K 4.170157

April 7, 2017

Ms. Laraine Moriguchi
2829 Kanani Street
Līhu'e, Hawai'i 96766

Subject: Kūhiō Highway, Replacement of Hanamā'ulu (Kapaia) Stream Bridge, District of Līhu'e, Island of Kaua'i
Hanamā'ulu Ahupua'a
Federal Aid Project No. BR-56-01(48)
Tax Map Keys: (4) 3-8-002:999 (por.), 001 (por.); (4) 3-7-001:001 (por.); (4) 3-7-004:009 (por.)

Dear Ms. Moriguchi:

Thank you for your participation at the February 15, 2017 informational meeting and subsequent written comments for the Kapaia Bridge Replacement project. We have reviewed your comments and would like to provide a response.

You have asked whether the $40,792,000 for the new mauka bridge alternative includes the cost of relocating the sewer pump station located at the corner of Mā'alo Road and Kūhiō Highway. The mauka alternative did include an $8.5 million component cost to reconstruct the sewer pump station. However, the cost does not include the permanent right-of-way needed for the displaced pump station. So, depending on whether additional land is needed for a displaced pump station, this estimate may be too low.

You have asked why a permanent mauka bridge alignment was not chosen. One of the reasons, is that the cost is significantly higher than the other alternatives. The $40,792,000 cost is 162% higher than the permanent makai alignment alternative which is the next lowest cost alternative. It also would take nearly twice as long to construct, and would have the greatest impact to private property as far as the extent of land acquisition. In addition to the impact to the pump station noted above, a reason for the excessive cost is the construction complexity caused by the steep terrain and heavy vegetation on the mauka side. This requires significant earthwork, grading and grubbing which is needed to allow access for construction equipment to reach the bridge foundation locations.

You have asked whether the Mā'alo Road Bridge is strong enough to bear the weight of all the tractor trailers that travel over it daily. The Mā'alo Road Bridge was constructed in 1927, six years before the Kapaia Bridge. A bridge inspection report is currently being done so the load rating of the bridge cannot be stated with accuracy at the present time. It is noted however, that the bridge width, at 26.2 feet, is narrower than the existing Kapaia Bridge. This cannot accommodate bike lane and sidewalk improvements along with two vehicular travel lanes.

You have requested to see a detailed alignment plan of the highway on the Hanamā'ulu and Līhu'e approaches to the bridge with a turn off to Mā'alo Road. Although we have not formulated permanent alignment alternatives with a connection to Mā'alo Road, there is a temporary mauka detour alternative with a turnoff to Mā'alo Road. This was not selected as the preferred detour alternative because of several drawbacks. The downhill grade for Līhu'e bound traffic is steep (12 percent) ending at a stop condition. The steep slope and stop condition raises safety issues. Moreover, the stop condition on an arterial highway like Kūhiō Highway will cause an additional bottleneck in commuter and area traffic which many people already consider congested. A permanent turnoff to Mā'alo Road would cause similar issues only on a long term basis.

You have also asked to see a plan as to how the bridge sidewalk will connect to sidewalks in Hanamā'ulu and Līhu'e. You have also asked when the sidewalk project will take place. The project proposes inclusion of a bike lane and sidewalk within the bridge cross section. At the present time, there are no specific projects to implement sidewalks or bike lanes in the immediate vicinity of the bridge.

Your letter, along with this response, will be reproduced and included in the forthcoming Final EA. We appreciate your participation in the Section 106 and Draft EA review process.

