JOSH GREEN, M.D.
GOVERNOR

HIGHWAY DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
ENVIRONMENTAL DESIGN SECTION, ROOM 688A
HIGHWAY DESIGN SECTION, ROOM 609
HYDRAULIC DESIGN SECTION, ROOM 636
TECHNICAL DESIGN SECTION, ROOM 688

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

EDWIN H. SNIFFEN
DIRECTOR

Deputy Directors
DREANALEE K. KALILI
TAMMY L. LEE
ROBIN K. SHISHIDO
JAMES KUNANE TOKIOKA

IN REPLY REFER TO:

HWY-DS 2.20069

February 1, 2024

TO: SCOTT GLENN, DIRECTOR
OFFICE OF PLANNING AND SUSTAINABLE DEVELOPMENT

FROM: HENRY KENNEDY *Henry Kennedy*
ENGINEERING PROGRAM MANAGER
DESIGN BRANCH

SUBJECT: HAWAII REVISED STATUTES (HRS) CHAPTER 343 DRAFT ENVIRONMENTAL ASSESSMENT FOR WAIAHOLE BRIDGE REPLACEMENT PROJECT,
KOOLAUPOKO DISTRICT, OAHU, HAWAII

With this letter, the State of Hawaii, Department of Transportation, transmits the Draft Environmental Assessment and Anticipated Finding of No Significant Impact (DEA-AFONSI) for the proposed Waiahole Bridge Replacement Project on the island of Oahu, for review and publication in the next available edition of The Environmental Notice.

In addition to this letter, you will find the online Environmental Review Program (ERP) Publication Form that has been submitted through the ERP website. The online submittal includes one electronic copy of the DEA-AFONSI as an Adobe Acrobat PDF file.

Should you have any questions, please contact us via email or mail:

State of Hawaii
Department of Transportation
Attn: Evan Kimoto
601 Kamokila Boulevard, Room 688
Kapolei, HI 96707
evan.kimoto@hawaii.gov

OR

PBR HAWAII & Associates, Inc.
Attn: Catie Cullison
1001 Bishop Street, Suite 650
Honolulu, HI 96813-3484
ccullison@pbrhawaii.com

From: webmaster@hawaii.gov
To: DBEDT OPSD Environmental Review Program
Subject: New online submission for The Environmental Notice
Date: Thursday, February 1, 2024 4:24:56 PM

Action Name

Waiahole Bridge Replacement Project

Type of Document/Determination

Draft environmental assessment and anticipated finding of no significant impact (DEA-AFNSI)

HRS §343-5(a) Trigger(s)

- (1) Propose the use of state or county lands or the use of state or county funds

Judicial district

Koʻolaupoko, Oʻahu

Tax Map Key(s) (TMK(s))

(1) 4-8-001:010; (1) 4-8-002:001; (1) 4-8-008:018; (1) 4-8-008:021; (1) 4-8-008:022; (1) 4-8-008:023; (1) 4-8-008:024; (1) 4-8-008:025; (1) 4-8-009:001; and (1) 4-8-009:006

Action type

Agency

Other required permits and approvals

• Special Management Area • Grading/Building Permits • Occupancy & Use of State Highway ROW Permit • Right of Entry Permit (DPR) • Historic Preservation HRS 6E-8 • National Historic Preservation Act - Section 106 • Coastal Zone Management (CZM) Federal Consistency Review • HRS Chapter 195D (DOFAW) • National Pollutant Discharge Elimination System (NPDES) Permit • Community Noise Permit • Disability and Communication Access Board (DCAB) Document Review for ADA Compliance • Endangered Species Act – Section 7 • Section 4(f) Review • Essential Fish Habitat (EFH) Review • Department of the Army Permits CWA Sections 404/RHA Section 10 • Water Quality Certification 401 • Stream Channel Alteration Permit (SCAP) • National Environmental Policy Act (NEPA) Review

Proposing/determining agency

State of Hawaii, Department of Transportation

Agency contact name

Evan Kimoto

Agency contact email (for info about the action)

evan.kimoto@hawaii.gov

Email address or URL for receiving comments

sysadmin@pbrhawaii.com

Agency contact phone

(808) 692-7551

Agency address

869 Punchbowl Street
Honolulu, Hawaii 96813
United States
Map It

Was this submittal prepared by a consultant?

Yes

Consultant

PBR HAWAII & Associates, Inc

Consultant contact name

Catie Cullison

Consultant contact email

ccullison@pbrhawaii.com

Consultant contact phone

(808) 521-5631

Consultant address

1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813
United States
Map It

Action summary

The State of Hawaii, Department of Transportation, Highways (HDOT) proposes to replace an existing bridge that crosses Waiahole Stream at Kamehameha Highway. This bridge replacement is needed because the current bridge is no longer functionally viable or structurally safe; the bridge is over a century old (built in 1922) and is unable to handle the current volume of traffic on Kamehameha Highway. The bridge is also lacking important safety features such as shoulders and pedestrian accessways per the American Association of State Highway Transportation Officials standards.

The project includes highway realignment, construction of a new bridge, demolition of the existing bridge, utility relocations, stream channel alterations, temporary business access, and use of a temporary staging area during construction.

Reasons supporting determination

Reasons supporting determination are provided in Section 7.1 of the DEA "Significance Criteria"

Attached documents (signed agency letter & EA/EIS)

- Signed-transmittal-letter-HWY-DS-2.20069-HRS-Ch-343-DEA-Transmittal-Letter-Waiahole-Bridge-part-1-signed.pdf
- Waiahole-Bridge-Replacement-Project-DEA.pdf

Action location map

- project-area.zip

Authorized individual

Catie Cullison

Authorization

- The above named authorized individual hereby certifies that he/she has the authority to make this submission.

Waiahole Bridge Replacement Project

Draft Environmental Assessment

Submitted Pursuant to Hawaii Revised Statutes, Chapter 343

PREPARED FOR:
State of Hawaii, Department of Transportation

PREPARED BY:
PBR HAWAII & ASSOCIATES, INC.

FEBRUARY 2024

WAIAHOLE BRIDGE REPLACEMENT PROJECT
DRAFT ENVIRONMENTAL ASSESSMENT –
ANTICIPATED FINDING OF NO SIGNFIFICANT IMPACT

SUMMARY

Project Name:	Waiahole Bridge Replacement Project
Proposing Agency:	State of Hawaii, Department of Transportation, Highways
Determining Agency:	State of Hawaii, Department of Transportation
Landowner:	State of Hawaii, Department of Transportation, City and County of Honolulu
Location:	Waiahole Bridge is located on Kamehameha Highway in the Waiahole Valley, Koolaupoko District, Island of Oahu, State of Hawaii. The bridge lies south of Waiahole Valley Road. See Figure 1: Regional Location Map.
Tax Map Keys:	(1) 4-8-001:010; (1) 4-8-002:001; (1) 4-8-008:018; (1) 4-8-008:021; (1) 4-8-008:022; (1) 4-8-008:023; (1) 4-8-008:024; (1) 4-8-008:025; (1) 4-8-009:001; and (1) 4-8-009:006 See Figure 2: Tax Map Key.
Project Area:	Approximately 10.4 acres in area, varies by alternative.
Existing Uses:	The existing use is Waiahole Bridge, a two-lane structure within the State highway right-of-way. See Figure 3: Site Photographs
Proposed Action:	Realign Kamehameha Highway and Reconstruct Waiahole Bridge. See Figure 4: Site Plan.
State Land Use Designation:	Agricultural
County Zoning:	Agricultural-General (AG-2)
Special Management Area:	Within the Special Management Area
Anticipated Determination:	Finding of No Significant Impact (FONSI)

TABLE OF CONTENTS

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ACRONYMS AND ABBREVIATIONS

AASHTO	American Association of State Highway and Transportation Officials
AC	Asphalt Concrete
ADA	Americans with Disabilities Act
ALISH	Agricultural Lands of Importance
ACOE	Army Corps of Engineers
AG-2	City and County of Honolulu Zoning District, Agricultural-General
CZMA	Coastal Zone Management Act
DCAB	Disability and Communications Access Board
DLNR	State of Hawaii Department of Land & Natural Resources
DOH	State of Hawaii Department of Health
DPP	City and County of Honolulu, Department of Planning and Permitting
DTS	City and County of Honolulu, Department of Transportation Services
EA	Environmental Assessment
EPA	United States Environmental Protection Agency
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
FONSI	Finding of No Significant Impact
HAR	Hawaii Administrative Rules
HDOT	Hawaii Department of Transportation
HFD	Honolulu Fire Department
HPD	Honolulu Police Department
H-POWER	Honolulu Program of Waste Energy Recovery
HRS	Hawaii Revised Statutes
LSB	University of Hawaii Land Study Bureau
NEPA	National Environmental Policy Act of 1969
NHPA	National Historic Preservation Act
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resource Conservation Service
OEQC	State of Hawaii, Office of Environmental Quality Control
OHWL	Ordinary High Water Line
ROW	Right of Way
SAFETEA-LU	Safe Accountable Flexible Efficient Transportation Equity Act
SHPD	State Historic Preservation Division
SHPO	State Historic Preservation Officer
SLR	Sea Level Rise
SMA	Special Management Area
STIP	Statewide Transportation Improvement Program
TMK	Tax Map Key
USFWS	United States Fish and Wildlife Service
USDA	United States Department of Agriculture
WotUS	Waters of the US

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1.0 INTRODUCTION

This Environmental Assessment (EA) is prepared in accordance with Chapter 343, Hawaii Revised Statutes (HRS) and Hawaii Administrative Rules (HARs), Title 11, Chapter 200.1 for the Kamehameha Highway Replacement of the Waiahole Bridge.

1.1 BACKGROUND

The State of Hawaii, Department of Transportation, Highways (HDOT) proposes to replace an existing bridge that crosses Waiahole Stream at Kamehameha Highway. HDOT owns and operates the highway and bridge structure and is the lead agency for this project. The project is Federal Aid Project No. BR-083-1(088). Funds for this project are, in part, from the U.S. Department of Transportation, Federal Highway Administration (FHWA).

In 2017, a pre-consultation and community meeting was held for the Waiahole Bridge replacement. Due to community concerns about safety along this section of Kamehameha Highway, HDOT has updated the project by considering an alternative to realign approximately 1,000 lineal feet of the highway and constructing the new bridge adjacent to the downstream face of the existing bridge. The intersection of Waiahole Valley Road and Kamehameha Highway will be redesigned to accommodate the new highway alignment.

1.2 PROJECT SITE

The existing Waiahole Bridge (Bridge No. 003000830303459) carries Kamehameha Highway over the Waiahole Stream at Milepost 34.59 on Route 83. The bridge is located 0.04 miles south of Waiahole Valley Road, adjacent to the Waiahole Poi Factory. The two-span bridge was constructed in 1922 and measures 65.9 ft. long by 26.2 ft. wide. The superstructure consists of concrete tee beams and is overlaid with asphalt pavement. The abutments are constructed of concrete, as well as the multi-column bents. The bridge railing is a concrete solid panel with a cap. A timber pedestrian bridge with timber railings was added to one side of the bridge in 1968. The pedestrian bridge is connected to the upstream bridge railing with metal brackets.

The project site will also include unimproved park property under the jurisdiction of City and County of Honolulu (Waiahole Beach Park) north of the bridge for construction staging as well as land area makai of the existing highway and bridge to accommodate the realigned highway and new bridge location See Figure 4: Site Plan.

1.3 SURROUNDING AREA

The proposed project site is located on Kamehameha Highway (Route 83) along the east (windward) coast of the island of Oahu. The project location is adjacent to the Waiahole Valley Agricultural Park and Residential Lots Subdivision which encompasses approximately 600 acres. There, the Hawaii Housing Finance and Development Corporation (HHFDC) manages 92 residential and agricultural leases. Department of Hawaiian Home Lands also leases 20 homestead parcels within the general project vicinity. Agriculture is the predominant land use and a poi

factory is located on the northern (up-stream) side of the bridge. The factory, which is not located on a parcel affected by the new bridge, uses an area along the northwestern corner of the bridge for parking.

1.4 PROJECT PURPOSE AND NEED

The purpose of replacing Waiahole bridge is to meet current State and Federal design guidelines, address bridge maintenance concerns, improve traffic safety for motorists, cyclists and pedestrians as well as meet projected travel demands on Kamehameha Highway. A secondary purpose of the project is to reduce the occurrence of stream water overtopping the bridge when Waiahole Stream floods. Water flow in the stream often overtops the embankments because of debris clogging the opening beneath the bridge, and because of the insufficient hydraulic capacity of the stream at the bridge. The center piles often causes timber debris that is being washed downstream to become lodged against the piles, causing an eventual dam effect. The flood water mark on the bridge is located on the superstructure.

The primary need for the project is that the current bridge is no longer functionally viable or structurally safe; it has been assigned a Bridge Sufficiency Rating of 38% and is unable to handle the current volume of traffic on Kamehameha Highway. The bridge is also lacking important safety features such as shoulders and pedestrian accessways per the American Association of State Highway Transportation Officials standards. Additional settlement may adversely affect the overall structural capacity of the bridge. The settlement area has been filled with asphalt concrete (AC) over the years to make the roadway level.

1.5 PURPOSE OF THE DRAFT ENVIRONMENTAL ASSESSMENT

The purpose of the Environmental Assessment is to document and disclose the potential impacts associated with the Waiahole Bridge replacement alternatives.

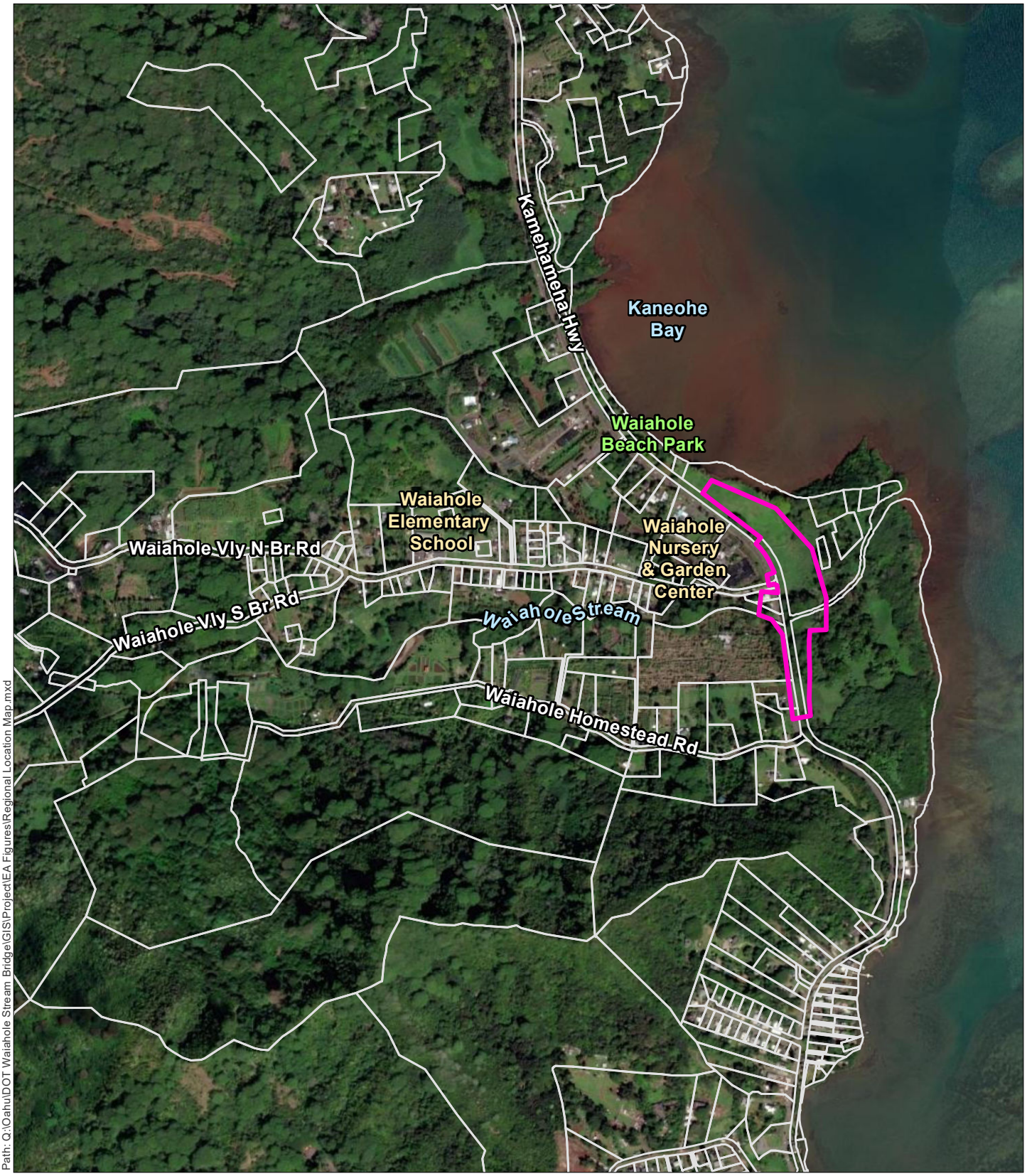
This Draft EA was prepared for the proposed action pursuant to Hawaii Revised Statues (HRS) Chapter 343, and Hawaii Administrative Rules (HARs), Title 11, Chapter 200.1. As set forth by HRS Chapter 343-5, an environmental assessment is required for actions that propose the use of state or county lands or the use of state or county funds. Because the project involves the realignment of a highway and replacement of a state-owned bridge and state funds, it therefore necessitates an environmental assessment.

Because the project is also a federal action (use of Federal Highways funds), separate environmental documentation will also be prepared to satisfy the requirements of 40 CFR Part 1500 relating to the National Environmental Policy Act (NEPA) as implemented through FHWA Laws and Regulations 23 USC 109 (h), 23 CFR 771, 772 and 774.

1.6 STUDIES CONTRIBUTING TO THIS ENVIRONMENTAL ASSESSMENT

The information contained in this report has been gathered from agency and community consultations, document and historical research, site visits, feasibility studies, biological and

hydrologic studies and generally available information regarding the characteristics of the site and surrounding area. References can be found in Section 9.0 of this report.



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Date: 1/26/2024

LEGEND

- Project Area
- TMK Parcels

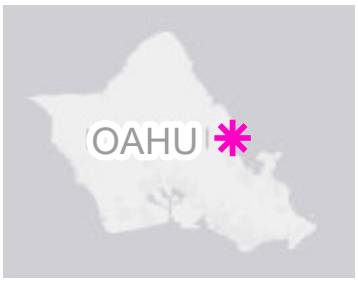


Figure 1:
Regional Location Map

Waiahole Bridge Replacement

State of Hawai'i — Island of O'ahu

North

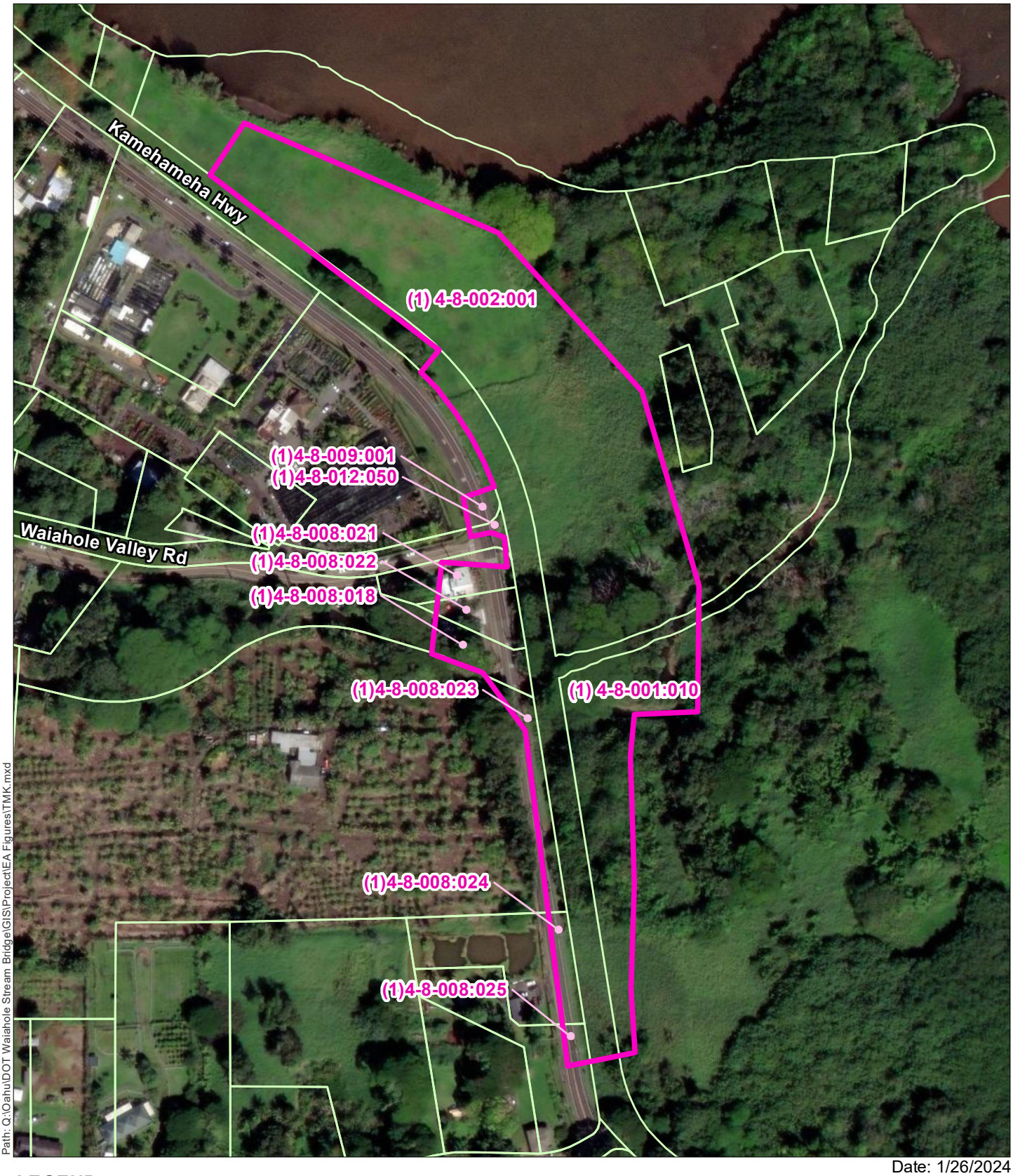
Linear Scale (feet)

0 500 1000

PBR HAWAII & ASSOCIATES, INC.

Source: City & County of Honolulu, 2023. ESRI Basemap.

Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.



Path: Q:\Oahu\DOT Waiahole Stream Bridge\GIS\Project\EA Figures\TMK.mxd

Date: 1/26/2024

LEGEND

- Project
- TMK Parcels

FIgure 2:
Tax Map Keys

Waiahole Bridge Replacement

State of Hawai'i — Island of O'ahu

North

Linear Scale (feet)

0 — 125 — 250

PBR HAWAII & ASSOCIATES, INC.

Source: City & County of Honolulu, 2023. ESRI Basemap.

Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

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Waiahole Bridge Replacement
Figure 3: Site Location Photos

Photo 1: Mauka side of bridge, pedestrian walkway

Photo 2: Bridge deck looking eastbound, pedestrian walkway

Photo 3: Waiahole Bridge center pier

Photo 4: Mauka side of bridge, pedestrian walkway, stream bank conditions

Photo 5: Pedestrian walkway

Photo 6: Makai bridge railing, looking westbound

LEGEND:

BB	Bottom Bank
BW	Bottom Wall
CLF	Chain Link Fence
— x —	Chain Link Fence
	Coconut Tree
Conc	Concrete
CRM	Concrete Rubble Masonry
D=	Diameter
	Drain Manhole
EAC	Edge Asphaltic Concrete
FH	Fire Hydrant
	Fire Hydrant
GP	Guard Post
GA	Guy Anchor
	Guy Anchor
H=	Height
Inv=	Invert
— OH/E —	Overhead Electric Line
	Palm Tree
	Pine Tree
PVC	Polyvinly Chloride
RCP	Reinforced Concrete Pipe
	Sign
	Sign
S=	Spread (Tree Canopy)
SDMH	Storm Drain Manhole
TB	Top Bank
T=	Top Wall
TW	Top Wall
	Traffic Reflector
	Tree
UP	Utility Pole
WMH	Water Manhole
	Water Manhole
WM	Water Meter
WV	Water Valve
	Water Valve
w/	with

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
HONOLULU HAWAII

RIGHT OF WAY MAP

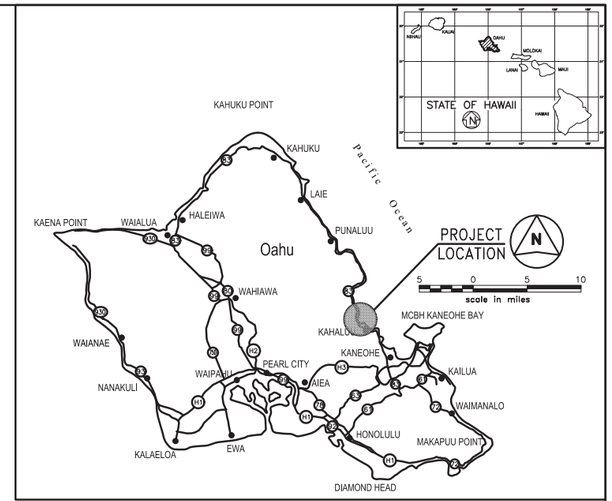
KAMEHAMEHA HIGHWAY

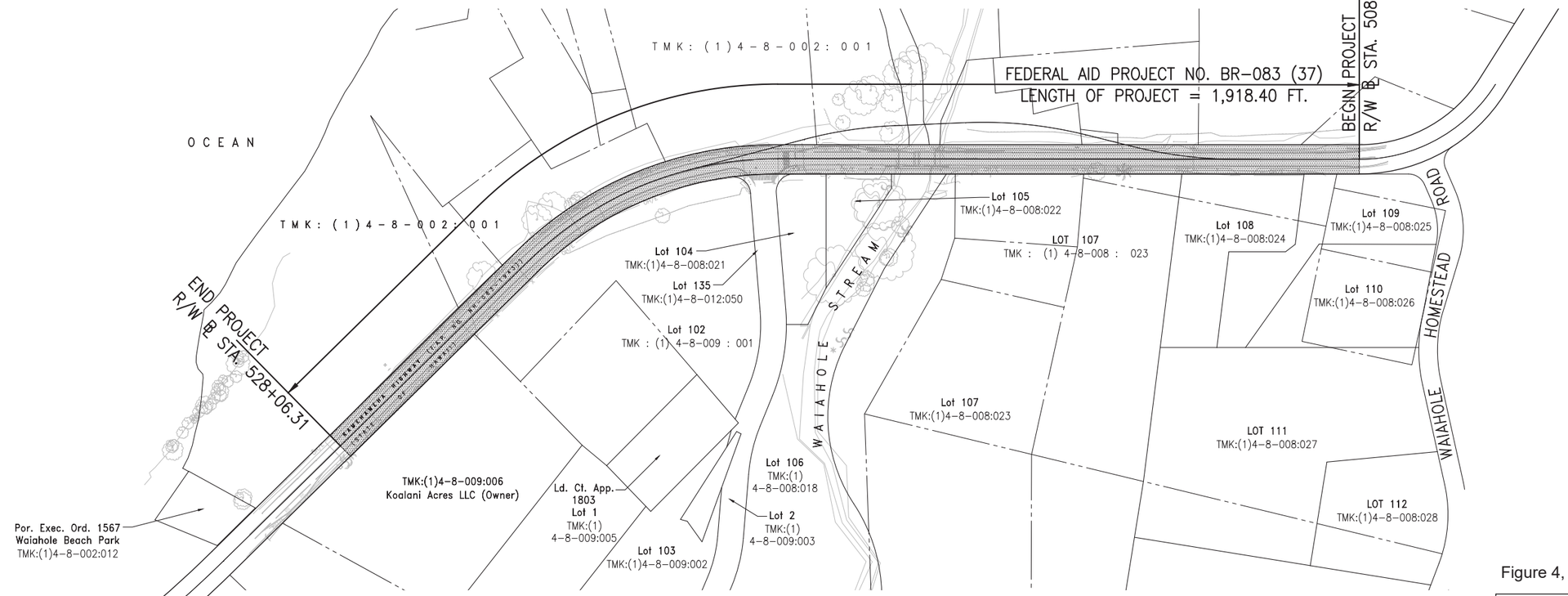
WAIAHOLE BRIDGE REPLACEMENT

FEDERAL AID PROJECT NO. BR-083 (37)

AT MAKAWAI, WAIAHOLE, KOOLAUPOKO, OAHU, HAWAII

STA. 508+87.91 TO STA. 528+06.31





LOCATION MAP

SCALE:1 IN.=100 FT.

Figure 4, Site Plan

DEPARTMENT OF TRANSPORTATION STATE OF HAWAII	
APPROVED:	DATE:
	FOR: ADMINISTRATOR, HIGHWAYS DIVISION

NO.	REVISION	APPROVED:	DATE

SHEET NO. 1 OF 3 SHEETS

TAX MAP KEY: (1) 4-8-01: 10; (1) 4-8-02: 01; (1) 4-8-08: 18, 21, 22; (1) 4-8-12: 50

MAP SHOWING CONSTRUCTION PARCELS ONLY.

22" x 36" = 5.5 Sq. Ft.

P.H.

TRUE NORTH
SCALE: 1 IN.=40 FT.

TMK:(1)4-8-002:006

L. L. Grant 4689, Lot 10 to McCandless

R. P. 1426, L. C. Aw. 10438, Ap. 3 to Naeole

Royal Patent 2317, Land Commission Award 10228, Apana 2 to Moo 2

Portion of Grant 4689 to L. L. McCandless, Lot 11

TMK: (1)4-8-001:010
City and County of Honolulu (Owner)

Portion of Royal Patent 1586, Land Commission Award 7662, Apana 1 to Kamaka

Portion of Royal Patent 1582, Land Commission Award 9959, Apana 2 to Lumai

Portion of Royal Patent 1092, Land Commission Award 8180, Apana 1 to Haole

Portion of Royal Patent 1426, Land Commission Award 10438, Apana 4 to Naeole

TMK: (1)4-8-002:001
City and County of Honolulu (Owner)

Land Commission Award 1090, Royal Patent 7560, Apana 1 to Kekauluau

R. P. 7869, L. C. Aw. 7665, Ap. 1 to Kukuinui

WAIAHOLE (STATE OF HAWAII) STREAM

Construction Parcel (C1) 240,573 Sq. Ft. or 5.523 Acres more or less

Construction Parcel (C2) 756 Sq. Ft. or 0.017 Acres more or less

Parcel (1) 26,774 Sq. Ft. or 0.615 Acres more or less

Parcel (2) 2,919 Sq. Ft. or 0.067 Acres more or less

Parcel (3) 40,795 Sq. Ft. or 0.937 Acres more or less

Construction Parcel (C3) 12,007 Sq. Ft. or 0.276 Acres

℄ CURVE DATA
Δ=12°24'12"
R=725.00'
T=78.78'
L=156.95'

℄ CURVE DATA
Δ=16°21'56"
R=725.00'
T=104.25'
L=207.08'

℄ CURVE DATA
Δ=44°33'00"
R=603.80'
T=247.33'
L=469.48'

℄ CURVE DATA
Δ=13°53'38"
R=725.00'
T=88.34'
L=175.81'

Portion of Lot 15 of Grant 10648 to L. L. McCandless

Lot P of Grant 10648 to L. L. McCandless

Cr. 10648, to L. L. McCandless Lot 16

R. P. 3631, L. C. Aw. 10759, Ap. 1 to Palaukai

KAMEHAMEHA HIGHWAY (F.A.P. No. F-083-1(22))
STATE OF HAWAII

Construction Parcel (C4) 2,612 Sq. Ft. or 0.060 Acres

Construction Parcel (C5) 1,105 Sq. Ft. or 0.025 Acres

Construction Parcel (C6) 4,906 Sq. Ft. or 0.113 Acres

Construction Parcel (C7) 13,094 Sq. Ft. or 0.301 Acres

Lot 104
TMK:(1)4-8-008:021
Hawaii Housing Finance and Dev. Corp. (Owner)

Lot 105
TMK:(1)4-8-008:022
Hawaii Housing Finance and Dev. Corp. (Owner)

Lot 106
TMK:(1)4-8-008:018
Hawaii Housing Finance and Dev. Corp. (Owner)

Por. of Cr. 4689 to L. L. McCandless, Lot 2

Portion of Grant 4689 to L. L. McCandless, Lot 5

WAIAHOLE VALLEY ROAD

Portion of Grant 4689 to L. L. McCandless, Lot 1

WAIAHOLE VALLEY AGRICULTURAL PARK (FILE PLAN 2052)

Portion of Royal Patent 1091, Land Commission Award 10229, Apana 1 to Malule

Royal Patent 1096, Land Commission Award 7654, Apana 1 to Kimo

Royal Patents 1581 and 2536, Land Commission Award 7570, Apana 1 to Kauahipaka

Portion Royal Patent 5703, Land Commission Award 3218, Apana 2 to Aikakee

LOTS
RESIDENTIAL AND

Lot 107
TMK: (1)4-8-008:023
Hawaii Housing Finance and Dev. Corp. (Owner)

Lot 108
TMK:(1)4-8-008:024
Hawaii Housing Finance and Dev. Corp. (Owner)

Lot 109
TMK:(1)4-8-008:025
Hawaii Housing Finance and Dev. Corp. (Owner)

SUBDIVISION
R. P. 1091, L. C. Aw. 10229, Ap. 2 to Malule

Por. of Cr. 10648 to L. L. McCandless

Grant 4689 to L. L. McCandless, Lot 6

R. P. 1096, L. C. Aw. 7654, Ap. 2 to Kimo

Lot 110
TMK:(1)4-8-008:026

Lot 135
TMK:(1)4-8-012:050
Hawaii Housing Finance and Dev. Corp. (Owner)

Por. of R. P. 1095, L. C. Aw. 7657 to Kaukulima

Lot 102
TMK : (1) 4-8-009 : 001
Hawaii Housing Finance and Dev. Corp. (Owner)

BEGIN PROJECT PT=508+87.91
1,572.11 N
1,526.80 E

1. ORIGIN OF AZIMUTHS: "PUU KAUAI" △ .
2. COORDINATES REFERRED TO "PUU KAUAI" △ .

NO.	REVISION	APPROVED:	DATE

ROMMEL C. OFALSA
LICENSED PROFESSIONAL LAND SURVEYOR
No.10544
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

ROMMEL C. OFALSA
LICENSED PROFESSIONAL LAND SURVEYOR
CERTIFICATE NO. 10544
License Expires: 4/30/2024

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

RIGHT OF WAY MAP
KAMEHAMEHA HIGHWAY

WAIAHOLE BRIDGE REPLACEMENT
FEDERAL AID PROJECT NO. BR-083 (37)
STA. 508+87.91 TO STA. 528+06.31
AT MAKAWAI, WAIAHOLE, KOOLAUPOKO, OAHU, HAWAII

HONOLULU, HAWAII
OCTOBER 6, 2023

SCALE: 40 0 40 80

APPROVED:

FOR: ADMINISTRATOR, HIGHWAYS DIVISION

SHEET NO. 2 OF 3 SHEETS

FIELD ENGINEER
FIELD BOOK(S)
PLOTTER
DATE PLOTTED
DWG NAME

TAX MAP KEY: (1) 4-8-01: 10; (1) 4-8-02: 01; (1) 4-8-08: 18, 21, 22; (1) 4-8-12: 50

MAP SHOWING CONSTRUCTION PARCELS ONLY.

22" x 36" = 5.5 Sq. Ft.

P.H.

TRUE NORTH
SCALE: 1 IN. = 40 FT.

1,400 E
3,400 N
3,000 N
2,600 N
1,000 E
600 E
3400 N

OCEAN

(STATE OF HAWAII)

Portion of Grant 4689 to L. L. McCandless
Lot 4

Por. Exec. Ord. 1567
Waiahole Beach Park
TMK:(1)4-8-002:012

TMK: (1)4-8-002: 001
City and County of Honolulu (Owner)

Grant 4001
to S. Cullen

Royal Patent 3631,
Land Commission Award 10759,
Apana 1 to Palaikai

Gr. 10648, to
L. L. McCandless
Lot 17

Royal Patent 3964,
Land Commission Award 7661,
Apana 1 to Kaukaliu

Gr. 10648, to
L. L. McCandless
Lot 16

R. P. 7869,
L. C. Aw. 7665,
Ap. 1 to Kukuinui

Land Commission Award 10909, Apana 1 to Kekaulaau
Royal Patent

TMK: (1)4-8-002: 001
City and County of Honolulu (Owner)

Grant 4689 to L. L. McCandless
Lot 10

WAIAHOLE STREAM
(STATE OF HAWAII)

Portion of Grant 4689 to L. L. McCandless
Lot 1

Portion of Grant 4689 to L. L. McCandless
Lot 2

Portion of Grant 4689 to L. L. McCandless
Lot 5

Construction Parcel (C1)
240,573 Sq. Ft.
or 5.523 Acres

Parcel (1)
26,774 Sq. Ft.
or 0.615 Acres
more or less

Construction Parcel (C2)
756 Sq. Ft.
or 0.017 Acres
more or less

Parcel (2)
2,919 Sq. Ft.
or 0.067 Acres
more or less

Construction Parcel (C4)
2,612 Sq. Ft.
or 0.060 Acres

Construction Parcel (C5)
1,105 Sq. Ft.
or 0.025 Acres

Construction Parcel (C6)
4,906 Sq. Ft.
or 0.113 Acres

Construction Parcel (C7)
13,094 Sq. Ft.
or 0.301 Acres

Lot 135
TMK:(1)4-8-012:050
Hawaii Housing Finance and Dev. Corp. (Owner)

Lot 104
TMK:(1)4-8-008:021
Hawaii Housing Finance and Dev. Corp. (Owner)

Lot 105
TMK:(1)4-8-008:022
Hawaii Housing Finance and Dev. Corp. (Owner)

Lot 102
TMK : (1) 4-8-009 : 001
Hawaii Housing Finance and Dev. Corp. (Owner)

Lot 106
TMK:(1)4-8-008:018
Hawaii Housing Finance and Dev. Corp. (Owner)

Lot 107
TMK:(1)4-8-008:023
Hawaii Housing Finance and Dev. Corp. (Owner)

TMK:(1)4-8-009:006
Koalani Acres LLC (Owner)

Ld. Ct. App. 1803
Lot 1
TMK:(1)4-8-009:005

Lot 103
TMK:(1)4-8-009:002

Lot 2
TMK:(1)4-8-009:003

Portion of Royal Patent 53 to Charles Magnet,
Land Commission Award 105 to William Walker

Portion of Royal Patent 1095,
Land Commission Award 7657
to Kaukulima

Royal Patents 1581 and 2536,
Land Commission Award 7570
Apana 1 to Kauahipaka

WAIAHOLE VALLEY ROAD

WAIAHOLE RESIDENTIAL (FILE

AGRICULTURAL PARK AND SUBDIVISION (FILE 2052)

VALLEY LOTS PLAN

KAMEHAMEHA HIGHWAY (F.A.P. NO. NH-083-1(43))
(STATE OF HAWAII)

CURVE DATA
Δ=12°24'12"
R=725.00'
T=78.78'
L=156.95'

CURVE DATA
Δ=44°33'00"
R=603.80'
T=247.33'
L=469.48'

PT=523+52.43
PC=518+82.95
PC=6+28.33
PT=7+85.28
END PROJECT
STA.528+06.31

2,523.19 N
1,348.58 E (15.00)
2,358.07 N
1,375.12 E
2,362.59 N
1,516.40 E
2,327.33 N
1,523.59 E
3,214.90 N
766.51 E

1. ORIGIN OF AZIMUTHS: "PUU KAUAI" △ .
2. COORDINATES REFERRED TO "PUU KAUAI" △ .

NO.	REVISION	APPROVED:	DATE

ROMMEL C. OFALSA
LICENSED PROFESSIONAL LAND SURVEYOR
No. 10544
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME
OR UNDER MY SUPERVISION.

ROMMEL C. OFALSA
LICENSED PROFESSIONAL LAND SURVEYOR
CERTIFICATE NO. 10544
License Expires: 4/30/2024

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

RIGHT OF WAY MAP
KAMEHAMEHA HIGHWAY

WAIAHOLE BRIDGE REPLACEMENT
FEDERAL AID PROJECT NO. BR-083 (37)
STA. 508+87.91 TO STA. 528+06.31
AT MAKAWAI, WAIAHOLE, KOOLAUPOKO, OAHU, HAWAII

HONOLULU, HAWAII
OCTOBER 6, 2023

SCALE: 40 0 40 80

APPROVED:

FOR: ADMINISTRATOR, HIGHWAYS DIVISION

SHEET NO. 3 OF 3 SHEETS

PREL. ENGINEER
PREL. SURVEYOR
DRAFTER
CHECKED BY
DESIGN BRCH.
DIST. ENGR.
DIST. FLDR.
PREL. FLDR.
R.O.W. FLDR.
FINAL FLDR.

TAX MAP KEY: (1) 4-8-01: 10; (1) 4-8-02: 01; (1) 4-8-08: 18, 21, 22; (1) 4-8-12: 50

MAP SHOWING CONSTRUCTION PARCELS ONLY.

22" x 36" = 5.5 Sq. Ft.

P.H.

2.0 DESCRIPTION OF ALTERNATIVES

In compliance with the provisions of Title 11, Department of Health, Chapter 200.1, Environmental Impact Statement Rules. The alternatives to the proposed project are limited to those that would allow the objectives of the project to be met, while minimizing potential adverse environmental impacts. As such, the project has been evaluated in terms of the following alternatives.

2.1 ALTERNATIVE 1: DEMOLISH EXISTING BRIDGE, CONSTRUCT NEW BRIDGE MAKAI OF ITS CURRENT ALIGNMENT

Alternative 1 has been revised based on the community's preference to include a new bridge located makai of the current bridge alignment. Kamehameha Highway will be realigned makai of its current site so as to locate the bridge at the community-preferred location. The approximately 1,000 feet of realigned highway will include two vehicle travel lanes, shoulders, and may include bus stop pull outs in both directions. The abandoned portion of the existing highway alignment will remain as part of HDOT right of way (ROW). The private driveway that currently connects to the existing highway alignment (Kaneohe-side of the bridge) will be re-routed and connected to the new alignment at a location where a safe line-of-sight can be achieved.

The new 130-foot span bridge will be a steel structure that will rely on drilled shafts for foundation support. The new bridge will not have any piers in Waiahole Stream. The proposed bridge will be approximately 55-feet in width to accommodate two 11-foot vehicle lanes, approximately 6.5-foot wide shoulders, a 5-foot wide separated pedestrian walkway, barriers and structural bracing elements. Utilities, including a Board of Water Supply water line and above-ground power lines will be relocated in alignment with the new bridge and highway realignment.

The existing bridge superstructure will be demolished and the existing piles will be removed down to the channel bottom elevation. The existing concrete bridge abutments on the banks will remain in place. The sandbar and vegetation that have accumulated in the vicinity of the existing bridge piles is proposed to be removed. Rip-rap is proposed to be placed on the widened stream banks to reduce scour erosion from stream waters.

Approximately 1.5 acres of City and County of Honolulu Park land (Waiahole Beach Park) and .06 acre (approximately 2,900 square feet) of state (HHFDC) land are proposed for permanent right of way acquisition to accommodate the highway realignment. During construction, approximately 5.52 acres of the adjacent, unimproved Waiahole Beach Park are proposed to be used for a staging area and construction access to the site. Additionally, about .5 acres of state (HHFDC) lands are proposed for temporary construction access. Construction materials will be secured, and rock material is expected to be imported on a temporary basis to minimize sediment transport following best management practices for erosion control. Upon completion of construction, the temporary construction staging and access area within the park will be returned to its pre-construction state.

Construction of the project is anticipated to commence in the calendar year 2026 and expected to run about 18 months. Rough order magnitude cost is expected to be approximately $15M.

2.2 ALTERNATIVE 2: DEMOLISH EXISTING BRIDGE, CONSTRUCT NEW BRIDGE WITH USE OF TEMPORARY DETOUR BRIDGE DURING CONSTRUCTION

This alternative includes the demolition of the existing bridge and construction of a new bridge at its current location. The new bridge will be approximately 85 feet long and will be widened to 43 feet out-to-out. Two 12 ft. wide travel lanes will be provided with two 8 feet wide shoulders to accommodate pedestrians and bicyclists. A temporary detour bridge will be installed to accommodate vehicle and pedestrian travel during construction. The temporary detour bridge will be constructed on the makai (ocean) side of the existing structure and will be open for travel in both directions while the new bridge is being built. The temporary abutments for the detour bridge will be Geosynthetic Reinforced Soil (GRS) in lieu of concrete. This type of abutment will be faster to install and remove and will result in less disturbance of the site soil. This alternative was presented to the community in 2017 and was not preferred by residents in the area due to safety concerns.

2.3 ALTERNATIVE 3: REHABILITATE AND WIDEN EXISTING BRIDGE

This alternative would involve repairs and retrofits to the existing structure to improve it to an acceptable condition. This alternative was immediately dismissed due to the condition of the existing bridge. The existing foundation structure was deemed unsuitable for any improvement, and in all scenarios would require complete demolition and replacement of the foundation and piles.

2.4 ALTERNATIVE 4: NO ACTION

This alternative involves no bridge reconstruction. There would be no environmental impacts and no permits required. However, without making adjustments to the bridge, it will continue to function with substandard function, including an absence of facilities for pedestrians and bicycles. The bridge is considered to be structurally deficient due to the overstressed exterior girders, settlement of the south abutment, and expansion joint support haunches. The no action alternative would continue to pose a hazard to motorists, pedestrians and bicyclists using the highway.

3.0 PROJECT DESCRIPTION

This section describes the proposed improvements, delineates construction activities and provides approximate costs for Alternative 1, to demolish existing bridge and construct a new bridge makai of its current alignment. Construction of the project is anticipated to commence in the calendar year 2026 and expected to run about 18 months. Rough order magnitude cost is expected to be approximately $15M.

The project includes highway realignment, construction of a new bridge, demolition of the existing bridge, utility relocations, stream channel alterations, temporary business access, and use of a temporary staging area during construction. These elements are described in more detail below.

3.1 HIGHWAY REALIGNMENT

The State of Hawaii, Department of Transportation Highways is planning to replace the existing Waiahole Bridge with a new steel bridge that meets current design standards. Due to community concerns about safety along this section of Kamehameha Highway, approximately 1,000 lineal feet of the highway will be realigned and the new bridge will be constructed adjacent to the downstream face of the existing bridge. See Figure 4: Site Plan.

The topography along the proposed new alignment slopes gently downward toward the Waiahole Stream. Structural fill will be placed along a portion of the alignment to make the top of new roadway close to the elevation of the existing roadway.

The intersection of Waiahole Valley Road and Kamehameha Highway will be redesigned to accommodate the new highway alignment. The abandoned portion of the existing highway alignment will remain as port of HDOT right of way. The private driveway that currently connects to the existing highway alignment south of the bridge will be re-routed and connected to the new alignment at a location where a safe line-of-sight can be achieved.

The total amount of City and County of Honolulu Park land, TMK (4)-8-002:001, planned for permanent right of way acquisition is 240,573 square feet or 1.55 acres.

A total of 19,861 square footage of HHFDC land is planned for temporary construction and 2,919 square feet, TMK (4)-8-008:018 for permanent right of way acquisition.

3.2 NEW BRIDGE DESCRIPTION

The new bridge will be a prefabricated steel bridge that meets current design standards. The bridge will have a 130-foot span. The bridge will be approximately 55-feet in width to accommodate two 11-foot vehicle lanes, approximately 6.5-foot wide shoulders, a 5-foot wide separated pedestrian walkway, barriers and structural bracing elements. The abutments will be cast-in-place concrete, supported by deep foundations (drilled shafts). The new bridge will be designed to carry current AASHTO HL-93 design live loads. See Figure 4: Site Plan.

3.3 DEMOLITION OF EXISTING BRIDGE

During the construction of the new bridge and highway alignment, the existing bridge will remain open to traffic. Once the new bridge and highway are completed the existing bridge will be demolished. The existing bridge superstructure will be demolished and the existing piles will be removed down to the channel bottom elevation. The existing concrete bridge abutments on the banks will remain in place. The sandbar and vegetation that have accumulated in the vicinity of the existing bridge piles is proposed to be removed. Rip-rap is proposed to be placed on the widened stream banks to reduce scour erosion from stream waters.

3.4 UTILITY RELOCATION

Utilities, including two Board of Water Supply water lines and above-ground power lines will be relocated in alignment with the new bridge and highway realignment. An auwai (irrigation ditch, canal, waterway) is located parallel to the mauka side of the highway that drains into the Waiahole Stream just upstream of the bridge. Drainage culverts extend beneath the existing highway that are considered as an extension of the auwai system. Because of the new highway alignment, the culverts will be extended further beneath the new highway to maintain drainage flows mauka to makai.

3.5 STREAM CHANNEL ALTERATIONS

One objective of this project is to attempt to increase the flood capacity of the stream channel to reduce some of the overtopping of the highway at the bridge. In addition to the installation of bridge with no in-stream piles and removal of the existing bridge and its support piles, the sandbar and vegetation that have accumulated in the vicinity of the existing bridge are proposed to be removed. To address the potential for erosive scouring from stream waters, rip-rap is proposed to be placed on the stream banks beneath the new bridge.

3.6 TEMPORARY CONTRACTOR STAGING AREA

During construction, approximately 240,573 square feet or 5.52 acres (TMK (1) 4-8-002:001) of the adjacent, unimproved Waiahole Beach Park are proposed to be used for a staging area and construction access to the site. Construction materials will be secured, and rock material is expected to be imported on a temporary basis to minimize sediment transport following best management practices for erosion control. Upon completion of construction, the temporary construction staging and access area within the park will be returned to its pre-construction state. Because the proposed staging area is a county park, access to the shoreline will be provided at all times.

3.7 TEMPORARY BUSINESS AND TRANSIT ACCESS

During construction a temporary bus stop will be installed to ensure continuous service by TheBus. Additionally, a bus bay may be installed on both the mauka and makai side of the Poi Factory to allow TheBus to pull in and out of traffic to drop off passengers. Delineators will be added to prevent vehicles accessing the abandoned highway. To ensure continuous access to the Waiahole

Poi Factory, parking accommodations will be made and temporary directional signage to the business will be provided.

3.8 PROJECT ALTERNATIVE COST ESTIMATES

Alternative 1 (Replace bridge downstream and relocate highway): Project mobilization and construction is anticipated to occur over 18 months. The estimated cost is $15M.

Alternative 2 (Demolish and Replace in same location): Project mobilization and construction is anticipated to between 12-24 months. The estimated project cost is $12,560,000

Alternative 3 (Rehabilitated and Widen): Project mobilization and construction is anticipated to occur over 12-24 months. The estimated project cost is $12,620,000.

Alternative 4 (No construction): The estimated project construction cost is $0.

3.9 ANTICIPATED PERMITS & APPROVALS

The following table identifies anticipated permits, regardless of selected alternative. In addition to these permits, the project will be subject to the National Environmental Policy Act of 1970 (NEPA). NEPA environmental documentation will be prepared separately from this document.
(see table on following page)

Table 1: Anticipated Permits and Approvals

Permit/Approval	Responsible Authority
Grading/Grubbing/Trenching/Building Permits	County Department of Planning and Permitting
Special Management Area Permit	County Department of Planning and Permitting
Right of Entry (ROE) Permit	County Department of Parks and Recreation
Hawaii Coastal Zone Management Program Federal Consistency Review	State Office of Planning and Sustainable Development
HDOT Permit for Occupancy & Use of State Highway ROW	State Department of Transportation
National Historic Preservation Act - Section 106 Compliance	State Historic Preservation Division
HRS Chapter 6E Historic Preservation Review	State Historic Preservation Division
HRS 195D Consultation	State Department of Natural Resources Division of Forestry and Wildlife (DOFAW); Division of Aquatic Resources (DAR)
Stream Channel Alteration Permit (SCAP)	State Department of Land and Natural Resources, Commission on Water Resources
National Pollutant Discharge Elimination System (NPDES) Permit	State Department of Health
Disability and Communication Access Board (DCAB) Document Review	State Department of Health, Disability and Access Board
Water Quality Certification 401	State Department of Health, Clean Water Branch
Community Noise Permit	State Department of Health
Noise Variance	State Department of Health
National Environmental Policy Act (NEPA) Review (Categorical Exclusion)	US Department of Transportation - Federal Highway Administration
Endangered Species Act (ESA) Section 7 Review	US Fish and Wildlife Service, National Oceanic Atmospheric Administration - National Marine Fisheries Service
Magnuson-Stevens Act Essential Fish Habitat Consultation	National Oceanic Atmospheric Administration - National Marine Fisheries Service
Department of the Army Permits CWA Sections 404/RHA Section 10	United States Army Corps of Engineers
Section 4(f) Review	FHWA

4.0 DESCRIPTION OF THE AFFECTED NATURAL ENVIRONMENT, POTENTIAL IMPACTS AND MITIGATION MEASURES

This section describes the existing conditions of the physical or natural environment, potential impacts of the project on the environment, and mitigation measures to minimize any impacts.

4.1 CLIMATE

Existing Conditions
The site is located on the eastern (windward) side of Oahu, which sees stronger winds and rains than the rest of the island, but where temperatures are consistent year-round. Data from the Western Regional Climate Center indicates that at nearby Kaneohe, the average annual maximum temperature is 82.7 degrees with an average minimum temperature of 71.2 degrees. Average annual precipitation in Kaneohe is 53.80 inches per year (National Oceanic and Atmospheric Administration, 2023).

Potential Impacts and Mitigation
The proposed bridge replacement is not expected to have an impact on climatic conditions and no mitigation measures are planned. Additional discussion on the effects of climate change are discussed in section 4.5 of this document.

4.2 GEOLOGY AND TOPOGRAPHY

Existing Conditions
The Waiahole Valley is located along the eastern (windward) side of the island of Oahu. The creation of Oahu is the result of two shield volcanoes forming the Waianae Mountain Range to the west and the Koolau Mountain Range to the east (MacDonald, G.A. et al, 1983). The Koolau volcano, the younger of the two volcanoes, is estimated to be about 2.7 million years old. The eastern side of the Koolau Mountain Range collapsed into the sea approximately two million years ago, resulting in the steep slope seen along the windward side of the range (Juvik, 1998). Today, the Waiahole Stream runs mauka to makai (land to sea) with a total drainage area of 3.83 square miles.

The topography immediately surrounding the perennial Waiahole Stream is flat with an elevation of approximately 10 feet above mean sea level. Total topographic elevation of the project site varies from approximately 20 feet above mean sea level at the southern boundary of the project site to three feet above mean sea level at the northern boundary. Downstream of the bridge, makai of the project area, the maximum elevation is 5 feet above mean sea level while maximum elevation for the upstream area is 13 feet above mean sea level.

Potential Impacts and Mitigation

No impacts to the topography and geology beyond the highway realignment are expected. The topography along the proposed new highway alignment slopes gently downward toward the Waiahole Stream. To maintain the same roadway elevation as the existing highway alignment, structural fill will be placed along a portion of the alignment. The intention is to make the top of new highway the same elevation as the existing highway. Impacts from grading will be addressed through best management practices for erosion control. Impacts to the floodplain are discussed in greater detail in Section 4.4.

4.3 SOILS

A summary of studies that classify soils in Hawaii is provided below.

4.3.1 U.S. Department of Agriculture (USDA) Web Soil Survey

The USDA Web Soil Survey shows the near-surface soils of the project area as Hanalei silty clay at the northern boundary of the project area and Pearl Harbor clay throughout the rest of the site. The characteristics of Hanalei silty clay include a moderately high to high hydraulic conductivity of approximately 0.20 to 1.98 inches per hour. Pearl Harbor clay consists of clay over muck to at least 31 inches.

4.3.2 Natural Resource Conservation Service

Site soils associated with the Waiahole Stream gulch are identified as “Pearl Harbor clay” by the Natural Resource Conservation Service (NRCS), as shown in Figure 5: NRCS Soil Survey. This soil classification is found primarily along the coastal plains of Hawaii at approximately sea level. Drainage is very poor resulting in slow runoff or ponding.

4.3.3 Land Study Bureau Detailed Land Classification

The University of Hawaii Land Study Bureau (LSB) document entitled Detailed Land Classification, Island of Oahu, classifies non-urban land by a five-class productivity rating system, using the letters A, B, C, D and E, where “A” (Prime) represents the highest class of productivity and “E” (Very Poor) the lowest (Murabayashi, E.T. et al, 1967). Waiahole Stream gulch and mauka lands are designated with a poor productivity rating, “D” (Poor). See
Figure 6.

4.3.4 Agricultural Lands of Importance to the State of Hawaii

The State of Hawaii Department of Agriculture’s Agricultural Lands of Importance to the State of Hawaii (ALISH) system rates agricultural land as “Prime,” “Unique” or “Other.” The remaining land is not classified (State of Hawaii Department of Agriculture, 1977). The land associated with Waiahole Stream is classified as “Unique” by the system. See Figure 7.

During the 2023 Draft EA pre-assessment consultation period, DLNR-OCCL provided the following comments:

Staff's research identified that the project site is in the State of Hawaii Agricultural Land Use District, and the City and County of Honolulu AG-2 General Agricultural District. The OCCL regulates land uses within the State Land Use Conservation District, as such, the project appears to be located outside of our jurisdiction. Therefore, a Conservation District Use Permit would not be required.

See Appendix A-2 for the pre-assessment consultation comment letters and responses for more detail on each of the comments presented by DLNR-OCCL.

4.3.5 Soil Condition

Previous geotechnical test borings drilled in 2017 encountered surface soil consisting of grayish brown to dark brown clayey silt. The soil was in a soft to medium stiff condition. Underlying the surface clayey silt at depths ranging from about 2.5 to 9 feet was grayish brown gravel and silty gravel. The gravel and silty gravel were in medium dense to loose conditions.

Soft and highly compressible dark gray clayey silt was encountered at depths of about 16.5 to 17 feet, extending to depths of about 57 to 59 feet. Underlying the soft clayey silt was stiff clayey silt, dense silty gravel with cobbles and boulders, and completely weathered rock down to the maximum depths drilled.

Potential Impacts and Mitigation
During the 2023 Draft EA pre-assessment consultation period, DOH-Clean Air Branch provided the following comments:

For construction and other activities associated with the project, the applicable provisions of Hawaii Administrative Rules §11-60.1-33 shall be followed to mitigate fugitive dust impacts. Also, please see our standard comments at:https://health.hawaii.gov/cab/files/2022/05/Standard-Comments-for-Land-Use-Reviews-Clean-Air-Branch-2022-1.pdf

During the 2023 Draft EA pre-assessment consultation period, DOH-Clean Water Branch provided the following comments:

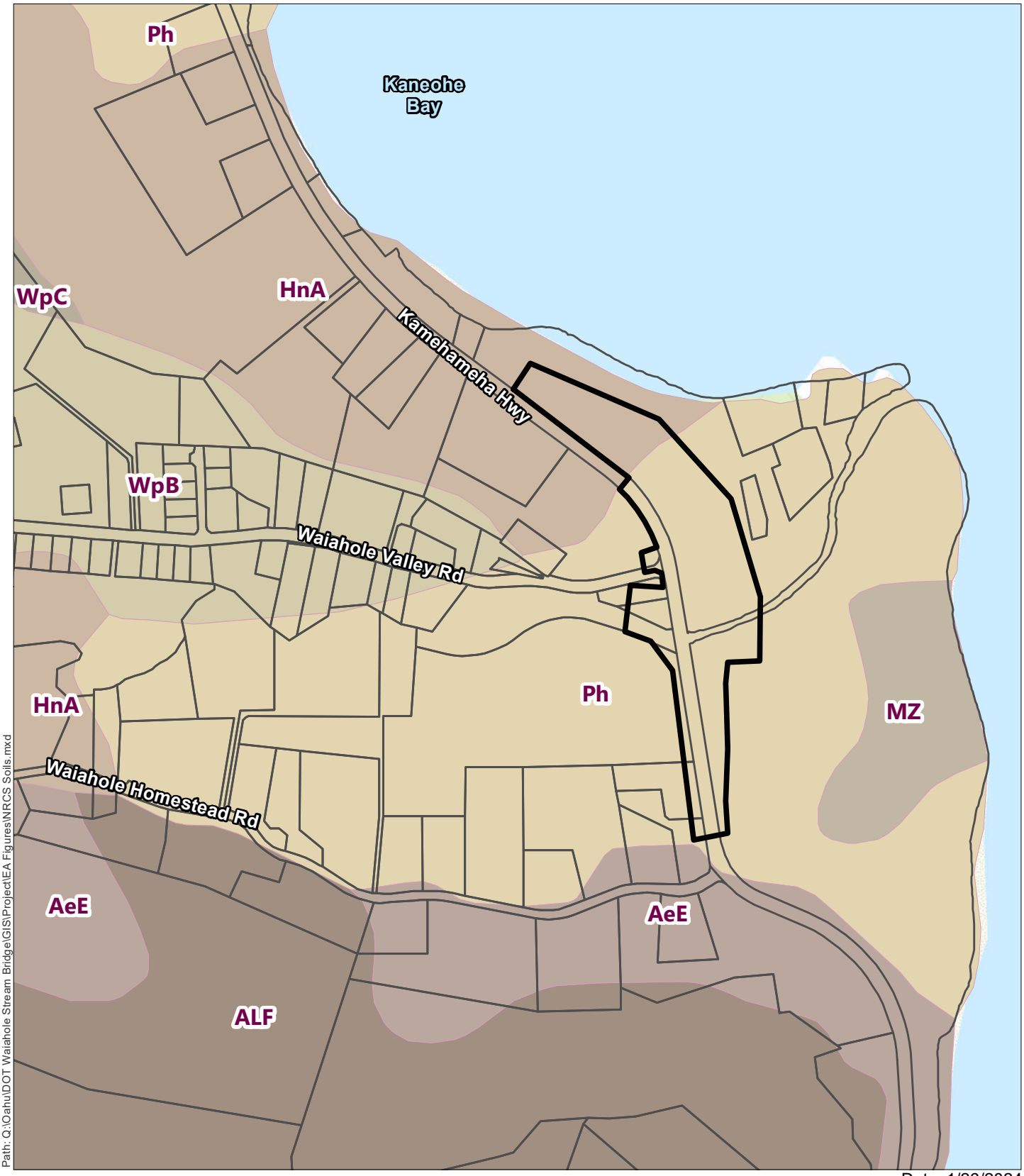
Please see the Department of Health, Clean Water Branch's (CWB) standard comments regarding water pollution control at: https://health.hawaii.gov/cwb/clean-water-branch-home-page/cwb-standard-comments/. These standard comments specify your project's responsibilities to maintain water quality and any necessary permitting issued by the Clean Water Branch.

See Appendix A-2 for the pre-assessment consultation comment letters and responses for more detail on each of the comments presented by DOH-Clean Air Branch & DOH-Clean Water Branch.

The proposed bridge replacement will occur along the makai side of the current bridge alignment and within the Waiahole Stream's channel. During construction, localized disturbance to the top soil will occur and structural elements may penetrate the subsurface. Contractors will use best management practices (BMPs) to minimize erosion and stormwater runoff during construction. The disturbed areas of the construction site will be replanted with vegetation to help control erosion as well as the spread of invasive species. All grading operations will be conducted in compliance with dust and erosion control requirements of the County Grubbing, Grading and Stockpiling Ordinance (Ordinance 808) and applicable provisions of Chapter 11-60.1, HAR (Hawaii Administrative Rules), Section 11-60.1-33 regarding Fugitive Dust. A watering program could be one strategy implemented during construction as necessary to minimize soil loss through fugitive dust emission. Other erosion control measures include cleaning job-site construction equipment and establishing groundcover as quickly as possible after grading. Permanent landscaping will also help to retain soil throughout the project. In addition to construction watering programs and landscaping, other mitigation measures generally associated with best management practices include:

- Early construction of erosion control features;
- Use of temporary berms and cut-off ditches where needed; and
- Use of temporary silt fences or straw bale barriers to trap silt.

To further mitigate potential soil impacts, a National Pollutant Discharge Elimination System (NPDES) permit will be obtained prior to construction to address point source discharges during construction. Removal of sediment from the stream channel may occur as part of the project. If sediment removal is pursued, applicable permits will be acquired. Compliance with permit conditions will serve to minimize any adverse effects.



Path: Q:\Oahu\DOT Waiahole Stream Bridge\GIS\Project\EA Figures\NRCS Soils.mxd

Date: 1/26/2024

LEGEND

- Project Area
- TMK Parcels

Soil Classification

- ALF: Alaeloa silty clay, 40-70% slopes
- AeE: Alaeloa silty clay, older substrate, 15-35% slopes, MLRA 167
- HnA: Hanalei silty clay, 0-2% slopes, MLRA 167
- MZ: Marsh
- Ph: Pearl Harbor clay, 0-2% slopes, MLRA 163
- WpB: Waikane silty clay, 3-8% slopes
- WpC: Waikane silty clay, 8-15% slopes

Figure 5:
NRCS Soil Classification

Waiahole Bridge Replacement

State of Hawai'i
Island of O'ahu

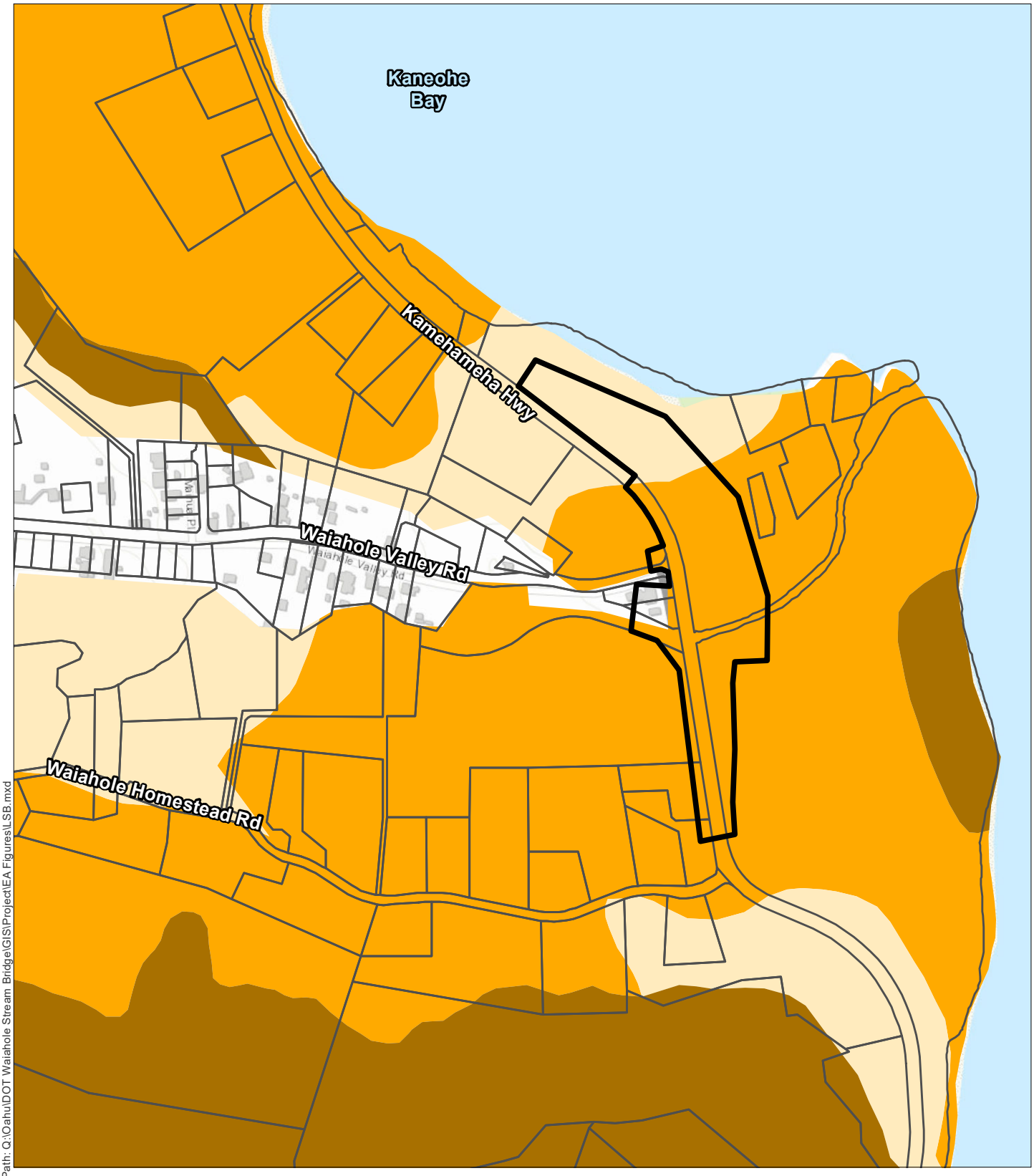
North

Linear Scale (feet)
0 250 500

PBR HAWAII & ASSOCIATES, INC.

Source: City & County of Honolulu, 2023. USDA NRCS, 2020. ESRI Basemap.

Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.



Path: Q:\Oahu\DOT Waiahole Stream Bridge\GIS\Project\EA Figures\LSB.mxd

LEGEND

- Project Area
- TMK Parcels

LSB Land Classification

- C - Fair
- D - Poor
- E - Very Poor

Figure 6:
Land Study Bureau's Detailed Agricultural Land Productivity Ratings (LSB)

Date: 1/26/2024

Waiahole Bridge Replacement

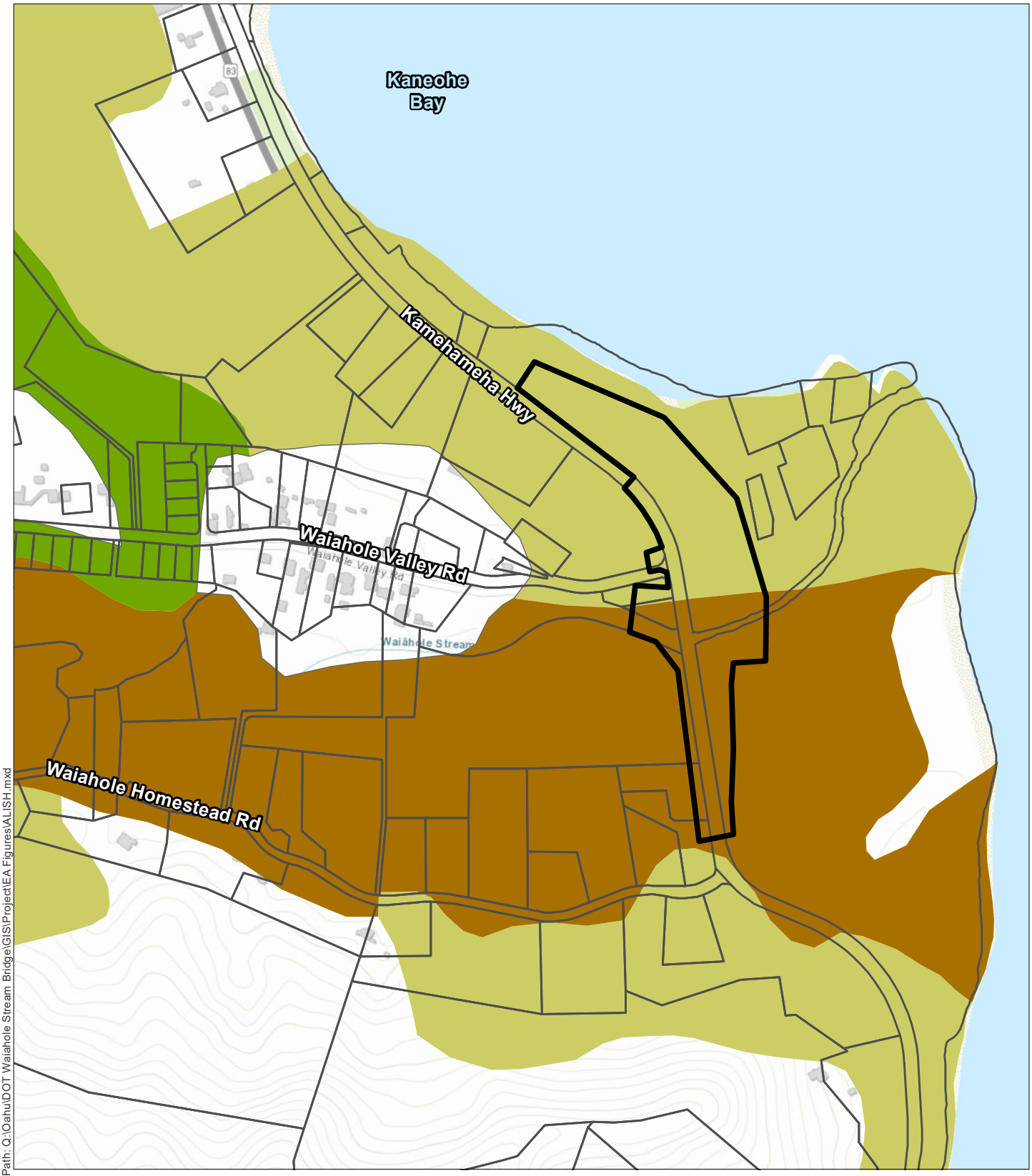
State of Hawai'i
Island of O'ahu

North

Linear Scale (feet)
0 250 500

PBR HAWAII & ASSOCIATES, INC.

Source: City & County of Honolulu, 2023. University of Hawaii Land Study Bureau, 1972, digitized by State OP, 2012. ESRI Basemap.
Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.



Path: Q:\Oahu\DOT Waiahole Stream Bridge\GIS\Project\EA Figures\ALISH.mxd

LEGEND

- Project Area
- TMK Parcels

ALISH

- Prime ALISH
- Unique ALISH
- Other ALISH
- Unclassified

Figure 7: Agricultural Lands of Importance to the State of Hawaii (ALISH)

Date: 1/26/2024

Waiahole Bridge Replacement

State of Hawai'i — Island of O'ahu

North

Linear Scale (feet): 0 — 250 — 500

PBR HAWAII & ASSOCIATES, INC.

Source: City & County of Honolulu, 2023. State Department of Agriculture, 1977, digitized by OP. ESRI Basemap.

Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

4.4 NATURAL HAZARDS

Existing Conditions
Natural hazards impacting the Hawaiian Islands include flooding, tsunami inundation, hurricanes, volcanic eruptions, and earthquakes.

Flooding
According to the Flood Insurance Rate Map (FIRM) Panel 15003C0255G prepared by the Federal Emergency Management Agency (FEMA), National Flood Insurance Program, the Waiahole Bridge is located in Zone A and AE. Zone A and AE are special flood hazard areas with a designated 1% chance flood event. Lands beyond the banks of Waiahole Stream are designated Zone X and XS. Zone XS is within the 0.2% annual chance flood event while Zone X delineates areas outside of the 0.2% annual chance flood zone.

Tsunami Inundation
The Waiahole Bridge is within the tsunami evaluation zone, which is the inland area delineated where tsunami inundation is expected to go beyond the immediate shoreline. The surrounding project area is within the extreme tsunami evacuation zone, which is the estimated inundation area after a magnitude 9+ earthquake.

Hurricanes
Since 1980, two hurricanes have had a devastating effect on Oahu. They were Hurricane Iwa in 1982 and Hurricane Iniki in 1992. While it is difficult to predict such natural occurrences, it is reasonable to assume that future incidents are likely. However, the threat of such hazard is no greater for the proposed project site than any other location on Oahu, except for potential flooding issues associated with the stream.

Volcanic Eruptions and Earthquakes
Volcanic hazard is considered minimal due to the extinct status of Oahu's volcanoes. In Hawaii, most earthquakes are linked to volcanic activity, unlike other areas where a shift in tectonic plates is the cause of an earthquake. Each year, thousands of earthquakes occur in Hawaii, the vast majority of which are so small they are detectable only with highly sensitive instruments. The threat of an earthquake to the site area is no greater than any other location on Oahu.

Potential Impacts and Mitigation
Under the preferred alternative to replace the bridge, normal traffic flows will be maintained as the existing bridge will remain in place until the highway is realigned and the new bridge is installed. The highway and bridge will remain open for normal use, including emergency access and evacuations.

The new bridge will not exacerbate any natural hazard conditions and is expected to have a beneficial impact as it has been designed to alleviate future flooding events by accommodating greater stream flow volumes, and by removing structures from the stream bed that often collect debris. The upstream channel will be realigned and widened which will provide the stream a more direct and unobstructed path through the bridge and increase the volume of water that can flow

underneath. Sediment may be removed from the stream channel to facilitate water conveyance and minimize debris build-up and appropriate permits for sediment removal from the stream channel will be acquired. A hydraulic and scour report was prepared by WEST Consultants and is included in Appendix B. The report's purpose was to evaluate the effects that the proposed bridge may have on water depths during flood conditions and to evaluate how waters may scour the stream channel under the proposed bridge.

Using hydraulic modeling (methodology described in report), the 5-year, 10-year, 50-year, 100-year, 200-year, and 500-year existing conditions were calculated. Flood elevations calculated for the proposed bridge improvements are predicted to range from 14.3 feet in a 5-year flood and a depth of 16.3 feet in a 500-year flood.

The hydraulic analysis summarizes a model that looked at a variety of potential bridge spans (no piles) in a peak flow discharge flood scenarios. The preferred alternative (Alternative 1 in the hydraulic analysis) involves a 130-foot span, no piles located about 60-feet makai of the current Waiahole Bridge. It assumes that the Waiahole Stream channel under the bridge is re-graded from about 200-feet upstream of the crossing to about 100-feet downstream. The regrade assumes the sandbar that has accumulated in front of the existing bridge piles will also be removed. The model found that all bridge span widths would reduce the river profile upstream of the existing bridge, with the 130-foot span bridge reducing the river profile most significantly. The proposed 130-foot-wide bridge will reduce the upstream surface water elevation from 17.5 feet to close to 16.0 feet while the downstream surface water elevation will only slightly increase by less than one half a foot. The model shows that removing the existing bridge abutments to make the upstream channel wider would cause a higher water surface profile than just leaving them in place.

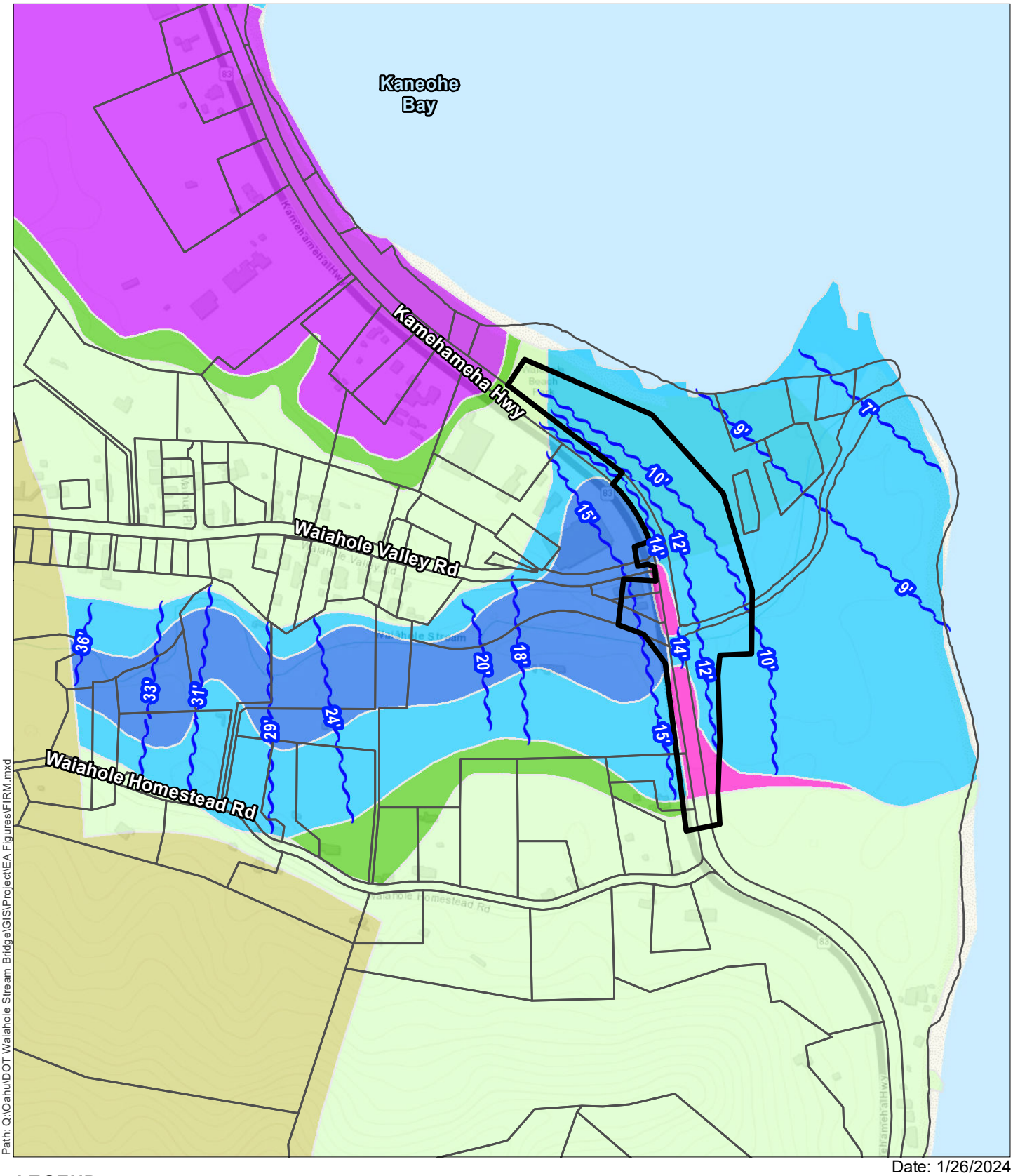
To protect the new bridge from contraction and scour, both the channel and new proposed streambanks will be lined with riprap. The riprap should be placed in the channel, on the banks and around the bridge abutments. A scour analysis was conducted to determine where riprap should be placed and the size of the material recommended for use. To prevent abutment scour both the channel and the new proposed streambanks are proposed to be lined with riprap. Riprap size (d50) is required to protect the bridge abutment and riprap size d30 is required to protect the banks.

The hydrologic, hydraulic and scour analysis (Appendix B), concludes, "compared to the existing bridge conditions, the proposed bridge is estimated to reduce the water surface elevation of the 100- and 500-year flood upstream of the bridge, however, the bridge is expected to continue to be overtopped during these storm events." The new bridge is not expected to pass a 5 year stream discharge estimates without overtopping.

Table 2: Hydraulic Model Results for 100- and 500-year Flood Events

	Top of Bridge Deck lowest elevation (elevation in feet)	100-year flood		500-year flood	
		Water surface elevation	Overtopping	Water surface elevation	Overtopping
Existing conditions	15.2	14.03	1.0	14.38	1.5
Proposed conditions	13.8	14.0	.8	14.22	1.3

In addition to the hydrologic modeling work that has been conducted for this project, coordination with the City and County of Honolulu Department of Planning and Permitting (DPP) has been initiated by the DOT and their design consultants to address permitting requirements associated with changes to the floodplain from the proposed realignment of the highway and relocation of the bridge.



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Date: 1/26/2024

LEGEND

- Project Area
- Base Flood Elevation (BFE) Line

Flood Hazard Areas

- A: 1%-Annual-Chance Flood, no BFE
- AE: 1%-Annual-Chance Flood, with BFE
- AH: 1%-Annual-Chance Flood, Flood Depths of 1-3ft, with BFE
- AEF: Floodway Areas in
- XS: 0.2%-Annual-Chance Flood
- X: Outside 0.2%-Annual-Chance Floodplain
- D: Unstudied Areas

Figure 8:
Flood Insurance Rate Map

Waiahole Bridge Replacement

State of Hawai'i
Island of O'ahu

North

Linear Scale (feet)
0 250 500

PBR HAWAII & ASSOCIATES, INC.

Source: City & County of Honolulu, 2023. FEMA Flood Map Service Center, 2023. ESRI Basemap.

Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

4.5 SEA LEVEL RISE & CLIMATE CHANGE

Existing Conditions

While the project site is outside the Sea level rise (SLR) exposure area of 3.2 feet. SLR and climate change have the potential to negatively affect the existing site and surrounding environment as well as exacerbate any existing risk from natural hazards. Coastal ecosystems are particularly vulnerable to the effects of climate change, including changing climate patterns, extreme weather events, and sea level rise, which may increase the magnitude of wind, flood, rain impacts, and storm surges within coastal regions. While the extent of the impacts from SLR and climate change is not known for certain, the most immediate threats to the existing site from SLR and climate change include increased flooding events and structural damage to existing roads and vital infrastructure as a result of more intense weather conditions and potential storm surges.

Potential Impacts and Mitigation

During the 2023 Draft EA pre-assessment consultation period, OPSD provided the following comments:

Due to the project area's proximity to the shoreline, this bridge replacement project may be vulnerable to coastal inundation and natural hazards associated with SLR. These impacts include storm surge, coastal erosion, intense wave action, high winds, and potentially hurricanes. These coastal area threats may negatively affect the long-term viability of Kamehameha Highway (near Waiahole) and the bridge spans that serve it. To assess the potential environmental impacts and vulnerability of this facility, we suggest the Draft EA refer to the findings of the Hawaii Sea Level Rise Vulnerability and Adaptation Report 2017, accepted by the Hawaii Climate Change Mitigation and Adaptation Commission.

The Report, and Hawaii Sea Level Rise Viewer at https://www.pacioos.hawaii.edu/shoreline/slr-hawaii/ identifies a 3.2-foot SLR exposure area across the main Hawaiian Islands, as a starting evaluation point. The Draft EA should provide a map of 3.2-foot SLR exposure area in relation to the project area, and consider site-specific mitigation measures, including setbacks from the shoreline or relocation options further inland, increasing the height of the support facilities to accommodate higher water levels, or various climate change adaptation strategies to respond to impacts of 3.2-foot SLR or greater.

HDOT has adopted the Bridge Adaptive Policy Regarding Sea Level Rise which identifies "the 3.2 feet sea level rise (SLR) exposure area projected to occur in the State by the end of the century as one of the primary planning criteria for existing and future development" and 1.1 ft. SLR in 2050 (State of Hawaii Department of Transportation, 2023). Due to the project site being out of the 3.2 ft SLR exposure area, this policy does not apply, however measures have been taken to plan for future SLR by ensuring that the new bridge is a prefabricated bridge that can be easily

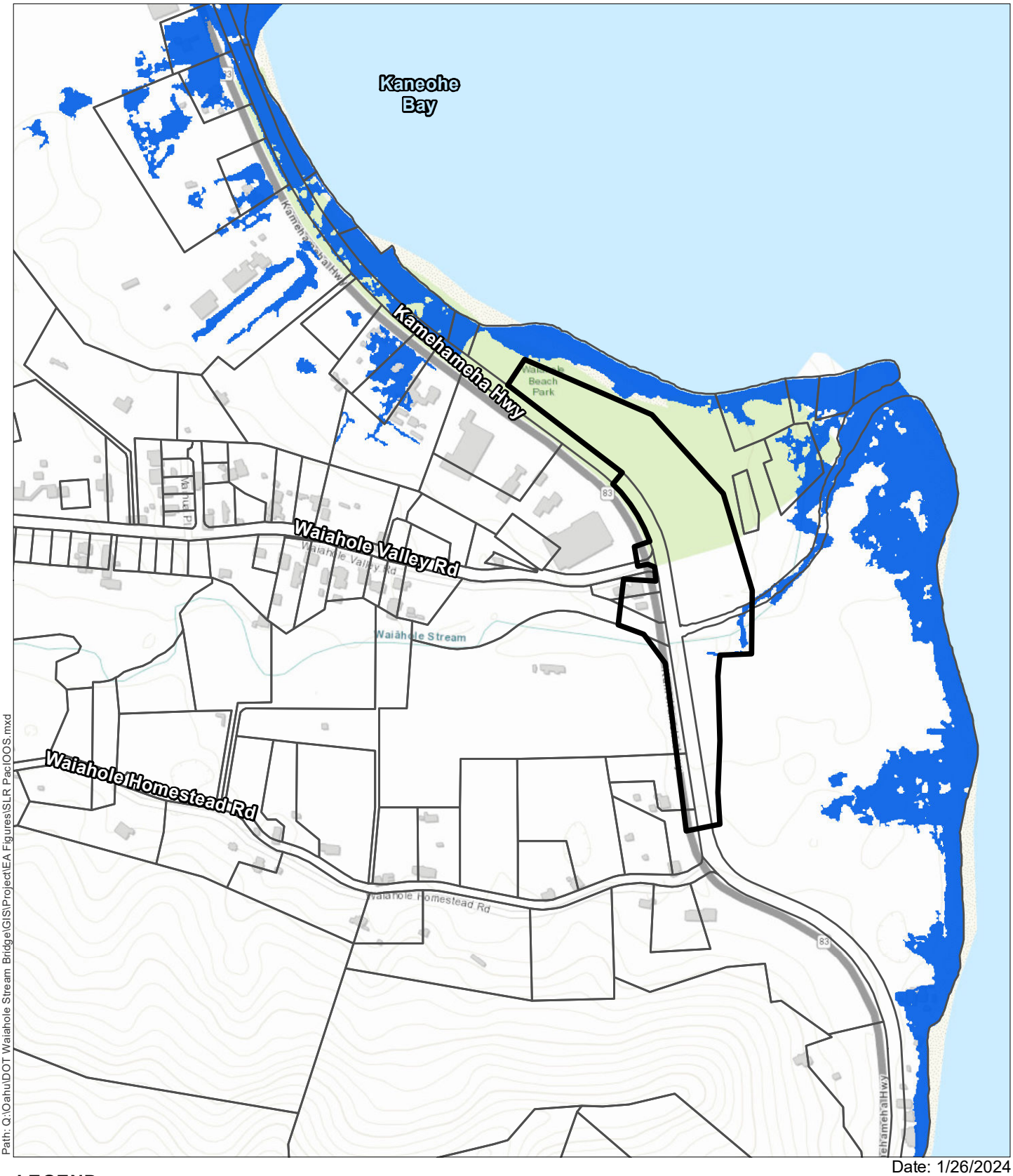
relocated if needed. See Appendix A-2 for the pre-assessment consultation comment letters and responses for more detail on each of the comments presented by OPSD.

Pre-consultation comments from the Department of Planning and Permitting in year 2017 found in Appendix A-1, recommends analysis of the possible impact of sea level rise on the project and if it is likely that sea level rise will increase the risks of flooding and erosion during the life of the structures, how the design of the project and proposed operations will address those risks and provide resilience in recovering from any flooding or erosion.

The proposed bridge replacement and new channel abutments will not increase the vulnerability of existing roadways and the surrounding environment to impacts of SLR and climate change. Nor is the bridge proposed in a location expected to be inundated by ocean waters. Figure 9: Sea Level Rise Estimate (3.2ft) and Figure 10: Sea Level Rise Estimate (1.1ft) show the estimated relationship between the bridge and ocean waters under a 3.2 ft. and 1.1 ft. level rise scenarios. The figures rely on data from the National Oceanic and Atmospheric Administration (NOAA). Similarly, a review of the Hawaii sea level rise viewer, shows under the most conservative available estimate on-line (a 3.2-foot scenario), that ocean waters will rise makai of the bridge, but will not overtop at this location (Appendix B).

The new bridge design is expected to mitigate the effects of greater flooding events by providing more direct stream flow within the channel through a combination of a longer bridge span, widened abutments to increase the width of the stream channel, and elimination of an in-water piles. The bridge replacement will also bring the structure up to current design standards and will be able to withstand more intense weather conditions than the existing structure. The resulting structural modifications will improve the safety and reliability of the structure for serving everyday multi-modal transportation as well as improve emergency and evacuation services.

The long-term effects of SLR and climate change are not anticipated to directly impact the short-term construction activities and operations of the relocation of Kamehameha Highway required for the bridge replacement and channel improvements. Therefore, construction activities will follow best management practices to mitigate short-term construction impacts as discussed previously (see section 4.3) and no additional mitigation is proposed.



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Date: 1/26/2024

LEGEND

- Project Area
- PacIOOS 3.2 ft Sea Level Rise Scenario

Figure 9:
Sea Level Rise

Waiahole Bridge Replacement

State of Hawai'i — Island of O'ahu

North

Linear Scale (feet)

0 250 500

PBR HAWAII & ASSOCIATES, INC.

Source: City & County of Honolulu, 2023. University of Hawaii Coastal Geology Group & Tetra Tech, Inc., 2017. ESRI Basemap.

Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

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Date: 1/26/2024

LEGEND

- Project Area
- PacIOOS 1.1 ft Sea Level Rise Scenario

Figure 10:
1.1-Ft Sea Level Rise Exposure Area

Waiahole Bridge Replacement

State of Hawai'i — Island of O'ahu

North

Linear Scale (feet)

0 250 500

PBR HAWAII & ASSOCIATES, INC.

Source: City & County of Honolulu, 2023. University of Hawaii Coastal Geology Group & Tetra Tech, Inc., 2017. ESRI Basemap.

Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

4.6 SURFACE WATER

Existing Conditions

Waiahole Stream is a perennial stream with a four-square mile watershed (Parham, 2008). Stormwater in the action area flows as overland flow into Waiahole Stream, is impounded by wetlands in the area, or is absorbed into the ground and enters the stream via hyporheic exchange. An ordinary high-water mark (OHWM) survey of the stream was performed as part of a Jurisdictional Determination (JD) conducted by Haley & Aldrich in September 2023 (Appendix C). The OHWM survey demarcated Waiahole Stream approximately 150 ft upstream and 250 ft downstream of Waiahole Bridge. The stream within the project area has a gradient is approximately 1% or less and the banks are heavily vegetated. Riparian vegetation was found to be undisturbed downstream of the bridge and dominated by Guinea (*Megathyrsus maximums)* and elephant grass (*Cenchrus purpureus)* understory cover with monkeypod (*Samanea saman)* and gunpowder (*Trema orientalis)* overstory. The stream averages 33 feet in width and ranges between 14 feet and 70 feet wide within the project area surveyed. Stream depth is approximately between 1 to 5 feet.

Waiahole Stream is considered a riverine, upper perennial, permanently flooded wetland with an unconsolidated bottom (R3UBH) by the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI). Downstream of the proposed bridge, there are palustrine, emergent, persistent wetlands that are seasonally flooded (PEM1C). Just east of the project site are palustrine, freshwater forested/shrub (PFO3C) wetlands (US Fish and Wildlife Service, 2023).

Several wetlands were identified throughout the project area. Three depressional palustrine emergent wetlands, Wetlands A, D, and E, were identified along the northeastern, southeastern, and northwestern boundaries of the project area, respectively. A riverine emergent wetland, Wetland B, was identified adjacent to the northern bank of the Waiahole Stream and east of the bridge (see Appendix C). According to the "Revised Definition of 'Waters of the United States'; Conforming" rule, only Wetland B is considered to be under USACE jurisdiction as it has a direct surface connection to Waiahole Stream, a relatively permanent tributary to the Pacific Ocean. An approved Jurisdictional Determination from USACE Honolulu District Regulatory Program is being sought.

Wetland A extends approximately 1.28 acres from the east side of Kamehameha Highway to the north of Waiahole Stream and south of the Waiahole Beach Park. Most of Wetland A is regularly disturbed by maintenance mowing. Vegetation in the southern portion consists of thick stands of buffalo grass. Wetland A receives flow from a culvert under Kamehameha Highway, likely reducing flood impacts to the road by storing excess water during heavy rainfall.

A riverine emergent wetland (Wetland B) extends 0.37 acres adjacent to the northern bank of Waiahole Stream and east of Waiahole Bridge. The main hydrologic input to the wetland is from Waiahole Stream, with additional secondary runoff from the adjacent area. Wetland B is connected to Waiahole Stream. The area is dominated by elephant grass and lacks shrub and tree strata.

Wetland D is located east and adjacent to Kamehameha Highway and south of Waiahole Stream. Wetland D is at least 0.81 acres in size, and likely extends east and further outside of the project area. The wetland is a monoculture of elephant grass stands. Wetland D receives agricultural runoff west of Kamehameha Highway that discharges into Wetland D through a culvert.

Wetland E is approximately 0.14 acres and located just west of the project area, north of Waiahole Stream and across Kamehameha Highway from Wetland A. Wetland E is disturbed by regular maintenance mowing of broad-leaf carpet grass and *Paspalum sp*. covering the area. Surface runoff from the surrounding street that drains through a culvert into Wetland E is the main hydrological input.

Potential Impacts and Mitigation

The proposed project will impact WotUS below the OHWM of Waiahole Stream and within the adjacent Wetland B. Impacts will result from regrading stream embankments beneath the new bridge and immediately downstream of the bridge and removing vegetation and sediment upstream and downstream of the existing bridge. In addition, the center piers of the existing bridge will be removed down to the mudline to allow for improved flow. There will be disturbance of 0.32 acres below the OHWM of Waiahole Stream, including approximately 180 cubic yards (cy) of excavation and 305 cy of fill. Approximately 0.04 acres and 110 cy of Wetland B will be excavated for the new highway alignment. Table 2 summarizes impact quantities to wetlands and Waiahole Stream. As construction plans for replacing Waiahole Bridge will involve a total of 0.36 acres of WotUS impacted by dredge or fill material, a Department of the Army permit administered by the USACE will be required.

Natural stream flow conditions will be permanently improved by these project elements; however, work in the stream has the potential to temporarily negatively impact stream water quality during construction. Standard BMPs for in-water work, such as isolating the active working area with sandbags or silt curtain, will be utilized to minimize the impact of construction on stream water quality. Long-term impacts to the stream, although permanent, are anticipated to be beneficial by allowing more natural hydrologic and sedimentation processes to occur within the stream.

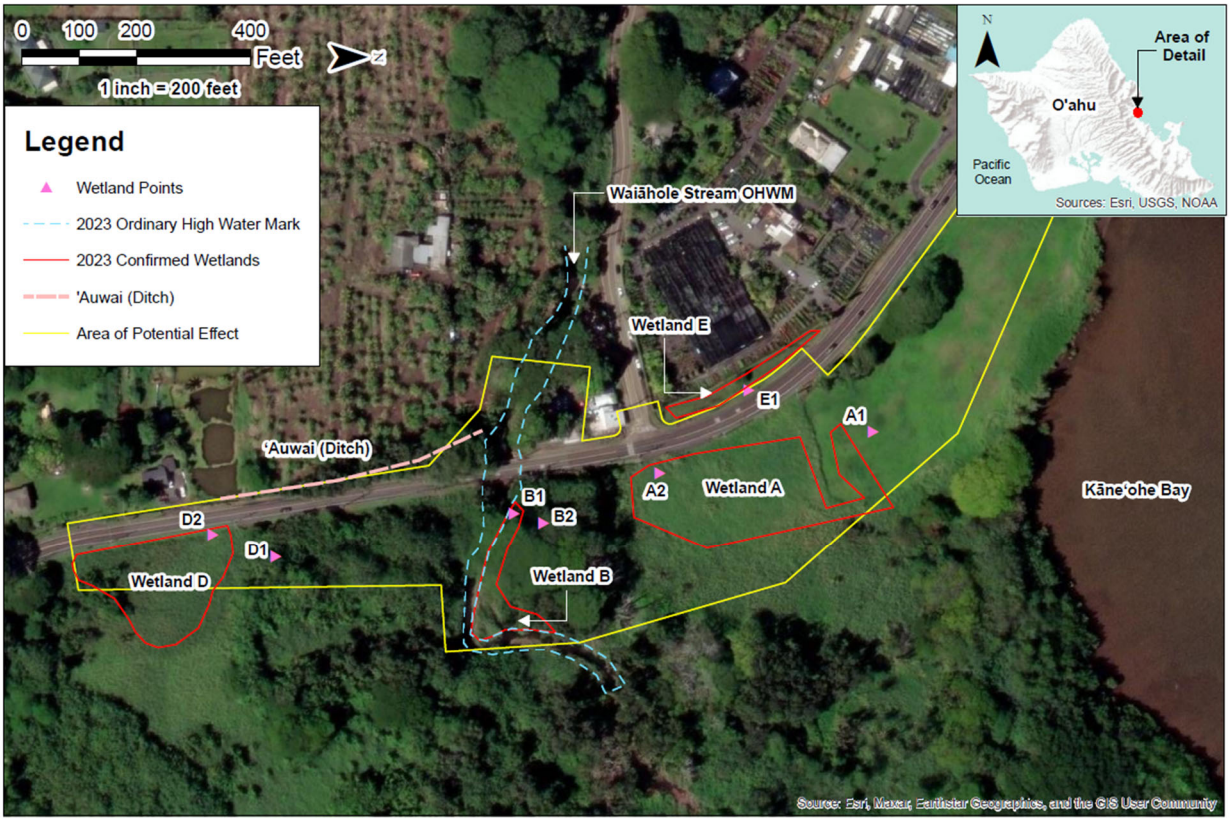
Although Wetlands A and D no longer appear to qualify as WotUS under the 2023 Conforming Rule, we are reporting impacts to these non-WotUS wetlands for informational purposes. Approximately 0.06 acres of Wetland A and 0.02 acres of Wetland D are expected to be impacted permanently by the construction of the new highway alignment. Approximately 250 cy of fill will be placed in Wetland A and 30 cy of fill into Wetland D for construction of the new alignment roadway embankments. The impacts to Wetlands A and D are expected to be negligible, as hydraulic storage will not be significantly reduced and the wetlands have little habitat value as most of the area has been disturbed due regular grass cutting maintenance. Table 2 summarizes the quantities and areas of impact to each wetland or stream area below the OHWM.

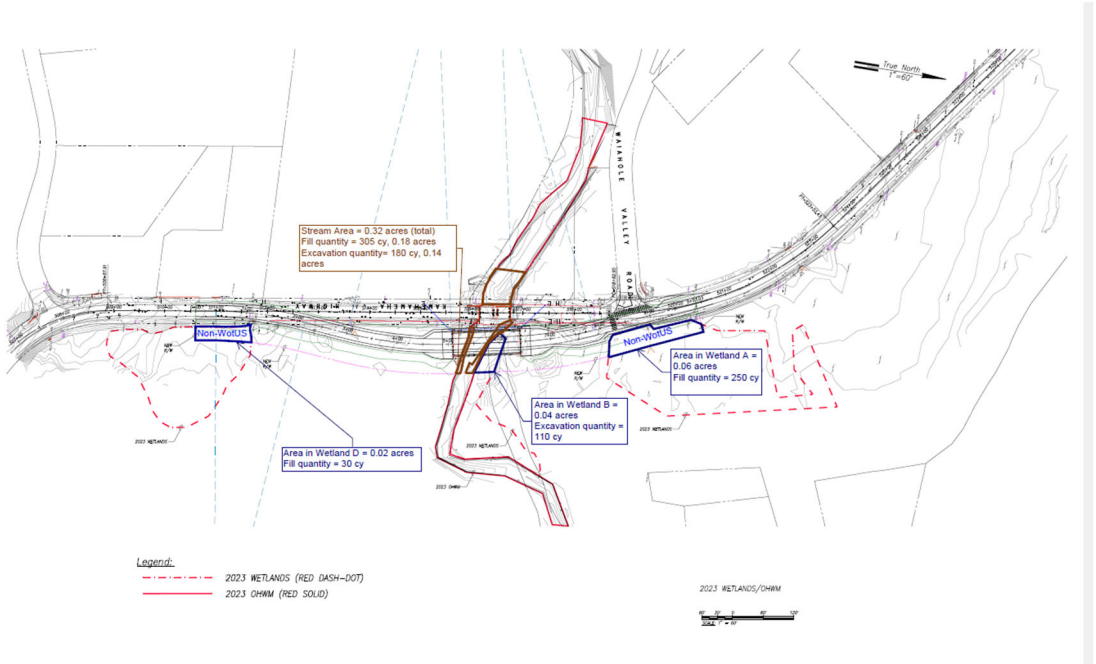
Table 3: Wetland and Stream Impacts

Wetland	WotUS Designation	Excavation Quantity (cy)	Fill Quantity (cy)	Area (acres)
Wetland A	Non-WotUS	--	250	0.06
Wetland B	WotUS	110	--	0.04
Wetland D	Non-WotUS	--	30	0.02
Waiahole Stream	WotUS	180	305	0.14 (excavation) 0.18 (fill)

Notes:
Total area of WotUS Impacted: 0.36 acres
Total amount of fill in WotUS: 305 cy
Total amount of excavation in WotUS: 290 cy

Figure 11: Wetland Delineation Results





4.7 FLORA

Existing Conditions

The area surrounding Waiahole Stream consists most of fallow agriculturally zoned lands and park lands. A terrestrial biological survey was conducted by Haley and Aldrich for the project in September 2023. Results are documented in a Biological Evaluation (Appendix D).