Sincerely,

Lawrence J. Dill, P.E.
District Engineer

FR:es

c: HWY-DE, Wilson Okamoto Corporation (Milton Arakawa)

Mr. Raymond McCormick
State of Hawai'I Department of Transportation
Highways Division
Kaua'I District Office
1720 Haleukana Street
Lihu'e, HI 96766

SUBJECT: KUHIO HIGHWAY, REPLACEMENT OF HANAMA'ULU (KAPAIA) STREAM BRIDGE, DISTRICT OF LIHU'E, ISLAND OF KAUAI
Federal Aid Project No. BR-056-1(048)
Public Informational Meeting for
National Historic Preservation Act Section 106, National Environmental Policy Act, and Chapter 343 Hawai'I Revised Statutes Consultation
Wednesday, February 15, 2017

My name is Eddie Sarita. I am a life-long residest of Hanama'ulu, a community located east of and adjacent to Kapaia where the above-described project is located. I currently serve as president of the Hanama'ulu Community Association but the comments I offer are personal. I submit these comments, however, grounded by the fact that I have been a long- supporter for improved traffic management for the traffic that passes through Hanama'ulu. As a member of the Kauai County Council (1977 – 1984), I along with many others lobbied to have Kapule Highway constructed. I also lobbied for the installation of traffic lights on Kauai when there were only 2 traffic lights operating on the island; on Rice Street in Lihue. Today, there are traffic lights at almost every critical intersection on the island.

The State DOT's Preferred Alternative calls for a single-span replacement bridge along the existing alignment with construction of a temporary mauka bypass bridge to provide traffic continuity access during construction of the new replacement bridge meaning allowance for traffic to continue to pass between Lihue & Hanama'ulu through the temporary mauka detour bridge. Estimated project total cost is $25,031,000 and require an 18-month completion period.

My preference is for the "Existing Alignment with Kapule Bypass Option" shown in Table 1 on Page 26 of the Kapai Bridge Design Alternatives information packet. My preference is based on the following.

PROS

1. this alignment option mirrors the preferred alternative EXCEPT it does not include a mauka detour bridge.
2. it has a shorter buildout period; 12 months vs 18 months.
3. its total project cost is less, $14, 507,000 vs $25, 031,000; approximately 79% less.
4. deleting construction of a mauka detour bridge will create a lesser impact upon the existing stream and all nearby properties and activities.

5. this lesser impact includes the fact that allowing traffic to continue to flow during the replacement of the existing bridge will undoubtedly require additional stringent traffic control and direction in the proximity of construction activity. Due to its temporary nature, the mauka detour bridge cannot be built to highway standards that will permit the passage of traffic at current speed limits and traffic volumes. That will mean the employment of stop & go measures that will back traffic up in both directions during normal business hours for the duration of the project's construction period.

6. elimination of the normal traffic flow will permit the contractor more freedom of movement and to employ his workforce more efficiently with the benefit that the work will proceed more orderly and be completed faster.

CONS

1. with no direct link between Lihue and Hanama'ulu, resident and businesses on both sides of the project location will have to use Kapule Highway as a detour to get to the other side; requiring an additional 13 minutes driving time.
2. it may mean the loss of business activity to businesses located in Hanama'ulu such as the gas station and 7-11 and to Walmart and the Kapaia businesses.

3. emergency vehicles such as the ambulance service will take longer to get to Wilcox Hospital

Conclusion

In the 1970's when we were lobbying for Kapule Highway and traffic lights, businesses located along Kuhio Highway in Hanama'ulu and Lihue were fearful that the diversion of traffic would have serious impacts upon their operations. They could not visualize that with the sheer volume of traffic, no one would stop to patronize them . Many people will experience some inconvenience because of the lack of a direct link but this will only be for 12 months not 18 months with the existing alignment and no mauka detour bridge option. It will be safer for everyone but it will mean some sacrifices on everyone's part. The PROS and CONS shown convinces me that the choice of the Existing Alignment with Kapule Bypass Option should be given closer study and consideration by the DOT and its consultant. I recognize, however, that either alignment will ultimately improve the bridge's integrity, safer with the addition of sidewalks on both sides along with new bike paths and greatly add to its lifespan while preserving its 2-lane width.

Thank you for this opportunity for offer my comments.