The terrestrial botanical survey did not document any sensitive or endangered plants. The majority of the species observed in the project area were non-native with dominant tree species including monkeypod (*Samanea saman*), tropical almond (*Terminalia catappa*), Moluccan albizia (*Falcataria moluccana*), gunpowder tree (*Trema orientalis*), macaranga (*Macaranga tanarius*), and mango (*Mangifera indica*). The herbaceous stratum was primarily Guinea grass (*Megathyrsus maximus*), elephant grass (*Cenchrus purpureus*), wedelia (*Sphagneticola trilobata*), sensitive plant (*Mimosa pudica*), umbrella sedge (*Cyperus involucratus*), California grass (*Urochloa mutica*), sourbush (*Pluchea carolinensis*), maile pilau (*Paederia foetida*), and basketgrass (*Oplismenus hirtellus*). A total of 75 non-native naturalized species were identified.

Seven native indigenous species were documented, including hala (*Pandanus tectorius*), the presumed indigenous hau (*Hibiscus tiliaceus*), uhaloa (*Waltheria indica*), mauu laiki (*Paspalum scrobiculatum*), kaee (*Mucuna gigantea*), moa (*Psilotum nudum*), and ihi (*Oxalis corniculata*). Seven Polynesian introduced species documented include ki (*Cordyline fruticosa*), primrose willow (*Ludwigia octovalvis*), maia (*Musa* sp.), kalo (*Colocasia esculenta*), ape (*Alocasia macrorrhizos*), niu (*Cocos nucifera*), and kukui (*Aleurites moluccana*).

Potential Impacts and Mitigation

The BE concluded that no threatened or endangered botanical resources will be impacted by the project.

The State of Hawaii Department of Forestry and Wildlife (DOFAW) provided recommendations to minimize effects to native species and ecosystems in their pre-consultation comments on December 1, 2023. DOFAW recommend minimizing the movement of plant and soil material between worksites which could contain fungal pathogens, vertebrate and invertebrate pests, or invasive plant parts. All equipment, materials, and personnel should be cleaned of excess soil and debris to minimize the risk of spreading invasive species. Movement of known host material for the Coconut Rhinoceros Beetle (CRB), such as entire dead trees, mulch, compost, trimming, and decaying stumps, and live palm *Washingtonia, Livistona, Pritchardia, Cocos* (coconut palms)*, Phoenix* (date palms)*, and Roystonea* (royal palms) species shall be avoided. Should host material need to be removed from the site, it will not be removed from the island of Oahu, following Plant Quarantine Interim Rule 22-1. Finally, DOFAW recommends using native plant species for landscaping that are appropriate for the area.

4.8 AQUATIC BIOTA

Existing Conditions

The Atlas of Hawaiian Watershed and their Aquatic Resources (Parham et. al, 2008) identifies eleven endemic and indigenous aquatic biota species that could possibly occur within the project area as their presence has been documented in the lower reaches of the Waiahole Stream. Native species identified include five fish species, the oopu (*Eleotris sandwicensis),* Hawaiian flagtail (*Kuhlia xenura*), oopu nopili (*Sicyopterus stimpsoni),* oopu naniha (*Stenogobius hawaiiensis),* and the flathead grey mullet (*Mugil cephalus)* and several native insect species including *Orthocladius sp., Dasyrhicnoessa insularis,* and *Scatella sexnotata* and fly species *Procanace williamsi* and *Thambemyia acrosticalis.*

On November 21st, 2023, the Department of Land and Natural Resources Division of Aquatic Resources (DAR) responded to the DOT's request for pre-consultation comments. DAR identified ten native aquatic biota species, including seven fish species (*Eleotris sandwicensis, Stenogobius hawaiiensis, Awaous hawaiiensis, Sicyopterus stimpsoni, Lentipes concolor*, and juvenile species of *Caranx sp., Kuhlia xenura*, and *Mugil cephalus*); two crustacean species (*Macrobrachium grandimanus, Atyoida bisulcata*); and one mollusk species (*Neritina vespertina*), as possibly occurring below, in, and above the project site in the Waiahole Stream and estuary. All the native stream biota have an amphidromous life cycle which means they have a dependence on connectivity to the ocean. The adult animals lay their eggs in the stream and as the larvae hatch, they are swept downstream into the ocean, where they grow into post-larvae/juveniles before migrating back upstream. DAR requests that specific BMPs be followed during construction and demolition activities to avoid creating barriers that could block downstream and upstream movement of stream biota and to minimize the potential for erosion, siltation, pollution and degradation of the aquatic environment (Appendix A-2). Specific BMPs are described as mitigation measures in the section below.

On November 30th, 2023, the Hawaii Department of Transportation received pre-consultation comments from the United States Department of the Interior, U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office (PIFWO). The comments indicated that there were no native *Megalagrion* damselflies present at the site, but that the stream reach is a known transit corridor for aquatic trust resources, notably native prawns and gobioid fishes. PIFWO noted that embayment water in front of Waiahole is often very turbid, but several large patch reefs are present not far offshore of the stream delta. No recent survey work of the proximal shallow water marine resources off of the mouth of Waiahole Stream is known. PIFWO requests that nearby stream resources be considered if significant stream channel alteration and attendant sediment mobilization occur due to the bridge replacement. However, PIFWO acknowledges that generally bridge replacements should have minimal impact to nearby marine waters if BMPs are implemented.

On November 3rd, 2017, the Hawaii Department of Transportation requested pre-consultation comments from NOAA's National Marine Fisheries Service (NMFS) Pacific Islands Regional Office on the preparation for this Environmental Assessment. Initial consultation indicated that the Waiahole Stream is adjacent to essential fish habitat within Kaneohe Bay. The same area is also identified as a Habitat Area of Particular Concern. Therefore, NMFS provided comments to inform project mitigation measures, found in Appendix A-1, but was unable to estimate all potential adverse effects until further consultation was completed.

Waiahole Stream does not include Essential Fish Habitat (EFH) within the immediate project area, but the stream flows into Kaneohe Bay, which is approximately 1,500 ft downstream of the downstream extent of the project. The water column and bottom of Kaneohe Bay are defined as EFH and support various life stages for the management unit species (MUS) identified in the Western Pacific Regional Fishery Management Council's Pelagic and Hawaii Archipelago Fishery Ecosystem Plans. Essential fish habitat in Kaneohe Bay includes:

- Bottom fish and seamount groundfish, including Amberjack/Black Jack/Sea Bass, Blue Stripe Snapper/Gray Jobfish, Giant Trevally, Pink Snapper, Red Snapper/Longtail Snapper, Yellowtail Snapper, Snapper, and Silver Jaw Jobfish/Thicklip Trevally.
- Main Hawaii Islands Coral Reef Ecosystem (National Oceanic and Atmospheric Administration, 2023).

See Appendix A-2 for the pre-assessment consultation comment letters and responses for more detail on each of the comments presented by DLNR-Aquatic Resources.

Potential Impacts and Mitigation Measures

The project will alter stream embankments beneath the new bridge and immediately downstream of the bridge and removing vegetation and sediment upstream and downstream of the existing bridge. In addition, the center piers of the existing bridge will be removed down to the mudline to allow for a better, unimpeded flow. Natural stream flow conditions will be improved by these project elements; however, this work will occur in the aquatic environment and could potentially impact aquatic biota in the affected area and downstream of the project area.

A scour analysis was conducted to ensure sufficient hydrologic function of the bridge and stream. The bridge abutments have also been designed to minimize stream bank disturbances and ensure sufficient water depths by aligning them with the stream channel. Disturbance to the Waiahole Stream riparian zone within the project area is expected to occur; however, the impacts will be temporary, and the area will be revegetated at the completion of the project. Best management practices (BMPs) described below will be implemented to reduce sedimentation and turbidity.

Best management practices requested by DAR include the following:

1. Stream bank areas denuded of vegetation should be planted or covered as quickly as possible to prevent erosion and the vegetation cleared along stream banks should be removed and prevented from falling into the stream/estuary environment;
2. Scheduling construction and stream maintenance activities during periods of minimal rainfall;
3. Prevent construction materials, petroleum products, debris and landscaping products from falling, blowing or leaching into the aquatic environment;
4. Reduce the disturbance and impacts to stream channel bottom substrate types (cobble, boulders, etc.) as much as possible;
5. Maintain continuous stream flow within the stream channel; and
   Contact DAR immediately in the event that an unforeseen event poses a potential threat to the aquatic environment.

The USFWS recommends the following measures to be incorporated into project planning to avoid or minimize impacts into project planning for work in or around aquatic environments. Standard BMP recommendations include: 1) Authorized dredging and filling-related activities should be designed to avoid indirect, negative impacts to aquatic habitats beyond the planned project area; 2) Dredging/filling in the marine environment should be scheduled to avoid coral spawning and recruitment periods and sea turtle nesting and hatching periods specified by the Pacific Island Fish and Wildlife Office (PIFWO); 3) Turbidity and siltation from project-related work should be minimized and contained by silt containment devices and curtaining work during flooding or adverse weather conditions. BMPs should be maintained for the life of the construction period until turbidity and stabilization are stabilized and must be removed and disposed of at an approved site at the end of construction; 4) All project construction-related materials and equipment should be inspected for pollutants including but not limited to: marine fouling organisms, grease, oil, and cleaned to remove pollutants prior to use. Project-related activities should not result in any debris disposal, non-native species introductions, or attraction of non-native pests to the affected or adjacent aquatic or terrestrial habitats; 5) Project construction-related materials should not be stockpiled in, or in close proximity to aquatic habitats and should be protected from erosion (e.g., filter fabric) to prevent materials from being carried into waters by wind or rain; 6) Fueling of project-related vehicles and equipment should take place away from the aquatic environment and a contingency plan to control petroleum products should be developed and stored on site. Absorbent pads and contaminant booms should be stored on site to facilitate clean-up of accidental petroleum releases; and 7) All deliberately exposed soil or under-layer materials used in the project near water should be protected from erosion and stabilized as soon as possible with geotextile, filter fabric, or native or non-invasive vegetation matting or hydroseeding (US Fish and Wildlife Service, 2022).

4.9 AVIAN AND REPTILIAN RESOURCES

Existing Conditions

Haley & Aldrich conducted a terrestrial biological survey in September 2023 of the project area in support of a biological evaluation (BE) of the project (Appendix D). The majority of birds observed during the survey were non-native, introduced species. Twelve non-native birds were observed or

heard during the survey. The most prevalent birds seen were Warbling White-eyes (*Zosterops japonicus*) and bulbul (*Psittacula krameri*). Cattle Egret (*Bubulcus ibis*), Common Myna (*Acridotheres tristis*), Red-Crested Cardinal (*Paroaria coronata*), and Saffron Finch (*Sicalis flaveola*) were observed infrequently.

Two Mallard x Hawaiian Duck hybrids were observed in the auwai west of Kamehameha Highway. Pure Hawaiian Ducks (*Anas wyvilliana*) are not known to exist on Oahu as they have hybridized with feral Mallards (*Anas platyrhynchos*). The only non-hybrid and endangered Koloa maoli are known to occur and breed on Kauai (Fowler, 2009) and (Uyehara, 2007). The indigenous migratory kolea or Pacific Golden Plover (*Pluvialis fulva*) were commonly observed in the grassy lawn areas of Waiahole Beach Park.

The BE report includes a review of the Endangered Species Act (ESA-listed species and critical habitats) from the United States Fish and Wildlife Service (USFWS)'s Information for Planning and Consultation (US Fish and Wildlife Service, 2023) site. Listed avian species that IPaC reports may occur in or near the project area are Hawaiian seabirds including the endangered Hawaii distinct population segment (DPS) of the Band-rumped Storm-Petrel (*Oceanodroma castro)*, Newell's Shearwater (*Puffinus newelli*), Hawaiian Petrel (*Pterodroma sandwichensis*), and Short-tailed Albatross (*Phoebastria (=Diomedea) albatrus*) and Hawaiian waterbirds, including the Hawaiian coot (*Fulica americana alai*), Hawaiian Gallinule (*Gallinula galeata sandvicensis*), Hawaiian Stilt (*Himantopus mexicanus knudseni*), and Hawaiian Duck (*Anas wyvilliana*). No critical habitat for these listed species occurs in the project area.

The Hawaii DPS of the green sea turtle (*Chelonia mydas)* is listed as threatened. On Oahu, green sea turtles have been observed foraging in Kaneohe Bay, into which Waiahole Stream outlets 1,500 ft downstream of the project site. Nesting by this species has been documented on the east side of Oahu, on the military installations of both Marine Corps Base Hawaii, Kaneohe and Bellows Air Force Station, Bellows Field Beach Park. Female green sea turtles begin to mate in March and lay eggs on sandy beaches between April and September.

The Hawaiian Short-Eared Owl (*Asio flammeus sandwichensis*), also known as the pueo, has the potential to occur within or traverse through the project area. Pueo is an endemic subspecies of the short-eared owl and is State listed as Endangered on Oahu. The pueo occupy a variety of habitats from sea level to 8,000 ft. Unlike other owl species, pueo are active during the day and are seen hovering or soaring over open areas, searching for small mammals. Pueo are most active at dawn and dusk twilights. Pueo nest on the ground, so their eggs and young are vulnerable to predation by rats, cats, and the small Indian mongoose; however, they are unlikely to occur or nest in the action area as there is frequent human presence and disturbance along the roadway.

According to the BE report (Appendix D), listed waterbirds and seabirds do not appear to use the Waiahole Stream nor the surrounding area regularly. Suitable foraging areas along Waiahole Stream and following ephemeral ponding in wetland areas may occur in the project area, but the project area crosses Kamehameha Highway, which has heavy vehicular traffic. Anthropogenic use of the project area also disturbs the area and makes it less likely for listed species to be present. Migratory waterbirds may be occasionally found along the mouth of the Waiahole Stream and

along the shoreline in small numbers, but the pedestrian and vehicular disturbance likely deter long-term stays. The assessment report concludes that the proposed project is not likely to adversely affect Hawaiian waterbirds or seabirds.

On November 30th, 2023, the Hawaii Department of Transportation received pre-consultation comments from PIFWO on the preparation for this environmental assessment. Initial consultation indicated that federally listed Hawaiian seabirds and waterbirds named above may occur or transit through the vicinity of the proposed project area. The PIFWO lists measures to minimize potential project impacts to Hawaiian seabirds and Hawaiian waterbirds, which are described below and also in the BE prepared for the project.

The State of Hawaii Department of Forestry and Wildlife (DOFAW) provided pre-consultation comments on December 1, 2023. DOFAW indicated that endangered Hawaiian waterbirds and seabirds also have the potential to traverse the project area. DOFAW states that permanent lighting would pose a very high risk of seabird attraction on the proposed stretch or road. Endangered water birds include the Hawaiian duck, Hawaiian stilt, Hawaiian coot, and Hawaiian moorhen. Endangered seabirds include the Hawaiian Petrel, Newell's Shearwater, and the Band-rumped Storm-Petrel.

Informal pre-consultation with the State of Hawaii Department of Forestry and Wildlife (DOFAW) in 2017 indicated that the state endangered Hawaiian short-eared owl (*Asio flammeus sandwichensis*), also known as the Pueo, has the potential to occur within or traverse through the project area.

Potential Impacts and Mitigation Measures

Construction activities may create disturbance, such as noise, air pollutants, and vegetation removal, that could affect Hawaiian waterbird foraging areas. Construction activities may also result in creating standing water which could attract the Hawaiian stilt or other waterbirds to the project area to nest. Nocturnal Hawaiian seabirds may transit portions of the project area or nearshore waters where they could be exposed to artificial nighttime light sources.

To ensure that threatened and endangered species are not likely to be adversely affected by the proposed action, the following mitigation measures summarized from the BE report (Appendix D) and recommended by the USFWS's Avoidance, Minimization, and Conservation Measures (US Fish and Wildlife Service, 2023) should be implemented.

Hawaiian waterbirds

To avoid and minimize impact to waterbirds, applicable best management practices regarding work in and around aquatic environments should be incorporated into the project design (see Section 4.8). In areas where waterbirds are known to be present, post and implement reduced speed limits and inform project personnel and contractors about the presence of endangered species on-site. A nest survey should be conducted prior to project initiation and repeated within 3 days of project initiation and after any subsequent delay of work of 3 days or more, during which birds may attempt to nest. If a nest or active brood is found, PIFWO will be contacted within 48 hours for further guidance and a 100-foot buffer will be established and maintained around all active

nests and broods until the chicks or ducklings have fledged. A biological monitor should be present on the project site during all construction or earth moving activities until the chicks/ducklings fledge.

Hawaiian seabirds
Hawaiian seabirds may traverse the project area at night during the breeding, nesting, and fledging seasons (March 1 through December 15). Seabird fallout primarily occurs during the fledging season (September 15 through December 15) as chicks will fledge from their nests and use the moonlight to guide them to the ocean. Artificial lights, including those used during nighttime construction, can disorient seabirds and cause them to fall to the ground from exhaustion. While grounded, the birds are at increased risk of being attacked by predators, hit by automobiles, or starvation. To mitigate against seabird fallout, nighttime construction should be avoided. However, if nighttime work must be conducted, nighttime construction will be avoided during the seabird fledgling period between September 15 through December 15 and outdoor lights will be fully shielded so that the bulb can only be seen from below bulb height. With the exception of street lighting, automatic motion sensor switches and controls will be used on outdoor lights or lights will be turned off when activity is not occurring in the project area. For adherence to highway safety requirements, the project will require new lighting. However, the highway lighting incorporated in the design will retain comparable lighting to existing conditions and will adhere to modern design standards to mitigate adverse impacts to Hawaiian seabirds. Post-construction streetlighting will meet State laws for shielding and brightness.

Hawaiian Short-Eared Owl
Although pueo are not likely nest in the project area due to frequent human presence and disturbance along the highway, DOFAW recommends that a qualified biologist conduct transect surveys of the disturbance areas during dawn or dusk hours to detect any active pueo nests before any disturbing activity such as vegetation clearing and ground-based disturbance. If a pueo nest is discovered, notify DOFAW staff, minimize time spent at the nest, and establish a minimum buffer distance of 100 meters from the nest until chicks are capable of flight. DOFAW recommends removing and excluding non-native mammals such as mongoose, cats, dogs, and ungulates from the nesting area and minimizing habitat alterations and disturbance during pueo breeding season.

Green Sea Turtle
Green sea turtle onshore basking areas and federally proposed critical habitat occurs 1.5 miles to the north of the proposed project on Secret Island and are not likely to be affected by the project. Disturbance from construction activities (e.g., human disturbance, noise, air pollutants) will occur and there may be the potential for water quality impacts (siltation) from the project. Pollutants could enter sea turtle foraging areas in Kaneohe Bay (about 1,500 ft from the existing bridge). To prevent impacts to green sea turtles, applicable water quality BMPs and erosion control methods (see Section 4.8) to prevent siltation in the stream will be implemented.

Artificial light can affect female sea turtle nesting and sea turtle hatchlings. Sea turtle hatchlings instinctively crawl to the ocean after emerging from their nest, following natural light from the stars and the moon. However, hatchlings can be disoriented if they see artificial light sources, causing them to crawl inland towards those lights. Similar to hatchlings, adult female sea turtles

that come ashore at night to nest are also affected by artificial nighttime light sources. Artificial lights can cause females to abandon a nesting effort, resulting in a false crawl or a nesting attempt where the female fails to deposit eggs (Witherington, 1992) (Witherington, B.E. and Martin, R.E., 2000) or causing the turtle to return to water and inadvertently shed her eggs at sea. To prevent impacts to nesting females or hatchlings, construction will only be conducted during the day and bright night-time construction signage will not be used. For adherence to highway safety requirements, the project will require new lighting. However, the highway lighting incorporated in the design will retain comparable lighting to existing conditions and will adhere to modern design standards to mitigate adverse impacts to sea turtle nesting.

4.10 MAMMALIAN RESOURCES

Existing Conditions

Haley & Aldrich conducted a terrestrial biological survey in September 2023 of the project area in support of a biological evaluation (BE) of the project (Appendix D). No sensitive or endangered mammalian species were identified during the survey. Signs of feral pigs (*Sus scrofa)* and several small Indian mongoose (*Herpestes javanicus)* were observed, and dogs were heard barking in the general area. Other non-native pests such as the European house mouse (*Mus musculus domesticus*), roof rat (*Rattus r. rattus*), brown rat (*Rattus norvegicus*), Polynesian rats (*Rattus exulans hawaiiensis*), and/or feral house cats (*Felis catus*) likely use various resources found within the APE.

Consultation with IPaC and pre-consultation response from the PIFWO in November 2023 revealed that the Hawaiian hoary bat (*Lasiurus cinereus semotus*), also known as the Opeapea, possibly occupies or travels through the area. The Hawaiian hoary bat roosts in exotic and native woody vegetation. They can be found in trees or shrubs 15 feet high or taller and will forage for insects from three to 500 feet above the ground. While various foraging and roosting habitats in buildings, agricultural fields, open expanses of grasslands, and wetland habitats exist in the project area, this region of Oahu does not appear to be a significant foraging or roosting area for Hawaiian hoary bats. Threats to the Hawaiian hoary bat include clearing vegetation where the bats may roost or entanglement in barbed wire fencing.

Hawaiian monk seals could forage within the action area just off Waiahole Beach Park. However, Hawaiian monk seal presence in the action area is expected to be rare because the nearest terrestrial critical habitat, where resting, avoiding predators, molting (shedding), pupping (give birth), and nursing occurs, is over 12 miles away.

Potential Impacts and Mitigation Measures

Several mature trees will need to be cut or removed to replace Waiahole Bridge, and construction activities will generate noise and disturbance which may affect Hawaiian hoary bats. If woody trees or shrubs 15 feet or taller are cleared when bats are pupping between June 1 through September 15, there is a risk that adults may abandon their young or that young bats could inadvertently be harmed or killed. Therefore, woody plants, trees, and shrubs greater than 15 feet tall will not be removed or otherwise disturbed during pup rearing season (June 1 through September 15).

In addition, the project will not use barbed wire fencing at any time during the execution of construction and post construction activities to prevent entanglement of the hoary bat in barbed wire fencing while foraging.

During construction of the bridge human interactions could occur from noise created in the staging area of Waiahole Beach Park. To minimize and avoid potential project impacts to listed Hawaiian monk seal a staging area of 50 feet back from the edge of the shoreline will be established.

5.0 DESCRIPTION OF EXISTING HUMAN ENVIRONMENT, POTENTIAL IMPACTS, AND MITIGATION MEASURES

This section describes the existing conditions of the human environment, potential impacts of the proposed project and mitigation measures proposed to minimize any impacts.

5.1 ARCHAEOLOGICAL AND HISTORIC RESOURCES

Existing Conditions

The Waiahole Bridge was designed by R.O Mowry and constructed in 1922. The bridge is a two-span reinforced concrete tee beam superstructure with a concrete abutment wall and multi-column bent structure underlying a reinforced concrete deck with AC overlay. When first constructed there were no shoulders to allow room for pedestrian crossings. A wooden pedestrian walkway was added to the mauka side of the bridge in 1968. (ASM & Associates, 2018).

In 1997, HDOT proposed the Waiahole Bridge Replacement project. The project included the replacement of the Waiahole Bridge with a longer and wider bridge to accommodate windward population growth. The project included construction of a temporary bypass road/culvert to be used during the installation of the new replacement bridge.

In a letter dated August 14, 1998 (Log No. 22063, Doc No. 9808co09), SHPD's Administrator, Deputy Historic Preservation Officer, and Secretary of Interior's Professional Qualified Architectural Historian, Don Hibbard, concurred that the replacement project should have no effect on any known historic resources as the bridge was not cited as being historically significant per the State of Hawaii Historic Bridge Inventory and Evaluation (1996).

In early 2001, a draft environmental assessment was submitted to the Department of Land and Natural Resources Chairperson, Gilbert Coloma-Aragan. It was received by SHPD on April 2, 2001. In response to the proposed bridge removal and bypass road, SHPD in a letter dated May 18, 2001 (Log No. 27494, Doc No. 0105EJ14), indicated again that the Waiahole Bridge was "not significant." SHPD also stated that the impacts from historical agricultural activities, and activities associated with the construction of Kamehameha Highway and Waiahole Bridge suggests that intact cultural deposits are unlikely to remain.

Archaeological investigations in the area of the bridge replacement project have previously identified features in the area of the realigned highway (O'Leary, 2005). An updated Archaeological Inventory Survey (AIS) was conducted in 2023/2024 by ASM affiliates to investigate those areas within the Area of Potential Effect that were unsurveyed in the past. The draft AIS can be found in Appendix E). Fieldwork for the archaeological survey consisted of an intensive pedestrian survey and three shovel pit test to determine if there were subsurface cultural layers or materials within the project area. Due to the presence of dense cane grass fields, several areas were not surveyed.

No subsurface cultural deposits or native soil deposits were encountered during ASM's subsurface testing. Deeper subsurface excavations were not conducted due to heavy rain and saturated soil deposits, however, information in the 2005 archaeological inventory survey and field investigations in 2023 yielded the following information.

The 2005 archaeological study identified the former pond field, State Inventory of Historic Properties (SIHP) Site 50-80-10-6758, as having three features: Feature A consisted of a subsurface agricultural deposit, Feature B an earthen berm, and Feature C an auwai. During the 2023 fieldwork, Features B and C were reidentified. As a result of subsurface testing the 2005 archaeological study identified Feature A as an old agricultural surface used for kalo cultivation, however Feature A was not observed in 2023, likely due to site conditions at the time of the field work.

Feature B, runs roughly parallel to Kamehameha Highway and is made up of earth with basalt cobbles along its upper surface. Historic photos suggest that the berm was used to separating two loi. The 2005 AIS recorded the earthen berm to be 66 meters in length, However the current survey recorded it as roughly 86 meters long.

Feature C consists of remnants of an auwai originating from a culvert that runs underneath Kamehameha Highway and extending eastward for 120 meters. During current fieldwork, the auwai was overgrown with cane grass and dense vegetation. No water flowed through the auwai at the time of the survey, but the presence of modern PVC pipes suggests that the ditch was used to irrigate former agricultural fields and loi through the 1970s.

In addition, the 2023 field work documented in the AIS in Appendix E identified four previously undocumented features associated with SIHP # -6758. The undocumented features consisted of two auwai, an earthen berm, and three culverts. Two undocumented archaeological sites including Waiahole bridge and a concrete foundation were identified as well.

Feature D is a newly identified auwai associated with SIHP # -6758. The auwai is 34 meters long located in the southern portion of the project area between Kamehameha Highway and Feature B. Aerial photos suggest that Feature D was built prior to 1928 and was likely used to irrigate the loi within the vicinity.

Feature E, F, and G are newly identified culverts within the project area, their construction is likely associated with the construction of the road. Located on the mauka side of the Highway, Features E and F are located in the southern portion of the project area and Feature G, also on the mauka side of the highway is located at the intersection with Waiahole Valley Road.

Potential Impacts and Mitigation Measures

The agricultural deposit and auwai are situated within portions of the area slated for ground-disturbing activity, while the historic culverts are within the project area but outside of the area slated for ground-disturbance. It is recommended in the AIS that a preservation plan pursuant to HAR §13-275-8(1)(A) be conducted for SIHP # -6758 which includes rehabilitation and appropriate cultural use. Additionally, it is further recommended in the AIS that on-site

archaeological monitoring for identification purposes all ground disturbing activities be conducted pursuant to HAR §13-279-3.

While no burial sites have been listed in the immediate project area, there exists the possibility of uncovering habitation or human remains during the demolition and construction process, including previously undocmented extents of the subsurface agricultural deposit of SIHP # -6758. In the event that any remains are found during construction, all work will cease and the State Historic Preservation Division will be notified for further action.

The DOT has initiated the state and federally-required historic review processes required by HRS 6E-8 and Section 106 of the National Historic Preservation Act. Compliance with HRS 6E-8 and Section 106 of the National Historic Preservation Act will be maintained.

During the Draft EA 2023 pre-assessment consultation period, DAGS-Archives Division provided the following comments:

Please be sure to photo document the historic bridge in site and forward those images to the Archives for preservation. Historic bridges are a popular photographic theme, and we would want to ensure that bridge in memory.

See Appendix A-2 for the pre-assessment consultation comment letters and responses for more detail on each of the comments presented by DAGS-Archives Division.

5.2 CULTURAL RESOURCES

Existing Conditions

A Cultural Impact Assessment (CIA) was prepared by ASM & Affiliates in 2018 in preparation for a previous Environmental Assessment (Project No. BR-083-1[37]) to evaluate traditional and customary practices and resources in the project area and the potential for impacts to these cultural resources. The 2018 CIA is attached as Appendix F and includes archival research as well as communication with individuals and community members with knowledge of the project area and its cultural resources.

The name Waiahole was derived from *wai* (water) and *ahole (*referring to the Kuhlia malo fish) and was a center for hard taro cultivation during pre-contact, native Hawaiian settlement on Oahu (ibid). The entire district of Koolaupoko, during the pre-contact era, contained fishponds along Kaneohe Bay and expansive wetland taro loi. Loi were watered by a network of auwai that connected the farms to the streams. Taro cultivation decreased along with the steady decline in the native population during colonial settlement. The Great Mahele of 1848 further changed the land use by dividing the land between the king, chiefs, government and the people through Land Commission Awards (LCAs). There are approximately 8 LCA located partially or fully within the study area and an additional 11that fall within close proximity to the study area but were deemed to be outside of the project boundaries.

In the 1870s, population increased, presumably associated with the influx in Chinese immigrants working in rice cultivation (ibid). By 1961 diversified agriculture, grazing, residential use, and undeveloped forestland were the major land uses in the district. Today taro cultivation continues to be an important cultural component to the area and the Waiahole Poi Factory survives as a tourist destination as well as an important community resource to perpetuate traditional Hawaiian taro cultivation and poi production.

Potential Impacts and Mitigation Measures
As discussed in Section 5.1, several features of SIHP Site # 50-80-10-6758, including a subsurface agricultural layer and portions of two auwai cross into the study area near Kamehameha Highway south of the Waiahole Stream. These were historically fed by culverts, which are still extant within the project area, and which drew water from an irrigation canal still present mauka of the highway. These are situated within portions of the area slated for ground-disturbing activity and, thus, it is suggested that mitigation in the form of a preservation plan is appropriate mitigation and should include restoration.

The Waiahole Poi Factory was also identified as an important cultural resource to the community. It is located outside of the APE and will not be directly impacted by the project. There could be, however, secondary or indirect impacts to the establishment. Mitigation measures suggested include endeavoring to enhance access to the Waiahole Poi Factory by providing parking and pedestrian access that does not encroach on highway right-of-way and ensures public safety.

5.3 NOISE

Existing Conditions
The predominant sources of noise in the vicinity of the site stem from automobile traffic on Kamehameha Highway. Other sources of noise are from nearby intersections and the daily operations of the adjacent Waiahole Poi Factory.

Potential Impacts and Mitigation Measures
During project construction, there will be temporary noise impacts associated with the construction equipment required to replace the bridge, realign the highway and demolish the existing bridge. The construction must adhere to the requirements of the Community Noise Control rules and there is a potential for the need of permits or variances.

Construction noise has the potential to affect Hawaiian monk seal and Hawaiian waterbird foraging. This noise disturbance could come from the staging area in Waiahole Beach Park due to the proximity to the shoreline and Wetland A which has ephemeral ponding (See Section 4.6 and Appendix C for more information on wetlands in the project area). The bridge bypass road will also temporarily impact Wetland A and bring vehicle traffic closer to Wetland A. However, even though suitable habitat for these species exists in the action area, their occurrence is expected to be rare because ponding in Wetland A is temporary and the nearest terrestrial critical habitat for Hawaiian monk seals, where resting, avoiding predators, molting (shedding), pupping (give birth), and nursing occurs, is over 12 miles away. In addition, the mitigation measures from Section 4.9

and 4.10 will be in place to minimize noise effects. For these reasons, the noise effects to Hawaiian monk seal and Hawaiian waterbirds are discountable.

During the 2023 Draft EA pre-assessment consultation period, the DOH –Noise Section Branch provided the following comments:

Please ensure compliance with Chapter 11-46 HAR Community Noise Control. Submit all applicable permit/variance documents to allow sufficient review time.

See Appendix A-2 for the pre-assessment consultation comment letters and responses for more detail on each of the comments presented by DOH-Noise Section Branch.

To mitigate construction noise levels, the State Department of Transportation will work with the contractor to ensure adherence with State Department of Health (DOH) regulations, use of proper equipment and regular vehicle maintenance. Equipment mufflers or other noise attenuating equipment may also be employed as required. All construction activities will be limited to daylight work hours. It is expected that after the proposed construction is complete, ongoing noise generating activities will be similar to existing conditions.

5.4 AIR QUALITY

Existing Conditions
Due to relatively undeveloped nature of the surrounding vicinity of the project, air quality is excellent. Pollutants that exist will be attributable to automobile traffic on Kamehameha Highway. Emissions from such sources are intermittent and are quickly dispersed by prevailing winds.

Potential Impacts and Mitigation Measures
The bridge replacement will not negatively impact air quality in the area. Emissions derived from operation of construction equipment and other vehicles involved in construction activities may temporarily affect the ambient air quality in the immediate vicinity. However, these effects will be minimized through proper maintenance of construction equipment and vehicles. In addition, there may be a temporary adverse impact on air quality attributable to dust generated during project construction, particularly earthmoving activity. Best management practices for construction will be employed to minimize fugitive dust.

5.5 VISUAL RESOURCES

Existing Conditions
At the location of the bridge, land is relatively low-lying, tucked between an undeveloped park on the makai side, and the (non-native) forested banks of the Waiahole Stream on the mauka side. At the bridge itself, vegetation obscures views of the stream and the ocean and the Waiahole Poi Factory features prominently. See site photos,

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Figure 3. Along Kamehameha Highway, utility poles line the right of way transmitting overhead lines, and commercial nurseries are situated on the mauka side of the road, but the mountains and the ocean are within view of the driving public.

Potential Impacts and Mitigation Measures
It is expected that some vegetation removal will be required to replace Waiahole Bridge. However, vegetation removal will be limited to what is immediately necessary to accomplish construction and afford safe operation of the new bridge. Due to the overgrown nature of the shrubs and trees immediately mauka and makai of the bridge, the overhead components of the steel structure are not expected to interrupt views. With exception of realignment of utility poles, the highway realignment will not involve any new overhead structures. Thus, views mauka and makai from the highway will remain unobstructed. Upon construction, disturbed earth will be replanted for erosion control. Replacement of vegetation in these areas will serve to return the project site to pre-construction condition.

5.6 SOCIO-ECONOMIC CHARACTERISTICS

5.6.1 Community Character

Existing Conditions
The project site is located in the ahupuaa of Waiahole on the Island of Oahu. Waiahole is also the name of the nearby community, located within the Waikane Census Designated Place (CDP).

Population data is available for the year 2020 from the U.S. Census American Community Survey as shown in the following table. The population in the Waikane CDP is older than the Oahu population as a whole. Racial composition in the Waikane CDP differs from that of the rest of the County and State in that representation of Native Hawaiian and Other Pacific Islander is greater among persons in Waikane as are people who identify as two or more races, while Asian-alone representation is much lower. Rates of poverty are lower in the Waikane CDP than the County or State averages, and reflecting the rural environment, people commute by transit, walking, or bicycling at a lower rate than elsewhere in the County (note, all data is 2020 census, which could have greater margins of error due to the COVID-19 global pandemic) . See Tables 3-5, below.

Table 4: Census 2020 Population Data

Characteristic	Waikane CDP*	City & County of Honolulu*	State of Hawaii*
Total population	576	979,682	1,402,074
Median age in years	46	38.2	39.4
% of population under 18	16.8%	21.1%	21.3%
% of population 65 years and over	29.50%	17.8%	18.4%
% of population that identifies as one race	63.2%	76.7%	75.7%
White alone	22.9%	20.2%	24.1%
Black or African American alone	0.0%	2.5%	1.9%
Am. Indian & Alaska Native alone	0.0%	.2%	.2%
Asian alone	23.1%	42.6%	37.6%
Native Hawaiian & Other Pacific Islander	16.3%	10.0%	10.4%
Some other Race	.9%	1.2%	1.4%
Two or more races	36.8%	23.3%	24.3%
Total Housing Units	238	352,788	546,571
Occupied Housing Units	217	316,928	467,932
Vacant Housing Units	21	35,860	78,639

*Percentages may not add up to 100% due to rounding.

Table 5: Census 2020 Poverty Data

Poverty Status	Waikane CDP	City & County of Honolulu
Families	.9%	5.5%
Individuals	3.3%	7.8%

Table 6: Census 2020 Commuting Data

Commuting to Work	Waikane CDP*	City & County of Honolulu*
Car, truck or van – drove alone	64.4%	65.2%
Car, truck or van – carpooled	17%	13.4%
Public transportation	4.3%	7.1%
Walked, other means	2.0%	5.6%
Worked at home	5.5%	5.1%

*Percentages may not add up to 100% due to rounding.

Potential Impacts and Mitigation Measures
The bridge replacement is not expected to alter the demographic characteristics of the Waikane Census Designated Place or the greater City & County of Honolulu. Beneficial impact may be realized by those who can more safely walk, bicycle, or access transit due to the project's improvements. No mitigation measures are proposed.

5.6.2 Economy

Existing Conditions
The visitor industry continues to be the driving force of the City & County economy. While the Oahu General Plan highlights the need to diversify the economy, it also recognizes that existing facilities require regular maintenance and upgrades (City and County of Honolulu, 2021).

Potential Impacts and Mitigation Measures
The bridge replacement is not expected to impact the local economy in a negative manner. All options for the bridge replacement involve maintaining operation of two lanes of traffic. The construction itself will stimulate purchase of materials (generating excise tax revenues) and employment for labor (generating income tax revenues).

The project site is located on lands designated by the state as Agricultural. Public roadways are permissible uses in the agricultural districts (HRS 205-4.5). The majority of the project will occur within City & County right-of-way. Some project alternatives consider bridge approaches that encroach into adjacent parcels, outside the highway right-of-way, however, the topography of the adjacent properties is such that the areas are not currently used for agricultural purposes, nor would they be expected to be used for agricultural purposes. If an alternative is selected that involves an encroachment into any adjacent parcels that are not within the right-of-way will require agreements from the appropriate landowners.

5.7 INFRASTRUCTURE

5.7.1 Roadways and Traffic

Existing Conditions
Waiahole Bridge is located on Kamehameha Highway (State Highway 83), near Waiahole Valley Road and the community of Waikane. Kamehameha Highway is the principal route between the North Shore communities of Kualoa, Punaluu and Laie and Kaneohe to the south, which contains a dense residential community and military base. In the project vicinity, the roadway consists of two vehicle travel lanes and bus stops just north of the bridge. The Waiahole Bridge is a concrete structure with a 27-foot-wide deck. The width of the bridge does not allow for striped shoulders. Bridge guardrails are concrete. Guardrails at the approaches to the bridge in both directions are metal. The bridge spans Waiahole Stream and is supported by abutments that are located well upslope of the Ordinary High Water Mark (OHWM).

Potential Impacts and Mitigation Measures

The purpose of the project is to replace the Waiahole Bridge in order to bring the bridge into compliance with AASHTO HL-93 safety standards and to provide a safer travel corridor fronting the Waiahole Poi Factory and Waiahole Valley Road intersection.

During the 2023 Draft EA pre-assessment consultation period, DTS provided the following comments:

- *Transportation Impacts. Discuss short term impacts of City and County of Honolulu roadways in DEA.*
- *Bicycle Improvements. Kamehameha Highway fronting the project site is classified as an "Avenue" planned to have sidewalks, a shoulder bikeway, two travel lanes, bus service mixed with general purpose travel, and no on-street parking. The typical future street cross section will resemble in concept the second design on Page 76 of the City's Complete Streets Design Manual. A priority 1 Shoulder Bikeway proposed project (Project ID 1-38 in the 2019 Oahu Bike Plan) is located on Kamehameha Highway crossing the project site. The replacement bridge shall be designed to accommodate the proposed shoulder bikeway and minimize the number and size of potential conflict areas between bicyclists, pedestrians, and vehicles.*
- *Bus Stops. The project site is in the immediate vicinity of bus stops. Please coordinate roadway improvements with Department of Transportation Services (DTS)-Transportation Mobility Division (TMD). Contact DTS-TMD at TheBusStop@honolulu.gov.*
- *Neighborhood Impacts. The area representatives, neighborhood board, as well as the area guests, businesses, emergency personnel (fire, ambulance, and police), Oahu Transit Services, Inc. (TheBus and TheHandi-Van), etc., should be kept apprised of the details and status throughout the project and the impacts that the project may have on the adjoining local street area network.*
- *Disability and Communication Access Board (DCAB). Project plans (vehicular and pedestrian circulation, sidewalks, parking and pedestrian pathways, vehicular ingress/egress, etc.) should be reviewed and approved by DCAB to ensure full compliance with Americans with Disabilities Act requirements.*

The Honolulu Police Department (HPD) 2017 pre-consultation comments requested the following:

- Evaluate the outcome of the traffic flow affected by the re routed highway and bridge replacement.
- Provide traffic mitigation plan to implement traffic controls and management
- Obtain all necessary street usage permits from Department of Transportation Services for parking and transportation of construction equipment.

Updated pre-consultation comments in 2023 from HPD indicate concern for safety signage during project construction and advised the DOT to keep the community informed of the project.

During construction, there may be occasional and temporary delays to traffic during the transport of equipment and materials. However, all options considered for the replacement of the bridge involve maintaining two operational lanes to accommodate traffic in both directions. In order to

mitigate against the expected traffic interruptions, the State of Hawaii Department of Transportation will notify the Waiahole Elementary School Principal regarding project activities and have begun working with the Oahu Transit Services to temporarily relocate the City bus stops. Traffic controls and best management practices will also be employed to ease traffic disruptions.

The proposed bridge will be approximately 55-feet in width to accommodate two 11-foot vehicle lanes, approximately 6.5-foot wide shoulders to accommodate bicyclists, a 5-foot wide separated pedestrian walkway, barriers and structural bracing elements. The approximately 1,000 feet of realigned highway will include two 11-foot vehicle travel lanes, 5-foot wide shoulders for pedestrian/bike each direction, with a total highway width of 32-feet. The realigned highway may also include bus stop pull outs in both directions, pending on final coordination between DTS and HDOT.

During the 2023 Draft EA pre-assessment consultation period, DDC provided the following comments:

DDC has a future project to repave a portion of Kamehameha Highway within the City's jurisdiction. The project called Rehabilitation of Streets, Unit 73C, will repave Kamehameha Highway from approximately North of Heeia Stream to Kahekili Highway. The project includes asphalt pavement resurfacing, shoreline protection measures, erosion protection measures, guardrail work and a proposed realignment of an approximately 3,000 linear foot section of Kamehameha Hwy inland in the location of the currently undeveloped Heeia Kea Valley Nature Park.

See Appendix A-2 for the pre-assessment consultation comment letters and responses for more detail on each of the comments presented by DTS, DDC, and HPD.

5.7.2 Water

Existing Conditions
The Board of Water Supply (BWS) provides the public water supply to residents of Oahu including the surrounding residential and agricultural communities in Waikane. Project pre-consultation with the Board of Water Supply in 2017 and 2023 confirms that currently there is an 8-inch pipeline mounted on the bridge and a buried 30-inch main in close proximity to the bridge. Water services are required to remain in service throughout the duration of the project.

Potential Impacts and Mitigation Measures
The BWS provided pre-consultation comments in 2017 and again in 2023. The 2017 comments included specific instructions to protect their water mains during construction and use of a temporary bypass road (the preferred alternative at the time). The 2023 comments direct the DOT to submit plans to BWS for review and approval.

DOT will submit construction plans to the Board of Water Supply, as requested, to ensure there are no interruption to the regular operation of water services during the implementation of the project. Coordination with the BWS Capital Projects Division has begun.

See Appendix A-1 and A-2 for the pre-assessment consultation comment letters and responses for more detail on each of the comments presented by BWS.

5.7.3 Wastewater

Existing Conditions
The Department of Environmental Services administers and operates the City's wastewater treatment facilities program. However, there are no wastewater facilities or public sewer lines in the project area.

Potential Impacts and Mitigation Measures
The considered alternatives will have no impacts on the public wastewater system, as there are no facilities in the project area.

5.7.4 Drainage

Existing Conditions
North of Waiahole Bridge, on Waiahole Valley Road, a grate drain inlet collects stormwater from TMK: (4) 2-7-007:001. No apparent stormwater infrastructure is located on or near the project site. There are several culvert crossings under the existing Kamehameha Highway, some of which are extensions of auwai.

Potential Impacts and Mitigation Measures
Drainage will not be significantly impacted on a long-term basis, but could experience temporary construction related impacts. During the construction period, culvert pipes located in the realigned highway will be lengthened to continue drainage flow mauka to makai. The realigned highway surface will be naturally drained, similar to the existing flow pattern. In order to avoid any impacts to Waiahole Stream from sedimentation and pollutants during construction, best management practices for stormwater management will be employed utilizing DOT's best management practices manual (PC-BMP-Manual_220718-FULL.pdf (stormwaterhawaii.com)).

5.7.5 Electrical and Communication Systems

Existing Conditions
Electric utility service for the island is provided by the Hawaiian Electric Company (HECO). Hawaiian Telcom (HTCO) and Chater Communications, previously known as Oceanic Time Warner Cable) are the two providers of telephone and internet services for the island. HTCO's facilities along Kamehameha Highway include overhead cables installed on the joint utility poles located on the makai side of the highway. The overhead service cables include a service drop to a residence located adjacent to the bridge. An underground cable is also attached to the bridge. This cable has not been identified as HECO, HTCO, or Charter Communications. It may be the Army Corps Joint Trunk Cable; further investigation is required.

Potential Impacts and Mitigation Measures
The new bridge will require overhead and underground utility lines on the makai side of the highway be relocated. Some will be permanently relocated further makai to follow the new roadway alignment and others will be relocated to the mauka side of the roadway to maintain services to the properties on the mauka side of the road. Currently, the utility wires are too low and do not allow adequate vertical clearance for trucks to safely pass beneath without hitting the lines. The relocation may include electric, telephone and cable television service outages in the immediate vicinity of the bridge.

In addition to the utility relocation, reconfiguration of the street light fixtures will follow the realignment of the utility poles. Lighting for the bridge will be provided by utility pole mounted light fixtures located just off each end of the bridge while the rest of the affect roadway will be illuminated from fixture mounted to utility poles on the makai side of the roadway.

Further investigation is required to identify the underground cable that is attached to the bottom of the bridge.

5.7.6 Solid Waste Disposal

Existing Conditions
Solid Waste is managed by the City & County of Honolulu - Public Works Department through the Honolulu Program of Waste Energy Recovery (H-POWER), a waste-to-energy plant located in Kapolei. The plant handles up to 3,000 tons of solid waste per day, and produces about 8% of the energy need of Oahu.

Potential Impacts and Mitigation Measures
The proposed bridge replacement will have no impact on solid waste disposal operations. All bridge replacement alternatives will maintain travel in both directions.

Pre-Consultation comments from the State Department of Health, Solid and Hazardous Waste Branch note the regulations for hazardous waste and used oil are in chapters 11-260.1 to 11-279.1 of the Hawaii Administrative Rules. The comments further note that the Solid Waste Section enforces laws and regulations contained in chapters 342H and 3421, HRS and chapter 11-58.1, HAR, relating to solid waste management control. During demolition of the old concrete bridge and construction of the new steel bridge, the project will maintain compliance with State laws and rules pertaining to hazardous waste and construction debris management and disposal.

See Appendix A-2 for the pre-assessment consultation comment letters and responses for more detail on each of the comments presented by DOH-Solid and Hazardous Waste Branch.

5.8 PUBLIC SERVICES

5.8.1 Police & Fire Protection

Existing Conditions

The Honolulu Police Department (HPD) handles the policing of the project area and of the Island of Oahu at large. The project is located approximately 6.5 miles from the Kaneohe HPD Substation. The Honolulu Fire Department (HFD) similarly handles fire service, with the nearest fire station being Kahaluu Fire Station approximately 2.1 miles away. Per pre-consultation suggestions from the Honolulu Fire Department in 2023, National Fire Protection Association 1, Uniform Fire Code, 2012 conditions must be met as it relates to any and all access roads. The Waiahole Bridge design team shall ensure roads have an unobstructed vertical clearance of no less than 17 feet, are designed and maintained to support the loads of fire apparatus, have an all-weather driving surface, have a minimum road width to accommodate a fire apparatus to turn around, and will not exceed a one foot drop in 20 feet.

During the 2023 Draft EA pre-assessment consultation period, HPD provided the following comments:

> *The Honolulu Police Department (HPD) has reviewed the information provided and has some concerns. The HPD recommends that all necessary signs, lights, barricades, and other safety equipment be installed and maintained by the contractor during the project. Furthermore, public notification should be made to affected businesses and/or residents due to alternate access to the area and additional delays for the ingress and egress of construction vehicles, equipment, and deliveries during the construction phase of the project.*

See Appendix A-2 for the pre-assessment consultation comment letters and responses for more detail on each of the comments presented by HPD.

Potential Impacts and Mitigation Measures

The construction of the new bridge is intended to contribute to a safer transportation system, enhancing the ability of policy and fire personnel to respond to emergencies. During construction the existing bridge will be open, allowing for two way vehicular traffic. The Department of Transportation will necessarily coordinate with HPD and HFD during any construction related traffic pattern changes and ensure the new bridge and rerouted Highway conform to HPD design safety standards. Pre-consultation with the Honolulu Police Department requests that the project team evaluate the outcome of the traffic flow affected by the highway realignment and bridge replacement at the project site as well as provide a traffic mitigation plan to implement controls and management for construction vehicles driving to and from the work site.

In addition, the contractor must install and maintain all the necessary safety equipment and lights during the project.

5.8.2 Education

Existing Conditions
Public school education is under the direct supervision of the Hawaii State Department of Education. Oahu public schools are divided into four school districts: Honolulu District, Central District, Leeward District, and Windward District. Each district is further subdivided into two or three complex areas and each complex area contains four to six complexes. The nearest public school to the project is Waiahole Elementary School, on the nearby Waiahole Valley Road, which is within the Windward District, Castle Complex. A total of 4,722 students were enrolled in the Castle Complex public school system in 2015-2016. Higher education on Oahu is provided through a number of Community Colleges including the Honolulu, Kapiolani, Leeward, and West Oahu campuses. The University of Hawaii at Manoa, the flagship 4-year university for the State of Hawaii, is also located on Oahu. The aforementioned two (2) year colleges and four (4) year university offers a variety of post-secondary education opportunities for its students.

Potential Impacts and Mitigation Measures
The project is not expected to affect school capacity or enrollment. Under all alternatives, the highway will remain operational. No impacts are expected, however, as requested by the pre-consultation comments submitted by the Department of Education in 2017, the State of Hawaii Department of Transportation will notify the Waiahole Elementary School Principal of any project actions that may disrupt normal traffic flow and therefore impact students and parents indirectly.

During the 2023 Draft EA pre-assessment consultation period, DOE provided the following comments:

The Department is in strong support of the replacement of the existing Waiahole Bridge. The Department kindly requests that you consult with the administration of Waiahole Elementary School as soon as possible to identify and minimize any potential impact on pedestrian and vehicular traffic that may affect the school's operations.

See Appendix A-2 for the pre-assessment consultation comment letters and responses for more detail on each of the comments presented by DOE.

5.8.3 Health Care Services

Existing Conditions
The Straub Family Medical Center, Kaneohe is located approximately 5 miles from the project site. The nearest hospitals are approximately 13 miles away in Kailua, urban Honolulu and Pearl City.

Potential Impacts and Mitigation Measures
Because Kamehameha Highway is the principal transportation corridor between nearby communities and healthcare facilities in Kaneohe and Honolulu, the existing bridge will remain open to traffic during construction. Thus, access to emergency room or other hospital facilities should not be affected.

5.8.4 Recreational Facilities

Existing Conditions

Nearby recreational activities include Waiahole Beach Park, Heeia State Park, Waiahole Forest Reserve and Kualoa Regional Park. The State parks, including Heeia State Park and the Waiahole Forest Reserve, are under the management authority of the State of Hawaii Department of Land and Natural Resources (DLNR). Heeia State Park is a coastal park south of the proposed project area and managed by a non-profit, Kamaaina Kids under a curatorship agreement with the DLNR Division of State Parks. The Waiahole Forest Reserve is located mauka of the project site and is open to the public for recreational purposes. Managed by the DLNR Division of Forestry and Wildlife, the reserve's purpose is to restore the surrounding watershed, preserve open space, and protect the native, threatened and endangered species of Hawaii. The City and County of Honolulu parks, including the Waiahole Beach Park and the Kualoa Regional Park, are managed by the Department of Parks and Recreation. Kualoa Regional Park is a coastal park located north of the project site and popular for ocean access. Waiahole Beach Park is immediately adjacent to the project area. It is undeveloped and periodically mowed. Uses appear to be passive recreation activities and fishing access.

Potential Impacts and Mitigation Measures

Temporary and long term impacts are anticipated to Waiahole Beach Park. HDOT intends to utilize a construction access and staging area as part of the bridge replacement project for a rerouted highway and laydown area during the 18- to 24- month period of construction activity. A portion of the park will also be used as a stockpiling area during the construction of the replacement bridge. The total amount of City and County of Honolulu Park land, TMK (1) 4-8-002:001, planned for project use on a temporary basis is approximately 240,573 square feet or 5.52 acres.

Pre-consultation with the City and County of Honolulu Department of Parks and Recreation in 2017 suggests that the project consider the suitability of the proposed staging area due to the low lying, soft and possibly inaccessible nature of the site. The Department also suggests meeting with the Waiahole Park Manager for approval of the proposed staging area and to determine all possible accessible routes in and out of the park. A preliminary meeting with Honolulu Parks and Recreation administration and staff was held in December, 2023. Follow up communications will continue to plan for construction access and staging. In addition, HDOT will request concurrence with the City and County of Honolulu on meeting the requirements of Federal use of State lands as stipulated in Section 4(f) identified in 23 CFR 774.13. No funds from the Land and Water Conservation Fund were used in the acquisition of the Waiahole Beach park and therefore, the requirements of 6f of the Land and Water Conservation Act do not apply to this project.

To address concern about low-lying areas during construction, the wetlands areas within the park will not be utilized for construction access or staging. All applicable temporary BMPs within the staging area such as utilizing construction mats or geotextiles, vehicle tracking, sediment control, vegetation protection, and stockpile management will be installed.

Long term, the highway relocation will utilize a linear area of the park measuring approximately 1.55 acres in total area. This use of park area is deemed necessary to provide the public a more safe experience when accessing community resources including the Park, the Waiahole Poi Factory, and Waiahole Valley Road.

6.0 LAND USE CONFORMANCE

The processing of various permits and approvals are prerequisites to the implementation of the project. Relevant federal, State of Hawaii, and City and County of Honolulu land use plans, policies, and ordinances are described below.

6.1 FEDERAL

6.1.1 National Environmental Protection Act of 1969 as Amended (NEPA)

The FHWA identifies three classes of actions which set forth the level of documentation required in the NEPA process. The rehabilitation or replacement of Waiahole Bridge is not a Class I action requiring an EIS, nor is it a Class II action, Categorical Exclusion. Thus it is categorized as a Class III action, an Environmental Assessment, because the significance of the environmental impact is not clearly established. A NEPA EA will be prepared for this project and will include documentation with the HRS 343 process.

6.1.2 Americans with Disabilities Act (ADA)

The Americans with Disabilities Act (ADA) of 1990 sets forth guidelines for accessibility to buildings and facilities for individuals with physical disabilities. Project plans will be submitted to the State of Hawaii Disabilities and Communications Access Board for review and approval before construction.

6.1.3 Clean Water Act

The Clean Water Act establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters. Section 401 and 404 of the Clean Water Act regulates activities that may result in a discharge into navigable waters. This includes discharges to perennial streams with hydrologic connection to the ocean as well as wetlands. Work below the Ordinary High Water Mark (OHWM) is proposed in order to widen the stream channels beneath the bridge and a Department of Army Section 404 permit will be required if riprap or fill is placed below the OHWM.

A depressional palustrine emergent wetland will be impacted by the construction of the highway realignment. Approximately 0.29 acres of the wetland is estimated to be affected; however, the impact to this wetland (Wetland A) is expected to be negligible, as hydraulic storage will not be significantly reduced and the wetland has little habitat value as most of the area has been disturbed due to City and County of Honolulu park maintenance. This wetland does not appear to be subject to Army Corps jurisdiction under the current Waters of the US rule.

The National Pollutant Discharge Elimination System (NPDES) permit system is part of the implementation program of the Clean Water Act. NPDES permits for discharge of construction stormwater are required when more than an acre of land disturbance is proposed. The project is anticipated to exceed one acre of land disturbance, and will likely qualify for coverage under the

State's General Permit (HAR 11-55,); therefore, a, Notice of Intent (NOI) for coverage under the State's General Permit for discharge of construction stormwater. Should the contractor need to discharge dewatering effluent during construction, they will be required to obtain coverage under the State's General Permit for construction dewatering. The BMPs typically required through the NPDES permit process will mitigate concerns about receiving water quality impacts.

6.1.4 Coastal Zone Management Act

The Coastal Zone Management Act (CZMA) provides for management of coastal resources. The National Coastal Zone Management Act requires that federal actions, including actions requiring a federal permit or actions receiving federal funds, located within the coastal zone are consistent with state Coastal Zone Management program objectives and policies. As the Waiahole Bridge will be funded, in part, by the Federal Highway Administration and will require an Army Corps of Engineers permit, Federal Consistency with a state's approved coastal management program is required. As stipulated by the State of Hawaii Office of Planning, the Office of Planning is responsible for conducting Federal Consistency reviews.

During the 2023 Draft EA pre-assessment consultation period, OPSD provided the following comments:

We note that the review material identifies the use of federal funds but does not indicate the source of federal funding being used to replace this bridge. If federal assistance sources such as the 20.205 Highway Planning and Construction, U.S. Department of Transportation, Federal Highway Administration (FHWA) are used, then this project may be subject to CZMA federal consistency. Additionally, the need for federal permits or approvals such as a Department of the Army permit may also trigger CZMA federal consistency.

OPSD is the lead state agency with the authority to conduct CZMA federal consistency determinations. We recommend that HDOT consult with our office on the applicability of CZMA federal consistency.

CZM consistency review will be sought from the OPSD. See Appendix A-2 for the pre-assessment consultation comment letters and responses for more detail on each of the comments presented by OPSD.

Implementation of Coastal Zone Management Act requirements are delegated to local authorities. Additional discussion relating to compliance with Hawaii's Coastal Zone Management Program and the City and County of Honolulu Special Management Area are discussed in Sections 6.2.3 and 6.3.5 in this document.

6.1.5 Endangered Species Act

Section 7 of the Endangered Species Act of 1973 (ESA) requires that actions that are funded by federal agencies do not jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of their critical habitat. Section 7 of this act

details the process for consultation between the acting agency and the United States Fish and Wildlife Service (USFWS). Section 7 consultation with the USFWS has been initiated. Correspondence can be found in Appendix G. More detailed discussion about USFWS protected resources has been discussed in Sections 4.7, 4.8, 4.9, and 4.10 of this document.

6.1.6 National Historic Preservation Act

Section 106 of the National Historic Preservation Act (NHPA) requires that any federal department, or any agency acting on behalf of a federal department consider the effect of its actions on sites or structures that are included or eligible for inclusion in the National Register of Historic Places. An archaeological inventory survey was conducted and discussed at greater length in Section 5.1 (Archaeological and Historic Resources) of this document. Compliance with Section 106 will be required and will be documented in NEPA materials.

6.1.7 Wild and Scenic Rivers Act

Pursuant to an Act of Congress in 1962, lands, waters, or rivers were designated as Wild or Scenic Rivers by the U.S. Government for protection. No rivers within the State of Hawaii are designated a Wild or Scenic River (United States of America, 2023).

6.2 STATE OF HAWAII

6.2.1 State Environmental Review Law (Chapter 343, Hawaii Revised Statutes)

The State Environmental Review Law (Chapter 343, Hawaii Revised Statutes (HRS)) requires an environmental assessment for any action that proposes the use of State lands and funds. This environmental assessment has been prepared in compliance with Chapter 343, HRS as the project requires the use of State land and funds.

6.2.2 State Land Use Law (Chapter 205, Hawaii Revised Statutes)

The State Land Use Law (Chapter 205, HRS), establishes the State Land Use Commission and authorizes this body to designate all lands in the State into one of four districts: Urban, Rural, Agricultural, or Conservation.

The proposed site improvements are located within the State Agricultural District (Figure 12: State Land Use District). The Agricultural District includes lands for the cultivation of crops, aquaculture, raising livestock, wind energy facilities, timber cultivation, agriculture-support activities and land with significant potential for agricultural uses. Pursuant to HRS Section 205-4.5, public roadways are permissible within the agricultural districts.

6.2.3 Hawaii Coastal Zone Management Program (Chapter 205A, Hawaii Revised Statutes)

The U.S. Congress enacted the Coastal Zone Management (CZM) Act to assist states in better managing coastal and estuarine environments. The act provides grants to states that develop and

implement federally-approved CZM plans. The State of Hawaii's CZM Act Program was enacted pursuant to Chapter 205A, HRS. The program outlines management objectives centered around ten areas: 1) Recreational Resources; 2) Historic Resources; 3) Scenic and Open Space Resources; 4) Coastal Ecosystems; 5) Economic Uses; 6) Coastal Hazards; 7) Managing Development; 8) Public Participation in Coastal Management; 9) Beach Protection; and 10) Marine Resources. All lands within the State of Hawaii fall within the CZM area, including the Project Area.

The objectives and policies of the Hawaii CZM Program, along with a detailed discussion of how the Waiahole Bridge replacement alternatives conform to these objectives and policies, are discussed below.

During the 2023 Draft EA pre-assessment consultation period, OPSD provided the following comments:

The CZM area is defined as "all lands of the State and the area extending seaward from the shoreline to the limit of the State's police power and management authority, including the U.S. territorial sea" under Hawaii Revised Statutes (HRS) § 205A-1.

Pursuant to HRS § 205A-4, in implementing the objectives of the CZM program, agencies shall consider ecological, cultural, historic, esthetic, recreational, scenic, open space values, coastal hazards, and economic development. As the proposed action is being submitted by HDOT, the Draft Environmental Assessment (Draft EA) should include a discussion on the project's consistency with the policies of the Hawaii CZM Program, HRS § 205A-2, as amended.

Furthermore, the objectives and supporting policies of the Hawaii CZM Program serve as the foundation of the enforceable policies of the State of Hawaii. Disclosure of impacts on CZM objectives and supporting policies as it relates to HRS Chapter 343 requirements, will aid the State in determining impacts to the resources of the coastal zone, and mitigation measures on lands involved for this proposed action.

See Appendix A-2 for the pre-assessment consultation comment letters and responses for more detail on each of the comments presented by OPSD.

S = Supportive, N/S = Not Supportive, N/A = Not Applicable

COASTAL ZONE MANAGEMENT ACT, CHAPTER 205A, HRS	**S**	**N/S**	**N/A**
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			X
(B) Provide adequate, accessible, and diverse recreational opportunities in the coastal zone management area by:			

COASTAL ZONE MANAGEMENT ACT, CHAPTER 205A, HRS	S	N/S	N/A
(i) Protecting coastal resources uniquely suited for recreational activities that cannot be provided in other areas;	X		
(ii) Requiring replacement of coastal resources having significant recreational value including, but not limited to, surfing sites, fishponds, and sand beaches, when such resources will be unavoidably damaged by development; or requiring reasonable monetary compensation to the State for recreation when replacement is not feasible or desirable;			X
(iii) Providing and managing adequate public access, consistent with conservation of natural resources, to and along shorelines with recreational value;	X		
(iv) Providing an adequate supply of shoreline parks and other recreational facilities suitable for public recreation;			X
(v) Ensuring public recreational uses 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;	X		
(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;	X		
(vii) Developing new shoreline recreational opportunities, where appropriate, such as artificial lagoons, artificial beaches, and artificial reefs for surfing and fishing; and			X
(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.			X

Discussion: The Project is not anticipated to generate additional demands on existing public parks and beach areas, however, it is conceivable that as other shoreline access points are diminished or destroyed by sea level rise, more people may elect to use Waiahole Beach Park in the future. The Project's safety features which includes a buffered pedestrian walkway, shoulders for bicyclists and a reconfigured Highway alignment are interventions that support more people accessing the Park.

During construction, stockpiling activities will occur within the adjacent City and County of Honolulu Waiahole Beach Park located along the makai side of the highway, just north of Waiahole Stream. Access to the shoreline at this park will be provided at all times. through a designated thoroughfare along one side of the park boundary.

To protect water resources for purposes including recreation, the State of Hawaii has adopted water quality standards. Generally, these standards will require the submittal and adherence to a NPDES permit. This permit requires compliance with best management practices (BMPs) during

COASTAL ZONE MANAGEMENT ACT, CHAPTER 205A, HRS	S	N/S	N/A
construction to minimize soil erosion into adjacent waterways. A NPDES permit will be obtained prior to construction, unless the No Action alternative is selected.			
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;	X		
(B) Maximize information retention through preservation of remains and artifacts or salvage operations; and	X		
(C) Support state goals for protection, restoration, interpretation, and display of historic resources.	X		
Discussion: A Cultural Impact Assessment was conducted and an auwai found within the project area. The Waiahole Poi Factory, while outside of the immediate project area, was also found to possibly be impacted by the project. Mitigation measures have been proposed and are detailed in Sections 5.1 and 5.2 to ensure the protection of these cultural resources.			
SCENIC AND OPEN SPACE RESOURCES			
Objective: (A) Protect, preserve, and, where desirable, restore or improve the quality of coastal scenic and open space resources.			
Policies:			
(A) Identify valued scenic resources in the coastal zone management area;	X		
(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;	X		
(C) Preserve, maintain, and, where desirable, improve and restore shoreline open space and scenic resources; and			X
(D) Encourage those developments that are not coastal dependent to locate in inland areas.			X
Discussion: It is expected that some vegetation removal will be required to replace Waiahole Bridge. However, vegetation removal will be limited to what is immediately necessary to accomplish construction and afford safe operation of the new bridge. Due to the overgrown nature of the shrubs and trees immediately mauka and makai of the bridge, the overhead components of the steel structure are not expected to interrupt views. With exception of realignment of utility poles, the highway realignment will not involve any new overhead structures. Thus, views mauka and makai from the highway will remain unobstructed. Upon construction, disturbed earth will be replanted for erosion control. Replacement of vegetation in these areas will serve to return the project site to pre-construction condition.			
COASTAL ECOSYSTEMS			

COASTAL ZONE MANAGEMENT ACT, CHAPTER 205A, HRS	**S**	**N/ S**	**N/ A**
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;	X		
(B) Improve the technical basis for natural resource management;			X
(C) Preserve valuable coastal ecosystems, including reefs, of significant biological or economic importance;			X
(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			X
(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.	X		

Discussion: The Atlas of Hawaiian Watershed and their Aquatic Resources (Parham et. al, 2008) identifies eleven endemic and indigenous aquatic biota species that could possibly occur within the project area as their presence has been documented in the lower reaches of the Waiahole Stream. Native species identified include five fish species, the oopu (*Eleotris sandwicensis),* Hawaiian flagtail (*Kuhlia xenura*), oopu nopili (*Sicyopterus stimpsoni),* oopu naniha (*Stenogobius hawaiiensis),* and the flathead grey mullet (*Mugil cephalus)* and several native insect species including *Orthocladius sp., Dasyrhicnoessa insularis,* and *Scatella sexnotata* and fly species *Procanace williamsi* and *Thambemyia acrosticalis.*

Waiahole Stream does not include Essential Fish Habitat (EFH) within the immediate project area but the stream flows into Kaneohe Bay, which is approximately 1,500 ft downstream of the downstream extent of the project. The water column and bottom of Kaneohe Bay are defined as EFH and support various life stages for the management unit species (MUS) identified in the Western Pacific Regional Fishery Management Council's Pelagic and Hawaii Archipelago Fishery Ecosystem Plans. Essential fish habitat in Kaneohe Bay includes:

- Bottom fish and seamount groundfish, including Amberjack/Black Jack/Sea Bass, Blue Stripe Snapper/Gray Jobfish, Giant Trevally, Pink Snapper, Red Snapper/Longtail Snapper, Yellowtail Snapper, Snapper, and Silver Jaw Jobfish/Thicklip Trevally.
- Main Hawaii Islands Coral Reef Ecosystem (NOAA, 2023).

To protect and minimize impacts to the aquatic environments directly adjacent to the proposed project as well as those up and downstream, DAR requests that all necessary precautionary measures be taken throughout the project. It is important that during the bridge construction and demolition activities there is an avoidance of the creation of barriers that could block this

COASTAL ZONE MANAGEMENT ACT, CHAPTER 205A, HRS	S	N/S	N/A
downstream and upstream movement of stream biota. These mitigative measures will be included in the Biological Evaluation prepared for the project. The requirements of the Biological Evaluation will then be carried forward into project design and implementation. The proposed project will impact Waters of the US below the OHWM of Waiahole Stream and within the adjacent Wetland B. Impacts will result from regrading stream embankments beneath the new bridge and immediately downstream of the bridge and removing vegetation and sediment upstream and downstream of the existing bridge. In addition, the center piles of the existing bridge will be removed down to the mudline to allow for improved flow. There will be disturbance of 0.32 acres below the OHWM of Waiahole Stream, including approximately 180 cubic yards (cy) of excavation and 305 cy of fill. Approximately 0.04 acres and 110 cy of Wetland B will be excavated for the new highway alignment. Table 2 summarizes impact quantities to wetlands and Waiahole Stream. As construction plans for replacing Waiahole Bridge will involve a total of 0.36 acres of WotUS impacted by dredge or fill material, a Department of the Army permit administered by the USACE will be required. Natural stream flow conditions will be permanently improved by these project elements; however, work in the stream has the potential to temporarily negatively impact stream water quality during construction. Standard BMPs for in-water work, such as isolating the active working area with sandbags or silt curtain, will be utilized to minimize the impact of construction on stream water quality. Long-term impacts to the stream, although permanent, are anticipated to be beneficial by allowing more natural hydrologic and sedimentation processes to occur within the stream. Although Wetlands A and D no longer appear to qualify as WotUS under the 2023 Conforming Rule, we are reporting impacts to these non-WotUS wetlands for informational purposes. Approximately 0.06 acres of Wetland A and 0.02 acres of Wetland D are expected to be impacted permanently by the construction of the new highway alignment. Approximately 250 cy of fill will be placed in Wetland A and 30 cy of fill into Wetland D for construction of the new alignment roadway embankments. The impacts to Wetlands A and D are expected to be negligible, as hydraulic storage will not be significantly reduced and the wetlands have little habitat value as most of the area has been disturbed due regular grass cutting maintenance.			
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;			X
(B) Ensure that coastal dependent development such as harbors and ports, and coastal related development such as visitor industry 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			X

COASTAL ZONE MANAGEMENT ACT, CHAPTER 205A, HRS	**S**	**N/ S**	**N/ A**
(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:			X
(i) Use of presently designated locations is not feasible;			X
(ii) Adverse environmental effects are minimized; and			X
(iii) The development is important to the State's economy.			X
Discussion: The Waiahole Bridge project is not a coastal dependent development. The replacement of the bridge will provide greater highway capacity and improved safety for vehicles, bicycles, and pedestrians. The project is not expected to impact the local economy in a negative manner.			
COASTAL HAZARDS			
Objective: (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;			X
(B) Control development in areas subject to storm wave, tsunami, flood, erosion, hurricane, wind, subsidence, and point and nonpoint source pollution hazards;			X
(C) Ensure that developments comply with requirements of the Federal Flood Insurance Program; and	X		
(D) Prevent coastal flooding from inland projects.	X		
Discussion: The Waiahole Bridge Replacement will not present or exacerbate any hazard conditions relating to tsunamis, hurricanes, or other coastal hazards. The new bridge will not exacerbate any natural hazard conditions and is expected to have a beneficial impact as it has been designed to alleviate future flooding events by accommodating greater stream flow volumes, and by removing structures from the stream bed that often collect debris. The upstream channel will be realigned and widened which will provide the stream a more direct and unobstructed path through the bridge and increase the volume of water that can flow underneath. Sediment may be removed from the stream channel to facilitate water conveyance and minimize debris build-up and appropriate permits for sediment removal from the stream channel will be acquired. The project area is within the tsunami evacuation zone and within Zone A of the FEMA flood hazard designation. During construction of the highway realignment and replacement bridge, the highway and bridge will remain open for normal use, including emergency access and evacuations. Because the realignment of the highway includes the addition of fill material in the floodplain, coordination with the City and County of Honolulu Department of Planning and Permitting (DPP) has been initiated by the DOT and their design consultants to address permitting requirements associated with changes to the floodplain.			

COASTAL ZONE MANAGEMENT ACT, CHAPTER 205A, HRS	S	N/S	N/A
MANAGING DEVELOPMENT			
Objective: (A) Improve the development review process, communication, and public participation in the management of coastal resources and hazards.			
Policies:			
(A) Use, implement, and enforce existing law effectively to the maximum extent possible in managing present and future coastal zone development;			X
(B) Facilitate timely processing of applications for development permits and resolve overlapping or conflicting permit requirements; and			X
(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.	X		
Discussion: The purpose of the EA is to communicate the potential short and long-term impacts of the proposed Waiahole Bridge replacement project at an early stage in the process. A public meeting was held in 2017 in which community preferences were voiced and heard. The project was reconsidered and the preferred alternative described in this document is the result. Two additional community meetings were held in January, 2023 to discuss the design with the community and consider their concerns, suggestions, and insights. After the Draft EA is published, it will be made available to agencies and stakeholder for review. Meetings have been held with stakeholders include the State Historic Preservation Division and the Army Corps of Engineers in order to ensure compliance with all federal, state, and county laws and objectives.			
PUBLIC PARTICIPATION			
Objective: (A) Stimulate public awareness, education, and participation in coastal management.			
Policies:			
(A) Promote public involvement in coastal zone management processes;	X		
(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			X
(C) Organize workshops, policy dialogues, and site-specific mediations to respond to coastal issues and conflicts.			X
Discussion: This EA serves as a disclosure document of potential impacts and mitigation measures, including coastal zone management issues. The EA is published in the Office of Environmental Review's Environmental Notice, whereby opportunity for comment by agencies and the public are provided. Pre-consultation with the State of Hawaii Office of Planning and Sustainable Development was conducted to ensure compliance with federal consistency requirements.			
BEACH PROTECTION			
Objective: (A) Protect beaches for public use and recreation.			
Policies:			

COASTAL ZONE MANAGEMENT ACT, CHAPTER 205A, HRS	**S**	**N/ S**	**N/ A**
(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;	X		
(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	X		
(C) Minimize the construction of public erosion-protection structures seaward of the shoreline.	X		
(D) Minimize grading of and damage to coastal dunes;			X
(E) Prohibit private property owners from creating a public nuisance by inducing or cultivating the private property owner's vegetation in a beach transit corridor; and			X
(F) Prohibit private property owners from creating a public nuisance by allowing the private property owner's unmaintained vegetation to interfere or encroach upon a beach transit corridor.			X
Discussion: The Waiahole Bridge is inland from the shoreline setback and is not expected to interfere with natural shoreline processes. Improvements to the hydraulic capacity of the bridge is anticipated to help with flood control and normal stream function close to the shoreline.			
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;			X
(B) Coordinate the management of marine and coastal resources and activities to improve effectiveness and efficiency;			X
(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;			X
(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			X
(E) Encourage research and development of new, innovative technologies for exploring, using, or protecting marine and coastal resources.			X
Discussion: The Waiahole Bridge replacement project will not have a significant adverse impact on marine or coastal resources. Appropriate best management practices (BMPs) and erosion control measures will be implemented to ensure that marine and coastal resources are not adversely impacted by construction activities.			

6.2.4 Hawaii State Plan

The Hawaii State Plan (Chapter 226, HRS) sets forth the goals, objectives, polices, and priority guidelines for growth, development, and allocation of limited resources throughout the State. It contains diverse policies and objectives on topics of state interest including but not limited to, the economy, agriculture, the visitor industry, federal expenditure, the physical environment, facility systems, socio-cultural advancement, and sustainability. Conformity with applicable provisions of the State Plan is discussed below. The State Plan is divided into three parts: Part I (Overall Theme, Goals, Objectives and Policies); Part II (Planning, Coordination and Implementation); and Part III (Priority Guidelines). Part II elements of the State Plan pertain primarily to the administrative structure and implementation process of the Plan and Part III is meant to establish overall priority guidelines to address areas of statewide concern. As such, comments regarding the applicability of Parts II and III to the Waiahole Bridge replacement are not appropriate and are therefore not included. Part I is provided in matrix format below and the checked boxes indicate whether the individual objectives and policies are supported, not supported, or not applicable. Applicable goals and policies of the Hawaii State Plan are discussed below.

HAWAII STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/ S**	**N/ A**
HRS § 226-1: Findings and Purpose			
HRS § 226-2: Definitions			
HRS § 226-3: Overall Theme.			
Hawaii's people, as both individuals and groups, generally accept and live by a number of principles or values which are an integral part of society. This concept is the unifying theme of the State Plan. The following principles or values are established as the overall theme of the Hawaii State Plan: *(1) Individual and family self-sufficiency refers to the rights of people to maintain as much self-reliance as possible. It is an expression of the value of independence, in other words, being able to freely pursue personal interests and goals. Self-sufficiency means that individuals and families can express and maintain their own self-interest so long as that self-interest does not adversely affect the general welfare. Individual freedom and individual achievement are possible only by reason of other people in society, the institutions, arrangements and customs that they maintain, and the rights and responsibilities that they sanction.* *(2) Social and economic mobility refers to the right of individuals to choose and to have the opportunities for choice available to them. It is a corollary to self-sufficiency. Social and economic mobility means that opportunities and incentives are available for people to seek out their own levels of social and economic fulfillment.* *(3) Community or social well-being is a value that encompasses many things. In essence, it refers to healthy social, economic, and physical environments that benefit the community as a whole. A sense of social responsibility, of caring for others and for the well-being of our community and of participating in social and political life, are important aspects of this concept. It further implies the aloha spirit--attitudes of tolerance, respect, cooperation and unselfish giving, within which Hawaii's society can progress.*			

HAWAII STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/ S**	**N/ A**
One of the basic functions of our society is to enhance the ability of individuals and groups to pursue their goals freely, to satisfy basic needs and to secure desired socio-economic levels. The elements of choice and mobility within society's legal framework are fundamental rights. Society's role is to encourage conditions within which individuals and groups can approach their desired levels of self-reliance and self-determination. This enables people to gain confidence and self-esteem; citizens contribute more when they possess such qualities in a free and open society. *Government promotes citizen freedom, self-reliance, self-determination, social and civic responsibility and goals achievement by keeping order, by increasing cooperation among many diverse individuals and groups, and by fostering social and civic responsibilities that affect the general welfare. The greater the number and activities of individuals and groups, the more complex government's role becomes. The function of government, however, is to assist citizens in attaining their goals. Government provides for meaningful participation by the people in decision-making and for effective access to authority as well as an equitable sharing of benefits. Citizens have a responsibility to work with their government to contribute to society's improvement. They must also conduct their activities within an agreed-upon legal system that protects human rights.*			
Discussion: The replacement of the Waiahole Bridge in order to meet current AASHTO safety design standards is an action that supports these values by allowing individuals and families to rely on safe and functional public infrastructure in order to pursue their economic and social goals.			
HRS § 226-4: State Goals.			
In order to guarantee, for the present and future generations, those elements of choice and mobility that insure that individuals and groups may approach their desired levels of self-reliance and self-determination, it shall be the goal of the State to achieve: *(1) A strong, viable economy, characterized by stability, diversity and growth that enables fulfillment of the needs and expectations of Hawaii's present and future generations.* *(2) A desired physical environment, characterized by beauty, cleanliness, quiet, stable natural systems, and uniqueness, that enhances the mental and physical well-being of the people.* (3) *Physical, social and economic well-being, for individuals and families in Hawaii, that nourishes a sense of community responsibility, of caring and of participation in community life.*			
Discussion: The project supports a strong and viable economy by improving the existing transportation network that allows individuals to access jobs and recreational opportunities on the Windward side of Oahu.			

HAWAII STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
HRS § 226-5: Objectives and policies for population.			
(a) Objective: *It shall be the objective in planning for the State's population to guide population growth to be consistent with the achievement of physical, economic and social objectives contained in this chapter.*			
(b) Policies:			
(1) Manage population growth statewide in a manner that provides increased opportunities for Hawaii's people to pursue their physical, social and economic aspirations while recognizing the unique needs of each county.			X
(2) Encourage an increase in economic activities and employment opportunities on the neighbor islands consistent with community needs and desires.			X
(3) Promote increased opportunities for Hawaii's people to pursue their socio-economic aspirations throughout the islands.			X
(4) Encourage research activities and public awareness programs to foster an understanding of Hawaii's limited capacity to accommodate population needs and to address concerns resulting from an increase in Hawaii's population.			X
(5) Encourage federal actions and coordination among major governmental agencies to promote a more balanced distribution of immigrants among the states, provided that such actions do not prevent the reunion of immediate family members.			X
(6) Pursue an increase in federal assistance for states with a greater proportion of foreign immigrants relative to their state's population.			X
(7) Plan the development and availability of land and water resources in a coordinated manner so as to provide for the desired levels of growth in each geographic area.			X
Discussion: The project has no relation to the State's goals regarding population.			
HRS § 226-6: Objectives and policies for the economy in general.			
(a) Objectives: *Planning for the State's economy in general shall be directed toward achievement of the following objectives:*			
(1) Increased and diversified employment opportunities to achieve full employment, increased income and job choice, and improved living standards for Hawaii's people, while at the same time stimulating the development and expansion of economic activities capitalizing on defense, dual-use, and science and technology assets, particularly on the neighbor islands where employment opportunities may be limited.			X
(2) A steadily growing and diversified economic base that is not overly dependent on a few industries, and includes the development and expansion of industries on the neighbor islands.			X

HAWAII STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
(b) Policies:			
(1) Promote and encourage entrepreneurship within Hawaii by residents and nonresidents of the State.			X
(2) Expand Hawaii's national and international marketing, communication, and organizational ties, to increase the State's capacity to adjust to and capitalize upon economic changes and opportunities occurring outside the State.			X
(3) Promote Hawaii as an attractive market for environmentally and socially sound investment activities that benefit Hawaii's people.			X
(4) Transform and maintain Hawaii as a place that welcomes and facilitates innovative activity that may lead to commercial opportunities.			X
(5) Promote innovative activity that may pose initial risks, but ultimately contribute to the economy of Hawaii.			X
(6) Seek broader outlets for new or expanded Hawaii business investments.			X
(7) Expand existing markets and penetrate new markets for Hawaii's products and services.			X
(8) Assure that the basic economic needs of Hawaii's people are maintained in the event of disruptions in overseas transportation.			X
(9) Strive to achieve a level of construction activity responsive to, and consistent with, state growth objectives.			X
(10) Encourage the formation of cooperatives and other favorable marketing arrangements at the local or regional level to assist Hawaii's small scale producers, manufacturers, and distributors.			X
(11) Encourage labor-intensive activities that are economically satisfying and which offer opportunities for upward mobility.			X
(12) Encourage innovative activities that may not be labor-intensive, but may otherwise contribute to the economy of Hawaii.			X
(13) Foster greater cooperation and coordination between the government and private sectors in developing Hawaii's employment and economic growth opportunities.			X
(14) Stimulate the development and expansion of economic activities which will benefit areas with substantial or expected employment problems.			X
(15) Maintain acceptable working conditions and standards for Hawaii's workers.			X
(16) Provide equal employment opportunities for all segments of Hawaii's population through affirmative action and nondiscrimination measures.			X

HAWAII STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
(17) Stimulate the development and expansion of economic activities capitalizing on defense, dual-use, and science and technology assets, particularly on the neighbor islands where employment opportunities may be limited.			X
(18) Encourage businesses that have favorable financial multiplier effects within Hawaii's economy, particularly with respect to emerging industries in science and technology.			X
(19) Promote and protect intangible resources in Hawaii, such as scenic beauty and the aloha spirit, which are vital to a healthy economy.			X
(20) Increase effective communication between the educational community and the private sector to develop relevant curricula and training programs to meet future employment needs in general, and requirements of new, potential growth industries in particular.			X
(21) Foster a business climate in Hawaii--including attitudes, tax and regulatory policies, and financial and technical assistance programs--that is conducive to the expansion of existing enterprises and the creation and attraction of new business and industry.			X
Discussion: Safe and reliable roadways support the economy by providing transportation networks that connect people to employment, recreational, and social activities. Aside from construction jobs and maintenance of a critical public facility, The Project itself, cannot be construed as an economic development effort of the likes described by these objectives.			
HRS § 226-7: Objectives and policies for the economy – agriculture			
(a) Objectives: *Planning for the State's economy with regard to agriculture shall be directed towards achievement of the following objectives:*			
(1) Viability of Hawaii's sugar and pineapple industries.			X
(2) Growth and development of diversified agriculture throughout the State.			X
(3) An agriculture industry that continues to constitute a dynamic and essential component of Hawaii's strategic, economic, and social well-being.			X
(b) Policies:			
(1) Establish a clear direction for Hawaii's agriculture through stakeholder commitment and advocacy.			X
(2) Encourage agriculture by making best use of natural resources.			X
(3) Provide the governor and the legislature with information and options needed for prudent decision making for the development of agriculture.			X
(4) Establish strong relationships between the agricultural and visitor industries for mutual marketing benefits.			X
(5) Foster increased public awareness and understanding of the contributions and benefits of agriculture as a major sector of Hawaii's economy.			X
(6) Seek the enactment and retention of federal and state legislation that benefits Hawaii's agricultural industries.			X

HAWAII STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
(7) Strengthen diversified agriculture by developing an effective promotion, marketing, and distribution system between Hawaii's food producers and consumers in the State, nation, and world.			X
(8) Support research and development activities that strengthen economic productivity in agriculture, stimulate greater efficiency, and enhance the development of new products and agricultural by-products.			X
(9) Enhance agricultural growth by providing public incentives and encouraging private initiatives.			X
(10) Assure the availability of agriculturally suitable lands with adequate water to accommodate present and future needs.			X
(11) Increase the attractiveness and opportunities for an agricultural education and livelihood.			X
(12) In addition to the State's priority on food, expand Hawaii's agricultural base by promoting growth and development of flowers, tropical fruits and plants, livestock, feed grains, forestry, food crops, aquaculture, and other potential enterprises.			X
(13) Promote economically competitive activities that increase Hawaii's agricultural self-sufficiency, including the increased purchase and use of Hawaii-grown food and food products by residents, businesses, and governmental bodies as defined under section 103D-104.			X
(14) Promote and assist in the establishment of sound financial programs for diversified agriculture.			X
(15) Institute and support programs and activities to assist the entry of displaced agricultural workers into alternative agricultural or other employment.			X
(16) Facilitate the transition of agricultural lands in economically non-feasible agricultural production to economically viable agricultural uses.			X
Discussion: The objectives do not apply as the project is not defined as an agricultural effort.			
HRS § 226-8: Objectives and policies for the economy – visitor industry			
(a) Objectives: *Planning for the State's economy with regard to the visitor industry shall be directed towards the achievement of the objective of a visitor industry that constitutes a major component of steady growth for Hawaii's economy.*			
(b) Policies:			
(1) Support and assist in the promotion of Hawaii's visitor attractions and facilities.			X
(2) Ensure that visitor industry activities are in keeping with the social, economic, and physical needs and aspirations of Hawaii's people.			X
(3) Improve the quality of existing visitor destination areas by utilizing Hawaii's strengths in science and technology.			X

HAWAII STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/ S**	**N/ A**
(4) Encourage cooperation and coordination between the government and private sectors in developing and maintaining well-designed, adequately serviced visitor industry and related developments which are sensitive to neighboring communities and activities.	X		
(5) Develop the industry in a manner that will continue to provide new job opportunities and steady employment for Hawaii's people.			X
(6) Provide opportunities for Hawaii's people to obtain job training and education that will allow for upward mobility within the visitor industry.			X
(7) Foster a recognition of the contribution of the visitor industry to Hawaii's economy and the need to perpetuate the aloha spirit.			X
(8) Foster an understanding by visitors of the aloha spirit and of the unique and sensitive character of Hawaii's cultures and values.			X
Discussion: The project adequately services the visitor industry while supporting the neighboring community by building safe roadways that allow visitors to enjoy adjacent businesses such as the Waiahole Poi Factory and other nearby recreational facilities.			
HRS § 226-9: Objective and policies for the economy – federal expenditures			
(a) Objective: *Planning for the State's economy with regard to federal expenditures shall be directed towards achievement of the objective of a stable federal investment base as an integral component of Hawaii's economy.*			
(b) Policies:			
(1) Encourage the sustained flow of federal expenditures in Hawaii that generates long-term government civilian employment.			X
(2) Promote Hawaii's supportive role in national defense, in a manner consistent with Hawaii's social, environmental, and cultural goals by building upon dual-use and defense applications to develop thriving ocean engineering, aerospace research and development, and related dual-use technology sectors in Hawaii's economy.			X
(3) Promote the development of federally supported activities in Hawaii that respect state-wide economic concerns, are sensitive to community needs, and minimize adverse impacts on Hawaii's environment.	X		
(4) Increase opportunities for entry and advancement of Hawaii's people into federal government service.			X
(5) Promote federal use of local commodities, services, and facilities available in Hawaii.			X
(6) Strengthen federal-state-county communication and coordination in all federal activities that affect Hawaii.	X		
(7) Pursue the return of federally controlled lands in Hawaii that are not required for either the defense of the nation or for other purposes of national importance, and promote the mutually beneficial exchanges of land between federal agencies, the State, and the counties.			X

HAWAII STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/ S**	**N/ A**
Discussion: The project utilizes Federal funding to support community needs by investing in Oahu's roadways. The U.S. Federal Department of Transportation and the Hawaii State Department of Transportation have determined that the replacement of Waiahole Bridge is a priority, as the existing bridge does not conform to current design standards, and has difficulty supporting the volume of traffic that uses Kamehameha Highway.			
HRS § 226-10: Objectives and policies for the economy – potential growth and innovative activities.			
(a) Objective: *Planning for the State's economy with regard to potential growth and innovative activities shall be directed towards achievement of the objective of development and expansion of potential growth and innovative activities that serve to increase and diversify Hawaii's economic base.*			
(b) Policies:			
(1) Facilitate investment and employment in economic activities that have the potential to expand and diversify Hawaii's economy, including but not limited to diversified agriculture, aquaculture, renewable energy development, creative media, health care, and science and technology-based sectors.			X
(2) Facilitate investment in innovative activity that may pose risks or be less labor-intensive than other traditional business activity, but if successful, will generate revenue in Hawaii through the export of services or products or substitution of imported services or products.			X
(3) Encourage entrepreneurship in innovative activity by academic researchers and instructors who may not have the background, skill, or initial inclination to commercially exploit their discoveries or achievements.			X
(4) Recognize that innovative activity is not exclusively dependent upon individuals with advanced formal education, but that many self-taught, motivated individuals are able, willing, sufficiently knowledgeable, and equipped with the attitude necessary to undertake innovative activity.			X
(5) Increase the opportunities for investors in innovative activity and talent engaged in innovative activity to personally meet and interact at cultural, art, entertainment, culinary, athletic, or visitor-oriented events without a business focus.			X
(6) Expand Hawaii's capacity to attract and service international programs and activities that generate employment for Hawaii's people.			X
(7) Enhance and promote Hawaii's role as a center for international relations, trade, finance, services, technology, education, culture, and the arts.			X
(8) Accelerate research and development of new energy- related industries based on wind, solar, ocean, and underground resources and solid waste.			X
(9) Promote Hawaii's geographic, environmental, social, and technological advantages to attract new economic activities into the State.			X

HAWAII STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/ S**	**N/ A**
(10) Provide public incentives and encourage private initiative to attract new industries that best support Hawaii's social, economic, physical, and environmental objectives.			X
(11) Increase research and the development of ocean-related economic activities such as mining, food production, and scientific research.			X
(12) Develop, promote, and support research and educational and training programs that will enhance Hawaii's ability to attract and develop economic activities of benefit to Hawaii.			X
(13) Foster a broader public recognition and understanding of the potential benefits of new, or innovative growth-oriented industry in Hawaii.			X
(14) Encourage the development and implementation of joint federal and state initiatives to attract federal programs and projects that will support Hawaii's social, economic, physical, and environmental objectives.			X
(15) Increase research and development of businesses and services in the telecommunications and information industries.			X
(16) Foster the research and development of non-fossil fuel and energy efficient modes of transportation.			X
(17) Recognize and promote health care and health care information technology as growth industries.			X
Discussion: The project has no relation to the State's goals regarding innovative activities.			
HRS § 226-10.5: Objectives and policies for the economy – information industry			
(a) Objective: *Planning for the State's economy with regard to telecommunications and information technology shall be directed toward recognizing that broadband and wireless communication capability and infrastructure are foundations for an innovative economy and positioning Hawaii as a leader in broadband and wireless communications and applications in the Pacific Region.*			
(b) Policies:			
(1) Promote efforts to attain the highest speeds of electronic and wireless communication within Hawaii and between Hawaii and the world, and make high speed communication available to all residents and businesses in Hawaii.			X
(2) Encourage the continued development and expansion of the telecommunications infrastructure serving Hawaii to accommodate future growth and innovation in Hawaii's economy.			X
(3) Facilitate the development of new or innovative business and service ventures in the information industry which will provide employment opportunities for the people of Hawaii.			X
(4) Encourage mainland- and foreign-based companies of all sizes, whether information technology-focused or not, to allow their principals, employees, or contractors to live in and work from Hawaii, using technology to			X

HAWAII STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
communicate with their headquarters, offices, or customers located out-of-state.			
(5) Encourage greater cooperation between the public and private sectors in developing and maintaining a well-designed information industry.			X
(6) Ensure that the development of new businesses and services in the industry are in keeping with the social, economic, and physical needs and aspirations of Hawaii's people.			X
(7) Provide opportunities for Hawaii's people to obtain job training and education that will allow for upward mobility within the information industry.			X
(8) Foster a recognition of the contribution of the information industry to Hawaii's economy.			X
(9) Assist in the promotion of Hawaii as a broker, creator, and processor of information in the Pacific.			X
Discussion: The project has no relation to the State's goals on expanding the information industry as described herein.			
HRS § 226-11: Objectives and policies for the physical environment – land-based, shoreline, and marine resources.			
(a) Objectives: *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:*			
(1) Prudent use of Hawaii's land-based, shoreline, and marine resources.	X		
(2) Effective protection of Hawaii's unique and fragile environmental resources.	X		
(b) Policies:			
(1) Exercise an overall conservation ethic in the use of Hawaii's natural resources.			X
(2) Ensure compatibility between land-based and water-based activities and natural resources and ecological systems.			X
(3) Take into account the physical attributes of areas when planning and designing activities and facilities.	X		
(4) Manage natural resources and environs to encourage their beneficial and multiple use without generating costly or irreparable environmental damage.			X
(5) Consider multiple uses in watershed areas, provided such uses do not detrimentally affect water quality and recharge functions.			X
(6) Encourage the protection of rare or endangered plant and animal species and habitats native to Hawaii.	X		
(7) Provide public incentives that encourage private actions to protect significant natural resources from degradation or unnecessary depletion.			X

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(8) Pursue compatible relationships among activities, facilities, and natural resources.	X		
(9) Promote increased accessibility and prudent use of inland and shoreline areas for public recreational, educational, and scientific purposes.			X
Discussion: The project includes design standards that will accommodate a greater flooding event, realign and widen the stream channel to provide an unobstructed path through the bridge crossing and mitigate against any adverse impacts to surrounding flora and fauna. These efforts will serve to satisfy these objectives and policies.			
HRS § 226-12: Objective and policies for the physical environment – scenic, natural beauty, and historic resources.			
(a) Objective: *Planning for the State's physical environment shall be directed towards achievement of the objective of enhancement of Hawaii's scenic assets, natural beauty, and multi-cultural/historical resources.*			
(b) Policies:			
(1) Promote the preservation and restoration of significant natural and historic resources.			X
(2) Provide incentives to maintain and enhance historic, cultural, and scenic amenities.			X
(3) Promote the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.	X		
(4) Protect those special areas, structures, and elements that are an integral and functional part of Hawaii's ethnic and cultural heritage.	X		
(5) Encourage the design of developments and activities that complement the natural beauty of the islands.	X		
Discussion: The Project is not a project that can be construed to be the promotion of or incentive for preservation or restoration as the State's objectives are written. Rather the project is one that will employ best practices for completing infrastructure improvements to ensure appropriate mitigations against adverse impacts to scenic, natural beauty, and historic resources.			
HRS § 226-13: Objectives and policies for the physical environment – land, air, and water quality.			
(a) Objectives: *Planning for the State's physical environment with regard to land, air, and water quality shall be directed towards achievement of the following objectives:*			
(1) Maintenance and pursuit of improved quality in Hawaii's land, air, and water resources.			X
(2) Greater public awareness and appreciation of Hawaii's environmental resources.			X
(b) Policies:			
(1) Foster educational activities that promote a better understanding of Hawaii's limited environmental resources.			X
(2) Promote the proper management of Hawaii's land and water resources.	X		

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(3) Promote effective measures to achieve desired quality in Hawaii's surface, ground, and coastal waters.			X
(4) Encourage actions to maintain or improve aural and air quality levels to enhance the health and well-being of Hawaii's people.			X
(5) Reduce the threat to life and property from erosion, flooding, tsunamis, hurricanes, earthquakes, volcanic eruptions, and other natural or man-induced hazards and disasters.			X
(6) Encourage design and construction practices that enhance the physical qualities of Hawaii's communities.	X		
(7) Encourage urban developments in close proximity to existing services and facilities.			X
(8) Foster recognition of the importance and value of the land, air, and water resources to Hawaii's people, their cultures and visitors.			X
Discussion: Replacement of the Waiahole Bridge is a necessary community enhancement. The Project indirectly supports the proper management of Hawaii's land and water through communications and adherence to the guidance and regulations set forth by agencies charged with managing those resources.			
HRS § 226-14: Objective and policies for facility systems – in general.			
(a) Objective: *Planning for the State's facility systems in general shall be directed towards achievement of the objective of water, transportation, waste disposal, and energy and telecommunication systems that support statewide social, economic, and physical objectives.*			
(b) Policies:			
(1) Accommodate the needs of Hawaii's people through coordination of facility systems and capital improvement priorities in consonance with state and county plans.	X		
(2) Encourage flexibility in the design and development of facility systems to promote prudent use of resources and accommodate changing public demands and priorities.	X		
(3) Ensure that required facility systems can be supported within resource capacities and at reasonable cost to the user.	X		
(4) Pursue alternative methods of financing programs and projects and cost-saving techniques in the planning, construction, and maintenance of facility systems.	X		
Discussion: The project supports each objective by coordinating the funding, planning, and logistics between Federal, State and County agencies. The U.S. Federal Department of Transportation and the Hawaii State Department of Transportation have determined that the replacement of Waiahole Bridge is a priority, as the existing bridge does not conform to current design standards and has difficulty supporting the volume of traffic that uses Kamehameha Highway. State analysis has found that the bridge is structurally deficient and functionally obsolete and as such has been assigned a Bridge Sufficiency Rating of 38%. The State has exhibited flexibility in design by considering community comments in 2017 and redesigning the			

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project in response. That flexibility is maintained as the design is further refined as a result of pre-consultation comments, and comments to this document from partner agencies charged with managing land, natural and historic resources, and public facilities.			
HRS § 226-15: Objectives and policies for facility systems – solid and liquid wastes.			
(a) Objectives: *Planning for the State's facility systems with regard to solid and liquid wastes shall be directed towards the achievement of the following objectives:*			
(1) Maintenance of basic public health and sanitation standards relating to treatment and disposal of solid and liquid wastes.			X
(2) Provision of adequate sewerage facilities for physical and economic activities that alleviate problems in housing, employment, mobility, and other areas.			X
(b) Policies:			
(1) Encourage the adequate development of sewerage facilities that complement planned growth.			X
(2) Promote re-use and recycling to reduce solid and liquid wastes and employ a conservation ethic.			X
(3) Promote research to develop more efficient and economical treatment and disposal of solid and liquid wastes.			X
Discussion: The project has no relation to the State's goals regarding solid and liquid wastes.			
HRS § 226-16: Objective and policies for facility systems – water.			
(a) Objective: *Planning for the State's facility systems with regard to water shall be directed towards achievement of the objective of the provision of water to adequately accommodate domestic, agricultural, commercial, industrial, recreational, and other needs within resource capacities.*			
(b) Policies:			
(1) Coordinate development of land use activities with existing and potential water supply.			X
(2) Support research and development of alternative methods to meet future water requirements well in advance of anticipated needs.			X
(3) Reclaim and encourage the productive use of runoff water and wastewater discharges.			X
(4) Assist in improving the quality, efficiency, service, and storage capabilities of water systems for domestic and agricultural use.	X		
(5) Support water supply services to areas experiencing critical water problems.			X
(6) Promote water conservation programs and practices in government, private industry, and the general public to help ensure adequate water to meet long-term needs.			X
Discussion: The project has no relation to the State's goals regarding water facility systems, except to ensure that the Board of Water Supply transmission lines are realigned with the highway.			
HRS § 226-17: Objectives and policies for facility systems – transportation.			

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(a) Objective: *Planning for the State's facility systems with regard to transportation shall be directed toward 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.	X		
(2) A statewide transportation system that is consistent with and will accommodate planned growth objectives throughout the State.	X		
(b) Policies:			
(1) Design, program, and develop a multi-modal system in conformance with desired growth and physical development as stated in this chapter;	X		
(2) Coordinate state, county, federal, and private transportation activities and programs toward the achievement of statewide objectives;	X		
(3) Encourage a reasonable distribution of financial responsibilities for transportation among participating governmental and private parties;	X		
(4) Provide for improved accessibility to shipping, docking, and storage facilities;			X
(5) Promote a reasonable level and variety of mass transportation services that adequately meet statewide and community needs;			X
(6) Encourage transportation systems that serve to accommodate present and future development needs of communities;	X		
(7) Encourage a variety of carriers to offer increased opportunities and advantages to interisland movement of people and goods;			X
(8) Increase the capacities of airport and harbor systems and support facilities to effectively accommodate transshipment and storage needs;			X
(9) Encourage the development of transportation systems and programs which would assist statewide economic growth and diversification;			X
(10) Encourage the design and development of transportation systems sensitive to the needs of affected communities and the quality of Hawaii's natural environment;	X		
(11) Encourage safe and convenient use of low-cost, energy-efficient, non-polluting means of transportation;	X		
(12) Coordinate intergovernmental land use and transportation planning activities to ensure the timely delivery of supporting transportation infrastructure in order to accommodate planned growth objectives; and			X
(13) Encourage diversification of transportation modes and infrastructure to promote alternate fuels and energy efficiency.	X		
Discussion: The project has been prioritized and included as a Statewide Transportation Improvement Project and will benefit in part from federal funding from the U.S. Department of Transportation Federal Highways Administration. The project supports these objectives by increasing bridge lane widths to better accommodate freight movement, buses and cars. It supports the island's multimodal transportation system by			

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providing a separated, buffered pedestrian walkway and shoulders to accommodate bicyclists. The process of coordinating efforts between multiple public and private stakeholders with the goal of meeting the transportation needs of the immediate surrounding community is ongoing.			
HRS § 226-18: Objectives and policies for facility systems – energy.			
(a) Objectives: *Planning for the State's facility systems with regard to energy shall be directed toward the achievement of the following objectives, giving due consideration to all:*			
(1) Dependable, efficient, and economical statewide energy systems capable of supporting the needs of the people;			X
(2) Increased energy security and self-sufficiency through the reduction and ultimate elimination of Hawaii's dependence on imported fuels for electrical generation and ground transportation;			X
(3) Greater diversification of energy generation in the face of threats to Hawaii's energy supplies and systems;			X
(4) Reduction, avoidance, or sequestration of greenhouse gas emissions from energy supply and use; and			X
(5) Utility models that make the social and financial interests of Hawaii's utility customers a priority.			X
(b) To achieve the energy objectives, it shall be the policy of this State to ensure the short- and long-term provision of adequate, reasonably priced, and dependable energy services to accommodate demand.			X
(c) Other Policies:			
(1) Support research and development as well as promote the use of renewable energy sources;			X
(2) Ensure that the combination of energy supplies and energy-saving systems is sufficient to support the demands of growth;			X
(3) Base decisions of least-cost supply-side and demand-side energy resource options on a comparison of their total costs and benefits when a least-cost is determined by a reasonably comprehensive, quantitative, and qualitative accounting of their long-term, direct and indirect economic, environmental, social, cultural, and public health costs and benefits;			X
(4) Promote all cost-effective conservation of power and fuel supplies through measures including:			X
(A) Development of cost-effective demand-side management programs;			X
(B) Education;			X
(C) Adoption of energy-efficient practices and technologies; and			X
(D) Increasing energy efficiency and decreasing energy use in public infrastructure;			X
(5) Ensure, to the extent that new supply-side resources are needed, that the development or expansion of energy systems uses the least-cost energy supply option and maximizes efficient technologies;			X

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(6) Support research, development, demonstration, and use of energy efficiency, load management, and other demand-side management programs, practices, and technologies;			X
(7) Promote alternate fuels and transportation energy efficiency;			X
(8) Support actions that reduce, avoid, or sequester greenhouse gases in utility, transportation, and industrial sector applications;			X
(9) Support actions that reduce, avoid, or sequester Hawaii's greenhouse gas emissions through agriculture and forestry initiatives.			X
(10) Provide priority handling and processing for all state and county permits required for renewable energy projects;			X
(11) Ensure that liquefied natural gas is used only as a cost-effective transitional, limited-term replacement of petroleum for electricity generation and does not impede the development and use of other cost-effective renewable energy sources; and			X
(12) Promote the development of indigenous geothermal energy resources that are located on public trust land as an affordable and reliable source of firm power for Hawaii.			X
Discussion: The project has no relation to the State's goals regarding energy facility systems.			
HRS § 226-18.5: Objectives and policies for facility systems – telecommunications.			
(a) Objective: *Planning for the State's telecommunications facility systems shall be directed towards the achievement of dependable, efficient, and economical statewide telecommunications systems capable of supporting the needs of the people.*			
(b) To achieve the telecommunications objective, it shall be the policy of this State to ensure the provision of adequate, reasonably priced, and dependable telecommunications services to accommodate demand.			
(c) Other Policies:			
(1) Facilitate research and development of telecommunications systems and resources;			X
(2) Encourage public and private sector efforts to develop means for adequate, ongoing telecommunications planning;			X
(3) Promote efficient management and use of existing telecommunications systems and services; and			X
(4) Facilitate the development of education and training of telecommunications personnel.			X
Discussion: The project has no relation to the State's goals regarding telecommunication facility systems, except to realign utilities with the highway. Communications with the utility providers is ongoing through the design process and will continue through construction.			
HRS § 226-19: Objectives and policies for socio-cultural advancement – housing.			
(a) Objectives: *Planning for the State's socio-cultural advancement with regard to housing shall be directed toward the achievement of the following objectives:*			

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(1) Greater opportunities for Hawaii's people to secure reasonably priced, safe, sanitary, and livable homes, located in suitable environments that satisfactorily accommodate the needs and desires of families and individuals, through collaboration and cooperation between government and nonprofit and for-profit developers to ensure that more affordable housing is made available to very low-, low- and moderate-income segments of Hawaii's population.			X
(2) The orderly development of residential areas sensitive to community needs and other land uses.			X
(3) The development and provision of affordable rental housing by the State to meet the housing needs of Hawaii's people.			X
(b) Policies:			
(1) Effectively accommodate the housing needs of Hawaii's people.			X
(2) Stimulate and promote feasible approaches that increase housing choices for low-income, moderate-income, and gap-group households.			X
(3) Increase homeownership and rental opportunities and choices in terms of quality, location, cost, densities, style, and size of housing.			X
(4) Promote appropriate improvement, rehabilitation, and maintenance of existing housing units and residential areas.			X
(5) Promote design and location of housing developments taking into account the physical setting, accessibility to public facilities and services, and other concerns of existing communities and surrounding areas.			X
(6) Facilitate the use of available vacant, developable, and underutilized urban lands for housing.			X
(7) Foster a variety of lifestyles traditional to Hawaii through the design and maintenance of neighborhoods that reflect the culture and values of the community.			X
(8) Promote research and development of methods to reduce the cost of housing construction in Hawaii.			X
Discussion: The project has no relation to the State's goals regarding housing, except to provide a more safe, multimodal transportation facility to the residential community in Waiahole.			
HRS § 226-20: Objectives and policies for socio-cultural advancement – health			
(a) Objectives: *Planning for the State's socio-cultural advancement with regard to health shall be directed towards achievement of the following objectives:*			
(1) Fulfillment of basic individual health needs of the general public.			X
(2) Maintenance of sanitary and environmentally healthful conditions in Hawaii's communities.			X
(3) Elimination of health disparities by identifying and addressing social determinants of health.			X
(b) Policies:			

HAWAII STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
(1) Provide adequate and accessible services and facilities for prevention and treatment of physical and mental health problems, including substance abuse.			X
(2) Encourage improved cooperation among public and private sectors in the provision of health care to accommodate the total health needs of individuals throughout the State.			X
(3) Encourage public and private efforts to develop and promote statewide and local strategies to reduce health care and related insurance costs.	X		
(4) Foster an awareness of the need for personal health maintenance and preventive health care through education and other measures.			X
(5) Provide programs, services, and activities that ensure environmentally healthful and sanitary conditions.			X
(6) Improve the State's capabilities in preventing contamination by pesticides and other potentially hazardous substances through increased coordination, education, monitoring, and enforcement.			X
(7) Prioritize programs, services, interventions, and activities that address identified social determinants of health to improve native Hawaiian health and well-being consistent with the United States Congress' declaration of policy as codified in title 42 United States Code section 11702, and to reduce health disparities of disproportionately affected demographics, including native Hawaiians, other Pacific Islanders, and Filipinos. The prioritization of affected demographic groups other than native Hawaiians may be reviewed every ten years and revised based on the best available epidemiological and public health data.			X
Discussion: The project has little relation to the State's goals regarding health, as written in these Objectives. However, the addition of protected pedestrian walkway and shoulders to accommodate bicyclists support State of Hawaii Department of Health initiatives promoting a built environment that encourages walking and biking (State of Hawaii, Department of Health, 2023).			
HRS § 226-21: Objective and policies for socio-cultural advancement – education.			
(a) Objectives: *Planning for the State's socio-cultural advancement with regard to education shall be directed towards achievement of the objective of the provision of a variety of educational opportunities to enable individuals to fulfill their needs, responsibilities, and aspirations.*			
(b) Policies:			
(1) Support educational programs and activities that enhance personal development, physical fitness, recreation, and cultural pursuits of all groups.			X
(2) Ensure the provision of adequate and accessible educational services and facilities that are designed to meet individual and community needs.			X
(3) Provide appropriate educational opportunities for groups with special needs.			X

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(4) Promote educational programs which enhance understanding of Hawaii's cultural heritage.			X
(5) Provide higher educational opportunities that enable Hawaii's people to adapt to changing employment demands.			X
(6) Assist individuals, especially those experiencing critical employment problems or barriers, or undergoing employment transitions, by providing appropriate employment training programs and other related educational opportunities.			X
(7) Promote programs and activities that facilitate the acquisition of basic skills, such as reading, writing, computing, listening, speaking, and reasoning.			X
(8) Emphasize quality educational programs in Hawaii's institutions to promote academic excellence.			X
(9) Support research programs and activities that enhance the education programs of the State.			X
Discussion: The project has no relation to the State's goals regarding education.			
HRS § 226-22: Objective and policies for socio-cultural advancement – social services.			
(a) Objective: *Planning for the State's socio-cultural advancement with regard to social services shall be directed towards the achievement of the objective of improved public and private social services and activities that enable individuals, families, and groups to become more self-reliant and confident to improve their well-being.*			
(b) Policies:			
(1) Assist individuals, especially those in need of attaining a minimally adequate standard of living and those confronted by social and economic hardship conditions, through social services and activities within the State's fiscal capacities.			X
(2) Promote coordination and integrative approaches among public and private agencies and programs to jointly address social problems that will enable individuals, families, and groups to deal effectively with social problems and to enhance their participation in society.			X
(3) Facilitate the adjustment of new residents, especially recently arrived immigrants, into Hawaii's communities.			X
(4) Promote alternatives to institutional care in the provision of long-term care for elder and disabled populations.			X
(5) Support public and private efforts to prevent domestic abuse and child molestation, and assist victims of abuse and neglect.			X
(6) Promote programs which assist people in need of family planning services to enable them to meet their needs.			X
Discussion: The project has no relation to the State's goals regarding social services.			
HRS § 226-23: Objective and policies for socio-cultural advancement – leisure.			

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(a) Objective: *Planning for the State's socio-cultural advancement with regard to leisure shall be directed towards the achievement of the objective of the adequate provision of resources to accommodate diverse cultural, artistic, and recreational needs for present and future generations.*			
(b) Policies:			
(1) Foster and preserve Hawaii's multi-cultural heritage through supportive cultural, artistic, recreational, and humanities-oriented programs and activities.			X
(2) Provide a wide range of activities and facilities to fulfill the cultural, artistic, and recreational needs of all diverse and special groups effectively and efficiently.			X
(3) Enhance the enjoyment of recreational experiences through safety and security measures, educational opportunities, and improved facility design and maintenance.	X		
(4) Promote the recreational and educational potential of natural resources having scenic, open space, cultural, historical, geological, or biological values while ensuring that their inherent values are preserved.			X
(5) Ensure opportunities for everyone to use and enjoy Hawaii's recreational resources.			X
(6) Assure the availability of sufficient resources to provide for future cultural, artistic, and recreational needs.			X
(7) Provide adequate and accessible physical fitness programs to promote the physical and mental well-being of Hawaii's people.			X
(8) Increase opportunities for appreciation and participation in the creative arts, including the literary, theatrical, visual, musical, folk, and traditional art forms.			X
(9) Encourage the development of creative expression in the artistic disciplines to enable all segments of Hawaii's population to participate in the creative arts.			X
(10) Assure adequate access to significant natural and cultural resources in public ownership.			X
Discussion: The project proposes to improve travel experiences, by making the highway and bridge safer for motorized vehicles, bicyclists, and pedestrians.			
HRS § 226-24: Objective and policies for socio-cultural advancement – individual rights and personal well-being.			
(a) Objective: *Planning for the State's socio-cultural advancement with regard to individual rights and personal well-being shall be directed towards achievement of the objective of increased opportunities and protection of individual rights to enable individuals to fulfill their socio-economic needs and aspirations.*			
(b) Policies:			

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(1) Provide effective services and activities that protect individuals from criminal acts and unfair practices and that alleviate the consequences of criminal acts in order to foster a safe and secure environment.			X
(2) Uphold and protect the national and state constitutional rights of every individual.			X
(3) Assure access to, and availability of, legal assistance, consumer protection, and other public services which strive to attain social justice.			X
(4) Ensure equal opportunities for individual participation in society.			X
Discussion: The project has no relation to the State's goals regarding individual rights and personal well-being.			
HRS § 226-25: Objective and policies for socio-cultural advancement – culture.			
(a) Objective: *Planning for the State's socio-cultural advancement with regard to culture shall be directed toward the achievement of the objective of enhancement of cultural identities, traditions, values, customs, and arts of Hawaii's people.*			
(b) Policies:			
(1) Foster increased knowledge and understanding of Hawaii's ethnic and cultural heritages and the history of Hawaii.			X
(2) Support activities and conditions that promote cultural values, customs, and arts that enrich the lifestyles of Hawaii's people and which are sensitive and responsive to family and community needs.			X
(3) Encourage increased awareness of the effects of proposed public and private actions on the integrity and quality of cultural and community lifestyles in Hawaii.			X
(4) Encourage the essence of the aloha spirit in people's daily activities to promote harmonious relationships among Hawaii's people and visitors.			X
Discussion: The project has no relation to the State's goals regarding cultural objectives, except to maintain access to the shoreline and improve the public's ability to traverse to the shoreline by motorized vehicle, by bicycle, or by walking or rolling.			
HRS § 226-26: Objectives and policies for socio-cultural advancement – public safety.			
Objectives: *Planning for the State's socio-cultural advancement with regard to public safety shall be directed towards the achievement of the following objectives:*			
(1) Assurance of public safety and adequate protection of life and property for all people.			X
(2) Optimum organizational readiness and capability in all phases of emergency management to maintain the strength, resources, and social and economic well-being of the community in the event of civil disruptions, wars, natural disasters, and other major disturbances.			X
(3) Promotion of a sense of community responsibility for the welfare and safety of Hawaii's people.			X
(b) Policies related to public safety:			

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(1) Ensure that public safety programs are effective and responsive to community needs.			X
(2) Encourage increased community awareness and participation in public safety programs.			X
(c) Policies related to criminal justice:			
(1) Support criminal justice programs aimed at preventing and curtailing criminal activities.			X
(2) Develop a coordinated, systematic approach to criminal justice administration among all criminal justice agencies.			X
(3) Provide a range of correctional resources which may include facilities and alternatives to traditional incarceration in order to address the varied security needs of the community and successfully reintegrate offenders into the community.			X
(d) Policies related to emergency management:			
(1) Ensure that responsible organizations are in a proper state of readiness to respond to major war-related, natural, or technological disasters and civil disturbances at all times.			X
(2) Enhance the coordination between emergency management programs throughout the State.			X
Discussion: The project has no relation to the State's goals regarding public safety objectives.			
HRS § 226-27: Objectives and policies for socio-cultural advancement – government.			
(a) Objectives: *Planning the State's socio-cultural advancement with regard to government shall be directed towards the achievement of the following objectives:*			
(1) Efficient, effective, and responsive government services at all levels in the State.	X		
(2) Fiscal integrity, responsibility, and efficiency in the state government and county governments.	X		
(b) Policies:			
(1) Provide for necessary public goods and services not assumed by the private sector.	X		
(2) Pursue an openness and responsiveness in government that permits the flow of public information, interaction, and response.			X
(3) Minimize the size of government to that necessary to be effective.			X
(4) Stimulate the responsibility in citizens to productively participate in government for a better Hawaii.			X
(5) Assure that government attitudes, actions, and services are sensitive to community needs and concerns.	X		
(6) Provide for a balanced fiscal budget.			X
(7) Improve the fiscal budgeting and management system of the State.			X

HAWAII STATE PLAN, CHAPTER 226, HRS – PART I. OVERALL THEME, GOALS, OBJECTIVES AND POLICIES (Key: S = Supportive, N/S = Not Supportive, N/A = Not Applicable)	**S**	**N/S**	**N/A**
(8) Promote the consolidation of state and county governmental functions to increase the effective and efficient delivery of government programs and services and to eliminate duplicative services wherever feasible.	X		
Discussion: The Waiahole Bridge replacement proposed project provides necessary public services to the community on a public roadway while also maintaining fiscal responsibility by pursuing Federal funds to assist with project costs. The project demonstrates responsible fiscal planning and responsiveness to community needs. Kamehameha Highway and Waiahole Bridge are managed by the Department of Transportation, Highways. The provision of safe and reliable roadways is within the purview of the agency and, as such, they continue to seek multi-stakeholder collaboration for the provision of these public goods. The State of Hawaii Department of Transportation coordinates with other state, county and federal agencies to efficiently deliver transportation services and to coordinate, where possible, with other projects that may take advantage of the bridge replacement activities.			

6.3 CITY AND COUNTY OF HONOLULU

6.3.1 The City and County of Honolulu General Plan

The General Plan for the City and County of Honolulu is a policy document for the long-range development of the Island of Oahu. The General Plan is a statement of social, economic, environmental, and design objectives for the general welfare and prosperity of the people of Oahu. These objectives contain desirable conditions to be sought in the 20-year planning horizon. The General Plan also includes policies to help direct attainment of the plan's objectives. It was originally adopted in 1977 and most recently amended in 2021.

General Plan Objectives and Policies relating to transportation include a focus on multi-modal network and services that is safe, integrated with land use, and supports travel by people of all ages and abilities. Specifically, a policy (Objective A, Policy 3) suggests providing multi-modal transportation services outside of the urban centers of Oahu sufficient to meet the needs of the communities being served. Additionally, a policy (Objective A, Policy 4) speaks to ensuring adequate and safe access for communities serviced by the coastal highway system and to plan for the relocation of highways subject to sea level rise.

Discussion: The Project purpose is to maintain a highway transportation system that provides for the public transport of individuals to and from work and commercial destinations outside of the urban corridor and to provide better pedestrian and bike crossings for a more integrated multi-modal transportation system. HDOT has adopted the Bridge Adaptive Policy Regarding Sea Level Rise which identifies "the 3.2 feet sea level rise (SLR) exposure area projected to occur in the State by the end of the century as one of the primary planning criteria for existing and future development" and 1.1 ft. SLR in 2050 (HDOT, 2023). Due to the project site being out of the 3.2 ft SLR exposure area, this policy does not apply, however measures have been taken to plan for

future SLR by ensuring that the new bridge is a prefabricated bridge that can be easily relocated if needed.

6.3.2 Koolau Poko Sustainable Communities Plan

The purpose of the Koolau Poko Sustainable Communities Plan[1] is to establish specific policies for future development and land use within the Koolau Poko region as intended by the City and County of Honolulu General Plan (City and County of Honolulu, Department of Planning and Permitting, 2017). The policies include physical, social and economic measures that relate specifically to the Koolau Poko community area located north-east of the Koolau mountain range. Goals and objectives of the Sustainable Communities Plan which are applicable to the project include:

Section 3.1.1 Open Space Preservation…Promote the dual use of roadway and drainage corridors to create linear open space that is also a more inviting environment for walking, jogging and biking. Where physical modification of natural drainageways is necessary to provide adequate flood protection, design and construct such modifications to maintain habitat and aesthetic values, as well as to avoid degradation of the stream, coastline and nearshore water quality.

Section 3.5.1 Residential Use… Encourage bus, pedestrian, and bicycle travel, particularly to reach neighborhood destinations such as schools, parks, and convenience stores, recognizing the need for accessible design and safe travel conditions for elderly and/ or disabled people. Implement passive and active automobile traffic calming measures on residential neighborhood streets and plant street trees to provide shading for sidewalks and bus stops. Provide sufficient area within the public right-of-way to accommodate bus stop shelters.

Section 4.1.5 Transportation Systems… Reduce conflicts between travel and vehicular travel and improve pedestrian safety.

Discussion: The proposed replacement of the Waiahole Bridge is consistent with the Koolau Poko Sustainable Communities Plan in that it enhances the safety of the bridge and highway intersection for those who live and travel through the Koolau Poko community. The enhancements including separated pedestrian walkway, a shoulder to facilitate bicycling, and realigned intersection support the highway itself as part of the open space network where people can walk, run, and roll more safely than under current conditions.

6.3.3 County Zoning

The project site is located in the AG-2, General Agricultural district as shown in Figure 14: Zoning Map. The purpose of Agricultural Districts is to maintain agricultural lands for economic use, prevent incompatible use conflicts, and to promote the viability of existing agricultural operations.

[1] The spelling of this community plan by the City and County of Honolulu is two words, Koolau Poko. This area of Oahu is often spelled as a single word, Koolaupoko. For the purposes of referencing the City and County of Honolulu's Sustainable Community Plan, Koolau Poko will be used in this Section of the document.

Section 21-3.50 of the City and County of Honolulu Comprehensive Zoning Ordinance (CZO) pertains to development and activities within the AG-2 General Agricultural District. The purpose of the General Agricultural District is to ”conserve and protect agricultural activities on smaller parcels of land.”.

Discussion: The replacement of Waiahole Bridge will not alter the essential characteristics of the area, nor will it curtail the use of surrounding lands for agricultural purposes.

6.3.4 City and County of Honolulu Complete Streets Policy

The City and County of Honolulu adopted a Complete Streets policy in 2012 (City and County of Honolulu, 2012). The policy recognizes the benefits of providing street design that promotes safe access for pedestrians, bicyclists, motorists and public transportation users. As such, the policy resolves that all roadway projects in the City and County of Honolulu be balanced and equitable in accommodating travel by bicyclists, public transportation vehicles and their passengers and pedestrians of all ages and abilities.

Discussion: Except for the no action alternative, all design options considered for this project meet the intent of the City and County's Complete Streets policy. More specifically, DTS provided pre-consultation comments (also discussed in Section 5.7.1, and reprinted in Appendix A-2) relating to implementation of the policy and the complete streets manual as reference:

- *Bicycle Improvements. Kamehameha Highway fronting the project site is classified as an "Avenue" planned to have sidewalks, a shoulder bikeway, two travel lanes, bus service mixed with general purpose travel, and no on-street parking. The typical future street cross section will resemble in concept the second design on Page 76 of the City's Complete Streets Design Manual. A priority 1 Shoulder Bikeway proposed project (Project ID 1-38 in the 2019 Oahu Bike Plan) is located on Kamehameha Highway crossing the project site. The replacement bridge shall be designed to accommodate the proposed shoulder bikeway and minimize the number and size of potential conflict areas between bicyclists, pedestrians, and vehicles.*

The proposed bridge will be approximately 55-feet in width to accommodate two 11-foot vehicle lanes, approximately 6.5-foot wide shoulders to accommodate bicyclists, a 5-foot wide separated pedestrian walkway, barriers and structural bracing elements. The approximately 1,000 feet of realigned highway will include two 11-foot vehicle travel lanes, 5-foot wide shoulders for pedestrian/bike each direction, with a total highway width of 32-feet. The realigned highway may also include bus stop pull outs in both directions, pending on final coordination between DTS and HDOT.

6.3.5 Special Management Area

The Special Management Area (SMA) was established to protect coastal resources in areas extending inland of the shoreline. The City and County of Honolulu is the regulatory authority administering SMA permits and shoreline setback provisions. The SMA permit was established in 1975 with the enactment of the Shoreline Protection Act (Act 176) and now serves as the

cornerstone of the Hawaii CZM Program. The SMA permit is the management tool of the CZM Program that ensures that all developments with the SMA are implemented in accordance with the CZM objectives, policies, and County guidelines. The City and County of Honolulu is delegated with the authority to implement the Special Management Area. The SMA requirements are codified in Revised Ordinances of Honolulu, Chapter 25. Chapter 25, ROH was updated by Ordinance 23-4 in 2023.

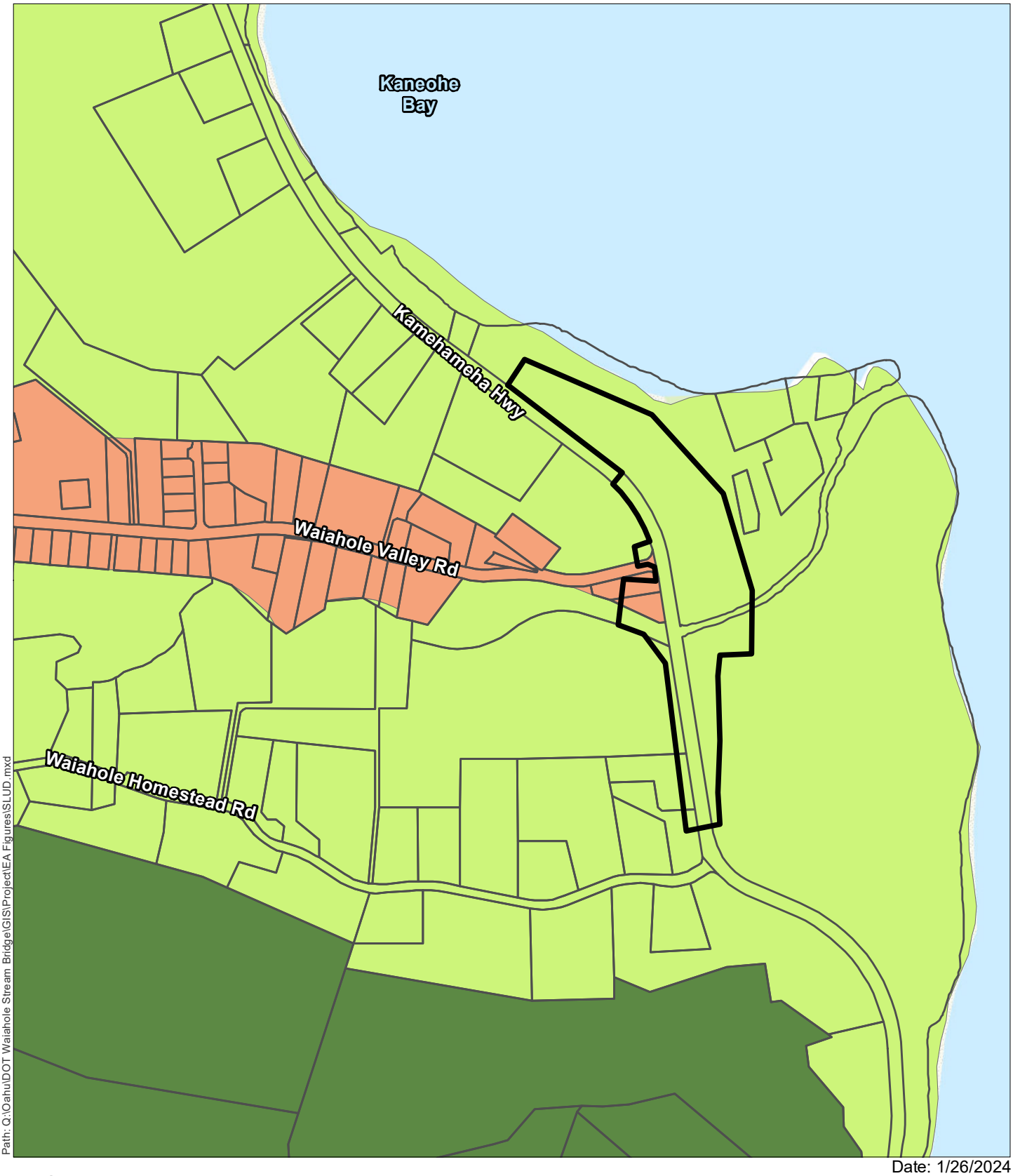
During the 2023 Draft EA pre-assessment consultation period, OPSD provided the following comments:

We note that Kamehameha Highway, along the north shore of Oahu, frequently constitutes the outermost boundary of the SMA as delineated by the City and County of Honolulu (CCH). We recommend that the CCH, Department of Planning and Permitting be consulted on the applicability of SMA Use permitting.

During the 2023 Draft EA pre-assessment consultation period, the Department of Planning and Permitting referred back to 2017 their agency's pre-assessment consultation comments which noted that the Project is within the SMA.

Discussion: It is assumed that a SMA Major will be required as the Project includes realignment of the highway that necessitates new right of way, meeting the definition of "Development" in ROH Chapter 25-1.3.

Special Management Area Objectives, policies, and guidelines are outlined in ROH Chapter 25-3.1. These requirements are those codified in HRS 205-A and are discussed in detail in Chapter 6.2.3 of this document.



Path: Q:\Oahu\DOT Waiahole Stream Bridge\GIS\Project\EA Figures\SLUD.mxd

Date: 1/26/2024

LEGEND

- Project Area
- TMK Parcels

State Land Use Districts

- Agricultural
- Conservation
- Urban

Figure 12:
State Land Use Districts

Waiahole Bridge Replacement

State of Hawai'i — Island of O'ahu

North

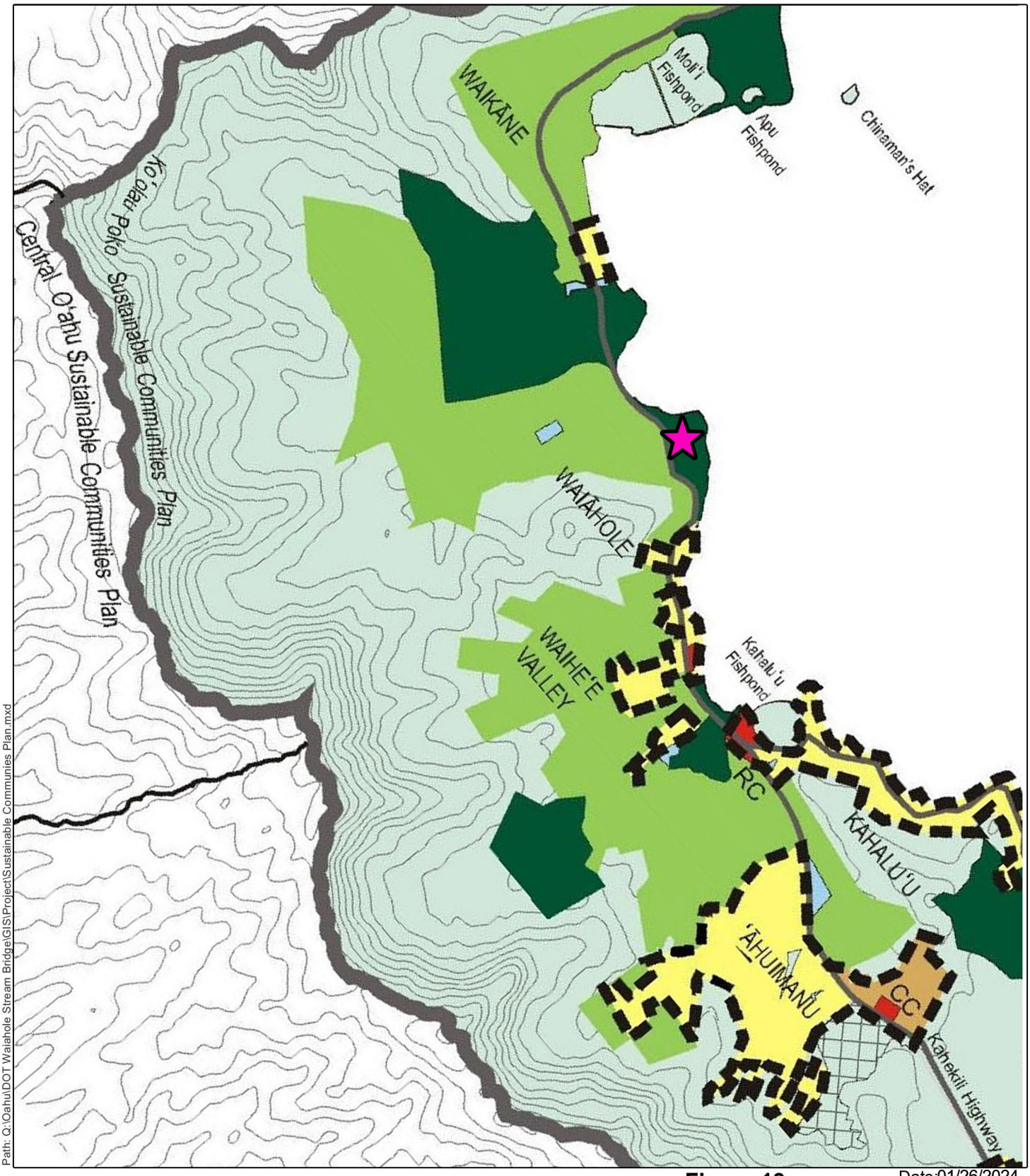
Linear Scale (feet)

0 250 500

PBR HAWAII & ASSOCIATES, INC.

Source: City & County of Honolulu, 2023. State Land Use Commission, 2020, ESRI Basemap.

Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.



Path: Q:\Oahu\DOT Waiahole Stream Bridge\GIS\Project\Sustainable Communities Plan.mxd

Date:01/26/2024

Figure 13:
Koolau Poko Sustainable Communities Plan
Waiahole Bridge Replacement

LEGEND

- Project Area
- Preservation Areas
- Agricultural Areas
- Parks
- Medium Density Residential
- Low Density Residential
- Institutional
- Rural Commercial Center (RC) Suburban Commercial Center (SC), Community Commercial Center (CC), and Regional Town Center (TC)
- Freeways, Highways, and Major Roads
- Community Growth Boundary
- Golf Courses and Cemeteries

State of Hawai'i — Island of O'ahu

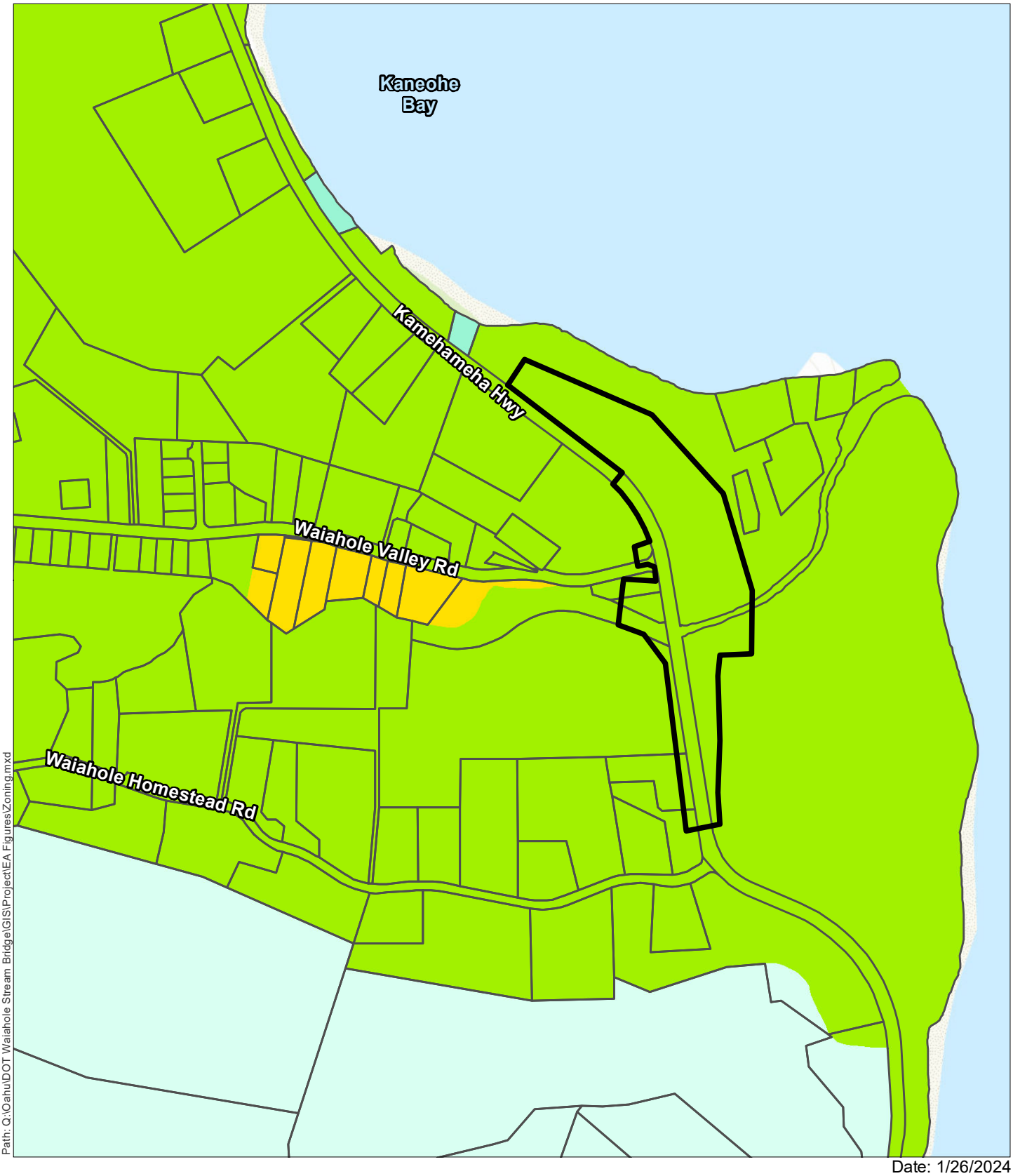
North

Linear Scale (feet): 0 — 2000 — 4000

PBR HAWAII & ASSOCIATES, INC.

Source: City & County of Honolulu, 2017

Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.



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Date: 1/26/2024

LEGEND

Project Area

TMK Parcels

Zoning

- P-1
- P-2
- AG-2
- COUNTRY

Figure 14: Zoning

Waiahole Bridge Replacement

State of Hawai'i

Island of O'ahu

North

Linear Scale (feet)

0 250 500

PBR HAWAII & ASSOCIATES, INC.

Source: City & County of Honolulu, 2023. ESRI Basemap.

Disclaimer: This graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

7.0 ANTICIPATED DETERMINATION, FINDINGS, & REASONS FOR SUPPORTING THE ANTICIPATED DETERMINATION

To determine whether the proposed action may have a significant impact on the environment, including all phases of the project, expected consequences, both primary and secondary, cumulative as well as short- and long-term effects have been evaluated. Based on the research performed and studies evaluated, HDOT is anticipating a Finding of No Significant Impact (FONSI) as detailed in this section.

7.1 SIGNIFICANCE CRITERIA

According to the Department of Health Environmental Impact Assessment Rules Section 11-200.1-13 HAR, an applicant or agency must determine whether an action may have a significant impact on the environment, including all phases of the project, its expected consequences both primary and secondary, its cumulative impact with other projects and its short and long-term effects. In making the determination, the rules establish "significance criteria" to be used as a basis for identifying whether significant environmental impact will occur. According to the Rules, an action shall be determined to have a significant impact on the environment if it meets any one of the following criteria:

(1) Irrevocably commits a natural, cultural or historic resource;

As concluded by the biological surveys and report, although vegetation is likely to be removed for the project there were no threatened or endangered species observed at the project site, nor did the project site provide critical habitat for any threatened or endangered plants or animals. Because certain threatened and endangered species are known to fly over the area and could be present at times, mitigation measures will be employed. Those mitigation measures include avoiding nighttime work, shielding street lights and refraining from clearing large trees during the Hawaiian hoary bat pupping season.

Four wetland areas (named A, B, D, and E in Appendix C). were identified throughout the project area. One of these wetlands, "B" is considered to be under USACE jurisdiction as it has a direct connection to Waiahole Stream. This wetland will be impacted by the highway realignment, thus a Department of the Army permit administered by the USACE will be required.

Bridge support structures will all be constructed well above the Ordinary High Water Mark.

The DOT has initiated the state and federally-required historic review processes required by HRS 6E-8 and Section 106 of the National Historic Preservation Act. Compliance with HRS 6E-8 and Section 106 of the National Historic Preservation Act will be maintained.

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

The proposed rehabilitation or replacement of the bridge will not curtail any use of the environment. Access to Waiahole Beach Park to the public will remain open throughout the construction and upon completion of the highway realignment and bridge replacement. In-water, wetland, and floodplain work will be conducted utilizing best management practices and under the guidance of regulating agencies as described in Sections 4.4, and 4.6-4.8.

(3) Conflicts with the State's long-term environmental policies or goals established by law;

The Project is consistent with the Environmental Policies established in Chapter 344, HRS. Specifically, the Project is consistent with the guidelines pertaining to Transportation, which include:

> *Encourage transportation systems in harmony with the lifestyle of the people and environment of the State;*
>
> *Encourage public and private vehicles and transportation systems to conserve energy, reduce pollution emission, including noise, and provide safe and convenient accommodations for their users.*

These policies are furthered by the proposed upgraded infrastructure that includes increased safety measures for all modes of transportation. The inclusion of shoulders and a separated pedestrian facility encourage use of bicycles and walking/rolling for moving through Waiahole. The facilities should also make accessing the bus a safer and more attractive option for people who wish to use transit.

The Project further maintains consistency with those long-term environmental policies relating to Land, water, mineral, visual, air and other natural resources as discussed throughout this document.

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

The project will not substantially affect the economic and social welfare or the cultural practices of the community or the State. The bridge replacement will serve to enhance the capacity of the transportation system, including provisions for pedestrians and bicyclists and contributing to a safer conditions for the traveling public.

(5) Substantially affects public health;

The project will not negatively affect public health. When completed, the bridge replacement will contribute to a transportation system that helps to promote public health through multi-modal improvements while supporting efficient travel to health care and emergency services.

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

The bridge replacement is not expected to have any impacts such as population changes or increased demand on public facilities.

(7) Involves a substantial degradation of environmental quality;

Upon completion of construction, the bridge will not contribute to a degradation of environmental quality. As discussed throughout this document, best management practices for erosion control will be employed during construction to ensure protect natural resources in the area. Alterations to wetlands, floodplain, and the stream will be conducted in compliance with permitting agencies and their requirements and/or mitigations as applicable. Permitting coordination is ongoing and will continue as the Project design moves from the conceptual toward construction drawings.

(8) Is individually limited but cumulatively has considerable effect on the environment, or involves a commitment for larger actions;

The proposed project addresses a safety and capacity issue that exists presently. It does not commit the State to larger actions in the future and measures have been taken to plan for the future by ensuring that the new bridge is a prefabricated bridge that can be easily relocated if needed in response to sea level rise.

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

The project is not expected to affect rare, threatened or endangered species. Precautions, as guided by the USFWS and the DLNR Division of Forestry and Wildlife will be taken to ensure that night lighting does not affect seabirds and tree removal will not take place during the Hawaiian hoary bat pupping season.

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

During construction, short-term potential impacts on air quality, noise, and water quality may occur. However, these impacts are limited and temporary and will not negatively affect long-term air or water quality or noise levels.

(11) Substantially affects or is likely to suffer damage by being located in an environmentally sensitive area, such as a flood plain, sea level rise exposure area, beach, erosion-prone area, geologically hazardous land, estuary, freshwater, or coastal waters.

Kamehameha Highway is located on the coast and as such, it is in an environmentally sensitive area. Careful planning for construction and coordination with regulatory agencies will be required

to ensure that environmentally sensitive areas are not adversely affected. Discussion of these measures are found in Chapter 4 of this document.

(12) Substantially affects scenic vistas and view planes during the day or night, identified in county or state plans or studies;

As discussed in Section 5.5 of this document, scenic vistas at the bridge itself are obscured by vegetation. However, north of the bridge where the highway will be realigned there are views to the mountains and the ocean. With exception of realignment of utility poles, the highway realignment will not involve any new overhead structures. Thus, views mauka and makai from the highway will remain unobstructed. For adherence to highway safety requirements, the project will require new lighting. However, the highway lighting incorporated in the design will retain comparable lighting to existing conditions and will adhere to modern design standards to mitigate adverse impacts to Hawaiian seabirds. Post-construction streetlighting will meet State laws for shielding and brightness.

(13) Requires substantial energy consumption or emit substantial greenhouse gases.

Once completed, the bridge will require no energy consumption, nor will it emit substantial green house gases. It is anticipated that the addition of pedestrian and bicycle facilities will help to encourage use of alternative modes of transportation thereby contributing to Hawaii's larger effort to reduce greenhouse gas emissions.

7.2 ANTICIPATED DETERMINATION

On the basis of the above criteria, the discussion of impacts and mitigation measures contained in this document, it is anticipated that the Approving Agency, the State of Hawaii Department of Transportation, will find that the replacement of Waiahole Bridge will not have a significant effect on the environment. Pursuant to Chapter 343, Hawaii Revised Statutes, the Accepting Agency is anticipated to issue a Finding of No Significant Impact (FONSI) for the proposed project.

8.0 PUBLIC & AGENCY ENGAGEMENT

8.1 PRE-CONSULTATION

The Department of Transportation has solicited public and agency comments for this project through letters and meetings to request input in advance of this EA. Please see Appendix A-1 and A-2 for pre-assessment consultations conducted in 2017 and again in 2023.

An initial community meeting was held to discuss this project in 2017. A subsequent presentation was made to the Kahaluu Neighborhood Board on January 10, 2023 and a community meeting was held to discuss this Project was held on January 18, 2023.

When the project was reinitiated with the new preferred alternative, a pre-assessment consultation was sent to agencies and individuals to ensure that the public and agencies were aware of the project changes and to solicit updated feedback. Community member contacts were compiled from the sign-in sheet for the public meeting that was held for the Project in 2017. Pre-Assessment Consultation comments received in 2023 are included throughout this document and are provided in full in Appendix A-2. See Table 7 for parties consulted in 2017 and Table 8 for parties consulted in 2023.

Table 7: Pre-Assessment Consulted Parties, 2017

Parties Consulted	Request Sent	Comment Received
Federal		
US Army Corps of Engineers, Honolulu District Regulatory Branch	November 03, 2017	November 22, 2017
NOAA Fisheries, Pacific Island Regional Office, Habitat Conservation Division	November 03, 2017	December 04, 2017
State of Hawaii		
Department of Business Economic Development & Tourism, Hawaii Housing Finance and Development Corporation	November 03, 2017	November 29, 2017
Department of Business Economic Development & Tourism, Office of Planning	November 03, 2017	November 22, 2017
Department of Health, Clean Water Branch	November 03, 2017	November 22, 2017
Department of Defense, Office of the Adjutant General	November 03, 2017	November 15, 2017
Department of Education, Office of School Facilities and Support Services	November 03, 2017	November 13, 2017
City and County of Honolulu		
Board of Water Supply, Water Resources Division, Long-Range Planning Branch	November 03, 2017	December 04, 2017
Department of Community Services	November 03, 2017	November 27, 2017

Parties Consulted	Request Sent	Comment Received
Department of Design and Construction	November 03, 2017	December 05, 2017
Department of Facility Maintenance, Division of Road Maintenance	November 03, 2017	November 20, 2017
Department of Parks & Recreation	November 03, 2017	November 29, 2017
Department of Planning and Permitting	November 03, 2017	December 04, 2017
Department of Transportation Services	November 03, 2017	December 08, 2017
Honolulu Fire Department	November 03, 2017	December 06, 2017
Police Department, Office of the Chief	November 03, 2017	November 20, 2017

Table 8: Pre-Assessment Consulted Parties, 2023

Parties Consulted	Request Sent	Comment Received
Federal		
US Army Corps of Engineers, Honolulu District Regulatory Branch	November 7, 2023	
Department of the Navy - Naval Facilities Engineering Command Pacific	November 7, 2023	November 28, 2023
U.S. Fish and Wildlife Service	November 13, 2023	November 30, 2023
National Marine Fisheries Service	November 13, 2023	
Federal Transit Administration	November 7, 2023	
Federal Highway Administration, Highways Division	November 7, 2023	
USDA - Natural Resources Conservation Service	November 7, 2023	
U.S. Coast Guard	November 7, 2023	
Environmental Protection Agency	November 13, 2023	
Federal Emergency Management Agency	November 7, 2023	
National Parks Service	November 13, 2023	
DOI Geological Survey - Pacific Islands Water Science Center	November 13, 2023	
State of Hawaii		
Department of Accounting and General Services	November 7, 2023	November 16, 2023
Department of Accounting and General Services- Archives Division	November 13, 2023	November 13, 2023
Department of Agriculture	November 7, 2023	
Department of the Attorney General	November 7, 2023	
Department of the Attorney General, Commerce and Economic Development Division	November 7, 2023	

Parties Consulted	Request Sent	Comment Received
Department of Business Economic Development & Tourism	November 7, 2023	
DBEDT - Hawaii State Energy Office / Strategic Industries Division	November 13, 2023	
DBEDT - Hawaii Housing Finance and Development Corporation	November 7, 2023	November 22, 2023
DBEDT - Land Use Commission	November 13, 2023	
DBEDT - Office of Planning & Sustainable Development	November 7, 2023	November 28, 2023
DBEDT - Research Division Library	November 7, 2023	
Department of Defense - Engineering Office	November 7, 2023	November 28, 2023
Department of Education	November 7, 2023	November 27, 2023
Department of Hawaiian Home Lands	November 13, 2023	
Department of Health	November 7, 2023	
Department of Health, Environmental Health Administration	November 7, 2023	
Department of Health - Clean Air Branch	November 13, 2023	November 16, 2023
Department of Health - Clean Water Branch	November 13, 2023	November 16, 2023
Department of Health - Environmental Management Division	November 7, 2023	
Department of Health - Wastewater Branch	November 13, 2023	
Department of Health - Safe Drinking Water Branch	November 7, 2023	
Department of Health - Solid & Hazardous Waste Branch	November 13, 2023	November 17, 2023
Department of Health - Hazard Evaluation & Emergency Response Office	November 13, 2023	
Department of Health - Environmental Health Services Division	November 13, 2023 *Email bounced back*	
Department of Health - Indoor and Radiological Health Branch	November 13, 2023	November 13, 2023
Department of Health - Sanitation Branch	November 13, 2023	
Department of Health - Vector Control Branch	November 13, 2023	
Department of Health - State Laboratories Division	November 13, 2023	November 13, 2023
Department of Health – Noise Division	November 13, 2023	November 13, 2023
Department of Human Services	November 7, 2023	November 29, 2023
Department of Land and Natural Resources	November 7, 2023	

Parties Consulted	Request Sent	Comment Received
DLNR - Historic Preservation Division	November 13, 2023	
DLNR - Land Division	November 13, 2023	
DLNR Commission on Water Resource Management	November 7, 2023	
DLNR Division of Aquatic Resources	November 13, 2023	November 21, 2023
DLNR Division of Boating & Ocean Recreation	November 13, 2023	November 14, 2023
DLNR DOFAW	November 7, 2023	December 1, 2023
DLNR DOFAW Na Ala Hele	November 13, 2023	
DLNR Engineering Division	November 7, 2023	
DLNR Office of Conservation & Coastal Lands	November 7, 2023	November 20, 2023
Department of Public Safety	November 7, 2023	
Hawaii Public Housing Authority	November 7, 2023	
Hawaii Tourism Authority	November 7, 2023	
Judiciary - Office of the Administrative Director of Courts	November 7, 2023	
Office of Hawaiian Affairs	November 7, 2023	
Hawaii Tourism Authority	November 7, 2023	
City and County of Honolulu		
Board of Water Supply	November 7, 2023	December 1, 2023
Department of Budget and Fiscal Services	November 7, 2023	
Department of Community Services	November 7, 2023	November 15, 2023
Department of Customer Services	November 7, 2023	
Department of Design and Construction	November 7, 2023	November 28, 2023
Department of Emergency Management	November 7, 2023	December 7, 2023
Department of Enterprise Services	November 7, 2023	
Department of Environmental Services	November 7, 2023	
Department of Facility Maintenance	November 7, 2023	December 1, 2023
Department of Land Management	November 7, 2023	
Department of Parks and Recreation	November 7, 2023	
Department of Planning and Permitting	November 7, 2023	December 6, 2023
Department of Transportation Services	November 7, 2023	November 30, 2023
Honolulu Authority for Rapid Transportation	November 7, 2023	
Honolulu Emergency Services Department	November 7, 2023	
Honolulu Fire Department	November 7, 2023	November 20, 2023
Honolulu Police Department	November 7, 2023	November 20, 2023
Office of Climate Change, Sustainability and Resiliency	November 13, 2023	
Office of Economic Development	November 7, 2023	

Parties Consulted	Request Sent	Comment Received
Office of Housing	November 7, 2023	
Oahu Transit Services	November 7, 2023	
Community		
Hawaii Community Development Authority	November 7, 2023	
Hawaii Gas	November 13, 2023	
Hawaiian Electric Company, Inc	November 7, 2023	
Hawaiian Telcom	November 13, 2023	
Honolulu Civil Beat	November 13, 2023	
Honolulu Star Advertiser	November 13, 2023	
Oahu MPO	November 13, 2023	November 14, 2023
Spectrum	November 13, 2023	
Waiahole Elementary	November 13, 2023	
Waiahole Nursery & Garden Center	November 7, 2023	
Waiahole Homestead Farms	November 7, 2023	
Waiahole Poi Factory	November 13, 2023	
Cynthia Hopkins	November 13, 2023	December 6, 2023
Nick Cambra	November 13, 2023	November 14, 2023
Nicholas Reppun	November 13, 2023	December 6, 2023
Rainbow Ulii	November 13, 2023	December 5, 2023
Silvestre Ulep	November 13, 2023	December 6, 2023
Verna Ulii	November 13, 2023	December 5, 2023

8.2 ADDITIONAL CONSULTATION

8.2.1 Chapter 195D, Conservation of Aquatic Life, Wildlife and Land Plants

Appendix A-2 contains correspondence with the Department of Land and Natural Resources, Division of Forestry and Wildlife and the Division of Aquatic Resources as it pertains to Chapter 195D of Hawaii Revised Statutes 03 Title 12 Conservation and Resources.

8.2.2 Chapter 6E-8, Historic Preservation

Appendix H contains correspondence with the State Historic Preservation Division as it pertains to Chapter 6E-8 of Hawaii Revised Statutes.

8.2.3 Section 7, Endangered Species Act

Appendix G contains correspondence with the U.S. Fish and Wildlife Service as it pertains to the Endangered Species Act.

8.2.4 Section 106, National Historic Preservation Act

DOT will be consulting with the State Historic Preservation Officer and Native Hawaiian Organizations on behalf of FHWA in compliance with Section 106.

9.0 REFERENCES

City and County of Honolulu. (2012). Ordinance 12-15. *Relating to Complete Streets*. Honolulu: https://www.honolulu.gov/rep/site/dpptod/dpptod_docs2/Ord_12_15.pdf.

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APPENDIX A-1

Catie Cullison

From: Frager, Rebecca M CIV USARMY CEPOH (US) <Rebecca.M.Frager@usace.army.mil>
Sent: Wednesday, November 22, 2017 11:27 AM
To: Catie Cullison
Subject: RE: POH-2017-00241 (Waiahole Bridge Replacement, Island of Oahu, Kaneohe, HI)

Aloha Ms. Cullison,

I have reviewed your letter requesting comments for the Waiahole Bridge Replacement, in Kaneohe, Island of Oahu, HI. We have assigned your project Department of the Army (DA) File number: POH-2017-00241. Please refer to this number in all future correspondence with our office regarding this project.

The replacement of the bridge may require a permit from our office. At this point, my first question for you is whether or not the stream is tidally influenced. Secondly, will there be any in-water work required to complete the bridge replacement?

Thank you for your cooperation with the Honolulu Regulatory Branch.

Sincerely,
Becca Frager
Biologist
U.S. Army Corps of Engineers
Honolulu District Regulatory Office
Building 230
Fort Shafter, HI 96858-5440
808-835-4307

-----Original Message-----
From: Tatum, Alton L CTR (US)
Sent: Tuesday, November 14, 2017 4:55 PM
To: ccullison@pbrhawaii.com
Cc: Frager, Rebecca M CIV USARMY CEPOH (US) <Rebecca.M.Frager@usace.army.mil>
Subject: POH-2017-00241 (Waiahole Bridge Replacement, Island of Oahu, Kaneohe, HI)

Your project has been assigned Department of the Army File No. POH-XXXX-XXXXX and is currently assigned to Ms. Rebecca Frager (PROJECT MANAGER). You may contact her at (808) 835-4307 or via email at Rebecca.M.Frager@usace.army.mil.

If you have not received a response from the above project manager within 30 days, please contact our main office at (808) 835-4303 or via email at CEPOH-RO@usace.army.mil.

Mahalo,

ALTON L. TATUM
Administrative Assistant, Regulatory Office USACE-Honolulu District Bldg 252 Fort Shafter, HI 96858-5440
Phone: (808)-835-4303
Fax: (808)-835-4126

Catie Cullison

From: Tatum, Alton L CTR (US) <Alton.L.Tatum@usace.army.mil>
Sent: Tuesday, November 14, 2017 4:55 PM
To: Catie Cullison
Cc: Frager, Rebecca M CIV USARMY CEPOH (US)
Subject: POH-2017-00241 (Waiahole Bridge Replacement, Island of Oahu, Kaneohe, HI)

Follow Up Flag: Follow up
Flag Status: Flagged

Your project has been assigned Department of the Army File No. POH-XXXX-XXXXX and is currently assigned to Ms. Rebecca Frager (PROJECT MANAGER). You may contact her at (808) 835-4307 or via email at Rebecca.M.Frager@usace.army.mil.

If you have not received a response from the above project manager within 30 days, please contact our main office at (808) 835-4303 or via email at CEPOH-RO@usace.army.mil.

Mahalo,

ALTON L. TATUM
Administrative Assistant, Regulatory Office USACE-Honolulu District Bldg 252 Fort Shafter, HI 96858-5440
Phone: (808)-835-4303
Fax: (808)-835-4126

Catie Cullison

From: Shannon Lyday Ruseborn - NOAA Affiliate <shannon.ruseborn@noaa.gov>
Sent: Monday, December 04, 2017 8:46 AM
To: Catie Cullison
Cc: Gerry Davis - NOAA Federal; Malia Chow - NOAA Federal
Subject: Waiahole Bridge Replacement

Project Name: Waiahole Bridge Replacement and Construction of Temporary Bypass

Applicant: State of Hawaii Department of Transportation, Highways Division

Agent: PBR Hawaii & Associates, Inc., Attn: Catie Cullison

Re: NMFS Technical Assistance

Date: December 4, 2017

NMFS EFH Consultation Point of Contact: Shannon Ruseborn

In their November 3rd 2017 letter, PBR Hawaii & Associates requested comments from NOAA's National Marine Fisheries Service (NMFS) Pacific Islands Regional Office (PIRO) on the preparation of an Environmental Assessment for the State of Hawaii Department of Transportation (HDOT) proposal to replace Waiahole Bridge, located on Kamehamea Highway in Ko'olaupoko, Oahu. The proposed project will require a permit from the United States Army Corps of Engineers (USACE). Additionally, it is anticipated that HDOT will be using federal funds for the project. As such, NMFS anticipates that either USACE or the federal funding agency will consult with NMFS on the essential fish habitat (EFH) provisions of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act, section 305(b)) as described by 50 CFR 600.920, and Section 7 of the Endangered Species Act.

The proposed project includes activities which may adversely affect the quality and/or quantity of EFH. Therefore, NMFS PIRO Habitat Conservation Division (HCD) provides the following comments in order to inform project proponents how to avoid, minimize, and offset or otherwise mitigate for adverse effects to EFH while in the planning phase of the project. It is expected that NMFS' comments, if adopted and implemented, will expedite the EFH consultation with NMFS for this project. This letter does not provide any comments pursuant to the Endangered Species Act, which can be obtained directly from NMFS' Protected Resources Division.

Project Description

The existing Waiahole Bridge is a 66-foot long, 26-foot wide, two-span concrete girder structure over the Waiahole Stream. The bridge is over 100 years old, lacks important safety features, and cannot handle the current volume of traffic. The proposed project activities include demolition of the existing bridge; creating a detour road and temporary bridge; and construction of a new bridge with improved approaches and bridge pier scour protection. Currently, stream water can overtop the stream embankments and debris gets caught under the bridge by the center pier. As part of the proposed work, the stream channel and bridge span will be widened and the center pier removed. Waiahole Stream empties into Kaneohe Bay, between Waiahole Beach Park and Waiahole-Waikane Nature Preserve.

Magnuson-Stevens Act

The Magnuson-Steven Act defines EFH as "those waters and substrates necessary to fish for spawning, breeding, feeding or growth to maturity" (16 U.S.C. 1802(10)). Adverse effects to EFH may result from actions occurring within EFH or "upstream" from EFH; and may include site-

specific or habitat-wide impacts including individual, cumulative, or synergistic consequences of actions (50 C.F.R. § 600.810(a)). The water column and bottom of Kaneohe Bay adjacent to Waiahole Stream are defined as EFH and support various life stages for the management unit species (MUS) identified in the Western Pacific Regional Fishery Management Council's Pelagic and Hawaii Archipelago Fishery Ecosystem Plans.

Additionally, Kaneohe Bay is identified as a Habitat Area of Particular Concern (HAPC). HAPCs are subsets of EFH that merit special considerations to conserve the habitat because they meet at least one of the following conditions: 1) the importance of the ecological function provided by the habitat; 2) the extent to which the habitat is sensitive to human-induced environmental degradation; 3) whether, and to what extent, development activities are, or will be, stressing the habitat type; and 4) the rarity of the habitat type (50 CFR 600.815(a)(8)). Actions that occur in HAPCs may receive more scrutiny by NMFS and action agencies may want to consider extra measures to avoid, minimize, or mitigate adverse effects on EFH within HAPCs.

The minimum requirements to initiate an EFH consultation includes the following basic information (i.e., standard of evidence) as described at 50 CFR 600.920 (e)(3).

1) A description of the proposed action.

2) An analysis of the potential adverse effects of the action on EFH, and the MUS.

3) The federal agency conclusions regarding the effects of the action on EFH.

4) Proposed mitigation (avoidance, minimization and offset) measures if applicable.

Early coordination can be provided throughout the lead Federal agency's planning process, and typically leads to the identification of the types of information needed and the appropriate confidence level (i.e., accuracy) of supporting data (i.e., the standard of evidence) for PIRO HCD to: (1) conduct an initial review of the proposed action, (2) determine completeness of the materials, and (3) determine the appropriate scale of the EFH effects analysis.

NMFS Comments

NMFS is unable to estimate all potential adverse effects to EFH as a result of project activities until more explicit project implementation information is made available. However, the following approaches can be incorporated and many project impacts to NOAA trust resources would be avoided and/or minimized.

General

• Address the cumulative impacts of past, present, and foreseeable future development activities on aquatic habitats by considering them in the review process for road construction projects.

• Use "soft" approaches in lieu of impervious "hard" stabilization and modifications whenever possible to allow for water infiltration.

• Include efforts to preserve and enhance aquatic habitat to offset impacts from proposed stream modifications.

Construction

• Conduct in-water construction activities during the dry season to prevent environmental impacts to aquatic species. Temporary diversions and coffer dams may be suitable alternatives with proper planning.

• Design and install new structures in a manner not to interfere with aquatic organism passage and that complies with all applicable regulations.

• Design the structure to maintain or replicate natural stream channel and flow conditions to the greatest extent practicable. The structure should be able to pass peak flows in accordance with state and federal regulations. Ensure sufficient hydrologic data have been collected.

• Design bridge abutments to minimize disturbances to stream banks, and place abutments outside of the floodplain whenever possible. Design structures to provide sufficient water depth and maintain suitable water velocities for aquatic species during their migration season. An open bottom bridge is preferred.

• Avoid in-water work as much as possible. If there are no alternatives to conducting work on land and in-water work must be conducted, construction activities should take place during a time of year that would have the least environmental impacts to aquatic species (low flow season). Also, ensure that materials used for the bridge are nontoxic to aquatic organisms (avoid pressure treated lumber).

Habitat: Streams

• Avoid the modification of riparian habitat and use non-impervious materials whenever possible.

• If excavation of stream channel is required, recommend stabilizing area by planting bare soil areas with vegetation and maintaining the vegetated areas by irrigation and weeding.

• Construct a low-flow channel to facilitate aquatic biota passage and help maintain water temperature in reaches where water velocities require armoring of the stream bed.

• Replace in-stream aquatic biota habitat by installing boulders, rock weirs, and woody debris and by planting riverine aquatic cover vegetation to provide shade and habitat.

Water Quality

• Recommended BMPs/mechanisms for reducing sedimentation and turbidity: silt fences, silt curtains, geotextile rock bag protection, dewatering using the Caisson system, use of coffer dams.

• Inspect BMPs for preventing/minimizing erosion regularly for integrity. If integrity is lost, stop work until properly functioning.

• Specify erosion control measures in construction plans.

• Avoid side casting of road materials into streams.

• Use only native vegetation for stabilization plantings and maintain or stabilize upstream and downstream channel and bank conditions if the structure causes erosion or accretion problems.

• Use seasonal restrictions to avoid water quality impacts to coral reef habitat during species critical life history stages; June through August for coral reef spawning.

• Design and maintain roadway and associated stormwater collection systems efficiently.

• Avoid impervious surfaces in wetlands and consider low impacts development stormwater practices to retain storm flows and pollutants on-site and maintain roadway and associated stormwater collection systems properly.

• Ensure that the hydrodynamics and sedimentation patterns are properly modeled and that the design avoids erosion to adjacent properties when "hard" stabilization is deemed necessary.

• Implement an erosion control BMP plan to avoid and minimize sedimentation and turbidity during and post-construction.

Conclusion

The preferred method for submitting requests for consultations with NMFS PIRO is via the email address EFHESAconsult@noaa.gov. However, the point of contact for essential fish habitat consultations under the Magnuson-Stevens Act is Gerry Davis, Assistant Regional Administrator for the Habitat Conservation Division, gerry.davis@noaa.gov. The point of contact for Section 7 of the Endangered Species Act is Anne Garrett, Assistant Regional Administrator for the Protected Resources Division, ann.garrett@noaa.gov.

NMFS is committed to providing continued cooperation and subject matter technical expertise that result in beneficial outcomes for NOAA trust resources and sufficiently comply with relevant mandates, while achieving the project goals effectively and expeditiously. Please contact Shannon Ruseborn at 808-725-5017 and/or Shannon.ruseborn@noaa.gov with any comments, questions, or to request further technical assistance.

Shannon Lyday Ruseborn
EFH/Habitat Blueprint Assistant Coordinator
Contractor - Lynker Technologies
Habitat Conservation Division
NOAA Fisheries, Pacific Island Regional Office
Inouye Regional Center
1845 Wasp Blvd.
Honolulu, HI 96818
shannon.ruseborn@noaa.gov
808-725-5017

DAVID Y. IGE
GOVERNOR

CRAIG K. HIRAI
EXECUTIVE DIRECTOR

STATE OF HAWAII
DEPARTMENT OF BUSINESS ECONOMIC DEVELOPMENT & TOURISM
HAWAII HOUSING FINANCE AND DEVELOPMENT CORPORATION
677 QUEEN STREET, SUITE 300
Honolulu, Hawaii 96813
FAX: (808) 587-0600

IN REPLY PLEASE REFER TO:
17:AM/387

November 29, 2017

PBR HAWAII & Associates, Inc.
Attn: Catie Cullison
1001 Bishop Street, Suite 650
Honolulu, HI 96813-3484

Re: **Pre-Assessment Consultation for Kamehameha Highway (Route 83) Replacement of Waiāhole Bridge and Construction of a Temporary Bypass, Waiāhole, Ko'olaupoko, O'ahu**

Dear Ms. Cullison:

This is in response to your letter dated November 3, 2017 regarding the Pre-Assessment consultation of the proposed Waiāhole Bridge Replacement and Temporary Bypass.

The proposed project is adjacent to the Waiāhole Valley Agricultural Park and Residential Lots Subdivision, of which Hawaii Housing Finance and Development Corporation (HHFDC) owns and manages approximately 600 acres. In addition to HHFDC's 92 residential and agricultural lessees, there are approximately 20 parcels leased from the Department of Hawaiian Home Lands and various private landowners within Waiāhole Valley. These lessees and landowners will be affected by the proposed construction activities and ultimately benefit from replacement of the bridge.

For years, residents and farmers in Waiāhole have expressed their concern with the existing Waiāhole Bridge, which historically has caused damaging floods due to its inability to handle water flow during periods of heavy rain. The historic Waiāhole Poi Factory, the Waiahole Botanicals nursery, and surrounding farms have all been flooded in recent years.

The narrowness of the existing bridge creates vehicular, pedestrian, and cyclist safety issues due to its proximity to the intersection of Kamehameha Highway and Waiāhole Valley Road as well as the adjacent Waiāhole Poi Factory. We recommend that these life safety issues be considered during the design phase for the temporary bypass and permanent bridge replacement.

To the extent that the project will require the use of HHFDC lands for access, construction staging, etc., Rights of Entry should be requested from HHFDC.

Thank you for the opportunity to comment on this worthwhile project.

If you have any questions, please call Jason Takata, Property Management Coordinator, at 587-0585.

Sincerely,

Craig K. Hirai
Executive Director

OFFICE OF PLANNING
STATE OF HAWAII

DAVID Y. IGE
GOVERNOR

LEO R. ASUNCION
DIRECTOR
OFFICE OF PLANNING

235 South Beretania Street, 6th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Telephone: (808) 587-2846
Fax: (808) 587-2824
Web: http://planning.hawaii.gov/

DTS201711211612NA

November 22, 2017

Ms. Catie Cullison
Senior Associate
PBR HAWAII & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484

Dear Ms. Cullison:

Subject: Pre-Assessment Consultation for Environmental Assessment – Kamehameha Highway (Route 83) Replacement of Waiahole Bridge and Construction of a Temporary Bypass
TMK: (1) 4-8-001:010; 4-8-002:001; 4-8-008:018, 021-025; and 4-8-009; 001 and 006

Thank you for the opportunity to provide comments on this pre-assessment consultation request for the preparation of a Draft Environmental Assessment (Draft EA) on the Waiahole Bridge replacement and construction of a temporary bypass road project. This project is proposed by the State of Hawaii Department of Transportation (HDOT), Highways Division. The pre-consultation review material was transmitted to our office via letter dated November 3, 2017.

It is our understanding that HDOT seeks to replace the Waiahole Bridge located along Kamehameha Highway, Waiahole Valley, Oahu. The current bridge is nearly a century old and does not meet American Association of State Highway Transportation Officials safety standards. HDOT has deemed this viaduct as no longer viable and structurally unsafe to accommodate the volume of traffic that it currently serves.

HDOT construction activities include the demolition of the existing bridge and providing a detour (which may include a temporary bridge); construction of a new wider bridge with the center pier removed; bridge scour protection; and improving vehicular bridge approach areas. This project will require staging areas adjacent to the bridge and possible night time work.

The Office of Planning (OP) has reviewed the transmitted material and has the following comments to offer:

1. Pursuant to Hawaii Administrative Rules (HAR) § 11-200-10(4) – general description of the action's technical, economic, social, and environmental characteristics, this project must demonstrate that it is consistent with a number of state environmental, social, economic goals, and policies. Hawaii Revised Statutes (HRS) Chapter 226, the Hawaii State Planning Act, provides goals, objectives, policies, planning coordination and implementation, and priority guidelines for growth, development, and the allocation of

resources throughout the state.

The Draft EA should include a discussion on the project's ability to meet all parts of HRS Chapter 226. The analysis should examine consistency with these statutes or clarify where it is in conflict with them. If any of these statutes are not applicable to the project, the analysis should affirmatively state such determination, followed by discussion paragraphs.

2. The coastal zone management (CZM) area is defined as "all lands of the State and the area extending seaward from the shoreline to the limit of the State's police power and management authority, including the U.S. territorial sea" (HRS § 205A-1).

   HRS Chapter 205A-5(b) requires all state and county agencies to enforce the CZM objectives and policies. The Draft EA should include an assessment as to how the proposed action conforms to each of the goals and objectives as listed in HRS § 205A-2. Compliance with HRS § 205A-2 is an important component for satisfying the requirements of HRS Chapter 343.

3. The proposed project site is located within the special management area (SMA) delineated by the City and County of Honolulu. Please consult with the Department of Planning and Permitting (DPP), City and County of Honolulu on SMA use requirements and permitting.

4. Based on the information provided, this project may utilize federal funding and involves work within the bed or banks of Waiahole Stream. If construction activities require a federal permit (e.g., Department of the Army Permit), or federal funding is involved, this project may be subject to a federal consistency review. The national Coastal Zone Management Act (CZMA) requires that federal actions be consistent with approved state coastal programs enforceable policies. Federal actions are defined by this act as activities performed by a federal agency; activities that require federal permits or approvals; or state and local government projects that receive federal financial assistance.

   OP is the lead state agency with the authority to conduct CZMA federal consistency reviews. Please contact our office regarding the CZMA federal consistency review.

5. Pursuant to HAR § 11-200-10(6) – identification and summary of impacts and alternatives considered; in order to ensure that the surface water and marine resources of Oahu remain protected, the negative effects of stormwater inundation, potentially caused by the proposed development activities, should be evaluated in the Draft EA. Issues that may be examined include, but are not limited to, project site characteristics in relation to flood and erosion prone areas, open spaces, the potential vulnerability of surface water resources, drainage infrastructure currently in place, soil absorption characteristics of the area, and examining the amount of permeable versus impervious surfaces in the project area. These items should be considered when developing mitigation measures for the protection for surface water resources and the coastal

ecosystem, pursuant to HAR § 11-200-10(7).

Based on the information provided, due to the project's location, parcel size, and the potential increase of impervious surfaces in the Waiahole Valley area, this proposed action may be subject to the DPP rules on drainage and onsite stormwater management. Please contact DPP on the application and necessity of their low impact development (LID) post-construction standards as they pertain to this project.

To assist in the development of onsite stormwater management strategies and the use of LID measures, OP has developed guidance documents on this subject. We recommend consulting these stormwater evaluative tools when developing mitigation approaches for polluted runoff. They offer useful techniques to keep land-based pollutants and sediment in place, while considering the management practices best suited for the topography of the area and the types of contaminants potentially impacting nearby water resources. The evaluative tools that should be used during the design process include:

- Stormwater Impact Assessments can be used to identify and analyze information on hydrology, sensitivity of coastal and riparian resources, and management measures to control runoff, as well as consider secondary and cumulative impacts to the area.
  http://files.hawaii.gov/dbedt/op/czm/initiative/stomwater_imapct/final_stormwater_impact_assessments_guidance.pdf

- Low Impact Development (LID), A Practitioners Guide covers a range of structural best management practices for stormwater control management, onsite infiltration techniques, water reuse methods, and structure layout designs that minimize negative environmental impacts.
  http://files.hawaii.gov/dbedt/op/czm/initiative/lid/lid_guide_2006.pdf

If you have any questions regarding this comment letter, please contact Joshua Hekekia of our office at (808) 587-2845.

Sincerely,

Leo R. Asuncion
Director

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:
EMD/CWB

11036PST.17

November 22, 2017

Ms. Catie Cullison
Senior Associate
PBR Hawaii & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484

Dear Ms. Cullison:

SUBJECT: Comments on the Pre-Assessment Consultation for Environmental Assessment (EA) for the Kamehameha Highway (Route 83) Replacement of Waiahole Bridge and Construction of Temporary Bypass, Koolaupoko, Island of Oahu, Hawaii TMKs 1st: 4-8-001:010, 4-8-002:001, 4-8-008:018, 4-8-008:021, 4-8-08:022, 4-8-008:023, 4-8-008:024, 4-8-008:025, 4-8-009:001, and 4-8-009:006 Federal Aid Project No. BR-083-1(37)

The Department of Health (DOH), Clean Water Branch (CWB), acknowledges receipt of your letter, dated November 3, 2017, requesting comments on the subject project. The DOH-CWB has reviewed the document and offers these comments. Please note that our review is based solely on the information provided in the subject document and its compliance with the Hawaii Administrative Rules (HAR), Chapters 11-54 and 11-55. The State of Hawaii, Department of Transportation may be responsible for fulfilling additional requirements related to our program. We recommend that they also read our standard comments on our website at: http://health.hawaii.gov/epo/files/2013/05/Clean-Water-Branch-Std-Comments.pdf.

1. 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).

2. The Applicant may be required to obtain National Pollutant Discharge Elimination System (NPDES) permit coverage for discharges of wastewater, including storm water runoff, into State surface waters (HAR, Chapter 11-55).

For NPDES general permit coverage, a Notice of Intent (NOI) form must be submitted at least 30 calendar days before the commencement of the discharge. An application for an NPDES individual permit must be submitted at least 180 calendar days before the commencement of the discharge. To request NPDES permit coverage, the Applicant must submit the applicable form ("CWB Individual NPDES Form" or "CWB NOI Form") through the e-Permitting Portal and the hard copy certification statement with the respective filing fee ($1,000 for an individual NPDES permit or $500 for a Notice of General Permit Coverage). The Applicant can open the e-Permitting Portal website located at: https://eha-cloud.doh.hawaii.gov/epermit/. They will be asked to do a one-time registration to obtain their login and password. After they register, they can click on the Application Finder tool and locate the appropriate form. They can then follow the instructions to complete and submit the form.

3. If the Applicant's project involves work in, over, or under waters of the United States, it is highly recommended that they contact the Army Corp of Engineers, Regulatory Branch (Tel: 835-4303) regarding their permitting requirements.

   Pursuant to Federal Water Pollution Control Act [commonly known as the "Clean Water Act" (CWA)], Paragraph 401(a)(1), a Section 401 Water Quality Certification (WQC) is required for "[a]ny applicant for Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may **result** in any discharge into the navigable waters..." (emphasis added). The term "discharge" is defined in CWA, Subsections 502(16), 502(12), and 502(6); Title 40 of the Code of Federal Regulations, Section 122.2; and HAR, Chapter 11-54.

4. 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.

5. It is the State's position that all projects must reduce, reuse, and recycle to protect, restore, and sustain water quality and beneficial uses of State waters. Project planning should:

   a. Treat storm water as a resource to be protected by integrating it into project planning and permitting. Storm water has long been recognized as a source of irrigation that will not deplete potable water resources. What is often overlooked is that storm water recharges ground water supplies and feeds streams and estuaries; to ensure that these water cycles are not disrupted, storm water cannot be relegated as a waste product of impervious surfaces. Any project

planning must recognize storm water as an asset that sustains and protects natural ecosystems and traditional beneficial uses of State waters, like community beautification, beach going, swimming, and fishing. The approaches necessary to do so, including low impact development methods or ecological bio-engineering of drainage ways must be identified in the planning stages to allow designers opportunity to include those approaches up front, prior to seeking zoning, construction, or building permits.

b. Clearly articulate the State's position on water quality and the beneficial uses of State waters. The plan should include statements regarding the implementation of methods to conserve natural resources (e.g., minimizing potable water for irrigation, gray water re-use options, energy conservation through smart design) and improve water quality.

c. Consider storm water Best Management Practice (BMP) approaches that minimize the use of potable water for irrigation through storm water storage and reuse, percolate storm water to recharge groundwater to revitalize natural hydrology, and treat storm water which is to be discharged.

d. Consider the use of green building practices, such as pervious pavement and landscaping with native vegetation, to improve water quality by reducing excessive runoff and the need for excessive fertilization, respectively.

e. Identify opportunities for retrofitting or bio-engineering existing storm water infrastructure to restore ecological function while maintaining, or even enhancing, hydraulic capacity. Particular consideration should be given to areas prone to flooding, or where the infrastructure is aged and will need to be rehabilitated.

If you have any questions, please visit our website at: http://health.hawaii.gov/cwb, or contact the Engineering Section, CWB, at (808) 586-4309.

Sincerely,

for

ALEC WONG, P.E., CHIEF
Clean Water Branch

c: DOH-EPO [via e-mail Noella.Narimatsu@doh.hawaii.gov only]

DAVID Y. IGE
GOVERNOR

ARTHUR J. LOGAN
MAJOR GENERAL
ADJUTANT GENERAL

KENNETH S. HARA
BRIGADIER GENERAL
DEPUTY ADJUTANT GENERAL

STATE OF HAWAII
DEPARTMENT OF DEFENSE
OFFICE OF THE ADJUTANT GENERAL
3949 DIAMOND HEAD ROAD
HONOLULU, HAWAII 96816-4495

November 15, 2017

Ms. Catie Cullison
PBR Hawaii & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484

Dear Ms. Cullison

Subject: Pre-assessment Consultation for Kamehameha Highway Replacement of Waiahole Bridge and Construction of a Temporary Bypass, Koolaupoko, Oahu, Waiahole

Thank you for the opportunity to comment on the above project. The State of Hawaii Department of Defense has no comments to offer relative to the project.

Should you have any questions or concerns, please have your staff contact Ms. Shao Yu Lee, our Land Manager on Oahu, at (808) 733-4222.

Sincerely,

NEAL S. MITSUYOSHI, P.E.
Colonel, Hawaii National Guard
Chief Engineering Officer

c: Mr. David Kennard, Hawaii Emergency Management Agency (HI-EMA)
Ms. Havinne Okamura, HI-EMA
Mr. Albert Chong, HI-EMA
Mr. Karl Motoyama, Hawaii Army National Guard Environmental (HIARNG-ENV)
Maj Nhut Dao, 154th Civil Engineer Squadron (154th CES)

DAVID Y. IGE
GOVERNOR

DR. CHRISTINA M. KISHIMOTO
SUPERINTENDENT

STATE OF HAWAI`I
DEPARTMENT OF EDUCATION
P.O. BOX 2360
HONOLULU, HAWAI`I 96804

OFFICE OF SCHOOL FACILITIES AND SUPPORT SERVICES

November 13, 2017

Ms. Catie Cullison
PBR HAWAII & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484

Re: Pre-Assessment Consultation for Replacement of Waiahole Bridge, Waiahole, Oahu

Dear Ms. Cullison:

The Department of Education (DOE) would like to make one request for the pre-assessment phase of the Waiahole Bridge replacement project. We ask that the Principal of Waiahole Elementary School be notified in advance of any and all project related activities that will affect traffic flow on Waiahole Valley Road. School students and staff would be a significant part of the daily traffic entering and exiting the valley.

The DOE appreciates the opportunity to offer this early request. If you have any questions, please call Heidi Meeker of the Planning Section, Facilities Development Branch, at 784-5095.

Respectfully,

Kenneth G. Masden II
Public Works Manager
Planning Section

KGM:jmb

c: Matt Ho, CAS, Castle-Kahuku Complex Area

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HI 96843
www.boardofwatersupply.com

December 4, 2017

Ms. Catie Cullison
PBR Hawaii & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484

Dear Ms. Cullison:

Subject: Your Letter Dated November 3, 2017 Regarding the Pre-Assessment Consultation for Kamehameha Highway Replacement of Waiahole Bridge and Construction of a Temporary By-pass, Koolaupoko, Oahu, Waiahole Tax Map Key: 4-8-001: 010, 4-8-002: 001, 4-8-008: 018, 021 to 025, 4-8-009: 001 & 006, Federal Aid Project No. BR-083-1(37)

Thank you for the opportunity to review the subject project.

We have the following comments to offer:

1. The Board of Water Supply (BWS) has existing water infrastructure (waterlines, service laterals, valves, water meters and fire hydrants) in the vicinity of the proposed replacement bridge and temporary by-pass project.

    a. We have an existing 8-inch pipeline hanging on the bridge which is connected to our Waihee 265 water system. The connection to the water system must remain in service during construction. We require a temporary equivalent size main be installed with the temporary by-pass road.

    b. The final replacement of the existing 8-inch main on the bridge may be increased to a 12-inch main to improve fire protection for the BWS water system.

    c. We have an existing 30-inch pipeline near the existing bridge which connects the Kahana 315 system to the Windward 272 water system. The connection between the water systems must remain in service during construction. If the main may be impacted and/or moved during construction, we require further consultation as to how the main will be moved and still provide the ability to move water across this section.

2. Construction plans should be submitted for BWS review and approval to ensure that the proposed project does not interfere with the operation and maintenance of the existing infrastructure.

3. We reserve further comments until the Environmental Assessment is published for Public Review and as development plans are further along.

If you have any questions, please contact Iris Oda, Long-Range Planning Branch of our Water Resources Division at 748-5946 or by e-mail at ioda@hbws.org.

Very truly yours,

ERNEST Y. W. LAU, P.E.
Manager and Chief Engineer

DEPARTMENT OF COMMUNITY SERVICES
CITY AND COUNTY OF HONOLULU
925 DILLINGHAM BOULEVARD, SUITE 200 • HONOLULU, HAWAII 96817
PHONE: (808) 768-7762 • FAX: (808) 768-7792
www.honolulu.gov/dcs

KIRK CALDWELL
MAYOR

PAMELA A. WITTY-OAKLAND
DIRECTOR

SUSAN L. FERNANDEZ
DEPUTY DIRECTOR

November 27, 2017

Ms. Catie Cullison
PBR HAWAII & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813

Dear Ms. Cullison:

SUBJECT: Pre-Assessment Consultation
Kamehameha Highway (Route 83) Replacement of Waiahole Bridge and Construction of a Temporary Bypass, Ko'olaupoko, Federal Aid Project No. BR-003-4(37)
Honolulu, Oahu, Hawaii
Tax Map Keys: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018, (1) 4-8-008:021 thru 025, (1) 4-8-009:001, and (1) 4-8-009:006

Thank you for your letter and the pre-assessment information regarding Federal Aid Project BR-003-4(37).

Our review of the document provided indicated the proposed project will have no adverse impacts on any Department of Community Services' activities or projects at this time.

Thank you for providing us with the opportunity to comment on this letter.

Sincerely,

Pamela A. Witty-Oakland
Director

PWO:ta

DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 11TH FLOOR
HONOLULU, HAWAII 96813
Phone: (808) 768-8480 • Fax: (808) 768-4567
Web site: www.honolulu.gov

KIRK CALDWELL
MAYOR

ROBERT J. KRONING, P.E.
DIRECTOR

MARK YONAMINE, P.E.
DEPUTY DIRECTOR

December 5, 2017

PBR Hawaii and Associates, Inc.
ATTN: Catie Cullison
1001 Bishop Street, Suite 650
Honolulu, HI 96813

Ms. Cullison,

Subject: Pre-Assessment Consultation for Kamehameha Highway Replacement of Waiahole Bridge and Construction of a Temporary Bypass, Koolaupoko, Oahu, Waiahole

Thank you for the opportunity to review and comment. The Department of Design and Construction does not have any current or future project that would be impacted by this work in the park land.

However, our Facilities Division recommends that the State of Hawaii Department of Transportation Administration work closely with the Department of Parks and Recreation to insure that there is no adverse impact to their current or future activities.

Should you have any further questions, please call me at 768-8480.

Sincerely,

Robert J. Kroning, P.E.
Director

RJK:ms(708805)

DEPARTMENT OF FACILITY MAINTENANCE

CITY AND COUNTY OF HONOLULU

1000 Ulu`ohia Street, Suite 215, Kapolei, Hawaii 96707
Phone: (808) 768-3343 • Fax: (808) 768-3381
Website: www.honolulu.gov

KIRK CALDWELL
MAYOR

ROSS S. SASAMURA, P.E.
DIRECTOR AND CHIEF ENGINEER

EDUARDO P. MANGLALLAN
DEPUTY DIRECTOR

IN REPLY REFER TO:
DRM 17-620

November 20, 2017

Ms. Catie Cullison
Senior Associate
PBR HAWAII & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484

Dear Ms. Cullison:

Subject: Pre-Assessment Consultation for Kamehameha Highway (Route 83) Replacement of Waiahole Bridge and Construction of a Temporary Bypass

Thank you for allowing us the opportunity to review and comment on your letter dated November 3, 2017, on the above subject.

We have no comments at this time, as we do not have any facilities or easements on the subject property. However, there is a City bus stop next to the Waiahole Bridge, which may need to be temporary relocated during construction. Please coordinate with Oahu Transit Services.

If you have any questions, please call Mr. Kyle Oyasato of the Division of Road Maintenance at 768-3697.

Sincerely,

Ross S. Sasamura, P.E.
Director and Chief Engineer

cc: Oahu Transit Services

DEPARTMENT OF PARKS & RECREATION

CITY AND COUNTY OF HONOLULU

1000 Uluohia Street, Suite 309, Kapolei, Hawaii 96707
Phone: (808) 768-3003 • Fax: (808) 768-3053
Website: www.honolulu.gov

KIRK CALDWELL
MAYOR

MICHELE K. NEKOTA
DIRECTOR

JEANNE C. ISHIKAWA
DEPUTY DIRECTOR

November 29, 2017

Ms. Catie Cullison, Senior Associate
PBR Hawaii & Associates
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813

Dear Ms. Cullison:

SUBJECT: Pre-Assessment Consultation for Kamehameha Highway (Route 83) Replacement of Waiahole Bridge and construction of a temporary bypass Koolaupoko, Oahu, WaiaholeTMK's (1) 4-8-001:010, 4-8-002:001, 4-8-008:018, 4-8-008:021, 4-8-008:022, 4-8-008:023, 4-8-008:024, 4-8-008:025, 4-8-009:001, 4-8-009:006 Federal-Aid Project No. BR-083-1(37)

Thank you for the opportunity to review and comment at the pre-consultation stage of the Environmental Assessment for the subject project.

The Department of Parks and Recreation strongly suggests the project's design/construction team take a close look at the suitability of the proposed staging area on a portion of the adjacent park property in the vicinity of the Waiahole Bridge, as it is a low lying area often soft and inaccessible.

We suggest the design/construction team schedule a meeting with District Park Manager, Miles Hazama to secure the Department's approval of the specific staging area required, and determination of accessible routes in and out of the park and restoration of the property upon completion of construction. Mr. Hazama can be contacted at 768-8984.

There are no other programs or activities of the Department that should be affected by the project.

Should you have any questions, please contact John Reid, Planner at 768-3017.

Sincerely,

Michele K. Nekota
Director

MKN:jr
(708928)

cc: Miles Hazama, Department of Parks and Recreation

DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 7TH FLOOR • HONOLULU, HAWAII 96813
PHONE: (808) 768-8000 • FAX: (808) 768-6041
DEPT. WEB SITE: www.honoluludpp.org • CITY WEB SITE: www.honolulu.gov

KIRK CALDWELL
MAYOR

KATHY K. SOKUGAWA
ACTING DIRECTOR

TIMOTHY F. T. HIU
DEPUTY DIRECTOR

2017/ELOG-2301 (df)

December 4, 2017

Ms. Catie Cullison
PBR Hawaii & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484

Dear Ms. Cullison:

This is in response to your letter of transmittal dated November 3, 2017, requesting comments on the pre-assessment for a Draft Environmental Assessment (DEA) for the Kamehameha Highway (Route 83) Replacement of Waiahole Bridge and Construction of a Temporary Bypass Project, Koolaupoko, Waiahole, TMK: 4-8-001: 010, 4-8-002: 001, 4-8-008: 018, 4-8-008: 021, 4-8-008: 022, 4-8-008: 023, 4-8-008: 024, 4-8-008: 025, 4-8-009: 001, and 4-8-009: 006.

Our preliminary comments are as follows:

1. The DEA should describe how the proposed project meets the planning principles and guidelines for the Koolaupoko Sustainable Communities Plan including, but not limited, to Section 4.1 ("Transportation Systems").

2. The DEA should include an analysis of the possible impact of sea level rise on the project. If it is likely that sea level rise will increase the risks of flooding and erosion during the life of the project structures, the DEA should discuss how the design of the project and proposed operations at the project site will address those risks and provide resilience in recovering from any flooding or erosion.

The national standard for making such project assessments has been developed by the U. S. Army Corps of Engineers (USACE).

- The USACE issued an Engineering Regulation (ER 1100-2-8162) on December 13, 2013, which provides "guidance for incorporating the direct and indirect physical effects of projected future sea level change across the project life cycle in managing, planning, engineering, designing, constructing, operating, and maintaining USACE projects."

- The guidance in the regulation can be used as the basis for assessing the "potential relative sea level change" that might be experienced by projects in shoreline areas, and is required to be used for all USACE civil works.

- See **http://www.corpsclimate.us/rccslca.cfm** for more details, including use of an online sea-level calculator, which can be used to produce Oahu specific projections of sea level rise through 2100. The calculator also provides data from the closest National Oceanic and Atmospheric Administration tidal gauge, on the historic patterns of high water levels and tidal variations, which can be used to determine how episodic flooding might be affected by projected sea level rise.

  A professional geologist or engineer can provide a coastal hazard assessment and determine if sea level rise will result in increased exposure to permanent or episodic flooding, groundwater inundation, coastal erosion, or beach loss at the project site.

3. The project is located in the Special Management Area (SMA).

4. The project may require a grading permit. If a grading permit is required, then the project shall comply with the "Rules Relating to Water Quality."

Should you have any questions, please contact Don Fujii, of the Site Development Division, at 768-8107.

Very truly yours,

Kathy K. Sokugawa
Acting Director

cc: Planning Division
LUPD

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 3RD FLOOR
HONOLULU, HAWAII 96813
Phone: (808) 768-8305 • Fax: (808) 768-4730 • Internet: www.honolulu.gov

KIRK CALDWELL
MAYOR

WES FRYSZTACKI
DIRECTOR

JON Y. NOUCHI
DEPUTY DIRECTOR

TP11/17-710645R

December 8, 2017

Ms. Catie Cullison
Senior Associate
PBR HAWAII & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484

Dear Ms. Cullison:

SUBJECT: Pre-Consultation Draft Environmental Assessment (DEA) for Kamehameha Highway (Route 83) Replacement of Waiahole Bridge and Construction of a Temporary Bypass, Waiahole, Oahu, Hawaii

In response to your letter dated November 3, 2017, we have the following comments:

1. This project is in an existing public transit service area. To ensure that the project development does not affect public transit services (bus operations, bus routes, bus stops and para-transit operations); submit project plans to DTS - Public Transit Division (PTD) for review and approval. Contact DTS-PTD at 768-8396, 768-8370, 768-8374 or TheBusStop@honolulu.gov.

2. Construction materials and equipment should be transferred to and from the project site during off-peak traffic hours (8:30 a.m. to 3:30 p.m.) to minimize any possible disruption to traffic on the local streets.

3. The area Neighborhood Board, as well as the area businesses, emergency personnel (fire, ambulance and police), Oahu Transit Services, Inc. (TheBus and TheHandi-Van), etc., should be kept apprised of the details of the proposed project and the impacts that the project may have on the adjoining local street area network.

Thank you for the opportunity to review this matter. Should you have any questions, please contact Renee Yamasaki of my staff at 768-8383.

Very truly yours,

Wes Frysztacki
Director

HONOLULU FIRE DEPARTMENT

CITY AND COUNTY OF HONOLULU

636 South Street
Honolulu, Hawaii 96813-5007
Phone: 808-723-7139 Fax: 808-723-7111 Internet: www.honolulu.gov/hfd

KIRK CALDWELL
MAYOR

MANUEL P. NEVES
FIRE CHIEF

LIONEL CAMARA JR.
DEPUTY FIRE CHIEF

December 6, 2017

Ms. Catie Cullison
Senior Associate
PBR Hawaii & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484

Dear Ms. Cullison:

Subject: Preassessment Consultation for Kamehameha Highway
Replacement of Waiahole Bridge and Construction of a Temporary Bypass
Tax Map Keys: 4-8-001: 010
4-8-002: 001
4-8-008: 018, 021, 022, 023, 024 and 025
4-8-009: 001 and 006

In response to your letter dated November 3, 2017, regarding the abovementioned subject, the Honolulu Fire Department requires that the following requirements of the National Fire Protection Association (NFPA) 1; Uniform Fire Code (UFC)™ 2012 Edition are met:

1. Fire department access roads shall have an unobstructed width of not less than 20 feet or as approved by the Authority Having Jurisdiction (AHJ). (NFPA 1; UFC™, 2012 Edition, Section 18.2.3.4.1.1.)

2. Fire department access roads shall have an unobstructed vertical clearance of not less than 13 feet 6 inches (4.1 meters) or as approved by the AHJ. (NFPA 1; UFC™, 2012 Edition, Section 18.2.3.4.1.2.)

3. Fire department access roads shall be designed and maintained to support the imposed loads of fire apparatus and shall be provided with an all-weather driving surface. (NFPA 1; UFC™, 2012 Edition, Section 18.2.3.4.2 Surface.)

4. Turns in fire department access roads shall maintain the minimum road width. (NFPA 1; UFC™, 2012 Edition, Section 18.2.3.4.3.2.)

5. Dead-end fire department access roads in excess of 150 feet in length shall be provided with approved provisions for the fire apparatus to turn around. (NFPA 1; UFC™, 2012 Edition, Section 18.2.3.4.4, Dead Ends.)

6. The angle of approach and departure for any means of fire department access road shall not exceed one-foot drop in 20 feet (0.3 meter drop in 6 meters) or the design limitations of the fire apparatus of the fire department, and shall be subject to approval by the AHJ. (NFPA 1; UFC™, 2012 Edition, Section 18.2.3.4.6.2*.)

Should you have questions, please contact Battalion Chief Wayne Masuda of our Fire Prevention Bureau at 723-7151 or wmasuda@honolulu.gov.

Sincerely,

Socrates D. Bratakos

SOCRATES D. BRATAKOS
Assistant Chief

SDB/TC:bh

POLICE DEPARTMENT

CITY AND COUNTY OF HONOLULU

801 SOUTH BERETANIA STREET · HONOLULU, HAWAII 96813
TELEPHONE: (808) 529-3111 · INTERNET: www.honolulupd.org

KIRK CALDWELL
MAYOR

Susan Ballard
CHIEF

(vacant)
(vacant)
DEPUTY CHIEFS

OUR REFERENCE MT-DK

November 20, 2017

Ms. Catie Cullison
PBR HAWAII & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484

Dear Ms. Cullison:

This is in response to your letter of November 3, 2017, requesting comments on a Pre-Assessment Consultation, Draft Environmental Assessment, for the Kamehameha Highway (Route 83) Replacement of Waiahole Bridge and Construction of a Temporary Bypass project in Koolaupoko.

The Honolulu Police Department has reviewed this project and has concerns regarding the safe flow of traffic at the project site.

We recommend that the developer evaluate the outcome of the traffic flow affected by the detour road and bridge at the project site, especially along Kamehameha Highway in the area south of Waiahole Valley Road. We also recommend that the developer provide a traffic mitigation plan to implement traffic controls and management (e.g., flag persons, clear signage and cones, special duty officers, etc.) for construction vehicles driving to and from the work site. This will ensure a safe means of ingress/egress for construction vehicles, motorists, and pedestrians in the vicinity.

Additionally, the contractor should obtain the necessary street usage permits from the Department of Transportation Services, City and County of Honolulu, for the purposes of parking and transporting any construction equipment around the vicinity of the project area.

If there are any questions, please call Major Gordon Gomes District 4 (Kailua-Kaneohe-Kahuku) at 723-8639.

Thank you for the opportunity to review this project.

Sincerely,

SUSAN BALLARD
Chief of Police

By
MARK TSUYEMURA
Management Analyst VI
Office of the Chief

Serving and Protecting With Aloha

APPENDIX A-2

From: Catie Cullison
To: Kayla Palmer
Subject: FW: State DOT Letter
Date: Tuesday, November 28, 2023 7:06:50 AM
Attachments: State of Hawaii DOT Ltr (Waiahole Bridge Replacement).PDF

From: Stock, Thomas R LCDR USN NAVFAC PAC PEARL HI (USA) <thomas.r.stock.mil@us.navy.mil>
Sent: Tuesday, November 28, 2023 7:02 AM
To: Catie Cullison <ccullison@pbrhawaii.com>
Cc: Raya, Silvia B CPO USN NAVFAC PAC PEARL HI (USA) <silvia.b.raya.mil@us.navy.mil>; Borengasser, W R (Billy) CIV USN NAVFAC PAC PEARL HI (USA) <william.r.borengasser.civ@us.navy.mil>; Wong, Marc K CIV USN NAVFAC PAC PEARL HI (USA) <marc.k.wong.civ@us.navy.mil>
Subject: FW: State DOT Letter

Aloha,

Confirming we are in receipt of the attached letter and we do not have any projects that would be impacted by the proposed intersection improvements.

Please let me know if you have any questions. Thank you.

Very respectfully,
Thomas R. Stock, P.E.
LCDR, CEC, USN
Executive Assistant to the Commander
NAVFAC Pacific / COMPACFLT Civil Engineer
Office: 808-472-1000/1005
NIPR: thomas.r.stock.mil@us.navy.mil
SIPR: thomas.r.stock3@navy.smil.mil

From: Borengasser, W R (Billy) CIV USN NAVFAC PAC PEARL HI (USA) <william.r.borengasser.civ@us.navy.mil>
Sent: Friday, November 17, 2023 8:41 AM
To: Stock, Thomas R LCDR USN NAVFAC PAC PEARL HI (USA) <thomas.r.stock.mil@us.navy.mil>
Cc: Wong, Marc K CIV USN NAVFAC PAC PEARL HI (USA) <marc.k.wong.civ@us.navy.mil>
Subject: State DOT Letter

LCDR Stock,

Confirming that NAVFAC does not have any projects that would be impacted by the proposed intersection improvements identified in the attached letter.

Very Respectfully,
Billy

Billy Borengasser, P.E.
Director, Construction Program (DC5)
Design and Construction Business Line (DCBL)
Naval Facilities Engineering Systems Command Pacific
258 Makalapa Drive
JBPHH, HI 96860-3134
Phone: (808) 472-1172
Email: william.borengasser@navy.mil

JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA

DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
ENVIRONMENTAL DESIGN SECTION, ROOM 688A
HIGHWAY DESIGN SECTION, ROOM 609
HYDRAULIC DESIGN SECTION, ROOM 636
TECHNICAL DESIGN SECTION, ROOM 688

EDWIN H. SNIFFEN
DIRECTOR
KA LUNA HO'OKELE

Deputy Directors
Nā Hope Luna Ho'okele
DREANALEE K. KALILI
TAMMY L. LEE
ROBIN K. SHISHIDO

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF TRANSPORTATION | KA 'OIHANA ALAKAU
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:

HWY-DS 2.20093

February 1, 2024

Rear Admiral Jeffery Killan, Commander
Naval Facilities Engineering Command Pacific
258 Makalapa Drive, Suite 100
Pearl Harbor, Hawaii 96860-3134

Dear Rear Admiral Killan:

Subject: Pre-Assessment Consultation for Kamehameha Highway (Route 83)
Replacement of Waiahole Bridge, Koolaupoko, Oahu, Waiahole,
Tax Map Keys: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018,
(1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023, (1) 4-8-008:024,
(1) 4-8-008:025, (1) 4-8-009:001, and (1) 4-8-009:006
Federal-Aid Project No. BR-083-1(088)

Thank you for your email comment dated November 28, 2023 regarding the subject project. We acknowledge your comments below and provide the following responses.

> *We do not have any projects that would be impacted by the proposed intersection improvements.*

We acknowledge your comment stating that the proposed project will have no adverse impacts on any of your projects or activities.

We will include you in future correspondence as we seek further input on the proposed improvements to the intersection throughout the environmental review process in compliance with Hawaii Revised Statutes Chapter 343.

We value your participation in the environmental review process. Your letter and this response will be reproduced in the forthcoming Draft Environmental Assessment.

Should you have any questions please contact Evan Kimoto, State of Hawaii Department of Transportation Project Manager, at (808) 692-7551, or by email at evan.kimoto@hawaii.gov

Sincerely,

Henry Kennedy

HENRY KENNEDY
Engineering Program Manager
Design Branch

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawai‘i 96850

In Reply Refer To:
2023-0130791-S7-001

November 30, 2023

Mr. Henry Kennedy
Attn: Ms. Catie Cullison
PBR Hawai‘i & Associates. Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawai‘i 96813

Subject: Technical Assistance for the Proposed Waiahole Bridge Replacement Project on Route 83, O‘ahu (HWY-DS 2.2137; Federal Aid Project No. BR-083-1 (088))

Dear Mr. Kennedy:

Thank you for your October 31, 2023, letter, requesting technical assistance for the proposed Waiāhole Bridge Replacement Project on Route 83 (Kamehameha Highway), located on the island of O‘ahu [TMKs: (1) 4-8-001:010, 4-8-002:001, 4-8-008:018, :021 through :025, 4-8-009:001 and :006]. In 2017, the State of Hawai‘i Department of Transportation (HDOT) held a pre-consultation and community meeting for the Waiāhole Bridge Replacement Project. Due to community concerns about safety along this section of Kamehameha Highway, HDOT has updated the proposed project by planning to realign approximately 1,000 lineal feet of the highway and constructing the new bridge adjacent to the downstream face of the existing bridge. The intersection of Waiāhole Valley Road and Kamehameha Highway will be redesigned to accommodate the new highway alignment.