Eddie Sarita
5088 Paka Drive
Lihue, HI 96766

DAVID Y. IGE
GOVERNOR

FORD N. FUCHIGAMI
DIRECTOR

Deputy Directors
JADE T. BUTAY
ROSS M. HIGASHI
EDWIN H. SNIFFEN
DARRELL T. YOUNG

IN REPLY REFER TO:
HWY-K 4.170146

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
KAUAI DISTRICT
1720 HALEUKANA STREET
LIHUE, HAWAII 96766

March 31, 2017

Mr. Eddie Sarita
5088 Paka Drive
Līhu'e, Hawai'i 96766

Subject: Kūhiō Highway, Replacement of Hanamā'ulu (Kapaia) Stream Bridge, District of Līhu'e, Island of Kaua'i
Hanamā'ulu Ahupua'a
Federal Aid Project No. BR-056-1(48)
Tax Map Keys: (4) 3-8-002:999 (por.), 001 (por.); (4) 3-7-001:001 (por.); (4) 3-7-004:009 (por.)

Dear Mr. Sarita:

Thank you for your participation at the February 15, 2017 informational meeting and subsequent written comments for the Kapaia Bridge Replacement project. We have reviewed your comments and would like to provide a response.

The proposed preferred alternative calls for a single span replacement bridge along the existing alignment with construction of a temporary mauka bypass bridge to provide traffic continuity during the period of construction. Your preference is a replacement bridge along the existing alignment with use of existing Kāpule Highway as the detour during construction.

You have noted a number of advantages to the use of Kāpule Highway as a temporary detour during construction. It would involve a shorter build out period (12 months vs. 18 months) and the cost of the project is significantly reduced ($14,507,000 vs. $25,031,000). Please note that we have performed additional studies regarding the mauka detour bridge alternative as a result of the February meeting. We have determined that significant savings can be achieved by extending the length of the detour bridge in order to avoid the expensive fills and walls that would have been required. The revised cost of the mauka detour bridge is $5.3 million.

As far as disadvantages, you have noted the fact that it will take an additional estimated 13 minutes driving time to get to the other side if the bridge is closed during the period of construction. There may also be a loss of business activity to businesses in the vicinity. Since Wilcox Memorial Hospital is located in close proximity to the Kapaia Bridge, ambulance service will be delayed during the period of construction.

You have raised a number of pertinent points for consideration. In our study of alternatives, the use of Kāpule Highway as a temporary detour has been considered. However, we believe that a significant point is that further disruption of traffic within the Kapa'a-Wailua-Hanamā'ulu-Līhu'e corridor, even if it is temporary, will significantly affect commuter and area traffic which many people already consider congested. Thus, we believe that the proposed preferred alternative would generally maintain existing traffic conditions without further deterioration due to the construction of the project.

Should Kapaia Bridge be closed during construction, this will also inconvenience nearby residents, businesses as well as schools and routine medical services. Emergency response time to and from Wilcox Memorial Hospital would also be negatively affected. Thus, the proposed preferred alternative of a single span replacement bridge along the existing alignment with construction of a temporary mauka bypass bridge to provide traffic continuity during the period of construction offered the best balance with the foregoing factors taken into consideration.

We appreciate your statements regarding improvements to the bridge's integrity as well as your support for the addition of sidewalks and bike lanes on both sides of the bridge. The proposed addition of these amenities are positive improvements for the area. We also want to confirm that the project will preserve its two-lane width and are considering 11 to 12 foot wide vehicular travel lanes.

Your letter, along with this response, will be reproduced and included in the forthcoming Final Environmental Assessment (EA). We appreciate your participation in the Section 106 and Draft EA review process.

Sincerely,

Lawrence J. Dill, P.E.
District Engineer

FR:es

c: HWY-DE, Wilson Okamoto Corporation (Milton Arakawa)

WILSON OKAMOTO
CORPORATION

ENGINEERS | PLANNERS | CONSULTANTS

1907 S. BERETANIA ST
SUITE 400
HONOLULU, HI 96826

PH 808 946 2277
FX 808 946 2253
www.wilsonokamoto.com