The bridge replacement is proposed on the site of the existing Waiāhole Bridge, a 66-foot long and 26-foot wide two-span concrete girder structure. This bridge replacement is needed because the current bridge is structurally deficient. The bridge is unable to handle the current volume of traffic on Kamehameha Highway and is lacking important safety features such as shoulders and pedestrian accessways per the American Association of State Highway Transportation Officials standards.

The proposed bridge includes new railings and accessways to allow vehicles, bicycles, and pedestrians to use the bridge safely. During the construction of the new bridge and highway alignment, the existing bridge will remain open to traffic. Once the new bridge and highway are

completed the existing bridge will be demolished. Demolition of the existing bridge will include the removal of the center pier down to the mudline.

Our letter has been prepared under the authority of and in accordance with provisions of the Endangered Species Act of 1973 (16 U.S.C. 1531 *et seq*.), as amended (ESA). We have reviewed the information you provided and pertinent information in our files, as it pertains to federally listed species in accordance with section 7 of the ESA. Our data indicate the following species may occur or transit through the vicinity of the proposed project area: the endangered ʻuaʻu (Hawaiian petrel, *Pterodroma sandwichensis*), endangered Hawaiʻi distinct population segment (DPS) of the ʻakēʻakē (band-rumped storm-petrel, *Hydrobates castro*), threatened ʻaʻo (Newell's shearwater, *Puffinus newelli*) (hereafter collectively referred to as Hawaiian seabirds); endangered ʻōpeʻapeʻa (Hawaiian hoary bat, *Lasiurus cinereus semotus*); endangered koloa maoli (Hawaiian duck, *Anas wyvilliana*), endangered ʻalae keʻokeʻo (Hawaiian coot, *Fulica alai*), endangered aeʻo (Hawaiian stilt, *Himantopus mexicanus knudseni*), and endangered ʻalae ʻula (Hawaiian gallinule, *Gallinula galeata sandvicensis*) (hereafter collectively referred to as Hawaiian waterbirds). We provide the following to assist you in preparation of your project.

Hawaiian Seabirds

Hawaiian seabirds may traverse the project area at night during the breeding, nesting, and fledging seasons, March 1 through December 15. Outdoor lighting could result in seabird disorientation, fallout, and injury or mortality. Seabirds are attracted to lights and after circling the lights they may become exhausted and collide with nearby wires, buildings, or other structures or they may land on the ground. Downed seabirds are subject to increased mortality due to collision with automobiles, starvation, and predation by dogs, cats, and other predators. Young birds (fledglings) traversing the project area between September 15 and December 15, in their first flights from their mountain nests to the sea, are particularly vulnerable to light attraction.

To avoid and minimize potential project impacts to Hawaiian seabirds we recommend you incorporate the following measures into your project design:

- Fully shielded all outdoor lights so the bulb can only be seen from below.
- Install automatic motion sensor switches and controls on all outdoor lights or turned off lights when human activity is not occurring in the lighted area.
- Avoid nighttime construction during the seabird fledging period, September 15 through December 15.

Hawaiian Hoary Bat

Hawaiian hoary bat roosts in woody vegetation across all islands and will leave their young unattended in trees and shrubs when they forage. If trees or shrubs 15 feet or taller are cleared during the pupping season, June 1 through September 15, there is a risk that young bats could inadvertently be harmed or killed, since they are too young to fly or move away from disturbance. Hawaiian hoary bat forages for insects from as low as 3 feet to higher than 500 feet above the ground and can become entangled in barbed wire used for fencing.

To avoid and minimize potential project impacts to the endangered Hawaiian hoary bat, we

recommend you incorporate the following applicable measures into your project design:

- Do not disturb, remove, or trim woody plants greater than 15 feet tall during the birthing and pup rearing season for Hawaiian hoary bat, June 1 through September 15.
- Do not use barbed wire for fencing.

Hawaiian Waterbirds

Hawaiian waterbirds are currently found in a variety of wetland habitats including freshwater marshes and ponds, coastal estuaries and ponds, artificial reservoirs, kalo or taro (*Colocasia esculenta*) loʻi or patches, irrigation ditches, sewage treatment ponds, and in the case of the koloa maoli, montane streams and marshlands. Aeʻo may also be found wherever ephemeral or persistent standing water may occur. Threats to these species include habitat loss and habitat degradation.

To avoid and minimize potential project impacts to Hawaiian waterbirds we recommend you incorporate the following measures into your project design:

- In areas where waterbirds are known to be present, post and implement reduced speed limits, and inform project personnel and contractors about the presence of endangered species on-site.
- If water resources are located within or adjacent to the project area, incorporate applicable best management practices (BMPs) regarding work in aquatic environments into the project design (see enclosure).
- Have a biological monitor that is familiar with the species' biology conduct Hawaiian waterbird nest surveys where appropriate habitat occurs within the vicinity of the project site prior to project initiation. Repeat surveys again within 3 days of project initiation and after any subsequent delay of work of 3 or more days (during which the birds may attempt to nest). If a nest or active brood is found:
    - Contact the Service within 48 hours for further guidance.
    - Establish and maintain a 100-foot buffer around all active nests and/or broods until the chicks/ducklings have fledged. Do no conduct potentially disruptive activities or habitat alteration within this buffer.
    - Have a biological monitor that is familiar with the species' biology present on the project site during all construction or earth moving activities until the chicks/ducklings fledge to ensure that Hawaiian waterbirds and nests are not adversely impacted.

In terms of aquatic resources potentially impacted by this proposed project, there are no native *Megalagrion* damselflies present at the construction site, although the stream reach is a known transit corridor for other aquatic trust resources, notably native prawns and gobioid fishes, which have been documented along the length of Waiāhole Stream (Filbert and Englund 1995). The status of the proximal shallow water marine resources off the mouth of Waiāhole Stream has not been the subject of recent survey work that we are aware of. The embayment water in front of Waiāhole is often very turbid, but several large patch reefs are present not far offshore of the stream delta. Marine surveys fronting ʻĪao Stream found high density corals in the nearshore reefs beyond the reef crest despite high levels of sedimentation and turbidity. As such, nearby marine resources may need to be considered if significant stream channel alteration and attendant sediment mobilization occur due to the bridge replacement. Generally, bridge replacements

should have minimal impact to nearby marine waters if best management practices are implemented. The Service recommends an early coordination meeting to discuss aquatic impacts as the project develops.

We appreciate your efforts to conserve protected species. If you have questions regarding this response, please contact Charmian Dang, Fish and Wildlife Biologist (email: Charmian_Dang@fws.gov). To coordinate a meeting to discuss aquatic resources, please contact Dr. Anthony Montgomery, Marine Biologist (email: Tony_Montgomery@fws.gov). When referring to this project please include this reference number: 2023-0130791-S7-001.

Sincerely,

JINY KIM

Digitally signed by JINY KIM
Date: 2023.11.30 17:40:05 -10'00'

Island Team Manager
O‘ahu, Kaua‘i, Northwest Hawaiian Islands and American Samoa

Reference Cited: Filbert, R. and R. Englund. 1995. Waiahole Ditch Water Contested Case: biological assessments of windward and leeward streams. Consultant’s report prepared for Kamehameha Schools/Bishop Estate. ix + 146 pp.

Enclosure: Service Recommended Standard BMP

U.S. Fish and Wildlife Service
Recommended Standard Best Management Practices

The U.S. Fish and Wildlife Service (Service) recommends the following measures to be incorporated into project planning to avoid or minimize impacts to fish and wildlife resources. Best Management Practices (BMPs) include the incorporation of procedures or materials that may be used to reduce either direct or indirect negative impacts to aquatic habitats that result from project construction-related activities. These BMPs are recommended in addition to, and do not over-ride any terms, conditions, or other recommendations prepared by the Service, other federal, state or local agencies. If you have questions concerning these BMPs, please contact the Service's Aquatic Ecosystems Conservation Program at 808-792-9400.

1. Authorized dredging and filling-related activities that may result in the temporary or permanent loss of aquatic habitats should be designed to avoid indirect, negative impacts to aquatic habitats beyond the planned project area.

2. Dredging/filling in the marine environment should be scheduled to avoid coral spawning and recruitment periods, and sea turtle nesting and hatching periods. Because these periods are variable throughout the Pacific islands, we recommend contacting the relevant local, state, or federal fish and wildlife resource agency for site specific guidance.

3. Turbidity and siltation from project-related work should be minimized and contained within the project area by silt containment devices and curtailing work during flooding or adverse tidal and weather conditions. BMPs should be maintained for the life of the construction period until turbidity and siltation within the project area is stabilized. All project construction-related debris and sediment containment devices should be removed and disposed of at an approved site.

4. All project construction-related materials and equipment (dredges, vessels, backhoes, silt curtains, etc.) to be placed in an aquatic environment should be inspected for pollutants including, but not limited to; marine fouling organisms, grease, oil, etc., and cleaned to remove pollutants prior to use. Project related activities should not result in any debris disposal, non-native species introductions, or attraction of non-native pests to the affected or adjacent aquatic or terrestrial habitats. Implementing both a litter-control plan and a Hazard Analysis and Critical Control Point plan (HACCP – see http://www.haccp-nrm.org/Wizard/default.asp) can help to prevent attraction and introduction of non-native species.

5. Project construction-related materials (fill, revetment rock, pipe, etc.) should not be stockpiled in, or in close proximity to aquatic habitats and should be protected from erosion (*e.g.*, with filter fabric, etc.), to prevent materials from being carried into waters by wind, rain, or high surf.

6. Fueling of project-related vehicles and equipment should take place away from the aquatic environment and a contingency plan to control petroleum products accidentally spilled during the project should be developed. The plan should be retained on site with the person responsible for compliance with the plan. Absorbent pads and containment booms should be stored on-site to facilitate the clean-up of accidental petroleum releases.

7. All deliberately exposed soil or under-layer materials used in the project near water should be protected from erosion and stabilized as soon as possible with geotextile, filter fabric or native or non-invasive vegetation matting, hydro-seeding, etc.

From: Kayla Palmer
To: Kayla Palmer
Subject: FW: 2023-0130791-S7-001 Waiahole Bridge UFWS PreConsultation Comments - Question
Date: Tuesday, January 23, 2024 10:18:00 AM
Attachments: image001.png

From: Polhemus, Dan <dan_polhemus@fws.gov>
Sent: Tuesday, January 23, 2024 9:25 AM
To: Dang, Charmian I <charmian_dang@fws.gov>; Chock, Taylor <TChock@haleyaldrich.com>; Montgomery, Anthony <tony_montgomery@fws.gov>
Cc: Catie Cullison <ccullison@pbrhawaii.com>; Kayla Palmer <kpalmer@pbrhawaii.com>; Marsters, Janice <JMarsters@haleyaldrich.com>; Shannon, Jim <JShannon@haleyaldrich.com>
Subject: Re: 2023-0130791-S7-001 Waiahole Bridge UFWS PreConsultation Comments - Question

CAUTION: External Email

Charmie -

Should say Waiahole Stream, not Iao Stream.

Not sure where that typo slipped in, but it should definitely be corrected. Thanks for the proofreading and catch.

- Dan Polhemus

Dr. Dan A. Polhemus
Pacific Islands Fish and Wildlife Office
U. S. Fish and Wildlife Service
Honolulu, HI 96850 USA

Phone: 808-779-4202
FAX: (808) 792-9581
e-mail: dan_polhemus@fws.gov

"Strategy without tactics
is the slowest route to victory.
Tactics without strategy
is the noise before defeat."

~ Sun Tzu

From: Dang, Charmian I <charmian_dang@fws.gov>
Sent: Tuesday, January 23, 2024 9:15 AM
To: Chock, Taylor <TChock@haleyaldrich.com>; Polhemus, Dan <dan_polhemus@fws.gov>; Montgomery, Anthony <tony_montgomery@fws.gov>
Cc: Catie Cullison <ccullison@pbrhawaii.com>; Kayla Palmer <kpalmer@pbrhawaii.com>; Marsters, Janice <JMarsters@haleyaldrich.com>; Shannon, Jim <JShannon@haleyaldrich.com>
Subject: Re: [EXTERNAL] 2023-0130791-S7-001 Waiahole Bridge UFWS PreConsultation Comments - Question

Hi Taylor,

I am cc'ing Dan and Tony from the Aquatics Program as this is what they added in the letter for their program.

~~~~~~

Charmian Dang

U. S. Fish and Wildlife Biologist

Pacific Islands Fish and Wildlife Office

300 Ala Moana Boulevard, Room 3-122

Honolulu, Hawaii 96850

808-792-9400

From: Chock, Taylor <TChock@haleyaldrich.com>
Sent: Tuesday, January 23, 2024 8:37 AM
To: Dang, Charmian I <charmian_dang@fws.gov>
Cc: Catie Cullison <ccullison@pbrhawaii.com>; Kayla Palmer <kpalmer@pbrhawaii.com>; Marsters, Janice <JMarsters@haleyaldrich.com>; Shannon, Jim <JShannon@haleyaldrich.com>
Subject: [EXTERNAL] 2023-0130791-S7-001 Waiahole Bridge UFWS PreConsultation Comments - Question
~~~~~~

Aloha Charmian,

The USFWS had provided the attached Pre-Consultation Comments for the Waiāhole Bridge Replacement Project (2023-0130791-S7-001) Draft EA on November 30, 2023. We wanted to clarify the highlighted statement below, which references "Marine surveys fronting ʻĪao Stream" on the bottom of page 3. May you please confirm if ʻĪao Stream should be referenced here (rather than Waiāhole)?

> In terms of aquatic resources potentially impacted by this proposed project, there are no native *Megalagrion* damselflies present at the construction site, although the stream reach is a known transit corridor for other aquatic trust resources, notably native prawns and gobioid fishes, which have been documented along the length of Waiāhole Stream (Filbert and Englund 1995). The status of the proximal shallow water marine resources off the mouth of Waiāhole Stream has not been the subject of recent survey work that we are aware of. The embayment water in front of Waiāhole is often very turbid, but several large patch reefs are present not far offshore of the stream delta. Marine surveys fronting ʻĪao Stream found high density corals in the nearshore reefs beyond the reef crest despite high levels of sedimentation and turbidity. As such, nearby marine resources may need to be considered if significant stream channel alteration and attendant sediment mobilization occur due to the bridge replacement. Generally, bridge replacements

Mahalo,
Taylor

Taylor Chock
Environmental Scientist

Haley & Aldrich, Inc.
6 Waterfront Plaza
500 Ala Moana Boulevard | Suite 6-250
Honolulu, HI 96813

Office: (808) 470-2081

www.haleyaldrich.com

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DESIGN BRANCH, ROOM 688A
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EDWIN H. SNIFFEN
DIRECTOR
KA LUNA HO'OKELE

Deputy Directors
Nā Hope Luna Ho'okele
DREANALEE K. KALILI
TAMMY L. LEE
ROBIN K. SHISHIDO

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF TRANSPORTATION | KA 'OIHANA ALAKAU
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:

HWY-DS 2.20092

February 1, 2024

Ms. Jiny Kim, Island Team Leader
U.S. Fish and Wildlife Service
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawaii 96850

Dear Ms. Kim:

Subject: Pre-Assessment Consultation for Kamehameha Highway (Route 83)
Replacement of Waiahole Bridge, Koolaupoko, Oahu, Waiahole,
Tax Map Keys: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018,
(1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023, (1) 4-8-008:024,
(1) 4-8-008:025, (1) 4-8-009:001, and (1) 4-8-009:006
Federal-Aid Project No. BR-083-1(088)

Thank you for your technical assistance letter dated November 30, 2023, (U.S. Fish and Wildlife Service (USFWS) File No. 2023-0130791-S7-001). We acknowledge your comments below and provide the following responses.

The bridge replacement is proposed on the site of the existing Waiāhole Bridge, a 66-foot long and 26-foot wide two-span concrete girder structure. This bridge replacement is needed because the current bridge is structurally deficient. The bridge is unable to handle the current volume of traffic on Kamehameha Highway and is lacking important safety features such as shoulders and pedestrian accessways per the American Association of State Highway Transportation Officials standards.

The proposed bridge includes new railings and accessways to allow vehicles, bicycles, and pedestrians to use the bridge safely. During the construction of the new bridge and highway alignment, the existing bridge will remain open to traffic. Once the new bridge and highway are completed the existing bridge will be demolished. Demolition of the existing bridge will include the removal of the center pier down to the mudline.

Our letter has been prepared under the authority of and in accordance with provisions of the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.), as amended (ESA). We have reviewed the information you provided and pertinent information in our files, as it pertains to federally listed species in accordance with section 7 of the ESA. Our data indicate the following species may occur or transit through the vicinity of the proposed project area: the endangered 'ua'u (Hawaiian petrel, Pterodroma sandwichensis), endangered Hawai'i distinct population segment

(DPS) of the ʻakēʻakē (band-rumped storm-petrel, Hydrobates castro), threatened ʻaʻo (Newell's shearwater, Puffinus newelli) (hereafter collectively referred to as Hawaiian seabirds); endangered ʻōpeʻapeʻa (Hawaiian hoary bat, Lasiurus cinereus semotus); endangered koloa maoli (Hawaiian duck, Anas wyvilliana), endangered ʻalae keʻokeʻo (Hawaiian coot, Fulica alai), endangered aeʻo (Hawaiian stilt, Himantopus mexicanus knudseni), and endangered ʻalae ʻula (Hawaiian gallinule, Gallinula galeata sandvicensis) (hereafter collectively referred to as Hawaiian waterbirds). We provide the following to assist you in preparation of your project.

<u>Hawaiian Seabirds</u>
Hawaiian seabirds may traverse the project area at night during the breeding, nesting, and fledging seasons, March 1 through December 15. Outdoor lighting could result in seabird disorientation, fallout, and injury or mortality. Seabirds are attracted to lights and after circling the lights they may become exhausted and collide with nearby wires, buildings, or other structures or they may land on the ground. Downed seabirds are subject to increased mortality due to collision with automobiles, starvation, and predation by dogs, cats, and other predators. Young birds (fledglings) traversing the project area between September 15 and December 15, in their first flights from their mountain nests to the sea, are particularly vulnerable to light attraction.

To avoid and minimize potential project impacts to Hawaiian seabirds we recommend you incorporate the following measures into your project design:
• Fully shielded all outdoor lights so the bulb can only be seen from below.
• Install automatic motion sensor switches and controls on all outdoor lights or turned off lights when human activity is not occurring in the lighted area.
• Avoid nighttime construction during the seabird fledging period, September 15 through December 15.

<u>Hawaiian Hoary Bat</u>
Hawaiian hoary bat roosts in woody vegetation across all islands and will leave their young unattended in trees and shrubs when they forage. If trees or shrubs 15 feet or taller are cleared during the pupping season, June 1 through September 15, there is a risk that young bats could inadvertently be harmed or killed, since they are too young to fly or move away from disturbance. Hawaiian hoary bat forages for insects from as low as 3 feet to higher than 500 feet above the ground and can become entangled in barbed wire used for fencing.
To avoid and minimize potential project impacts to the endangered Hawaiian hoary bat, we recommend you incorporate the following applicable measures into your project design:
• Do not disturb, remove, or trim woody plants greater than 15 feet tall during the birthing and pup rearing season for Hawaiian hoary bat, June 1 through September 15.
• Do not use barbed wire for fencing.

<u>Hawaiian Waterbirds</u>
Hawaiian waterbirds are currently found in a variety of wetland habitats including freshwater marshes and ponds, coastal estuaries and ponds, artificial reservoirs, kalo or taro (Colocasia esculenta) loʻi or patches, irrigation ditches, sewage treatment ponds, and in the case of the koloa maoli, montane streams and marshlands. Aeʻo may also be found wherever ephemeral or

persistent standing water may occur. Threats to these species include habitat loss and habitat degradation.
To avoid and minimize potential project impacts to Hawaiian waterbirds we recommend you incorporate the following measures into your project design:

- *In areas where waterbirds are known to be present, post and implement reduced speed limits, and inform project personnel and contractors about the presence of endangered species on-site.*
- *If water resources are located within or adjacent to the project area, incorporate applicable best management practices (BMPs) regarding work in aquatic environments into the project design (see enclosure).*
- *Have a biological monitor that is familiar with the species' biology conduct Hawaiian waterbird nest surveys where appropriate habitat occurs within the vicinity of the project site prior to project initiation. Repeat surveys again within 3 days of project initiation and after any subsequent delay of work of 3 or more days (during which the birds may attempt to nest). If a nest or active brood is found: ○ Contact the Service within 48 hours for further guidance.*
    - *Establish and maintain a 100-foot buffer around all active nests and/or broods until the chicks/ducklings have fledged. Do no conduct potentially disruptive activities or habitat alteration within this buffer.*
    - *Have a biological monitor that is familiar with the species' biology present on the project site during all construction or earth moving activities until the chicks/ducklings fledge to ensure that Hawaiian waterbirds and nests are not adversely impacted.*

In terms of aquatic resources potentially impacted by this proposed project, there are no native Megalagrion damselflies present at the construction site, although the stream reach is a known transit corridor for other aquatic trust resources, notably native prawns and gobioid fishes, which have been documented along the length of Waiāhole Stream (Filbert and Englund 1995). The status of the proximal shallow water marine resources off the mouth of Waiāhole Stream has not been the subject of recent survey work that we are aware of. The embayment water in front of Waiāhole is often very turbid, but several large patch reefs are present not far offshore of the stream delta. Marine surveys fronting 'Īao Stream found high density corals in the nearshore reefs beyond the reef crest despite high levels of sedimentation and turbidity. As such, nearby marine resources may need to be considered if significant stream channel alteration and attendant sediment mobilization occur due to the bridge replacement. Generally, bridge replacements should have minimal impact to nearby marine waters if best management practices are implemented. The Service recommends an early coordination meeting to discuss aquatic impacts as the project develops.

Thank you for responding to our request for preliminary consultation and providing your comments and recommendations. Due to federal funding and federal permits required for the project, the project requires an Endangered Species Act (ESA) Section 7 Consultation. To fulfill the Section 7 consultation, a Biological Evaluation (BE) was prepared and will be included as an appendix to the Draft Environmental Assessment (DEA). The BE concluded that the project

"may affect, but is not likely to adversely affect" listed species if proper best management practices (BMPs) to mitigate potential effects are implemented.

We acknowledge that listed Hawaiian waterbirds, Hawaiian seabirds, and the Hawaiian hoary bat may occur in or transit through the Waiahole Bridge Replacement project site. Best Management Practices (BMP) and mitigative measures for listed Hawaiian waterbirds and Hawaiian seabirds that you described will be included in Section 4.9 of the DEA, and those for the Hawaiian hoary bat will be included in Section 4.10 of the DEA.

Regarding aquatic resources, we note that there may be high density of corals in the nearshore reefs beyond the reef crest from Waiahole Stream despite high levels of sedimentation and turbidity. Waiahole Stream does not include Essential Fish Habitat (EFH) within the immediate project area but the stream flows into Kaneohe Bay, which is approximately 1,500 feet downstream of the downstream extent of the project. The water column and bottom of Kaneohe Bay are defined as EFH and support various life stages for the management unit species (MUS) identified in the Western Pacific Regional Fishery Management Council's Pelagic and Hawaii Archipelago Fishery Ecosystem Plans. More information on EFH and species can be found in the DEA. An EFH Assessment is included as Appendix F to the BE prepared for the project and concludes that the project would have no adverse effect to EFH if proper BMPs are in place.

Pre-consultation with the State of Hawaii Department of Land and Natural Resources Division of Aquatic Resources (DAR) indicates that native aquatic biota that may occur in Waiahole Stream and estuary include seven fish species (*Eleotris sandwicensis, Stenogobius hawaiiensis, Awaous hawaiiensis, Sicyopterus stimpsoni, Lentipes concolor*, and juvenile species of *Caranx sp., Kuhlia xenura*, and *Mugil cephalus*); two crustacean species (*Macrobrachium grandimanus, Atyoida bisulcata*); and one mollusk species (*Neritina vespertina*). All the native stream biota have an amphidromous life cycle which means they have a dependence on connectivity to the ocean. The adult animals lay their eggs in the stream and as the larvae hatch, they are swept downstream into the ocean, where they grow into post-larvae/juveniles before migrating back upstream.

DAR recommends the following BMPs to mitigate sedimentation and turbidity in Waiahole Stream to mitigate effects to native fish and crustacean species and nearshore coral reefs:

1. Stream bank areas denuded of vegetation should be planted or covered as quickly as possible to prevent erosion and the vegetation cleared along stream banks should be removed and prevented from falling into the stream/estuary environment;
2. Scheduling construction and stream maintenance activities during periods of minimal rainfall;

3. Prevent construction materials, petroleum products, debris and landscaping products from falling, blowing or leaching into the aquatic environment;
4. Reduce the disturbance and impacts to stream channel bottom substrate types (cobble, boulders, etc.) as much as possible; and
5. Maintain continuous stream flow within the stream channel.

In addition, standard USFWS BMPs that minimize impacts for work in or around aquatic environments[1] will be implemented. All mitigation measures listed will be documented in Section 4.8 of the DEA, the BE, and in project specifications and plans for the contractor.

We will include you in future correspondence as we seek further input on the proposed improvements to the intersection throughout the environmental review process in compliance with Hawaii Revised Statutes Chapter 343.

We value your participation in the environmental review process. Your letter and this response will be reproduced in the forthcoming Draft Environmental Assessment.

Should you have any questions please contact Evan Kimoto, State of Hawaii Department of Transportation Project Manager, at (808) 692-7551, or by email at evan.kimoto@hawaii.gov

Sincerely,

Henry Kennedy

HENRY KENNEDY
Engineering Program Manager
Design Branch

[1] USFWS, 2022. Best Management Practices for Work In or Around Aquatic Environments (BMPs). April. Available online at: https://www.fws.gov/media/best-management-practices-work-or-around-aquatic-environments-bmps.

JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA

KEITH A. REGAN
COMPTROLLER
KA LUNA HO'OMALU HANA LAULĀ

MEOH-LENG SILLIMAN
DEPUTY COMPTROLLER
KA HOPE LUNA HO'OMALU HANA LAULĀ

STATE OF HAWAI'I | KA MOKU'ĀINA O HAWAI'I
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES | KA 'OIHANA LOIHELU A LAWELAWE LAULĀ
P.O. BOX 119, HONOLULU, HAWAII 96810-0119

(P) 23.193

NOV 16 2023

MEMORANDUM

TO: Henry Kennedy
Engineering Program Manager
Department of Transportation

FROM: Christine L. Kinimaka
Public Works Administrator

SUBJECT: Pre-Assessment Consultation for Kamehameha Highway (Route 83) Replacement of Waiahole Bridge, Koolaupoko, Oahu, Waiahole, Tax Map Keys: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018, (1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023, (1) 4-8-008:024, (1) 4-8-008:025, (1) 4-8-009:001, and (1) 4-8-009:006; Federal-Aid Project No. BR-083-1(088)

Thank you for the opportunity to provide comments on the subject project. The project does not impact any of the Department of Accounting and General Services' projects or existing facilities in the Kaneohe area, and we have no comments to offer at this time.

If you have any questions, your staff may call Dennis Chen of the Planning Branch at (808) 586-0491, or e-mail him at dennis.yk.chen@hawaii.gov.

DE:mo
c: Catie Cullison, PBR Hawaii & Associates, Inc.

JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA

DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
ENVIRONMENTAL DESIGN SECTION, ROOM 688A
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STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF TRANSPORTATION | KA 'OIHANA ALAKAU
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:

HWY-DS 2.20098

February 1, 2024

TO: KEITH A. REGAN, COMPTROLLER
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES

FROM: HENRY KENNEDY *Henry Kennedy*
ENGINEERING PROGRAM MANAGER
DESIGN BRANCH

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR KAMEHAMEHA HIGHWAY (ROUTE 83) REPLACEMENT OF WAIAHOLE BRIDGE, KOOLAUPOKO, OAHU, WAIAHOLE, TAX MAP KEYS: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018, (1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023, (1) 4-8-008:024, (1) 4-8-008:025, (1) 4-8-009:001, AND (1) 4-8-009:006 FEDERAL-AID PROJECT NO. BR-083-1(088)

Thank you for your memorandum dated November 16, 2023 (State of Hawaii Department of Accounting and General Services (DAGS) reference no. (P)23.193) regarding the subject project. We acknowledge that DAGS has no comments on the proposed project.

We will include you in future correspondence as we seek further input on the proposed improvements to the intersection throughout the environmental review process in compliance with Hawaii Revised Statutes Chapter 343.

We value your participation in the environmental review process. Your letter and this response will be reproduced in the forthcoming Draft Environmental Assessment.

Should you have any questions please contact Evan Kimoto, State of Hawaii Department of Transportation Project Manager, at (808) 692-7551, or by email at evan.kimoto@hawaii.gov

From:	Kayla Palmer
To:	Kayla Palmer
Subject:	RE: HWY-DS 2.2137 Pre-Assessment Consultation for Kamehameha Highway Replacement of Waiahole Bridge
Date:	Tuesday, November 28, 2023 11:32:03 AM
Attachments:	image001.png image003.png

From: Jansen, Adam <adam.jansen@hawaii.gov>
Sent: Monday, November 13, 2023 10:30 AM
To: Kimoto, Evan <evan.kimoto@hawaii.gov>
Cc: Kayla Palmer <kpalmer@pbrhawaii.com>; Jiabao Chen <JChen@kaihawaii.com>; Catie Cullison <ccullison@pbrhawaii.com>
Subject: RE: HWY-DS 2.2137 Pre-Assessment Consultation for Kamehameha Highway Replacement of Waiahole Bridge

Aloha e Evan
The Archives has no opinion in the bridge replacement project -- but we do request that should the plan go through as summarized in the document that was attached, please be sure to photo document the historic bridge in situ and forward those images to the Archives for preservation. Historic bridges are a popular photographic theme and we would want to ensure that bridge in memory.

Mahalo nui
Adam

Adam Jansen, PhD
State Archivist | Luna Akewika Mokuʻāina

Department of Accounting and General Services | *ʻOihana Mālama Moʻohelu Kālā a me nā Hana Laulā*

E: adam.jansen@hawaii.gov
T: 808-586-0310
W: https://ags.hawaii.gov/archives
Hawaiʻi State Archives
Kekāuluohi Building
364 S. King Street, Honolulu, Hawaiʻi 96813

HAWAIʻI STATE ARCHIVES
Waihona Palapala Aupuni o ka Mokuʻāina ʻo Hawaiʻi

When knowledge is protected, knowledge emerges
I mālama ʻia ka ʻike, hua mai ka ʻike

JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA

DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
ENVIRONMENTAL DESIGN SECTION, ROOM 688A
HIGHWAY DESIGN SECTION, ROOM 609
HYDRAULIC DESIGN SECTION, ROOM 636
TECHNICAL DESIGN SECTION, ROOM 688

EDWIN H. SNIFFEN
DIRECTOR
KA LUNA HO'OKELE

Deputy Directors
Nā Hope Luna Ho'okele
DREANALEE K. KALILI
TAMMY L. LEE
ROBIN K. SHISHIDO

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF TRANSPORTATION | KA 'OIHANA ALAKAU
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:

HWY-DS 2.20096

February 1, 2024

TO: ADAM JANSEN, STATE ARCHIVIST
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES

FROM: HENRY KENNEDY Henry Kennedy
ENGINEERING PROGRAM MANAGER
DESIGN BRANCH

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR KAMEHAMEHA HIGHWAY (ROUTE 83) REPLACEMENT OF WAIAHOLE BRIDGE, KOOLAUPOKO, OAHU, WAIAHOLE, TAX MAP KEYS: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018, (1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023, (1) 4-8-008:024, (1) 4-8-008:025, (1) 4-8-009:001, AND (1) 4-8-009:006
FEDERAL-AID PROJECT NO. BR-083-1(088)

Thank you for your email comments dated November 13, 2023 regarding the subject project. We acknowledge your comments below and provide the following responses.

> *Please be sure to photo document the historic bridge in site and forward those images to the Archives for preservation. Historic bridges are a popular photographic theme, and we would want to ensure that bridge in memory.*

We acknowledge your recommendation to take pictures of Waiahole Bridge. The team will indeed take pictures and send them to the Department of Accounting and General Services.

We will include you in future correspondence as we seek further input on the proposed improvements to the intersection throughout the environmental review process in compliance with Hawaii Revised Statutes Chapter 343.

We value your participation in the environmental review process. Your letter and this response will be reproduced in the forthcoming Draft Environmental Assessment.

Should you have any questions please contact Evan Kimoto, State of Hawaii Department of Transportation Project Manager, at (808) 692-7551, or by email at evan.kimoto@hawaii.gov

JOSH GREEN, M.D.
GOVERNOR

SYLVIA LUKE
LT. GOVERNOR

DEAN MINAKAMI
EXECUTIVE DIRECTOR

STATE OF HAWAII
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM
HAWAII HOUSING FINANCE AND DEVELOPMENT CORPORATION
677 QUEEN STREET, SUITE 300
HONOLULU, HAWAII 96813
PHONE: (808) 587-0620
FAX: (808) 587-0600

IN REPLY REFER TO:

23:PECB/76

November 22, 2023

PBR Hawaii and Associates, Inc.
Attention: Catie Cullison
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813

Email: cullison@pbrhawaii.com

Dear Ms. Cullison:

Subject: Pre-Assessment Consultation for the Replacement of Waiahole Bridge Project
Kamehameha Highway, Oahu
Tax Map Keys: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018, (1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023, (1) 4-8-008:024, (1) 4-8-008:025, (1) 4-8-009:001, and (1) 4-8-009:006

Thank you for the opportunity to review the Replacement of Waiahole Bridge Project (Project) and to provide early comments on the forthcoming draft environmental assessment (DEA).

In 2017, the Department of Transportation, Highways Division (DOT-H) conducted a community meeting for the Project where safety concerns were received on the Waiahole Bridge section of Kamehameha Highway. As a result, the section between the Waiahole Valley Road/Kamehameha Highway intersection and Waiahole Bridge has been redesigned to accommodate the realignment of the highway based on public input.

The Hawaii Housing Finance and Development Corporation owns and manages most of the lands in Waiahole Valley, and as such, has a vested interest in this Project and for the well-being of the community. We appreciate that DOT-H engaged the community and has considered their concerns. We look forward to reviewing the DEA and the opportunity to provide additional comments once more detailed plans are developed.

If you have any questions, please have your staff contact Mr. Dean Watase, Housing Planning Manager, at 587-0639 or by email at dean.k.watase@hawaii.gov.

Sincerely,

Dean Minakami

Dean Minakami
Executive Director

JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA

DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
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EDWIN H. SNIFFEN
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STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF TRANSPORTATION | KA 'OIHANA ALAKAU
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:

HWY-DS 2.20111

February 1, 2024

TO: DEAN MINAKAMI, DEVELOPMENT BRANCH CHIEF
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT AND TOURISM

FROM: HENRY KENNEDY *Henry Kennedy*
ENGINEERING PROGRAM MANAGER
DESIGN BRANCH

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR KAMEHAMEHA HIGHWAY (ROUTE 83) REPLACEMENT OF WAIAHOLE BRIDGE, KOOLAUPOKO, OAHU, WAIAHOLE, TAX MAP KEYS: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018, (1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023, (1) 4-8-008:024, (1) 4-8-008:025, (1) 4-8-009:001, AND (1) 4-8-009:006
FEDERAL-AID PROJECT NO. BR-083-1(088)

Thank you for your memorandum dated November 22, 2023, (Hawaii Housing Finance and Development Corporation File No. 23:PECB/76) regarding the subject project. We acknowledge your comments below and provide the following responses.

In 2017, the Department of Transportation, Highways Division (DOT-H) conducted a community meeting for the Project where safety concerns were received on the Waiahole Bridge section of Kamehameha Highway. As a result, the section between the Waiahole Valley Road/Kamehameha Highway intersection and Waiahole Bridge has been redesigned to accommodate the realignment of the highway based on public input.

The Hawaii Housing Finance and Development Corporation owns and manages most of the lands in Waiahole Valley, and as such, has a vested interest in this Project and for the well-being of the community. We appreciate that DOT-H engaged the community and has considered their concerns. We look forward to reviewing the DEA and the opportunity to provide additional comments once more detailed plans are developed.

We appreciate your support for the proposed project. We will include you in future correspondence as we seek further input on the proposed improvements to the intersection throughout the environmental review process in compliance with Hawaii Revised Statutes Chapter 343.

We value your participation in the environmental review process. Your letter and this response will be reproduced in the forthcoming Draft Environmental Assessment.

Should you have any questions please contact Evan Kimoto, State of Hawaii Department of Transportation Project Manager, at (808) 692-7551, or by email at evan.kimoto@hawaii.gov

STATE OF HAWAIʻI
OFFICE OF PLANNING
& SUSTAINABLE DEVELOPMENT

235 South Beretania Street, 6th Floor, Honolulu, Hawaiʻi 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaiʻi 96804

Telephone: (808) 587-2846
Fax: (808) 587-2824
Web: https://planning.hawaii.gov/

JOSH GREEN, M.D.
GOVERNOR

SYLVIA LUKE
LT. GOVERNOR

MARY ALICE EVANS
INTERIM DIRECTOR

Coastal Zone Management Program

Environmental Review Program

Land Use Commission

Land Use Division

Special Plans Branch

State Transit-Oriented Development

Statewide Geographic Information System

Statewide Sustainability Program

DTS 202311090831NA

November 28, 2023

Ms. Catie Cullison, AICP
Vice President
PBR HAW All & Associates, Inc.
Attention: Catie Cullison
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484

Dear Ms. Cullison:

Subject: Request for Comments; Pre-Assessment Consult;
Replacement of Waiahole Bridge;
TMKs (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018, (1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023, (1) 4-8-008:024, (1) 4-8-008:025, (1) 4-8-009:001 & (1) 4-8-009:006; Federal-aid Project # BR-083-1(088)

Thank you for the opportunity to provide comments on the pre-consultation request for the proposed Waiahole Bridge Replacement project. The review material was received by our office via memo dated October 31, 2023.

It is our understanding that the State of Hawaii Department of Transportation (HDOT) proposes to replace the Waiahole Bridge, located on Kamehameha Highway in the Waiahole Valley, south of Waiahole Valley Road. The replacement is proposed on the site of the existing Waiahole Bridge for a 66-foot long and 26-foot wide two-span concrete girder structure. This bridge replacement is needed because the current bridge is structurally deficient; and is unable to handle the current volume of vehicular traffic on Kamehameha Highway. The bridge is also lacking important safety features such as shoulders and pedestrian accessways per the American Association of State Highway Transportation Officials standards.

The Office of Planning and Sustainable Development (OPSD) has reviewed the submitted material and has the following comments to offer:

1. Coastal Zone Management Act (CZMA), Federal Consistency
   We note that the review material identifies the use of federal funds but does not indicate the source of federal funding being used to replace this bridge. If federal assistance sources such as the 20.205 Highway Planning and Construction, U.S. Department of Transportation, Federal Highway Administration (FHWA) are used, then this project may be subject to CZMA federal consistency. Additionally, the need for federal permits or approvals such as a Department of the Army permit may also trigger CZMA federal consistency.

   OPSD is the lead state agency with the authority to conduct CZMA federal consistency determinations. We recommend that HDOT consult with our office on the applicability of CZMA federal consistency.

2. Hawai‘i Coastal Zone Management (CZM) Program
   The CZM area is defined as "all lands of the State and the area extending seaward from the shoreline to the limit of the State's police power and management authority, including the U.S. territorial sea" under Hawai‘i Revised Statutes (HRS) § 205A-1.

   Pursuant to HRS § 205A-4, in implementing the objectives of the CZM program, agencies shall consider ecological, cultural, historic, esthetic, recreational, scenic, open space values, coastal hazards, and economic development. As the proposed action is being submitted by HDOT, the Draft Environmental Assessment (Draft EA) should include a discussion on the project's consistency with the policies of the Hawai‘i CZM Program, HRS § 205A-2, as amended.

   Furthermore, the objectives and supporting policies of the Hawai‘i CZM Program serve as the foundation of the enforceable policies of the State of Hawai‘i. Disclosure of impacts on CZM objectives and supporting policies as it relates to HRS Chapter 343 requirements, will aid the State in determining impacts to the resources of the coastal zone, and mitigation measures on lands involved for this proposed action.

3. Special Management Area (SMA) Use Permitting
   We note that Kamehameha Highway, along the north shore of O‘ahu, frequently constitutes the outermost boundary of the SMA as delineated by the City and County of Honolulu (CCH). We recommend that the CCH, Department of Planning and Permitting be consulted on the applicability of SMA Use permitting.

4. Stormwater Runoff, Erosion, and Water Resources
   Pursuant to Hawaii Administrative Rules (HAR) § 11-200.1-18(d)(7) – identification and analysis of impacts and alternatives considered; to ensure that nearshore marine resources along the coastal areas of Windward O‘ahu remain protected, the negative effects of stormwater inundation and sediment loading surrounding the proposed project site, ensuing from bridge and roadway improvements during the construction and operational phase should be evaluated.

Issues that may be examined include, but are not limited to, project site characteristics in relation to flood and erosion prone areas, vulnerability of the nearshore environment any increase in volume or flow rate of stormwater runoff. Developing mitigation measures for the protection for surface water resources and the coastal ecosystem should take this into account, pursuant to HAR § 11-200.1-18(d)(8).

5. Climate Change Adaptation/Sea Level Rise (SLR)
Due to the project area's proximity to the shoreline, this bridge replacement project may be vulnerable to coastal inundation and natural hazards associated with SLR. These impacts include storm surge, coastal erosion, intense wave action, high winds, and potentially hurricanes. These coastal area threats may negatively affect the long-term viability of Kamehameha Highway (near Waiahole) and the bridge spans that serve it. To assess the potential environmental impacts and vulnerability of this facility, we suggest the Draft EA refer to the findings of the Hawai'i Sea Level Rise Vulnerability and Adaptation Report 2017, accepted by the Hawai'i Climate Change Mitigation and Adaptation Commission.

The Report, and Hawaii Sea Level Rise Viewer at https://www.pacioos.hawaii.edu /shoreline/slr-hawaii/ identifies a 3.2-foot SLR exposure area across the main Hawaiian Islands, as a starting evaluation point. The Draft EA should provide a map of 3.2-foot SLR exposure area in relation to the project area, and consider site-specific mitigation measures, including setbacks from the shoreline or relocation options further inland, increasing the height of the support facilities to accommodate higher water levels, or various climate change adaptation strategies to respond to impacts of 3.2-foot SLR or greater.

If you have any questions, please contact Joshua Hekekia on Environmental Assessment concerns as they relate to this OPSD response letter at (808) 587-2845; or Debra Mendes on CZMA federal consistency issues at (808) 587-2840.

Sincerely,

Mary Alice Evans

Mary Alice Evans,
Interim Director

JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA

DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
ENVIRONMENTAL DESIGN SECTION, ROOM 688A
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EDWIN H. SNIFFEN
DIRECTOR
KA LUNA HO'OKELE

Deputy Directors
Nā Hope Luna Ho'okele
DREANALEE K. KALILI
TAMMY L. LEE
ROBIN K. SHISHIDO

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF TRANSPORTATION | KA 'OIHANA ALAKAU
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:

HWY-DS 2.20113

February 1, 2024

TO: MARY ALICE EVANS, INTERIM DIR
OFFICE OF PLANNING AND SUSTAINABLE DEVELOPMENT

FROM: HENRY KENNEDY Henry Kennedy
ENGINEERING PROGRAM MANAGER
DESIGN BRANCH

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR KAMEHAMEHA HIGHWAY (ROUTE 83) REPLACEMENT OF WAIAHOLE BRIDGE, KOOLAUPOKO, OAHU, WAIAHOLE, TAX MAP KEYS: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018, (1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023, (1) 4-8-008:024, (1) 4-8-008:025, (1) 4-8-009:001, AND (1) 4-8-009:006 FEDERAL-AID PROJECT NO. BR-083-1(088)

Thank you for your memorandum dated November 28, 2023, (Office of Planning and Sustainable Development File No. DTS 202311090831NA) regarding the subject project. We acknowledge your comments below and provide the following responses.

1. *Coastal Zone Management Act (CZMA), Federal Consistency*
We note that the review material identifies the use of federal funds but does not indicate the source of federal funding being used to replace this bridge. If federal assistance sources such as the 20.205 Highway Planning and Construction, U.S. Department of Transportation, Federal Highway Administration (FHWA) are used, then this project may be subject to CZMA federal consistency. Additionally, the need for federal permits or approvals such as a Department of the Army permit may also trigger CZMA federal consistency.

   OPSD is the lead state agency with the authority to conduct CZMA federal consistency determinations. We recommend that HDOT consult with our office on the applicability of CZMA federal consistency.

2. *Hawai'i Coastal Zone Management (CZM) Program*
The CZM area is defined as "all lands of the State and the area extending seaward from the shoreline to the limit of the State's police power and management authority, including the U.S. territorial sea" under Hawai'i Revised Statutes (HRS) § 205A-1.

Pursuant to HRS § 205A-4, in implementing the objectives of the CZM program, agencies shall consider ecological, cultural, historic, esthetic, recreational, scenic, open space values, coastal hazards, and economic development. As the proposed action is being submitted by HDOT, the Draft Environmental Assessment (Draft EA) should include a discussion on the project's consistency with the policies of the Hawai'i CZM Program, HRS § 205A-2, as amended.

Furthermore, the objectives and supporting policies of the Hawai'i CZM Program serve as the foundation of the enforceable policies of the State of Hawai'i. Disclosure of impacts on CZM objectives and supporting policies as it relates to HRS Chapter 343 requirements, will aid the State in determining impacts to the resources of the coastal zone, and mitigation measures on lands involved for this proposed action.

3. *Special Management Area (SMA) Use Permitting*
   We note that Kamehameha Highway, along the north shore of O'ahu, frequently constitutes the outermost boundary of the SMA as delineated by the City and County of Honolulu (CCH). We recommend that the CCH, Department of Planning and Permitting be consulted on the applicability of SMA Use permitting.

4. *Stormwater Runoff, Erosion, and Water Resources*
   Pursuant to Hawaii Administrative Rules (HAR) § 11-200.1-18(d)(7) – identification and analysis of impacts and alternatives considered; to ensure that nearshore marine resources along the coastal areas of Windward O'ahu remain protected, the negative effects of stormwater inundation and sediment loading surrounding the proposed project site, ensuing from bridge and roadway improvements during the construction and operational phase should be evaluated.

   Issues that may be examined include, but are not limited to, project site characteristics in relation to flood and erosion prone areas, vulnerability of the nearshore environment any increase in volume or flow rate of stormwater runoff. Developing mitigation measures for the protection for surface water resources and the coastal ecosystem should take this into account, pursuant to HAR § 11-200.1-18(d)(8).

5. *Climate Change Adaptation/Sea Level Rise (SLR)*
   Due to the project area's proximity to the shoreline, this bridge replacement project may be vulnerable to coastal inundation and natural hazards associated with SLR. These impacts include storm surge, coastal erosion, intense wave action, high winds, and potentially hurricanes. These coastal area threats may negatively affect the long-term viability of Kamehameha Highway (near Waiahole) and the bridge spans that serve it. To assess the potential environmental impacts and vulnerability of this facility, we suggest the Draft EA refer to the findings of the Hawai'i Sea Level Rise Vulnerability and Adaptation Report 2017, accepted by the Hawai'i Climate Change Mitigation and Adaptation Commission.

*The Report, and Hawaii Sea Level Rise Viewer at https://*www.pacioos.hawaii.edu*/shoreline/slr-hawaii/ identifies a 3.2-foot SLR exposure area across the main Hawaiian Islands, as a starting evaluation point. The Draft EA should provide a map of 3.2-foot SLR exposure area in relation to the project area, and consider site-specific mitigation measures, including setbacks from the shoreline or relocation options further inland, increasing the height of the support facilities to accommodate higher water levels, or various climate change adaptation strategies to respond to impacts of 3.2-foot SLR or greater.*

We acknowledge your comments relating to the Coastal Zone Management Act, Coastal Zone Management Consistency Review, and Special Management Area. The Draft Environmental Assessment (DEA) includes an analysis of the State's Coastal Zone Management objectives and policies. Additionally, the City and County of Honolulu Department of Planning and Permitting has confirmed that the Project is within the Special Management Area. Because the Project involves relocation of the Highway outside of the existing right of way, it is assumed at this time that a Special Management Area Assessment will be required. The State of Hawaii Department of Transportation (HDOT) will coordinate through the City and County of Honolulu Department of Planning and Permitting.

We acknowledge your comments relating to storm water runoff, erosion, and water resources. Please review the DEA Sections 4.2-4.10 which includes information on surface waters, nearshore waters, aquatic and land-based biota, potential impacts to these resources and proposed avoidance and mitigation measures.

We further acknowledge your comments relating to climate change and sea level rise. The DEA, Section 4.5 discusses the HDOT Bridge Adaptive Policy relating to sea level rise.

We will include you in future correspondence as we seek further input on the proposed improvements to the intersection throughout the environmental review process in compliance with Hawaii Revised Statutes Chapter 343.

We value your participation in the environmental review process. Your letter and this response will be reproduced in the forthcoming DEA.

Should you have any questions please contact Evan Kimoto, HDOT Project Manager, at (808) 692-7551, or by email at evan.kimoto@hawaii.gov

JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA

KENNETH S. HARA
MAJOR GENERAL
ADJUTANT GENERAL
KA 'AKUKANA KENELALA

STEPHEN F. LOGAN
BRIGADIER GENERAL
DEPUTY ADJUTANT GENERAL
KA HOPE 'AKUKANA KENELALA

STATE OF HAWAI'I
KA MOKU'ĀINA O HAWAI'I
DEPARTMENT OF DEFENSE
KA 'OIHANA PILI KAUA
OFFICE OF THE ADJUTANT GENERAL
3949 DIAMOND HEAD ROAD
HONOLULU, HAWAI'I 96816-4495

Ms. Catie Cullison
PBR HAWAII & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484

SUBJECT: Pre-Assessment Consultation Environmental Assessment – Replacement of Waiahole Bridge, Waiahole, Oahu, Hawaii
TMK: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018, (1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023,(1) 4-8-008:024, (1) 4-8-008:025, (1) 4-8-009:001, and (1) 4-8-009:006

Dear Ms. Cullison:

Thank you for the opportunity to comment on the above project. The State of Hawaii Department of Defense has no comments to offer relative to the project at this time.

Should there be any questions, please contact Mr. Tad T. Nakayama at 808-369-3490 or tad.t.nakayama@hawaii.gov.

Sincerely,

Shao Yu L. Lee, R.A.
Major, Hawaii National Guard
Chief Engineering Officer

JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA

DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
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EDWIN H. SNIFFEN
DIRECTOR
KA LUNA HO'OKELE

Deputy Directors
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DREANALEE K. KALILI
TAMMY L. LEE
ROBIN K. SHISHIDO

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF TRANSPORTATION | KA 'OIHANA ALAKAU
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:

HWY-DS 2.20112

February 1, 2024

TO: SHAO YU L. LEE, CHIEF ENGINEERING OFFICER
DEPARTMENT OF DEFENSE

FROM: HENRY KENNEDY *Henry Kennedy*
ENGINEERING PROGRAM MANAGER
DESIGN BRANCH

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR KAMEHAMEHA HIGHWAY (ROUTE 83) REPLACEMENT OF WAIAHOLE BRIDGE, KOOLAUPOKO, OAHU, WAIAHOLE, TAX MAP KEYS: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018, (1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023, (1) 4-8-008:024, (1) 4-8-008:025, (1) 4-8-009:001, AND (1) 4-8-009:006 FEDERAL-AID PROJECT NO. BR-083-1(088)

Thank you for your response letter dated November 28, 2023 regarding the subject project. We acknowledge that the State of Hawaii Department of Defense has no comments on the proposed project.

We will include you in future correspondence as we seek further input on the proposed improvements to the intersection throughout the environmental review process in compliance with Hawaii Revised Statutes Chapter 343.

We value your participation in the environmental review process. Your letter and this response will be reproduced in the forthcoming Draft Environmental Assessment.

Should you have any questions please contact Evan Kimoto, State of Hawaii Department of Transportation Project Manager, at (808) 692-7551, or by email at evan.kimoto@hawaii.gov

JOSH GREEN, M.D.
GOVERNOR

KEITH T. HAYASHI
SUPERINTENDENT

STATE OF HAWAI`I
DEPARTMENT OF EDUCATION
KA 'OIHANA HO'ONA'AUAO
P.O. BOX 2360
HONOLULU, HAWAI`I 96804

OFFICE OF FACILITIES AND OPERATIONS

November 27, 2023

Catie Cullison
PBR Hawaii & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813

Re: Pre-Assessment Consultation for Kamehameha Highway (Route83) Replacement of Waiahole Bridge, Koolaupoko, Oahu, Waiahole, Tax Map Keys: (1)4-8-001:010, (1)4-8-002:001, (1)4-8-008:018, (1)4-8-008:021, (1)4-8-008:022, (1)4-8-008:023, (1)4-8-008:024, (1)4-8-008:025, (1)4-8-009:001, and (1)4-8-009:006
Federal –Aid Project No. BR-083-1(088)

Dear Ms. Cullison:

Per a memorandum dated October 31, 2023, from the Department of Transportation, the Hawaii State Department of Education (Department) has the following comment on the proposed replacement of the Waiahole Bridge.

The Department is in strong support of the replacement of the existing Waiahole Bridge. The Department kindly requests that you consult with the administration of Waiahole Elementary School as soon as possible to identify and minimize any potential impact on pedestrian and vehicular traffic that may affect the school's operations.

Should you have any questions, please contact Cori China, of the Facilities Development Branch, Planning Section, at (808) 784-5080 or via email at cori.china@k12.hi.us.

We appreciate the opportunity to comment.

Sincerely,

Roy Ikeda
Interim Public Works Manager
Planning Section

RI:ctc
c: Facilities Development Branch

JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA

DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
ENVIRONMENTAL DESIGN SECTION, ROOM 688A
HIGHWAY DESIGN SECTION, ROOM 609
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EDWIN H. SNIFFEN
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STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF TRANSPORTATION | KA 'OIHANA ALAKAU
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:

HWY-DS 2.20104

February 1, 2024

TO: KEITH T. HAYASHI, SUPERINTENDENT
DEPARTMENT OF EDUCATION

FROM: HENRY KENNEDY Henry Kennedy
ENGINEERING PROGRAM MANAGER
DESIGN BRANCH

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR KAMEHAMEHA HIGHWAY (ROUTE 83) REPLACEMENT OF WAIAHOLE BRIDGE, KOOLAUPOKO, OAHU, WAIAHOLE, TAX MAP KEYS: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018, (1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023, (1) 4-8-008:024, (1) 4-8-008:025, (1) 4-8-009:001, AND (1) 4-8-009:006
FEDERAL-AID PROJECT NO. BR-083-1(088)

Thank you for your response letter dated November 27, 2023 regarding the subject project. We acknowledge your comments below and provide the following responses.

> *The Department is in strong support of the replacement of the existing Waiahole Bridge. The Department kindly requests that you consult with the administration of Waiahole Elementary School as soon as possible to identify and minimize any potential impact on pedestrian and vehicular traffic that may affect the school's operations.*

We appreciate your recommendation to consult with Waiahole Elementary School. Waiahole Elementary School has been included in the Pre-Consultation and Draft Environmental Assessment review process. In addition, Waiahole Elementary School will be informed of any construction activities that may potentially impact vehicular and pedestrian traffic.

We will include you in future correspondence as we seek further input on the proposed improvements to the intersection throughout the environmental review process in compliance with HRS Chapter 343.

We value your participation in the environmental review process. Your letter and this response will be reproduced in the forthcoming Draft Environmental Assessment.

Should you have any questions please contact Evan Kimoto, State of Hawaii Department of Transportation Project Manager, at (808) 692-7551, or by email at evan.kimoto@hawaii.gov

From: Catie Cullison
To: Kayla Palmer
Subject: FW: Pre-Assessment Consultation for Kamehameha Highway Replacement of Waiahole Bridge
Date: Thursday, November 16, 2023 11:20:09 AM

From: DOH.CABPDTSS <DOH.CABPDTSS@doh.hawaii.gov>
Sent: Thursday, November 16, 2023 10:22 AM
To: Catie Cullison <ccullison@pbrhawaii.com>
Cc: Kimoto, Evan <evan.kimoto@hawaii.gov>
Subject: Pre-Assessment Consultation for Kamehameha Highway Replacement of Waiahole Bridge

Agency: Evan Kimoto
Hawaii Department of Transportation
Design Branch
evan.kimoto@hawaii.gov
808-692-7551

Consultant: Catie Cullison
PBR HAWAII & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484
ccullison@pbrhawaii.com

Aloha,

Thank you for the opportunity to provide comments on the proposed project for Kamehameha Highway (Route 83) replacement of Waiahole Bridge in Koolaupoko, Oahu, Hawaii. The Clean Air Branch (CAB) would like to make the following comments on the subject:

- For construction and other activities associated with the project, the applicable provisions of Hawaii Administrative Rules §11-60.1-33 shall be followed to mitigate fugitive dust impacts.
- Also, please see our standard comments at:

https://health.hawaii.gov/cab/files/2022/05/Standard-Comments-for-Land-Use-Reviews-Clean-Air-Branch-2022-1.pdf

Please let us know if you have any questions or concerns.

Thank you very much,
Colby

Standard Comments for Land Use Reviews
Clean Air Branch
Hawaii State Department of Health

If your proposed project:

Requires an Air Pollution Control Permit

- You must obtain an air pollution control permit from the Clean Air Branch and comply with all applicable conditions and requirements. If you do not know if you need an air pollution control permit, please contact the Permitting Section of the Clean Air Branch.
- Permit application forms can be found here: https://health.hawaii.gov/cab/permit-application-forms/

Includes construction, demolition, or renovation activities that involve potential asbestos and lead containing materials:

- Asbestos may be present in any existing structure. Prior to demolition, you must contact the Indoor and Radiological Health Branch, Asbestos-Lead Section. Testing may be required to determine if building materials may contain asbestos, such as: drywall, vinyl floor tile, mastic, caulking, roofing materials, insulation, special coatings, etc.
- Structures built prior to 1980 may also contain lead paint. Prior to demolition, contact the Indoor and Radiological Health Branch, Asbestos-Lead Section. Testing may need to be conducted to determine if building materials contain lead.
- Some construction activities have the potential to create excessive noise and may require noise permits. For DOH Noise Permits and/or Variances and for more information on the Indoor and Radiological Health Branch, please visit: https://health.hawaii.gov/irhb/

Includes demolition of structures or land clearing

- Department of Health, Administrative Rule: Title 11, Chapter 26, Vector Control, Section 11-26-35, Rodents; Demolition of Structures and Clearing of Sites and Vacant Lots, requires that:
    - No person, firm or corporation shall demolish or clear any structure, site, or vacant lot without first ascertaining the presence or absence of rodents which may endanger the public health by dispersal from such premises.
    - Should such inspection reveal the presence of rodents, the person, firm, or corporation shall eradicate the rodents before demolishing or clearing the structure, site, or vacant lot.
    - The Department may conduct an independent inspection to monitor compliance, or request a written report.
- The purpose of this rule is to prevent rodents from dispersing into adjacent areas from infested buildings or vacant lands during demolition or land clearing.
- Contractors may either hire a pest control firm or do the job themselves with a qualified employee. Rodenticides must be inspected daily and replenished as necessary to provide a continuous supply for at least one week prior to the start of any work.

- To submit notifications or for more information, contract the Vector Control Branch: https://health.hawaii.gov/vcb/

Has the potential to generate fugitive dust

- You must reasonably control the generation of all airborne, visible fugitive dust. Note that construction activities that occur near to existing residences, businesses, public areas and major thoroughfares exacerbate potential dust concerns. It is recommended that a dust control management plan be developed which identifies and mitigates all activities that may generate airborne, visible fugitive dust. The plan, which does *not* require Department of Health approval, should help you recognize and minimize potential airborne, visible fugitive dust problems.
- Construction activities must comply with the provisions of Hawaii Administrative Rules, §11-60.1-33 on Fugitive Dust. In addition, for cases involving mixed land use, we strongly recommend that buffer zones be established, wherever possible, in order to alleviate potential nuisance complaints.
- You must provide reasonable measures to control airborne, visible fugitive dust from the road areas and during the various phases of construction. These measures include, but are not limited to, the following:
    - Planning the different phases of construction, focusing on minimizing the amount of airborne, visible fugitive dust-generating materials and activities, centralizing on-site vehicular traffic routes, and locating potential dust-generating equipment in areas of the least impact;
    - Providing an adequate water source at the site prior to start-up of construction activities; Landscaping and providing rapid covering of bare areas, including slopes, starting from the initial grading phase;
    - Minimizing airborne, visible fugitive dust from shoulders and access roads;
    - Providing reasonable dust control measures during weekends, after hours, and prior to daily start-up of construction activities; and
    - Controlling airborne, visible fugitive dust from debris being hauled away from the project site.
- If you have questions about fugitive dust, please contact the Enforcement Section of the Clean Air Branch

Increases the population and potential number of vehicles in an area:

- The creation of apartment buildings, complexes, and residential communities may increase the overall population in an area. Increasing the population in an area may inadvertently lead to more air pollution via vehicle exhaust. Vehicle exhaust releases molecules in the air that negatively impact human health and air quality, as they are known lung irritants, carcinogens, and greenhouse gases.
- Ensure that residents keep their vehicle idling time to three (3) minutes or less.
- Provide bike racks and/or electric vehicle charging stations for residents.
- Ensure that there are sufficient and safe pedestrian walkways and crosswalks throughout and around the development.
- Conduct a traffic study to ensure that the new development does not significantly impact traffic in the area.

Clean Air Branch (808) 586-4200 cab@doh.hawaii.gov	Indoor Radiological Health Branch (808) 586-4700	Vector Control Branch (808) 586-4400

JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA

DESIGN BRANCH, ROOM 688A
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STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF TRANSPORTATION | KA 'OIHANA ALAKAU
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:

HWY-DS 2.20105

February 1, 2024

TO: MARIANNE FUJI ROSSIO, ENGINEERING PROGRAM MANAGER
DEPARTMENT OF HEALTH

FROM: HENRY KENNEDY *Henry Kennedy*
ENGINEERING PROGRAM MANAGER
DESIGN BRANCH

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR KAMEHAMEHA HIGHWAY (ROUTE 83) REPLACEMENT OF WAIAHOLE BRIDGE, KOOLAUPOKO, OAHU, WAIAHOLE, TAX MAP KEYS: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018, (1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023, (1) 4-8-008:024, (1) 4-8-008:025, (1) 4-8-009:001, AND (1) 4-8-009:006 FEDERAL-AID PROJECT NO. BR-083-1(088)

Thank you for your response email dated November 16, 2023 regarding the subject project. We acknowledge your comments below and provide the following responses.

Thank you for the opportunity to provide comments on the proposed project for Kamehameha Highway (Route 83) replacement of Waiahole Bridge in Koolaupoko, Oahu, Hawaii. The Clean Air Branch (CAB) would like to make the following comments on the subject:

- *For construction and other activities associated with the project, the applicable provisions of Hawaii Administrative Rules §11-60.1-33 shall be followed to mitigate fugitive dust impacts.*
- *Also, please see our standard comments at: https://health.hawaii.gov/cab/files/2022/05/Standard-Comments-for-Land-Use-Reviews-Clean-Air-Branch-2022-1.pdf*

We acknowledge your comment and will review the relevant guidance on mitigating fugitive dust impacts. All grading operations will be conducted in compliance with dust and erosion control requirements of the County Grubbing, Grading and Stockpiling Ordinance (Ordinance 808) and applicable provisions of Chapter 11-60.1, Hawaii Administrative Rules (HAR), Section 11-60.1-33 regarding Fugitive Dust. A watering program will be implemented during construction as necessary to minimize soil loss through fugitive dust emission.

The replaced bridge will not negatively impact air quality in the area.

Emissions derived from operation of construction equipment and other vehicles involved in construction activities may temporarily affect the ambient air quality in the immediate vicinity. However, these effects will be minimized through proper maintenance of construction equipment and vehicles. In addition, there may be a temporary adverse impact on air quality attributable to dust generated during project construction, particularly earthmoving activity. Best management practices for construction will be employed to minimize fugitive dust.

We will include you in future correspondence as we seek further input on the proposed improvements to the intersection throughout the environmental review process in compliance with Hawaii Revised Statutes Chapter 343.

We value your participation in the environmental review process. Your letter and this response will be reproduced in the forthcoming Draft Environmental Assessment.

Should you have any questions please contact Evan Kimoto, State of Hawaii Department of Transportation Project Manager, at (808) 692-7551, or by email at evan.kimoto@hawaii.gov

JOSH GREEN, M.D.
GOVERNOR OF HAWAI'I
KE KIA'ĀINA O KA MOKU'ĀINA 'O HAWAI'I

KENNETH S. FINK, MD, MGA, MPH
DIRECTOR OF HEALTH
KA LUNA HO'OKELE

STATE OF HAWAI'I
DEPARTMENT OF HEALTH
KA 'OIHANA OLAKINO
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
File:

07016CMHK.23

July 28, 2023

MEMORANDUM

SUBJECT: Clean Water Branch Standard Project Comments

TO: Agencies and Project Owners

FROM: DARRYL LUM, P.E., CHIEF
Clean Water Branch

This memo is provided for your information and sharing. You are encouraged to share this memo with your project partners, team members, and appropriate personnel.

The Department of Health (DOH), Clean Water Branch (CWB) will no longer be responding directly to requests for comments on the following documents (Pre-consultation, Early Consultation, Preparation Notice, Draft, Final, Addendums, and/or Supplements):

- Environmental Impact Statements (EIS)
- Environmental Assessments (EA)
- Stream Channel Alteration Permits (SCAP)
- Stream Diversion Works Permits (SDWP)
- Well Construction/Pump Installation Permits
- Conservation District Use Applications (CDUA)
- Special Management Area Permits (SMAP)
- Shoreline Setback Areas (SSA)

For agencies or project owners requiring DOH-CWB comments for one or more of these documents, please utilize the DOH-CWB Standard Comments below regarding your project's responsibilities to maintain water quality and any necessary permitting. DOH-CWB Standard Comments are also available on the DOH-CWB website located at: http://health.hawaii.gov/cwb/.

DOH-CWB Standard Comments

The following information is for agencies and/or project owners who are seeking comments regarding environmental compliance for their projects with the Hawaii Administrative Rules (HAR), Chapters 11-53, 11-54 and 11-55. You may be responsible for fulfilling additional requirements related to our program.

1. 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).

2. You may be required to obtain National Pollutant Discharge Elimination System (NPDES) permit coverage for point source water pollutant discharges into State surface waters (HAR, Chapter 11-55). Point source means any discernible, confined, and discrete conveyance from which pollutants are or may be discharged.

    For NPDES general permit coverage, a Notice of Intent (NOI) form must be submitted at least 30 calendar days before the commencement of the discharge. An application for a NPDES individual permit must be submitted at least 180 calendar days before the commencement of the discharge. To request NPDES permit coverage, you must submit the applicable form ("CWB Individual NPDES Form" or "CWB NOI Form") through the e-Permitting Portal and the hard copy certification statement with the respective filing fee ($1,000 for an individual NPDES permit or $500 for a Notice of General Permit Coverage). Please open the e-Permitting Portal website located at: https://eha-cloud.doh.hawaii.gov/epermit/. You will be asked to do a one-time registration to obtain your login and password. After you register, click on the Application Finder tool and locate the appropriate form. Follow the instructions to complete and submit the form.

    The DOH, Environmental Health Administration (EHA) e-Permitting Portal received Cross-Media Electronic Reporting Rule (CROMERR) certification by the Environmental Protection Agency (EPA) for electronic signature. Currently, Applicants and Permittees may now certify and submit EHA Electronic Signature Forms electronically through the EHA e-Permitting Portal without the need to physically send in an ink signature and CD/DVD/flash drive.

Beginning January 31, 2023, the DOH-CWB will only utilize electronic signature e-Permitting forms and discontinue the hard-copy signature forms. All hard-copy signature certification e-Permitting forms, including compliance forms, will be inactivated.

The electronic signature forms will require electronic signature approval to submit a form to the CWB. For details on how to obtain the electronic signature approval please visit CWB website located at: https://health.hawaii.gov/cwb/announcements/cwb-announces-new-requirement-for-electronic-signature-approval-for-all-submissions-beginning-january-31-2023/.

The NPDES NOI or application will be processed after the filing fees submitted and payable to the "State of Hawaii" in the form of a pre-printed check, cashier's check, money order, or as otherwise specified by the director is received by the CWB.

Some of the activities requiring NPDES permit coverage include, but, are not limited to:

a. Discharges of Storm Water.

   i. For Construction Activities Disturbing One (1) or More Acres of Total Land Area.

      By HAR Chapter 11-55, an NPDES permit is required before the start of the construction activities that result in the disturbance of one (1) or more acres of total land area, including clearing, grading, and excavation. 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.

   ii. For Industrial Activities for facilities with primary Standard Industrial Classification (SIC) Codes regulated in the Code of Federal Regulations (CFR) at 40 CFR 122.26(b)(14)(i) through (ix) and (xi). If a facility has more than one SIC code, the activity that generates the greatest revenue is the primary SIC code. If revenue information is unavailable, use the SIC code for the activity with the most employees. If employee information is also unavailable, use the SIC code for the activity with the greatest production.

   iii. From a small Municipal Separate Storm Sewer System (along with certain non-storm water discharges).

b. Discharges to State surface waters from construction activity hydrotesting or dewatering.

c. Discharges to State surface waters from cooling water applications.

d. Discharges to State surface waters from the application of pesticides (including insecticides, herbicides, fungicides, rodenticides, and various other substances to control pest) to State waters.

e. Well-Drilling Activities.

Any discharge to State surface waters of treated process wastewater effluent associated with well drilling activities is regulated by HAR Chapter 11-55. Discharges of treated process wastewater effluent (including well drilling slurries, lubricating fluids wastewater, and well purge wastewater) to State surface waters requires NPDES permit coverage.

NPDES permit coverage is not required for well pump testing. For well pump testing, the discharger shall take all measures necessary to prevent the discharge of pollutants from entering State waters. Such measures shall include, if necessary, containment of initial discharge until the discharge is essentially free of pollutants. If the discharge is entering a stream or river bed, best management practices (BMPs) shall be implemented to prevent the discharge from disturbing the clarity of the receiving water. If the discharge is entering a storm drain, the discharger must obtain written permission from the owner of the storm drain prior to discharge. Furthermore, BMPs shall be implemented to prevent the discharge from collecting sediments and other pollutants prior to entering the storm drain.

3. A Section 401 Water Quality Certification (WQC) may be required if your project/activity:

a. Requires a federal license or permit; and

b. May result in a discharge into waters of the United States (WOTUS).

"License or permit" means any permit, certificate, approval, registration, charter, membership, statutory exemption, or other form of permission granted by an agency of the federal government to conduct any activity which may result in any discharge.

The term “discharge” is defined in Clean Water Act, Subsections 502(16), 502(12), and 502(6).

Examples of “discharge” include, but are not limited to, allowing the following pollutants to enter WOTUS from the surface, or in-water: solid waste, rock/sand/dirt, heat, sewage, construction debris, any underwater work, chemicals, fugitive dust/spray paint, agricultural wastes, biological materials, industrial wastes, concrete/sealant/epoxy, and washing/cleaning effluent.

Determine if your project/activity requires a federal permit, license, certificate, approval, registration, or statutory exemption by contacting the appropriate federal agencies (e.g. Department of the Army (DA), U.S. Army Corps of Engineers (COE), Pacific Ocean Division Honolulu District Office (POH) Tel: (808) 835-4303; U.S. Environmental Protection Agency, Region 9 Tel: (415) 947-8021; Federal Energy Regulatory Commission Tel: (866) 208-3372; U.S. Coast Guard Office of Bridge Programs Tel: (202) 372-1511). If your project involves work in, over, or under waters of the United States, it is highly recommended that you contact the COE-POH regarding their DA permitting requirements.

To request an individual Section 401 WQC, you must complete and submit the Section 401 WQC application together with $1,000 filing fee made payable to the "State of Hawaii" in the form of a check or other method specified by the department. This application is available on the e-Permitting Portal website located at: https://eha-cloud.doh.hawaii.gov/epermit/.

The processing of a Section 401 WQC application will begin after the CWB has received filing fee. The processing of a Section 401 WQC application is also subject to the compliance with 40 CFR §121 requirements.

Beginning January 31, 2023, the DOH-CWB will only utilize electronic signature e-Permitting forms and discontinue the hard-copy signature forms. All hard-copy signature certification e-Permitting forms, including compliance forms, will be inactivated.

The electronic signature forms will require electronic signature approval to submit a form to the CWB. For details on how to obtain the electronic signature approval please visit CWB website located at: https://health.hawaii.gov/cwb/announcements/cwb-announces-new-requirement-for-electronic-signature-approval-for-all-submissions-beginning-january-31-2023/.

Please see HAR, Chapters 11-53 and 11-54 for the State's Water Quality Standards and for more information on the Section 401 WQC. HAR, Chapters 11-53 and 11-54 are available on the CWB website at: http://health.hawaii.gov/cwb/.

4. 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, Chapters 11-53 and 11-54, and/or permitting requirements, specified in HAR, Chapter 11-55, may be subject to penalties of $25,000 per day per violation and up to two (2) years in jail.

5. It is the State's position that all projects must reduce, reuse, and recycle to protect, restore, and sustain water quality and beneficial uses of State waters. Project planning should:

   a. Treat storm water as a resource to be protected by integrating it into project planning and permitting. Storm water has long been recognized as a source of irrigation that will not deplete potable water resources. What is often overlooked is that storm water recharges ground water supplies and feeds streams and estuaries; to ensure that these water cycles are not disrupted, storm water cannot be relegated as a waste product of impervious surfaces. Any project planning must recognize storm water as an asset that sustains and protects natural ecosystems and traditional beneficial uses of State waters, like community beautification, beach going, swimming, and fishing. The approaches necessary to do so, including low impact development methods or ecological bio-engineering of drainage ways must be identified in the planning stages to allow designers opportunity to include those approaches up front, prior to seeking zoning, construction, or building permits.

   b. Clearly articulate the State's position on water quality and the beneficial uses of State waters. The plan should include statements regarding the implementation of methods to conserve natural resources (e.g. minimizing potable water for irrigation, gray water re-use options, energy conservation through smart design) and improve water quality.

   c. Consider storm water Best Management Practice (BMP) approaches that minimize the use of potable water for irrigation through storm water storage and reuse, percolate storm water to recharge groundwater to revitalize natural hydrology, and treat storm water which is to be discharged.

d. Consider the use of green building practices, such as pervious pavement and landscaping with native vegetation, to improve water quality by reducing excessive runoff and the need for excessive fertilization, respectively.

e. Identify opportunities for retrofitting or bio-engineering existing storm water infrastructure to restore ecological function while maintaining, or even enhancing, hydraulic capacity. Consideration should be given to areas prone to flooding, or where the infrastructure is aged and will need to be rehabilitated.

JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA

DESIGN BRANCH, ROOM 688A
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STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF TRANSPORTATION | KA 'OIHANA ALAKAU
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:

HWY-DS 2.20106

February 1, 2024

TO: DARRYL C. LUM, ENGINEER
DEPARTMENT OF HEALTH

FROM: HENRY KENNEDY *Henry Kennedy*
ENGINEERING PROGRAM MANAGER
DESIGN BRANCH

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR KAMEHAMEHA HIGHWAY (ROUTE 83) REPLACEMENT OF WAIAHOLE BRIDGE, KOOLAUPOKO, OAHU, WAIAHOLE, TAX MAP KEYS: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018, (1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023, (1) 4-8-008:024, (1) 4-8-008:025, (1) 4-8-009:001, AND (1) 4-8-009:006 FEDERAL-AID PROJECT NO. BR-083-1(088)

Thank you for your memorandum dated November 13, 2023, (Clean Water Branch File No. 07016CMHK.23) regarding the subject project. We acknowledge your comments below and provide the following responses.

> *Please see the Department of Health, Clean Water Branch's (CWB) standard comments regarding water pollution control at: https://health.hawaii.gov/cwb/clean-water-branch-home-page/cwb-standard-comments/. These standard comments specify your project's responsibilities to maintain water quality and any necessary permitting issued by the Clean Water Branch.*

The design of the proposed improvements will incorporate best management practices for stormwater management to mitigate the impact on existing hydrology. During construction, best management practices for managing stormwater and erosion control will be employed to avoid temporary inputs of sediment and pollutants into surface water resources.

We will include you in future correspondence as we seek further input on the proposed improvements to the intersection throughout the environmental review process in compliance with Hawaii Revised Statutes Chapter 343.

We value your participation in the environmental review process. Your letter and this response will be reproduced in the forthcoming Draft Environmental Assessment.

Should you have any questions please contact Evan Kimoto, State of Hawaii Department of Transportation Project Manager, at (808) 692-7551, or by email at evan.kimoto@hawaii.gov

From:	Kayla Palmer
To:	Kayla Palmer
Subject:	FW: EA Comments HWY-DS 2.2137
Date:	Tuesday, December 12, 2023 4:58:00 PM
Attachments:	Pre-Assessment Consultation Waiahole Bridge.pdf STANDARD COMMENTS.pdf

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From: shwb <shwb@doh.hawaii.gov>
Sent: Friday, November 17, 2023 7:05 AM
To: Catie Cullison <ccullison@pbrhawaii.com>
Subject: EA Comments HWY-DS 2.2137

Aloha,

Attached is our Comments for Kam Hwy Route 83 replacement of waiahole bridge.

Solid and Hazardous Waste Branch
State of Hawaii | Department of Health
2827 Waimano Home Road, #100, Pearl City, HI 96782
Phone Number: (808) 586-4226 | Fax Number: (808) 586-7509

Solid and Hazardous Waste Branch Standard Comments

November 26, 2018

The Solid and Hazardous Waste Branch administers programs in the areas of:

1) Management of hazardous waste;
2) Management of solid waste; and
3) Regulation of underground storage tanks.

Our general comments on projects are below. For further information about these programs, please contact the Solid and Hazardous Waste Branch at (808) 586-4226. All chapters of the Hawaii Revised Statutes (HRS) are at https://www.capitol.hawaii .gov/hrscurrent/.

Hazardous Waste Program

- The state regulations for hazardous waste and used oil are in chapters 11-260.1 to 11-279.1, Hawaii Administrative Rules (HAR) [http://health.hawaii.go v/shwb/hwrules/]. These rules apply to the identification, handling, transportation, storage, and disposal of regulated hazardous waste and used oil. Generators, transporters and treatment, storage, and disposal facilities of hazardous waste and used oil must adhere to these requirements. Violations are subject to penalties under chapter 342J, HRS.

Solid Waste Section

- The Solid Waste Section (SWS) enforces laws and regulations contained in chapters 342H and 3421, HRS, and chapter 11-58.1, HAR, "Solid Waste Management Control" [http://health.hawaii .gov/shwb/solid-waste/].

- The purpose of the rules is to establish minimum standards governing the design, construction, installation, operation, and maintenance of solid waste disposal, recycling, reclamation, and transfer systems.

- All facilities that accept solid wastes are required to obtain a solid waste management permit from the SWS. Examples of the types of facilities governed by these regulations include landfills, transfer stations and convenience centers, recycling facilities, composting facilities, and salvage facilities. Medical waste, infectious waste, and foreign waste treatment facilities are also included.

- Generators of solid waste are required to ensure that their wastes are properly delivered to permitted solid waste management facilities. Managers of construction and demolition projects should require their waste contractors to submit disposal receipts and invoices to ensure proper disposal of wastes.

Office of Solid Waste Management

- The Office of Solid Waste Management (OSWM) administers statewide integrated solid waste management planning activities, which apply to the counties, as well as various recycling programs, e.g., the Glass Advance Disposal Fee (ADF) and Deposit Beverage Container (DBC) Programs. Management of the DBC Program is conducted pursuant to chapter 342G, HRS, which contains compliance and enforcement provisions, and chapter 11-282, HAR, "Deposit Beverage Recycling" [http://health.hawaii.gov/hi5/rules-regulations- additional- links/]. OSWM is also responsible for limited enforcement and compliance of solid waste management facilities that operate primarily as certified DBC redemption centers pursuant to chapter 342H, HRS, and chapter 11-58.1, HAR, "Solid Waste Management Control" [http://health.hawaii.gov/shwb/solid-waste/]. Authority for the integrated solid waste management planning and ADF programs is contained in chapter 342G, HRS.

- Glass Advance Disposal Fee Program: Businesses that import glass containers into Hawaii are required to register with the Department of Health (DOH) and pay a 1.5 cent per container fee. Fee revenue is distributed to the counties for the operation of glass recycling programs.

- Deposit Beverage Container Program: Business that manufacture or import deposit beverage containers into Hawaii are required to register with the DOH and pay the five-cent deposit and one cent container fee on each deposit container. Deposits and fees are deposited into a special fund and are used to reimburse DBC redemption center refunds paid to consumers; and to pay handling fees to redemption/recycling companies to process and recycle collected deposit beverage containers; and to pay program administrative costs.

- The DOH reimburses and pays an associated handling fee for the redemption of DBC. These transactions are conducted only with certified redemption centers. Certification requires obtaining a solid waste management permit from the SWS (which addresses environmental issues) and a certification from the DBC program (which standardizes the redemption process).

- Chapter 342G, HRS, encourages the reduction of waste generation, reuse of discarded materials, and the recycling of solid waste. Businesses, property managers and developers, and government entities are highly encouraged to develop solid waste management plans to ensure proper handling of wastes and divert recyclables from being landfilled.

- Solid waste management plans seek to maximize waste diversion and minimize disposal. Such plans should include designated areas to promote the collection of reusable and recyclable materials.

Underground Storage Tank Program

- The state's underground storage tank (UST) regulations, found in chapter 11-280.1, HAR [http://health.hawaii.gov/shwb/underg round-storage-tanks /], include specific requirements that UST owners and operators must meet when installing, operating, and permanently closing their UST systems and addressing releases from USTs. Violations are subject to penalties under chapter 11-280.1, HAR, and chapter 342L, HRS.

- A permit is required prior to the installation and operation of a UST. Any new UST system that will be installed must have secondary containment with interstitial monitoring. Refer to subchapters 2, 3, 4, and 12 of chapter 11-280.1, HAR. The installation permit expires 1 year from the date of issuance. The operation permit expires 5 years from the date of issuance.

- §11-280.1-50, HAR, requires owners and operators of USTs or tank systems to notify DOH within 24) hours and follow the procedures in §11-280.1-52, HAR, if any of the following occur, with specific exceptions found in the rules:

  1) The discovery by any person of evidence of regulated substances which may have been released at the UST site or in the surrounding area (such as the presence of free product or vapors in soils, basements, sewer and utility lines, or nearby surface water);
  2) Unusual UST system operating conditions observed or experienced (such as the erratic behavior of product dispensing equipment, the sudden loss of product from the UST, or an unexplained presence of water in the tank); or
  3) Monitoring results from a release detection method required under §§11-280.1-41 or 11-280 .1-42 indicate a release may have occurred.

- For release response actions, responsible parties and their consultants and contractors should follow the applicable guidance in the DOH, Hazard Evaluation Emergency (HEER) Office Technical Guidance Manual, HEER Environmental Action Level (EAL) guidance, and other guidance documents on the DOH HEER Office website [http://eha- web.doh.hawaii.gov /eha-cma/Org/HEER/], including those pertaining to Multi-Increment Sampling of soil, low flow groundwater sampling, soil vapor sampling, and Environmental Hazard Evaluations /Environmental Hazard Management Plans.

JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA

DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
ENVIRONMENTAL DESIGN SECTION, ROOM 688A
HIGHWAY DESIGN SECTION, ROOM 609
HYDRAULIC DESIGN SECTION, ROOM 636
TECHNICAL DESIGN SECTION, ROOM 688

EDWIN H. SNIFFEN
DIRECTOR
KA LUNA HO'OKELE

Deputy Directors
Nā Hope Luna Ho'okele
DREANALEE K. KALILI
TAMMY L. LEE
ROBIN K. SHISHIDO

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF TRANSPORTATION | KA 'OIHANA ALAKAU
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:

HWY-DS 2.20109

February 1, 2024

TO: LENE K. ICHINOTSUBO, ENGINEER
DEPARTMENT OF HEALTH

FROM: HENRY KENNEDY *Henry Kennedy*
ENGINEERING PROGRAM MANAGER
DESIGN BRANCH

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR KAMEHAMEHA HIGHWAY (ROUTE 83) REPLACEMENT OF WAIAHOLE BRIDGE, KOOLAUPOKO, OAHU, WAIAHOLE, TAX MAP KEYS: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018, (1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023, (1) 4-8-008:024, (1) 4-8-008:025, (1) 4-8-009:001, AND (1) 4-8-009:006 FEDERAL-AID PROJECT NO. BR-083-1(088)

Thank you for your memorandum dated November 17, 2023 regarding the subject project. We acknowledge your comments below and provide the following responses.

We acknowledge your comments in the attached memorandum regarding the regulations for hazardous waste and used oil are in chapters 11-260.1 to 11-279.1 of the Hawaii Administrative Rules (HAR). The comments further note that the Solid Waste Section enforces laws and regulations contained in chapters 342H and 3421, Hawaii Revised Statutes (HRS) and chapter 11-58.1, HAR, relating to solid waste management control. During demolition of the old concrete bridge and construction of the new steel bridge, the project will maintain compliance with State laws and rules pertaining to hazardous waste and construction debris management and disposal.

The proposed bridge replacement will have no impact on solid waste disposal operations. All bridge rehabilitation and reconstruction alternatives will maintain travel in both directions.

We will include you in future correspondence as we seek further input on the proposed improvements to the intersection throughout the environmental review process in compliance with HRS Chapter 343.

We value your participation in the environmental review process. Your letter and this response will be reproduced in the forthcoming Draft Environmental Assessment.

Should you have any questions please contact Evan Kimoto, State of Hawaii Department of Transportation Project Manager, at (808) 692-7551, or by email at evan.kimoto@hawaii.gov

From:	Kayla Palmer
To:	Kayla Palmer
Subject:	RE: HWY-DS 2.2137 Pre-Assessment Consultation for Kamehameha Highway Replacement of Waiahole Bridge
Date:	Tuesday, November 28, 2023 10:47:13 AM

From: Lau, Geoffrey T. <geoffrey.lau@doh.hawaii.gov>
Sent: Monday, November 13, 2023 4:34 PM
To: Catie Cullison <ccullison@pbrhawaii.com>
Subject: RE: HWY-DS 2.2137 Pre-Assessment Consultation for Kamehameha Highway Replacement of Waiahole Bridge

Hello Catie Cullison,

I do not have any comments on the environmental assessment for "HWY-DS 2.2137 Pre-Assessment Consultation for Kamehameha Highway Replacement of Waiahole Bridge."

If you have any questions, please contact me.

Geoffrey Lau
Radiation Section Supervisor
State of Hawaii Department of Health
Indoor and Radiological Health Branch
99-945 Halawa Valley Street
Aiea, Hawaii 96701
Phone number: (808) 586-4700
Fax number: (808) 586-5811
E-mail: geoffrey.lau@doh.hawaii.gov

JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA

DESIGN BRANCH, ROOM 688A
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STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF TRANSPORTATION | KA 'OIHANA ALAKAU
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:

HWY-DS 2.20108

February 1, 2024

TO: GEOFFREY T. LAU, RADIATION SECTION SUPERVISOR
DEPARTMENT OF HEALTH

FROM: HENRY KENNEDY *Henry Kennedy*
ENGINEERING PROGRAM MANAGER
DESIGN BRANCH

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR KAMEHAMEHA HIGHWAY (ROUTE 83) REPLACEMENT OF WAIAHOLE BRIDGE, KOOLAUPOKO, OAHU, WAIAHOLE, TAX MAP KEYS: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018, (1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023, (1) 4-8-008:024, (1) 4-8-008:025, (1) 4-8-009:001, AND (1) 4-8-009:006 FEDERAL-AID PROJECT NO. BR-083-1(088)

Thank you for your email comment dated November 13, 2023 regarding the subject project. We acknowledge that the State of Hawaii Department of Health-Indoor and Radiological Health Branch has no comments on the proposed project.

We will include you in future correspondence as we seek further input on the proposed improvements to the intersection throughout the environmental review process in compliance with Hawaii Revised Statutes Chapter 343.

We value your participation in the environmental review process. Your letter and this response will be reproduced in the forthcoming Draft Environmental Assessment.

Should you have any questions please contact Evan Kimoto, State of Hawaii Department of Transportation Project Manager, at (808) 692-7551, or by email at evan.kimoto@hawaii.gov

From:	Kayla Palmer
To:	Kayla Palmer
Subject:	RE: HWY-DS 2.2137 Pre-Assessment Consultation for Kamehameha Highway Replacement of Waiahole Bridge
Date:	Tuesday, November 28, 2023 11:37:21 AM

From: Desmond, Edward <edward.desmond@doh.hawaii.gov>
Sent: Monday, November 13, 2023 11:23 AM
To: Kimoto, Evan <evan.kimoto@hawaii.gov>
Cc: Kayla Palmer <kpalmer@pbrhawaii.com>; Jiabao Chen <JChen@kaihawaii.com>; Catie Cullison <ccullison@pbrhawaii.com>; Keao, Kaena N <kaena.n.keao@hawaii.gov>; Ho, Kathleen S. <Kathleen.Ho@doh.hawaii.gov>
Subject: RE: HWY-DS 2.2137 Pre-Assessment Consultation for Kamehameha Highway Replacement of Waiahole Bridge

I cannot see any way in which the proposed intersection improvements would have an impact on any of the State Laboratory's existing or proposed projects, plans, policies, or programs.

Sincerely,

Edward P. Desmond, Ph.D., D(ABMM)
State Laboratories Administrator
2725 Waimano Home Road
Pearl City, HI 96782

JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA

DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
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TECHNICAL DESIGN SECTION, ROOM 688

EDWIN H. SNIFFEN
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Deputy Directors
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STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF TRANSPORTATION | KA 'OIHANA ALAKAU
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:

HWY-DS 2.20110

February 1, 2024

TO: EDWARD DESMOND, ADMINISTRATOR
DEPARTMENT OF HEALTH

FROM: HENRY KENNEDY Henry Kennedy
ENGINEERING PROGRAM MANAGER
DESIGN BRANCH

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR KAMEHAMEHA HIGHWAY (ROUTE 83) REPLACEMENT OF WAIAHOLE BRIDGE, KOOLAUPOKO, OAHU, WAIAHOLE, TAX MAP KEYS: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018, (1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023, (1) 4-8-008:024, (1) 4-8-008:025, (1) 4-8-009:001, AND (1) 4-8-009:006 FEDERAL-AID PROJECT NO. BR-083-1(088)

Thank you for your email comment dated November 13, 2023 regarding the subject project. We acknowledge that the State of Hawaii Department Of Health-State Laboratories Division has no comments on the proposed project.

We will include you in future correspondence as we seek further input on the proposed improvements to the intersection throughout the environmental review process in compliance with Hawaii Revised Statutes Chapter 343.

We value your participation in the environmental review process. Your letter and this response will be reproduced in the forthcoming Draft Environmental Assessment.

Should you have any questions please contact Evan Kimoto, State of Hawaii Department of Transportation Project Manager, at (808) 692-7551, or by email at evan.kimoto@hawaii.gov

From:	Kayla Palmer
To:	Kayla Palmer
Subject:	RE: HWY-DS 2.2137 Pre-Assessment Consultation for Kamehameha Highway Replacement of Waiahole Bridge
Date:	Tuesday, November 28, 2023 10:52:25 AM

From: Haruno, Shawn H. <shawn.haruno@doh.hawaii.gov>
Sent: Monday, November 13, 2023 10:37 AM
To: Kimoto, Evan <evan.kimoto@hawaii.gov>
Cc: Kayla Palmer <kpalmer@pbrhawaii.com>; Jiabao Chen <JChen@kaihawaii.com>; Catie Cullison <ccullison@pbrhawaii.com>
Subject: RE: HWY-DS 2.2137 Pre-Assessment Consultation for Kamehameha Highway Replacement of Waiahole Bridge

Aloha Evan, please ensure compliance with Chapter 11-46 HAR Community Noise Control. Submit all applicable permit/variance documents to allow sufficient review time.

Mahalo,
Shawn

Shawn Haruno, Noise Section Supervisor
State of Hawaii – Department of Health
Indoor and Radiological Health Branch
99-945 Halawa Valley Street
Aiea, HI 96701
Office: 808-586-4700
Cell: 808-294-9695
https://health.hawaii.gov/irhb/noise/

JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA

DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
ENVIRONMENTAL DESIGN SECTION, ROOM 688A
HIGHWAY DESIGN SECTION, ROOM 609
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TECHNICAL DESIGN SECTION, ROOM 688

EDWIN H. SNIFFEN
DIRECTOR
KA LUNA HO'OKELE

Deputy Directors
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DREANALEE K. KALILI
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STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF TRANSPORTATION | KA 'OIHANA ALAKAU
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:

HWY-DS 2.20107

February 1, 2024

TO: SHAWN H. HARUNO, NOISE SECTION SUPERVISOR
DEPARTMENT OF HEALTH

FROM: HENRY KENNEDY Henry Kennedy
ENGINEERING PROGRAM MANAGER
DESIGN BRANCH

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR KAMEHAMEHA HIGHWAY (ROUTE 83) REPLACEMENT OF WAIAHOLE BRIDGE, KOOLAUPOKO, OAHU, WAIAHOLE, TAX MAP KEYS: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018, (1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023, (1) 4-8-008:024, (1) 4-8-008:025, (1) 4-8-009:001, AND (1) 4-8-009:006 FEDERAL-AID PROJECT NO. BR-083-1(088)

Thank you for your email comment dated November 13, 2023 regarding the subject project. We acknowledge your comments below and provide the following responses.

> *Please ensure compliance with Chapter 11-46 HAR Community Noise Control. Submit all applicable permit/variance documents to allow sufficient review time.*

We acknowledge your comment to ensure compliance with Chapter 11-46 Hawaii Administrative Rules Community Noise Control. To mitigate construction noise levels, the State Department of Transportation will work with the contractor to ensure adherence with State Department of Health (DOH) regulations, use of proper equipment and regular vehicle maintenance.

We will include you in future correspondence as we seek further input on the proposed improvements to the intersection throughout the environmental review process in compliance with Hawaii Revised Statutes Chapter 343.

We value your participation in the environmental review process. Your letter and this response will be reproduced in the forthcoming Draft Environmental Assessment.

Should you have any questions please contact Evan Kimoto, State of Hawaii Department of Transportation Project Manager, at (808) 692-7551, or by email at evan.kimoto@hawaii.gov

JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA

CATHY BETTS
DIRECTOR
KA LUNA HO'OKELE

JOSEPH CAMPOS II
DEPUTY DIRECTOR
KA HOPE LUNA HO'OKELE

TRISTA SPEER
DEPUTY DIRECTOR
KA HOPE LUNA HO'OKELE

STATE OF HAWAII
KA MOKU'ĀINA O HAWAI'I
DEPARTMENT OF HUMAN SERVICES
KA 'OIHANA MĀLAMA LAWELAWE KANAKA
BENEFIT, EMPLOYMENT AND SUPPORT SERVICES DIVISION
1010 Richards Street, Suite 512
Honolulu, Hawaii 96813

Re: 23-00283

November 29, 2023

Ms. Catie Cullison
PBR HAWAII & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484

Dear Ms. Cullison:

Subject: Pre-Assessment Consultation for Kamehameha Highway (Route 83) Replacement of Waiahole Bridge, Koolaupoko, Oahu, Waiahole, Tax Map Keys: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018, (1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023, (1) 4-8-008:024, (1) 4-8-008:025, (1) 4-8-009:001, and (1) 4-8-009-006 Federal-Aid Project No. BR-083-1(088)

This is in response to letter dated October 31, 2023 requesting the Department of Human Services (DHS) to comment on the above-named project.

DHS has reviewed the Kamehameha Highway (Route 83) Replacement of Waiahole Bridge project and the map of the area. At this time, DHS has no comments.

If you should have any questions regarding this matter, please contact Ms. Tracy Oshita, Acting Child Care Regulation Program Specialist at (808) 586-5243.

Sincerely,

Scott Nakasone
Assistant Division Administrator

c: Cathy Betts, Director

JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA

DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
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EDWIN H. SNIFFEN
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STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF TRANSPORTATION | KA 'OIHANA ALAKAU
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:

HWY-DS 2.20099

February 1, 2024

TO: CATHY A. BETTS, DIRECTOR
DEPARTMENT OF HUMAN SERVICES

FROM: HENRY KENNEDY *Henry Kennedy*
ENGINEERING PROGRAM MANAGER
DESIGN BRANCH

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR KAMEHAMEHA HIGHWAY (ROUTE 83) REPLACEMENT OF WAIAHOLE BRIDGE, KOOLAUPOKO, OAHU, WAIAHOLE, TAX MAP KEYS: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018, (1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023, (1) 4-8-008:024, (1) 4-8-008:025, (1) 4-8-009:001, AND (1) 4-8-009:006 FEDERAL-AID PROJECT NO. BR-083-1(088)

Thank you for your email comments dated November 29, 2023, (Department of Human Services (DHS) File No. 23-00283) regarding the subject project. We acknowledge that DHS has no comments on the proposed project.

We will include you in future correspondence as we seek further input on the proposed improvements to the intersection throughout the environmental review process in compliance with Hawaii Revised Statutes Chapter 343.

We value your participation in the environmental review process. Your letter and this response will be reproduced in the forthcoming Draft Environmental Assessment.

Should you have any questions please contact Evan Kimoto, State of Hawaii Department of Transportation Project Manager, at (808) 692-7551, or by email at evan.kimoto@hawaii.gov

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF AQUATIC RESOURCES
1151 PUNCHBOWL STREET, ROOM 330
HONOLULU, HAWAII 96813

Date: November 21, 2023

DAR # AR6517

MEMORANDUM

TO: Brian J. Neilson
DAR Administrator

FROM: Glenn Higashi GH, Aquatic Biologist

SUBJECT: Pre-Assessment Consultation for Kamehameha Highway (Route 83) Replacement of Waiahole Bridge

Request Submitted by: PBR Hawaii & Associates

Location of Project: Koolaupoku, Oahu, Waiahole TMK: (1) 4-8-001:010, 4-8-002:001, 4-8-008:018, 4-8-008:021-25, 4-8-009:001, and 4-8-009:006.

Brief Description of Project:

The State of Hawaii Department of Transportation (HDOT) is proposing to replace Waiahole Bridge, which is located on the Kamehameha Highway in the Waiahole Valley, south of Waiahole Valley Road.

In 2017, a pre-consultation and community meeting was held for the Waiahole Bridge Replacement project. Due to community concerns about safety along this section of Kamehameha Highway, HDOT has updated the project by planning to realign approximately1,000 lineal feet of the highway

Comments:

☐ No Comments ☒ Comments Attached

Thank you for providing DAR the opportunity to review and comment on the proposed project. Should there be any changes to the project plan, DAR requests the opportunity to review and comment on those changes.

Comments Approved: _____ Date: Nov 29, 2023

Brian J. Neilson
DAR Administrator

DAR# AR6517

Brief Description of Project

and constructing the new bridge adjacent to the downstream face of the existing bridge. The intersection of Waiahole Valley Road and Kamehameha Highway will be redesigned to accommodate the new highway alignment.

The replacement is proposed on the site of the existing Waiahole Bridge, a 66-foot long and a 26-foot wide two-span concrete girder structure. This bridge replacement is needed because
the current bridge is structurally deficient; the bridge is almost a century old (built in 1922) and
is unable to handle the current volume of traffic on Kamehameha Highway. The bridge is also
lacking important safety features such as shoulders and pedestrian accessways per the American
Association of State Highway Transportation Officials standards. The purpose of the project is
to meet current State and Federal design guidelines, address bridge maintenance concerns, improve traffic safety for motorists, cyclists and pedestrians as well as meet projected demands
on Kamehameha Highway.

The proposed bridge includes new railings and accessways to allow vehicles, bicycles, and
pedestrians to use the bridge safely. During the construction of the new bridge and highway
alignment, the existing bridge will remain open to traffic. Once the new bridge and highway are
completed the existing bridge will be demolished. Demolition of the existing bridge will include
the removal of the center pier down to the mudline.

The project's use of State lands and the potential use of federal funds triggers State Environmental Impact Statement law (Chapter 343, Hawaii Revised Statutes (HRS)) and environmental documentation consistent with the National Environmental Policy Act. On behalf
of HDOT, PBR HAWAII & Associates, Inc. will be preparing environmental documentation for
the proposed improvements.

In accordance with Hawaii Administrative Rules, Section 11-200.1-18(a), we seek your input as
to whether the proposed intersection improvements may have an impact on any of your existing

DAR# AR6517

Comments

The State of Hawaii Department of Transportations is proposing to replace Waiahole Bridge, which is located on the Kamehameha Highway in the Waiahole Valley, south of Waiahole Valley Road. The proposed project crosses the lower portions of Waiahole Stream and estuary.
Short-term impacts to the aquatic ecosystem may occur during the construction of the new bridge and demolition of the old bridge.

Waiahole Stream and estuary provides habitat for native aquatic biota composed of more than 7 fish species (Eleotris sandwicensis, Stenogobius hawaiiensis, Awaous hawaiiensis, Sicyopterus
stimpsoni, Lentipes concolor, and juvenile species of Caranx sp., Kuhlia xenura, and Mugil cephalus); 2 crustacean species (Macrobrachium grandimanus, Atyoida bisulcata); and 1 mollusk species (Neritina vespertina) which may occur below, in and above the project site. All the native stream biota share an amphidromous life cycle which means they have a dependence on connectivity to the ocean. The adult animals lay their eggs in the stream and as the larvae hatch they are swept down stream into the ocean, where they grow into post-larvae/juveniles before migrating back upstream.

To protect and minimize impacts to the aquatic environments directly adjacent to the proposed project as well as those up and downstream, DAR requests that all necessary precautionary measures be taken throughout the project. It is important that during the bridge construction and demolition activities that there is an avoidance of the creation of barriers that could block this downstream and upstream movement of stream biota. Best Management Practices (BMPs) or mitigative measures should be implemented during these activities to minimize the potential for erosion, siltation, pollution, and degradation of the aquatic environment.
1) Stream bank areas denuded of vegetation should be planted or covered as quickly as
possible to prevent erosion and the vegetation cleared along stream banks should be removed and prevented from falling into the stream/estuary environment;
2) Scheduling construction and stream maintenance activities during periods of minimal rainfall;
3) Prevent construction materials, petroleum products, debris and landscaping products from
falling, blowing or leaching into the aquatic environment;
4) Reduce the disturbance and impacts to stream channel bottom substrate types (cobble,
boulders, etc.) as much as possible; and,
5) Maintain continuous stream flow within the stream channel.

DAR# AR6517

Comments

Lastly, DAR requests that they be contacted immediately in the event that an unforeseen event poses a potential threat to the aquatic environment.

JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA

DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
ENVIRONMENTAL DESIGN SECTION, ROOM 688A
HIGHWAY DESIGN SECTION, ROOM 609
HYDRAULIC DESIGN SECTION, ROOM 636
TECHNICAL DESIGN SECTION, ROOM 688

EDWIN H. SNIFFEN
DIRECTOR
KA LUNA HO'OKELE

Deputy Directors
Nā Hope Luna Ho'okele
DREANALEE K. KALILI
TAMMY L. LEE
ROBIN K. SHISHIDO

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF TRANSPORTATION | KA 'OIHANA ALAKAU
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:

HWY-DS 2.20100

February 1, 2024

TO: BRIAN J. NEILSON, ADMINISTRATOR
DEPARTMENT OF LAND AND NATURAL RESOURCES

FROM: HENRY KENNEDY *Henry Kennedy*
ENGINEERING PROGRAM MANAGER
DESIGN BRANCH

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR KAMEHAMEHA HIGHWAY (ROUTE 83) REPLACEMENT OF WAIAHOLE BRIDGE, KOOLAUPOKO, OAHU, WAIAHOLE, TAX MAP KEYS: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018, (1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023, (1) 4-8-008:024, (1) 4-8-008:025, (1) 4-8-009:001, AND (1) 4-8-009:006
FEDERAL-AID PROJECT NO. BR-083-1(088)

Thank you for your response letter dated November 21, 2023, (Division of Aquatic Resources (DAR) File No. AR6517) regarding the subject project. We acknowledge your comments below and provide the following responses.

The State of Hawaii Department of Transportations is proposing to replace Waiahole Bridge, which is located on the Kamehameha Highway in the Waiahole Valley, south of Waiahole Valley Road. The proposed project crosses the lower portions of Waiahole Stream and estuary. Short-term impacts to the aquatic ecosystem may occur during the construction of the new bridge and demolition of the old bridge.

Waiahole Stream and estuary provides habitat for native aquatic biota composed of more than 7 fish species (Eleotris sandwicensis, Stenogobius hawaiiensis, Awaous hawaiiensis, Sicyopterus stimpsoni, Lentipes concolor, and juvenile species of Caranx sp., Kuhlia xenura, and Mugil cephalus); 2 crustacean species (Macrobrachium grandimanus, Atyoida bisulcata); and 1 mollusk species (Neritina vespertina) which may occur below, in and above the project site. All the native stream biota shares an amphidromous life cycle which means they have a dependence on connectivity to the ocean. The adult animals lay their eggs in the stream and as the larvae hatch they are swept downstream into the ocean, where they grow into post-larvae/juveniles before migrating back upstream.

To protect and minimize impacts to the aquatic environments directly adjacent to the proposed project as well as those up and downstream, DAR requests that all necessary precautionary measures be taken throughout the project. It is important that during the bridge construction and demolition activities there is an avoidance of the creation of barriers that could block this downstream and upstream movement of stream biota. Best Management Practices (BMPs) or mitigative measures should be implemented during these activities to minimize the potential for erosion, siltation, pollution, and degradation of the aquatic environment.

1. *Stream bank areas denuded of vegetation should be planted or covered as quickly as possible to prevent erosion and the vegetation cleared along stream banks should be removed and prevented from falling into the stream/estuary environment;*
2. *Scheduling construction and stream maintenance activities during periods of minimal rainfall;*
3. *Prevent construction materials, petroleum products, debris and landscaping products from falling, blowing or leaching into the aquatic environment;*
4. *Reduce the disturbance and impacts to stream channel bottom substrate types (cobble, boulders, etc.) as much as possible; and,*
5. *Maintain continuous stream flow within the stream channel.*

Lastly, DAR requests that they be contacted immediately in the event that an unforeseen event poses a potential threat to the aquatic environment.

Thank you for responding to our request for preliminary consultation and providing your comments and recommendations. We acknowledge that seven native fish species, two crustacean species, and one mollusk species with amphidromous life cycles may occur below, in, and above the Waiahole Bridge Replacement project site. The Best Management Practices and mitigative measures that you described will be included in Section 4.8 of the Draft Environmental Assessment, in the Biological Evaluation prepared for the project, and in project specifications and plans prepared for the project.

We will include you in future correspondence as we seek further input on the proposed improvements to the intersection throughout the environmental review process in compliance with Hawaii Revised Statues Chapter 343.

We value your participation in the environmental review process. Your letter and this response will be reproduced in the forthcoming Draft Environmental Assessment.

Should you have any questions please contact Evan Kimoto, State of Hawaii Department of Transportation Project Manager, at (808) 692-7551, or by email at evan.kimoto@hawaii.gov

From:	Kayla Palmer
To:	Kayla Palmer
Subject:	RE: HWY-DS 2.2137 Pre-Assessment Consultation for Kamehameha Highway Replacement of Waiahole Bridge
Date:	Tuesday, November 28, 2023 11:34:26 AM

From: Underwood, Ed R <ed.r.underwood@hawaii.gov>
Sent: Tuesday, November 14, 2023 8:12 AM
To: Kimoto, Evan <evan.kimoto@hawaii.gov>
Cc: Kayla Palmer <kpalmer@pbrhawaii.com>; Jiabao Chen <JChen@kaihawaii.com>; Catie Cullison <ccullison@pbrhawaii.com>; Statts, Meghan L <meghan.l.statts@hawaii.gov>; McCall, Finn D <finn.d.mccall@hawaii.gov>
Subject: RE: HWY-DS 2.2137 Pre-Assessment Consultation for Kamehameha Highway Replacement of Waiahole Bridge

Aloha Mr. Kimoto,

We have no comments.

Thank you,

Ed

Edward R. Underwood, Administrator
Department of Land and Natural Resources
Division of Boating and Ocean Recreation
4 Sand Island Access Road #4
Honolulu, Hawaii 96819
(808) 586-9314

JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA

DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
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EDWIN H. SNIFFEN
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STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF TRANSPORTATION | KA 'OIHANA ALAKAU
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:

HWY-DS 2.20101

February 1, 2024

TO: ED R. UNDERWOOD, BOATING ADMINISTRATOR
DEPARTMENT OF LAND AND NATURAL RESOURCES

FROM: HENRY KENNEDY *Henry Kennedy*
ENGINEERING PROGRAM MANAGER
DESIGN BRANCH

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR KAMEHAMEHA HIGHWAY (ROUTE 83) REPLACEMENT OF WAIAHOLE BRIDGE, KOOLAUPOKO, OAHU, WAIAHOLE, TAX MAP KEYS: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018, (1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023, (1) 4-8-008:024, (1) 4-8-008:025, (1) 4-8-009:001, AND (1) 4-8-009:006 FEDERAL-AID PROJECT NO. BR-083-1(088)

Thank you for your email comment dated November 14, 2023 regarding the subject project. We acknowledge that the State of Hawaii Department of Land and Resources - Division of Boating and Ocean Recreation has no comments on the proposed project.

We will include you in future correspondence as we seek further input on the proposed improvements to the intersection throughout the environmental review process in compliance with Hawaii Revised Statutes Chapter 343.

We value your participation in the environmental review process. Your letter and this response will be reproduced in the forthcoming Draft Environmental Assessment.

Should you have any questions please contact Evan Kimoto, State of Hawaii Department of Transportation Project Manager, at (808) 692-7551, or by email at evan.kimoto@hawaii.gov

JOSH GREEN, M.D.
GOVERNOR | KE KIA'ĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'ĀINA

DAWN N. S. CHANG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA 'OIHANA KUMUWAIWAI 'ĀINA
LAND DIVISION

P.O. BOX 621
HONOLULU, HAWAII 96809

December 7, 2023

LD 0388

PBR HAWAII & Associates
Attention: Catie Cullison
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484

Via email:ccullison@pbrhawaii.com

Dear Miss Cullison:

SUBJECT: **Pre-Assessment Consultation for Kamehameha Highway (Route 83) Replacement of Waiahole Bridge, Koolaupoko, Oahu, Federal-Aid Project No. BR-083-1(088), TMKs: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018, (1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023, (1) 4-8-008:024, (1) 4-8-008:025, (1) 4-8-009:001, and (1) 4-8-009:006**

Thank you for the opportunity to review and comment on the subject project. The Land Division of the Department of Land and Natural Resources (DLNR) distributed copies of your request to DLNR's various divisions for their review and comment.

Enclosed are comments received from our Division of Forestry and Wildlife. Should you have any questions, please feel free to contact Timothy Chee via email at *timothy.chee@hawaii.gov*. Thank you.

Sincerely,

Russell Tsuji

Russell Y. Tsuji
Land Administrator

Attachments
cc: Central Files

JOSH GREEN, M.D.
GOVERNOR | KE KIA'ĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'ĀINA

DAWN N. S. CHANG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA 'OIHANA KUMUWAIWAI 'ĀINA
LAND DIVISION

P.O. BOX 621
HONOLULU, HAWAII 96809

November 9, 2023

LD 0388

MEMORANDUM

FROM: **DLNR Agencies:**
X Div. of Aquatic Resources *(via email: kendall.l.tucker@hawaii.gov)*
X Div. of Boating & Ocean Recreation (*via email: richard.t.howard@hawaii.gov)*
X Engineering Division *(via email: DLNR.Engr@hawaii.gov)*
X Div. of Forestry & Wildlife *(via email: Rubyrosa.T.Terrago@hawaii.gov)*
X Div. of State Parks (curt.a.cottrell@hawaii.gov)
X Commission on Water Resource Management *(via email: DLNR.CWRM@hawaii.gov)*
X Office of Conservation & Coastal Lands *(via email:Sharleen.k.kuba@hawaii.gov)*
X Land Division – Oahu District *(via email: barry.w.cheung@hawaii.gov)*
X Aha Moku *(via email: leimana.k.damate@hawaii.gov)*

TO: Russell Y. Tsuji, Land Administrator *Russell Tsuji*

SUBJECT: **Pre-Assessment Consultation for Kamehameha Highway (Route 83) Replacement of Waiahole Bridge, Koolaupoko, Oahu, Federal-Aid Project No. BR-083-1(088)**

LOCATION: Waiahole District, Island of Oahu, Hawaii
TMKs: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018, (1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023, (1) 4-8-008:024, (1) 4-8-008:025, (1) 4-8-009:001, and (1) 4-8-009:006

APPLICANT: **PBR HAWAII & Associates, Inc.**

Transmitted for your review and comment is information on the above-referenced project. Please submit any comments to *timothy.chee@hawaii.gov* at the Land Division by the internal deadline of **November 29, 2023**. If no response is received by this date, we will assume your agency has no comments. If you have any questions, please contact Timothy Chee at the above email address. Thank you.

BRIEF COMMENTS:

Attachments
Cc: Central Files

( ) We have no objections.
( ) We have no comments.
( ) We have no additional comments.
(☑) Comments are included/attached.

Signed: JDO
Print Name: Jason D. Omick, Acting Wildlife Prog. Mgr.
Division: Forestry and Wildlife
Date: Dec 7, 2023

STATE OF HAWAIʻI | KA MOKUʻĀINA ʻO HAWAIʻI
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA ʻOIHANA KUMUWAIWAI ʻĀINA

DIVISION OF FORESTRY AND WILDLIFE
1151 PUNCHBOWL STREET, ROOM 325
HONOLULU, HAWAII 96813

December 1, 2023

Log no. 4323

MEMORANDUM

TO: RUSSELL Y. TSUJI, Administrator
Land Division

FROM: JASON D. OMICK, Acting Wildlife Program Manager
Division of Forestry and Wildlife

SUBJECT: **Request for Comments on the Pre-Assessment for Kamehameha Highway (Route 83) Replacement of Waiahole Bridge, Koolaupoko, O'ahu, Federal-Aid Project No. BR-083-1(088).**

The Department of Land and Natural Resources, Division of Forestry and Wildlife (DOFAW) has received your request for comments on the pre-assessment for the Kamehameha Highway (Route 83) replacement of Waiahole Bridge, Federal-Aid Project No. BR-083-1(088), located in the Waiahole Valley on the island of O'ahu; TMKs: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018, (1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023, (1) 4-8-008:024, (1) 4-8-008:025, (1) 4-8-009:001, and (1) 4-8-009:006. The State of Hawai'i Department of Transportation (HDOT) is planning to realign approximately 1,000 lineal feet of the highway and construct the new bridge adjacent to the downstream face of the existing bridge. The existing Waiahole Bridge is 66-feet long, and 26-feet wide and at almost a century old is unable to handle the current volume of traffic on Kamehameha Highway. The proposed bridge would include new railings and accessways, to increase bridge safety. During the construction of the new bridge and highway alignment, the existing bridge will remain open to traffic. Once the new bridge and highway are completed, the demolition of the existing bridge will occur. Demolition will include the removal of the center pier down to the mudline.

DOFAW provides the following comments regarding the potential for the proposed work to affect listed species in the vicinity of the project area.

The State listed ʻōpeʻapeʻa or Hawaiian Hoary Bat (*Lasiurus cinereus semotus*) could potentially occur at or in the vicinity of the project and may roost in nearby trees. Any required site clearing should be timed to avoid disturbance to bats during their birthing and pup rearing season (June 1 through September 15). During this period woody plants greater than 15 feet

(4.6 meters) tall should not be disturbed, removed, or trimmed. Barbed wire should also be avoided for any construction because bats can become ensnared and killed by such fencing material during flight.

Artificial lighting can adversely impact seabirds that may pass through the area at night by causing them to become disoriented. This disorientation can result in their collision with manmade structures or the grounding of birds. It is DOFAW's stance that **permanent lighting would pose a very high risk of seabird attraction on the proposed stretch of road.** New highway lights, therefore, should not be installed in this area to protect seabird flyways and preserve the night sky. For nighttime work that might be required, DOFAW recommends that all lights used be fully shielded to minimize the attraction of seabirds. Nighttime work that requires outdoor lighting should be avoided during the seabird fledging season from September 15 through December 15, the period when young seabirds make their maiden sea voyage. For illustrations and guidance related to seabird-friendly light styles that also protect seabirds and the dark starry skies of Hawai'i please visit: https://dlnr.hawaii.gov/wildlife/files/2016/03/DOC439.pdf.

State-listed waterbirds such as ae'o or Hawaiian stilt (*Himantopus mexicanus knudseni*), 'alae ke'oke'o or Hawaiian coot (*Fulica alai*), 'alae 'ula or Hawaiian gallinule (*Gallinula chloropus sandvicensis*), and koloa maoli or Hawaiian Duck (*Anas wyvilliana*) could potentially occur at or in the vicinity of the proposed project site. It is against State law to harm or harass these species. If any of these species are present during construction, all activities within 100 feet (30 meters) should cease and the bird or birds should not be approached. Work may continue after the bird or birds leave the area of their own accord. If a nest is discovered at any point, please contact the O'ahu Branch DOFAW Office at (808) 973-9778 and establish a buffer zone around the nest.

The State endangered pueo or Hawaiian Short-eared owl (*Asio flammeus sandwichensis*) could potentially occur in the project vicinity. Pueo are most active during dawn and dusk twilights. Remove and exclude non-native mammals such as mongoose, cats, dogs, and ungulates from the nesting area. Minimize habitat alterations and disturbance during pueo breeding season. Before any potentially disturbing activity like clearing vegetation, especially ground-based disturbance, DOFAW recommends a qualified biologist conduct surveys during crepuscular hours and walk line transects through the area to detect any active pueo nests. If a pueo nest is discovered, notify DOFAW staff, minimize time spent at the nest, and establish a minimum buffer distance of 100 meters from the nest until chicks are capable of flight.

DOFAW recommends using native plant species for landscaping that are appropriate for the area; i.e., plants for which climate conditions are suitable for them to thrive, plants that historically occurred there, etc. Please do not plant invasive species. DOFAW also recommends referring to www.plantpono.org for guidance on the selection and evaluation of landscaping plants and to determine the potential invasiveness of plants proposed for use in the project.

DOFAW recommends minimizing the movement of plant or soil material between worksites. Soil and plant material may contain detrimental fungal pathogens (e.g., Rapid 'Ōhi'a Death), vertebrate and invertebrate pests (e.g., Little Fire Ants, Coconut Rhinoceros Beetles, etc.), or invasive plant parts (e.g., Miconia, Pampas Grass, etc.) that could harm our native species and ecosystems. We recommend consulting the O'ahu Invasive Species Committee (OISC) at (808) 266-7994 to help plan, design, and construct the project, learn of

any high-risk invasive species in the area, and ways to mitigate their spread. All equipment, materials, and personnel should be cleaned of excess soil and debris to minimize the risk of spreading invasive species.

The invasive Coconut Rhinoceros Beetle (CRB) or *Oryctes rhinoceros* is known to occur on the island of Oʻahu. On July 1, 2022, the Hawaiʻi Department of Agriculture (HDOA) approved Plant Quarantine Interim Rule 22-1. This rule restricts the movement of CRB-host material within or to and from the island of Oʻahu, which is defined as the Quarantine Area. Regulated material (host material or host plants) is considered a risk for potential CRB infestation. Host material for the beetle specifically includes a) entire dead trees, b) mulch, compost, trimmings, fruit, and vegetative scraps, and c) decaying stumps. CRB host plants include the live palm plants in the following genera: *Washingtonia*, *Livistona*, and *Pritchardia* (all commonly known as fan palms), *Cocos* (coconut palms), *Phoenix* (date palms), and *Roystonea* (royal palms). When such material or these specific plants are moved there is a risk of spreading CRB because they may contain CRB in any life stage. For more information regarding CRB, please visit https://dlnr.hawaii.gov/hisc/info/invasive-species-profiles/coconut-rhinoceros-beetle/.

DOFAW is concerned about impacts to vulnerable birds from nonnative predators such as cats, rodents, and mongooses. We recommend taking action to minimize predator presence; remove cats, place bait stations for rodents and mongoose, and provide covered trash receptacles.

We recommend that Best Management Practices are employed during and after construction to contain any soils and sediment to prevent damage to near-shore waters and marine ecosystems.

We appreciate your efforts to work with our office for the conservation of our native species. These comments are general guidelines and should not be considered comprehensive for this site or project. It is the responsibility of the applicant to do their own due diligence to avoid any negative environmental impacts. Should the scope of the project change significantly, or should it become apparent that threatened or endangered species may be impacted, please contact our staff as soon as possible. If you have any questions, please contact Myrna N. Girald Pérez, Protected Species Habitat Conservation Planning Coordinator at (808) 265-3276 or myrna.girald-perez@hawaii.gov.

Sincerely,

JASON D. OMICK
Acting Wildlife Program Manager

JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA

DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
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TECHNICAL DESIGN SECTION, ROOM 688

EDWIN H. SNIFFEN
DIRECTOR
KA LUNA HO'OKELE

Deputy Directors
Nā Hope Luna Ho'okele
DREANALEE K. KALILI
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ROBIN K. SHISHIDO

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF TRANSPORTATION | KA 'OIHANA ALAKAU
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:

HWY-DS 2.20102

February 1, 2024

TO: JASON D. OMICK, ACTING WILDLIFE PROGRAM MANAGER
DEPARTMENT OF LAND AND NATURAL RESOURCES

FROM: HENRY KENNEDY *Henry Kennedy*
ENGINEERING PROGRAM MANAGER
DESIGN BRANCH

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR KAMEHAMEHA HIGHWAY (ROUTE 83) REPLACEMENT OF WAIAHOLE BRIDGE, KOOLAUPOKO, OAHU, WAIAHOLE, TAX MAP KEYS: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018, (1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023, (1) 4-8-008:024, (1) 4-8-008:025, (1) 4-8-009:001, AND (1) 4-8-009:006 FEDERAL-AID PROJECT NO. BR-083-1(088)

Thank you for your memorandum dated December 1, 2023, (Division of Forestry and Wildlife (DOFAW) File No. 4323) regarding the subject project. We acknowledge your comments below and provide the following responses.

The State listed 'ōpe'ape'a or Hawaiian Hoary Bat (Lasiurus cinereus semotus) could potentially occur at or in the vicinity of the project and may roost in nearby trees. Any required site clearing should be timed to avoid disturbance to bats during their birthing and pup rearing season (June 1 through September 15). During this period woody plants greater than 15 feet 4.6 meters) tall should not be disturbed, removed, or trimmed. Barbed wire should also be avoided for any construction because bats can become ensnared and killed by such fencing material during flight.

Artificial lighting can adversely impact seabirds that may pass through the area at night by causing them to become disoriented. This disorientation can result in their collision with manmade structures or the grounding of birds. It is DOFAW's stance that ***permanent lighting would pose a very high risk of seabird attraction on the proposed stretch of road.*** *New highway lights, therefore, should not be installed in this area to protect seabird flyways and preserve the night sky. For nighttime work that might be required, DOFAW recommends that all lights used be fully shielded to minimize the attraction of seabirds. Nighttime work that requires outdoor lighting should be avoided during the seabird fledging season from September 15 through December 15, the period when young seabirds make their maiden sea voyage. For illustrations and guidance related to seabird-friendly light styles that also*

protect seabirds and the dark starry skies of Hawai‘i please visit: https://dlnr.hawaii.gov/wildlife/files/2016/03/DOC439.pdf.

State-listed waterbirds such as ae‘o or Hawaiian stilt (Himantopus mexicanus knudseni), ‘alae ke‘oke‘o or Hawaiian coot (Fulica alai), ‘alae ‘ula or Hawaiian gallinule (Gallinula chloropus sandvicensis), and koloa maoli or Hawaiian Duck (Anas wyvilliana) could potentially occur at or in the vicinity of the proposed project site. It is against State law to harm or harass these species. If any of these species are present during construction, all activities within 100 feet (30 meters) should cease and the bird or birds should not be approached. Work may continue after the bird or birds leave the area of their own accord. If a nest is discovered at any point, please contact the O‘ahu Branch DOFAW Office at (808) 973-9778 and establish a buffer zone around the nest.

The State endangered pueo or Hawaiian Short-eared owl (Asio flammeus sandwichensis) could potentially occur in the project vicinity. Pueo are most active during dawn and dusk twilights. Remove and exclude non-native mammals such as mongoose, cats, dogs, and ungulates from the nesting area. Minimize habitat alterations and disturbance during pueo breeding season. Before any potentially disturbing activity like clearing vegetation, especially ground-based disturbance, DOFAW recommends a qualified biologist conduct surveys during crepuscular hours and walk line transects through the area to detect any active pueo nests. If a pueo nest is discovered, notify DOFAW staff, minimize time spent at the nest, and establish a minimum buffer distance of 100 meters from the nest until chicks are capable of flight.

DOFAW recommends using native plant species for landscaping that are appropriate for the area; i.e., plants for which climate conditions are suitable for them to thrive, plants that historically occurred there, etc. Please do not plant invasive species. DOFAW also recommends referring to www.plantpono.org for guidance on the selection and evaluation of landscaping plants and to determine the potential invasiveness of plants proposed for use in the project.

DOFAW recommends minimizing the movement of plant or soil material between worksites. Soil and plant material may contain detrimental fungal pathogens (e.g., Rapid ‘Ōhi‘a Death), vertebrate and invertebrate pests (e.g., Little Fire Ants, Coconut Rhinoceros Beetles, etc.), or invasive plant parts (e.g., Miconia, Pampas Grass, etc.) that could harm our native species and ecosystems. We recommend consulting the O‘ahu Invasive Species Committee (OISC) at (808) 266-7994 to help plan, design, and construct the project, learn of any high-risk invasive species in the area, and ways to mitigate their spread. All equipment, materials, and personnel should be cleaned of excess soil and debris to minimize the risk of spreading invasive species. The invasive Coconut Rhinoceros Beetle (CRB) or Oryctes rhinoceros is known to occur on the island of O‘ahu. On July 1, 2022, the Hawai‘i Department of Agriculture (HDOA) approved Plant Quarantine Interim Rule 22-1. This rule restricts the movement of CRB-host material within or to and from the island of O‘ahu,

which is defined as the Quarantine Area. Regulated material (host material or host plants) is considered a risk for potential CRB infestation. Host material for the beetle specifically includes a) entire dead trees, b) mulch, compost, trimmings, fruit, and vegetative scraps, and c) decaying stumps. CRB host plants include the live palm plants in the following genera: Washingtonia, Livistona, and Pritchardia (all commonly known as fan palms), Cocos (coconut palms), Phoenix (date palms), and Roystonea (royal palms). When such material or these specific plants are moved there is a risk of spreading CRB because they may contain CRB in any life stage. For more information regarding CRB, please visit https://dlnr.hawaii.gov/hisc/info/invasive-species-profiles/coconut-rhinocerosbeetle/.

DOFAW is concerned about impacts to vulnerable birds from nonnative predators such as cats, rodents, and mongooses. We recommend taking action to minimize predator presence; remove cats, place bait stations for rodents and mongoose, and provide covered trash receptacles.

We recommend that Best Management Practices are employed during and after construction to contain any soils and sediment to prevent damage to near-shore waters and marine ecosystems.

Thank you for responding to our request for preliminary consultation and providing your comments and recommendations. Due to federal funding and federal permits required for the project, the project requires an Endangered Species Act (ESA) Section 7 Consultation. To fulfill the Section 7 consultation, a Biological Evaluation (BE) was prepared and will be included as an appendix to the Draft Environmental Assessment (DEA). The BE evaluates impacts to the federally listed Hawaiian hoary bat, Hawaiian seabirds, and Hawaiian waterbirds. The BE concluded that the project "may affect but is not likely to adversely affect" listed species if proper best management practices (BMPs) to mitigate potential impacts are implemented.

We acknowledge that listed Hawaiian waterbirds, Hawaiian seabirds, pueo, and the Hawaiian hoary bat may occur in or transit through the Waiahole Bridge Replacement project site. BMPs and mitigative measures for listed avian species that you described will be included in Section 4.9 Avian and Reptilian Resources of the DEA, and those for the Hawaiian hoary bat will be included in Section 4.10 Mammalian Resources of the DEA. At this time, there are no plans to remove nonnative predators or place bait stations; however, if trash receptables are required, they will be covered to minimize predator presence and bait stations will be added if predators are observed to be attracted to trash receptacles. We acknowledge DOFAW's stance that "**permanent lighting would pose a very high risk of seabird attraction on the proposed stretch of road.** New highway lights, therefore, should not be installed in this area to protect seabird flyways and preserve the night sky." While lighting will be installed to mitigate nighttime traffic accidents at the bridge, post-construction street lighting will meet State laws for shielding and brightness.

Native plant species appropriate for the area will be used for landscaping where feasible. The plans for site restoration are that the area will be returned to the original conditions. A landscape plan will be provided in the plans.

We acknowledge the threats of fungal pathogens and pests that can result from moving plant or soil material between worksites. Movement of known host material for the Coconut Rhinoceros Beetle, such as entire dead trees, mulch, compost, trimming, and decaying stumps, and live palm *Washingtonia, Livistona, Pritchardia, Cocos* (coconut palms)*, Phoenix* (date palms)*, and Roystonea* (royal palms) species shall be avoided. Should host material need to be removed from the site, it will not be removed from the island of Oahu, in accordance with Plant Quarantine Interim Rule 22-1. DOFAW's recommendations for minimizing the spread of pests and pathogens will be included in Section 4.7 Plant Resources of the DEA. The resources on the Oahu Invasive Species Committee's (OISC) website will be reviewed and OISC will be consulted for their comments on the DEA.

BMPs will be employed during and after construction to contain soils and minimize stream bank disturbances and runoff into nearshore water and marine ecosystems. Potential impacts and mitigation measures to minimize effects to aquatic biota are discussed in Section 4.8 Aquatic Resources of the DEA.

We will include you in future correspondence as we seek further input on the proposed improvements to the intersection throughout the environmental review process in compliance with Hawaii Revised Statutes Chapter 343.

We value your participation in the environmental review process. Your letter and this response will be reproduced in the forthcoming Draft Environmental Assessment.

Should you have any questions please contact Evan Kimoto, State of Hawaii Department of Transportation Project Manager, at (808) 692-7551, or by email at evan.kimoto@hawaii.gov

JOSH GREEN, M.D.
GOVERNOR | KE KIA'ĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'ĀINA

KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA 'OIHANA KUMUWAIWAI 'ĀINA
OFFICE OF CONSERVATION AND COASTAL LANDS
P.O. BOX 621
HONOLULU, HAWAII 96809

DAWN N.S. CHANG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

LAURA H.E. KAAKUA
FIRST DEPUTY

M. KALEO MANUEL
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

REF:OCCL:CM

Correspondence: OA 24-69

Nov 20, 2023

Henry Kennedy
Engineering Program Manager, Design Branch
Department of Transportation
State of Hawaii
601 Kamokila Boulevard
Kapolei, HI 96707

SUBJECT: Pre-Assessment Consultation for Kamehameha Highway (Route 83) Replacement of Waiahole Bridge; Koolaupoko, Oahu; Tax Map Keys (TMK): (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018, (1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023, (1) 4-8-008:024, (1) 4-8-008:025, (1) 4-8-009:001, and (1) 4-8-009:006; Federal-Aid Project No. BR-083-1(088)

Dear Mr. Kennedy,

The Office of Conservation and Coastal Lands (OCCL) has reviewed your correspondence regarding the proposed replacement of the Waiahole Bridge. The bridge is located on Kamehameha Highway makai of Waiahole valley. According to the information you provided, the proposed project will include the construction of a new bridge adjacent to the makai face of the existing bridge. Also, realignment of Kamehameha Highway will occur during construction of the proposed bridge. The proposed bridge will include new railings accessway to allow vehicles, bicycles, and pedestrians to safely use the bridge. A replacement bridge is needed because the current bridge that was built in 1922 (almost 100 years ago) has been determined to be structurally deficient. Upon completion of the new bridge the old bridge will be dismantled.

Staff's research identified that the project site is in the State of Hawaii Agricultural Land Use District, and the City and County of Honolulu AG-2 General Agricultural District. The OCCL regulates land uses within the State Land Use Conservation District, as such, the project appears to be located outside of our jurisdiction. Therefore, a Conservation District Use Permit would not be required.

Should you have any questions regarding this correspondence, contact Cal Miyahara of the Office of Conservation and Coastal Lands at (808) 798-6147 or calen.miyahara@hawaii.gov.

Sincerely,

S Michael Cain

Michael Cain, Administrator
Office of Conservation and Coastal Lands

C: ODLO
City-Department of Planning and Permitting

JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA

DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
ENVIRONMENTAL DESIGN SECTION, ROOM 688A
HIGHWAY DESIGN SECTION, ROOM 609
HYDRAULIC DESIGN SECTION, ROOM 636
TECHNICAL DESIGN SECTION, ROOM 688

EDWIN H. SNIFFEN
DIRECTOR
KA LUNA HO'OKELE

Deputy Directors
Nā Hope Luna Ho'okele
DREANALEE K. KALILI
TAMMY L. LEE
ROBIN K. SHISHIDO

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF TRANSPORTATION | KA 'OIHANA ALAKAU
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:

HWY-DS 2.20103

February 1, 2024

TO: MICHAEL CAIN, ADMINISTRATOR
DEPARTMENT OF LAND AND NATURAL RESOURCES

FROM: HENRY KENNEDY Henry Kennedy
ENGINEERING PROGRAM MANAGER
DESIGN BRANCH

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR KAMEHAMEHA HIGHWAY (ROUTE 83) REPLACEMENT OF WAIAHOLE BRIDGE, KOOLAUPOKO, OAHU, WAIAHOLE, TAX MAP KEYS: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018, (1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023, (1) 4-8-008:024, (1) 4-8-008:025, (1) 4-8-009:001, AND (1) 4-8-009:006 FEDERAL-AID PROJECT NO. BR-083-1(088)

Thank you for your response letter dated November 20, 2023 (Office of Conservation and Coastal Lands (OCCL) File No. OA 24-69) regarding the subject project. We acknowledge your comments below and provide the following responses.

> *Staff's research identified that the project site is in the State of Hawaii Agricultural Land Use District, and the City and County of Honolulu AG-2 General Agricultural District. The OCCL regulates land uses within the State Land Use Conservation District, as such, the project appears to be located outside of our jurisdiction. Therefore, a Conservation District Use Permit would not be required.*

We acknowledge your comment regarding the proposed project not requiring a Conservation District Use Permit since the project site is within the agricultural district designation. In addition, construction activities related to the project will not impact any areas within a designated conservation district.

We will include you in future correspondence as we seek further input on the proposed improvements to the intersection throughout the environmental review process in compliance with Hawaii Revised Statutes Chapter 343.

We value your participation in the environmental review process. Your letter and this response will be reproduced in the forthcoming Draft Environmental Assessment.

Should you have any questions please contact Evan Kimoto, State of Hawaii Department of Transportation Project Manager, at (808) 692-7551, or by email at evan.kimoto@hawaii.gov

BOARD OF WATER SUPPLY
KA ʻOIHANA WAI
CITY AND COUNTY OF HONOLULU

630 SOUTH BERETANIA STREET • HONOLULU, HAWAIʻI 96843
Phone: (808) 748-5000 • www.boardofwatersupply.com

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MAYOR
MEIA

ERNEST Y. W. LAU, P.E.
MANAGER AND CHIEF ENGINEER
MANAKIA A ME KAHU WILIKĪ

ERWIN KAWATA
DEPUTY MANAGER
HOPE MANAKIA

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GENE C. ALBANO, P.E., Ex-Officio

December 1, 2023

Ms. Catie Cullison
PBR HAWAII & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawaiʻi 96813-3484

Dear Ms. Cullison:

Subject: Your Letter Dated October 31, 2023 Requesting Comments on the Pre-Assessment Consultation for Kamehameha Highway (Route 83) Replacement of Waiāhole Bridge – Tax Map Key: 4-8-001: 010; 4-8-002: 001; 4-8-008: 018, 021 Through 025; 4-8-009: 001, 006

Thank you for your letter regarding the proposed bridge replacement project.

The Honolulu Board of Water Supply (BWS) has 8-inch and 30-inch water mains along Kamehameha Highway within the proposed Waiāhole Bridge Replacement Project Area. Please coordinate with our Capital Projects Division regarding any potential water line re-alignment and/or relocations.

The construction plans should be submitted for BWS review and approval and the construction schedule should be coordinated with BWS to minimize impacts on the water system.

If you have any questions, please contact Robert Chun, Project Review Branch of our Water Resources Division at (808) 748-5443.

Very truly yours,

ERNEST Y. W. LAU, P.E.
Manager and Chief Engineer

JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA

DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
ENVIRONMENTAL DESIGN SECTION, ROOM 688A
HIGHWAY DESIGN SECTION, ROOM 609
HYDRAULIC DESIGN SECTION, ROOM 636
TECHNICAL DESIGN SECTION, ROOM 688

EDWIN H. SNIFFEN
DIRECTOR
KA LUNA HO'OKELE

Deputy Directors
Nā Hope Luna Ho'okele
DREANALEE K. KALILI
TAMMY L. LEE
ROBIN K. SHISHIDO

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF TRANSPORTATION | KA 'OIHANA ALAKAU
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:

HWY-DS 2.20083

February 1, 2024

Mr. Ernest Lau
Manager and Chief Engineer
Board of Water Supply
630 South Beretania Street
Honolulu, Hawaii 96843

Dear Mr. Lau:

Subject: Pre-Assessment Consultation for Kamehameha Highway (Route 83)
Replacement of Waiahole Bridge, Koolaupoko, Oahu, Waiahole,
Tax Map Keys: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018,
(1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023, (1) 4-8-008:024,
(1) 4-8-008:025, (1) 4-8-009:001, and (1) 4-8-009:006
Federal-Aid Project No. BR-083-1(088)

Thank you for your response letter dated December 1, 2023 regarding the subject project. We acknowledge your comments below and provide the following responses.

> *The Honolulu Board of Water Supply (BWS) has 8-inch and 30-inch water mains along Kamehameha Highway within the proposed Waiahole Bridge Replacement Project Area. Please coordinate with our Capital Projects Division regarding any potential water line re-alignment and/or relocations.*
> *The construction plans should be submitted for BWS review and approval and the construction schedule should be coordinated with BWS to minimize impacts on the water system.*

We acknowledge the Board of Water Supply (BWS) water mains along Kamehameha Highway within the project area. The design team has connected with the BWS Capital Projects Division Plans Review Section to begin planning water line realignment and construction phasing.

We acknowledge the need to submit construction plans to BWS for review and approval.

We will include you in future correspondence as we seek further input on the proposed improvements to the intersection throughout the environmental review process in compliance with Hawaii Revised Statutes Chapter 343.

We value your participation in the environmental review process. Your letter and this response will be reproduced in the forthcoming Draft Environmental Assessment.

Should you have any questions please contact Evan Kimoto, State of Hawaii Department of Transportation Project Manager, at (808) 692-7551, or by email at evan.kimoto@hawaii.gov

Sincerely,

Henry Kennedy

HENRY KENNEDY
Engineering Program Manager
Design Branch

DEPARTMENT OF COMMUNITY SERVICES
KA 'OIHANA LAWELAWE KAIĀULU
CITY AND COUNTY OF HONOLULU

925 DILLINGHAM BOULEVARD, SUITE 200 • HONOLULU, HAWAI'I 96817
PHONE: (808) 768-7762 • FAX: (808) 768-7792 • WEB: www.honolulu.gov

RICK BLANGIARDI
MAYOR
MEIA

ANTON C. KRUCKY
DIRECTOR
PO'O

AEDWARD LOS BANOS
DEPUTY DIRECTOR
HOPE PO'O

November 15, 2023

PBR HAWAII & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813
Attn: Catie Cullison

Dear Ms. Cullison:

SUBJECT: Pre-Consultation: DRAFT Environmental Assessment
Waiāhole Bridge Replacement
TMKs: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018 and 021 to 025, (1) 4-8-009:001, and (1) 4-8-009:006

Thank you for notifying us that PBR HAWAII & Associates, Inc. is preparing a Draft Environmental Assessment (DEA) for the above-named project on behalf of the State of Hawai'i Department of Transportation (HDOT).

Our review indicates that the proposed project should have no adverse impacts on any Department of Community Services activities or projects in the surrounding neighborhood.

Thank you for providing us the opportunity to comment on this matter.

Sincerely,

Anton C. Krucky
Director

JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA

DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
ENVIRONMENTAL DESIGN SECTION, ROOM 688A
HIGHWAY DESIGN SECTION, ROOM 609
HYDRAULIC DESIGN SECTION, ROOM 636
TECHNICAL DESIGN SECTION, ROOM 688

EDWIN H. SNIFFEN
DIRECTOR
KA LUNA HO'OKELE

Deputy Directors
Nā Hope Luna Ho'okele
DREANALEE K. KALILI
TAMMY L. LEE
ROBIN K. SHISHIDO

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF TRANSPORTATION | KA 'OIHANA ALAKAU
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:

HWY-DS 2.20084

February 1, 2024

Mr. Anton Krucky, Director
Department of Community Services
925 Dillingham Boulevard, Suite 200
Honolulu, Hawaii 96817

Dear Mr. Krucky:

Subject: Pre-Assessment Consultation for Kamehameha Highway (Route 83)
Replacement of Waiahole Bridge, Koolaupoko, Oahu, Waiahole,
Tax Map Keys: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018,
(1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023, (1) 4-8-008:024,
(1) 4-8-008:025, (1) 4-8-009:001, and (1) 4-8-009:006
Federal-Aid Project No. BR-083-1(088)

Thank you for your response letter dated November 15, 2023 regarding the subject project. We acknowledge your comments below and provide the following responses.

> *Our review indicates that the proposed project should have no adverse impacts on any Department of Community Services activities or projects in the surrounding neighborhood.*

We acknowledge your comment stating that the proposed project will have no adverse impacts on Department of Community Services activities or projects within the surrounding neighborhood.

We will include you in future correspondence as we seek further input on the proposed improvements to the intersection throughout the environmental review process in compliance with Hawaii Revised Statutes Chapter 343.

We value your participation in the environmental review process. Your letter and this response will be reproduced in the forthcoming Draft Environmental Assessment.

Should you have any questions please contact Evan Kimoto, State of Hawaii Department of Transportation Project Manager, at (808) 692-7551, or by email at evan.kimoto@hawaii.gov

Sincerely,

Henry Kennedy

HENRY KENNEDY
Engineering Program Manager
Design Branch

DEPARTMENT OF DESIGN AND CONSTRUCTION
KA 'OIHANA HAKULAU A ME KE KĀPILI
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 11TH FLOOR • HONOLULU, HAWAI'I 96813
PHONE: (808) 768-8480 • FAX: (808) 768-4567 • WEBSITE: honolulu.gov

RICK BLANGIARDI
MAYOR
MEIA

HAKU MILLES, P.E.
DIRECTOR
PO'O

BRYAN GALLAGHER, P.E.
DEPUTY DIRECTOR
HOPE PO'O

November 28, 2023

SENT VIA EMAIL

Catie Cullison
ccullison@pbrhawaii.com

Dear Ms. Cullison:

Subject: Pre-Assessment Consultation for Kamehameha Highway (Route 83)
Replacement of Waiāhole Bridge, Ko'olaupoko, O'ahu, Waiāhole
TMKs: (1) 4-8-001:010,(1) 4-8-002:001, (1) 4-8-008:018, (1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023, (1) 4-8-008:024, (1) 4-8-008:025, (1) 4-8-009:001, and (1) 4-8-009:006
Federal-Aid Project No. BR-083-1(088)

Thank you for the opportunity to review and comment. Our Civil Division has the following comments.

DDC has a future project to repave a portion of Kamehameha Highway within the City's jurisdiction. The project called Rehabilitation of Streets, Unit 73C, will repave Kamehameha Highway from approximately North of He'eia Stream to Kahekili Highway. The project includes asphalt pavement resurfacing, shoreline protection measures, erosion protection measures, guardrail work and a proposed realignment of an approximately 3,000 linear foot section of Kamehameha Hwy inland in the location of the currently undeveloped He'eia Kea Valley Nature Park.

The project is currently starting the Pre-Assessment Consultation for the project DEA.

Should you have any further questions, please contact Stan Katsura, Civil Division Chief at (808) 768-8836.

Sincerely,

FOR Haku Milles, P.E., LEED AP
Director

HM:krn (912375)

JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA

DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
ENVIRONMENTAL DESIGN SECTION, ROOM 688A
HIGHWAY DESIGN SECTION, ROOM 609
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TECHNICAL DESIGN SECTION, ROOM 688

EDWIN H. SNIFFEN
DIRECTOR
KA LUNA HO'OKELE

Deputy Directors
Nā Hope Luna Ho'okele
DREANALEE K. KALILI
TAMMY L. LEE
ROBIN K. SHISHIDO

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF TRANSPORTATION | KA 'OIHANA ALAKAU
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:

HWY-DS 2.20085

February 1, 2024

Mr. Haku Milles, Director
Department of Design and Construction
Frank F. Fasi Municipal Building
650 South King Street 11th Floor
Honolulu, Hawaii 96813

Dear Mr. Milles:

Subject: Pre-Assessment Consultation for Kamehameha Highway (Route 83)
Replacement of Waiahole Bridge, Koolaupoko, Oahu, Waiahole,
Tax Map Keys: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018,
(1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023, (1) 4-8-008:024,
(1) 4-8-008:025, (1) 4-8-009:001, and (1) 4-8-009:006
Federal-Aid Project No. BR-083-1(088)

Thank you for your response letter dated November 28, 2023, (Department of Design and Construction (DDC) File No. HM: krn 912375) regarding the subject project. We acknowledge your comments below and provide the following responses.

> *DDC has a future project to repave a portion of Kamehameha Highway within the City's jurisdiction. The project called Rehabilitation of Streets, Unit 73C, will repave Kamehameha Highway from approximately North of Heeia Stream to Kahekili Highway. The project includes asphalt pavement resurfacing, shoreline protection measures, erosion protection measures, guardrail work and a proposed realignment of an approximately 3,000 linear foot section of Kamehameha Hwy inland in the location of the currently undeveloped Heeia Kea Valley Nature Park.*

We acknowledge your upcoming project to repave a portion of Kamehameha Highway between (roughly) Heeia Stream to Kahekili Highway, including an approximately 3,000-foot realignment of the highway. We will continue to coordinate with DDC Civil Division as each project progresses.

We will include you in future correspondence as we seek further input on the proposed improvements to the intersection throughout the environmental review process in compliance with Hawaii Revised Statutes Chapter 343.

We value your participation in the environmental review process. Your letter and this response will be reproduced in the forthcoming Draft Environmental Assessment.

Should you have any questions please contact Evan Kimoto, State of Hawaii Department of Transportation Project Manager, at (808) 692-7551, or by email at evan.kimoto@hawaii.gov

Sincerely,

Henry Kennedy

HENRY KENNEDY
Engineering Program Manager
Design Branch

From:	Kayla Palmer
To:	Kayla Palmer
Subject:	FW: Replacement of Waiahole Bridge
Date:	Tuesday, December 5, 2023 2:29:01 PM

From: Jacinto-Kawabata, Marie <m.jacinto-kawaba@honolulu.gov>
Sent: Tuesday, December 5, 2023 2:12 PM
To: Catie Cullison <ccullison@pbrhawaii.com>
Subject: Replacement of Waiahole Bridge

Aloha,

Director Toiya has no comments to the Pre-Assessment Consultation for Kamehameha Highway (Route 83) Replacement of Waiahole Bridge.

Mahalo,

Marie Jacinto-Kawabata
Office Assistant
City & County of Honolulu
Department of Emergency Management
Office: (808) 723-8960
Fax: (808) 768-1492

JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA

DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
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EDWIN H. SNIFFEN
DIRECTOR
KA LUNA HO'OKELE

Deputy Directors
Nā Hope Luna Ho'okele
DREANALEE K. KALILI
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ROBIN K. SHISHIDO

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF TRANSPORTATION | KA 'OIHANA ALAKAU
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:

HWY-DS 2.20086

February 1, 2024

Mr. Hiro Toiya, Director
Department of Emergency Management
650 South King Street Basement
Honolulu, Hawaii 96813

Dear Mr. Toiya:

Subject: Pre-Assessment Consultation for Kamehameha Highway (Route 83)
Replacement of Waiahole Bridge, Koolaupoko, Oahu, Waiahole,
Tax Map Keys: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018,
(1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023, (1) 4-8-008:024,
(1) 4-8-008:025, (1) 4-8-009:001, and (1) 4-8-009:006
Federal-Aid Project No. BR-083-1(088)

Thank you for your email comment dated December 5, 2023 regarding the subject project. We acknowledge that the Department of Emergency Management has no comments on the proposed project.

We will include you in future correspondence as we seek further input on the proposed improvements to the intersection throughout the environmental review process in compliance with Hawaii Revised Statutes Chapter 343.

We value your participation in the environmental review process. Your letter and this response will be reproduced in the forthcoming Draft Environmental Assessment.

Should you have any questions please contact Evan Kimoto, State of Hawaii Department of Transportation Project Manager, at (808) 692-7551, or by email at evan.kimoto@hawaii.gov

Sincerely,

Henry Kennedy

HENRY KENNEDY
Engineering Program Manager
Design Branch

DEPARTMENT OF FACILITY MAINTENANCE
KA ʻOIHANA MĀLAMA HALE
CITY AND COUNTY OF HONOLULU

1000 ULU`OHIA STREET, SUITE 215, KAPOLEI, HAWAI'I 96707
PHONE: (808) 768-3343 • Fax: (808) 768-3381 • WEBSITE: honolulu.gov

RICK BLANGIARDI
MAYOR
MEIA

GENE C. ALBANO, P.E.
DIRECTOR AND CHIEF ENGINEER
PO'O A ME LUNA NUI 'ENEKINIA

WARREN K. MAMIZUKA
DEPUTY DIRECTOR
HOPE PO'O

IN REPLY REFER TO:
DRM 23-523

December 1, 2023

PBR Hawaii & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813
Attention: Catie Cullison

Dear Ms. Cullison:

Subject: **Pre-Assessment Consultation for Kamehameha Highway (Route 83) Replacement of Waiahole Bridge, Koolaupoko, Oahu, Waiahole, Tax Map Keys: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018, (1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023, (1) 4-8-008:024, (1) 4-8-008:025, (1) 4-8-009:001, and (1) 4-8-009:006, Federal-Aid Project No. BR-083-1(088)**

Thank you for the opportunity to review and give our input regarding the Pre-Assessment Consultation for the Kamehameha Highway (Route 83) Replacement of Waiahole Bridge dated October 31, 2023.

We have no objections at this time, however, if we request further information of the proposed project and its impact to the City and County of Honolulu TMK: (1) 4-8-001:010 and (1) 4-8-002:001.

Should there be any questions, please contact Kyle Oyasato of Division of Road Maintenance at 808-768-3697.

Sincerely,

Gene C. Albano, P.E.
Director and Chief Engineer

JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA

DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
ENVIRONMENTAL DESIGN SECTION, ROOM 688A
HIGHWAY DESIGN SECTION, ROOM 609
HYDRAULIC DESIGN SECTION, ROOM 636
TECHNICAL DESIGN SECTION, ROOM 688

EDWIN H. SNIFFEN
DIRECTOR
KA LUNA HO'OKELE

Deputy Directors
Nā Hope Luna Ho'okele
DREANALEE K. KALILI
TAMMY L. LEE
ROBIN K. SHISHIDO

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF TRANSPORTATION | KA 'OIHANA ALAKAU
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:

HWY-DS 2.20087

February 1, 2024

Mr. Gene Albano
Director and Chief Engineer Designate
Department of Facility Maintenance
Kapolei Hale
1000 Uluohia Street, Suite 215
Honolulu, Hawaii 96707

Dear Mr. Albano:

Subject: Pre-Assessment Consultation for Kamehameha Highway (Route 83)
Replacement of Waiahole Bridge, Koolaupoko, Oahu, Waiahole,
Tax Map Keys: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018,
(1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023, (1) 4-8-008:024,
(1) 4-8-008:025, (1) 4-8-009:001, and (1) 4-8-009:006
Federal-Aid Project No. BR-083-1(088)

Thank you for your response letter dated December 1, 2023, (Department of Facility Maintenance (DFM) File No. DRM 23-523) regarding the subject project. We acknowledge that the DFM has no comments on the proposed project.

We will include you in future correspondence as we seek further input on the proposed improvements to the intersection throughout the environmental review process in compliance with Hawaii Revised Statutes Chapter 343.

We value your participation in the environmental review process. Your letter and this response will be reproduced in the forthcoming Draft Environmental Assessment.

Should you have any questions please contact Evan Kimoto, State of Hawaii Department of Transportation Project Manager, at (808) 692-7551, or by email at evan.kimoto@hawaii.gov

Sincerely,

Henry Kennedy

HENRY KENNEDY
Engineering Program Manager
Design Branch

DEPARTMENT OF PLANNING AND PERMITTING
KA 'OIHANA HO'OLĀLĀ A ME NĀ PALAPALA 'AE
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 7TH FLOOR • HONOLULU, HAWAI'I 96813
PHONE: (808) 768-8000 • FAX: (808) 768-6041 • WEBSITE: honolulu.gov/dpp

RICK BLANGIARDI
MAYOR
MEIA

DAWN TAKEUCHI APUNA
DIRECTOR
PO'O

JIRO A. SUMADA
DEPUTY DIRECTOR
HOPE PO'O

December 6, 2023

2023/ELOG-2066
(df)

Ms. Catie Cullison
PBR Hawai'i & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawai'i 96813-3484

Dear Ms. Cullison:

This is in response to a letter dated October 31, 2023, from the State of Hawai'i, Department of Transportation, requesting comments for the Kamehameha Highway (Route 83) Replacement of Waiāhole Bridge Project, Koolaupoko, Waiāhole, TMK Nos. 4-8-001: 010, 4-8-002: 001, 4-8-008: 018, 4-8-008: 021, 4-8-008: 022, 4-8-008: 023, 4-8-008: 024, 4-8-008: 025, 4-8-009: 001; and 4-8-009: 006.

Specifically, the letter asks for our Department's input as to whether the proposed intersection improvements at Waiāhole Valley Road and Kamehameha Highway may have an impact on any of our "...*existing or proposed projects, plans, policies, or programs*..." that should be considered when preparing the Hawai'i Revised Statutes, Chapter 343, Environment Assessment. We have no comments to offer at this time; however, please be reminded that our Department had previously commented on this project in our letter to you dated December 4, 2017 (2017/ELOG-2301.)

Should you have any questions, please contact Don Fujii, at (808) 768-8107, or Mel Takakura, at (808) 768-8104, of our Site Development Division.

Very truly yours,

Dawn Takeuchi Apuna
Director

cc: Department of Transportation

JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA

DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
ENVIRONMENTAL DESIGN SECTION, ROOM 688A
HIGHWAY DESIGN SECTION, ROOM 609
HYDRAULIC DESIGN SECTION, ROOM 636
TECHNICAL DESIGN SECTION, ROOM 688

EDWIN H. SNIFFEN
DIRECTOR
KA LUNA HO'OKELE

Deputy Directors
Nā Hope Luna Ho'okele
DREANALEE K. KALILI
TAMMY L. LEE
ROBIN K. SHISHIDO

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF TRANSPORTATION | KA 'OIHANA ALAKAU
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:

HWY-DS 2.20088

February 1, 2024

Ms. Dawn Apuna, Director Designate
Department of Planning and Permitting
Frank F. Fasi Municipal Building
650 South King Street 7th Floor
Honolulu, Hawaii 96813

Dear Ms. Apuna:

Subject: Pre-Assessment Consultation for Kamehameha Highway (Route 83)
Replacement of Waiahole Bridge, Koolaupoko, Oahu, Waiahole,
Tax Map Keys: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018,
(1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023, (1) 4-8-008:024,
(1) 4-8-008:025, (1) 4-8-009:001, and (1) 4-8-009:006
Federal-Aid Project No. BR-083-1(088)

Thank you for your email comment dated December 6, 2023, (Department of Planning and Permitting (DPM) File No. 2023/ELOG-2066 (df)) regarding the subject project. We acknowledge that the DPM is referencing an earlier pre-consultation comment letter dated December 4, 2017 and respond to the 2017 comments as follow.

1. Please see Draft Environmental Assessment (DEA) Section 6.3.2 which discusses compliance with the Sustainable Community Plan.
2. Please see DEA Sections 4.5, 4.6, and associated figures which discuss potential sea level rise as well as State of Hawaii Department of Transportation (HDOT)'s *Bridge Adaptive Policy Regarding Sea Level Rise.* Regarding Army Corps' policies, the design team includes personnel who are actively communicating with the State of Hawaii, Department of Agriculture (HDOA) on their policies and HDOA permits. This conversation is ongoing.
3. We acknowledge that the project area is within the Special Management Area (SMA). Please see DEA Sections 6.1.4, 6.2.3, and 6.3.5 relating to the Coastal Zone Management Act and the City and County of Honolulu's SMA policies which help to ensure compliance with the Act. Table 1 of the DEA acknowledges the requirement for SMA approval through the City and County of Honolulu.
4. The need for a grading permit is also acknowledged in Table 1 of the DEA and grading details will be further developed as the project design advances.

We will include you in future correspondence as we seek further input on the proposed improvements to the intersection throughout the environmental review process in compliance with Hawaii Revised Statutes Chapter 343.

We value your participation in the environmental review process. Your letter and this response will be reproduced in the forthcoming DEA.

Should you have any questions please contact Evan Kimoto, HDOT Project Manager, at (808) 692-7551, or by email at evan.kimoto@hawaii.gov

Sincerely,

Henry Kennedy

HENRY KENNEDY
Engineering Program Manager
Design Branch

DEPARTMENT OF TRANSPORTATION SERVICES
KA 'OIHANA LAWELAWE 'ŌHUA
CITY AND COUNTY OF HONOLULU
711 KAPI'OLANI BOULEVARD, SUITE 1600
HONOLULU, HAWAI'I 96813
Phone: (808) 768-8305 • Fax: (808) 768-4730 • Internet: www.honolulu.gov

RICK BLANGIARDI
MAYOR
MEIA

J. ROGER MORTON
DIRECTOR
PO'O

JON Y. NOUCHI
DEPUTY DIRECTOR
HOPE PO'O

TP11/23-912546

November 30, 2023

Catie Cullison, Project Manager
PBR HAWAII & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813

Dear Ms. Cullison:

SUBJECT: Pre-Assessment Consultation for Kamehameha Highway (Route 83)
Replacement of Waiahole Bridge, Koolaupoko, Oahu, Waiahole
Tax Map Keys: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018, (1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023, (1) 4-8-008:024, (1) 4-8-008:025, (1) 4-8-009:001, and (1) 4-8-009:006
Federal Aid Project No. BR-083-1(088)

Thank you for the opportunity to provide written comments regarding the Pre-Assessment Consultation for Kamehameha Highway (Route 83); Replacement of Waiahole Bridge, Koolaupoko, Oahu, Waiahole; Tax Map Keys: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018, (1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023, (1) 4-8-008:024, (1) 4-8-008:025, (1) 4-8-009:001, and (1) 4-8-009:006; Federal Aid Project No. BR-083-1(088). We have the following comments.

1. Transportation Impacts.

    i. The Draft Environmental Assessment (DEA) shall discuss short-term transportation impacts on the surrounding City and County of Honolulu (City) roadways and their respective mitigations.

2. Bicycle Improvements.

    i. Kamehameha Highway fronting the project site is classified as an "Avenue" planned to have sidewalks, a shoulder bikeway, two travel lanes, bus service mixed with general purpose travel, and no on-street

parking. The typical future street cross section will resemble in concept the second design on Page 76 of the City's Complete Streets Design Manual. A Priority 1 Shoulder Bikeway proposed project (Project ID 1-38 in the 2019 Oahu Bike Plan) is located on Kamehameha Highway crossing the project site. The replacement bridge shall be designed to accommodate the proposed shoulder bikeway and minimize the number and size of potential conflict areas between bicyclists, pedestrians, and vehicles.

3. Bus Stops. The project site is in the immediate vicinity of bus stops. Please coordinate roadway improvements with Department of Transportation Services (DTS) – Transportation Mobility Division (TMD). Contact DTS-TMD at TheBusStop@honolulu.gov

4. Neighborhood Impacts. The area representatives, neighborhood board, as well as the area guests, businesses, emergency personnel (fire, ambulance, and police), Oahu Transit Services, Inc. (TheBus and TheHandi-Van), etc., should be kept apprised of the details and status throughout the project and the impacts that the project may have on the adjoining local street area network.

5. Disability and Communication Access Board (DCAB). Project plans (vehicular and pedestrian circulation, sidewalks, parking and pedestrian pathways, vehicular ingress/egress, etc.) should be reviewed and approved by DCAB to ensure full compliance with Americans with Disabilities Act requirements.

Should you have any questions, please contact Greg Tsugawa, of my staff, at (808) 768-6683.

Very truly yours,

J. Roger Morton
Director

JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA

DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
ENVIRONMENTAL DESIGN SECTION, ROOM 688A
HIGHWAY DESIGN SECTION, ROOM 609
HYDRAULIC DESIGN SECTION, ROOM 636
TECHNICAL DESIGN SECTION, ROOM 688

EDWIN H. SNIFFEN
DIRECTOR
KA LUNA HO'OKELE

Deputy Directors
Nā Hope Luna Ho'okele
DREANALEE K. KALILI
TAMMY L. LEE
ROBIN K. SHISHIDO

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF TRANSPORTATION | KA 'OIHANA ALAKAU
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:

HWY-DS 2.20089

February 1, 2024

Mr. Roger Morton, Director
Department of Transportation Services
Frank F. Fasi Municipal Building
650 South King Street 3rd Floor
Honolulu, Hawaii 96813

Dear Mr. Morton:

Subject: Pre-Assessment Consultation for Kamehameha Highway (Route 83)
Replacement of Waiahole Bridge, Koolaupoko, Oahu, Waiahole,
Tax Map Keys: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018,
(1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023, (1) 4-8-008:024,
(1) 4-8-008:025, (1) 4-8-009:001, and (1) 4-8-009:006
Federal-Aid Project No. BR-083-1(088)

Thank you for your response letter dated November 30, 2023, (Department of Transportation Services File No. TP11/23-912546) regarding the subject project. We acknowledge your comments below and provide the following responses.

1. *Transportation Impacts. The Draft Environmental Assessment (DEA) shall discuss short-term transportation impacts on the surrounding City and County of Honolulu (City) roadways and their respective mitigations.*

2. *Bicycle Improvements. Kamehameha Highway fronting the project site is classified as an "Avenue" planned to have sidewalks, a shoulder bikeway, two travel lanes, bus service mixed with general purpose travel, and no on-street parking. The typical future street cross section will resemble in concept the second design on Page 76 of the City's Complete Streets Design Manual. A priority 1 Shoulder Bikeway proposed project (Project ID 1-38 in the 2019 Oahu Bike Plan) is located on Kamehameha Highway crossing the project site. The replacement bridge shall be designed to accommodate the proposed shoulder bikeway and minimize the number and size of potential conflict areas between bicyclists, pedestrians, and vehicles.*

3. *Bus Stops. The project site is in the immediate vicinity of bus stops. Please coordinate roadway improvements with Department of Transportation Services (DTS)-Transportation Mobility Division (TMD). Contact DTS-TMD at TheBusStop@honolulu.gov.*

4. *Neighborhood Impacts. The area representatives, neighborhood board, as well as the area guests, businesses, emergency personnel (fire, ambulance, and police), Oahu Transit Services, Inc. (TheBus and TheHandi-Van), etc., should be kept apprised of the details and status throughout the project and the impacts that the project may have on the adjoining local street area network.*

5. *Disability and Communication Access Board (DCAB). Project plans (vehicular and pedestrian circulation, sidewalks, parking and pedestrian pathways, vehicular ingress/egress, etc.) should be reviewed and approved by DCAB to ensure full compliance with Americans with Disabilities Act requirements.*

During construction, there may be occasional and temporary delays to traffic during the transport of equipment and materials. However, all options considered for the replacement of the bridge involve maintaining two operational lanes to accommodate traffic in both directions. In order to mitigate against the expected traffic interruptions, the State of Hawaii Department of Transportation (HDOT) will notify the Waiahole Elementary School Principal regarding project activities and have begun working with the Oahu Transit Services to temporarily relocate the City bus stops. Traffic controls and best management practices will also be employed to ease traffic disruptions.

We have reviewed the Honolulu Complete Streets Design Manual and the Oahu Bike Plan. The proposed bridge will be approximately 55-feet in width to accommodate two 11-foot vehicle lanes, approximately 6.5-foot wide shoulders to accommodate bicyclists, a 5-foot wide separated pedestrian walkway with barriers to minimize mode conflicts.

We acknowledge your suggestion to communicate with all interested parties about the project so as to reduce impacts on the community and local streets. In addition to agencies, pre-consultation notification was sent or emailed to community contacts. HDOT intends to hold community meetings as the bridge design develops.

We also acknowledge your comment to coordinate with DCAB. This is identified as a step in the design and approval process in the DEA.

We will include you in future correspondence as we seek further input on the proposed improvements to the intersection throughout the environmental review process in compliance with Hawaii Revised Statutes Chapter 343.

We value your participation in the environmental review process. Your letter and this response will be reproduced in the forthcoming DEA.

Should you have any questions please contact Evan Kimoto, HDOT Project Manager, at (808) 692-7551, or by email at evan.kimoto@hawaii.gov

Sincerely,

Henry Kennedy

HENRY KENNEDY
Engineering Program Manager
Design Branch

HONOLULU FIRE DEPARTMENT
KA ʻOIHANA KINAI AHI O HONOLULU
CITY AND COUNTY OF HONOLULU

636 SOUTH STREET • HONOLULU, HAWAI'I 96813
PHONE: (808) 723-7139 • FAX: (808) 723-7111 • WEBSITE: honolulu.gov

RICK BLANGIARDI
MAYOR
MEIA

SHELDON K. HAO
FIRE CHIEF
LUNA NUI KINAI AHI

JASON SAMALA
DEPUTY FIRE CHIEF
HOPE LUNA NUI KINAI AHI

November 20, 2023

Ms. Catie Cullison
PBR HAWAIʻI & Associates, Inc.
1001 Bishop Street, Suite 650
Honolulu, Hawaiʻi 96813-3484

Dear Ms. Cullison:

Subject: Preassessment Consultation for Kamehameha Highway (Route 83)
Replacement of Waiāhole Bridge
Koʻolau Poko, Oʻahu, Waiāhole
Tax Map Keys: 4-8-001: 010 and 4-8-002: 001
4-8-008: 018, 021, 022, 023, 024, and 025
4-8-009: 001, and 006
Federal-Aid Project No. BR-083-1(088)

In response to a letter dated October 31, 2023, from Mr Henry Kennedy of the State of Hawaiʻi Department of Transportation regarding the abovementioned subject, the Honolulu Fire Department (HFD) reviewed the submitted information and requires fire department access roads remain open. Any new roads or bridges must be in compliance with National Fire Protection Association 1; 2018 Edition, Chapter 18.

The abovementioned provisions are required by the HFD. This project may necessitate that additional requirements be met as determined by other agencies.

Should you have questions, please contact Battalion Chief Jean-Claude Bisch of our Fire Prevention Bureau at 808-723-7151 or jbisch@honolulu.gov.

Sincerely,

CRAIG UCHIMURA
Assistant Chief

CU/MD:bh

JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA

DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
ENVIRONMENTAL DESIGN SECTION, ROOM 688A
HIGHWAY DESIGN SECTION, ROOM 609
HYDRAULIC DESIGN SECTION, ROOM 636
TECHNICAL DESIGN SECTION, ROOM 688

EDWIN H. SNIFFEN
DIRECTOR
KA LUNA HO'OKELE

Deputy Directors
Nā Hope Luna Ho'okele
DREANALEE K. KALILI
TAMMY L. LEE
ROBIN K. SHISHIDO

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF TRANSPORTATION | KA 'OIHANA ALAKAU
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:

HWY-DS 2.20090

February 1, 2024

Chief Sheldon Kalani Hao
Fire Chief
Honolulu Fire Department
636 South Street
Honolulu, Hawaii 96813

Dear Chief Hao:

Subject: Pre-Assessment Consultation for Kamehameha Highway (Route 83)
Replacement of Waiahole Bridge, Koolaupoko, Oahu, Waiahole,
Tax Map Keys: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018,
(1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023, (1) 4-8-008:024,
(1) 4-8-008:025, (1) 4-8-009:001, and (1) 4-8-009:006
Federal-Aid Project No. BR-083-1(088)

Thank you for your response letter dated November 20, 2023 regarding the subject project. We acknowledge your comments below and provide the following responses.

> *The Honolulu Fire Department (HFD) reviewed the submitted information and requires fire department access roads remain open. Any new roads or bridges must be in compliance with National Fire Protection Association 1; 2018 Edition, Chapter 18. The abovementioned provisions are required by the HFD. This project may necessitate that additional requirements be met as determined by other agencies.*

We acknowledge your comment regarding access to fire department access roads and National Fire Protection Association Chapter 18 compliance. We do not anticipate any closures of fire department access roads. HFD will be informed of the detailed construction plans so that you may effectively adapt to potential road traffic delays.

We will include you in future correspondence as we seek further input on the proposed improvements to the intersection throughout the environmental review process in compliance with Hawaii Revised Statutes Chapter 343.

We value your participation in the environmental review process. Your letter and this response will be reproduced in the forthcoming Draft Environmental Assessment.

Should you have any questions please contact Evan Kimoto, State of Hawaii Department of Transportation Project Manager, at (808) 692-7551, or by email at evan.kimoto@hawaii.gov

Sincerely,

Henry Kennedy

HENRY KENNEDY
Engineering Program Manager
Design Branch

POLICE DEPARTMENT
KA 'OIHANA MĀKA'I O HONOLULU
CITY AND COUNTY OF HONOLULU
801 SOUTH BERETANIA STREET • HONOLULU, HAWAI'I 96813
TELEPHONE: (808) 529-3111 • WEBSITE: www.honolulupd.org

RICK BLANGIARDI
MAYOR
MEIA

ARTHUR J. LOGAN
CHIEF
KAHU MĀKA'I

KEITH K. HORIKAWA
RADE K. VANIC
DEPUTY CHIEFS
HOPE LUNA NUI MĀKA'I

OUR REFERENCE EO-SH

November 20, 2023

SENT VIA EMAIL

Ms. Catie Cullison
ccullison@pbrhawaii.com

Dear Ms. Cullison:

This is in response to the letter from the Department of Transportation, State of Hawaii dated October 31, 2023, requesting input on the Pre-Assessment Consultation for the proposed replacement of the Waiāhole Bridge project located on Kamehameha Highway in Waiāhole Valley.

The Honolulu Police Department (HPD) has reviewed the information provided and has some concerns. The HPD recommends that all necessary signs, lights, barricades, and other safety equipment be installed and maintained by the contractor during the project. Furthermore, public notification should be made to affected businesses and/or residents due to alternate access to the area and additional delays for the ingress and egress of construction vehicles, equipment, and deliveries during the construction phase of the project.

If there are any questions, please call Major Herbert Soria of District 4 (Kāne'ohe, Kailua, Kahuku) at (808) 723-8460.

Sincerely,

Glenn Hayashi

GLENN HAYASHI
Assistant Chief of Police
Support Services Bureau

JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA

DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
ENVIRONMENTAL DESIGN SECTION, ROOM 688A
HIGHWAY DESIGN SECTION, ROOM 609
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TECHNICAL DESIGN SECTION, ROOM 688

EDWIN H. SNIFFEN
DIRECTOR
KA LUNA HO'OKELE

Deputy Directors
Nā Hope Luna Ho'okele
DREANALEE K. KALILI
TAMMY L. LEE
ROBIN K. SHISHIDO

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF TRANSPORTATION | KA 'OIHANA ALAKAU
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:

HWY-DS 2.20091

February 1, 2024

Chief Arthur Logan
Chief of Police
Office of the Chief
801 South Beretania Street
Honolulu, Hawaii 96813

Dear Chief Logan:

Subject: Pre-Assessment Consultation for Kamehameha Highway (Route 83)
Replacement of Waiahole Bridge, Koolaupoko, Oahu, Waiahole,
Tax Map Keys: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018,
(1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023, (1) 4-8-008:024,
(1) 4-8-008:025, (1) 4-8-009:001, and (1) 4-8-009:006
Federal-Aid Project No. BR-083-1(088)

Thank you for your response letter dated November 20, 2023 (your reference EO-SH) regarding the subject project. We acknowledge your comments below and provide the following responses.

> *The Honolulu Police Department (HPD) has reviewed the information provided and has some concerns. The HPD recommends that all necessary signs, lights, barricades, and other safety equipment be installed and maintained by the contractor during the project. Furthermore, public notification should be made to affected businesses and/or residents due to alternate access to the area and additional delays for the ingress and egress of construction vehicles, equipment, and deliveries during the construction phase of the project.*

We acknowledge your comment that the contractor must install and maintain all the necessary safety equipment and lights during the project. Residents and businesses within the project area will also be informed of the construction plans so that they may effectively adapt to potential road traffic delays.

We will include you in future correspondence as we seek further input on the proposed improvements to the intersection throughout the environmental review process in compliance with Hawaii Revised Statutes Chapter 343.

We value your participation in the environmental review process. Your letter and this response will be reproduced in the forthcoming Draft Environmental Assessment.

Should you have any questions please contact Evan Kimoto, State of Hawaii Department of Transportation Project Manager, at (808) 692-7551, or by email at evan.kimoto@hawaii.gov

Sincerely,

Henry Kennedy

HENRY KENNEDY
Engineering Program Manager
Design Branch

MEMORANDUM

O.MPO-23-60
November 14, 2023

TO: CATIE CULLISION, PBR HAWAII & ASSOCIATES, INC.

FROM: MARK N. GARRITY, EXECUTIVE DIRECTOR
OAHU METROPOLITAN PLANNING ORGANIZATION

SUBJECT: RESPONSE TO HWY-DS 2.2137 PRE-ASSESSMENT CONSULTATION FOR KAMEHAMEHA HIGHWAY REPLACEMENT OF WAIAHOLE BRIDGE

Dear Ms. Cullison:

Thank you for the opportunity to comment on the HWY-DS 2.2137 Pre-Assessment Consultation for Kamehameha Highway Replacement of Waiahole Bridge. We find the proposed scope of work to be consistent with project OS34 in both the Transportation Improvement Program Federal Fiscal Years 2022-2025 (TIP FFYs 2022-2025) and the Oahu Regional Transportation Plan 2045 (ORTP 2045). We support the proposed changes and have no further comments at this time.

Should you have any further questions, please contact me at 808-586-2015.

Sincerely,

Mark N. Garrity
Executive Director

cc: Henry Kennedy, Department of Transportation
Evan Kimoto, Department of Transportation
Kayla Palmer, PBR Hawaii & Associates, Inc.
Jiabao Chen, PBR Hawaii & Associates, Inc.

JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA

DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
ENVIRONMENTAL DESIGN SECTION, ROOM 688A
HIGHWAY DESIGN SECTION, ROOM 609
HYDRAULIC DESIGN SECTION, ROOM 636
TECHNICAL DESIGN SECTION, ROOM 688

EDWIN H. SNIFFEN
DIRECTOR
KA LUNA HO'OKELE

Deputy Directors
Nā Hope Luna Ho'okele
DREANALEE K. KALILI
TAMMY L. LEE
ROBIN K. SHISHIDO

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF TRANSPORTATION | KA 'OIHANA ALAKAU
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:

HWY-DS 2.20091

February 1, 2024

Mr. Mark Garrity, Executive Director
Oahu Metropolitan Planning Organization
707 Richards Street, Suite 200
Honolulu, Hawaii 96813

Dear Mr. Garrity:

Subject: Pre-Assessment Consultation for Kamehameha Highway (Route 83)
Replacement of Waiahole Bridge, Koolaupoko, Oahu, Waiahole,
Tax Map Keys: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018,
(1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023, (1) 4-8-008:024,
(1) 4-8-008:025, (1) 4-8-009:001, and (1) 4-8-009:006
Federal-Aid Project No. BR-083-1(088)

Thank you for your response letter dated November 14, 2023, (Oahu Metropolitan Planning Organization File No. O.MPO-23-60) regarding the subject project. We acknowledge your comments below and provide the following responses.

> *Thank you for the opportunity to comment on the HWY-DS 2.2137 Pre-Assessment Consultation for Kamehameha Highway Replacement of Waiahole Bridge. We find the proposed scope of work to be consistent with project OS34 in both the Transportation Improvement Program Federal Fiscal Years 2022-2025 (TIP FFYs 2022-2025) and the Oahu Regional Transportation Plan 2045 (ORTP 2045). We support the proposed changes and have no further comments at this time.*

We appreciate your support for the proposed project and acknowledging its consistency with the Transportation Improvement Plan and the Oahu Regional Transportation Plan, 2045. We will include you in future correspondence as we seek further input on the proposed improvements to the intersection throughout the environmental review process in compliance with Hawaii Revised Statutes Chapter 343.

We value your participation in the environmental review process. Your letter and this response will be reproduced in the forthcoming Draft Environmental Assessment.

Should you have any questions please contact Evan Kimoto, State of Hawaii Department of Transportation Project Manager, at (808) 692-7551, or by email at evan.kimoto@hawaii.gov

Sincerely,

Henry Kennedy

HENRY KENNEDY
Engineering Program Manager
Design Branch

From: Kayla Palmer
To: Kayla Palmer
Subject: FW: COMMENTS DUE TOMORROW: Waiāhole Bridge
Date: Wednesday, December 6, 2023 1:53:07 PM

---------- Forwarded message ---------
From: **cynthia hopkins** <chopkins326@outlook.com>
Date: Wed, Dec 6, 2023 at 10:24 AM
Subject: Re: COMMENTS DUE TOMORROW: Waiāhole Bridge
To: Rainbow Ulii <ulii.rainbow@gmail.com>, WWCA Waiahole <wwcanews4community@gmail.com>

Thank you Rainbow,
I have a request that they put up slow light signals to mark the area and hopes that they leave it up even after the bridge construction.

Maybe this would be a good time to request speed humps at the site bc of the congested area.
Mahalo,
Cynthia Hopkins

Sent from my T-Mobile 5G Device
Get Outlook for Android

JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA

DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
ENVIRONMENTAL DESIGN SECTION, ROOM 688A
HIGHWAY DESIGN SECTION, ROOM 609
HYDRAULIC DESIGN SECTION, ROOM 636
TECHNICAL DESIGN SECTION, ROOM 688

EDWIN H. SNIFFEN
DIRECTOR
KA LUNA HO'OKELE

Deputy Directors
Nā Hope Luna Ho'okele
DREANALEE K. KALILI
TAMMY L. LEE
ROBIN K. SHISHIDO

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF TRANSPORTATION | KA 'OIHANA ALAKAU
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:

HWY-DS 2.20065

February 1, 2024

VIA EMAIL: chopkins326@outlook.com

Dear Cynthia Hopkins,

Subject: Pre-Assessment Consultation for Kamehameha Highway (Route 83)
Replacement of Waiahole Bridge, Koolaupoko, Oahu, Waiahole
Tax Map Keys: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018, (1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023, (1) 4-8-008:024, (1) 4-8-008:025, (1) 4-8-009:001, and (1) 4-8-009:006
Federal-Aid Project No. BR-083-1(088)

Thank you for your email comments dated December 6, 2023 regarding the subject project. We acknowledge your comments below and provide the following responses.

> *I have a request that they put up slow light signals to mark the area and hopes that they leave it up even after the bridge construction. Maybe this would be a good time to request speed humps at the site because of the congested area.*

We acknowledge your request to install slow light signal and speed bumps and will consider your proposal. Safety improvements proposed as part of the project include the relocation of the highway, a buffered 5 ft pedestrian facility, while also widening the travel lane to better accommodate buses and cars. Warning signage will be installed in compliance with the Federal Highway Manual on Uniform Traffic Control Devices.

We will include you in future correspondence as we seek further input on the proposed improvements to the intersection throughout the environmental review process in compliance with HRS Chapter 343.

We value your participation in the environmental review process. Your letter and this response will be reproduced in the forthcoming Draft Environmental Assessment.

Should you have any questions please contact Evan Kimoto, State of Hawaii Department of Transportation Project Manager, at (808) 692-7551, or by email at evan.kimoto@hawaii.gov

Sincerely,

Henry Kennedy

HENRY KENNEDY
Engineering Program Manager
Design Branch

From:	Kayla Palmer
To:	Kayla Palmer
Subject:	FW: Waiahole Bridge project
Date:	Tuesday, November 28, 2023 10:42:59 AM

From: W. Nick Cambra <thehawaiian69@hotmail.com>
Sent: Tuesday, November 14, 2023 8:10 PM
To: Catie Cullison <ccullison@pbrhawaii.com>
Subject: Waiahole Bridge project

Thank you for allowing me to give my input on this matter. As a resident of the area since 1959, I have seen many changes, and some of the residents have disagreed with some of the changes. I believe that the method being used by the state will impact the area the least, of any other options. I have seen it used on Kamehameha Highway in Punalu'u, and it worked. I am involved in community and meet with numerous people. I have explained the plan to them and the only complaint, to date, is the six years since the initial meeting. I will continue to inform the community since I received your letter. Thank you again.

JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA

DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
ENVIRONMENTAL DESIGN SECTION, ROOM 688A
HIGHWAY DESIGN SECTION, ROOM 609
HYDRAULIC DESIGN SECTION, ROOM 636
TECHNICAL DESIGN SECTION, ROOM 688

EDWIN H. SNIFFEN
DIRECTOR
KA LUNA HO'OKELE

Deputy Directors
Nā Hope Luna Ho'okele
DREANALEE K. KALILI
TAMMY L. LEE
ROBIN K. SHISHIDO

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF TRANSPORTATION | KA 'OIHANA ALAKAU
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:

HWY-DS 2.20078

February 1, 2024

VIA EMAIL: thehawaiian69@hotmail.com

Dear Nick Cambra,

SUBJECT: Pre-Assessment Consultation for Kamehameha Highway (Route 83)
Replacement of Waiahole Bridge, Koolaupoko, Oahu, Waiahole
Tax Map Keys: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018,
(1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023, (1) 4-8-008:024,
(1) 4-8-008:025, (1) 4-8-009:001, and (1) 4-8-009:006
Federal-Aid Project No. BR-083-1(088)

Thank you for your email comments dated November 14, 2023 regarding the subject project. We acknowledge your comments below and provide the following responses.

> *Thank you for allowing me to give my input on this matter. As a resident of the area since 1959, I have seen many changes, and some of the residents have disagreed with some of the changes. I believe that the method being used by the state will impact the area the least, of any other options. I have seen it used on Kamehameha Highway in Punaluu, and it worked. I am involved in the community and meet with numerous people. I have explained the plan to them and the only complaint, to date, is the six years since the initial meeting. I will continue to inform the community since I received your letter. Thank you again.*

We appreciate your support for the proposed project. We will include you in future correspondence as we seek further input on the proposed improvements to the intersection throughout the environmental review process in compliance with Hawaii Revised Statutes Chapter 343.

We value your participation in the environmental review process. Your letter and this response will be reproduced in the forthcoming Draft Environmental Assessment.

Should you have any questions please contact Evan Kimoto, State of Hawaii Department of Transportation Project Manager, at (808) 692-7551, or by email at evan.kimoto@hawaii.gov

Sincerely,

Henry Kennedy

HENRY KENNEDY
Engineering Program Manager
Design Branch

From: Kayla Palmer
To: Kayla Palmer
Subject: FW: public comment on HWY-DS 2.2137
Date: Wednesday, December 6, 2023 8:27:38 AM

From: Nicholas Reppun <n.reppun@gmail.com>
Sent: Tuesday, December 5, 2023 9:54 PM
To: Catie Cullison <ccullison@pbrhawaii.com>
Subject: public comment on HWY-DS 2.2137

Attention: Catie Cullison

Aloha,

The following are comments and questions on the proposed Waiahole bridge replacement project HWY-DS 2.2137.

Given the demolition of the old bridge and permanent realignment of the highway, what will happen to the affected property easements along the 1000‘ of roadway during and after construction (there appears to be several driveways impacted by the project). What will happen to the 1000‘ ft of old road, if it will be removed, what is the planned rehabilitation of the area and future maintenance plans?

Given the demolition of the old bridge and permanent realignment of the highway, what will happen to the affected auwai culverts? Regardless of the current condition of culverts, the new highway alignment construction should maintain and ensure the clear and unobstructed passage of auwai waters under the highway so that the waters may return to the stream flow as they should.

Regarding realignment of the roadway, it is an opportunity to improve the curve of the highway intersection with Waiahole Homestead road. This intersection location at such a dramatic turn in the highway has been the site of many accidents including multiple deaths. If the realignment of the highway were to extend all the way to Homestead Road, there would be space to both soften the curve and to add a left turn lane for the north bound traffic entering Homestead Road.

Thank you for your consideration.

Nick Reppun
Waiahole Resident

JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA

DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
ENVIRONMENTAL DESIGN SECTION, ROOM 688A
HIGHWAY DESIGN SECTION, ROOM 609
HYDRAULIC DESIGN SECTION, ROOM 636
TECHNICAL DESIGN SECTION, ROOM 688

EDWIN H. SNIFFEN
DIRECTOR
KA LUNA HO'OKELE

Deputy Directors
Nā Hope Luna Ho'okele
DREANALEE K. KALILI
TAMMY L. LEE
ROBIN K. SHISHIDO

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF TRANSPORTATION | KA 'OIHANA ALAKAU
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:

HWY-DS 2.20079

February 1, 2024

VIA EMAIL: n.reppun@gmail.com

Dear Nick Reppun,

SUBJECT: Pre-Assessment Consultation for Kamehameha Highway (Route 83)
Replacement of Waiahole Bridge, Koolaupoko, Oahu, Waiahole
Tax Map Keys: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018, (1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023, (1) 4-8-008:024, (1) 4-8-008:025, (1) 4-8-009:001, and (1) 4-8-009:006
Federal-Aid Project No. BR-083-1(088)

Thank you for your email comments dated December 5, 2023 regarding the subject project. We acknowledge your comments below and provide the following responses.

> *Given the demolition of the old bridge and permanent realignment of the highway, what will happen to the affected property easements along the 1000 ft of roadway during and after construction (there appears to be several driveways impacted by the project). What will happen to the 1000 ft of old road, if it will be removed, what is the planned rehabilitation of the area and future maintenance plans?*

The abandoned portion of the existing highway alignment will remain as part of State of Hawaii Department of Transportation (HDOT) right of way. The private driveway that currently connects to the existing highway alignment will be re-routed and connected to the new alignment at a location where a safe line-of-sight can be achieved.

> *Given the demolition of the old bridge and permanent realignment of the highway, what will happen to the affected auwai culverts? Regardless of the current condition of culverts, the new highway alignment construction should maintain and ensure the clear and unobstructed passage of auwai waters under the highway so that the waters may return to the stream flow as they should.*

A section of an auwai crosses into the study area near Kamehameha Highway south of the Waiahole Stream. Due to the particular importance of taro cultivation within Waiahole and the previous dominance of loi throughout the valley, the identification and preservation of this auwai has been deemed significant under Criterion E of Hawaii Administrative Rules 13-275-6.

Due to the new highway alignment, drainage culverts at the existing bridge will be extended further to the new highway alignment.

> *Regarding realignment of the roadway, it is an opportunity to improve the curve of the highway intersection with Waiahole Homestead road. This intersection location at such a dramatic turn in the highway has been the site of many accidents including multiple deaths. If the realignment of the highway were to extend all the way to Homestead Road, there would be space to both soften the curve and to add a left turn lane for the north bound traffic entering Homestead Road.*

We acknowledge your concern for safety at the intersection of Kamehameha Highway and Waiahole Homestead Road. The project extent is limited to the Waiahole Bridge and its more immediate surroundings.

We will include you in future correspondence as we seek further input on the proposed improvements to the intersection throughout the environmental review process in compliance with Hawaii Revised Statutes Chapter 343.

We value your participation in the environmental review process. Your letter and this response will be reproduced in the forthcoming Draft Environmental Assessment.

Should you have any questions please contact Evan Kimoto, HDOT Project Manager, at (808) 692-7551, or by email at evan.kimoto@hawaii.gov

Sincerely,

Henry Kennedy

HENRY KENNEDY
Engineering Program Manager
Design Branch

From:	Kayla Palmer
To:	Kayla Palmer
Subject:	FW: Waiāhole Bridge Project
Date:	Wednesday, December 6, 2023 8:33:24 AM

From: Rainbow Uli'i <rainbow@keyproject.org>
Sent: Tuesday, December 5, 2023 5:16 PM
To: Catie Cullison <ccullison@pbrhawaii.com>
Cc: Lucy Salas <chingsalas@gmail.com>
Subject: Waiāhole Bridge Project

Aloha,

My name is Rainbow Uli'i and I'm the Executive Director at KEY Project. I found an email today in our previous ED's account requesting comments for the Waiāhole bridge replacement project. Her account has been inactive since she left in September 2022, therefore I'm lucky that I found the email.

I'm emailing today to request an extension on the comment period to give community members time to respond and become aware of the project. I'm also the Secretary of the Waiāhole Waikāne Community Association, and would, with the support of our President who I've cc'd, be able to request comments from community members on a large scale. Even a 10 day extension would make a difference.

It's also important to note that the community is aware of the need for replacing the bridge, so my assumption is that the comments would likely be in strong support of the project. Of course, I cannot speak on behalf of all, but do understand, know and value the importance of community awareness and involvement for projects like this.

I also noticed that you are booking our pavilion for a public meeting with DOT. I've already reached out to Evan Kimoto to request an extension for the comment period, but it sounds like he wasn't too fond of the idea. I'm hoping you could advise him to decide otherwise, considering the need for community representation for this project.

Please let me know if you have any questions.

Mahalo nui,
Rainbow

JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA

DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
ENVIRONMENTAL DESIGN SECTION, ROOM 688A
HIGHWAY DESIGN SECTION, ROOM 609
HYDRAULIC DESIGN SECTION, ROOM 636
TECHNICAL DESIGN SECTION, ROOM 688

EDWIN H. SNIFFEN
DIRECTOR
KA LUNA HO'OKELE

Deputy Directors
Nā Hope Luna Ho'okele
DREANALEE K. KALILI
TAMMY L. LEE
ROBIN K. SHISHIDO

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF TRANSPORTATION | KA 'OIHANA ALAKAU
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:

HWY-DS 2.20080

February 1, 2024

VIA EMAIL: rainbow@keyproject.org

Dear Rainbow Ulii,

SUBJECT: Pre-Assessment Consultation for Kamehameha Highway (Route 83)
Replacement of Waiahole Bridge, Koolaupoko, Oahu, Waiahole
Tax Map Keys: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018, (1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023, (1) 4-8-008:024, (1) 4-8-008:025, (1) 4-8-009:001, and (1) 4-8-009:006
Federal-Aid Project No. BR-083-1(088)

Thank you for your email comments dated December 5, 2023 regarding the subject project. We acknowledge your comments below and provide the following responses.

My name is Rainbow Ulii and I'm the Executive Director at KEY Project. I found an email today in our previous ED's account requesting comments for the Waiahole bridge replacement project. Her account has been inactive since she left in September 2022, therefore I'm lucky that I found the email.

I'm emailing today to request an extension on the comment period to give community members time to respond and become aware of the project. I'm also the Secretary of the Waiahole Waikane Community Association, and would, with the support of our President who I've cc'd, be able to request comments from community members on a large scale. Even a 10 day extension would make a difference.

It's also important to note that the community is aware of the need for replacing the bridge, so my assumption is that the comments would likely be in strong support of the project. Of course, I cannot speak on behalf of all, but do understand, know and value the importance of community awareness and involvement for projects like this.

I also noticed that you are booking our pavilion for a public meeting with DOT. I've already reached out to Evan Kimoto to request an extension for the comment period, but it sounds like he wasn't too fond of the idea. I'm hoping you could advise him to decide otherwise, considering the need for community representation for this project.

We appreciate your interest in the proposed project. The mailing list will be updated to include you in your capacity as Executive Director of the KEY Project. The design team has appreciated your ongoing communications with your community.

We will include you in future correspondence as we seek further input on the proposed improvements to the intersection throughout the environmental review process in compliance with Hawaii Revised Statutes Chapter 343.

We value your participation in the environmental review process. Your letter and this response will be reproduced in the forthcoming Draft Environmental Assessment.

Should you have any questions please contact Evan Kimoto, State of Hawaii Department of Transportation Project Manager, at (808) 692-7551, or by email at evan.kimoto@hawaii.gov

Sincerely,

Henry Kennedy

HENRY KENNEDY
Engineering Program Manager
Design Branch

From: Kayla Palmer
To: Kayla Palmer
Subject: FW: COMMENTS DUE TOMORROW: Waiāhole Bridge
Date: Wednesday, December 6, 2023 1:54:07 PM

---------- Forwarded message ---------
From: **Silvestre Ulep** <sil1334ulep@gmail.com>
Date: Wed, Dec 6, 2023 at 8:03 AM
Subject: Re: COMMENTS DUE TOMORROW: Waiāhole Bridge
To: Rainbow Ulii <ulii.rainbow@gmail.com>
Cc: WWCA Waiahole <wwcanews4community@gmail.com>

The existing Waiahole Bridge is also a choke point of stream flow during the rainy months. The longitudinal swales are inadequate to conduct the overflow from the stream causing the floodwaters overtopping Kamehemeha Hwy. The culverts along the longitudinal swales are inadequate to conduct the stream overflow, plus the culvert across Kam Highway is inadequate to conduct the overflow to the ocean. The lots along Kam Hwy are flooded by the impounded floodwaters as Kam Hwy acts like a dam during prolonged rains. Please address the flooding problem now prevalent at the vicinity of Waiahole Bridge.

JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA

DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
ENVIRONMENTAL DESIGN SECTION, ROOM 688A
HIGHWAY DESIGN SECTION, ROOM 609
HYDRAULIC DESIGN SECTION, ROOM 636
TECHNICAL DESIGN SECTION, ROOM 688

EDWIN H. SNIFFEN
DIRECTOR
KA LUNA HO'OKELE

Deputy Directors
Nā Hope Luna Ho'okele
DREANALEE K. KALILI
TAMMY L. LEE
ROBIN K. SHISHIDO

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF TRANSPORTATION | KA 'OIHANA ALAKAU
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:

HWY-DS 2.20081

February 1, 2024

VIA EMAIL: sil1334ulep@gmail.com

Dear Silvestre Ulep,

SUBJECT: Pre-Assessment Consultation for Kamehameha Highway (Route 83)
Replacement of Waiahole Bridge, Koolaupoko, Oahu, Waiahole
Tax Map Keys: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018, (1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023, (1) 4-8-008:024, (1) 4-8-008:025, (1) 4-8-009:001, and (1) 4-8-009:006
Federal-Aid Project No. BR-083-1(088)

Thank you for your email comments dated December 6, 2023 regarding the subject project. We acknowledge your comments below and provide the following responses.

> *The existing Waiahole Bridge is also a choke point of stream flow during the rainy months. The longitudinal swales are inadequate to conduct the overflow from the stream causing the floodwaters overtopping Kamehemeha Hwy. The culverts along the longitudinal swales are inadequate to conduct the stream overflow, plus the culvert across Kam Highway is inadequate to conduct the overflow to the ocean. The lots along Kam Hwy are flooded by the impounded floodwaters as Kam Hwy acts like a dam during prolonged rains. Please address the flooding problem now prevalent at the vicinity of Waiahole Bridge.*

We acknowledge your comment regarding the flooding that occurs on Waiahole Bridge and Kamehameha Highway. To address the concern, the sand bar and vegetation that have accumulated in the vicinity of the existing bridge piles is proposed to be removed. Rip-rap is proposed to be placed on the widened stream banks to reduce erosion from stream waters. Additionally, the existing bridge superstructure will be demolished and the existing piles will be removed down to the channel bottom elevation. The existing concrete bridge abutments on the banks will remain in place. Modeling conducted by a hydrologist (see full report as an Appendix to the Draft Environmental Assessment) has shown that these measures will help to lower the stream level at the location of the bridge during storm events to an extent.

We will include you in future correspondence as we seek further input on the proposed improvements to the intersection throughout the environmental review process in compliance with Hawaii Revised Statutes Chapter 343.

We value your participation in the environmental review process. Your letter and this response will be reproduced in the forthcoming Draft Environmental Assessment.

Should you have any questions please contact Evan Kimoto, State of Hawaii Department of Transportation Project Manager, at (808) 692-7551, or by email at evan.kimoto@hawaii.gov

Sincerely,

Henry Kennedy

HENRY KENNEDY
Engineering Program Manager
Design Branch

From: Kayla Palmer
To: Kayla Palmer
Subject: FW: COMMENTS DUE TOMORROW: Waiāhole Bridge
Date: Wednesday, December 6, 2023 1:56:29 PM

---------- Forwarded message ---------
From: **verna ulii** <vkehau@gmail.com>
Date: Tue, Dec 5, 2023 at 6:01 PM
Subject: Re: COMMENTS DUE TOMORROW: Waiāhole Bridge
To: Rainbow Ulii <ulii.rainbow@gmail.com>

Wow!, living here on Waiahole valley road I'm delighted to hear we are finally close to getting a pedestrian crossing rail safety bridge to be able to walk and stand to watch the flowing river of Waiahole go out to the ocean.
Mahalo and safe working.
Verna Uli'i

JOSH GREEN, M.D.
GOVERNOR
KE KIA'ĀINA

DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
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HIGHWAY DESIGN SECTION, ROOM 609
HYDRAULIC DESIGN SECTION, ROOM 636
TECHNICAL DESIGN SECTION, ROOM 688

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DEPARTMENT OF TRANSPORTATION | KA 'OIHANA ALAKAU
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

IN REPLY REFER TO:

HWY-DS 2.20082

February 1, 2024

VIA EMAIL: vkehau@gmail.com

Dear Verna Ulii,

SUBJECT: Pre-Assessment Consultation for Kamehameha Highway (Route 83)
Replacement of Waiahole Bridge, Koolaupoko, Oahu, Waiahole
Tax Map Keys: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018,
(1) 4-8-008:021, (1) 4-8-008:022, (1) 4-8-008:023, (1) 4-8-008:024,
(1) 4-8-008:025, (1) 4-8-009:001, and (1) 4-8-009:006
Federal-Aid Project No. BR-083-1(088)

Thank you for your email comments dated December 5, 2023 regarding the subject project. We acknowledge your comments below and provide the following responses.

> *Wow!, living here on Waiahole valley road I'm delighted to hear we are finally close to getting a pedestrian crossing rail safety bridge to be able to walk and stand to watch the flowing river of Waiahole go out to the ocean.*

We appreciate your support for the proposed project. In addition to providing a separated 5 foot pedestrian walkway, the travel lanes of the bridge will also be widened and shoulders will be added to better accommodate bicycles, transit and cars.

We will include you in future correspondence as we seek further input on the proposed improvements to the intersection throughout the environmental review process in compliance with Hawaii Revised Statutes Chapter 343.

We value your participation in the environmental review process. Your letter and this response will be reproduced in the forthcoming Draft Environmental Assessment.

Should you have any questions please contact Evan Kimoto, State of Hawaii Department of Transportation Project Manager, at (808) 692-7551, or by email at evan.kimoto@hawaii.gov

Sincerely,

Henry Kennedy

HENRY KENNEDY
Engineering Program Manager
Design Branch

APPENDIX B

WAIAHOLE STREAM BRIDGE REPLACEMENT

Two-Dimensional Hydraulics & Scour Analysis

FINAL REPORT

11/13/2023

Prepared For:

KAI HAWAII
Honolulu, HI

Prepared By:

WEST Consultants, Inc.
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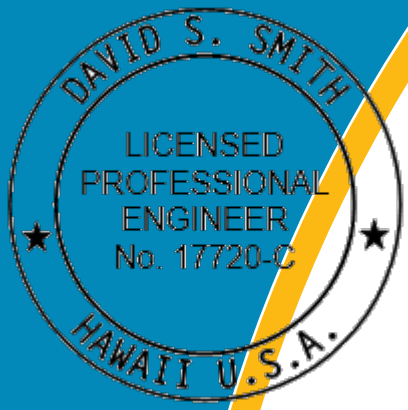
Suite 360
San Diego, CA 92127
(858) 487-9378
www.westconsultants.com



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

David S Smith

Signature

4/30/2024

Expiration Date of License

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FIGURES

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1. Introduction

1.1. Study Purpose

WEST Consultants, Inc. (WEST) was requested by KAI HAWAII (KAI) to conduct a hydraulic and scour analysis for the proposed replacement of Waiahole Stream Bridge on the Kamehameha Highway (State Route 83), on the Island of Hawaii. KAI HAWAII is the prime contractor on this project for the State of Hawaii Department of Transportation.

This report describes the two-dimensional (2D) hydraulic modeling, scour analysis and riprap sizing. Peak discharges were taken from a previous hydrologic study of Waiahole Stream prepared by WEST (WEST, 2018). Water surface elevations (WSE) for several proposed design alternatives were determined using the HEC-RAS 2D (River Analysis System) hydraulic model (USACE, 2022). The additional scour analysis and riprap sizing for the selected design alternative was performed following the HEC-18 (FHWA, 2012), HEC-23 (FHWA, 2009) and HDS (Caltrans, 2022) guidelines. A general location map is provided in Figure 1-1. and the vicinity map is provided in Figure 1-2.

Figure 1-1: Site Location.

Figure 1-2: Waiahole Stream Bridge Vicinity Map.

1.2. Data Collection and Review

For the study analysis, WEST reviewed the latest topographic data (LiDAR), existing bridge plans and proposed bridge and channel plans. Data sources included the Hawaii GIS portal (OPSD, 2017), the Federal Emergency Management Agency (FEMA) and the U.S. Geological Survey (USGS). In addition, the Hawaii Department of Transportation (HDOT) design guidelines and Federal Highway Administration (FHWA) bridge design criteria were reviewed, and have been referenced in this report.

1.3. Acknowledgments

Dr. Filippo Bressan, P.E., performed hydraulic modeling and scour calculations, as well as Geographic Information Systems (GIS) services. Dave Smith, P.E., CFM, provided quality control services and served as WEST project manager.

2. Two-dimensional (2D) Hydraulic Analysis

2.1. Peak Flows

Peak flow discharges were estimated by WEST using a combination of flood frequency analysis from USGS gage (USGS gage No. 16294100) and HEC-HMS modeling (WEST, 2018). The final peak flows adopted for this analysis are reported in Table 2-1 below.

Table 2-1. Adopted return period peak flows, Waiahole Stream at Waiahole Bridge

Return Period (years)	Peak Flow (cfs)
5	5,500
10	7,200
50	11,600
100	13,000
200	14,500
500	16,500

2.2. HEC-RAS 2D Model Development

WEST developed a two-dimensional (2D) hydraulic model of the Waiahole Stream and Bridge using the U.S. Army Corps of Engineers' HEC-RAS computer program (USACE, 2022). Figure 2-1 shows the HEC-RAS model grid extent as well as the model boundary conditions (light blue) and breaklines (red).

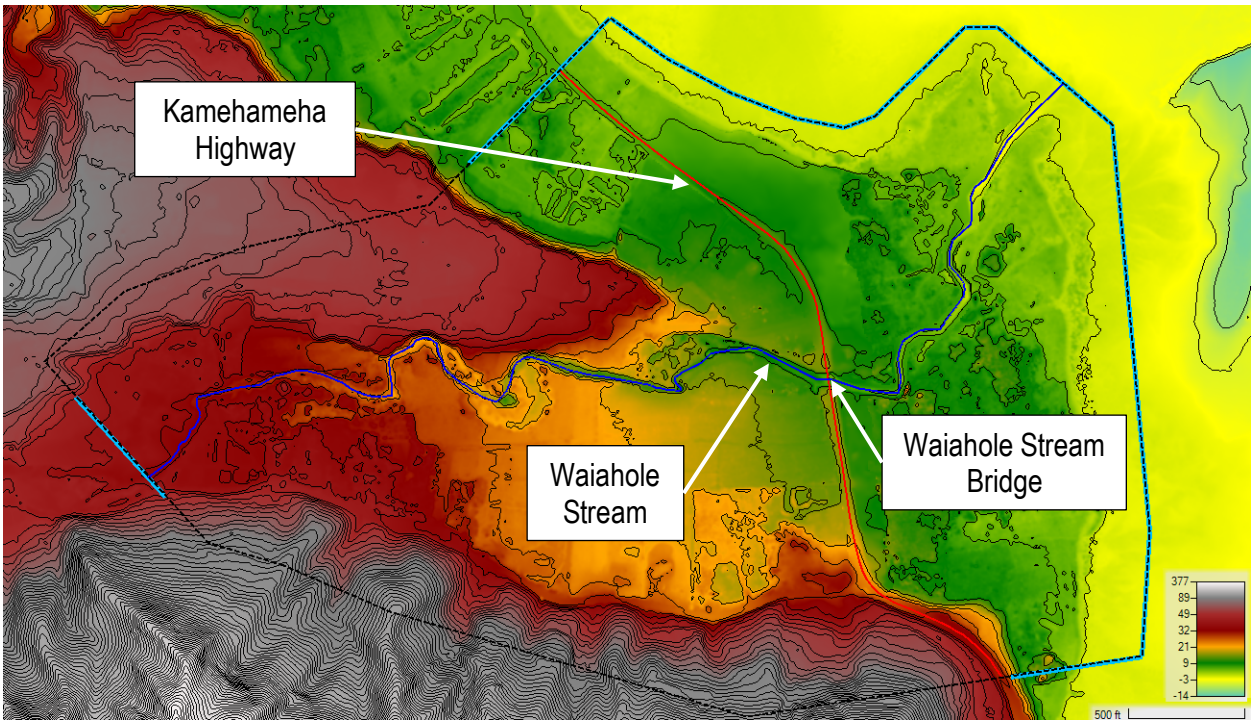


Figure 2-1: HEC-RAS Model Grid Extent.

Digital Terrain Model (DTM) data were obtained from the Hawaii Statewide GIS Program website. The terrain data consists of 1-meter resolution LiDAR with NAD 1983 horizontal datum in HARN State Plane Hawaii 3 FIPS 5103 Feet and the Local Tidal Datum (LTD) vertical datum. Additional terrain for the Waiahole Stream channel, the Kamehameha Highway and the proposed new road alignment and bridge channel and banks were provided to WEST by KAI.

A grid cell size of 15 feet was selected and convergence analysis during modeling development indicated that a computation time-step of 1 second was adequate to ensure model stability. The upstream boundary condition for the inflow hydrograph was placed about 0.7 miles upstream of the Waiahole Stream Bridge. The downstream boundary condition placed as at the shore about 0.4 miles downstream of the Waiahole Stream Bridge and set to normal depth with a slope of 0.001 that was estimated based on the average slope of the terrain at the boundary. Manning's *n* polygons were created based on Google earth aerial imagery, site photos, previous studies, and standard hydraulic references (Chow, 1959). Figure 2-2 shows the Manning's *n* regions and values used in this study.

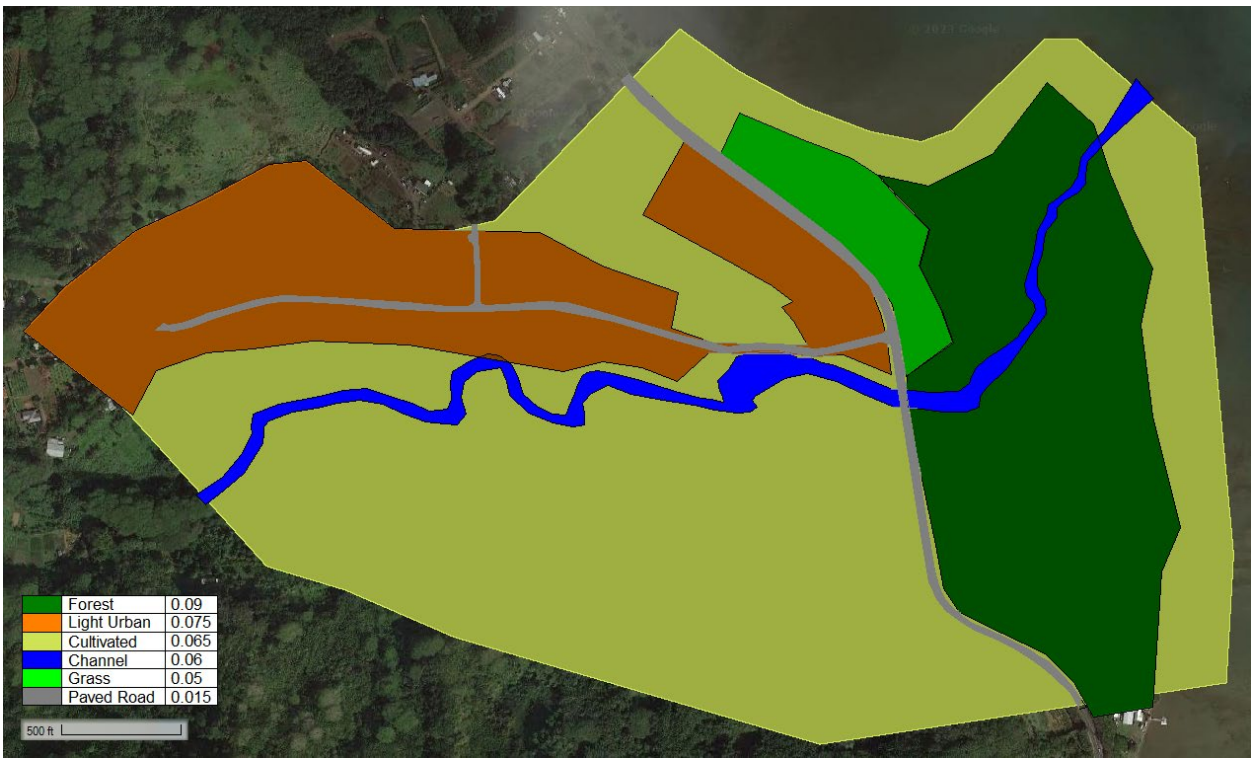


Figure 2-2: HEC-RAS Model Manning's *n* regions and values.

2.2.1. Existing Waiahole Stream Bridge

The existing Waiahole Stream Bridge has a span of 60 feet and two 2.5-foot wide piers (Figure 2-3). The bridge channel, abutments and as-built geometry implemented in HEC-RAS is shown in Figure 2-3.

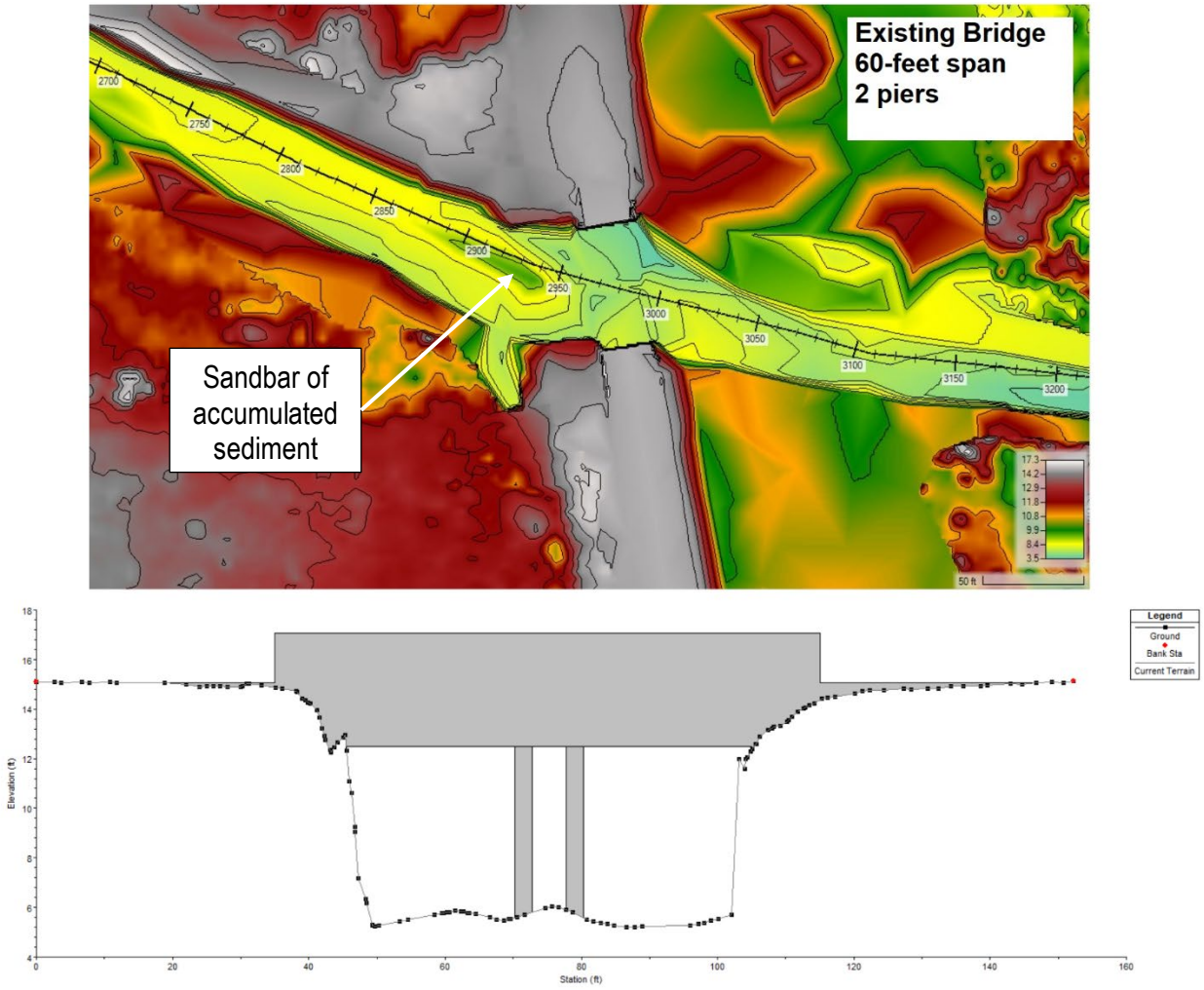


Figure 2-3: Existing Waiahole Stream Bridge.

2.2.2. Proposed Waiahole Stream Bridge

The existing Waiahole Stream Bridge will be replaced by a full span, no-piers Acrow bridge that will be built on a new embankment about 60 feet downstream of the existing crossing. Several bridge spans alternatives have been analyzed with the HEC-RAS model in order to assess the influence of the bridge opening on the water surface elevation. The design alternatives analyzed are the following:

- Alternative 1: 130-foot span (Figure 2-4).
- Alternative 2: 100-foot span (Figure 2-5).
- Alternative 3: 100-foot span and removal of the existing bridge abutments (Figure 2-6).
- Alternative 4: 80-foot span (Figure 2-7).

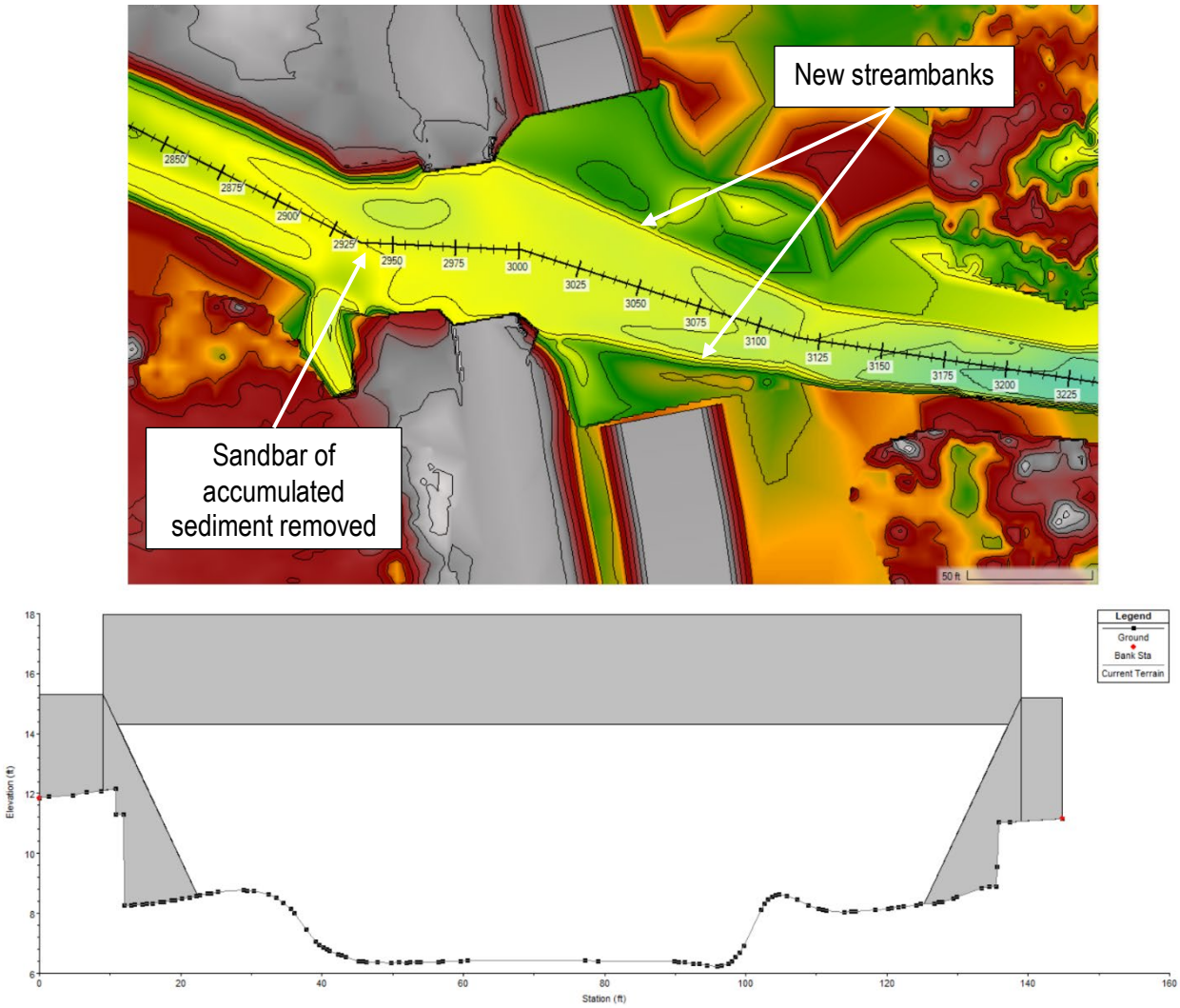


Figure 2-4: Proposed Waiahole Stream Bridge – Alternative 1: 130-foot span.

The Acrow bridge abutments will also be protected with riprap at a 2H:1V slope. This detail was also implemented in the HEC-RAS 2D model (Figure 2-4).

Alternative design 1, a 130-foot span, also proposes to regrade the Waiahole Stream channel under the bridge from about 200 feet upstream of the crossing to about 100 feet downstream. As part of the regrade the sandbar that accumulated in front of the existing bridge piers (Figure 2-3) will be removed and the stream banks below the proposed bridge opening will also be realigned (Figure 2-4).

The Alternative design 1 will also be used to estimate the bridge scour and scour countermeasures in Section 3 of this report.

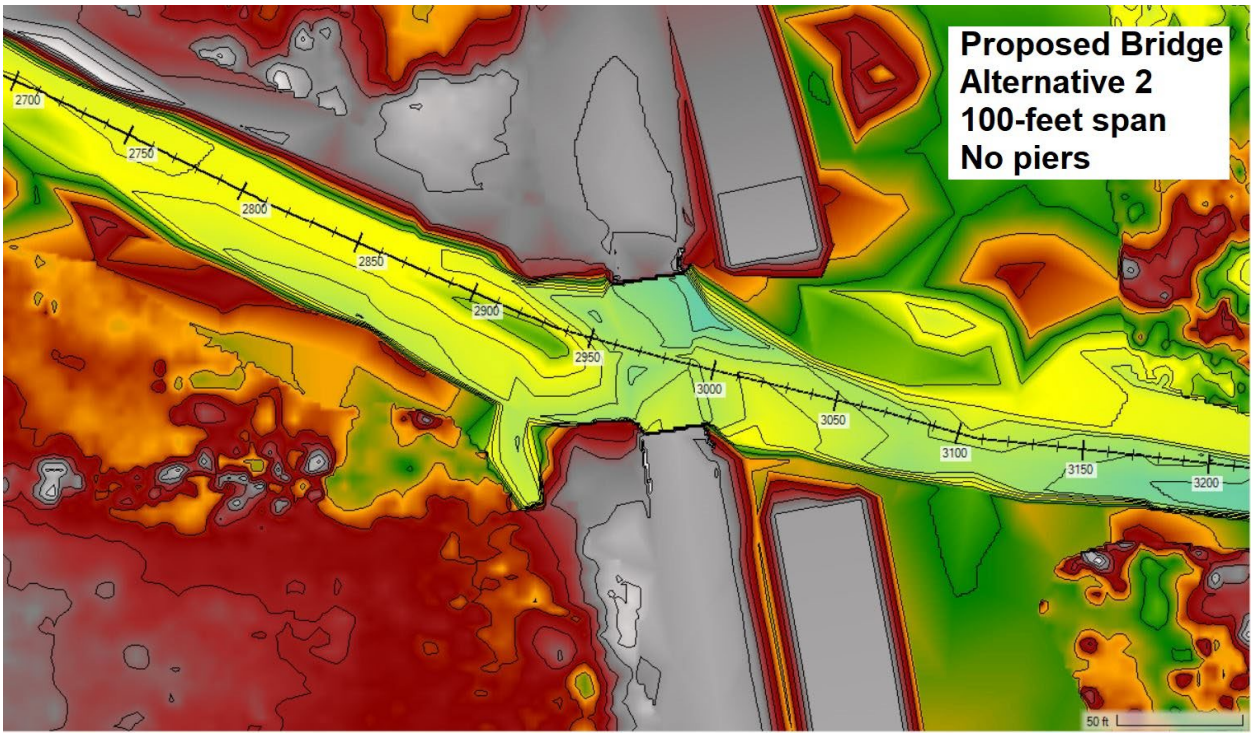


Figure 2-5: Proposed Waiahole Stream Bridge – Alternative 2: 10-foot span.

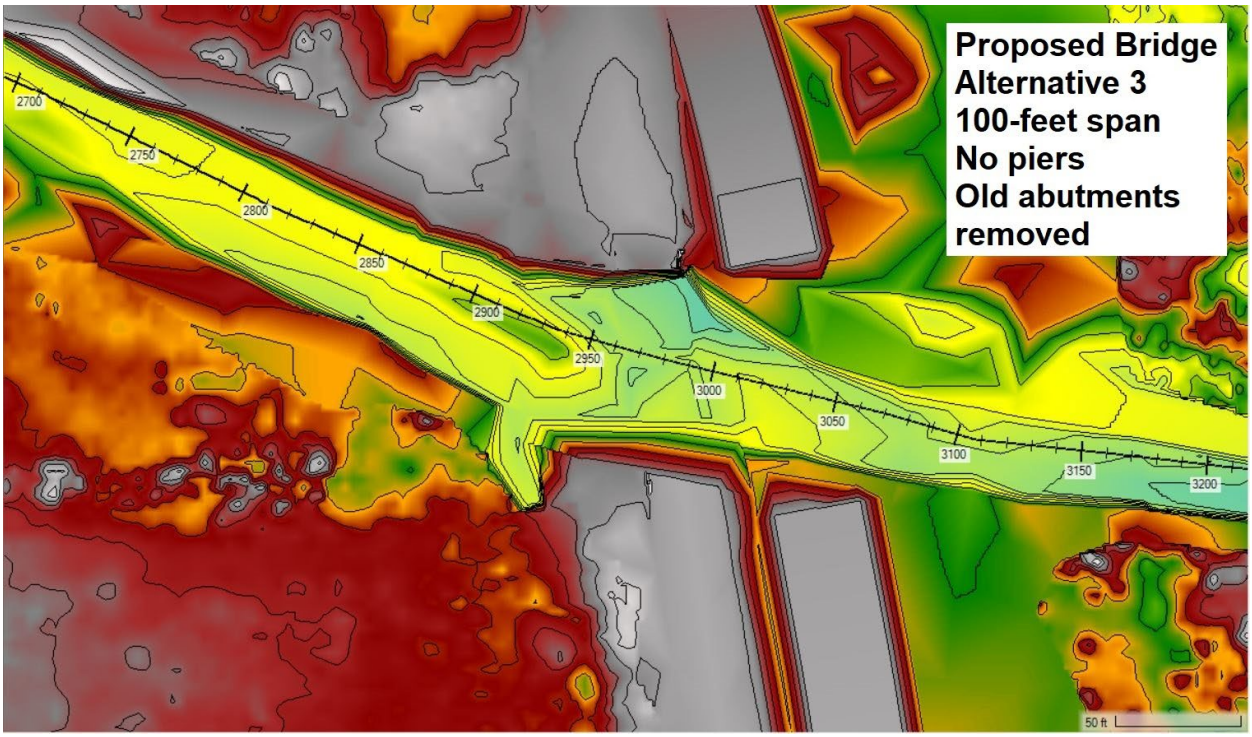


Figure 2-6: Proposed Waiahole Stream Bridge – Alternative 3: 100-foot span and removal of the existing bridge abutments.

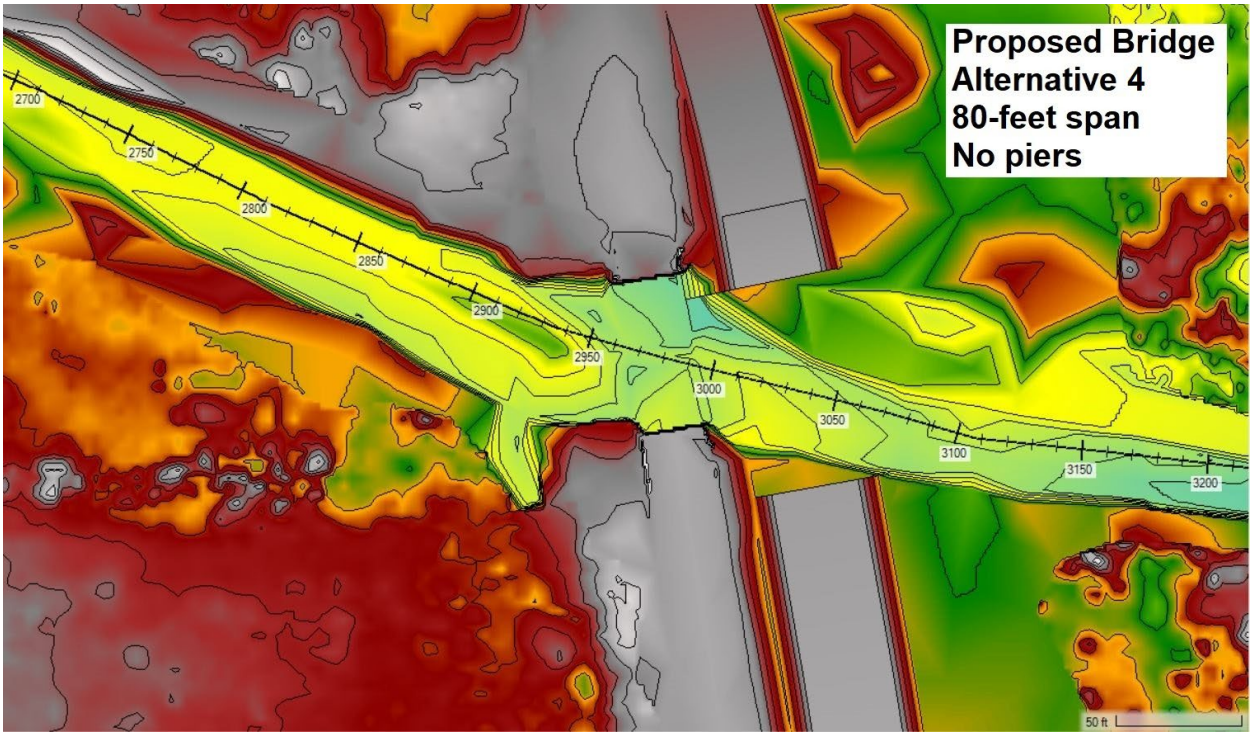


Figure 2-7: Proposed Waiahole Stream Bridge – Alternative 4: 80-foot span.

2.3. HEC-RAS 2D Model Results

The HEC-RAS 2D model results indicate that all the alternatives would reduce the river profile upstream of the existing bridge (Figure 2-8).

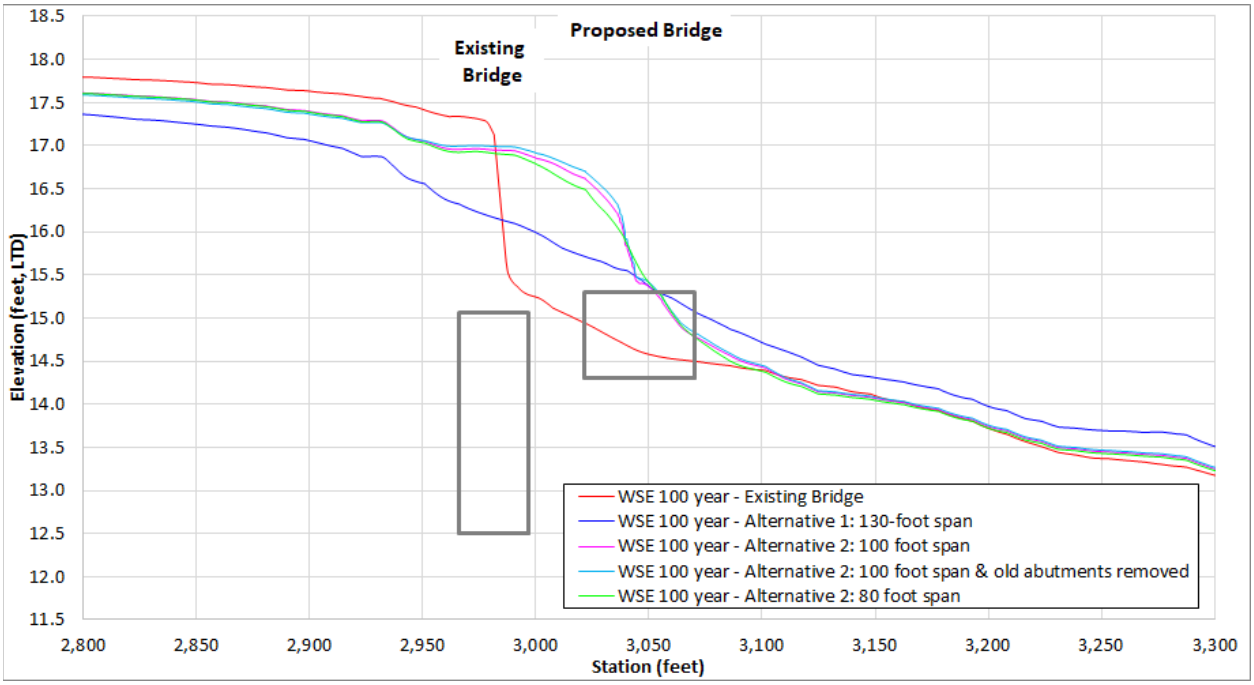


Figure 2-8: Existing vs Proposed Waiahole Stream Bridge Alternatives Water Surface Elevations (WSE).

The model indicates that the new bridge would slightly increase the water surface profile downstream of the new embankment. The order of magnitude of the increase would be everywhere less than 0.5 feet. In addition, the model also showed that removing the existing bridge abutments to make the upstream channel wider would cause a higher water surface profile than just leaving them in place.

The Water Surface Elevations profiles for Alternative 1 (130-foot span) are shown in Figure 2-9 and their values at the upstream face of the proposed bridge are reported in Table 2-2.

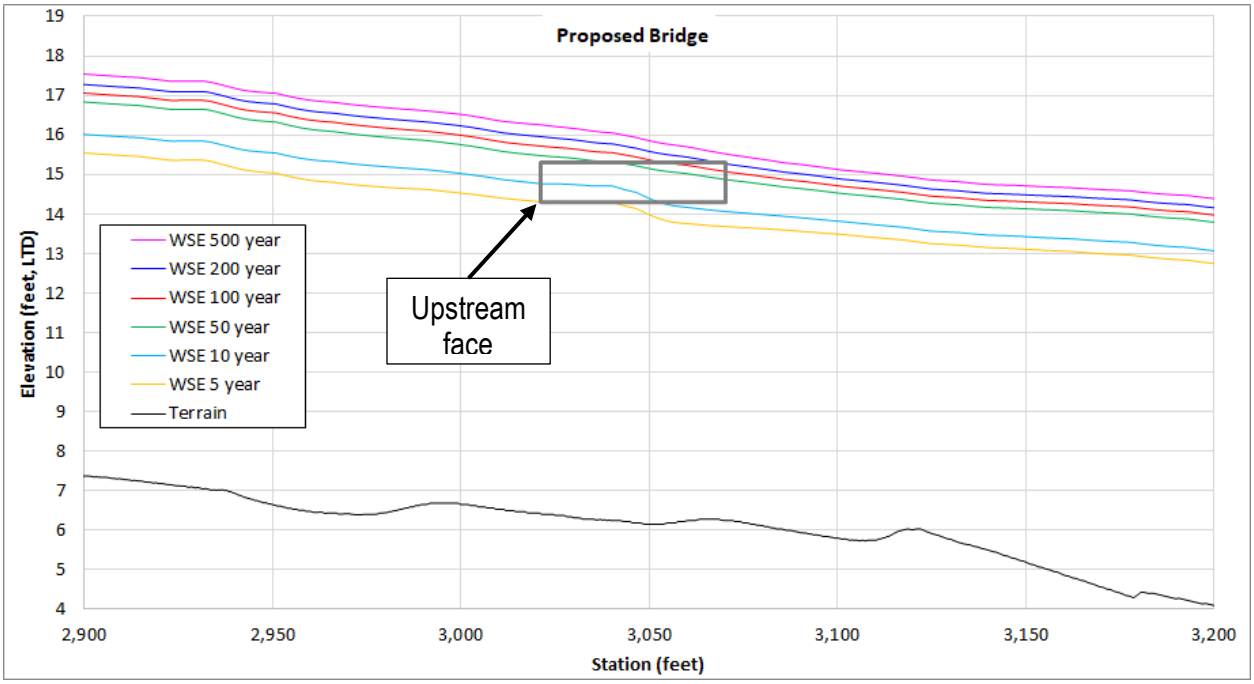


Figure 2-9: Proposed Waiahole Stream Bridge – Water Surface Elevations (Alternative 1: 130-foot span).

Table 2-2. Water Surface Elevations at upstream face of Proposed Bridge (Alternative 1: 130-foot span).

Return Period (years)	Water Surface Elevation (feet, LTD)
500	16.3
200	16.0
100	15.7
50	15.5
10	14.8
5	14.3
Bridge Low Chord	14.3

3. Scour Analysis

WEST computed bridge scour and riprap sizing for the proposed bridge Alternative 1 (130-foot span) following the HEC-18 (FHWA, 2012), HEC-23 (FHWA, 2009) and HDS (Caltrans, 2022) guidelines. The regraded channel up- and downstream of the crossing as well as the new proposed banklines were also taken into consideration when computing scour and riprap sizing.

3.1. Bridge Scour

3.1.1. Long Term Scour

Stage records measured by the USGS gaging station at Waiahole Bridge indicate that aggradation occurs at the site of the proposed bridge. As shown in Figure 3-1, the stage and corresponding bed elevation, for flows of 100, 200, and 300 cfs increased between 2008 and 2016 by approximately 0.5 feet. Therefore, long-term degradation was not considered for scour analysis.

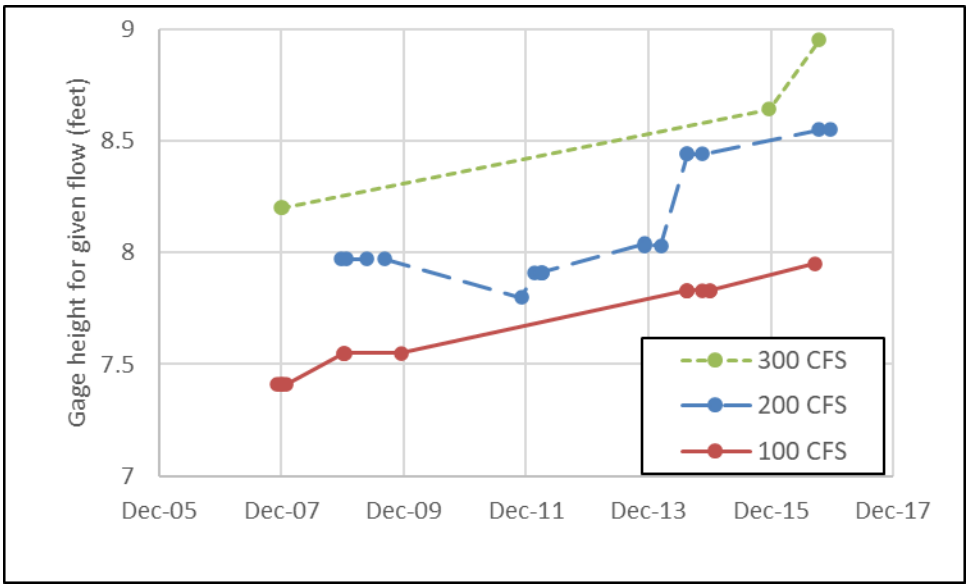


Figure 3-1: USGS stage record for 100, 200, 300 cfs flow at existing Waiahole Bridge.

3.1.2. Bend Scour

At the crossing between Kamehameha Highway and the Waiahole Stream, the channel is fairly straight and therefore bend scour was not computed.

3.1.3. Pier Scour

The proposed 130-foot span Acrow bridge does not have any pier and therefore pier scour was not computed.

3.1.4. Contraction and Abutment Scour

WEST evaluated scour at the proposed bridge using the NCHRP 24-20 approach (FHWA, 2012). In the middle of the channel only contraction scour applies, but at the abutments the scour will be the sum of contraction scour and local abutment scour. Although the proposed span (130-feet) is more than twice the existing bridge span (60-feet), the proposed alignment will be about 60 feet downstream of the existing

Kamehameha Highway. The new embankment will create a ditch between the existing and the proposed embankments which will convey a large amount of flow inside the new bridge. HEC-RAS 2D modeling results indicate that the upstream flow will be constricted from a width of about 300 feet to a width of 130 feet (Figure 3-2). This contracted flow will have a velocity that is larger than 8 feet per second during a 100-year or larger event (Figure 3-3).

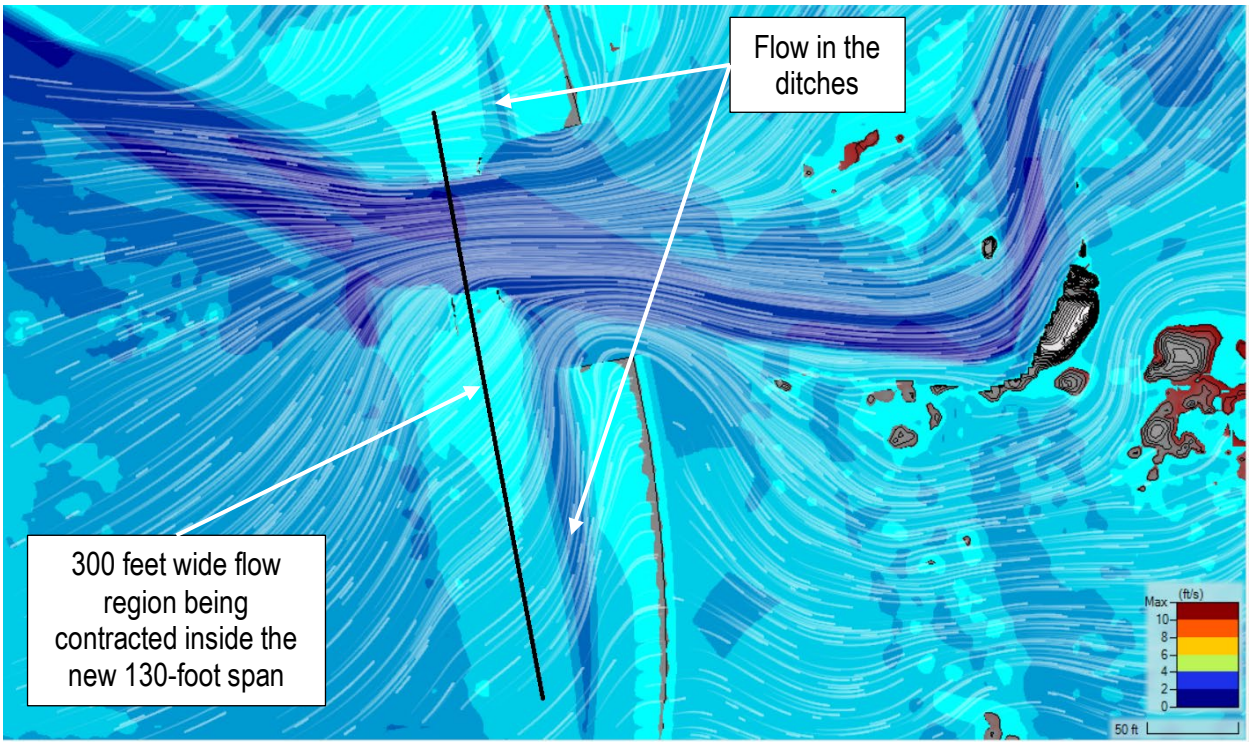


Figure 3-2: Flow contraction at the proposed 130-foot Waiahole Bridge.

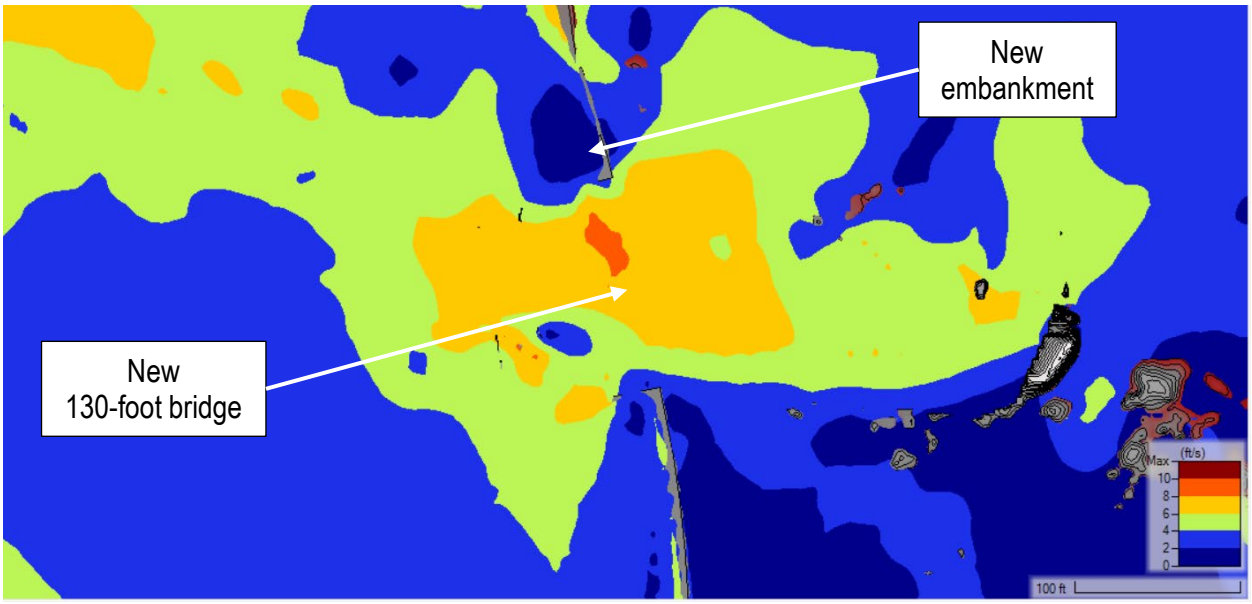


Figure 3-3: Flow velocity at the proposed 130-foot Waiahole Bridge.

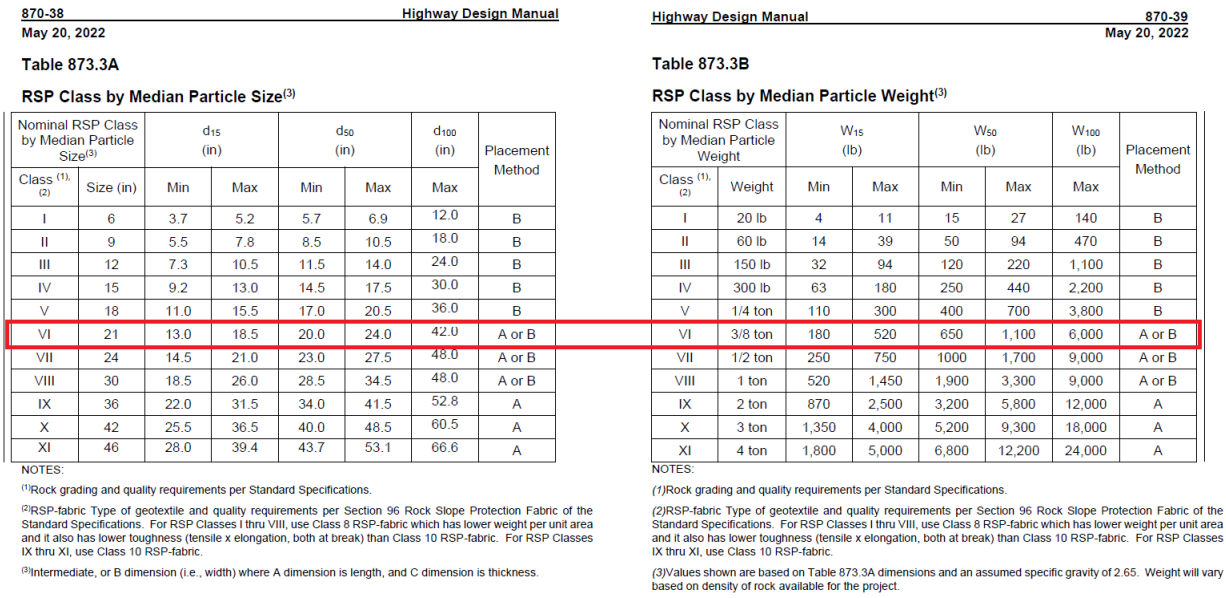
The intense flow contraction and subsequent large flow velocities will lead to a potentially large contraction and abutment scour. Total 200- and 500-year flows scour estimated depths and elevations are summarized in Table 3-1 below. The scour elevations are computed based on the proposed thalweg at the new bridge which was estimated to be at 6.3 feet (LTD). Although the bridge abutments' toes will be located on top of the banks at a higher elevation than the thalweg, computing the scour elevation from the thalweg assumes the worst-case scenario in which bank erosion leads to channel meandering and brings the thalweg next to the abutment toes.

Table 3-1. Bridge scour estimates at the Proposed Bridge (Alternative 1: 130-foot span).

Scour Component	Scour depths (feet)		Scour elevations (feet, LTD)	
	200-year	*500-year*	*200-year*	*500-year*
Contraction Scour	9.9	10.1	-3.6	-3.8
Left Abutment Scour	17.9	17.8	-11.6	-11.5
Right Abutment Scour	18.6	18.5	-12.3	-12.2

3.2. Bridge Scour Countermeasures

In order to protect the bridge from contraction and abutment scour, both the channel and the new proposed streambanks will be lined with riprap. Riprap shall be placed in the channel, on the banks and around the bridge abutments. The abutment riprap size (d50) was estimated based on the maximum velocity that is expected during a 500-year event and the method outlined in HEC-23 (Design Guideline 14, Rock Riprap at Bridge Abutments, FHWA, 2009). The riprap size to protect the streambanks was estimated following the Caltrans method (Caltrans, 2022) which, based on the local flow hydraulics, specifies the minimum d30 of the rocks. A factor of safety of 1.2 was considered in the calculations (FHWA, 2009). The d50 required to protect the bridge abutment is **20 inches** (1.7 feet) and the d30 to protect the banks is **5 inches** (0.4 feet). These riprap sizes can be obtained using the **Riprap Class VI** of the FHWA gradations (Figure 3-4).



870-38 Highway Design Manual
May 20, 2022

Table 873.3A

RSP Class by Median Particle Size[3]

Nominal RSP Class by Median Particle Size[3]		d_{15} (in)		d_{50} (in)		d_{100} (in)	Placement Method
Class [1], [2]	Size (in)	Min	Max	Min	Max	Max	
I	6	3.7	5.2	5.7	6.9	12.0	B
II	9	5.5	7.8	8.5	10.5	18.0	B
III	12	7.3	10.5	11.5	14.0	24.0	B
IV	15	9.2	13.0	14.5	17.5	30.0	B
V	18	11.0	15.5	17.0	20.5	36.0	B
VI	21	13.0	18.5	20.0	24.0	42.0	A or B
VII	24	14.5	21.0	23.0	27.5	48.0	A or B
VIII	30	18.5	26.0	28.5	34.5	48.0	A or B
IX	36	22.0	31.5	34.0	41.5	52.8	A
X	42	25.5	36.5	40.0	48.5	60.5	A
XI	46	28.0	39.4	43.7	53.1	66.6	A

NOTES:

[1]Rock grading and quality requirements per Standard Specifications.

[2]RSP-fabric Type of geotextile and quality requirements per Section 96 Rock Slope Protection Fabric of the Standard Specifications. For RSP Classes I thru VIII, use Class 8 RSP-fabric which has lower weight per unit area and it also has lower toughness (tensile x elongation, both at break) than Class 10 RSP-fabric. For RSP Classes IX thru XI, use Class 10 RSP-fabric.

[3]Intermediate, or B dimension (i.e., width) where A dimension is length, and C dimension is thickness.

Highway Design Manual 870-39
May 20, 2022

Table 873.3B

RSP Class by Median Particle Weight[3]

Nominal RSP Class by Median Particle Weight		W_{15} (lb)		W_{50} (lb)		W_{100} (lb)	Placement Method
Class [1], [2]	Weight	Min	Max	Min	Max	Max	
I	20 lb	4	11	15	27	140	B
II	60 lb	14	39	50	94	470	B
III	150 lb	32	94	120	220	1,100	B
IV	300 lb	63	180	250	440	2,200	B
V	1/4 ton	110	300	400	700	3,800	B
VI	3/8 ton	180	520	650	1,100	6,000	A or B
VII	1/2 ton	250	750	1000	1,700	9,000	A or B
VIII	1 ton	520	1,450	1,900	3,300	9,000	A or B
IX	2 ton	870	2,500	3,200	5,800	12,000	A
X	3 ton	1,350	4,000	5,200	9,300	18,000	A
XI	4 ton	1,800	5,000	6,800	12,200	24,000	A

NOTES:

*(1)*Rock grading and quality requirements per Standard Specifications.

*(2)*RSP-fabric Type of geotextile and quality requirements per Section 96 Rock Slope Protection Fabric of the Standard Specifications. For RSP Classes I thru VIII, use Class 8 RSP-fabric which has lower weight per unit area and it also has lower toughness (tensile x elongation, both at break) than Class 10 RSP-fabric. For RSP Classes IX thru XI, use Class 10 RSP-fabric.

*(3)*Values shown are based on Table 873.3A dimensions and an assumed specific gravity of 2.65. Weight will vary based on density of rock available for the project.

Figure 3-4: FHWA riprap gradations with the recommended class for Waiahole Bridge.

4. References

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U.S Army Corps of Engineers. (USACE) (2022). HEC-RAS (version 6.3.1) User Manual. Davis: Hydraulic Engineering Center.

WAIAHOLE STREAM BRIDGE REPLACEMENT

Floodway No-Rise Certification

FINAL REPORT

12/18/2023

Prepared For:

KAI HAWAII
Honolulu, HI

Prepared By:

WEST Consultants, Inc.
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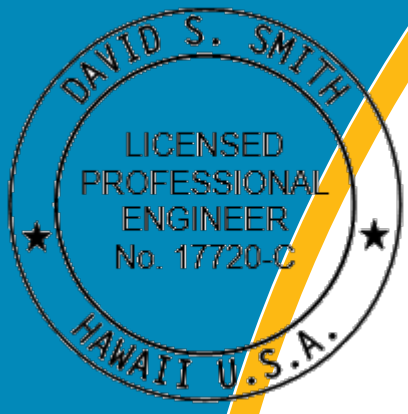

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

David S Smith

Signature

4/30/2024

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TABLE OF CONTENTS

FIGURES

TABLES

1. Introduction

1.1. Study Purpose

This report was prepared by WEST Consultants, Inc. (WEST) at the request of KAI Hawaii (KAI) to serve as "No Rise" certification for the proposed replacement of Waiahole Stream Bridge on the Kamehameha Highway (State Route 83), on the Island of Oahu. KAI is the prime contractor on this project for the State of Hawaii Department of Transportation.

WEST developed a two-dimensional (2D) hydraulic model to analyze the existing bridge and the proposed replacement bridge across Waiahole Stream. Peak discharges were estimated using hydrologic modeling, flood frequency analysis following Bulletin 17B, and the latest Hawaii regression equations (WEST, 2018). The hydraulic model was developed using the HEC-RAS 2D Version 6.3.1. (River Analysis System) hydraulic model (USACE, 2022). A general location map is provided in Figure 1-1. and the vicinity map is provided in Figure 1-2.

Figure 1-1: Site Location.

Figure 1-2: Waiahole Stream Bridge Vicinity Map.

1.2. Data Collection and Review

For the study analysis, WEST reviewed the latest topographic data (LiDAR), existing bridge plans and proposed bridge and channel plans. Data sources included the Hawaii GIS portal (OPSD, 2017), the Federal Emergency Management Agency (FEMA) and the U.S. Geological Survey (USGS). In addition, the Hawaii Department of Transportation (HDOT) design guidelines and Federal Highway Administration (FHWA) bridge design criteria were reviewed and have been referenced in this report.

1.3. Acknowledgments

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2. Two-dimensional (2D) Hydraulic Analysis

2.1. Peak Flows

Peak flow discharges were estimated by WEST using a combination of flood frequency analysis from USGS gage (USGS gage No. 16294100) and HEC-HMS modeling (WEST, 2018). The final peak flows adopted for this analysis are reported in Table 2-1 below.

Table 2-1. Adopted return period peak flows, Waiahole Stream at Waiahole Bridge

Return Period (years)	Peak Flow (cfs)
5	5,500
10	7,200
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100	13,000
200	14,500
500	16,500

2.2. HEC-RAS 2D Model Development

WEST developed a two-dimensional (2D) hydraulic model of the Waiahole Stream and Bridge using the U.S. Army Corps of Engineers' HEC-RAS computer program (USACE, 2022). Figure 2-1 shows the HEC-RAS model grid extent as well as the model boundary conditions (light blue) and breaklines (red).

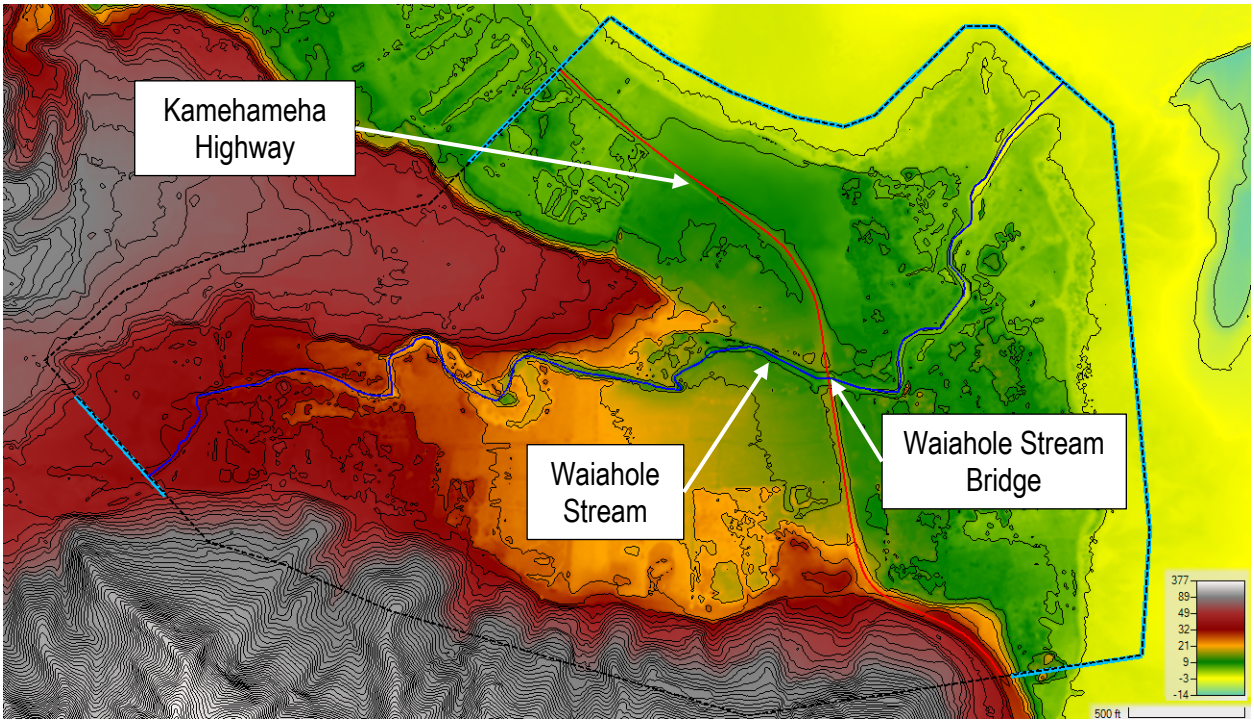

Figure 2-1: HEC-RAS 2D Model Grid Extent.

Digital Terrain Model (DTM) data were obtained from the Hawaii Statewide GIS Program website. The terrain data consists of 1-meter resolution LiDAR with NAD 1983 horizontal datum in HARN State Plane Hawaii 3 FIPS 5103 Feet and the Local Tidal Datum (LTD) vertical datum. Additional terrain for the Waiahole Stream channel, the Kamehameha Highway and the proposed new road alignment and bridge channel and banks were provided to WEST by KAI.

A grid cell size of 15 feet was selected and convergence analysis during modeling development indicated that a computation time-step of 1 second was adequate to ensure model stability. The upstream boundary condition for the inflow hydrograph was placed about 0.7 miles upstream of the Waiahole Stream Bridge. The downstream boundary condition placed as at the shore about 0.4 miles downstream of the Waiahole Stream Bridge and set to normal depth with a slope of 0.001 that was estimated based on the average slope of the terrain at the boundary. Manning's *n* polygons were created based on Google earth aerial imagery, site photos, previous studies, and standard hydraulic references (Chow, 1959). Figure 2-2 shows the Manning's *n* regions and values used in this study.

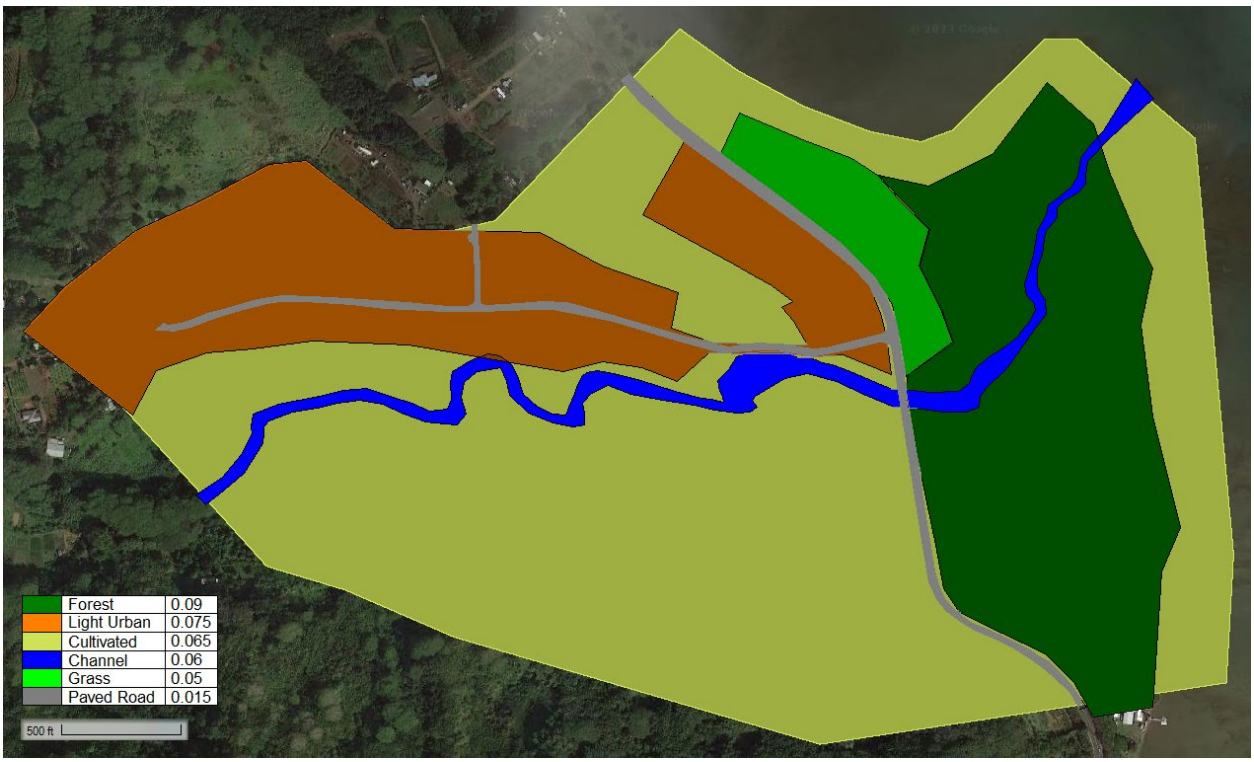

Figure 2-2: HEC-RAS 2D Model Manning's *n* regions and values.

2.2.1. Existing Waiahole Stream Bridge

The existing Waiahole Stream Bridge has a span of 60 feet and two 2.5-foot-wide piers (Figure 2-3). The bridge channel, abutments and as-built geometry implemented in HEC-RAS is shown in Figure 2-3.

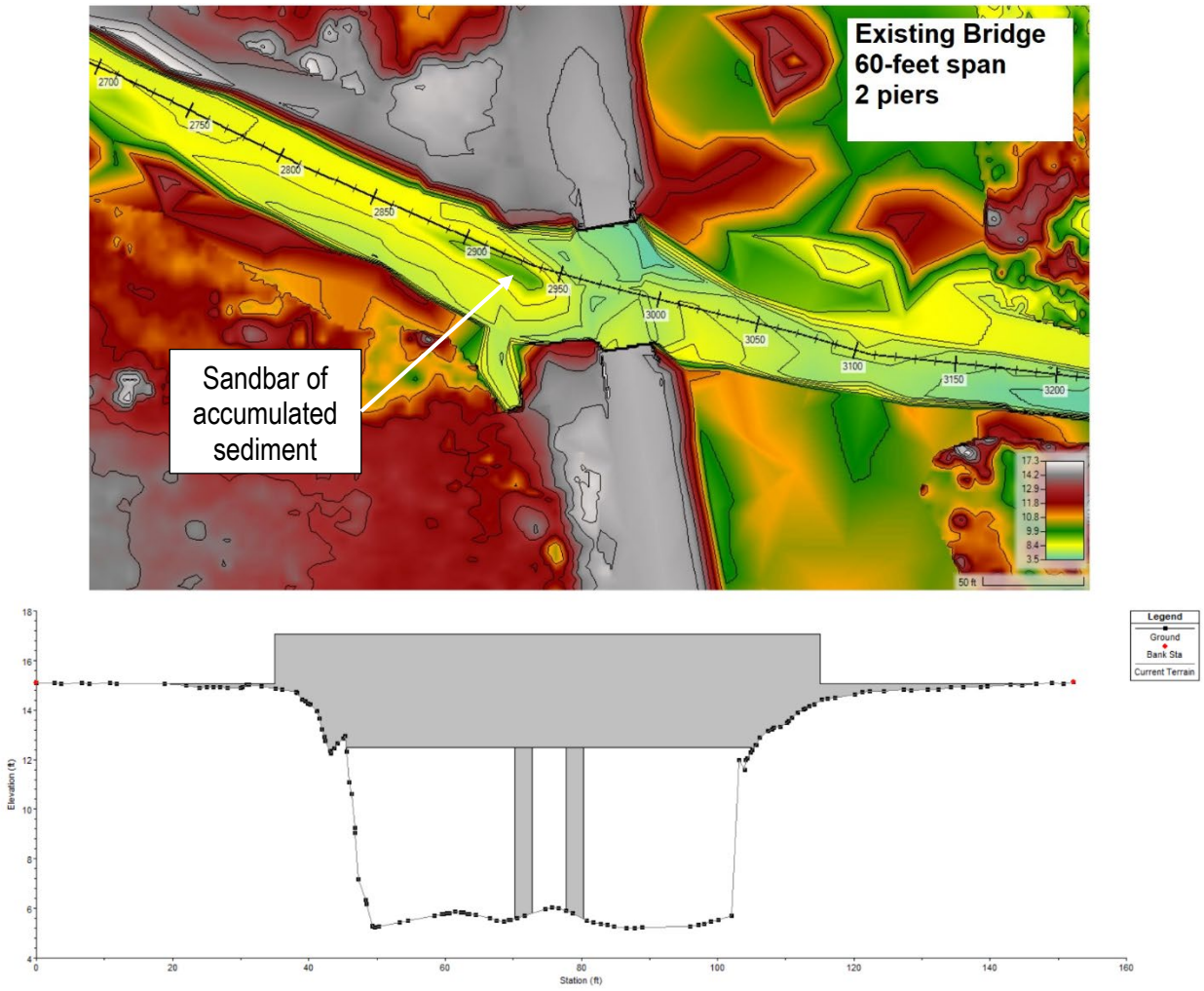

Figure 2-3: Existing Bridge on Waiahole Stream.

2.2.2. Proposed Waiahole Stream Bridge

The existing Waiahole Stream Bridge will be replaced by a full span, no-piers Acrow bridge that will be built on a new road embankment about 60 feet downstream of the existing crossing. The proposed Acrow bridge will have a 130-foot span with abutments protected with riprap at a 2H:1V slope (Figure 2-4).

The project also proposes to regrade the Waiahole Stream channel under the bridge from about 200 feet upstream of the crossing to about 100 feet downstream. As part of the regrade the sandbar that accumulated in front of the existing bridge piers (Figure 2-3) will be removed and the stream banks below the proposed bridge opening will also be realigned (Figure 2-4).

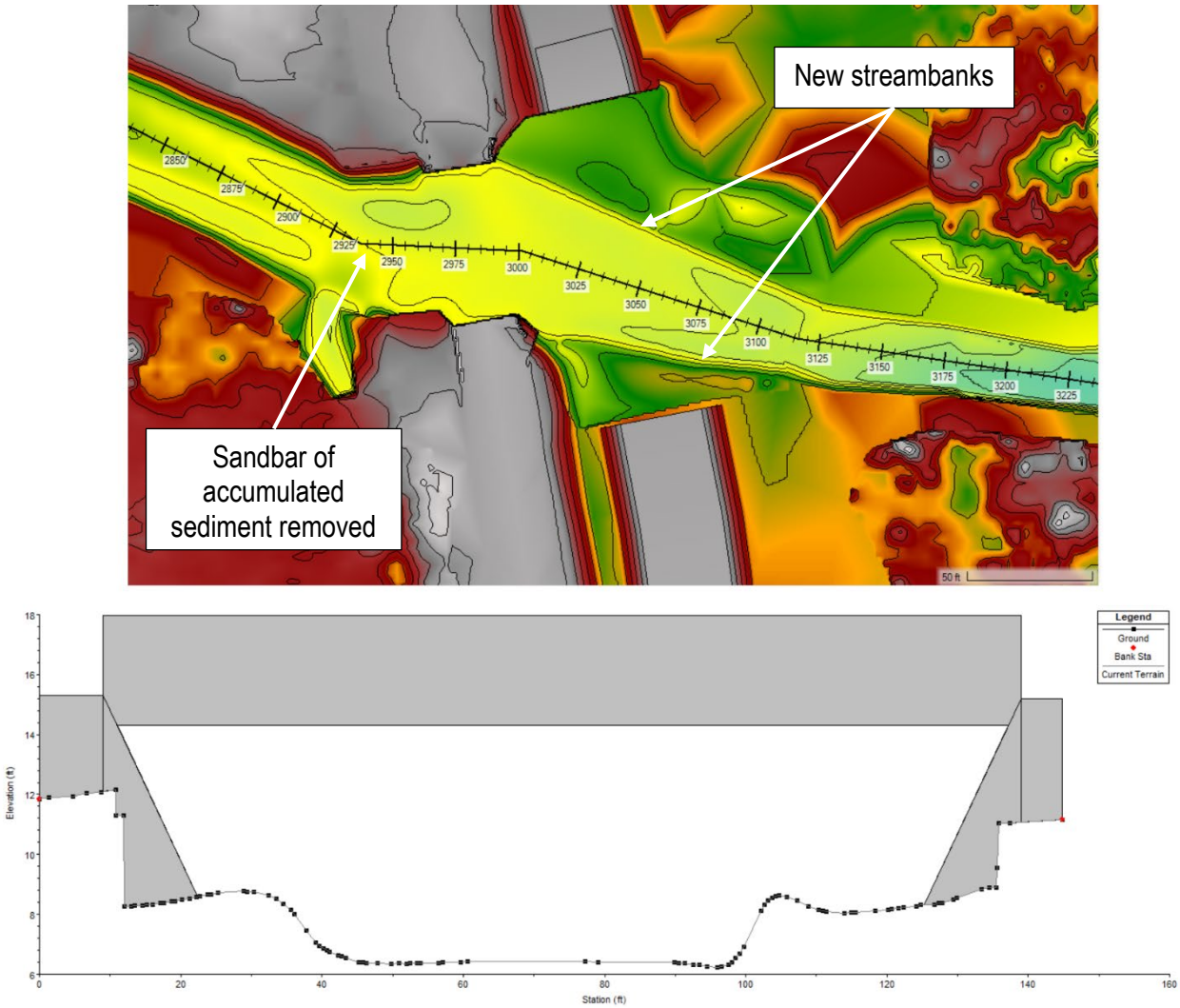

Figure 2-4: Proposed Acrow Bridge on Waiahole Stream.

2.3. HEC-RAS 2D Model Results

The HEC-RAS 2D model results indicate that the new Acrow bridge would reduce the river profile upstream of the existing bridge (Figure 2-8). The model also indicates that the new bridge would slightly increase the water surface profile downstream of the new embankment. The order of magnitude of the increase would be everywhere less than 0.5 feet, which is below the FEMA tolerance for tie-ins to the water surface elevation profiles for existing conditions.

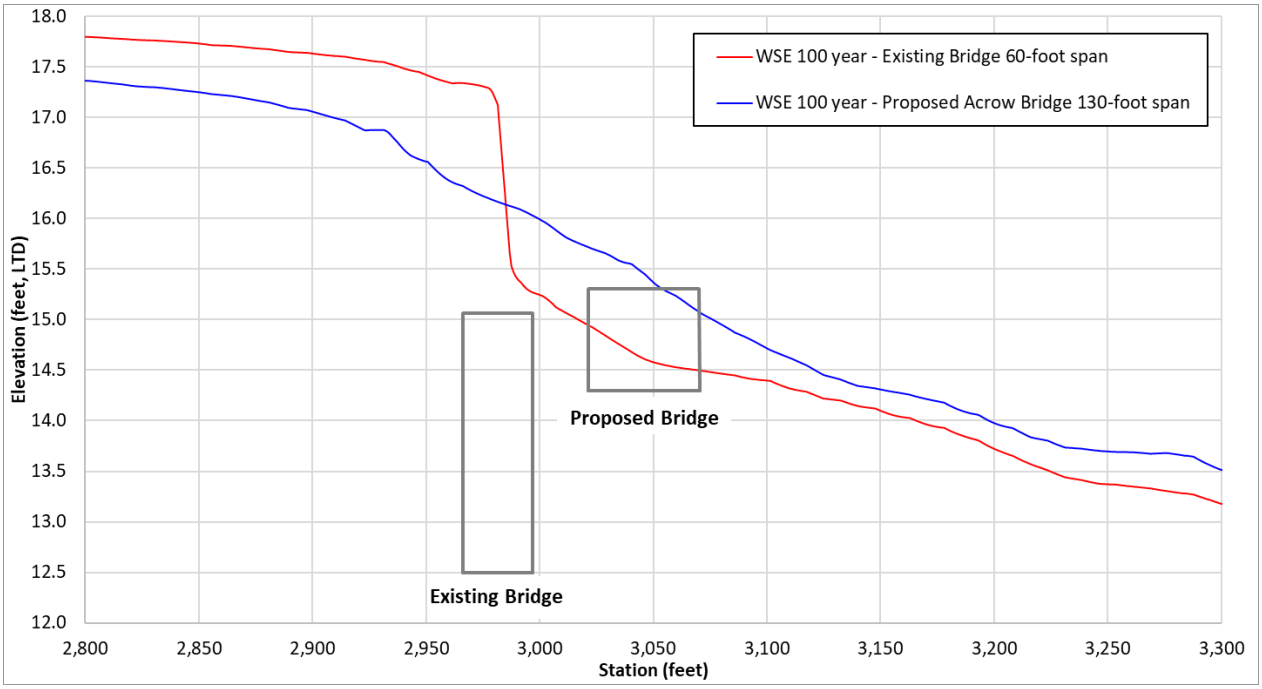

Figure 2-5: Existing vs Proposed Waiahole Stream Bridge WSE.

The water surface elevations profiles for the existing and the proposed Acrow bridge along the entire reach are shown in Figure 2-9. The figure also shows the FEMA floodway upstream of the crossing (FEMA, 2010). The model results indicate that the proposed Acrow bridge would reduce the water surface elevation everywhere along the floodway and therefore it would satisfy the FEMA “no-rise” condition.

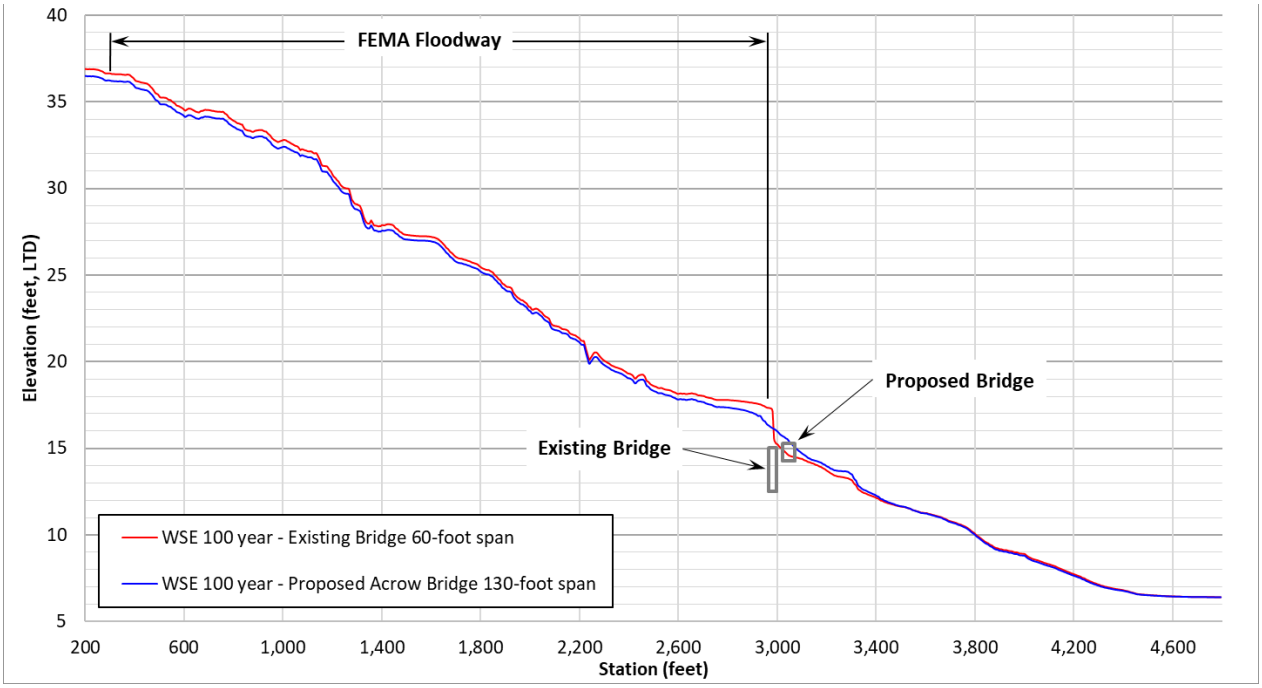

Figure 2-6: Existing vs Proposed Waiahole Stream Bridge WSE against FEMA floodway.

3. References

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APPENDIX C

HALEY ALDRICH

www.haleyaldrich.com

DRAFT

JURISDICTIONAL WETLAND AND ORDINARY HIGH WATER MARK DETERMINATION FOR THE WAIAHOLE BRIDGE REPLACEMENT PROJECT FEDERAL AID PROJECT NO. BR-083-1(088) COASTAL WAIAHOLE AHUPUAA, DISTRICT OF KOOLAUPOKO ISLAND OF OAHU, HAWAII

TMKS: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018; (1) 4-8-008:021; (1) 4-8-008:022; (1) 4-8-008:023; (1) 4-8-008:024; (1) 4-8-008:025; (1) 4-8-009:001, AND (1) 4-8-009:006

by
Haley & Aldrich, Inc.
500 Ala Moana Boulevard, Suite 6-250
Honolulu, HI 96813

for
State of Hawaii Department of Transportation – Highways
869 Punchbowl Street, Room 202
Honolulu, HI 96813

File No. 0208079-000

HALEY & ALDRICH
500 Ala Moana Boulevard, Suite 6-250
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808.587.7747

December 14, 2023
File No. 0208079-000

Michael Hunnemann, P.E.
Kai Hawaii, Inc.
50 S. Beretania Street, #C-119C
Honolulu, Hawaii 96813

Subject: Jurisdictional Wetland and Ordinary High Water Mark Determination for the Kamehameha Highway, Waiahole Bridge Replacement Project
Coastal Waiahole Ahupuaa, District of Koolaupoko, Island of Oahu, Hawaii
Federal Aid Project No.: BR-083-1(088)

Dear Mr. Hunnemann,

Haley & Aldrich, Inc. (Haley & Aldrich) hereby provides our report summarizing a jurisdictional determination (JD) assessment of wetlands and the location of the Ordinary High-Water Mark (OHWM) conducted in September 2023 for the Hawaii Department of Transportation's Waiahole Bridge Replacement Project. A Biological Evaluation for the above referenced project will be forwarded under separate cover.

Should you have any questions, please contact us at 808-470-2081 or email tchock@haleyaldrich.com.

Sincerely yours,
HALEY & ALDRICH

Taylor Chock
Environmental Scientist

Jim Shannon
Senior Biologist

https://haleyaldrich.sharepoint.com/sites/KAIHawaii/Shared Documents/0208079.Kai Waiahole Bridge Permitting/Compliance/JD Report/DRAFT Waiahole JD Report_Dec 2023_clean.docx

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HALEY ALDRICH

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C	Representative Photographs
D	NOAA Precipitation Data (2000-2023)
E	Wetland Determination Data Forms
F	Wetland and Stream Impacts

1. Introduction

Haley & Aldrich, Inc. is pleased to present this wetland and stream verification report to Hawaii Department of Transportation - Highways (HDOT) following a field survey conducted for the Waiahole Bridge Replacement Project, located on the Kamehameha Highway in Waiahole Valley, Koolaupoko District of Oahu (Appendix A; Figure 1). In 2017 Haley & Aldrich staff conducted a wetland and stream survey that delineated five wetlands (A, B, C, D, and E) and Waiahole Stream within the project area of potential affect (APE). The project scope and APE has changed with HDOT's decision to shift the bridge to the east (makai), requiring verification of our previous wetland and stream delineations conducted six years ago.

In September 2023, Haley & Aldrich biologists conducted a field survey in support of a jurisdictional determination (JD) to verify previous delineations of wetlands and waters regulated under Section 404 of the Clean Water Act (CWA) by the Department of the Army U.S. Army Corps of Engineers (USACE) (33 CFR 328) located within the APE. This report documents the investigation, best professional judgment, and an impact assessment by Haley & Aldrich. However, the JD should be considered preliminary until it has been reviewed and accepted by the USACE. Our work was performed in general accordance with our subconsultant agreement with KAI Hawaii, dated May 12, 2023.

1.1 PURPOSE AND BACKGROUND

The Waiahole Stream Bridge (National Bridge Inventory No. 003000830303459) supports Kamehameha Highway over the Waiahole Stream at Milepost 34.59 on Route 83 in Kaneohe on Oahu. The bridge is located 0.04 miles south of Waiahole Valley Road (Appendix A; Figure 1).

The purpose of the project is to replace the two-span Waiahole Stream Bridge, which was constructed in 1922 and measures 65.9 feet long by 26.2 feet wide. The United States (US) Federal Department of Transportation and HDOT have prioritized the replacement of Waiahole Bridge, as the existing bridge does not conform to current design standards and has difficulty supporting the volume of traffic along Kamehameha Highway.

The bridge is structurally deficient and functionally obsolete and has been assigned a Bridge Sufficiency Rating of 38% by HDOT. Settlement of the south abutment has caused sloping of the bridge parapet. The settled area has been filled with asphalt cement over the years to make the roadway level.

A secondary purpose of the project is to reduce the occurrence of stream water overtopping the bridge when Waiahole Stream floods. Water flow in the stream often overtops the embankments because of debris clogging the opening beneath the bridge, and because of the insufficient hydraulic capacity of the stream at the bridge. The center pier often causes timber debris washed downstream to become lodged against the pier, creating a dam effect. The flood water mark on the bridge is located on the superstructure.

A previous JD Report for the project conducted in 2017 by Hart Crowser (Appendix B) defined wetlands and Waters of the US (WOTUS) jurisdiction under the 2015 Clean Water Rule. The 2015 Clean Water Rule was repealed in 2019 and was eventually superseded by the May 25, 2023 "Revised Definition of 'Waters of the United States'; Conforming" hereafter referred to as the "Conforming Rule". In the 21-454 Sackett vs. EPA ruling, the Supreme Court held that WotUS includes only those wetlands with a continuous surface connection to bodies that are 'waters of the United States' in their own right and removed the significant nexus standard for adjacent wetlands. The Conforming Rule was published in the Federal Register on August 29, 2023, and went into effect on September 8, 2023, as 88 Final Rule (FR) 61964.

The JD included in this report is based on the Conforming Rule. As more than five years have passed since the 2017 JD survey was completed, the 2023 JD serves to verify previously identified wetlands, incorporate changes to the APE and project elements, and provide an updated JD under the Conforming Rule in support of the CWA Section 404 Permits that will be pursued through the USACE for this project.

1.2 PROJECT DESCRIPTION

The Federal Highway Administration (FHWA) is providing funding to the HDOT to replace the Waiahole Stream Bridge with a new structure that meets current design standards. Due to community concerns about safety along this section of Kamehameha Highway, HDOT has decided to realign approximately 1,000 lineal feet of the highway and construct the new bridge adjacent to the downstream face of the existing bridge. The intersection of Waiahole Valley Road and Kamehameha Highway will be redesigned to accommodate the new highway alignment.

Preliminary design for the new bridge consists of a prefabricated steel 130-foot single span by 42-foot-wide roadway. Two 11-foot-wide travel lanes will be provided, along with two 6.5-foot-wide shoulders and a 5-foot-wide sidewalk to accommodate pedestrians. The abutments will be cast-in-place concrete, supported by deep foundations (drilled shafts). The new bridge will be designed to carry current AASHTO HL-93 design live loads. The stream embankments beneath the new bridge and immediately downstream of the bridge will be regraded to increase water flow through the channel.

The existing bridge has two piers and a total span length of 60 feet. The center piers of the existing bridge will be removed down to the mudline to allow for improved flow in the stream. Former bridge abutments (upstream of the existing bridge) and the existing bridge abutments will remain for the purpose of providing erosion control for the embankments, and for the preservation of bridge elements with historic value. The project will remove vegetation and stream sediment upstream and downstream of the existing bridge to provide a positive stream grade and improved hydraulic flow. The project will result in a slight lowering of the water elevation upstream of the existing bridge. However, the upstream embankment and new bridge will continue to be overtopped during extreme flooding events due to the low embankments upstream and flat coastal plain near the shoreline. Scour protection (riprap) will be added to the embankments to provide long-term stability.

It is anticipated that the contractor will utilize the City and County of Honolulu's Waiahole Beach Park area, along the makai side of Kamehameha Highway, north of the bridge, for a contractor staging and storage area (Appendix C; Photo 5). Because the proposed staging and storage area is a county park, access to the shoreline will be provided via a designated thoroughfare along one side of the park boundary.

Construction of the new bridge is expected to start in January 2025 and take approximately two years, ending in December 2026.

2. Site Description

2.1 AREA OF POTENTIAL EFFECT AND SURROUNDING LAND USE

The APE is identified as an area that encompasses the existing Waiahole Stream Bridge, the new Waiahole Stream Bridge, realignment of the private driveway, approximately 200 feet upstream of the existing bridge, and a stockpile/staging area located north of the bridge in Waiahole Beach Park, totaling 11.75 acres (Appendix A; Figures 1 and 2). Appendix C includes representative photos of the APE.

The APE is located on Kamehameha Highway (Route 83) along the east (windward) coast of the island of Oahu. The project location is adjacent to the Waiahole Valley Agricultural Park and Residential Lots Subdivision, which encompasses approximately 600 acres. There, the Hawaii Housing Finance and Development Corporation (HHFDC) manages 92 residential and agricultural leases. Department of Hawaiian Home Lands (DHHL) also leases 20 homestead parcels within the project vicinity. Most of the APE is designated as "Agriculture" by the State Land Use Commission and the Waiahole Poi Factory is located on the northern mauka (up-stream) side of the bridge. The factory uses an area along the northwestern corner of the bridge for parking.

2.2 CLIMATE AND PRECIPITATION

Daily temperatures in Kaneohe average 71 degrees Fahrenheit (°F) in the winter months (i.e., January and February) and 77°F in the summer months (i.e., August and September) (Giambelluca et al., 2014). Humidity averages about 70 percent. Tradewinds with average speeds between 10 to 20 miles per hour (mph) from the north and northeast dominate the summer months (80 to 95 percent during May to October) and prevail about 60 percent during other times of the year. Rainfall occurs year-round, but most of the precipitation occurs in November, December, and March.

The Rainfall Atlas of Hawaii estimates mean annual rainfall at the Waiahole Stream Bridge to be 58 inches (Giambelluca et al., 2013). The nearest National Oceanic and Atmospheric Administration (NOAA) rain station located at the Daniel K. Inouye International Airport (HNL) logged the most rain event closest to the survey as occurring on August 25 (0.08 inches) (NOAA, 2023). Monthly total precipitation in February and April 2023 at HNL were higher than average, but January, May, June, July, and August 2023 were slightly lower than average in the months leading up to the survey compared to monthly precipitation over the past 20 years (Appendix D; NOAA, 2023).

2.3 WETLANDS

Waiahole Stream is considered a riverine, upper perennial, permanently flooded wetland with an unconsolidated bottom (R3UBH) by the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) (Appendix A; Figure 3). Downstream of the proposed bridge, palustrine, emergent, persistent wetlands are seasonally flooded (PEM1C) within the APE. Just east of the APE are palustrine, freshwater forested/shrub (PFO3C) wetlands (USFWS, 2023a; Appendix A; Figure 3).

The 2017 JD report (Hart Crowser, 2017) identified five wetlands (A, B, C, D, and E) within the project area. Results from the 2017 JD describing each wetland are described in more detail in Appendix B.

2.4 TOPOGRAPHY

Topography near the Waiahole Bridge is flat and consists of fallowed agriculturally zoned lands. Elevation around the APE is approximately 10 feet above mean sea level (MSL). Elevations vary from approximately 20 feet above MSL at the southern extent of the project, 10 feet above MSL at the bridge,

and 5 feet above MSL at the northern extent of the project area. In general, ground surface in the APE slopes slightly downward from west to east (i.e., mauka to makai) and from south to north. A 2022 topographic survey was done for the project.

2.5 SOILS

The United States Department of Agriculture (USDA) WebSoil Survey (USDA, 2023) characterizes soils on the north side of the site (20% of the APE) as Hanalei silty clay (HnA), 0 to 2% slopes, MLRA 167 and the southern 80% of the APE as Pearl Harbor clay (Ph), 0 to 2% slopes, MLRA 163. Both HnA and Ph are considered to be hydric soils (USDA NRCS, 2022). Only 0.2% of the APE is Alaeloa silty clay (AeE), older substrate, 15-35% slopes, MLRA 167. AeE soils are not considered to be hydric (USDA NRCS, 2022). A map showing USDA-defined soils in the project area is included in Appendix A, Figure 4.

According to the USDA, HnA soils are typically found on flood plains or on valley floors and are comprised of alluvium derived from basalt. HnA soils are poorly drained, frequently flooded, and have occasional ponding. The typical soil profile for the HnA consists of silty clay over silty clay loam to at least 26 inches. HnA has a moderately high to high hydraulic conductivity of approximately 0.20 to 1.98 inches per hour (USDA, 2023).

Ph soils are present in coastal plains and are very poorly drained with negligible runoff, occasional to no flooding, and have frequent ponding. The typical soil profile for the Ph consists of clay over muck to at least 31 inches. Ph soils have a very low to moderately low hydraulic conductivity of approximately 0.0 to 0.06 inches per hour (USDA, 2023).

2.6 HYDROLOGY

The project is in the Waiahole Stream watershed, Hydrologic Unit Code 20060000, and State of Hawaii Commission on Water Resources Management (CWRM), Division of Aquatic Resources (DAR) Watershed Code 32004. The Waiahole watershed is approximately four-square miles in size and has a maximum elevation of 2,743 feet. The watershed is considered medium in size, steep in the upper watershed, and with embayment. Storm water in the APE flows as overland flow into Waiahole Stream, is impounded by wetlands that occur within the APE, or is absorbed into the ground and enters the stream via hyporheic exchange (Parham et al., 2008). Waiahole Stream flows into Kaneohe Bay approximately 1,500 feet downstream (east) of the bridge.

Waiahole Stream is in an area characterized by Mink and Lau (1990) as underlain by the Koolaupoko aquifer sector within the Windward aquifer system. The aquifer is high level (i.e., freshwater not in contact with seawater), unconfined (i.e., the water table is the upper surface of saturated aquifer), and a dike aquifer. The groundwater is currently used as a drinking water source. It is fresh water, irreplaceable, and has a high vulnerability to contamination (Mink and Lau, 1990).

A United States Geological Survey (USGS) stream gage (16294100) is located upstream (west) of the Waiahole Stream bridge (Appendix A; Figure 5). Over the past 19 years of collected data, annual mean streamflow at the site is 29 cubic feet per second (cfs), with a low of 17 cfs in 2010 and a high of 53.7 cfs in 2015 (USGS, 2023).

2.7 FLOOD ZONE

The section of Waiahole Stream within the APE is characterized as Flood Zone AE with known base flood elevations between 10 to 15 feet within Flood Map 15003C0255G (FEMA, 2011). Waiahole Stream is considered a “Regulatory floodway”, which means that the stream and adjacent land areas must be reserved to discharge the base flood without cumulatively increasing the water surface elevation more

than a designated height (FEMA, 2020). The surrounding area is characterized by Flood Zones A and AE, which are special flood hazard areas with a 1% chance flood event.

2.8 FLORA AND FAUNA

A biological survey was conducted concurrently with the JD field work on September 12, 2023. The full survey results are under a separate cover as a biological evaluation for the project. The majority of the plant species observed in the APE were non-native with dominant tree species including monkeypod (*Samanea saman*), tropical almond (*Terminalia catappa*), Moluccan albizia (*Falcataria moluccana*), gunpowder tree (*Trema orientalis*), macaranga (*Macaranga tanarius*), and mango (*Mangifera indica*). The herbaceous stratum was primarily Guinea grass (*Megathyrsus maximus*), elephant grass (*Cenchrus purpureus*), wedelia (*Sphagneticola trilobata*), sensitive plant (*Mimosa pudica*), umbrella sedge (*Cyperus involucratus*), California grass (*Urochloa mutica*), sourbush (*Pluchea carolinensis*), maile pilau (*Paederia foetida*), and basketgrass (*Oplismenus hirtellus*).

Native indigenous species include a few hala (*Pandanus tectorius*), the presumed indigenous hau (*Hibiscus tiliaceus*), uhaloa (*Waltheria indica*), mauu laiki (*Paspalum scrobiculatum*), kaee (*Mucuna gigantea*), moa (*Psilotum nudum*), and ihi (*Oxalis corniculata*), Polynesian introduced species documented include ki (*Cordyline fruticosa*), primrose willow (*Ludwigia octovalvis*), maia (*Musa* sp.), kalo (*Colocasia esculenta*), ape (*Alocasia macrorrhizos*), niu (*Cocos nucifera*), and kukui (*Aleurites moluccana*).

The majority of birds observed during the survey were non-native, introduced species. Twelve non-native birds were observed or heard during the survey. The most prevalent birds seen were Warbling White-eyes (*Zosterops japonicus*) and bulbul (*Psittacula krameri*). Cattle Egret (*Bubulcus ibis*), Common Myna (*Acridotheres tristis*), Red-Crested Cardinal (*Paroaria coronata*), and Saffron Finch (*Sicalis flaveola*) were observed infrequently. Two koloa maoli or Hawaiian duck (*Anas wyvilliana*) hybrids were observed in the auwai west of Kamehameha Highway. Koloa maoli are not known to be on Oahu as they hybridized with feral mallards. Non-hybrid and endangered Hawaiian Ducks are only known to occur and breed on the Kauai Island (Uyehara et al. 2007, Fowler et al. 2009). The indigenous migratory kolea or Pacific golden plover *(Pluvialis fulva)* were observed commonly in the grassy lawn areas of Waiahole Beach Park.

A species list was obtained from the USFWS's Information for Planning and Consultation (IPaC) website to gather information on listed threatened and endangered species that may be present within or adjacent to the APE (USFWS, 2023). ESA-listed species reported by IPaC to potentially occur in the APE are listed in Table 1. None of the species on the IPaC list were seen in the area during the survey and there is no critical habitat in the area. In-depth analyses on the potential effects of the project on these species are described in the biological evaluation report for the project.

Table 1: ESA-Listed Species that may occur in the Action Area		
Common Name	**Scientific Name**	**ESA Status**
MAMMALS		
Hawaiian hoary bat	*Lasiurus cinereus semotus*	Endangered
BIRDS		
Hawaiian Duck	*Anas wyvilliana*	Endangered
Hawaiian Gallinule	*Gallinula galeata sandvicensis*	Endangered
Hawaiian Coot	*Fulica americana alai*	Endangered
Hawaiian Stilt	*Himantopus mexicanus knudseni*	Endangered
Band-rumped Storm-petrel	*Oceanodroma castro* (Hawaii Distinct Population Segment, DPS)	Endangered
Newell's Shearwater	*Puffinus newelli*	Threatened
Hawaiian Petrel	*Pterodroma sandwichensis*	Endangered
Short-tailed Albatross	*Phoebastria (=Diomedea) albatrus*	Endangered
REPTILES		
Green sea turtle	*Chelonia mydas* (Hawaii Distinct Population Segment, DPS)	Threatened
PLANT SPECIES		
akoko	*Euphorbia celastroides var. kaenana*	Endangered
enaena	*Pseudognaphalium sanwicensium var. molokaiense*	Endangered
awiwi	*Schenkia sebaeoides*	Endangered
Carter's Panicgrass	*Panicum fauriei var. carteri*	Endangered
Hilo Ischaemum	*Ischaemum byrone*	Endangered
Hairy purslane (ihi)	*Portulaca villosa*	Endangered
Agrimony sandbur (Kamanomano)	*Cenchrus agrimoniodes*	Endangered
FERNS AND ALLIES		
Lace fern	*Microlepia strigose var. mauiensis*	Endangered

Notes:
Source: Pacific Islands Fish and Wildlife Office (PIFWO) 2023. Information for Planning and Consultation (IPaC). Accessed 24 August 2023. Accessible online at: https://ipac.ecosphere.fws.gov/.

3. Methods

Prior to conducting the field survey, Haley & Aldrich conducted a review of online information, historical documents, maps, and other available resources. Haley & Aldrich staff compared satellite imagery available on Google Earth Pro with the 2017 USGS 7.5-minute topographic Kaneohe quadrangle map and the 2022 topographic survey map to identify topography and drainage patterns associated with the APE. We reviewed the USGS National Hydrographic Database (USGS 2023), U.S. Department of Agriculture (USDA) NRCS Web Soil Survey (USDA NRCS 2022), NWI maps (USFWS 2023; Cowardin, et al. 1979), the USACE 2020 Wetland Plant List for the State of Hawaii (Lichvar, et al. 2020), Hawaii hydric soils list (USDA NRCS, 2022), and the geological map of Oahu (Sherrod, at al. 2007). We also evaluated readily available aerial photographs and Google Earth satellite imagery from 2004 to the present. In addition, we reviewed previous water resource reports and environmental assessments/environmental impact statements, including the 2017 JD Report conducted for this project (Appendix B; Hart Crowser, 2017).

3.1 WETLAND DELINEATION

The wetland delineation was performed in accordance with the *U.S. Army Corps of Engineers Wetlands Delineation Manual* (USACE, 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Hawaii and Pacific Islands Region (Version 2) (USACE, 2012). These methods use a three-parameter approach for identifying and delineating wetlands, which is based on the presence of field indicators for hydrophytic vegetation, hydric soils, and hydrology.

To identify wetlands in the APE, Haley & Aldrich biologists evaluated conditions by walking through the APE and visiting previously identified wetlands from the 2017 survey (Appendix B; Hart Crowser, 2017). For each location that appeared to have potential wetland characteristics, data on dominant plant species, soil conditions at the sampling point, and evidence of hydrologic conditions were recorded on USACE *Wetland Data Forms for the Hawaii and Pacific Islands Region* (Appendix E). Upland points were also taken to confirm wetland boundaries. Photos of each site are in Appendix C.

3.1.1 Wetland Classification

The wetlands in the study area were classified using the USFWS classification system, which is based on an evaluation of attributes such as vegetation class, hydrologic regime, salinity, and substrate (Cowardin et al., 1979). Hydrophytic vegetation decisions are based on wetland indicator status of species that make up the plant community. The wetlands were also classified according to the hydrogeomorphic system, which is based on an evaluation of attributes such as the position of the wetland within the surrounding landscape, the source and location of water just before it enters the wetland, and the pattern of water movement in the wetland (Brinson, 1993).

3.2 ORDINARY HIGH WATER MARK DELINEATION

Federal jurisdiction of non-tidal tributaries is determined by the Ordinary High-Water Mark (OHWM), which defines the lateral extent of non-tidal aquatic features in the absence of adjacent wetlands. Haley & Aldrich biologists performed stream delineation along Waiahole Stream within the APE in accordance with the USACE *Regulatory Guidance Letter 05-05*: *Ordinary High-Water Mark Identification* (USACE, 2005) and using USACE Engineer Research & Development Center (ERDC)'s National Ordinary High Water Mark Field Delineation Manual for Rivers and Streams: Interim Version (USACE-ERDC, 2022). OHWM points were recorded using a Trimble TDC600® with a Trimble DA2 Antennae.

4. Results

Haley & Aldrich biologists Jim Shannon, Taylor Chock, and Andrew Sitlinger conducted the JD field survey on September 12, 2023. Weather during the surveys was dry with some clouds, with winds about 10 to 20 mph coming from the ENE. Wetland delineation and OHWM field results are shown in Appendix A, Figure 6.

4.1 WAIAHOLE STREAM

Waiahole Stream flows east to west beneath Waiahole Bridge at the center of the APE (Appendix A; Figure 2 and Appendix F). The stream gradient is approximately one percent or less in the APE and stream banks are heavily vegetated except in places downstream of the bridge on the north side, where campers access the stream for water.

Waiahole Stream, bounded by the OHWM, averages approximately 33 feet wide and ranges from 14 to 70 feet wide within the survey area; this width was similar to widths observed during the 2017 OHWM survey. There is some evidence (i.e., scour) that, at higher flows, a side channel of the stream flows through Wetland B. This side channel was evident in 2017 but seems to be more evident now. However, this observation does not change our OHWM determination from 2017.

Upstream of the bridge, we confirmed that there is a sediment island on the right bank that will be removed as part of the project (Appendix C; Photo 2).

A variety of habitat types including pools, glides, and riffles occur within the stream OHWM boundaries in the APE. The stream has moderate sinuosity and has braided channels in several areas. Water depths range from less than one foot in riffles to six feet in pools. Stream substrates ranged from silt to large cobbles. Upstream of the bridge stream substrates have aggraded and a large gravel bar is evident due to the constriction in flow created by the bridge.

At the time of the field survey, Waiahole Stream was flowing near the OHWM with a flow of 22.9 cfs and at 8.43 feet above MSL (USGS stream gauge 16294100 in Waiahole Stream above Kamehameha Highway). The range of mean monthly discharge between September 2003 to September 2023 in Waiahole Stream (USGS gage 16294100) ranged from a high of 205 cfs in March 2006 to a low of 16.4 cfs in September 2008.

The riparian vegetation of Waiahole Stream is dominated by dense elephant grass (*Cenchrus purpureus*) with a tree stratum consisting of Bingabing (*Macaranga mappa*) and monkeypod (*Samenea saman)* trees. The riparian zone is relatively undisturbed downstream of the bridge except for a foot trail and several unauthorized camping sites on the north side of the stream. A vegetated sediment "island" has accreted approximately 100 feet north of the bridge and will be removed as part of the bridge replacement project to improve hydraulic flow in the stream.

4.2 WETLANDS

4.2.1 Previously Identified Wetlands

Wetlands A, B, D, and E, previously identified in the 2017 survey were verified as wetlands in the APE during the current survey, as all three wetland indicators were present (Appendix B; Hart Crowser, 2017). Wetland Determination Data Forms - Hawaii and Pacific Islands Region for each test pit taken during the 2023 survey are included in Appendix E. However, under the 2023 Conforming Rule, Wetlands A, D, and E are likely no longer considered WotUS as they do not have a continuous surface

connection to WotUS (i.e., Waiahole Stream or the Pacific Ocean). Furthermore, Wetlands D and E may not be considered relatively permanent waters as there was no standing water during the survey. An additional wetland identified in 2017, Wetland C, was not verified during the current survey because of its location north and outside of the revised APE. In addition, Wetland C is likely no longer considered as WotUS as it does not have a direct surface connection the Pacific Ocean and is likely not relatively permanent.

Only Wetland B, a riverine, emergent wetland adjacent to the northern bank of Waiahole Stream, would still be considered jurisdictional under the Conforming Rule as it has a direct surface connection to Waiahole Stream. Wetland B is described in more detail in the following section.

4.2.2 Wetland B

In 2017, Wetland B was identified as a riverine, emergent wetland adjacent to the northern bank of Waiahole Stream and east of Waiahole Bridge. Data collected at B1 showed that all three wetland indicators were present. Wetland B appears to have remained about 0.3 acres in size from 2017.

Wetland B is dominated by elephant grass. Trees in Wetland B are dominated by bingabing and monkeypod. Typical vegetation is shown in Table 1. Soils underlying the vegetation at Sample Point B1 are very dark brown (7.5 YR 2.5/2) sand to a depth of 4 inches with redox features (5YR/4/6) indicated by masked sand grains. This qualifies as a hydric soil under indicator F6, redox dark surface. Smooth gravel and cobble below 4 inches indicate their stream origin. The primary source of Wetland B's hydrology is overbank flooding from Waiahole Stream. Sample Point B1 encountered the water table 8 inches below the ground surface.

5. Impact Assessment

The proposed project will impact WotUS below the OHWM of Waiahole Stream and within the adjacent Wetland B. Impacts will result from regrading stream embankments beneath the new bridge and immediately downstream of the bridge and removing vegetation and sediment upstream and downstream of the existing bridge. In addition, the center piers of the existing bridge will be removed down to the mudline to allow improved flow. There will be disturbance of 0.32 acres below the OHWM of Waiahole Stream, including approximately 180 cubic yards (cy) of excavation and 305 cy of fill. Approximately 0.04 acres and 110 cy of Wetland B will be excavated to widen the stream. Appendix F shows the areas where there will be impacts to wetlands and Waiahole Stream.

Natural stream flow conditions will be permanently improved by these project elements; however, work in the stream has the potential to temporarily negatively impact stream water quality during construction. Standard BMPs for in-water work, such as isolating the active working area with sandbags or silt curtain, will be utilized to minimize the impact of construction on stream water quality. Long-term impacts to the stream, although permanent, are anticipated to be beneficial by allowing more natural hydrologic and sedimentation processes to occur within the stream.

Although Wetlands A and D no longer appear to qualify as WOTUS under the Conforming Rule we are reporting impacts to these non-WotUS wetlands for informational purposes (see Section 4.2.1). Approximately 0.06 acres of Wetland A and 0.02 acres of Wetland D are expected to be impacted permanently by the construction of the new highway alignment. Approximately 250 cy of fill will be placed in Wetland A and 30 cy of fill into Wetland D for construction of the new alignment roadway embankments. The impacts to Wetlands A and D are expected to be negligible, as hydraulic storage will not be significantly reduced and the wetlands have little habitat value as most of the area has been disturbed due regular grass cutting maintenance. Table 2 below summarizes the quantities and areas of impact to each wetland or stream area below the OHWM.

Table 2: Wetland and Stream Impacts

Wetland	WotUS Designation	Excavation Quantity (cy)	Fill Quantity (cy)	Area (acres)
Wetland A	Non-WotUS	--	250	0.06
Wetland B	WotUS	110	--	0.04
Wetland D	Non-WotUS	--	30	0.02
Waiahole Stream	WotUS	180	305	0.14 (excavation) 0.18 (fill)

Notes:
Total area of WotUS Impacted: 0.36 acres
Total amount of fill in WotUS: 305 cy
Total amount of excavation in WotUS: 290 cy

As construction plans for replacing Waiahole Bridge will involve a total of 0.36 acres of WotUS impacted by dredge or fill material, a Department of the Army permit administered by the USACE will be required. A Section 404 Department of the Army Nationwide Permit (NWP) 14 for Linear Transportation Projects will likely be pursued. Our JD findings will be submitted to the Honolulu District U.S. Army Corps of Engineering Regulatory Branch (POH) for concurrence.

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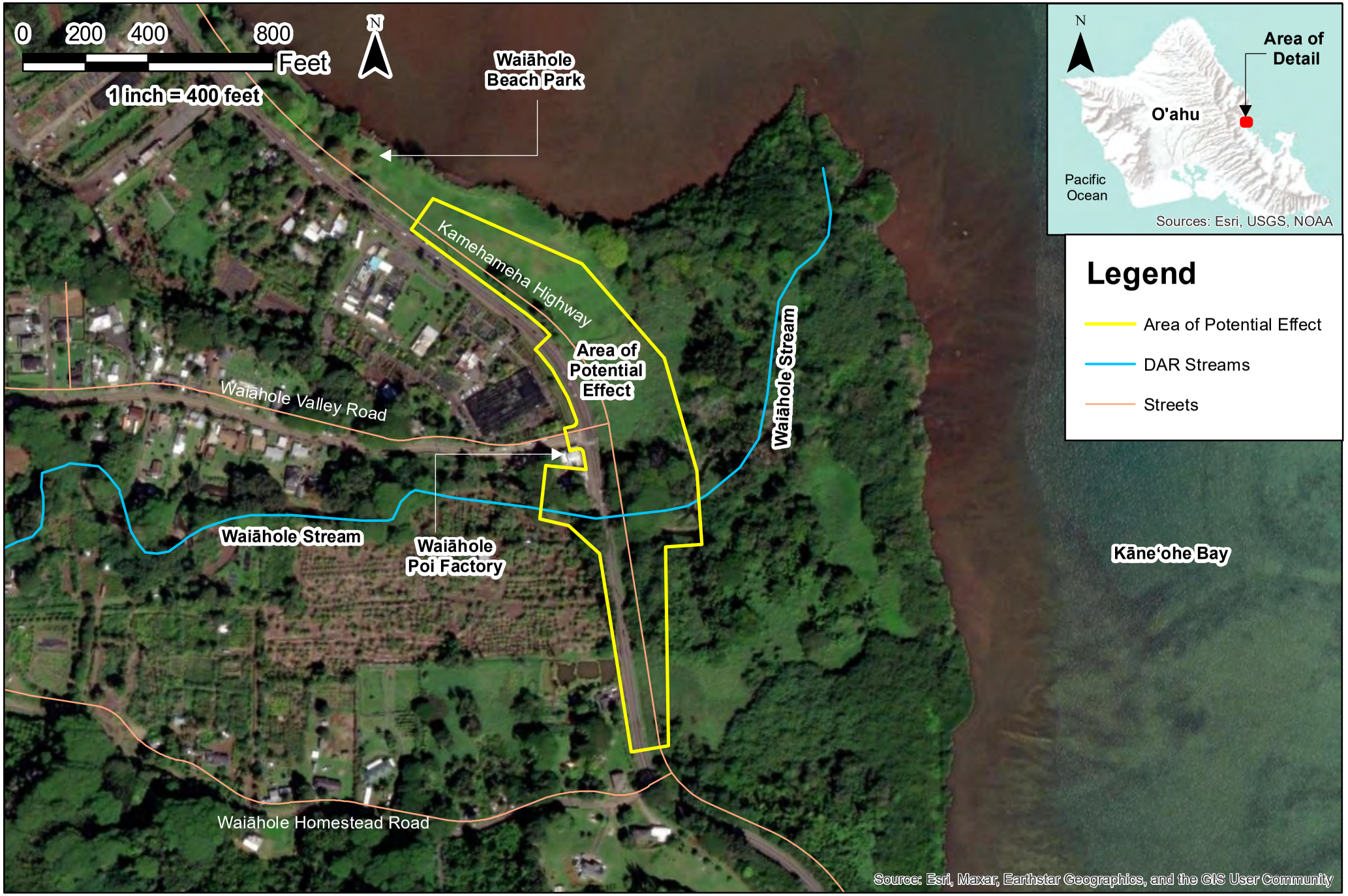
APPENDIX A
Figures



	Vicinity Map	Figure 1
	Waiāhole Bridge Replacement Project Kāneʻohe, Oʻahu, Hawaiʻi	

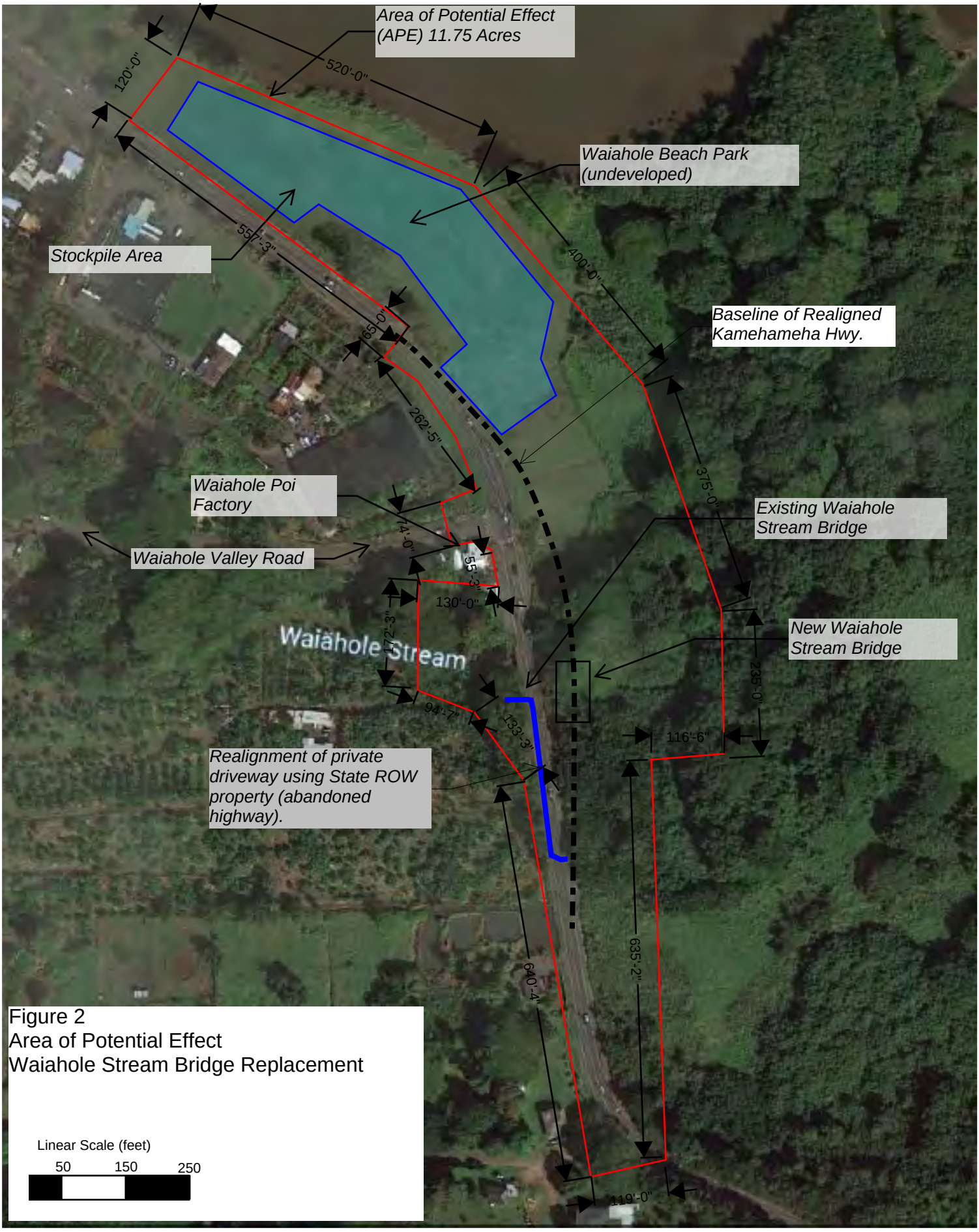
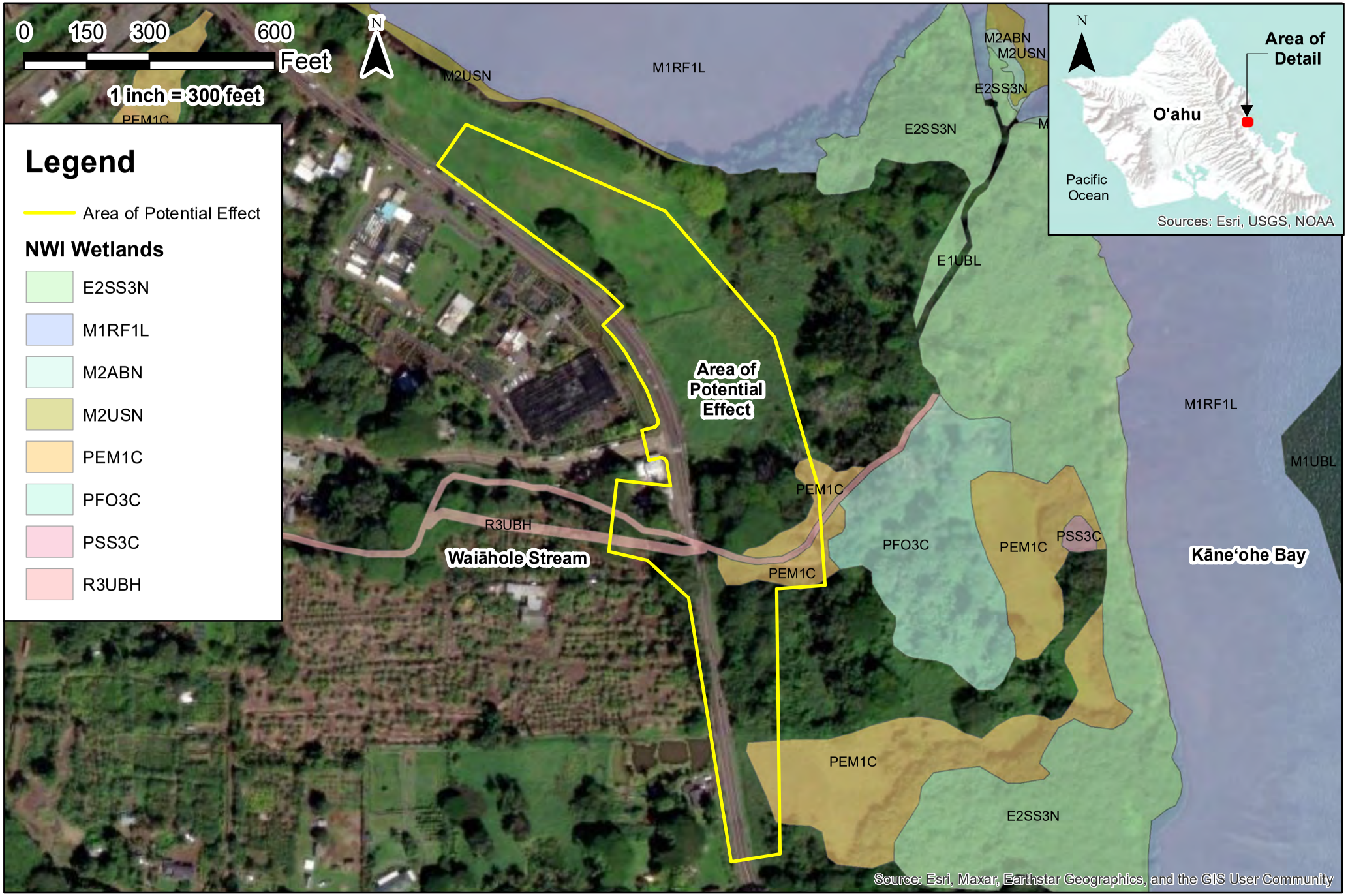


Figure 2
Area of Potential Effect
Waiahole Stream Bridge Replacement



	NWI Wetlands Map	Figure 3
	Waiāhole Bridge Replacement Project Kāneʻohe, Oʻahu, Hawaiʻi	

Figure 4a
Soil Map—Island of Oahu, Hawaii
(Waiahole Bridge Replacement)

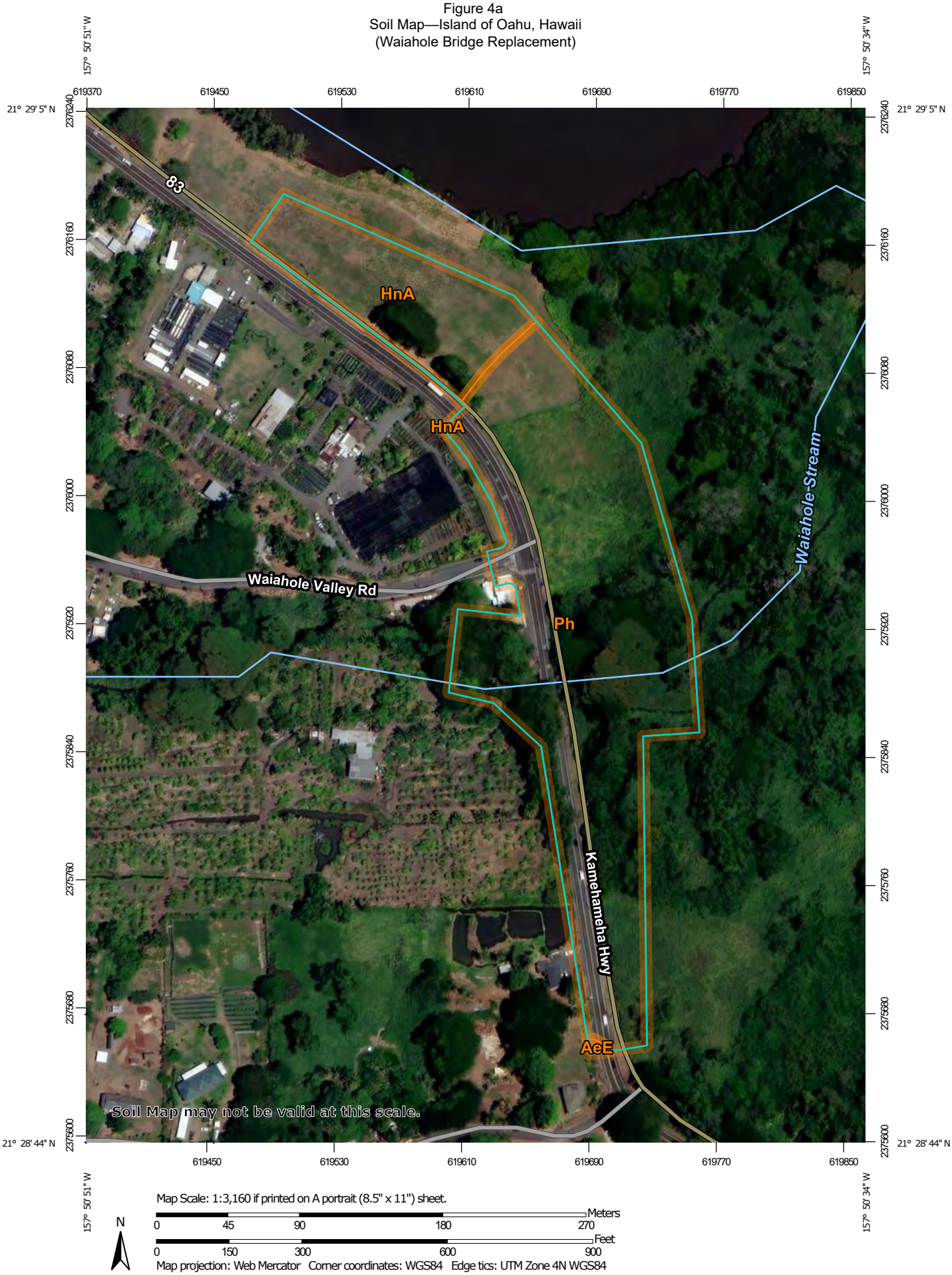


Figure 4b
Soil Map—Island of Oahu, Hawaii
(Waiahole Bridge Replacement)

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Island of Oahu, Hawaii
Survey Area Data: Version 17, Aug 30, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 29, 2017—Oct 11, 2020

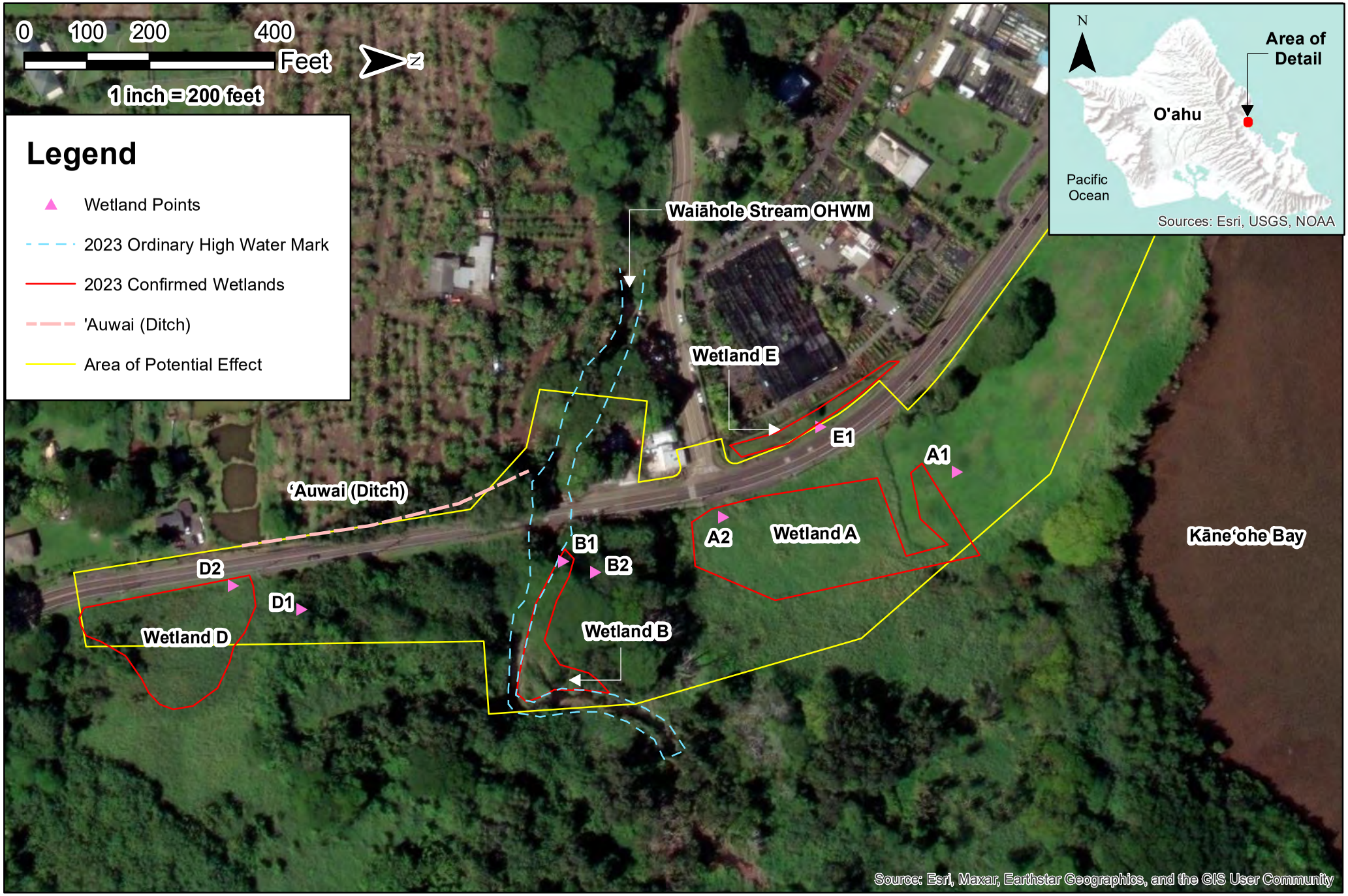
The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
AeE	Alaeloa silty clay, older substrate, 15 to 35 percent slopes, MLRA 167	0.0	0.2%
HnA	Hanalei silty clay, 0 to 2 percent slopes, MLRA 167	2.3	20.0%
Ph	Pearl Harbor clay, 0 to 2 percent slopes, MLRA 163	9.3	79.8%
Totals for Area of Interest		**11.6**	**100.0%**

Figure 5: Location of Stream Gage at Waiāhole Stream above Kamehameha Highway - 1612941000

USGS, 2023. 16294100 Waiāhole Stream above Kamehameha Highway, Oahu, HI. Available at: https://waterdata.usgs.gov/monitoring-location/16294100/#parameterCode=00060&period=P700D&showMedian=false.



	Field Results Map **Waiāhole Bridge Replacement Project** **Kāne'ohe, O'ahu, Hawai'i**	**Figure 6**

APPENDIX B
2017 Jurisdictional Determination Report

DRAFT

Wetland and Stream Report

Waiāhole Bridge Replacement Project
Kāneʻohe, Hawaiʻi

Prepared for
State of Hawaiʻi Department of Transportation Highways Division

February 2018
3100005001

HARTCROWSER

DRAFT

Wetland and Stream Report

Waiāhole Bridge Replacement Project
Kāneʻohe, Hawaiʻi

Prepared for
State of Hawaiʻi Department of Transportation Highways Division

February 2018
3100005001

Prepared by
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Wetland and Stream Impacts

Wetland and Stream Report

Waiāhole Bridge Replacement Project

Kāne'ohe, Hawai'i

1.0 INTRODUCTION

Hart Crowser, Inc. (Hart Crowser) is pleased to present this report to Hawai'i Department of Transportation Highways Division (HDOT) describing our wetland and stream delineation for the Waiāhole Bridge Replacement Project, located on the Kamehameha Highway in Waiāhole Valley, Ko`olaupoko District of O'ahu (Figure 1). The bridge is located 0.04 miles south of Waiāhole Valley Road, adjacent to the Waiāhole Poi Factory. Our work was performed in general accordance with our subconsultant agreement with KAI Hawai'i, dated May 25, 2017.

1.1 Project Description

The purpose of this project is to replace the existing bridge structure over the Waiāhole Stream (Appendix A Photographs). This bridge has been identified as structurally deficient and functionally obsolete based on the HDOT bridge management data. The existing bridge does not meet current standards with regards to roadway width, vehicular load capacity, pedestrian traffic, and bridge railings. In addition, water flow in the stream often overtops the embankments because of the insufficient hydraulic capacity of the bridge.

2.0 SITE DESCRIPTION

The wetland and stream delineation was conducted in the Area of Potential Affect (APE) and an additional 500 feet downstream of the bridge in Waiāhole Stream (Figure 2). The project APE is approximately 11.75 acres and encompasses stream areas upstream and downstream of the bridge, a proposed temporary construction bypass road, and a portion of Waiāhole Beach Park to be used as a construction staging area.

Figure 1 – Vicinity Map.

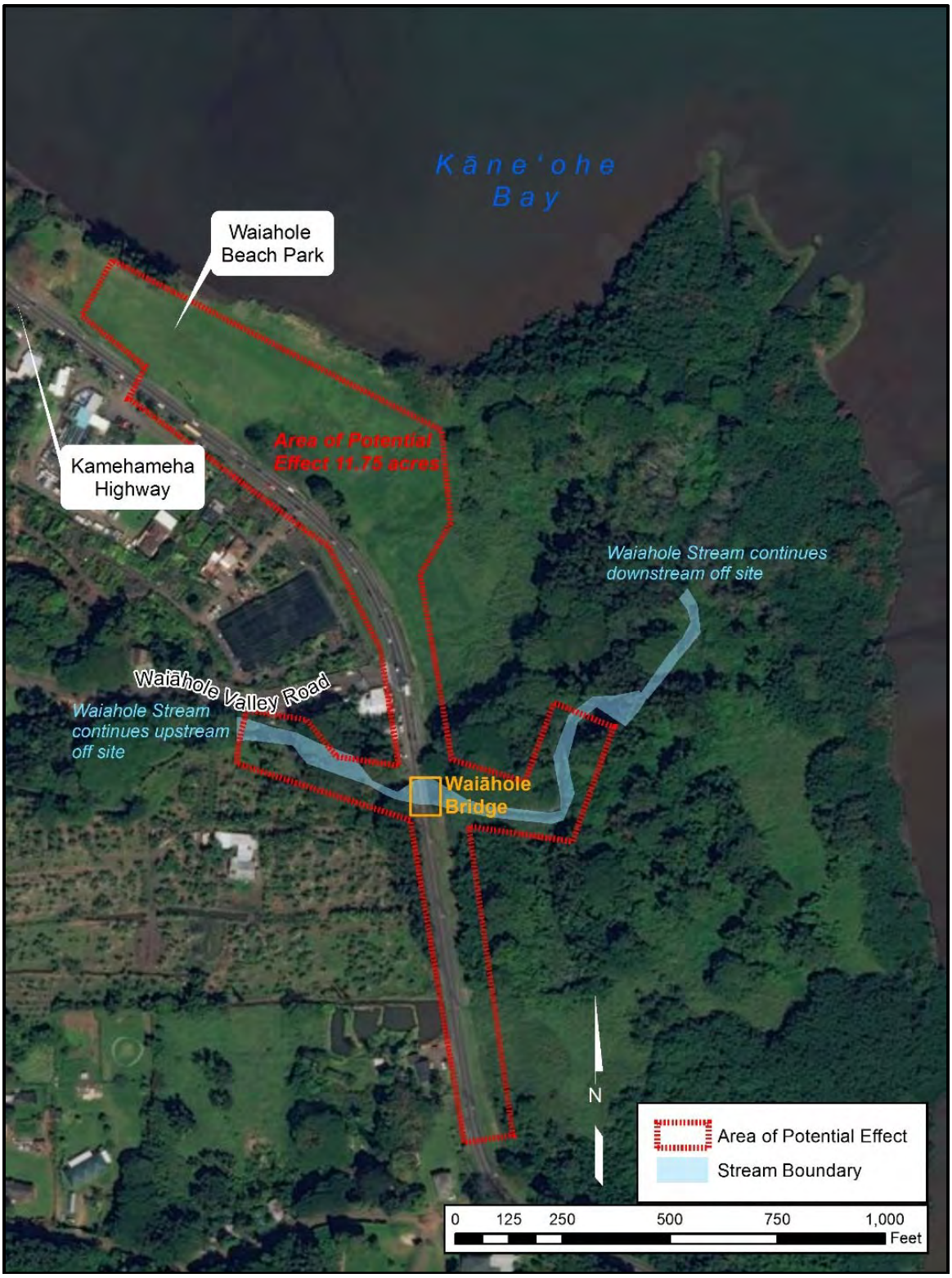

Figure 2 – Area of Potential Effect.

2.1 Topography

Topography near the Waiāhole Bridge is flat, and land in the area consists of fallowed agriculturally zoned lands (Figure 3). Elevation around the bridge project site is approximately 10 feet above mean sea level (MSL). North of the project, the area designated as "Urban" is the TMK for Waiāhole Poi Factory and parking area adjacent to the existing bridge. West of the project site along Waiāhole Valley Road there is also an Urban designated area consisting of residential homes.

Figure 3 – Land use near APE (Image credit: HoLIS).

Surface elevations vary from approximately 20 feet above MSL at the southern extent of the APE, 10 feet above MSL at the bridge and 3 feet above MSL at the northern extent of the APE. The maximum elevation on the APE's western (upstream) extent is 13 feet above MSL and 5 feet above MSL at the eastern (downstream) extent of the APE.

2.2 Soils

The near-surface soils at the site are mapped by the U.S. Department of Agriculture (USDA) on the Web Soil Survey (USDA 2016) website. Appendix B contains the Custom Soil Resource Report for the Island of Oʻahu, Hawaiʻi Waiāhole Project Area. The near-surface soils at the site are mapped by the USDA as Hanalei silty clay at the northern end of the site, and Pearl Harbor clay encompassing the rest of the site. Hanalei silty clay forms on flood plains on valley floors with a parent material of Alluvium derived from basalt. The typical soil profile for the Hanalei silty clay consists of silty clay over silty clay loam to at least 26 inches. Hanalei silty clay has a moderately high to high hydraulic conductivity of approximately 0.20 to 1.98 inches per hour. Pearl Harbor clay forms on coastal plains with a parent material containing alluvium. The typical soil profile for the Pearl Harbor clay consists of clay over muck to at least 31 inches. Pearl

Harbor clay has a very low to moderately low hydraulic conductivity of approximately 0.0 to 0.06 inches per hour.

2.3 Hydrology

The APE is in the Waiāhole Stream watershed, Hydrologic Unit Code 20060000. Storm water in the APE flows as overland flow into Waiāhole Stream, is impounded by wetlands that occur within the APE, or is absorbed into the ground and enters the stream via hyporheic exchange. Waiāhole Stream flows into Kaneohe Bay approximately 2,000 feet downstream (east) of the bridge.

A United States Geological Survey (USGS) stream gage (16294100) is located upstream (west) of the Waiāhole Bridge. Mean monthly discharge (cubic feet per second) for Waiāhole Stream for October 2001 to February 2017 is presented in Figure 4 (USGS 2017).

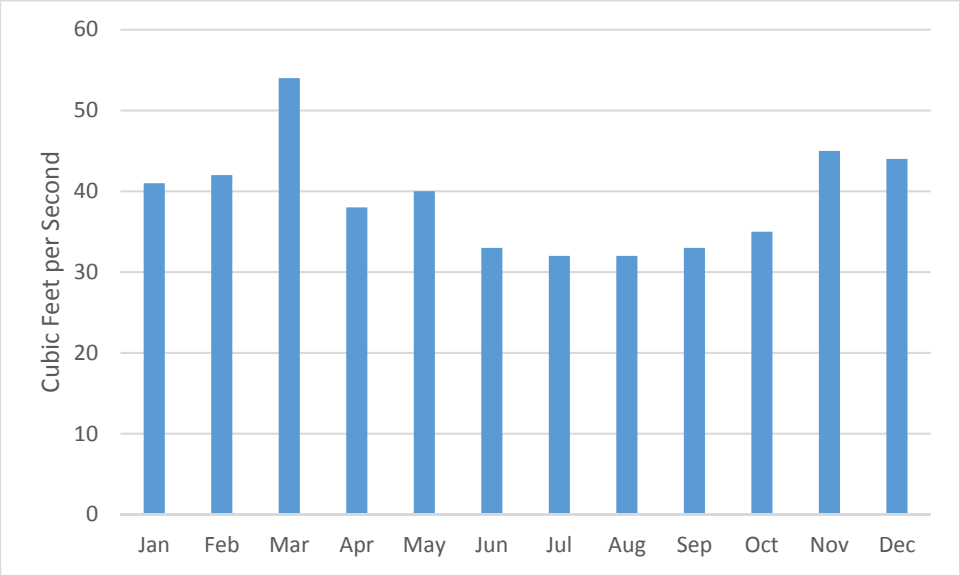

Figure 4. Mean Monthly Discharge (cubic feet per second) for Waiāhole Stream (USGS gage 16294100) for October 2001 to February 2017.

2.4 Flora and Fauna

The vegetation in the survey area is dominated by non-native species including elephant grass (*Cenchrus purpureus*), monkeypod (*Pithecellobium dulce*), and gunpowder tree (*Trema orientalis*). The State of Hawai'i Office of Planning provides a Threatened and Endangered (T&E) Plants layer that represents digitization of Division of Forestry and Wildlife 1992 T&E plant species maps. The T&E layer was overlaid on the APE and had a density value of "little or no T&E species" for T&E species concentration. A botanical resources assessment was conducted for the Waiāhole Bridge project by Char & Associates in August 1998 and the report summarized the site as "dominated by introduced plants such as elephant grass, California grass (*Brachiaria mutica*), Java Plum (*Syzygium cumini*), Guinea grass (*Megathyrsus maximus*), etc." (Char & Associates 1998). During the 2017 wetland and stream field assessments, no T&E species or habitat were found in the APE. A certified arborist with Steve Nimz and Associates, Inc. conducted a site visit and

did not observe any native or endangered tree or plant species (Steve Nimz and Associates 2016; Appendix C).

Terrestrial fauna recorded in the area during this 2017 wetland and stream field assessments and other previous surveys by Pacific Aquatic Environmental (1998) is predominantly non-native birds. Native waterbirds do not appear to use this area of Waiāhole Stream on a regular basis. Native forest birds are not found in this highly disturbed, low-elevation area. Migratory shorebirds have been observed at the mouth of Waiāhole Stream along the shoreline, but only in small numbers, and this area does not appear to be an important site for migratory birds (Pacific Aquatic Environmental 1998).

The federally endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*) and state endangered Hawaiian short-eared owl or pueo *(Asio flammeus sandwichensis*) may inhabit or transverse the area (USFWS 2017). Endangered waterbirds may occur in areas that become ponded during storms and may pass through the area, including Hawaiian duck (*Anas wyvilliana*), Hawaiian stilt (*Himantopus mexicanus knudseni*), Hawaiian coot (*Fulica alai*), and Hawaiian gallinule (*Gallinula chloropus sandvicensis*) (USFWS 2017, Pacific Aquatic Environmental 1998). Finally, seabirds, particularly the endangered Hawaiian petrel (*Pterodroma sandwichensis*) and threatened Newell's shearwater (*Puffinus auricularis newelli*), may fly over the project area at night (USFWS 2017).

3.0 METHODS

Before the survey, Hart Crowser reviewed National Wetland Inventory, USGS, and State of Hawai'i wetland data; geospatial data; aerial photographs; and topographic maps to identify potential wetlands or other waters of the U.S. in the survey area or the immediate vicinity. Information was also taken from the NRCS hydric soil data, as well as previous water resource reports and environmental assessments/environmental impact statements.

3.1 Stream Delineation

Hart Crowser biologists delineated the ordinary high-water mark (OHWM) in Waiāhole stream 500 feet upstream and 1,000 feet downstream of the bridge on June 5 and August 21, 2017. The delineation was performed in accordance with U.S. Army Corps of Engineers (USACE) Regulatory Guidance Letter 05-05 (USACE 2005) for identifying the OHWM for non-tidal, non-wetland waters.

3.2 Wetland Delineation

The wetland delineation was performed in accordance with the U.S. Army Corps of Engineer's Wetland Delineation Manual (USACE 1987) and the Regional Supplement to the U.S. Army Corps of Engineers' Wetlands Delineation Manual: Hawai'i and Pacific Islands Region (USACE 2012). These methods use a three-parameter approach for identifying and delineating wetlands, which is based on the presence of field indicators for hydrophytic vegetation, hydric soils, and hydrology.

To identify potential wetlands, wetland biologists evaluated conditions by walking through the study area June 5 through June 7,2017 and August 21, 2017. The August field effort was in response to an extended northern and southern boundary of the APE. For each location that appeared to have potential wetland

characteristics, data on dominant plant species, soil conditions, and evidence of hydrologic conditions were recorded on Hawai'i and Pacific Islands — Wetland Determination Data Forms (Appendix D). Adjacent upland locations were also analyzed to confirm wetland boundaries. Based on the collected data, a determination of wetland or upland was made for each location examined. GPS points were taken and flags were hung at the location of these sampling points and along the wetland boundaries.

3.3 Wetland Classification

The wetlands in the study area were classified according to the U.S. Fish and Wildlife Service classification system, which is based on an evaluation of attributes such as vegetation class, hydrologic regime, salinity, and substrate (Cowardin et al. 1979). Hydrophytic vegetation decisions are based on wetland indicator status of species that make up the plant community. The wetlands were also classified according to the hydrogeomorphic system, which is based on an evaluation of attributes such as the position of the wetland within the surrounding landscape, the source and location of water just before it enters the wetland, and the pattern of water movement in the wetland (Brinson 1993).

4.0 RESULTS

Hart Crowser delineated Waiāhole stream and five wetlands within the project APE (Figure 5). Wetland A and Wetland C are located within Waiāhole Beach Park. Wetland B is adjacent to Waiāhole Stream, east of Waiāhole Bridge. Wetland D and E are adjacent to Kamehameha Highway.

4.1 Waiāhole Stream

Waiāhole Stream flows east to west beneath Waiāhole Bridge at the center of the APE (Figure 2 and Appendix E). The stream gradient is approximately 1 percent or less in the APE, and stream banks are heavily vegetated except in places downstream of the bridge on the north side where campers access the stream for water. Waiāhole Stream bounded by the OHWM averages approximately 33 feet wide and ranges from 12-feet to 70- feet wide in the survey area. A variety of habitat types including pools, glides, and riffles occur in the APE. The stream has moderate sinuosity and has braided channels in several areas. Water depths range from less than one foot in riffles to five feet in pools. Stream substrates ranged from silt to large cobbles. Upstream of the bridge stream substrates have aggraded and a large gravel bar is evident due to the constriction point of the bridge.

At the time of our site visits, the Waiāhole Stream was flowing near the OHWM (daily mean discharge of 26.9 cubic feet per second (cfs) on June 6, 2017, USGS 16294100 Waiāhole Stream above Kamehameha Highway, Oahu, HI), but local residents report that the stream level fluctuates and can overtop the Waiāhole Bridge (10 feet above MSL) during heavy rains. The range of mean monthly discharge for October 2001 to February 2017 in Waiāhole Stream (USGS gage 16294100) ranged from a high of 205 cfs in March of 2006 to a low of 16.4 cfs in September of 2008.

The riparian vegetation of Waiāhole Stream is dominated by dense elephant grass with a tree stratum consisting of monkeypod and gunpowder trees. The riparian zone is relatively undisturbed downstream of the bridge except for a foot trail and several unauthorized camping sites on the north side. Upstream of

the bridge the County road and leased farmland encroach on the buffer. Waiāhole Stream has one directly associated wetland, i.e., Wetland B just downstream of the bridge.

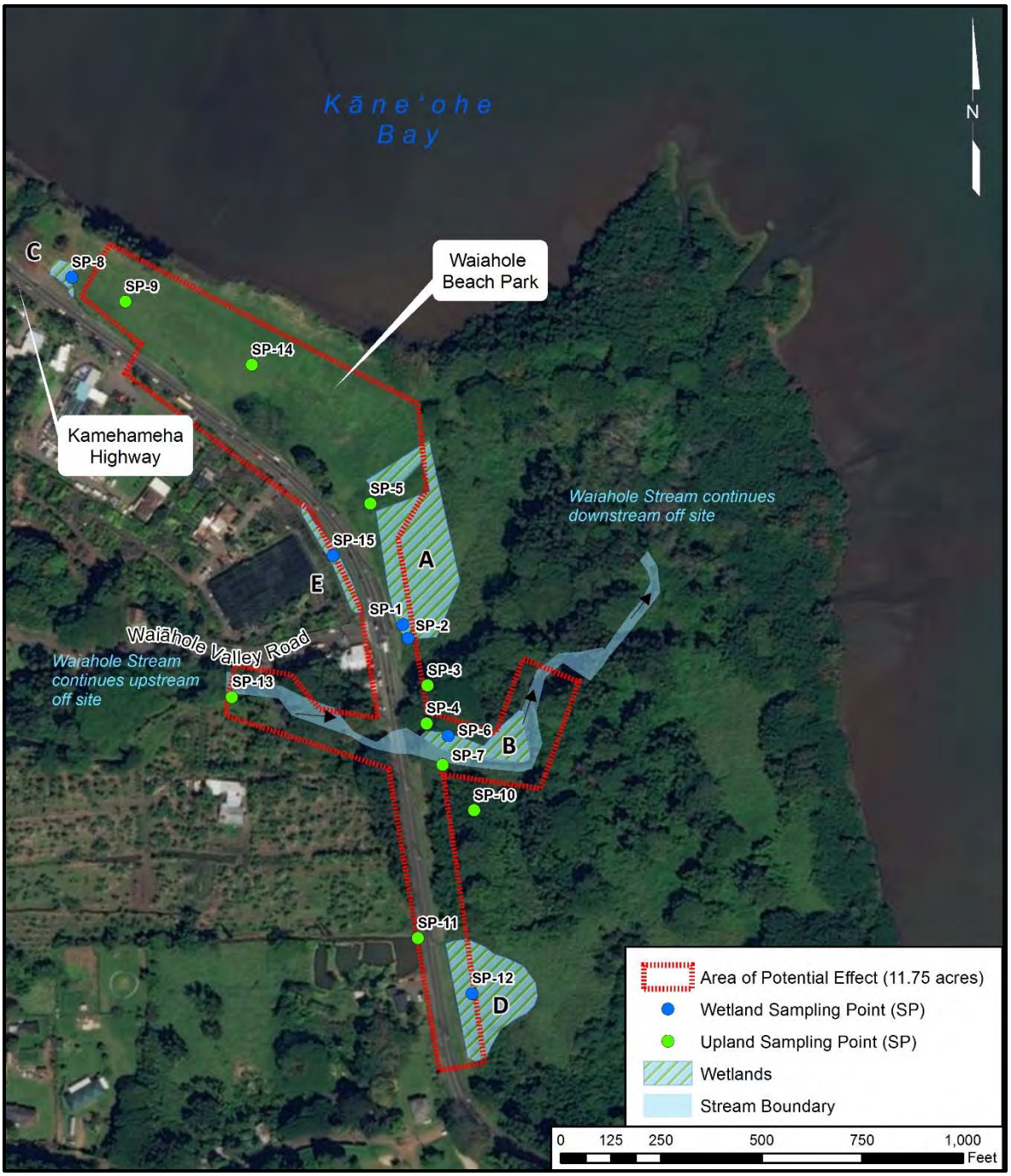

Figure 5 – Wetland delineation results within the Waiāhole Bridge Replacement Project's APE

4.2 Wetland A

Wetland A is a depressional, palustrine emergent wetland (PEM) located within Waiāhole Beach Park (Figure 5). Data collected at sampling point (SP) SP-1 and SP-2 showed that all three wetland indicators

were present (Appendix D). Wetland A is approximately 1.28 acres extending east from Kamehameha Highway.

Wetland A is dominated by para liverseed grass (*Urochloa mutica*) and sour crown grass (*Paspalum conjugatum*). Trees and shrubs were absent from this wetland, likely as a result of mowing activity conducted by the City and County of Honolulu Parks Department. A photo of typical vegetation is included in Table 1.

Soils underlying the vegetation at SP-1 are very dark brown (10 YR 2/2) clay loam to 15 inches and then are depleted (10 YR 3/1) very dark gray silt loam below 15 inches. This qualifies as a hydric soil under indicator A11, depleted below a dark surface. Redox features were observed in both layers in a yellowish red (5 YR 5/8) at 20% occurrence at 0-15 inches and 10% within 15-19+ inches.

Soils underlying the vegetation at SP-2 are very dark brown (10 YR 2/2) clay loam to 16 inches and then are depleted (10 YR 3/1) very dark gray silt loam below 16 inches. This qualifies as a hydric soil under indicator A11, depleted below a dark surface. Redox features were observed in both layers in a yellowish red (5 YR 5/8) at 4% occurrence at 0-16 inches and 15% within 16-20 inches. Saturation was present at a depth of 13 inches.

The hydrogeomorphic classification of the wetland is depressional, with the primary source of water being overland flow and precipitation. A culvert under Kamehameha Highway carries surface water flow from the north side of Waiāhole Valley Road to discharge into Wetland A. Local residents reported during heavy rain events Wetland A has standing water. Wetland A likely reduces flood impacts to Kamehameha Road through storing excess water during heavy rainfall. CCH Parks maintenance personnel reported that this area during the wet season becomes inundated with water and cannot be mowed due to unfavorable soil conditions for lawn equipment.

Table 1 – Wetland A Classification, Characteristics, and Buffer Conditions

Wetland name	Wetland A		
Location	Waiāhole Beach Park		
		**Cowardin classification**	Palustrine emergent
		Hydrogeomorphic classification	Depressional
		Wetland data form(s)	Appendix D, SP-1, SP-2
		Upland data form(s)	Appendix D, SP-3, SP-5
Size of entire wetland	Approximately 1.28 acres.		
Dominant vegetation	Wetland A is a palustrine emergent community dominated by para liverseed grass (Urochloa mutica) and sour crown grass (Paspalum conjugatum).		
Soils	Soils were examined to a 20-inch depth and exhibited hydric characteristics. At SP-1 and SP-2, soils were depleted, 10 YR 2/2, below a dark surface, 10YR 3/1 (hydric soil indicator A11).		
Hydrology	Soils were saturated at 13 inches in SP-2 and contained free water at 19 inches below the surface. The main hydrologic inputs to this wetland include surface runoff from the adjacent area and precipitation. This depressional wetland receives flows from a culvert under Kamehameha Highway.		
Rationale for delineation	All three wetland parameters are met.		
Buffer condition	Buffers surrounding the wetland are mostly disturbed and consist of mowed grasses and the Kamehameha Highway.		

4.3 Wetland B

Wetland B is a riverine, emergent wetland adjacent to the northern bank of Waiāhole Stream and east of Waiāhole Bridge (Figure 5). Data collected at SP-6 showed that all three wetland indicators were present. Wetland B is approximately 0.3 acres extending along the right bank of Waiāhole Stream (Figure 5).

Wetland B is vegetation dominated by elephant grass (*Cenchrus purpureus*). Trees and shrubs were absent from this wetland. Typical vegetation is shown in Table 2.

Soils underlying the vegetation at SP-6 are dark brown (10 YR 3/3) loam to 6 inches and then are depleted (10 YR 3/1) very dark gray silt loam below 6 inches. This qualifies as a hydric soil under indicator A11, depleted below a dark surface.

The primary source of Wetland B hydrology is overbank flooding from Waiāhole Stream. SP-6 indicated a water table 11 inches below the surface and saturation at 6 inches.

Table 2 – Wetland B Classification, Characteristics, and Buffer Conditions

Wetland name	Wetland B
Location	Adjacent to Waiāhole Stream's right bank east of Waiāhole Bridge
	**Cowardin classification**: Riverine emergent **Hydrogeomorphic classification**: Riverine **Wetland data form(s)**: Appendix C, SP-6 **Upland data form(s)**: Appendix C, SP-4
Size of entire wetland	Approximately 0.3 acres.
Dominant vegetation	Wetland B is freshwater emergent riverine wetland dominated by elephant grass (*Cenchrus purpureus*). The shrub and tree stratum was absent.
Soils	Soils were examined to a 16-inch depth and exhibited hydric characteristics. At SP-6, soils were depleted, (10Y/R 3/1, 6-20 inches) below a dark surface, (10 YR 3/3, 0-6 inches). Hydric soil indicator A11.
Hydrology	Soils were saturated at 6 inches below the surface. The main hydrologic inputs to this wetland include Waiāhole Stream, secondary runoff from the adjacent area, and precipitation. Wetland B drains into Waiāhole Stream.
Rationale for delineation	All three wetland parameters are met.
Buffer condition	Buffers of Wetland B are impacted by human disturbance from campers and trails within the buffer.

4.4 Wetland C

Wetland C is a palustrine emergent wetland east of Kamehameha Highway, just north of the northernmost extent of the APE (Figure 5). Wetland C is approximately 0.07 acres within a depressional area.

Wetland C is a depressional wetland dominated by para liverseed grass (Urochloa mutica). Typical vegetation is illustrated in Table 3.

Soils underlying the vegetation at SP-8 are dark brown (7.5 YR 3/2) silty clay to 9 inches and then are depleted (10 YR 2/1) black silt loam below 9 inches. This qualifies as a hydric soil under indicator A11,

depleted below a dark surface. Asphalt and gravel occurred throughout the 0- to 9-inch profile. Dark gray redox features were observed in the layer below 9 inches (10 YR 4/1) at 15% occurrence and dark brown redox features 5% (10 YR 3/3). The water table was present 13 inches below the surface and saturation at 10 inches was noted for SP-8.

The hydrogeomorphic classification of the wetland is depressional, with the primary source of water being overland flow and precipitation.

Table 3 – Wetland C Classification, Characteristics, and Buffer Conditions

Wetland name	Wetland C
Location	East of Kamehameha Highway and northern most extent of APE
	**Cowardin classification**: Palustrine emergent **Hydrogeomorphic classification**: Depressional **Wetland data form(s)**: Appendix C, SP-8 **Upland data form(s)**: Appendix C, SP-9
Size of entire wetland	Approximately 0.07 acres.
Dominant vegetation	Wetland C is a palustrine emergent community dominated by para liverseed grass (Urochloa mutica). One tropical-almond tree (*Terminalia catappa)* was within SP-8.
Soils	Soils were examined to a 21-inch depth and exhibited hydric characteristics. Soils were depleted, 10 YR 2/1, below a dark surface (hydric soil indicator A11).
Hydrology	Soils were saturated at 10 inches in SP-8 and contained free water at 13 inches below the surface. Water level within the pit was measured after 20 minutes and continued to rise. The main hydrologic inputs to this wetland include surface runoff from the adjacent area and precipitation. Positive alpha-alpha-Dipyridyl test.
Rationale for delineation	All three wetland parameters are met.
Buffer condition	Buffers surrounding the wetland are mostly disturbed and consist of mowed grasses and the Kamehameha Highway.

4.5 Wetland D

Wetland D is a depressional, palustrine emergent wetland associated with agricultural runoff west of Kamehameha Highway that discharges into Wetland D through a culvert. The wetland's west boundary is defined by Kamehameha Highway. The north boundary was delineated in the field. The east boundary was

estimated based on vegetation type (monoculture of elephant grass (*Cenchrus purpureus*)) observed in the field and aerial photographs, but was not delineated; however, it extends beyond the APE as shown in Figure 4. The south boundary of Wetland D may also extend beyond the APE limits, but the survey to the south ended at the APE limit. The Wetland D area shown on Figure 4 is 0.81 acres but, as noted, the wetland is likely larger and continues in the south and east directions, beyond what is depicted in Figure 4.

Wetland D is a palustrine emergent wetland dominated by elephant grass (*Cenchrus purpureus*). Trees and shrubs were absent from SP-12. Typical vegetation is shown in Table 4.

Soils underlying the vegetation are very dark gray (10 YR 3/1) clay to 3 inches and then dark grey (10 YR 4/1) below 3 inches. Redox features were observed in pore lings and the soil matrix. This soil qualifies as a hydric soil under indicator F3, depleted matrix (Appendix D).

Although no primary indicators were observed for hydrology there were two secondary indicators: surface soil cracks and geomorphic position. A large portion of Wetland D receives culvert discharge and surface soil cracks were observed at the drainage ditch (Appendix D). A photo of Typical vegetation is included in Table 4.

Table 4 – Wetland D Classification, Characteristics, and Buffer Conditions

Wetland name	Wetland D
Location	East of Kamehameha Highway
	**Cowardin classification**: Palustrine emergent **Hydrogeomorphic classification**: Depressional **Wetland data form(s)**: Appendix D, SP-12 **Upland data form(s)**: Appendix D, SP-11
Size of entire wetland	Approximately 0.81 acres.
Dominant vegetation	Wetland D is palustrine emergent wetland dominated by elephant grass (*Cenchrus purpureus*). Trees and shrubs were absent.
Soils	Soils were examined to a 17-inch depth and exhibited hydric characteristics. At SP-12, clay soils were observed to have a depleted matrix, 10YR 3/1 and 10 YR 4/1 with redox features (hydric soil indicator F3).
Hydrology	Although no primary indicators were observed for hydrology there were two secondary indicators: surface soil cracks and geomorphic position.
Rationale for delineation	All three wetland parameters are met.
Buffer condition	The wetland buffer is impacted by Kamehameha Highway. Trees create a buffer on the northern and southern boundaries of Wetland D. The primary vegetation within the upland area (SP-11) is broad-leaf carpet grass (*Axonopus compressus*).

4.6 Wetland E

Wetland E is a depressional, palustrine emergent wetland west of Kamehameha Highway (Figure 5). Wetland E is approximately 0.14 acres extending north and south along Kamehameha Highway, north of Waiāhole Valley Road.

Wetland E vegetation consists of broad-leaf carpet grass (*Axonopus compressus*) and *Paspalum sp*. One shaving bush tree (*Pseudobombax cf. ellipticum*) was within the sampling plot and shrubs were absent. Typical vegetation is shown in Table 5.

Soils underlying the vegetation at SP-15 are very dark gray (10 YR 3/1) silty clay to 18 inches with redox features changing below 9 inches. This qualifies as a hydric soil under indicator F6, redox dark surface.

The hydrogeomorphic classification of the wetland is depressional, with the primary source of water being overland flow and precipitation. Culverts are present at both the north (Kamehameha Highway) and south (Waiāhole Valley Road) ends of this wetland.

Table 5 – Wetland E Classification, Characteristics, and Buffer Conditions

Wetland name	Wetland E
Location	West of Kamehameha Highway

Cowardin classification	Palustrine emergent
Hydrogeomorphic classification	Depressional
Wetland data form(s)	Appendix D, SP-15
Upland data form(s)	Appendix D, SP-5

Size of entire wetland	Approximately 0.14 acres.
Dominant vegetation	Wetland E is a palustrine emergent community consisting of broad-leaf carpet grass (*Axonopus compressus*) and Paspalum sp.
Soils	Soils were examined to an 18-inch depth and exhibited hydric characteristics of depleted matrix (F3).
Hydrology	This depressional wetland receives outflows from a culvert under Waiāhole Valley Road. Oxidized rhizospheres were observed within the soil profile (hydrology indicator C3).
Rationale for delineation	All three wetland parameters are met.
Buffer condition	Buffers surrounding the wetland are mostly disturbed and consist of mowed grasses and the Kamehameha Highway.

5.0 IMPACT ASSESSMENT

The proposed project will impact Waiāhole Stream and Wetland A. Waiāhole Stream will be impacted during removal of the existing bridge and by widening the streambanks near the bridge to increase stream channel capacity (Appendix E Impacts Graphic). Best management practices will be implemented to minimize the temporary construction impacts. Widening of the streambanks will permanently impact 2,460 square feet of streambank and remove 437 cubic yards of streambank material. Although these streambank impacts are permanent, they are anticipated to be beneficial and allow more natural hydrologic and sediment processes within the stream to occur. We contend that the permanent impacts to the stream are self-mitigating and beneficial in the long term.

Impacts to Wetland A will be temporary and result from the construction of the temporary bypass road at the west boundary of the wetland. Wetland A impacts include 12,694 square feet (0.29 acres) and 1,563 cubic yards of fill to support the temporary bypass road (Appendix E Impacts Graphic). The temporarily impacted area is negligible compared to the overall size of the wetland (1.28 acres) and will not significantly reduce hydraulic storage. Existing vegetation is degraded (regularly mowed grasses) and provides very little habitat value. No threatened or endangered species are expected to inhabit Wetland A. Therefore, temporary impacts are insignificant and will not degrade Wetland A functions and values.

The bypass road fill will be removed from Wetland A and vegetation will be restored when the project is complete. A mitigation plan will be developed to compensate for temporary impacts to Wetland A from construction. The mitigation plan will include a planting plan with species, counts, and locations of plantings. It will also include a monitoring plan with performance standards and contingency planning.

6.0 REFERENCES

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APPENDIX A
Project Area Photographs

Photograph 1. Waiāhole Stream from upstream of bridge.

Photograph 2. Bridge and pedestrian deck.

Photograph 3. Waiāhole Stream under the bridge.

Photograph 4. Waiāhole Stream from downstream of bridge. Wetland B on the right.

APPENDIX B
Custom Soil Report for Waiāhole Project Area

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Island of Oahu, Hawaii

Waiahole Project Area

August 25, 2017

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Island of Oahu, Hawaii
Survey Area Data: Version 11, Sep 22, 2016

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 31, 2009—Aug 14, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Island of Oahu, Hawaii (HI990)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
AeE	Alaeloa silty clay, older substrate, 15 to 35 percent slopes, MLRA 167	1.0	0.8%
HnA	Hanalei silty clay, 0 to 2 percent slopes, MLRA 167	17.4	14.3%
MZ	Marsh	8.4	6.9%
Ph	Pearl Harbor clay	67.8	55.8%
WpB	Waikane silty clay, 3 to 8 percent slopes	5.5	4.6%
Totals for Area of Interest		**121.6**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Island of Oahu, Hawaii

AeE—Alaeloa silty clay, older substrate, 15 to 35 percent slopes, MLRA 167

Map Unit Setting

National map unit symbol: 2v0q1
Elevation: 100 to 1,500 feet
Mean annual precipitation: 35 to 60 inches
Mean annual air temperature: 70 to 75 degrees F
Frost-free period: 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Alaeloa, older substrate, and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Alaeloa, Older Substrate

Setting

Landform: Mountains
Landform position (two-dimensional): Backslope, toeslope
Landform position (three-dimensional): Lower third of mountainflank, interfluve
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Parent material: Residuum weathered from basalt

Typical profile

Ap - 0 to 10 inches: silty clay
Bt1 - 10 to 18 inches: silty clay
Bt2 - 18 to 29 inches: silty clay
Bt3 - 29 to 48 inches: silty clay
Bt4 - 48 to 58 inches: silty clay
C - 58 to 70 inches: stony silty clay

Properties and qualities

Slope: 15 to 35 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 7.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Hydric soil rating: No

HnA—Hanalei silty clay, 0 to 2 percent slopes, MLRA 167

Map Unit Setting

National map unit symbol: 2w02x
Elevation: 0 to 300 feet
Mean annual precipitation: 20 to 120 inches
Mean annual air temperature: 72 to 73 degrees F
Frost-free period: 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Hanalei and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hanalei

Setting

Landform: Flood plains on valley floors
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear
Across-slope shape: Linear, concave
Parent material: Alluvium derived from basalt

Typical profile

Apg - 0 to 6 inches: silty clay
Ag1 - 6 to 10 inches: silty clay
Ag2 - 10 to 13 inches: silty clay
Bg1 - 13 to 18 inches: silty clay loam
Bg2 - 18 to 26 inches: silty clay loam
Cg - 26 to 36 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: About 24 to 60 inches
Frequency of flooding: Frequent
Frequency of ponding: Occasional
Sodium adsorption ratio, maximum in profile: 5.0
Available water storage in profile: Moderate (about 6.7 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Ecological site: Volcanic Ash Forest (F164XY500HI)

Hydric soil rating: No

Minor Components

Hanalei, ponded

Percent of map unit: 15 percent
Landform: Flood plains on valley floors
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Linear
Across-slope shape: Linear, concave
Ecological site: Volcanic Ash Forest (F164XY500HI)
Hydric soil rating: Yes

MZ—Marsh

Map Unit Setting

National map unit symbol: hqgn
Elevation: 0 to 800 feet
Mean annual precipitation: 12 to 150 inches
Mean annual air temperature: 72 to 75 degrees F
Frost-free period: 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Marsh and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Marsh

Setting

Landform: Marshes
Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Organic

Typical profile

O1 - 0 to 10 inches: mucky peat
O2 - 10 to 60 inches: mucky peat

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent

Salinity, maximum in profile: Nonsaline to strongly saline (0.0 to 16.0 mmhos/cm)
Available water storage in profile: Very high (about 16.2 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8w
Hydrologic Soil Group: A/D
Hydric soil rating: Yes

Ph—Pearl Harbor clay

Map Unit Setting
National map unit symbol: hqhv
Elevation: 0 to 10 feet
Mean annual precipitation: 18 to 40 inches
Mean annual air temperature: 72 to 73 degrees F
Frost-free period: 365 days
Farmland classification: Not prime farmland

Map Unit Composition
Pearl harbor and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pearl Harbor

Setting
Landform: Coastal plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Alluvium

Typical profile
H1 - 0 to 12 inches: clay
H2 - 12 to 31 inches: clay
H3 - 31 to 48 inches: muck

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 18 to 48 inches
Frequency of flooding: Occasional
Frequency of ponding: Frequent
Available water storage in profile: Moderate (about 6.3 inches)

Interpretive groups
Land capability classification (irrigated): 4w

Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Inclusion
Percent of map unit: 20 percent
Landform: Coastal plains
Hydric soil rating: Yes

WpB—Waikane silty clay, 3 to 8 percent slopes

Map Unit Setting
National map unit symbol: hqjk
Elevation: 50 to 1,000 feet
Mean annual precipitation: 70 to 100 inches
Mean annual air temperature: 72 degrees F
Frost-free period: 365 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition
Waikane and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Waikane

Setting
Landform: Alluvial fans
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, rise
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Alluvium

Typical profile
H1 - 0 to 8 inches: silty clay
H2 - 8 to 60 inches: silty clay

Properties and qualities
Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Hydric soil rating: No

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APPENDIX C
Arborist Report

Steve Nimz and Associates Inc.
Consulting Arborist Services
PO BOX 10026 Honolulu, Hawaii 96816
Office # (808) 734-5963 Fax # (808) 732-4433
Email: Steve@stevenimz.com

May 31, 2016

Mike Hunnemann
Kai Hawaii
50 S. Beretania Street # C-119C
Honolulu, Hawaii 96813

Re: Waiahole Bridge

Dear Mr. Hunnemann:

The following comments address vegetation impacted by the new by-pass bridge to be installed on the Makai side of the existing Waiahole Bridge.

No native or endangered trees or plants were identified during my site inspection.

One (1) eight-inch diameter, twenty-five foot tall Monkeypod tree may require removal. The tree is a volunteer planting on the edge of the stream.

If you have any questions, please contact my office at 808-734-5963.

Respectfully yours,

Steve Nimz,
ASCA Consulting Arborist
ISA Certified Arborist # WE- 0314AM
ISA PNW Certified Tree Risk Assessor # 419

APPENDIX D
Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM – Hawai'i and Pacific Islands

Project/Site: Waiahole Bridge Replacement City: Waiahole Sampling Date: 5 June 17 Time: 1600

Applicant/Owner: Hawaii Department of Transportation State/Terr.: HI Island: Oahu Sampling Point: SP1

Investigator(s): Jim Shannon & Jessica Woo TMK/Parcel: 48002001

Landform (hillslope, coastal plain, etc.): coastal plain Local relief (concave, convex, none): none

Lat: 21°28'56.19"N Long: 157°50'41.51"W Datum: WGS84 Slope (%): 0

Soil Map Unit Name: Ph, Pearl Harbor clay - listed on Hydric Soils 2015 NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

On edge of mowed area adjacent to a road. Lawn is mowed on a regular basis. Local residents confirmed flooding of this area during rain events. Delineation was conducted in dry season, but precipitation was normal for dry season; rain gauge data <0.1". http://www.prh.noaa.gov/hnl/hydro/pages/jun17sum.php

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 20' Radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 10' Radius)			
1. None			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5' Radius)			
1. Urochloa mutica	75	Y	FACW
2. Axonopus compressus	25	Y	FAC
3.			
4.			
5.			
6.			
7.			
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 5' Radius)			
1. None			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SP1 on edge of mowed access area, but all plants could be identified. Near toe of highway road prism. All emergents.

SOIL

Sampling Point: SP1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-15	10YR 2/2	80	5YR 5/8	20	C	PL	Clay/Loam	
15-19+	10YR 3/1	90	5YR 5/8	10	C	PL	Silt/Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Muck Presence (A8)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Dark Surface (S7)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Stratified Layers (A5)
- ___ Sandy Mucky Mineral (S1)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Tilapia Nests (B17)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Fiddler Crab Burrows (C10) (Guam, CNMI, and American Samoa)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): None

Water Table Present? Yes _____ No _____ Depth (inches): >19"

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): >19"

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Hawai'i and Pacific Islands

Project/Site: Waiahole Bridge Replacement City: Waiahole Sampling Date: 6 June 17 Time: 900

Applicant/Owner: Hawaii Department of Transportation State/Terr.: HI Island: Oahu Sampling Point: SP2

Investigator(s): Jim Shannon & Jessica Woo TMK/Parcel: 48002001

Landform (hillslope, coastal plain, etc.): coastal plain Local relief (concave, convex, none): concave

Lat: 21°28'55.86"N Long: 157°50'41.25"W Datum: WGS84 Slope (%): <1

Soil Map Unit Name: Ph, Pearl Harbor clay- listed on Hydric Soils 2015 NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

Delineation was conducted in dry season, but precipitation was normal for dry season; rain gauge data <0.1". http://www.prh.noaa.gov/hnl/hydro/pages/jun17sum.php

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 20' Radius)			
1. None			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 10' Radius)			
1. None			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5' Radius)			
1. Urochloa mutica	25	Y	FACW
2. Paspalum conjugatum	35	Y	FAC
3. Axonopus compressus	20	Y	FAC
4. Cyperus polystachyos	20	Y	FACW
5.			
6.			
7.			
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 5' Radius)			
1. None			
2.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SP2 on edge in a slight depression. Toe of road on west edge. All grasses and emergents.

SOIL

Sampling Point: SP2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 2/2	96	5YR 5/8	4	C	M	Clay/Loam	
16-20	10YR 3/1	85	5YR 5/8	15	C	M	Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Muck Presence (A8)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Dark Surface (S7)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Stratified Layers (A5)
- ___ Sandy Mucky Mineral (S1)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3) at 13"
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Tilapia Nests (B17)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Fiddler Crab Burrows (C10) (Guam, CNMI, and American Samoa)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): None

Water Table Present? Yes X No _____ Depth (inches): 19"

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): 13"

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Rock layer at 13" and rocks are glistening.

WETLAND DETERMINATION DATA FORM – Hawai'i and Pacific Islands

Project/Site: Waiahole Bridge Replacement City: Waiahole Sampling Date: 6 June 17 Time: 1030

Applicant/Owner: Hawaii Department of Transportation State/Terr.: HI Island: Oahu Sampling Point: SP3

Investigator(s): Jim Shannon & Jessica Woo TMK/Parcel: 48002001

Landform (hillslope, coastal plain, etc.): coastal plain Local relief (concave, convex, none): none

Lat: 21°28'54.69"N Long: 157°50'40.95"W Datum: WGS84 Slope (%): 0

Soil Map Unit Name: Ph, Pearl Harbor clay - listed on Hydric Soils 2015 NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

Under tree canopy approximately 100 feet from the stream. Delineation was conducted in dry season, but precipitation was normal for dry season; rain gauge data <0.1". http://www.prh.noaa.gov/hnl/hydro/pages/jun17sum.php

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 20' Radius)			
1. Spathodea campanulata	10	Y	FACU
2.			
3.			
4.			
5.			
	10	= Total Cover	
Sapling/Shrub Stratum (Plot size: 10' Radius)			
1. Alocasia macrorrhizos	25	Y	FAC
2. Citharexylum spinosum	10	Y	FAC
3. Pandanus tectorius	5	N	FAC
4. Xanthosoma roseum	5	N	FAC
5.			
	45	= Total Cover	
Herb Stratum (Plot size: 5' Radius)			
1. Urochloa mutica	15	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	15	= Total Cover	
Woody Vine Stratum (Plot size: 10' Radius)			
1. Ipomoea alba	25	Y	FAC
2.			
	25	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SOIL

Sampling Point: SP3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-20	10YR 3/2	100	none				silty clay/loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Muck Presence (A8)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Dark Surface (S7)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Stratified Layers (A5)
- ___ Sandy Mucky Mineral (S1)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Soil brown. Soil dry and no water present.

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3) at 13"
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Tilapia Nests (B17)
- ___ Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Fiddler Crab Burrows (C10) (Guam, CNMI, and American Samoa)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): None

Water Table Present? Yes _____ No X Depth (inches): >20"

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): >20"

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Hawai'i and Pacific Islands

Project/Site: Waiahole Bridge Replacement City: Waiahole Sampling Date: 6 June 17 Time: 1110

Applicant/Owner: Hawaii Department of Transportation State/Terr.: HI Island: Oahu Sampling Point: SP4

Investigator(s): Jim Shannon & Jessica Woo TMK/Parcel: 48002001

Landform (hillslope, coastal plain, etc.): coastal plain Local relief (concave, convex, none): None

Lat: 21°28'54.04"N Long: 157°50'41.00"W Datum: WGS84 Slope (%): 0

Soil Map Unit Name: Ph, Pearl Harbor clay - listed on Hydric Soils 2015 NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

Data plot is approximately 5 feet above stream water surface elevation on top of bank. Delineation was conducted in dry season, but precipitation was normal for dry season; rain gauge data <0.1". http://www.prh.noaa.gov/hnl/hydro/pages/jun17sum.php

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 20' Radius)			
1. Pithecellobium dulce	65	Y	FAC
2.			
3.			
4.			
5.			
	65	= Total Cover	
Sapling/Shrub Stratum (Plot size: 10' Radius)			
1. Alocasia macrorrhizos	5	Y	FAC
2.			
3.			
4.			
5.			
	5	= Total Cover	
Herb Stratum (Plot size: 5' Radius)			
1. Cenchrus purpureus (syn: Pennisetum purpureum)	75	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	75	= Total Cover	
Woody Vine Stratum (Plot size: 10' Radius)			
1. Mucuna gigantea	15	Y	FACU
2.			
	15	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

Near trail by stream, ~25 bare ground in herb layer.

SOIL

Sampling Point: SP4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-20	10YR 3/3	100	none					

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Muck Presence (A8)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Dark Surface (S7)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Stratified Layers (A5)
- ___ Sandy Mucky Mineral (S1)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Top of bank above stream.

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3) at 13"
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Tilapia Nests (B17)
- ___ Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Fiddler Crab Burrows (C10) (Guam, CNMI, and American Samoa)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): None

Water Table Present? Yes _____ No X Depth (inches): >20"

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): >20"

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Hawai'i and Pacific Islands

Project/Site: Waiahole Bridge Replacement City: Waiahole Sampling Date: 7 June 17 Time: 0825

Applicant/Owner: Hawaii Department of Transportation State/Terr.: HI Island: Oahu Sampling Point: SP5

Investigator(s): Jim Shannon & Jessica Woo TMK/Parcel: 48002001

Landform (hillslope, coastal plain, etc.): coastal plain Local relief (concave, convex, none): convex

Lat: 21°28'58.87"N Long: 157°50'42.51"W Datum: WGS84 Slope (%): 1

Soil Map Unit Name: Ph, Pearl Harbor clay - listed on Hydric Soils 2015 NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No _____ (If no, explain in Remarks.)

Are Vegetation Yes, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes _____ No X	

Remarks:

Mowed grass area on a hummock between wetland A. Lawn is mowed on a regular basis. No hydrology indicators. Delineation was conducted in dry season, but precipitation was normal for dry season; rain gauge data <0.1". http://www.prh.noaa.gov/hnl/hydro/pages/jun17sum.php

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 20' Radius)			
1. None			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 10' Radius)			
1. None			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5' Radius)			
1. Axonopus compressus	90	Y	FAC
2. Megathyrsus maximus	8	N	FAC
3. Indigofera hendecaphylla	2	N	FAC
4.			
5.			
6.			
7.			
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 10' Radius)			
1. None			
2.			
	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species _____	x 1 =	_____
FACW species _____	x 2 =	_____
FAC species _____	x 3 =	_____
FACU species _____	x 4 =	_____
UPL species _____	x 5 =	_____
Column Totals: _____ (A)		_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

Recently mowed but all plants could be identified.

SOIL

Sampling Point: SP5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 2/2	100					silty clay	no redox features
6-15	10YR 3/1	85	5YR 4/6	15	C	M	clay	
15+	10YR 4/2	95	5YR 4/6	5	C	M	silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Muck Presence (A8)
X Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Dark Surface (S7)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ Stratified Layers (A5)
___ Sandy Mucky Mineral (S1)
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

Dry.

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ Tilapia Nests (B17)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Fiddler Crab Burrows (C10) (Guam, CNMI, and American Samoa)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Salt Deposits (C5)
___ Stunted or Stressed Plants (D1)
X Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): None
Water Table Present? Yes _____ No X Depth (inches): >15"
Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): >15"

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No primary indicators, no oxidized roots.

WETLAND DETERMINATION DATA FORM – Hawai'i and Pacific Islands

Project/Site: Waiahole Bridge Replacement City: Waiahole Sampling Date: 7 June 17 Time: 1030

Applicant/Owner: Hawaii Department of Transportation State/Terr.: HI Island: Oahu Sampling Point: SP6

Investigator(s): Jim Shannon & Jessica Woo TMK/Parcel: 48002001

Landform (hillslope, coastal plain, etc.): Coastal plain Local relief (concave, convex, none): None

Lat: 21°28'53.47"N Long: 157°50'40.01"W Datum: WGS84 Slope (%): 0

Soil Map Unit Name: Ph, Pearl Harbor clay - listed on Hydric Soils 2015 NWI classification: Riverine-Freshwater emergent

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? no Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

Adjacent to Waiahole Stream. Delineation was conducted in dry season, but precipitation was normal for dry season; rain gauge data <0.1". http://www.prh.noaa.gov/hnl/hydro/pages/jun17sum.php

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 20' Radius)			
1. None			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 10' Radius)			
1. None			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5' Radius)			
1. Cenchrus purpureus (syn: Pennisetum purpureum)	95	Y	FAC
2. Costus woodsonii	1	N	FACU
3.			
4.			
5.			
6.			
7.			
8.			
	96 = Total Cover		
Woody Vine Stratum (Plot size: 10' Radius)			
1. Mucuna gigantea	3	Y	FACU
2.			
	3 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	95	x 3 =	285
FACU species	4	x 4 =	16
UPL species	0	x 5 =	0
Column Totals:	101 (A)		301 (B)

Prevalence Index = B/A = 2.98

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

Costus woodsonii less than 1 meter high.

SOIL

Sampling Point: SP6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/3	100	none				loam	some gravel <1mm
6-20	10YR 3/1	100	none				silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Muck Presence (A8)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Dark Surface (S7)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Stratified Layers (A5)
- ___ Sandy Mucky Mineral (S1)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Tilapia Nests (B17)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Fiddler Crab Burrows (C10) (Guam, CNMI, and American Samoa)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): None

Water Table Present? Yes X No ___ Depth (inches): 11"

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 6"

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Hawai'i and Pacific Islands

Project/Site: Waiahole Bridge Replace City: Waiahole Sampling Date: 7 June 17 Time: 1515

Applicant/Owner: Hawaii Department of Transportation State/Terr.: HI Island: Oahu Sampling Point: SP7

Investigator(s): Jim Shannon & Jessica Woo TMK/Parcel: 48001010

Landform (hillslope, coastal plain, etc.): coastal plain Local relief (concave, convex, none): None

Lat: 21°28'52.95"N Long: 157°50'40.70"W Datum: WGS84 Slope (%): 0

Soil Map Unit Name: Ph, Pearl Harbor clay - listed on Hydric Soils 2015 NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

Adjacent to Waiahole Stream on top of bank approximately 5 feet above stream water surface. Delineation was conducted in dry season, but precipitation was normal for dry season; rain gauge data <0.1". http://www.prh.noaa.gov/hnl/hydro/pages/jun17sum.php

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 20' Radius)			
1. Trema orientalis	20	Y	FACU
2.			
3.			
4.			
5.			
	20	= Total Cover	
Sapling/Shrub Stratum (Plot size: 10' Radius)			
1. Alocasia cucullata	10	Y	FACU
2. Xanthosoma roseum	10	Y	FAC
3.			
4.			
5.			
	20	= Total Cover	
Herb Stratum (Plot size: 5' Radius)			
1. Cenchrus purpureus (syn: Pennisetum purpureum)	80	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	80	= Total Cover	
Woody Vine Stratum (Plot size: 10' Radius)			
1. Ipomoea alba	2	N	FAC
2. Mucuna gigantea	50	Y	FACU
	52	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	92	x 3 =	276
FACU species	80	x 4 =	320
UPL species	0	x 5 =	0
Column Totals:	172 (A)		596 (B)

Prevalence Index = B/A = 3.47

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks:

SOIL

Sampling Point: SP7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-19	10YR 3/3	100	none				silty loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Muck Presence (A8)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Dark Surface (S7)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Stratified Layers (A5)
- ___ Sandy Mucky Mineral (S1)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3) at 13"
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Tilapia Nests (B17)
- ___ Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Fiddler Crab Burrows (C10) (Guam, CNMI, and American Samoa)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): None

Water Table Present? Yes _____ No X Depth (inches): >19"

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): >19"

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Dry.

WETLAND DETERMINATION DATA FORM – Hawai'i and Pacific Islands

Project/Site: Waiahole Bridge Replacement City: Waiahole Sampling Date: 21 Aug 17 Time: 0852

Applicant/Owner: Hawaii Department of Transportation State/Terr.: HI Island: Oahu Sampling Point: SP8

Investigator(s): Jessica Woo, Susan Burr, and Bryson Luke TMK/Parcel: 48002012

Landform (hillslope, coastal plain, etc.): coastal plain Local relief (concave, convex, none): concave

Lat: 21.484448057 Long: -157.847119597 Datum: WGS84 Slope (%): <1

Soil Map Unit Name: Hanalei silty clay, 0 to 2 percent slopes, MLRA 167 - listed on Hydric Soils 2015 NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil Yes, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

Road barrier to mauka of boundary. Gravel in soil profile may be from road work or fill. Depression and California grass within wetland. Delineation was conducted in dry season, but precipitation was normal for dry season; rain gauge data .1" http://www.prh.noaa.gov/hnl/hydro/pages/aug17sum.php

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 20' Radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Terminalia catappa	25	Y	FAC
2.			
3.			
4.			
5.			
	25 = Total Cover		
Sapling/Shrub Stratum (Plot size: 3' Radius)			
1. None			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 3' Radius)			
1. Urochloa mutica	90	Y	FACW
2. Sphagneticola trilobata	8	N	FAC
3. Ludwigia octovalvis	2	N	OBL
4.			
5.			
6.			
7.			
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 20' Radius)			
1. Mimosa pudica	5	Y	FACU
2.			
	5 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SOIL

Sampling Point: SP8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-9	7.5 YR 3/2	100	None				Silty Clay	40% gravel
9-21	10 YR 2/1	80	10 YR 4/1	15	D	M	Sandy Clay	
			10 YR 3/3	5	C	PL & M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Muck Presence (A8)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Dark Surface (S7)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Stratified Layers (A5)
- ___ Sandy Mucky Mineral (S1)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks:

Asphalt & gravel throughout the 0-9" profile. 21" depth pit.

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Tilapia Nests (B17)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- X Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Fiddler Crab Burrows (C10) (Guam, CNMI, and American Samoa)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- X Dry-Season Water Table (C2)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): None

Water Table Present? Yes X No ____ Depth (inches): 13"

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 10"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Swale opposite of Kamehameha Highway. Pit is located in a low area that appears to drain to the ocean. Grass is unmowed in this area and mowed in surrounding areas.

Positive alpha-alpha-Dipyridyl test.

Water level within the pit was measured after 20 minutes and continued to rise.

WETLAND DETERMINATION DATA FORM – Hawai'i and Pacific Islands

Project/Site: Waiahole Bridge Replacement City: Waiahole Sampling Date: 21 Aug 17 Time: 0910

Applicant/Owner: Hawaii Department of Transportation State/Terr.: HI Island: Oahu Sampling Point: SP9

Investigator(s): Jessica Woo, Susan Burr, and Bryson Luke TMK/Parcel: 48002001

Landform (hillslope, coastal plain, etc.): coastal plain Local relief (concave, convex, none): none

Lat: 21.484295594 Long: -157.846754118 Datum: WGS84 Slope (%): 0

Soil Map Unit Name: Hanalei silty clay, 0 to 2 percent slopes, MLRA 167- listed on Hydric Soils 2015 NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation Yes, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____ No X	
Wetland Hydrology Present?	Yes _____ No X	

Remarks:

Lawn is mowed regularly. Delineation was conducted in dry season, but precipitation was normal for dry season; rain gauge data 0.1".
http://www.prh.noaa.gov/hnl/hydro/pages/aug17sum.php

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 20' Radius)			
1. None			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 3' Radius)			
1. None			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 3' Radius)			
1. Urochloa mutica	20	Y	FACW
2. Sphagneticola trilobata	40	Y	FAC
3. Axonopus compressus	20	Y	FAC
4. Indigofera hendecaphylla	20	Y	FAC
5. Paspalum conjugatum	2	N	FAC
6.			
7.			
8.			
	102 = Total Cover		
Woody Vine Stratum (Plot size: 20' Radius)			
1. Mimosa pudica	10	Y	FACU
2.			
	10 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species _____	x 1 =	_____
FACW species _____	x 2 =	_____
FAC species _____	x 3 =	_____
FACU species _____	x 4 =	_____
UPL species _____	x 5 =	_____
Column Totals: _____ (A)		_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

Recently mowed, but all plants could be identified.

SOIL

Sampling Point: SP9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-14	10 YR 4/3	100	None				Clay Loam	30% gravel

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Muck Presence (A8)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Dark Surface (S7)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Stratified Layers (A5)
- ___ Sandy Mucky Mineral (S1)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Tilapia Nests (B17)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Fiddler Crab Burrows (C10) (Guam, CNMI, and American Samoa)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): None

Water Table Present? Yes X No _____ Depth (inches): >14"

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): >14"

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Hawai'i and Pacific Islands

Project/Site: Waiahole Bridge Replacement City: Waiahole Sampling Date: 21 Aug 17 Time: 1112

Applicant/Owner: Hawaii Department of Transportation State/Terr.: HI Island: Oahu Sampling Point: SP10

Investigator(s): Jessica Woo, Susan Burr, and Bryson Luke TMK/Parcel: 48001010

Landform (hillslope, coastal plain, etc.): Coastal Plain Local relief (concave, convex, none): none

Lat: 21.481074001 Long: -157.844381825 Datum: WGS84 Slope (%): 0

Soil Map Unit Name: Ph, Pearl Harbor clay- listed on Hydric Soils 2015 NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

Forest adjacent to DP-7. Delineation was conducted in dry season, but precipitation was normal for dry season; rain gauge data 0.1".
http://www.prh.noaa.gov/hnl/hydro/pages/aug17sum.php

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 20' Radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Trema orientalis	40	Y	FACU
2. Leucaena leucocephala	20	Y	UPL
3.			
4.			
5.			
	60	= Total Cover	
Sapling/Shrub Stratum (Plot size: 3' Radius)			
1. Taliparitiliaceum*	2	N	FACW
2. Citharexylum caudatum*	2	N	UPL
3. *Lumped with Woody Vine Stratum total <5			
4.			
5.			
	4	= Total Cover	
Herb Stratum (Plot size: 3' Radius)			
1. Oplismenus hirtellus	85	Y	FAC
2. Ipomoea triloba	3	N	FAC
3.			
4.			
5.			
6.			
7.			
8.			
	88	= Total Cover	
Woody Vine Stratum (Plot size: 20' Radius)			
1. Paederia foetida	2	N	UPL
2. Mucuna gigantea	50	Y	FACU
	56	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	2	x 2 =	4
FAC species	88	x 3 =	264
FACU species	90	x 4 =	360
UPL species	24	x 5 =	120
Column Totals:	204 (A)		748 (B)

Prevalence Index = B/A = 3.667

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks:

SOIL

Sampling Point: SP10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-22"	5YR 3/1	100	None				Silty Clay	One layer

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Muck Presence (A8)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Dark Surface (S7)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Stratified Layers (A5)
- ___ Sandy Mucky Mineral (S1)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Tilapia Nests (B17)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Fiddler Crab Burrows (C10) (Guam, CNMI, and American Samoa)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): None

Water Table Present? Yes _____ No X Depth (inches): >22"

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): >22"

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Aerial imagery has dense tree canopy.

Remarks:

Negative alpha, alpha-dipyridyl reaction.

Forest adjacent to elephant grass.

WETLAND DETERMINATION DATA FORM – Hawai'i and Pacific Islands

Project/Site: Waiahole Bridge Replacement City: Waiahole Sampling Date: 21 Aug 17 Time: 1155

Applicant/Owner: Hawaii Department of Transportation State/Terr.: HI Island: Oahu Sampling Point: SP11

Investigator(s): Jessica Woo, Susan Burr, and Bryson Luke TMK/Parcel: 48008024

Landform (hillslope, coastal plain, etc.): coastal plain Local relief (concave, convex, none): convex

Lat: 21.480263608 Long: -157.844763959 Datum: WGS84 Slope (%): 1%

Soil Map Unit Name: Pearl Harbor clay- listed on Hydric Soils 2015 NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No _____ (If no, explain in Remarks.)

Are Vegetation Yes, Soil Yes, or Hydrology Yes significantly disturbed? Are "Normal Circumstances" present? Yes _____ No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

Pit located on roadside, vegetation recently mowed. Taro ponds located mauka. Pit representative of APE Mauka of Kamehameha Highway. Delineation was conducted in dry season, but precipitation was normal for dry season; rain gauge data 0.1". http://www.prh.noaa.gov/hnl/hydro/pages/aug17sum.php

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 20' Radius)			
1. None			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 5' Radius)			
1. None			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 3' Radius)			
1. Axonopus compressus	90	Y	FAC
2. Indigofera hendecaphylla	2	N	FAC
3. Paspalum conjugatum	2	N	FAC
4. Megathyrsus maximus	5	N	FAC
5. Desmodium incanum	1	N	FACU
6. Paederia foetida*	2	N	UPL
7.			
8.			
	102 = Total Cover		
Woody Vine Stratum (Plot size: 20' Radius)			
1. Moved to Herb <5% cover*			
2.			
	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SOIL

Sampling Point: SP11

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-17"	10 YR 3/3	90					Silty Clay	Roadside gravel present
	10 YR 3/1	4						Coke can in soil profile at 12" depth
	5 YR 3/4	3						
	7.5 YR 4/6	3						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Muck Presence (A8)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Dark Surface (S7)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Stratified Layers (A5)
- ___ Sandy Mucky Mineral (S1)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Colors are not redox features.

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Tilapia Nests (B17)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Fiddler Crab Burrows (C10) (Guam, CNMI, and American Samoa)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): None

Water Table Present? Yes _____ No X Depth (inches): >17"

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): >17"

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Negative alpha, alpha-dipyridyl reaction.

WETLAND DETERMINATION DATA FORM – Hawai'i and Pacific Islands

Project/Site: Waiahole Bridge Replacement City: Waiahole Sampling Date: 21 Aug 17 Time: 1242

Applicant/Owner: Hawaii Department of Transportation State/Terr.: HI Island: Oahu Sampling Point: SP12

Investigator(s): Jessica Woo, Susan Burr, and Bryson Luke TMK/Parcel: 48001010

Landform (hillslope, coastal plain, etc.): floodplain Local relief (concave, convex, none): None

Lat: 21.479912907 Long: -157.844394618 Datum: WGS84 Slope (%): 0%

Soil Map Unit Name: Pearl Harbor clay- listed on Hydric Soils 2015 NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** **Yes** X **No** _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

Monoculture of Cenchrus purpureus (syn: Pennisetum purpureum) that continues in makai direction. Delineation was conducted in dry season, but precipitation was normal for dry season; rain gauge data 0.1". http://www.prh.noaa.gov/hnl/hydro/pages/aug17sum.php

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 20' Radius)			
1. None			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 5' Radius)			
1. None			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 3' Radius)			
1. Cenchrus purpureus (syn: Pennisetum purpureum)	100	Y	FAC
2. Paederia foetida*	2	N	UPL
3.			
4.			
5.			
6.			
7.			
8.			
	102 = Total Cover		
Woody Vine Stratum (Plot size: 20' Radius)			
1. Moved to Herb Stratum <5% cover*			
2.			
	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** _____

Remarks:

SOIL

Sampling Point: SP12

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3"	10 YR 3/1	95	7.5 YR 4/6	5	C	M	Clay	
3-17"	10 YR 4/1	60	5YR 4/6	40	C	M, PL	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Muck Presence (A8)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Dark Surface (S7)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Stratified Layers (A5)
- ___ Sandy Mucky Mineral (S1)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Tilapia Nests (B17)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Fiddler Crab Burrows (C10) (Guam, CNMI, and American Samoa)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6) at drainage ditch
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2) culvert discharge
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): None

Water Table Present? Yes _____ No X Depth (inches): >17"

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): >17"

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Negative alpha, alpha-dipyridyl reaction.

WETLAND DETERMINATION DATA FORM – Hawai'i and Pacific Islands

Project/Site: Waiahole Bridge Replacement City: Waiahole Sampling Date: 21 Aug 17 Time: 1500

Applicant/Owner: Hawaii Department of Transportation State/Terr.: HI Island: Oahu Sampling Point: SP13

Investigator(s): Jessica Woo, Susan Burr, and Bryson Luke TMK/Parcel: 48008023

Landform (hillslope, coastal plain, etc.): coastal plain Local relief (concave, convex, none): none

Lat: 21.481790546 Long: -157.846029451 Datum: WGS84 Slope (%): 0

Soil Map Unit Name: Pearl Harbor clay- listed on Hydric Soils 2015 NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

Above top of bank with agricultural fields to the south. Delineation was conducted in dry season, but precipitation was normal for dry season; rain gauge data 0.1". http://www.prh.noaa.gov/hnl/hydro/pages/aug17sum.php

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 20' Radius)			
1. None			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 3' Radius)			
1. Cocos nucifera*	2	Y	FACU
2. *Lumped with Woody Vine Stratum total <5%			
3.			
4.			
5.			
	2 = Total Cover		
Herb Stratum (Plot size: 3' Radius)			
1. Paspalum conjugatum	85	Y	FAC
2. Sphagneticola trilobata	10	N	FAC
3. Pennisetum purpureum	5	N	FAC
4.			
5.			
6.			
7.			
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 20' Radius)			
1. Mimosa pudica	5	Y	FACU
2. Mucuna gigantea	2	Y	FACU
	9 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	100	x 3 =	300
FACU species	9	x 4 =	36
UPL species	0	x 5 =	0
Column Totals:	109 (A)		336 (B)

Prevalence Index = B/A = 3.083

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks:

SOIL

Sampling Point: SP13

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-19"	10YR 3/2	96	5YR 3/4	2	C	M	Silty Clay	
			5YR 4/6	2	C	M	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Muck Presence (A8)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Dark Surface (S7)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Stratified Layers (A5)
- ___ Sandy Mucky Mineral (S1)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

River rocks present in soil profile throughout.

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Tilapia Nests (B17)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Fiddler Crab Burrows (C10) (Guam, CNMI, and American Samoa)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): None

Water Table Present? Yes _____ No X Depth (inches): >19"

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): >19"

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Negative alpha, alpha-dipyridyl reaction.

WETLAND DETERMINATION DATA FORM – Hawai'i and Pacific Islands

Project/Site: Waiahole Bridge Replacement City: Waiahole Sampling Date: 21 Aug 17 Time: 0910

Applicant/Owner: Hawaii Department of Transportation State/Terr.: HI Island: Oahu Sampling Point: SP14

Investigator(s): Jessica Woo, Susan Burr, and Bryson Luke TMK/Parcel: 48002001

Landform (hillslope, coastal plain, etc.): coastal plain Local relief (concave, convex, none): none

Lat: 21.483895290 Long: -157.845893573 Datum: WGS84 Slope (%): 0

Soil Map Unit Name: Hanalei silty clay, 0 to 2 percent slopes, MLRA 167- listed on Hydric Soils 2015 NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No _____ (If no, explain in Remarks.)

Are Vegetation Yes, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

Lawn is mowed on a regular basis. Delineation was conducted in dry season, but precipitation was normal for dry season; rain gauge data 0.1".
http://www.prh.noaa.gov/hnl/hydro/pages/aug17sum.php

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 20' Radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. None			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 5' Radius)			
1. None			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 3' Radius)			
1. Axonopus compressus	60	Y	FAC
2. Megathyrsus maximus	25	Y	FAC
3. Sphagneticola trilobata	12	N	FAC
4. Indigofera hendecaphylla	10	N	FAC
5.			
6.			
7.			
8.			
	107 = Total Cover		
Woody Vine Stratum (Plot size: 20' Radius)			
1. None			
2.			
	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

Recently mowed, but all plants could be identified.

SOIL

Sampling Point: SP14

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-10	10 YR 4/3	100	None				Clay Loam	15% gravel, no redox

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Muck Presence (A8)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Dark Surface (S7)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Stratified Layers (A5)
- ___ Sandy Mucky Mineral (S1)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Hardpan

Depth (inches): 10"

Hydric Soil Present? Yes _____ No X

Remarks:

Clay hard pan at 10". Soil profile similar to SP2.

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Tilapia Nests (B17)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Fiddler Crab Burrows (C10) (Guam, CNMI, and American Samoa)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): None

Water Table Present? Yes X No _____ Depth (inches): >10"

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): >10"

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Hawai'i and Pacific Islands

Project/Site: Waiahole Bridge Replacement City: Waiahole Sampling Date: 21 Aug 17 Time: 1627

Applicant/Owner: Hawaii Department of Transportation State/Terr.: HI Island: Oahu Sampling Point: SP15

Investigator(s): Jessica Woo, Susan Burr, and Bryson Luke TMK/Parcel: 48009001

Landform (hillslope, coastal plain, etc.): coastal plain Local relief (concave, convex, none): concave

Lat: 21.482685678 Long: -157.845341321 Datum: WGS84 Slope (%): 0%

Soil Map Unit Name: Hanalei silty clay, 0 to 2 percent slopes, MLRA 167- listed on Hydric Soils 2015 NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation Yes, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

Vegetation is regularly mowed. Bounded on makai side by roadside fill. Delineation was conducted in dry season, but precipitation was normal for dry season; rain gauge data 0.1". http://www.prh.noaa.gov/hnl/hydro/pages/aug17sum.php

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 20' Radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Pseudobombax cf. ellipticum	20	Y	UPL
2.			
3.			
4.			
5.			
	20 = Total Cover		
Sapling/Shrub Stratum (Plot size: 5' Radius)			
1. None			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 3' Radius)			
1. Axonopus compressus	50	Y	FAC
2. Paspalum sp.	50	Y	FAC
3.			
4.			
5.			
6.			
7.			
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 20' Radius)			
1. None			
2.			
	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

Pseudobombax ellipticum was an ornamental planting.

SOIL

Sampling Point: SP15

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-9"	10 YR 3/1	90	2.5YR 3/4	10	C	PL	Silty Clay	
9-18"	10 YR 3/1	95	2.5YR 3/4	5	C	PL	Silty Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Muck Presence (A8)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Dark Surface (S7)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Stratified Layers (A5)
- ___ Sandy Mucky Mineral (S1)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Tilapia Nests (B17)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Fiddler Crab Burrows (C10) (Guam, CNMI, and American Samoa)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): None

Water Table Present? Yes _____ No X Depth (inches): >18"

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): >18"

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Culverts under Kamehameha Highway at both the north and south ends of this wetland.

Negative alpha, alpha-dipyridyl reaction.

APPENDIX E
Wetland and Stream Impacts

STREAM BANK
AREA = 2,460 SF
STREAM BANK
REMOVAL
VOLUME=437 CY

R/W

Limits of grading

PL

R/W

Limits of grading

WETLAND E

R/W

Limits of grading

APE

Limits of grading

APE

WETLAND A

AREA IN WETLAND =
12,694 SF
FILL QUANTITY=1,563 CY

TRUE NORTH
1"=40'

SCALE: 1" = 40'

APPENDIX C
Photograph Log

Waiahole Bridge Replacement Project
Waiahole, Oahu, Hawaii
File No. 0208079-000
Date Photographs Taken: September 12, 2023

No.	Photograph	Description
1		Upstream side of Waiahole Stream bridge, photo taken facing north.
2		Vegetated sediment “island” upstream of the bridge, which will be dredged and removed to improve stream flow. Photo taken facing north.

No.	Photograph	Description
3		Waiahole Bridge, photo taken facing south. Upstream is on the right side of the bridge, and downstream is to the left of the bridge.
4		Downstream side of Waiahole Stream bridge, photo taken facing southwest.

No.	Photograph	Description
5		Proposed soil/stockpile area in Waiahole Beach Park, north of the Waiahole Stream. Photo taken facing north.
6		Auwai that runs from Waiahole Stream parallel along the mauka side of Kamehameha Highway.

No.	Photograph	Description
7		Culvert on the north side of Waiahole Valley Road that runs below Kamehameha Highway and discharges into Wetland A (see below).

No.	Photograph	Description
8		Outlet from culvert that runs under Kamehameha Highway into a ditch on the makai side of Kamehameha Highway from Waiahole Valley Road (see above).
9		Wetland A, a palustrine emergent wetland located within the Waiahole Beach Park. Photo of the southern portion of Wetland A, facing east. This area was dominated an extremely thick stand of buffalo grass (*Urochloa mutica)* with standing water several feet below the grass litter.

No.	Photograph	Description
10		A side channel of Waiahole Stream in Wetland B, a riverine, emergent wetland adjacent to the northern bank of the Waiahole Stream and east of the Waiahole Bridge.
11		Wetland D, a depressional, palustrine emergent wetland associated with agricultural runoff east of Kamehameha Highway that discharges into Wetland D through a culvert. The wetland's west boundary is defined by Kamehameha Highway. The area is a thick monoculture of elephant grass (*Cenchrus purpureus)*.

No.	Photograph	Description
12		Wetland E is a depressional, palustrine emergent wetland in a frequently mowed area west and directly adjacent to Kamehameha Highway. Wetland E receives outflows from a culvert under Waiahole Valley Road and surface runoff from Kamehameha Highway.

APPENDIX D
NOAA Precipitation Data (2000-2023)

Monthly Total Precipitation for HONOLULU INTL AP, HI

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2000	1.26	0.07	0.38	0.46	0.03	0.03	0.41	1.17	0.78	0.25	2.09	0.17	7.10
2001	0.18	0.57	0.62	0.29	0.14	1.16	0.13	0.05	0.28	1.05	3.91	0.76	9.14
2002	3.91	0.69	2.51	0.08	1.96	0.07	0.12	0.27	0.10	2.11	0.36	0.04	12.22
2003	1.21	1.09	1.95	0.81	0.09	0.20	0.52	0.02	0.28	1.14	0.57	4.81	12.69
2004	6.88	9.47	0.56	0.58	1.29	0.31	0.09	3.74	1.01	1.25	7.87	5.96	39.01
2005	6.23	1.28	1.88	0.64	0.27	0.28	0.29	0.10	0.90	1.60	1.77	0.36	15.60
2006	1.53	2.62	16.92	0.75	1.11	0.09	0.08	0.11	0.66	2.50	2.50	0.58	29.45
2007	1.10	0.40	0.68	0.20	0.12	0.16	0.05	0.09	0.50	0.15	5.46	3.08	11.99
2008	0.29	0.42	0.08	0.20	0.53	0.55	0.80	0.38	0.43	0.57	2.93	7.58	14.76
2009	3.69	0.25	2.25	0.55	0.15	0.04	0.34	0.55	0.15	1.27	1.56	0.75	11.55
2010	0.71	0.67	0.59	0.28	1.40	0.22	0.38	0.13	0.63	0.11	0.55	11.73	17.40
2011	2.87	1.85	0.95	2.63	3.09	1.36	0.57	0.07	0.07	0.24	0.89	1.10	15.69
2012	0.56	1.14	5.50	0.24	0.04	0.06	0.13	0.07	0.52	0.09	0.22	0.01	8.58
2013	2.42	0.65	2.95	1.75	0.69	0.17	0.35	0.10	1.33	0.18	1.95	3.64	16.18
2014	2.45	1.23	2.61	0.33	3.35	0.58	1.12	0.56	0.58	5.51	1.43	1.07	20.82
2015	0.93	0.84	0.62	0.34	0.20	0.23	0.43	7.63	4.48	0.91	4.16	0.27	21.04
2016	0.03	0.40	0.22	0.22	3.17	0.19	2.71	1.58	2.92	0.12	0.73	0.87	13.16
2017	0.21	7.12	2.75	3.05	0.36	0.53	0.02	1.85	0.10	2.78	0.45	3.40	22.62
2018	0.06	4.12	2.57	1.19	0.25	0.15	0.23	1.02	1.78	4.62	0.36	0.60	16.95
2019	0.33	2.17	0.08	0.20	0.30	5.68	0.12	0.18	2.13	1.15	2.58	1.69	16.61
2020	1.13	0.88	3.76	2.56	0.55	0.10	0.77	0.13	0.10	3.20	0.16	0.31	13.65
2021	3.23	1.54	4.21	0.44	0.03	0.06	0.08	0.29	0.12	0.05	0.09	11.20	21.34
2022	6.34	0.05	0.39	0.04	1.40	0.01	0.24	0.07	0.43	0.79	0.15	2.24	12.15
2023	0.43	3.16	2.65	2.17	0.67	0.39	0.20	0.11	M	M	M	M	M
Mean	2.00	1.78	2.40	0.83	0.88	0.53	0.42	0.84	0.88	1.38	1.86	2.71	16.51
Max	6.88 2004	9.47 2004	16.92 2006	3.05 2017	3.35 2014	5.68 2019	2.71 2016	7.63 2015	4.48 2015	5.51 2014	7.87 2004	11.73 2010	39.01 2004
Min	0.03 2016	0.05 2022	0.08 2019	0.04 2022	0.03 2021	0.01 2022	0.02 2017	0.02 2003	0.07 2011	0.05 2021	0.09 2021	0.01 2012	7.10 2000

APPENDIX E
Wetland Delineation Data Forms

WETLAND DETERMINATION DATA FORM – Hawai'i and Pacific Islands Region

Project/Site: Waiahole Bridge Replacement Project City: Kaneohe Sampling Date: 2023-09-12 Time: 1245

Applicant/Owner: Department of Transportation Highways State/Terr/Comlth.: Hawaii Island: Oahu Sampling Point: A1

Investigator(s): Taylor Chock, Jim Shannon, Andrew Sitlinger TMK/Parcel: 48002001

Landform (hillslope, coastal plain, etc.): Coastal Plain Local relief (concave, convex, none): Concave

Lat: 21.48332334 Long: -157.84513366 Datum: NAD 83 Slope (%): 0

Soil Map Unit Name: Ph - Pearl Harbor clay, 0 to 2 percent slopes, MLRA 163 NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✔	**Is the Sampled Area within a Wetland?** Yes _____ No ✔
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes _____	No ✔	

Remarks:
Within the County Waiahole Beach Park, west of Kamehameha Highway across of the Waiahole nursery. Only grasses and emergent plants present, no tree or shrub strata present.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 5 ft radius)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5 ft radius)			
1. Paspalum dilatatum	60	✔	FACU
2. Sphagneticola trilobata	25	✔	FAC
3. Megathyrsus maximus	10		FAC
4. Desmodium incanum	5		FACU
5.			
6.			
7.			
8.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	35	x 3 =	105
FACU species	65	x 4 =	260
UPL species	0	x 5 =	0
Column Totals:	100 (A)		365 (B)

Prevalence Index = B/A = 3.65

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✔

Remarks:

SOIL

Sampling Point: A1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR 2/1	90	7.5YR 4/6	10	C	PL	Clay Loam	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Muck Presence (A8)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Dark Surface (S7)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✔ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Stratified Layers (A5)
- ___ Sandy Mucky Mineral (S1)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✔ **No**

Remarks:

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Tilapia Nests (B17)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Fiddler Crab Burrows (C10) (Guam, CNMI, and American Samoa)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✔ Depth (inches):

Water Table Present? Yes _____ No ✔ Depth (inches):

Saturation Present? (includes capillary fringe) Yes _____ No ✔ Depth (inches):

Wetland Hydrology Present? Yes _____ No ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Hawai'i and Pacific Islands Region

Project/Site: Waiahole Bridge Replacement Project City: Kaneohe Sampling Date: 2023-09-12 Time: 130

Applicant/Owner: Department of Transportation Highways State/Terr/Comlth.: Hawaii Island: Oahu Sampling Point: A2

Investigator(s): Taylor Chock, Jim Shannon, Andrew Sitlinger TMK/Parcel: 48002001

Landform (hillslope, coastal plain, etc.): Coastal Plain Local relief (concave, convex, none): Concave

Lat: 21.48229703 Long: -157.84492417 Datum: NAD 83 Slope (%): 0

Soil Map Unit Name: Ph - Pearl Harbor clay, 0 to 2 percent slopes, MLRA 163 NWI classification: Palustrine emergent

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔ No _____	**Is the Sampled Area within a Wetland?** Yes ✔ No _____
Hydric Soil Present?	Yes ✔ No _____	
Wetland Hydrology Present?	Yes ✔ No _____	

Remarks:
Previously identified Wetland A on the makai side of Kamehameha Highway, approximately 150 ft north of the stream. Drainage culvert from surface runoff from Kamehameha Highway discharges into this area. Depressional PEM1C wetland identified; however, not considered jurisdictional according to the "Revised Definition of 'Waters of the United States'; Conforming," rule. Wetland does not have a direct surface connection to a State water.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 10 ft radius)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 10 ft radius)			
1. Urochloa mutica	100	✔	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	100	x 2 =	200
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		200 (B)

Prevalence Index = B/A = 2.00

Hydrophytic Vegetation Indicators:

✔ 1 - Rapid Test for Hydrophytic Vegetation

✔ 2 - Dominance Test is >50%

✔ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✔ No _____

Remarks:

Extremely thick vegetation layer

SOIL

Sampling Point: A2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR 3/1	100					Mucky Loam/Clay	very thick vegetation layer, saturated soil with standing water
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ✔ Hydrogen Sulfide (A4)
- ✔ Muck Presence (A8)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Dark Surface (S7)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Stratified Layers (A5)
- ___ Sandy Mucky Mineral (S1)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✔ **No**

Remarks:

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required; check all that apply)

- ✔ Surface Water (A1)
- ✔ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ✔ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Tilapia Nests (B17)
- ✔ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Fiddler Crab Burrows (C10) (Guam, CNMI, and American Samoa)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ✔ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✔ No ____ Depth (inches): 6

Water Table Present? Yes ✔ No ____ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ✔ No ____ Depth (inches): 0

Wetland Hydrology Present? Yes ✔ **No**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

The was about 6 inches of standing water beneath the thick vegetation layer. This depressional area receives flows from a culvert under Kamehameha Highway, likely reducing flood impacts to Kamehameha Road through storing excess water during heavy rainfall.

WETLAND DETERMINATION DATA FORM – Hawai'i and Pacific Islands Region

Project/Site: Waiahole Bridge Replacement Project City: Honolulu County Sampling Date: 2023-09-12 Time: 1137

Applicant/Owner: Department of Transportation Highways State/Terr/Comlth.: Hawaii Island: Oahu Sampling Point: B1

Investigator(s): Taylor Chock, Jim Shannon, Andrew Sitlinger TMK/Parcel: 48002001

Landform (hillslope, coastal plain, etc.): Coastal Plain Local relief (concave, convex, none): Concave

Lat: 21.48159424 Long: -157.84471638 Datum: NAD 83 Slope (%): 0

Soil Map Unit Name: Ph - Pearl Harbor clay, 0 to 2 percent slopes, MLRA 163 NWI classification: Palustrine emergent

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔ No _____	**Is the Sampled Area within a Wetland?** Yes ✔ No _____
Hydric Soil Present?	Yes ✔ No _____	
Wetland Hydrology Present?	Yes ✔ No _____	

Remarks:
Previously identified Wetland B, a freshwater emergent riverine wetland adjacent to the northern bank of Waiahole Stream and east of Waiahole Bridge. Smooth rocks and drift deposits present.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Macaranga mappa	50	✔	FAC
2. Samanea saman	50	✔	UPL
3.			
4.			
5.			
	100	= Total Cover	
Sapling/Shrub Stratum (Plot size: 5 ft radius)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5 ft radius)			
1. Cenchrus purpureus	80	✔	FAC
2. Landoltia punctata	10		OBL
3. Cyperus involucratus	5		FACW
4. Diplazium esculentum	2		FACW
5.			
6.			
7.			
8.			
	97	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.67 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	10	x 1 =	10
FACW species	7	x 2 =	14
FAC species	130	x 3 =	390
FACU species	0	x 4 =	0
UPL species	50	x 5 =	250
Column Totals:	197 (A)		664 (B)

Prevalence Index = B/A = 3.37

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✔ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✔ No _____

Remarks:

SOIL

Sampling Point: B1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 4	7.5YR 2.5/2	98	5YR 4/6	2	MS	M	Sand	
4 - 10								gravel and cobble
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Muck Presence (A8)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Gleyed Matrix (S4)
- ✔ Sandy Redox (S5)
- ___ Dark Surface (S7)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Stratified Layers (A5)
- ___ Sandy Mucky Mineral (S1)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Gravel and Cobble

Depth (inches): 4

Hydric Soil Present? Yes ✔ **No**

Remarks:

Assume hydric soil because of adjacent to Waiahole Stream channel. Smooth rocks and drift deposits present.

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✔ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ✔ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ✔ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Tilapia Nests (B17)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Fiddler Crab Burrows (C10) (Guam, CNMI, and American Samoa)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ✔ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ✔ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✔ Depth (inches):

Water Table Present? Yes ✔ No ___ Depth (inches): 8

Saturation Present? (includes capillary fringe) Yes ✔ No ___ Depth (inches): 4

Wetland Hydrology Present? Yes ✔ **No**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

The main hydrologic inputs to this wetland include Waihole Stream, secondary runoff from the adjacent area, and precipitation

WETLAND DETERMINATION DATA FORM – Hawai'i and Pacific Islands Region

Project/Site: Waiahole Bridge Replacement Project City: Honolulu County Sampling Date: 2023-09-12 Time: 1200

Applicant/Owner: Department of Transportation Highways State/Terr/Comlth.: Hawaii Island: Oahu Sampling Point: B2

Investigator(s): Taylor Chock, Jim Shannon, Andrew Sitlinger TMK/Parcel: 48002001

Landform (hillslope, coastal plain, etc.): Coastal Plain Local relief (concave, convex, none): None

Lat: 21.48173541 Long: -157.84466571 Datum: NAD 83 Slope (%): 0

Soil Map Unit Name: Ph - Pearl Harbor clay, 0 to 2 percent slopes, MLRA 163 NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No ✔
Hydric Soil Present?	Yes _____	No ✔	
Wetland Hydrology Present?	Yes _____	No ✔	

Remarks:
Forested area north of Wetland B, on the makai side of Kamehameha Highway.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Macaranga mappa	50	✔	FAC
2. Samanea saman	50	✔	UPL
3.			
4.			
5.			
	100	= Total Cover	
Sapling/Shrub Stratum (Plot size: 5 ft radius)			
1. Citharexylum caudatum	10	✔	UPL
2. Alocasia macrorrhizos	5	✔	FAC
3.			
4.			
5.			
	15	= Total Cover	
Herb Stratum (Plot size: 5 ft radius)			
1. Megathyrsus maximus	30	✔	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	30	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	85	x 3 =	255
FACU species	0	x 4 =	0
UPL species	60	x 5 =	300
Column Totals:	145 (A)		555 (B)

Prevalence Index = B/A = 3.83

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✔ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✔ No _____

Remarks:

SOIL

Sampling Point: B2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 12	10YR 3/3	100					Clay Loam	gravel and cobble present, refusal at 10 inches
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Muck Presence (A8)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Dark Surface (S7)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Stratified Layers (A5)
- ___ Sandy Mucky Mineral (S1)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: rock

Depth (inches): 10

Hydric Soil Present? Yes _____ No ✔

Remarks:

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Tilapia Nests (B17)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Fiddler Crab Burrows (C10) (Guam, CNMI, and American Samoa)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✔ Depth (inches):

Water Table Present? Yes _____ No ✔ Depth (inches):

Saturation Present? (includes capillary fringe) Yes _____ No ✔ Depth (inches):

Wetland Hydrology Present? Yes _____ No ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Hawai'i and Pacific Islands Region

Project/Site: Waiahole Bridge Replacement Project City: Honolulu County Sampling Date: 2023-09-12 Time: 1030 am

Applicant/Owner: Department of Transportation Highways State/Terr/Comlth.: Hawaii Island: Oahu Sampling Point: D1

Investigator(s): Taylor Chock, Jim Shannon, Andrew Sitlinger TMK/Parcel: 48001010

Landform (hillslope, coastal plain, etc.): Coastal Plain Local relief (concave, convex, none): None

Lat: 21.48044625 Long: -157.84449242 Datum: NAD 83 Slope (%): 0

Soil Map Unit Name: Ph - Pearl Harbor clay, 0 to 2 percent slopes, MLRA 163 NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✔	**Is the Sampled Area within a Wetland?** Yes _____ No ✔
Hydric Soil Present?	Yes _____	No ✔	
Wetland Hydrology Present?	Yes _____	No ✔	

Remarks:

Upland area, south of Waiahole Stream and makai of Kamehameha Highway.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Leucaena leucocephala	90	✔	UPL
2.			
3.			
4.			
5.			
	90	= Total Cover	
Sapling/Shrub Stratum (Plot size: 5 ft radius)			
1. Citharexylum caudatum	2		UPL
2.			
3.			
4.			
5.			
	2	= Total Cover	
Herb Stratum (Plot size: 5 ft radius)			
1. Oplismenus hirtellus	95	✔	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	95	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	95	x 3 =	285
FACU species	0	x 4 =	0
UPL species	92	x 5 =	460
Column Totals:	187 (A)		745 (B)

Prevalence Index = B/A = 3.98

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✔

Remarks:

SOIL

Sampling Point: D1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 10	10YR 3/1	100					Clay	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Muck Presence (A8)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Dark Surface (S7)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Stratified Layers (A5)
- ___ Sandy Mucky Mineral (S1)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✔

Remarks:

dry soil

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Tilapia Nests (B17)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Fiddler Crab Burrows (C10) (Guam, CNMI, and American Samoa)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✔ Depth (inches):

Water Table Present? Yes _____ No ✔ Depth (inches):

Saturation Present? (includes capillary fringe) Yes _____ No ✔ Depth (inches):

Wetland Hydrology Present? Yes _____ No ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Hawai'i and Pacific Islands Region

Project/Site: Waiahole Bridge Replacement Project City: Honolulu County Sampling Date: 2023-09-12 Time: 1110

Applicant/Owner: Department of Transportation Highways State/Terr/Comlth.: Hawaii Island: Oahu Sampling Point: D2

Investigator(s): Taylor Chock, Jim Shannon, Andrew Sitlinger TMK/Parcel: 48001010

Landform (hillslope, coastal plain, etc.): Floodplain Local relief (concave, convex, none): None

Lat: 21.48014397 Long: -157.84460409 Datum: NAD 83 Slope (%): 0

Soil Map Unit Name: Ph - Pearl Harbor clay, 0 to 2 percent slopes, MLRA 163 NWI classification: Palustrine emergent

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** Yes ✔ No _____
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes ✔	No _____	

Remarks:
Previously identified "Wetland D" area; south of Waiahole Stream and makai of Kamehameha Highway. PEM1C wetland identified; however, not considered jurisdictional according to the "Revised Definition of 'Waters of the United States'; Conforming," rule. Wetland does not have a direct surface connection to a State water.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 5 ft radius)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5 ft radius)			
1. Cenchrus purpureus	100	✔	FAC
2. Canavalia cathartica	2		FACU
3. Paederia foetida	2		UPL
4.			
5.			
6.			
7.			
8.			
	104	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	100	x 3 =	300
FACU species	2	x 4 =	8
UPL species	2	x 5 =	10
Column Totals:	104 (A)		318 (B)

Prevalence Index = B/A = 3.06

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✔ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✔ No _____

Remarks:

Trees and shrubs were absent.

SOIL

Sampling Point: D2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 10	10YR 3/1	90	7.5YR 4/6	10	C	M	Clay	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Muck Presence (A8)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Dark Surface (S7)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✔ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Stratified Layers (A5)
- ___ Sandy Mucky Mineral (S1)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✔ **No**

Remarks:

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Tilapia Nests (B17)
- ___ Hydrogen Sulfide Odor (C1)
- ✔ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Fiddler Crab Burrows (C10) (Guam, CNMI, and American Samoa)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✔ Depth (inches):

Water Table Present? Yes _____ No ✔ Depth (inches):

Saturation Present? (includes capillary fringe) Yes _____ No ✔ Depth (inches):

Wetland Hydrology Present? Yes ✔ **No**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Depressional, palustrine emergent wetland associated with agricultural runoff west of Kamehameha Highway that discharges into Wetland D through a culvert.

WETLAND DETERMINATION DATA FORM – Hawai'i and Pacific Islands Region

Project/Site: Waiahole Bridge Replacement Project City: Kaneohe Sampling Date: 2023-09-12 Time: 130

Applicant/Owner: Department of Transportation Highways State/Terr/Comlth.: Hawaii Island: Oahu Sampling Point: E1

Investigator(s): Taylor Chock, Jim Shannon, Andrew Sitlinger TMK/Parcel: 48009001

Landform (hillslope, coastal plain, etc.): Coastal Plain Local relief (concave, convex, none): Concave

Lat: 21.48272628 Long: -157.84534607 Datum: NAD 83 Slope (%): 0

Soil Map Unit Name: Ph - Pearl Harbor clay, 0 to 2 percent slopes, MLRA 163 NWI classification: Palustrine emergent

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation ✔, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** Yes ✔ No _____
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes ✔	No _____	

Remarks:
Mowed roadside grass mauka of Kamehameha Highway. Previously identified at "Wetland E". PEM1C wetland identified; however, not considered jurisdictional according to the "Revised Definition of 'Waters of the United States'; Conforming," rule. Wetland does not have a direct surface connection to a State water.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Pachira aquatica	20	✔	
2.			
3.			
4.			
5.			
	20 = Total Cover		
Sapling/Shrub Stratum (Plot size: 5 ft radius)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft radius)			
1. Megathyrsus maximus	95	✔	FAC
2. Axonopus fissifolius	5		FAC
3.			
4.			
5.			
6.			
7.			
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	100	x 3 =	300
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		300 (B)

Prevalence Index = B/A = 3.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✔ 2 - Dominance Test is >50%

✔ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✔ No _____

Remarks:
Pachira aquatica tree is an ornamental planting.

SOIL

Sampling Point: E1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 10	10YR 2/2	95	7.5YR 4/6	5	C	PL	Silty Clay	
-								
-								
-								
-								
-								
-								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Muck Presence (A8)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Dark Surface (S7)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✔ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Stratified Layers (A5)
- ___ Sandy Mucky Mineral (S1)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✔ **No**

Remarks:

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Tilapia Nests (B17)
- ___ Hydrogen Sulfide Odor (C1)
- ✔ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Fiddler Crab Burrows (C10) (Guam, CNMI, and American Samoa)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ✔ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✔ Depth (inches):

Water Table Present? Yes _____ No ✔ Depth (inches):

Saturation Present? (includes capillary fringe) Yes _____ No ✔ Depth (inches):

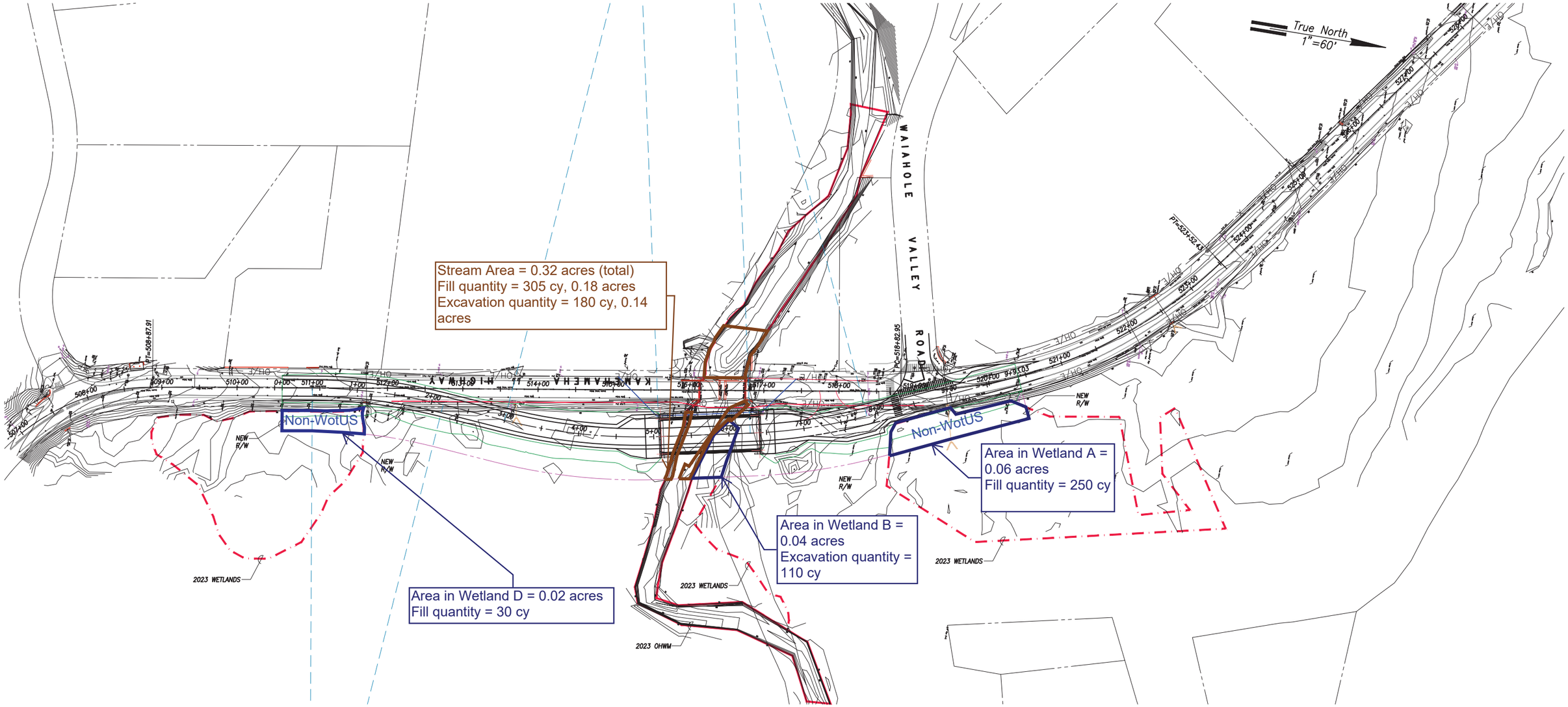
Wetland Hydrology Present? Yes ✔ **No**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

This depressional wetland receives outflows from a culvert under Waihole Valley Road and surface runoff from Kamehameha Highway.

APPENDIX F
Wetland and Stream Impacts



Legend:

2023 WETLANDS (RED DASH–DOT)

2023 OHWM (RED SOLID)

APPENDIX D

HALEY ALDRICH

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DRAFT

BIOLOGICAL EVALUATION
WAIAHOLE BRIDGE REPLACEMENT PROJECT
FEDERAL AID PROJECT NO. BR-083-1(088)
COASTAL WAIAHOLE AHUPUAA, DISTRICT OF KOOLAUPOKO
ISLAND OF OAHU, HAWAII
TMKS: (1) 4-8-001:010, (1) 4-8-002:001, (1) 4-8-008:018; (1) 4-8-008:021; (1) 4-8-008:022; (1) 4-8-008:023; (1) 4-8-008:024; (1) 4-8-009:001; AND (1) 4-8-009:006

by
Haley & Aldrich, Inc.
500 Ala Moana Boulevard, Suite 6-250
Honolulu, HI 96813

for
State of Hawaii Department of Transportation – Highways
869 Punchbowl Street, Room 202
Honolulu, HI 96813

File No. 0208079-000

HALEY & ALDRICH
500 Ala Moana Boulevard, Suite 6-250
Honolulu, HI 96813
808.587.7747

December 14, 2023
File No. 0208079-000

Michael Hunnemann, P.E.
Kai Hawaii, Inc.
50 S. Beretania Street, #C-119C
Honolulu, Hawaii 96813

Subject: Biological Evaluation
Kamehameha Highway, Waiahole Bridge Replacement Project
Coastal Waiahole Ahupuaa, District of Koolaupoko, Island of Oahu, Hawaii
Federal Aid Project No.: BR-083-1(088)

Dear Mr. Hunnemann,

Haley & Aldrich, Inc. (Haley & Aldrich) is pleased to provide this Biological Evaluation in support of the Waiahole Bridge Replacement Project's review under Endangered Species Act, as amended and in accordance with Section 7 consultation. We understand this report may also be utilized in support of the project Environmental Assessment under HAR Chapter 343 and the National Environmental Policy Act. Our report of findings on wetlands and waters of the United States will be forwarded under separate cover.

Should you have any questions, please contact us at 808-470-2081 or email tchock@haleyaldrich.com.

Sincerely yours,
HALEY & ALDRICH

Taylor Chock
Environmental Scientist

Jim Shannon
Senior Biologist

https://haleyaldrich.sharepoint.com/sites/KAIHawaii/Shared Documents/0208079.Kai Waiahole Bridge Permitting/Compliance/Biological Evaluation/DRAFT Waiahole Bridge Replacement Biological Evaluation_Dec 2023_clean.docx

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HALEY ALDRICH

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List of Appendices

1. Introduction

The Waiahole Stream Bridge (National Bridge Inventory No. 003000830303459) supports Kamehameha Highway over the Waiahole Stream at Milepost 34.59 on Route 83 in Kaneohe on Oahu. The bridge is located 0.04 miles south of Waiahole Valley Road (Appendix A; Figure 1).

The purpose of the project is to replace the two-span Waiahole Stream Bridge, which was constructed in 1922 and measures 65.9 feet long by 26.2 feet wide. The United States (US) Federal Department of Transportation and the Hawaii State Department of Transportation (HDOT) have prioritized the replacement of Waiahole Bridge, as the existing bridge does not conform to current design standard and has difficulty supporting the volume of traffic along Kamehameha Highway.

The bridge is considered to be structurally deficient and functionally obsolete and has been assigned a Bridge Sufficiency Rating of 38% by HDOT. There is considerable settlement of the south abutment, resulting in obvious sloping of the bridge parapet. The settlement area has been filled with asphalt cement over the years to make the roadway level.

A secondary purpose of the project is to reduce the occurrence of stream water overtopping the bridge when Waiahole Stream floods. Water flow in the stream often overtops the embankments because of debris clogging the opening beneath the bridge, in addition to insufficient hydraulic capacity of the stream at the bridge. The center pier often causes timber debris washed downstream to become lodged against the pier, causing a dam effect. The flood water mark on the bridge is visible on the superstructure.

1.1 PURPOSE AND FEDERAL NEXUS

This Biological Evaluation (BE) was prepared to assess the potential effects of the proposed Waiahole Bridge Replacement project (hereafter, proposed project) on fish and wildlife species listed as threatened or endangered, and critical habitats under the Endangered Species Act (ESA) of 1973 (16 United States Code [U.S.C] 153 *et seq.*), as amended. Due to funding for the proposed project from the Federal Highway Administration (FHWA), a federal nexus is created and the action requires ESA Section 7 consultation.

This BE includes a review of the ESA listed species and critical habitats from the United States Fish and Wildlife Service (USFWS)'s Information for Planning and Consultation (IPaC) site. The ESA status of each species, as well as our "effects determination" are summarized in Section 6, Table 2. Additionally, this BE evaluates the effects of the proposed project on essential fish habitat (EFH), pursuant to the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) as amended by the 1996 Sustainable Fisheries Act (SFA). EFH in the project vicinity and the effects of the proposed project on EFH are addressed in Appendix F.

In addition to Federally listed species, the BE also addresses the State-listed endangered Hawaiian short-eared owl and other aquatic state species of concern because the project is subject to the State of Hawaii's environmental review process (Hawaii Revised Statutes [HRS] 343 and 6E Review). State-listed species of concern are discussed further in Sections 5.3 and 6.6.

1.2 CONSULTATION HISTORY

An initial informal consultation with USFWS and the National Oceanic and Atmospheric Association (NOAA) National Marine Fisheries Service (NMFS) for the proposed project occurred on June 5, 2017, to discuss the project and the ESA species and EFH that could be affected. At this meeting, best management practices (BMPs) and appropriate minimization measures were discussed to avoid and

minimize impacts to ESA species and EFH. USFWS and NMFS provided information on BMPs that should be utilized for the project. The BE will be submitted to USFWS and NMFS to request their determination that an informal consultation is the appropriate level of review and to ask for their concurrence with the determination reached by this BE.

2. Project Description

The FHWA is providing funding to the HDOT to replace the existing Waiahole Stream Bridge with a new structure that meets current design standards. Due to community concerns about safety along this section of Kamehameha Highway, HDOT has decided to realign approximately 1,000 linear feet of the highway and construct the new bridge adjacent to the downstream face of the existing bridge. The intersection of Waiahole Valley Road and Kamehameha Highway will be redesigned to accommodate the new highway alignment (Appendix A; Figure 2).

The preliminary design for the new bridge consists of a prefabricated steel bridge with a 130-foot-long by 42-foot-wide roadway. Two 11-foot-wide travel lanes will be provided, along with two 6.5-foot-wide shoulders and a 5-foot-wide sidewalk to accommodate pedestrians. The abutments will be cast-in-place concrete, supported by deep foundations (drilled shafts). The new bridge will be designed to carry current AASHTO HL-93 design live loads. The stream embankments beneath the new bridge and immediately downstream of the bridge will be regraded to increase water flow through the channel.

The existing bridge has two piers and a total span length of 60 feet. The center piers of the existing bridge will be removed down to the mudline to allow for improved flow in the stream. Former bridge abutments (upstream of the existing bridge) and the existing bridge abutments will remain for the purpose of providing erosion control for the embankments, and for the preservation of bridge elements with historic value. The project will remove vegetation and stream sediment upstream and downstream of the existing bridge to provide a positive stream grade and improved hydraulic flow. The stream embankments beneath the new bridge and immediately downstream of the bridge will be regraded to increase water flow through the channel. Scour protection and erosion countermeasures will be added to the embankments to provide long-term stability. The project will result in a slight lowering of the water elevation upstream of the existing bridge. However, the upstream embankment and new bridge will continue to be overtopped during extreme flooding events due to the low embankments upstream and flat coastal plain near the shoreline. Scour protection (riprap) will be added to the embankments to provide long-term stability.

It is anticipated that the contractor will utilize the City and County of Honolulu's Waiahole Beach Park on the makai side of Kamehameha Highway and north of the bridge for a contractor staging and storage area (Appendix B; Photo 6). Because the proposed staging and storage area is a county park, access to the shoreline will be provided via a designated thoroughfare along one side of the park boundary.

2.1 CONSTRUCTION APPROACH

During the construction of the new bridge and highway alignment, both lanes of the existing bridge will remain open to traffic. Once the new bridge and highway are completed, traffic will be shifted to the new bridge and the existing bridge superstructure and center pier will be demolished.

The contractor's means and methods will determine the construction sequence for the realigned highway portion. The contractor will likely elect to begin roadway excavation and embankment filling for the new highway while the bridge foundations are being installed. Final highway paving and striping will follow the installation of the new bridge.

After the erection of the new bridge and the traffic is shifted onto the new highway, the contractor will demolish the existing bridge deck/railings/center piers, and all instream isolation and confinement structures and other temporary structures.

In general, the project will involve typical roadway and bridge construction activities including the following:

- Installing temporary erosion control measures and BMPs;
- Installing traffic controls;
- Realignment of roadway with structural fill;
- Relocating electrical utility poles;
- Installation of drilled shafts and concrete pilecaps;
- Erect/assemble steel bridge, pedestrian walkway and railings;
- Relocation of waterlines and mounting to new bridge structure;
- Roadway excavation, placing fill, grading, and paving;
- Constructing retaining walls;
- Demolishing existing bridge superstructure and pier;
- Regrading and reinforcing the stream embankments beneath the new bridge and downstream of the bridge;
- Revegetating disturbed areas; and
- Installing highway appurtenances such as signing, roadside barriers, and pavement markings.

Staging and storage of construction equipment and materials will occur within the Waiahole Beach Park area east of the highway, just north of the Waiahole Stream (Appendix A; Figure 2). Because the proposed contractor staging and storage area is a County park, public access to the shoreline will be provided via a designated thoroughfare along one side of the park boundary. Staging and storage of equipment will occur at least 60 feet away from the shoreline and as far away from the shoreline as possible to avoid impacts to the marine environment.

2.2 PROJECT EQUIPMENT

Construction equipment anticipated for clearing sediment and vegetation, construction of the bridge foundations, abutments, and superstructure may include, but is not limited to, the following:

- Bulldozers
- Augers for foundation construction
- Excavators
- Cranes
- Dump trucks
- Hydraulic rams
- Dewatering pumps and hoses

2.3 PROJECT TIMING

The proposed project will begin upon completion of design and permitting, with an estimated start date of January 2025. Construction of the new bridge is expected to take approximately two years, ending around December 2026.

2.4 BEST MANAGEMENT PRACTICES AND CONSERVATION

The project will involve demolition, excavation, grading, and construction in the stream and on the streambanks. Impacts of in-water construction would be minimized and mitigated through diligent use of BMPs, including the use of barriers to isolate and confine in-water work areas to prevent sediment, petroleum products, chemicals, and other liquids and solids from entering Waters of the United States (U.S.). The contractor will utilize appropriate methods to minimize or reduce sediments and turbidity in the river.

Erosion would be reduced by implementing BMPs during construction. An approved Storm Water Pollution Prevention Plan (SWPPP) would be developed for the site as part of the National Pollutant Discharge Elimination System (NPDES) permit that will be obtained for the project. BMPs to protect water quality will include the following:

- Minimize sedimentation via onsite drainage through BMPs or erosion control devices.
- Stabilize disturbed areas with erosion control BMPs.
- Revegetate disturbed areas as soon as practical after construction is completed in that area.
- Stabilize construction entrances to avoid offsite tracking of sediment onto roadways.
- Ensure that project-related materials placed in the water and equipment working near the water are free of pollutants.
- Fuel vehicles and equipment at least 60 feet away from the water, over a berm constructed with an impervious surface.

Accidental spills or releases of hazardous materials during construction could degrade the quality of stormwater runoff and reach Waiahole Stream. Appropriate control measures such as impermeable berms, secondary containment, and spill kits, would be implemented to prevent the release of hazardous materials or fuels to the environment. The potential for accidental spills or releases is low and, if they do occur, they would be contained and cleaned up immediately.

Federal (Section 404/401) permits will be needed for fill or dredging in regulated waters. A State Stream Channel Alteration Permit (SCAP) will be needed for proposed alteration of the stream near the bridge. If dewatering is required, it would be conducted in accordance with a dewatering permit obtained by the contractor, subject to strict BMP requirements for return flow to the stream and other treatment and discharge considerations.

2.5 ACTION AREA AND AREA OF POTENTIAL EFFECT

The Action Area includes all areas that may be affected directly or indirectly by the proposed project, not just the immediate area involved in the action. The Area of Potential Effect (APE) includes the geographic area or areas within which an undertaking may directly or indirectly cause alterations through the scale and nature of the proposed action.

The Action Area for the proposed project encompasses an approximate 100-foot buffer surrounding the 11.75-acre APE (Appendix A; Figure 1). The Action Area for the project extends to a distance at which

construction noise or stream turbidity would likely attenuate to background levels. The Action Area addresses concerns such as noise, airborne particles, and possible water quality effects that may occur outside the APE, including the Waiahole Stream channel (up and downstream), the highway corridor (for vegetation clearing and construction), and the area around the contractor's staging and storage area.

The APE, where the proposed actions will occur, totals 11.75 acres and encompasses the existing Waiahole Stream Bridge, the new Waiahole Stream Bridge, realignment of the private driveway, approximately 200 feet upstream of the existing bridge, and the contractor staging/storage area located north of the bridge in Waiahole Beach Park. Appendix B includes representative photos of the APE.

3. Environmental Baseline Conditions

Environmental baseline conditions were determined from a literature review and a site visit on September 12, 2023, and from previous site visits on June 5 to 7, 2017 and August 21, 2017. This BE is based upon the updated biological survey conducted in September 2023 in the APE (Appendix A; Figure 1). The APE is approximately 11.75 acres and includes a portion of Waiahole Beach Park to be used as a contractor staging and storage area.

3.1 CLIMATE

Daily temperatures in Kaneohe average 71 degrees Fahrenheit (°F) in the winter months (i.e., January and February) and 77°F in the summer months (i.e., August and September) (Giambelluca et al., 2014). Humidity averages about 70 percent. Tradewinds with average speeds between 10 to 20 miles per hour (mph) from the north and northeast dominate the summer months (80 to 95 percent during May to October) and prevail about 60 percent during other times of the year. Rainfall occurs year-round, but most of the precipitation occurs in November, December, and March. The Rainfall Atlas of Hawaii estimates mean annual rainfall at the Waiahole Stream Bridge to be 58 inches (Giambelluca et al., 2013).

3.2 TOPOGRAPHY, GEOLOGY, AND SOILS

Topography near the Waiahole Bridge is flat and consists of fallowed agriculturally zoned lands. Elevation around the bridge project site is approximately 10 feet above mean sea level (MSL). Elevations vary from approximately 20 feet above MSL at the southern extent of the project, 10 feet above MSL at the bridge, and 5 feet above MSL at the northern extent of the project. In general, the ground surface in the APE slopes slightly downward from west to east (i.e., mauka to makai). A 2022 topographic survey was done for the project.

The U.S. Department of Agriculture (USDA) WebSoil Survey (USDA NRCS, 2023) characterizes soils on the north side of the site (about 20% of the APE) as Hanalei silty clay (HnA), 0 to 2% slopes, MLRA 167, and the southern 80% of the APE as Pearl Harbor clay (Ph), 0 to 2% slopes, MLRA 163. Both HnA and Ph are considered to be hydric soils (USDA NRCS, 2022). HnA soils are considered to be ponded and occurring in flood plains and on valley floors and comprised of alluvium derived from basalt. HnA soils are typically poorly drained and frequently flooded and have occasional ponding. Ph soils are present in coastal plains and are very poorly drained with negligible runoff, occasional to no flooding, and frequent ponding. Only 0.2% of the APE is Alaeloa silty clay (AeE), exhibiting older substrate, 15-35% slopes, MLRA 167. AeE soils are not considered to be hydric (USDA NRCS, 2022). A map showing USDA-defined soils in the project area is included in Appendix A, Figure 3.

Waiahole Stream in the project area averages approximately 33 feet wide and ranges from 12 to 70 feet wide in the survey area. Substrates in Waiahole Stream are dominated by cobbles and gravel in the vicinity of the bridge with lesser amounts of sand and silt. The bridge has caused aggradation of cobbles and gravel upstream and some degradation of substrates downstream.

3.3 WETLANDS

The Waiahole Stream is considered a riverine, upper perennial, permanently flooded wetland with an unconsolidated bottom (R3UBH) by the USFWS National Wetlands Inventory. Downstream of the proposed bridge, palustrine, emergent, persistent wetlands are seasonally flooded (PEM1C) within the APE. Just east of the APE are palustrine, freshwater forested/shrub (PFO3C) wetlands (USFWS, 2023a; Appendix A; Figure 4).

No lakes or ponds exist in the action area, but four wetlands (A, B, D, and E) were defined in the action area during the jurisdictional determination survey, which has been provided as a separate document. For the purposes of this BE, each identified wetland is described briefly below, and their locations shown in Figure 5 (Appendix A).

Wetland A: Located on the east side of Kamehameha Highway north of Waiahole Stream and south of Waiahole Beach Park, most of the wetland is disturbed by regular maintenance mowing of the Park. Vegetation consists of thick stands of buffalo grass (*Paspalum dliatatum*); less than a foot of standing water among the grass stands was observed in the southern portion of the delineated wetland.

Wetland B: Located on the east side of Kamehameha Highway and the current Waiahole Stream bridge, this wetland encompasses a portion of the stream and can have rapidly moving water during flood events. The wetland is a dominated by elephant grass (*Cenchrus purpureus*).

Wetland D: Located on the east side of Kamehameha Highway, south of the Waiahole Stream, and immediately adjacent to the highway right-of-way (ROW). The wetland is a monoculture of elephant grass stands and no standing water was observed.

Wetland E: Located on the west side of Kamehameha Highway, north of Waiahole Stream. Broad-leaf carpet grass (*Axonopus compressus*) and *Paspalum sp*. cover the wetland area, which is mostly disturbed by regular maintenance mowing. No standing water was observed.

3.4 DESIGNATED OR PROPOSED CRITICAL HABITATS

There are no designated or proposed Critical Habitats located within the APE or likely to be affected by the project (Appendix A; Figure 6) (USFWS, 2023b).

In July 2023, the USFWS has proposed designating 2,223 acres of critical habitat on land where green sea turtles bask, nest, incubate, hatch and travel to the sea, including federal, state, private, and uncategorized lands in the Main Hawaiian Islands. NOAA Fisheries proposes to designate marine critical habitat from the mean high water to 20 meters depth to protect access to nesting beaches, migratory corridors, and important feeding and resting areas (USFWS, 2023c). The proposed project site is located 1.5 miles from the nearest proposed critical habitat for green sea turtles (USFWS, 2023c; Appendix A; Figure 7).

3.5 FLOOD ZONE

The section of Waiahole Stream within the APE is characterized as Flood Zone AE with known base flood elevations between 10 to 15 feet within Flood Map 15003C0255G (FEMA, 2011). The surrounding area is characterized by Flood Zones A and AE, which are defined as special flood hazard areas with a 1% chance flood event.

3.6 HYDROLOGY AND HYDROGEOLOGY

The project is in the Waiahole Stream watershed, USGS Hydrologic Unit Code 20060000 and State of Hawaii Commission on Water Resources Management (CWRM), Division of Aquatic Resources (DAR) Watershed Code 32004. The Waiahole watershed is approximately four-square miles in size and has a maximum elevation of 2,743 feet. The watershed is considered medium in size, steep in the upper watershed, and with embayment. Storm water in the APE flows overland into Waiahole Stream, is impounded by wetlands that occur within the APE, or is absorbed into the ground and enters the stream via hyporheic exchange (Parham et al., 2008). Waiahole Stream flows into Kaneohe Bay approximately 1,500 feet downstream (east) of the bridge.

A United States Geological Survey (USGS) stream gage (16294100) is located upstream (west) of the Waiahole Stream bridge. Over the past 19 years of collected data, annual mean streamflow at the site has been 29 cubic feet per second (cfs), with a low of 17 cfs in 2010 and a high of 53.7 cfs in 2015 (USGS, 2023).

Waiahole Stream is in an area characterized by Mink and Lau (1990) as underlain by the Koolaupoko aquifer sector within the Windward aquifer system. The aquifer is high level (i.e., freshwater not in contact with seawater), unconfined (i.e., the water table is the upper surface of saturated aquifer), and a dike aquifer. The groundwater is currently used as a drinking water source. It is fresh water, irreplaceable, and has a high vulnerability to contamination (Mink and Lau, 1990).

4. Biological Survey Methods

Prior to conducting field work, biologists reviewed the previous Biological Evaluation prepared for this project in 2017, publicly available scientific literature, environmental planning documents prepared for projects in and around the area, topographic maps and images, environmental compliance documents, and engineering drawings relevant to the proposed project and provided by the client. Reference lists of the detailed literature review conducted of online sources of peer-reviewed scientific publications; federal- and state-agency reports, management plans, and natural resource inventories.

The USFWS IPaC and Wetland Mapper websites were viewed to gather information on listed threatened and endangered species and wetland habitats within or adjacent to the APE (USFWS, 2023a and 2023b).

Terrestrial wildlife and vegetation surveys were conducted by Haley & Aldrich biologists of the APE on September 12, 2023, between 8 a.m. and 3 p.m. The weather during the field effort was dry but overcast, with ENE winds at 10 to 20 miles per hour. Surveying took place along the portion of Waiahole Stream within the APE, along the area adjacent to the ROW, and in the portion of Waiahole Beach Park likely to be designated for construction staging and stockpiling, totaling approximately 11.75 acres. Appendix A, Figure 1 illustrates the extent of the biological survey.

Bird identifications were performed visually and by vocalizations. An eight-minute point count following Scott et al., 1986 protocol was conducted from the cleared area in Waiahole Beach Park at 8 AM on September 12, 2023. Additional incidental observations were also collected during the pedestrian survey in the APE. Observations of mammals, amphibians, and reptiles were made incidental to the avian and vegetation survey.

Plant species, associated plant communities, and distribution within the APE were recorded during the vegetation survey. Also noted were disturbances to vegetation, topography, substrate types, and drainage features. Seasonal and temporal changes may affect the presence and location of plants and wildlife, and only plants and wildlife present at the time of the surveys were documented.

5. Biological Survey Results

5.1 TERRESTRIAL FAUNA

5.1.1 Birds

The majority of birds observed during the pedestrian survey and bird count on September 12, 2023 were non-native, introduced species (Table 1). Twelve non-native bird species were observed or heard during the survey. The most prevalent birds seen were Warbling White-eyes (*Zosterops japonicus*) and bulbul (*Psittacula krameri*). Cattle Egret (*Bubulcus ibis*), Common Myna (*Acridotheres tristis*), Red-Crested Cardinal (*Paroaria coronata*), and Saffron Finch (*Sicalis flaveola*) were observed infrequently.

Two Mallard x Hawaiian Duck hybrids were observed in the auwai west of Kamehameha Highway. Pure Hawaiian Ducks (*Anas wyvilliana*) are not known to exist on Oahu as they have hybridized with feral Mallards (*Anas platyrhynchos)* (see Section 6.3). The indigenous migratory kolea or Pacific Golden Plover *(Pluvialis fulva)* was commonly observed in the grassy lawn areas of Waiahole Beach Park.

Table 1: Birds Observed During the Survey

Common Name	Scientific Name	Biogeographic Status	Protected Status
Cattle Egret	*Bubulcus ibis*	Naturalized non-native resident	MBTA*
Common Myna	*Acridotheres tristis*	Naturalized non-native resident	None
Mejiro, Warbling White-eye	*Zosterops japonicus*	Naturalized non-native resident	None
Scaly Breasted Munia	*Lonchrua punctulata*	Naturalized non-native resident	None
Northern Cardinal	*Cardinalis cardinalis*	Naturalized non-native resident	None
Red-crested Cardinal	*Paroaria coronata*	Naturalized non-native resident	None
Saffron Finch	*Sicalis flaveola*	Naturalized non-native resident	None
Zebra Dove	*Geopelia striata*	Naturalized non-native resident	MBTA*
Spotted Dove	*Streptopelia chinensis*	Naturalized non-native resident	MBTA*
Pacific Golden Plover – Kolea	*Pluvialis fulva*	Indigenous Migratory	MBTA*
White-rumped Shama	*Copsychus malabaricus indicus*	Naturalized non-native resident	MBTA*
Red Junglefowl	*Gallus gallus*	Naturalized non-native resident	None
Red-vented bulbul	*Pycnonotus coronata*	Naturalized non-native resident	None
Mallard x Hawaiian Duck hybrid	*Anas platyrhynchos x Anas wyvilliana*	Hybridized with non-native residents	None

Note:
**MBTA: Protected by the Migratory Bird Treaty Act (USFWS, 2020).*

5.1.2 Mammals

During the survey, signs of feral pigs (*Sus scrofa*), such as trails and rooting, were noted throughout the APE. Several small Indian mongoose (*Herpestes javanicus*) were seen and dogs (*Canis lupus familiaris*) were heard barking in the general area. One or more rodents found on Oahu Island, including the European house mouse (*Mus musculus domesticus*), roof rat (*Rattus r. rattus*), brown rat (*Rattus norvegicus*), or Polynesian rats (*Rattus exulans hawaiiensis*), likely use various resources found within the APE even though they were not observed during the survey. Feral cats (*Felis catus*), also likely utilize resources within the APE. All these introduced mammals are deleterious to native ecosystems and the native faunal species dependent on them if their populations are unmanaged.

5.1.3 Reptiles and Amphibians

The introduced brown anole (*Anolis sagri*), a highly invasive species that has established quickly in the islands, was observed during the site visit. A deceased pond slider turtle (*Trachemys scripta*) was observed on the makai side of Kamehameha Highway.

5.2 TERRESTRIAL PLANTS

The survey for the Waiahole Bridge replacement project did not document any sensitive or endangered plants. Seven native indigenous species were documented, along with seven Polynesian introductions. Another 75 non-native naturalized species were observed, bringing the total to 89 identified plant species. A full list of observed species can be found in Appendix C.

The majority of the species observed in the APE were non-native with dominant tree species including monkeypod (*Samanea saman*), tropical almond (*Terminalia catappa*), Moluccan albizia (*Falcataria moluccana*), gunpowder tree (*Trema orientalis*), macaranga (*Macaranga tanarius*), and mango (*Mangifera indica*). The herbaceous stratum was primarily Guinea grass (*Megathyrsus maximus*), elephant grass (*Cenchrus purpureus*), wedelia (*Sphagneticola trilobata*), sensitive plant (*Mimosa pudica*), umbrella sedge (*Cyperus involucratus*), California grass (*Urochloa mutica*), sourbush (*Pluchea carolinensis*), maile pilau (*Paederia foetida*), and basketgrass (*Oplismenus hirtellus*).

Native indigenous species include a few hala (*Pandanus tectorius*), the presumed indigenous hau (*Hibiscus tiliaceus*), uhaloa (*Waltheria indica*), mauu laiki (*Paspalum scrobiculatum*), kaee (*Mucuna gigantea*), moa (*Psilotum nudum*), and ihi (*Oxalis corniculata*), Polynesian introduced species documented include ki (*Cordyline fruticosa*), primrose willow (*Ludwigia octovalvis*), maia (*Musa* sp.), kalo (*Colocasia esculenta*), ape (*Alocasia macrorrhizos*), niu (*Cocos nucifera*), and kukui (*Aleurites moluccana*).

A certified arborist with Steve Nimz and Associates, Inc., conducted a site visit in 2016 and did not find any native or endangered tree or plant species (Appendix C).

5.3 AQUATIC BIOTA

A formal stream survey for aquatic biota was not performed as part of the September 12, 2023 survey. We relied upon *The Atlas of Hawaiian Watershed and their Aquatic Resources* (Parham et. al, 2008*)*, which identifies eleven endemic and indigenous aquatic biota species that could possibly occur within the project area, as their presence has been documented in the lower reaches of the Waiahole Stream. Native species identified include five fish species: The oopu (*Eleotris sandwicensis),* Hawaiian flagtail (*Kuhlia xenura*), oopu nopili (*Sicyopterus stimpsoni),* oopu naniha (*Stenogobius hawaiiensis),* and the flathead grey mullet (*Mugil cephalus)* and several native insect species: including *Orthocladius sp., Dasyrhicnoessa insularis,* and *Scatella sexnotata* and fly species *Procanace williamsi* and *Thambemyia acrosticalis.*

Correspondence with the Hawaii Department of Land and Natural Resources (DAR) was initiated as part of DOT's pre-consultation for the environmental assessment and DAR responded on November 21, 2023. DAR identified ten native aquatic biota species as possibly occurring below, in, and above the project site in the Waiahole Stream and estuary, including seven fish species (*Eleotris sandwicensis, Stenogobius hawaiiensis, Awaous hawaiiensis, Sicyopterus stimpsoni, Lentipes concolor*, and juvenile species of *Caranx sp., Kuhlia xenura*, and *Mugil cephalus*); two crustacean species (*Macrobrachium grandimanus, Atyoida bisulcata*); and one mollusk species (*Neritina vespertina*). All the native stream biota have an amphidromous life cycle which means they have a dependence on connectivity to the ocean. The adult animals lay their eggs in the stream and, as the larvae hatch, they are swept downstream into the ocean, where they grow into post-larvae/juveniles before migrating back upstream.

Pre-consultation comments for the environmental assessment were also received from the United States Department of the Interior, U. S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office (PIFWO) on November 30, 2023. The comments indicated that there were no native *Megalagrion* damselflies present at the site but that the stream reach is a known transit corridor for aquatic trust resources, notably native prawns and gobioid fishes. PIFWO noted that embayment water in front of Waiahole is often very turbid, but several large patch reefs are present not far offshore of the stream delta. No recent survey work of the proximal shallow water marine resources off of the mouth of Waiahole Stream is known, but marine surveys fronting Iao Stream on Maui found high densities of corals in the nearshore reefs beyond the reef crest despite high levels of sedimentation and turbidity. PIFWO requested that nearby stream resources be considered if significant stream channel alteration and attendant sediment mobilization occur due to the bridge replacement. However, PIFWO acknowledged that generally bridge replacements should have minimal impact to nearby marine waters if BMPs are implemented.

6. Protected Species and Effects Analysis

The ESA-listed species provided by IPaC that may occur in the action area and be potentially impacted by the proposed project are presented in Table 2. There is no critical habitat listed in the action area (refer to Section 3.4).

Section 6.6 discusses State-listed Threatened and Endangered (T&E) species that may occur in the action area and potentially impacted by the proposed project.

Table 2: ESA-Listed Species that may occur in the Action Area (from IPaC)

Common Name	Scientific Name	ESA Status
MAMMALS		
Hawaiian hoary bat	*Lasiurus cinereus semotus*	Endangered
BIRDS		
Hawaiian Duck	*Anas wyvilliana*	Endangered
Hawaiian Gallinule	*Gallinula galeata sandvicensis*	Endangered
Hawaiian Coot	*Fulica americana alai*	Endangered
Hawaiian Stilt	*Himantopus mexicanus knudseni*	Endangered
Band-rumped Storm-petrel	*Oceanodroma castro* (Hawaii Distinct Population Segment, DPS)	Endangered
Newell's Shearwater	*Puffinus newelli*	Threatened
Hawaiian Petrel	*Pterodroma sandwichensis*	Endangered
Short-tailed Albatross	*Phoebastria (=Diomedea) albatrus*	Endangered
REPTILES		
Green sea turtle	*Chelonia mydas* (Hawaii Distinct Population Segment, DPS)	Threatened
PLANT SPECIES		
akoko	*Euphorbia celastroides var. kaenana*	Endangered
enaena	*Pseudognaphalium sanwicensium var. molokaiense*	Endangered
awiwi	*Schenkia sebaeoides*	Endangered
Carter's Panicgrass	*Panicum fauriei var. carteri*	Endangered
Hilo Ischaemum	*Ischaemum byrone*	Endangered
Hairy purslane (ihi)	*Portulaca villosa*	Endangered
Agrimony sandbur (Kamanomano)	*Cenchrus agrimoniodes*	Endangered
FERNS AND ALLIES		
Lace fern	*Microlepia strigose var. mauiensis*	Endangered

Note:
Source: Pacific Islands Fish and Wildlife Office (PIFWO) 2023. Information for Planning and Consultation (IPaC). Accessed 24 August 2023. Accessible online at: https://ipac.ecosphere.fws.gov/.

6.1 MAMMALS: HAWAIIAN HOARY BAT

The Hawaiian hoary bat is the only native terrestrial mammal in the State of Hawaii. Little is known about the Hawaiian hoary bat on Oahu, but studies on Hawaii Island indicate the species is widespread at all elevations from 33 to 6,562 feet. Further, bat activity varies with season and elevation; the greatest level of activity occurs at elevations below 4,000 feet from April to December. This bat roosts in a wide variety of native and non-native woody vegetation exceeding 15 feet in height (DLNR, 2015, Montoya-Aiona, 2020). They prefer trees with open access for launching into flight and coastlines and forest/pasture boundaries appear to be important foraging areas along with open landscapes, urban areas, and around river mouths near wet forests. Many albizia and monkeypod trees in and around the

APE are greater than 15 feet in height and may serve as roosting habitat for Hawaiian hoary bats. Pupping season is June 1 to September 15; during this time, roost disturbance to females and their flightless pups is greatest.

6.1.1 Potential Effects to Hawaiian Hoary Bats

The windward region of Oahu does not appear to be a significant foraging or roosting area for Hawaiian hoary bats based on a two-year island-wide study on Oahu between June 2017 to June 2019 (Starcevich et al., 2020) and acoustic monitoring results conducted at Marine Corps Base Hawaii between February 2019 and March 2021 (Pinzari et al., 2021). Nonetheless, large trees in the APE may serve as bat habitat. If woody trees or shrubs 15 feet or taller are cleared when bats are pupping, there is a risk that adults may abandon their young or that young bats could inadvertently be harmed or killed during vegetation removal efforts. Additionally, Hawaiian hoary bats forage for insects from as low as three feet to higher than 500 feet above the ground and can become entangled in barbed wire used for fencing (Appendix D; PIFWO, 2023). Effects determination and recommendations to minimize potential impacts to the Hawaiian hoary bat are included in Section 7.1.

6.2 HAWAIIAN SEABIRDS

Four Hawaiian seabird species were identified by IPac for the proposed project. These include three endangered species, the Short-tailed Albatross, Band-rumped Storm-Petrel (DPS), Hawaiian Petrel, and the threatened Newell's Shearwater. The Short-tailed Albatross only visits and breeds on atolls in the Northwestern Hawaiian Islands (VanderWerf, 2012, Deguchi et al., 2017, USFWS, 2020), and therefore no further discussion of effects determination is warranted. While the Band-rumped Storm-Petrel, a nocturnal seabird, has not been documented breeding historically or recently on Oahu Island (USFWS, 2021), effects to these species still may occur to individuals transiting the nearshore waters of the proposed project (Antaky et al., 2020). Hawaiian Petrel and Newell's Shearwater are nocturnal seabirds that have been detected on Oahu historically and recently (between 2021 to 2022) in the Koolau Mountains north and west of the proposed project site (Young et al., 2019; Pacific Rim Conservation, unpublished data). While no nests have been discovered in this region of the island, these two seabird species may be prospecting this area and could potentially be impacted both during construction, and therefore, are discussed further with the Band-rumped Storm-Petrel.

Threats to these species include habitat loss, light pollution, collision risk while commuting between inland nest sites and the ocean at night, fisheries bycatch, and predation from introduced mammalian predators (USFWS, 2021). Street and resort lights, especially in coastal areas, disorient fledglings, causing them to eventually fall to the ground (i.e., fallout) exhausted or increasing their chance of colliding with structures. Once on the ground, fledglings are unable to fly and die by vehicle strikes, predation, starvation or dehydration, and injuries. Because the fledging period for all nocturnal seabirds in Hawaii differs among islands and bird species, the general fallout season throughout the State is considered from September 15 to December 15 (DLNR, 2023).

Effects determination and recommendations to minimize potential impacts to Hawaiian seabirds are included in Section 7.2.

6.2.1 Potential Effects to Nocturnal Hawaiian Seabirds

No effects to Band-rumped Storm-Petrel, Hawaiian Petrel, or Newell's Shearwaters are expected to occur from the proposed project if care is taken with respect to lighting. These three nocturnal species would not be present transiting over or in the vicinity (nearshore waters) of the project's location during daylight hours when construction activities would occur. Construction should not be conducted at

night, nor should bright night-time construction signage be used, during the recognized fallout season from September 15 to December 15.

There is some potential for effects to occur to all three nocturnal seabird species depending upon the aspects of nighttime lighting post-construction. It is assumed that streetlights installed for the project will comply with State law requiring state-operated roads to utilize fully shielded lighting.

6.3 HAWAIIAN WATERBIRDS

Four endangered Hawaiian waterbirds that may occur in the APE include the Hawaiian Stilt, Hawaiian Coot; Hawaiian Gallinule, and Hawaiian Duck (IPaC, 2023). These species use a variety of wetland and open water environments including freshwater/saltwater marshes and ponds, estuaries and mudflats, artificial reservoirs, agricultural lands (primarily taro and stock watering ponds), irrigation and flood control ditches, sewage treatment ponds; in the case of the Hawaiian Duck, montane streams and bogs and, in the case of Hawaiian Stilts, wherever ephemeral or persistent standing water may occur. Each species, however, requires specific wetland requirements for foraging and nesting that can limit or increase the likelihood of their occurrence (Table 3).

Table 3*: Summary of water depths, salinity and vegetative cover used by each of the endangered water birds*

Species	Selected Habitat Characteristics
Hawaiian Coot	• tall emergent vegetation with low stem diversity • optimal depth not reported, probably between gallinule and stilt • fresh and brackish water
Hawaiian Gallinule	• dense, emergent cover • water <2 feet deep
Hawaiian Stilt	• limited and low-growing vegetation • water <0.5 feet deep • fresh water
Hawaiian Duck	• dense terrestrial vegetation • water <0.1 – 0.4 feet deep • fresh water

Source: Engilis and Reid 1994, Reed et al. 2011

The Hawaiian Coot is considered a full species, while the gallinule and stilt are subspecies of North American taxa (VanderWerf, 2012). Hawaiian Coot habitat includes freshwater and brackish ponds, irrigation ditches, and taro fields, with nest initiation primarily between March and September. However, nest building is strongly tied to rainfall because appropriate water levels are critical to nest success. The Hawaiian Coot occurs along portions of east Oahu, including the region of the proposed project.

The Hawaiian Gallinule, with its red blush on the front and sides of the tarsus, is widely distributed on Oahu, with most birds found between Haleiwa and Waimanalo. This waterbird will nest year-round, but primarily between March and August with nesting phenology tied to water levels and the presence of appropriately dense vegetation. Historically, the species occurred at the proposed project site and following the Waiahole stream restoration efforts in 1994, it returned to the area after increased water flow was returned (Tummons, 1996).

On Oahu, the largest numbers of the Hawaiian Stilt are found on the northern and eastern coasts, including the Nuupia ponds at Marine Corps Base Hawaii at Kaneohe. Stilts forage in shallow water with sparse, low-growing vegetation; they utilize different habitat for nesting, including next to or on low

islands with standing fresh, brackish, or saltwater habitats, or open tidal flats. Hawaiian Stilts may occur in marsh habitat at the mouth of the Waiahole Stream.

We did not include Hawaiian Ducks in our analysis because documented sightings are complicated by the presence of Mallard x Hawaiian Duck hybrids; it is difficult if not impossible to distinguish a pure Hawaiian Duck from a Mallard x Hawaiian Duck hybrid in the field without genetic testing, especially females. Pure Hawaiian Ducks are only known to occur and breed on the Kauai Island (Uyehara et al., 2007, Fowler et al., 2009). The two birds observed in the area during surveying are likely Mallard x Hawaiian Duck hybrids. Further, any mitigation taken for coots, gallinules, and stilts, would also apply to ducks, and hence they are addressed, if only by default.

6.3.1 Potential Effects to Hawaiian Waterbirds

The Hawaiian Coot, Gallinule, and Stilt occur in the region and could take advantage of wetland habitats in the Action Area and APE. However, given the current condition of these wetland habitats, i.e., the type and amount of vegetation present and limited open water areas, waterbird use is expected to be low or unlikely, except within the Waiahole Stream where waterflow is consistent and could attract coots and gallinules, or during heavy rainfall events that result in wetland flooding and areas of standing water that could attract stilts.

There are no freshwater ponds or brackish-water marshes within the APE. The mouth of Waiahole Stream, which is outside the action area, contains a small amount of brackish-water marsh habitat that stilts prefer. However, impacts to this habitat from the bridge replacement will not occur because of the BMPs that will be employed to maintain water quality. Four wetlands, labeled A, B, D, and E, were identified during the jurisdictional determination survey (conducted September 2023; Appendix A; Figure 5) and are described in Section 3.3. Suitable habitat for nesting and foraging habitat may occur in wetlands during periods of flooding.

There is some potential for effects to occur to waterbirds during construction. Impacts to Hawaiian waterbirds include water quality (turbidity, siltation, pollution, and debris), habitat disturbance (streambank alterations, vegetation removal), disruption in breeding cycle, noise (stress inducing), predation by introduced land mammals, and collision/entanglement with manmade structures (Appendix D; PIFWO, 2023). Post-construction conditions would be similar to pre-construction conditions, with no additional impacts to these species anticipated.

Effects determination and recommendations to minimize potential impacts to Hawaiian waterbirds are included in Section 8.3.

6.4 REPTILES: GREEN SEA TURTLE

On Oahu, green sea turtles have been observed foraging in Kaneohe Bay (Brill et al., 1995). Nesting by this species has been documented on the east side of Oahu, on the military installations of both Marine Corps Base Hawaii, Kaneohe and Bellows Air Force Station, Bellows Field Beach Park. Female green sea turtles begin to mate in March and lay eggs on sandy beaches between April and September.

Artificial light can affect female sea turtle nesting and sea turtle hatchlings. Sea turtle hatchlings instinctively crawl to the ocean after emerging from their nest, following natural light from the stars and the moon. However, hatchlings can be disoriented if they see artificial light sources, causing them to crawl inland towards those lights. Similar to hatchlings, adult female sea turtles that come ashore at night to nest are also affected by artificial nighttime light sources. Nesting success depends upon several factors including human-related impacts such as pedestrian traffic on beaches, campfires, vehicle headlights, and flashlights, and stochastic events such as storms, high/king tides, and chronic

beach erosion. Artificial lights can cause females to abandon a nesting effort, resulting in a false crawl or a nesting attempt where the female fails to deposit eggs (Witherington, 1992), or causing the turtle to return to water and inadvertently shed her eggs at sea (Witherington and Martin, 2000). In addition, light pollution may cause some adult turtles to use sub-optimal nesting habitat, causing a reduced number of hatchlings to be produced, hatchling survivorship to be compromised, and hatchling sex ratios to be altered. Besides the loss and degradation of nesting, basking, and foraging habitats, threats to green sea turtles include marine debris ingestion and entanglement, illegal poaching, and fibropapilloma tumors which causes imunosuppression (Balazs and Chaloupka, 2004, Thierry et al., 2001).

6.4.1 Potential Effects to Green Sea Turtles

Green sea turtle onshore basking areas and federally proposed critical habitat occurs 1.5 miles to the north of the proposed project on Secret Island and is not likely to be affected by the project. Additionally, foraging areas occur in Kaneohe Bay which the Waiahole Stream empties into (the stream mouth is about 1,500 feet from the existing bridge). The onshore area around Waiahole Stream is not used by turtles for basking or nesting. Water quality impacts (siltation) from the project could affect nearshore waters used for foraging. Construction should not be conducted at night, nor should bright nighttime construction signage be used to prevent impacts to nesting females or hatchlings.

6.5 PLANTS, FERNS AND ALLIES

Seven federally listed endangered plant species (akoko, enaena, awiwi, Carter's panicgrass, Hilo ischaemum, ihi, and kamanomano) and one fern species (*Microlepia strigose var. mauiensis)* were identified on the IPaC species list (Appendix D; PIFWO, 2023). However, the APE consists of mainly introduced species and its close proximity to Kamehameha Highway does not provide pristine habitat in which these endangered species are usually found. No endangered plant species were observed during our September field survey, and the State Department of Land and Natural Resources Division of Forestry and Wildlife (DOFAW) provides a T&E Plants layer that characterizes the action area is as having little or no T&E plant species (DOFAW, 1992).

6.5.1 Potential Effects on Plants Ferns and Allies

No threatened or endangered plant species exists in the action area; therefore, the proposed project will have no effect.

6.6 STATE-LISTED SPECIES OF GREATEST CONSERVATION NEED

State-listed Threatened and Endangered (T&E) species that may occur in the action area and potentially impacted by the proposed project and recommendations are discussed below.

6.6.1 Aquatic Biota

Although a formal stream survey for aquatic biota was not performed as part of the September 12, 2023 survey, correspondence from DAR and PIFWO indicate that amphidromous aquatic biota species could occur within the project area as their presence has been documented in the lower reaches of the Waiahole Stream and embayment (See Section 5.3).

6.6.1.1 Potential Effects to Aquatic Biota and Recommendations

Effects to aquatic biota may occur with any work in or around the stream area. The project will include changes to stream embankments beneath and immediately downstream of the new bridge and removing vegetation and sediment upstream and downstream of the existing bridge. In addition, the

center piers of the existing bridge will be removed down to the mudline to prevent blockages in the stream. Natural stream flow conditions will be improved by these project elements which would benefit aquatic biota in the long-term; however, in the short-term this work will occur in the aquatic environment and could impact aquatic biota in the affected area and downstream during construction without appropriate BMPs.

To protect and minimize impacts to aquatic biota directly adjacent to the project as well as those up and downstream, the following measures are recommended:

- Stream bank areas denuded of vegetation should be planted or covered as quickly as possible to prevent erosion and the vegetation cleared along stream banks should be removed and prevented from falling into the stream/estuary environment;
- Scheduling construction and stream maintenance activities during periods of minimal rainfall;
- Prevent construction materials, petroleum products, debris and landscaping products from falling, blowing or leaching into the aquatic environment;
- Reduce the disturbance and impacts to stream channel bottom substrate types (cobble, boulders, etc.) as much as possible; and
- Implement USFWS standard BMPs for working in or around aquatic environments (Appendix E).

6.6.2 Hawaiian Short-Eared Owl (Pueo)

The Hawaiian Short-Eared Owl (*Asio flammeus sandwichensis*), also known as the pueo, has the potential to occur within or traverse through the project area. The pueo is State-listed as Endangered on Oahu. The pueo occupy a variety of habitats and, unlike other owl species, are active during the day and are seen hovering or soaring over open areas, searching for small mammals. Pueo nest on the ground, so their eggs and young are vulnerable to predation by rats, cats, and the small Indian mongoose. Because of species' broad habitat use and lack of historical population data, key habitat variables are difficult to determine (DLNR, 2015).

6.6.2.1 Potential Effects to Hawaiian Short-Eared Owl

Pueo are unlikely to occur or nest in the action area as there is frequent human presence and disturbance along the highway; therefore, there are no anticipated effects to pueo from the project.

7. Effects Determinations and Recommendations

The effects determination is the conclusion of the analysis of potential direct and indirect effects of the proposed project on listed species and (proposed) critical habitat (green sea turtle). Regulatory guidance was obtained from the "Final Section 7 Consultation Handbook" (USFWS and NMFS, 1998) to make the effects determination and the appropriate recommendations to mitigate potential impacts (Table 4).

Table 4: Summary of ESA-Listed Species, Possible Time/Duration in the Action Area, Effects Determination, and BMPs

Species	Time and Duration in Action Area	Effects*	BMPs to Mitigate Potential Effects
MAMMALS			
Hawaiian Hoary Bat	June 1 to September 15	NLAA	• Woody plants greater than 15 feet tall will not be disturbed, removed, or trimmed during the bat breeding season (June 1 through September 15). • Barbed wire will not be used during or post-construction for fencing, including for staging area(s). • Do not conduct construction activities with artificial lighting during dawn and dusk hours when bats are feeding.
BIRDS			
Band-rumped Storm-petrel (Hawaiian DPS)	Breeding: late April/early May - October/mid-November Fledging: late September - mid-November	NLAA	• Construction work should be conducted during daylight hours. • Nighttime construction will be avoided during the seabird fledging period, September 15 through December 15. • If night work is necessary, construction lights should not use Light Emitting Diode (LED) white light, and light fixtures used must be fully shielded with upglow (light shining above the horizontal) and reflective light (off the ground surface) eliminated. • Post-construction streetlighting will meet State laws for shielding and brightness.
Hawaiian Petrel	Breeding: late February - late-December Fledging: mid-September - late-December	NLAA	
Newell's Shearwater	Breeding: early April - late November Fledging: October - late November	NLAA	
Hawaiian Gallinule	Year round	NLAA	• In areas where waterbirds are present, post and implement reduced speed limits and inform project personnel and contractors about the presence of endangered species on-site. • Implement, maintain, and repair appropriate erosion control methods throughout the entire construction period. Utilize silt fences and socks or sandbags, and design construction routes and equipment area staging to minimize soil erosion and deposits into wetland habitats.

Table 4: Summary of ESA-Listed Species, Possible Time/Duration in the Action Area, Effects Determination, and BMPs

Species	Time and Duration in Action Area	Effects*	BMPs to Mitigate Potential Effects

Hawaiian Coot	Year round	NLAA	• Provide project personnel and contractors with information about the presence of endangered species on-site (i.e., identification cards, wildlife emergency contacts, etc.).
			• As water resources are located within or adjacent to the project site, incorporated applicable water quality best management practices into the project design.
			• Have a biological monitor that is familiar with the species' biology conduct Hawaiian waterbird nest surveys where appropriate habitat occurs within the vicinity of the proposed project site immediately prior to project construction. Repeat surveys again within three days of construction start and after any subsequent delay of work of three or more days (during which the birds may attempt to nest).
			• <u>If a nest or active brood is found</u>:
			  • Contact PIFWO within 48 hours for further guidance.
			  • Establish and maintain a 100-foot buffer around all active nests and/or broods until the chicks have fledged. Do not conduct potentially disruptive activities or habitat alteration within this buffer.
			  • Have a biological monitor that is familiar with the species' biology present on the project site during all construction or earth moving activities until the chicks/ducklings fledge to ensure the waterbirds and nests are not adversely impacted.

Hawaiian Stilt	Year round	NLAA	
REPTILES			
Green Sea Turtle (Hawaiian DPS)	No onshore basking or nesting in Action Area	NLAA	• Implement, maintain, and repair appropriate erosion control methods throughout the entire construction period. Utilize silt fences and socks or sandbags, and design construction routes and staging areas to minimize soil erosion and deposits into stream habitats that lead to the ocean. • As water resources are located within or adjacent to the project site, incorporate applicable water quality best management practices into the project design. • Construction work should be conducted during daylight hours only.
FLORA			
Plant Species/Ferns and Allies	None in Action Area	NE	• Not Applicable

Notes:
**** NLAA** – Not likely to adversely affect; **NE** – No effect*

7.1 HAWAIIAN HOARY BAT

Given that bats have been documented within a six- to eight-mile home range from the APE, there is some potential for this species to be affected. Further, because woody vegetation ≥15 feet in height will be removed for the project, females birthing or pupping could be impacted. However, because the area where the proposed project is located has been demonstrated as an area with little to no bat activity, it is unlikely this species will be adversely affected. The determination for the Hawaiian hoary bat is **may affect, not likely to adversely affect**. The proposed project **may affect** Hawaiian hoary bat because:

- Suitable habitat occurs in the action area;
- A low number of bats have been previously detected within the bat's 6 to 8 mile foraging range; and
- Vegetation clearing of trees over 15 feet will occur for construction of the new bridge and highway corridor.

The proposed project **is not likely to adversely affect the** Hawaiian hoary bat if the following measures are implemented:

- Woody plants greater than 15 feet tall will not be disturbed, removed, or trimmed during the bat breeding season (June 1 through September 15); and
- Barbed wire will not be used during and post-construction for fencing, including for the contractor staging and storage area.

7.2 HAWAIIAN SEABIRDS

The listed Hawaiian seabirds discussed in this report may transit over the site at night or along nearshore coastal waters during the breeding season. The determination for these Hawaiian seabirds (Band-rumped Storm-petrel, Hawaiian Petrel, and Newell's Shearwater) is **may affect, not likely to adversely affect**. The proposed project **may affect** these Hawaiian seabirds because:

- Nocturnal Hawaiian seabirds may transit portions of action area or nearshore waters where they would be exposed to artificial nighttime light sources.

The proposed project **is not likely to adversely affect** nocturnal Hawaiian seabirds if the following measures are implemented:

- Construction work is planned to be conducted during daylight hours only;
- Nighttime construction will be strictly avoided during the seabird fledging period, September 15 through December 15 (USFWS, 2023d);
- If night work is necessary, construction lights should not use Light Emitting Diode (LED) white light, and light fixtures used must be fully shielded with upglow (light shining above the horizontal) and reflective light (off the ground surface) eliminated;
- Post-construction streetlighting will meet State laws for shielding and brightness.

7.3 HAWAIIAN WATERBIRDS

Suitable habitat for waterbirds may occur within the Waiahole Stream where waterflow is consistent or during heavy rainfall events that result in wetland flooding and areas of standing water. In addition, individual waterbirds may fly over or forage in the APE during project construction. Therefore, the

determination for the Hawaiian waterbirds is **may affect, not likely to adversely affect**. The proposed project **may affect** Hawaiian waterbirds because:

- Occasional ponding of portions of the APE may attract waterbirds (i.e., ephemeral ponding in Wetland A, Waiahole Stream); and
- Disturbance from construction activities (i.e., human disturbance, noise, air pollutants) will occur.

The proposed project **is not likely to adversely affect the** Hawaiian waterbirds if the following measures are implemented:

- In areas where waterbirds are known to be present, post and implement reduced speed limits and inform project personnel and contractors about the presence of endangered species on-site.
- Implement, maintain, and repair appropriate erosion control methods throughout the entire construction period. Utilize silt fences and socks or sandbags, and design construction routes and staging areas to minimize soil erosion and deposits into wetland habitats.
- Provide project personnel and contractors with information about the presence of endangered species on-site (i.e., identification cards, wildlife emergency contacts, etc.).
- As water resources are located within or adjacent to the project site, incorporate applicable water quality best management practices (see Appendices E and F) into the project design.
- Have a biological monitor familiar with the species' biology conduct Hawaiian waterbird nest surveys where appropriate habitat occurs within the vicinity of the proposed project site immediately prior to project construction. Repeat surveys again within three days of construction start and after any subsequent delay of work of three or more days (during which the birds may attempt to nest). If a nest or active brood is found:
  - Contact PIFWO within 48 hours for further guidance.
  - Establish and maintain a 100-foot buffer around active nests and/or broods until the chicks have fledged. Do not conduct potentially disruptive activities or habitat alteration within this buffer.
  - Have a biological monitor familiar with the species' biology present on the project site during all construction or earth moving activities until the chicks/ducklings fledge to ensure that Hawaiian waterbirds and nests are not adversely impacted (USFWS, 2023e).

7.4 HAWAIIAN GREEN SEA TURTLE

Suitable habitat for the green sea turtle lies downstream of the action area in nearshore waters. Therefore, the determination for the green sea turtle is **may affect, not likely to adversely affect**. The proposed project **may affect** the green sea turtle because:

- Disturbance from construction activities (e.g., human disturbance, noise, air pollutants) will occur and there may be the potential for water quality impacts (siltation) from the project. Pollutants could enter sea turtle foraging areas in Kaneohe Bay (about 1,500 feet from the existing bridge).
- Nesting female adult turtles and hatchlings can be disoriented by artificial nighttime light sources.

The proposed project **is not likely to adversely affect** the green sea turtle if the following measures are implemented:

- Implement, maintain, and repair appropriate erosion control methods throughout the entire construction period. Utilize silt fences and socks or sandbags, and design construction routes and staging areas to minimize soil erosion and deposits into stream habitats that lead to the ocean.
- As water resources are located within or adjacent to the project site, incorporate applicable water quality best management practices (see Appendices E and F) into the project design.
- Construction work is planned to be conducted during daylight hours only.

7.5 PLANTS AND FERNS AND ALLIES

No threatened or endangered plant species exists in the action area; therefore, the proposed project will have **no effect**.

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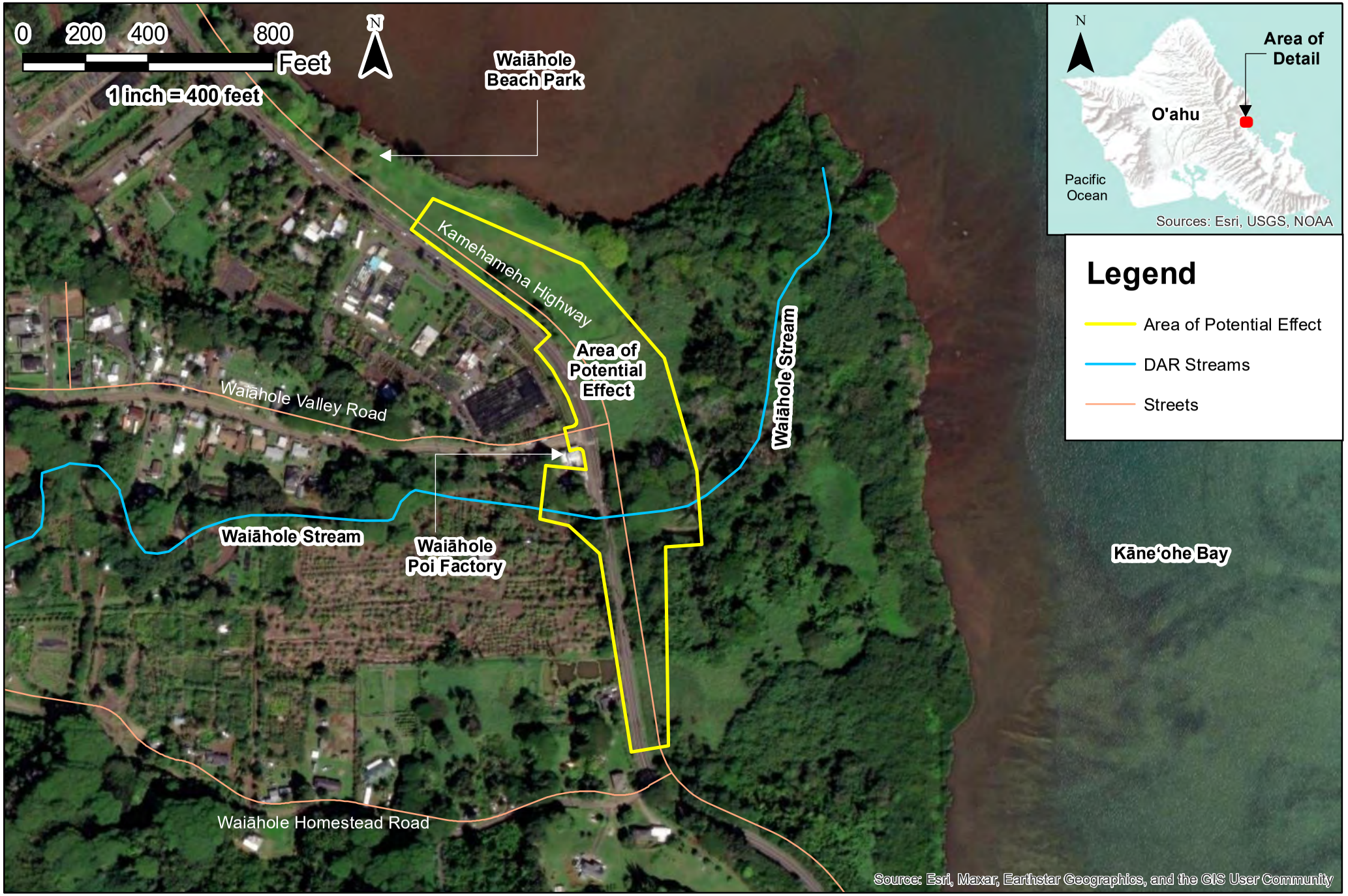
APPENDIX A
Figures



	Vicinity Map	Figure 1
	Waiāhole Bridge Replacement Project Kāneʻohe, Oʻahu, Hawaiʻi	

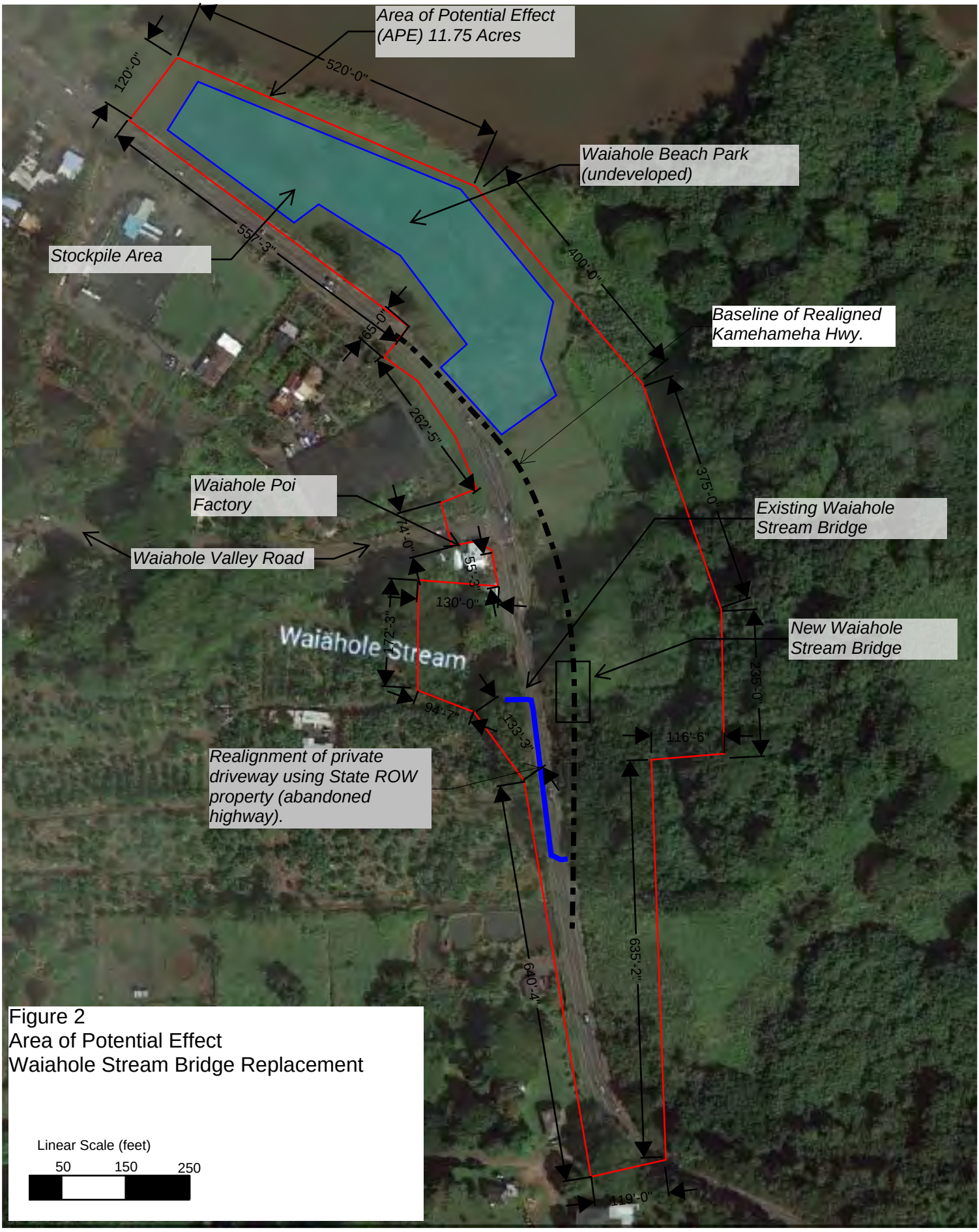


Figure 2
Area of Potential Effect
Waiahole Stream Bridge Replacement

Figure 3a
Soil Map—Island of Oahu, Hawaii
(Waiahole Bridge Replacement)

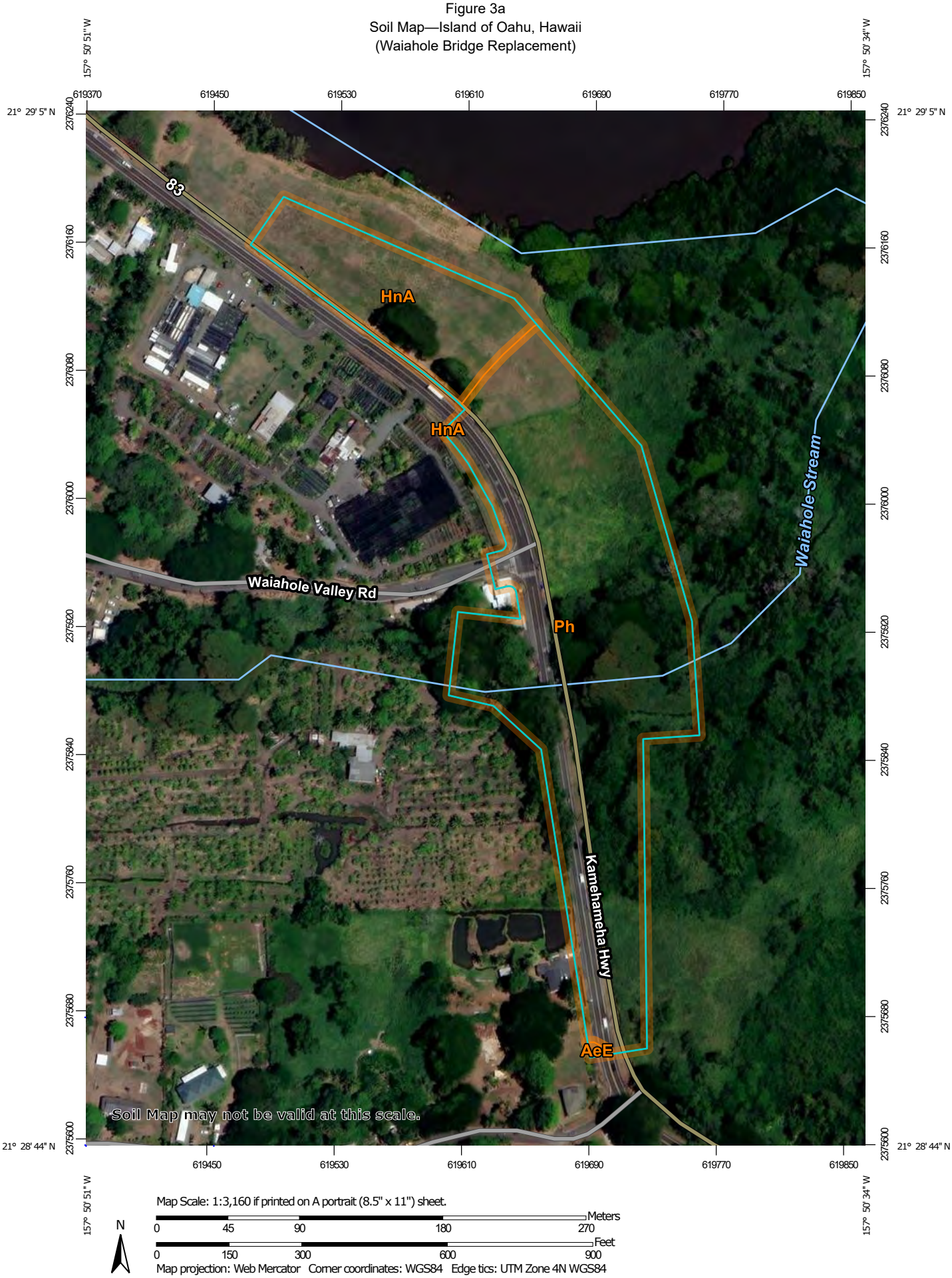


Figure 3b
Soil Map—Island of Oahu, Hawaii
(Waiahole Bridge Replacement)

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Island of Oahu, Hawaii
Survey Area Data: Version 17, Aug 30, 2022

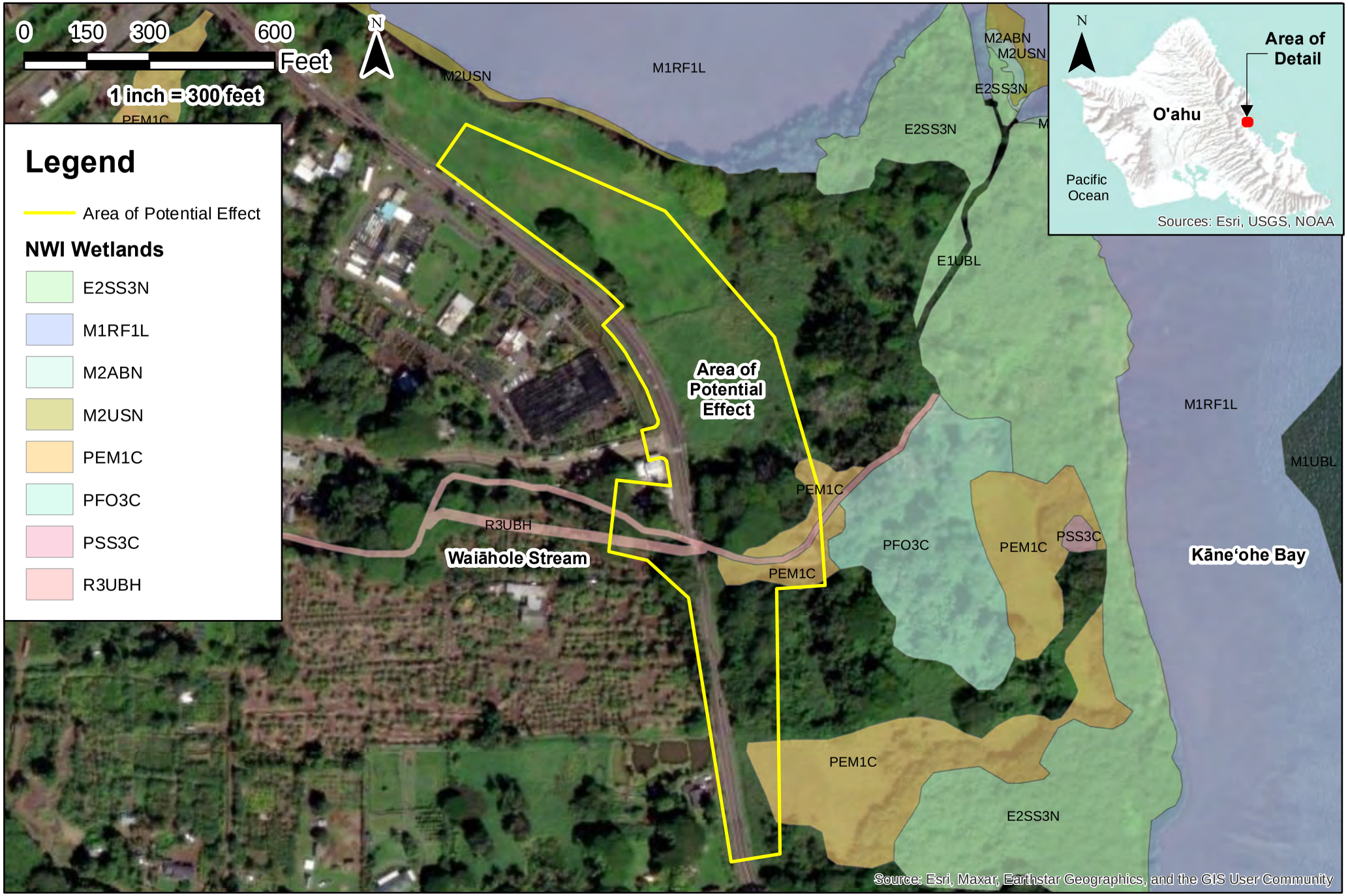
Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 29, 2017—Oct 11, 2020

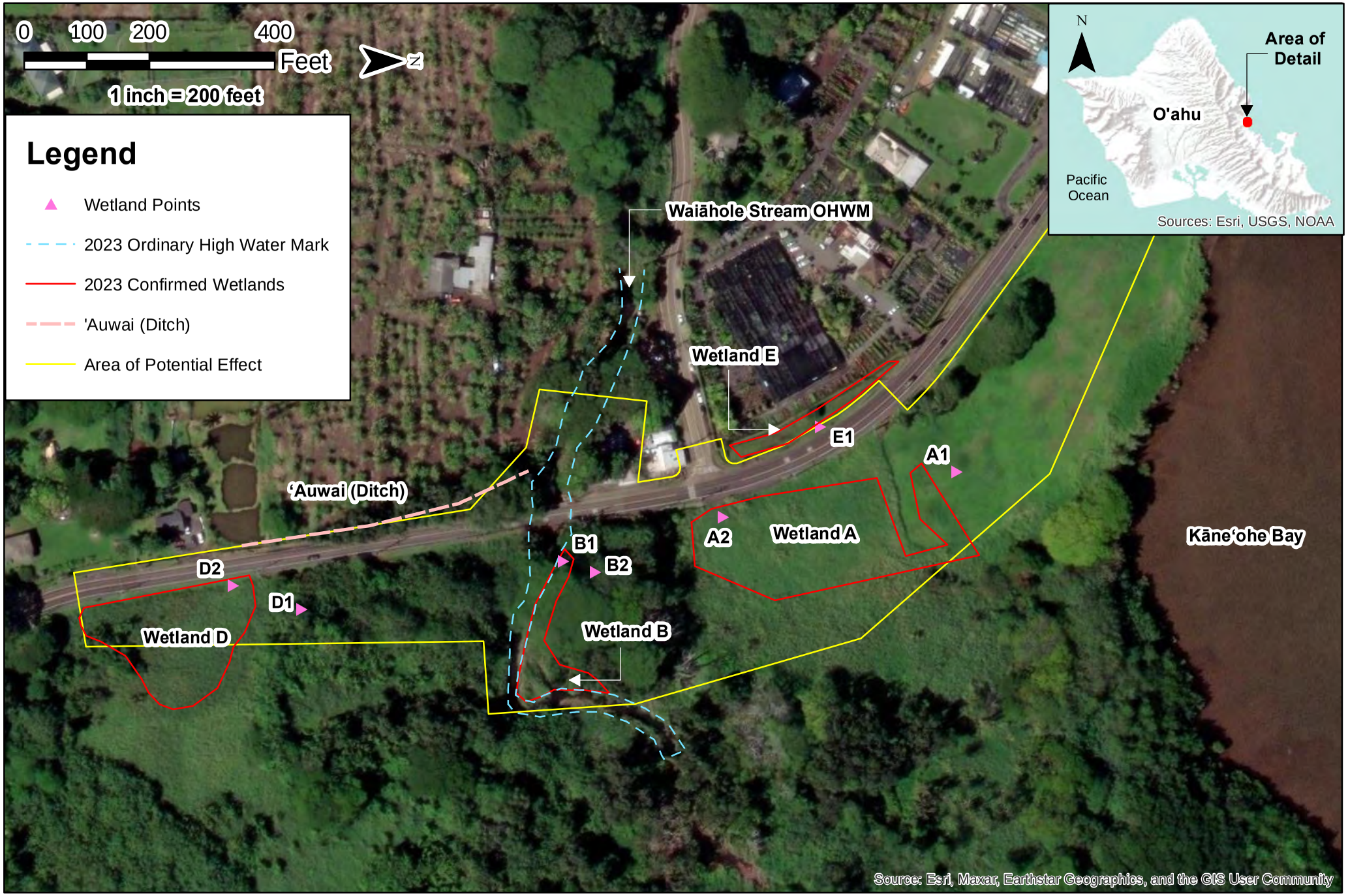
The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

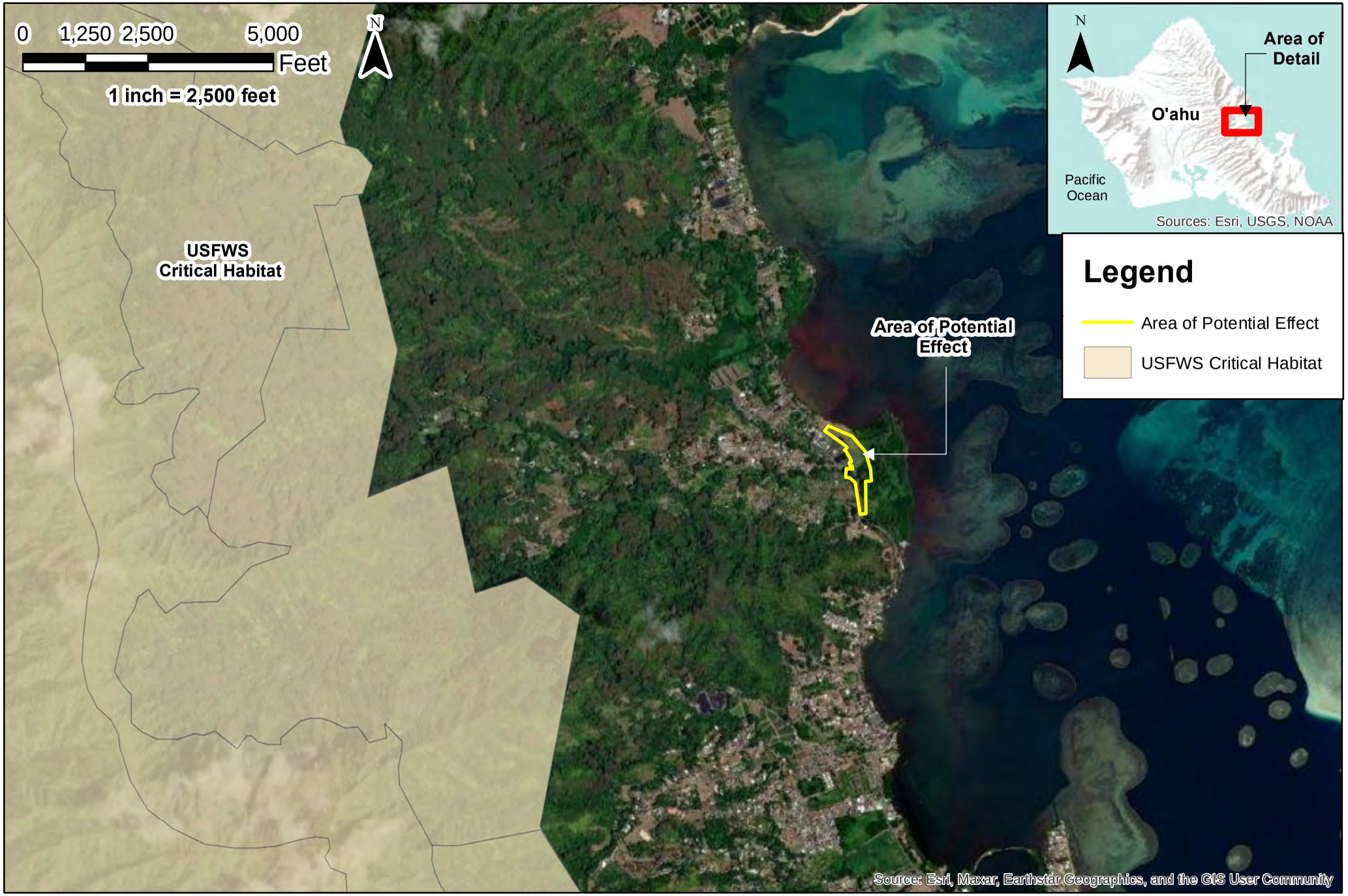
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
AeE	Alaeloa silty clay, older substrate, 15 to 35 percent slopes, MLRA 167	0.0	0.2%
HnA	Hanalei silty clay, 0 to 2 percent slopes, MLRA 167	2.3	20.0%
Ph	Pearl Harbor clay, 0 to 2 percent slopes, MLRA 163	9.3	79.8%
Totals for Area of Interest		**11.6**	**100.0%**



	NWI Wetlands Map	Figure 4
	Waiāhole Bridge Replacement Project Kāneʻohe, Oʻahu, Hawaiʻi	



	2023 Wetland Delineation Results Map	Figure 5
	Waiāhole Bridge Replacement Project Kāne'ohe, O'ahu, Hawai'i	



	USFWS Critical Habitat **Waiāhole Bridge Replacement Project** **Kāneʻohe, Oʻahu, Hawaiʻi**	**Figure 6**

Figure 7: Central North Pacific DPS Green Sea Turtle Proposed Critical Habitat (yellow) for O‘ahu Island in relation to proposed project site (purple circle)

Source: Spectrum News. 2023. Federal agencies propose designating critical habitat for green sea turtles. Environment. Published 20-July-2023. Accessed 21-September-2023. https://spectrumlocalnews.com/hi/hawaii/news/2023/07/19/federal-agencies-propose-designating-critical-habitat-for-green-sea-turtles.

APPENDIX B
Representative Photographs

Waiahole Bridge Replacement Project
Waiahole, Oahu, Hawaii
File No. 0208079-000
Date Photographs Taken: September 12, 2023

No.	Photograph	Description
1		Upstream side of Waiahole Stream bridge, photo taken facing north.
2		Vegetated sediment "island" upstream of the bridge and dominated by elephant grass (*Cenchrus purpureus*) will be dredged and removed to improve stream flow. Photo taken facing north.

No.	Photograph	Description
3		Waiahole Bridge, photo taken facing south. Upstream is on the right side of the photo, and downstream is to the left of the photo.
4		Downstream side of Waiahole Stream bridge, photo taken facing southwest.

No.	Photograph	Description
5		Thick vegetated area on the makai side of Waiahole Bridge, where the new road alignment will be placed. Trees include monkeypod (*Smanea saman*), Java plum (*Syzygium cumini*), and Moluccan albizia (*Falcataria moluccana*).
6		Proposed contractor staging and storage area in Waiahole Beach Park, north of Waiahole Stream. Photo taken facing north.

No.	Photograph	Description
7		Auwai that connects to Waiahole Stream that runs parallel along the mauka side of Kamehameha Highway.
8		Wetland A, a palustrine emergent wetland located within Waiahole Beach Park. Photo of the southern portion of Wetland A, facing east. This area was dominated an extremely thick stand of California grass (*Urochloa mutica)* with standing water several feet below the grass litter.

No.	Photograph	Description
9		Wetland B is a riverine, emergent wetland adjacent to the northern bank of Waiahole Stream and east of Waiahole Bridge.
10		Wetland D, a depressional, palustrine emergent wetland associated with runoff east of Kamehameha Highway that discharges into Wetland D through a culvert. The wetland's west boundary is defined by Kamehameha Highway. The area is a thick monoculture of elephant grass.

No.	Photograph	Description
11		Wetland E is a depressional, palustrine emergent wetland in a frequently mowed area west and directly adjacent to Kamehameha Highway.

APPENDIX C
List of Plant Species Observed and 2016 Arborist Report

APPENDIX C

List of Plant Species Observed

PLANT SPECIES LIST

The following checklist is an inventory of plant species observed within the project area of the proposed Waiahole Bridge Replacement Project on September 12, 2023 by Haley & Aldrich within the project area. The plant names are arranged alphabetically by family and then by species into each of four groups: Gymnosperms, Ferns and Fern Allies (Pteridophytes), Monocots, and Dicots. The taxonomy and nomenclature of the Ferns and Fern Allies follow Palmer (2002), while the gymnosperms and flowering plants, Monocots and Dicots, are in accordance with Wagner *et al*. (1990), Wagner and Herbst (1999), and Staples and Herbst (2005). Recent name changes follow the 2019 Hawaiian Naturalized Vascular Plants Checklist series (Imada 2019).

For each species, the following name is provided:

1. Scientific name with author citation.
2. Common English and/or Hawaiian name(s), when known.
3. Biogeographic status. The following symbols are used:

   I= indigenous= native to the Hawaiian Islands and elsewhere.

   P=Polynesian introduced=species that were introduced by the Polynesian migration to Hawaii, either intentionally or unintentionally, and are now naturalized.

   X=introduced or alien = all those plants brought to the Hawaiian Islands by humans, intentionally or accidentally, after Western contact, that is Cook's arrival in the islands in 1778.

   C=cultivated= plants cultivated for agricultural crops or ornamentals and not documented as naturalized.

SCIENTIFIC NAME	COMMON NAME	STATUS
PTERIDOPHYTES		
ATHYRIACEAE		
Diplazium esculentum (Retz.) Sw.	paca, vegetable fern	X
NEPHROLEPIDACEAE		
Nephrolepis brownii (Desv.) Hovenkamp&Miyam.	Asian swordfern	X
POLYPODIACEAE		
Microsorum grossum (Langsd. & Fisch.) S.B.Andrews	lauae	X
PSILOTACEAE		
Psilotum nudum (L.) P.Beauv.	moa	**I**
THELYPTERIDACEAE		
Christella parasitica (L.) Lev.		X
MONOCOTS		
AGAVACEAE		

SCIENTIFIC NAME	COMMON NAME	STATUS
Cordyline fruticosa (L.) A.Chev.	ki, ti	P
ARACEAE		
Alocasia macrorrhizos (L.) G.Don	ape, elephant's ear plant	P
Colocasia esculenta L.	kalo, taro	P
Diffenbachia maculata (Loddiges_G.Don	spotted dumb cane	X
Epipremnum pinnatum (L.) Engl.	pothos vine	X
Lemna obscura (Austin) Daubs	duckweed	X
Xanthosoma robustum Schott	ape	X
ARECACEAE		
Cocos nucifera L.	coconut	P
COMMELINACEAE		
Commelina diffusa Burm.f.	honohono	X
COSTACEAE		
Costus woodsonii Maas	Indian-head ginger	X
CYPERACEAE		
Cyperus brevifolius (Rottb.) Endl.	kilioopu, green kyllinga	X
Cyperus involucratis Rottb.	Umbrella sedge	X
Cyperus rotundus L.	Nut sedge	X
Cyperus mindorensis (Steud.) Huygh	kilioopu, white kyllinga	X
Fimbristylis ferruginea (L.) Vahl		X
HELICONIACEAE		
Heliconia sp.		X
MUSACEAE		
Musa sp. L.	maia, banana	P
PANDANACEAE		
Pandanus tectorius Parkinson ex Z	hala	I
POACEAE		
Cenchrus purpureus (Schumach.) Morrone	Elephant grass, Napier grass	X
Chloris barbata (L.) Sw.	swollen fingergrass	X
Cynodon dactylon (L.) Pers	manienie	X
Megathyrsus maximus (Jacq.) B.K.Simon & S.W.L. Jacobs	Guinea grass	X
Melinis minutiflora P.Beauv.	molasses grass	X
Melinis repens (Willd.) Zizka	Natal redtop	X
Oplismenus hirtellus (L.) P.Beauv. subsp. *hirtellus*	basketgrass, honohono	X
Paspalum fimbriatum Kunth	Fimbriate paspalum	X
Paspalum conjugatum P.J.Bergius	Hilo grass	X
Paspalum scrobiculatum L.	ricegrass, mauu laiki	I

SCIENTIFIC NAME	COMMON NAME	STATUS
Setaria parviflora (Poir.) Kerguelen	yellow foxtail	X
Sporobolus africanus (Poir.) Robyns & Tournay	Smutgrass	X
Urochloa mutica (Forssk.) T.Q.Nguyen	California grass	X
ZINGIBERACEAE		
Etlingera elatior (Jack) R.M.Sm.	Pink torch ginger	C
DICOTS		
ACANTHACEAE		
Thunbergia fragrans Roxb.	white thunbergia	X
AMARANTHACEAE		
Amaranthus spinosus L.	spiny amaranth	X
ANACARDIACEAE		
Mangifera indica L.	mango	X
APIACEAE		
Centella asiatica (L.) Urb.	Asiatic pennywort	X
ARALIACEAE		
Heptapleurum actinophyllum (Endl.) Lowry & G.M.Plunkett	octopus tree, umbrella tree	X
ASTERACEAE		
Bidens pilosa L.	Spanish needle	X
Crassocephalum crepidioides (Benth.) S.Moore	crassocephalum	X
Emilia fosbergii Nicolson	red pualele	X
Emilia sonchifolia (L.) DC. var. *sonchifolia*	Flora‘s paintbrush	X
Pluchea carolinensis (Jacq.) G. Don	sourbush	X
Sphagneticola trilobata (L.) Pruski	wedelia	X
Synedrella nodiflora (L.) Gaertn.	nodeweed	X
Youngia japonica (L.) DC.	Oriental hawksbeard	X
BIGNONIACEAE		
Spathodea campanulata P. Beauv.	African tulip	X
CANNABACEAE		
Trema orientalis (L.) Blume	gunpowder tree	X
CARYOPHYLLACEAE		
Drymaria cordata (L.) Willd. Ex Roem. & Schult. var. *pacifica* M.Mizush.	pipili, pilipili	X
COMBRETACEAE		
Terminalia catappa L.	tropical almond, false kamani	X

SCIENTIFIC NAME	COMMON NAME	STATUS
CONVOLVULACEAE		
Ipomoea obscura (L.) Ker Gawl		X
Ipomoea violacea L.	white morning glory	X
EUPHORBIACEAE		
Aleurites moluccana (L.) Willd.	kukui	P
Euphorbia hypercifolia L.	graceful spurge	X
Macaranga tanarius (L.) Mull.Arg.		X
Ricinus communis L.	castor bean	X
FABACEAE		
Canavalia cathartica Thouars	maunaloa	X
Chamaecrista nictitans (L.) Moench	partridge pea	X
Desmodium intortum (Mill.) Urb.	tick trefoil	X
Desmodium tortuosum (Sw.) DC.	Florida beggarweed	X
Grona triflora (L.) H.Ohashi & K.Ohashi	tick clover	X
Falcataria moluccana (Miq.) Barenby & J.W.Grimes	Moluccan albizia	X
Leucaena leucocephaa (Lam.) de Wit Subsp. *Leucocephala*	koa haole	X
Mimosa pudica L. var. *unijuga* (Duchass. & Walp.) Griseb.	sensitive plant, sleeping grass	X
Mucuna gigantea (Willd.) DC.	kaee, sea bean	I
Pithecellobium dulce (Roxb.) Benth.	opiuma	X
Samanea saman (Jacq.) Merr.	monkeypod	X
LAURACEAE		
Persea americana	avocado	X
MALVACEAE		
Hibiscus tiliaceus L.	hau	I
Sida acuta Burm.f. subsp. carpinifolia (L.f.) Borss.Waalk.		X
MYRTACEAE		
Syzygium cumini (L.) Skeels	Java plum	X
ONAGRACEAE		
Ludwigia octovalvis (Jacq.) P.H.Raven	primrose willow	P
OXALIDACEAE		
Oxalis corniculata L.	yellow wood sorrel, ihi	I
Oxalis debilis Kunth. *corymbosa* (DC.) Lourteig	pink wood sorrel, ihi pehu	X
PASSIFLORACEAE		
Passiflora edulis Sims	lilikoi, passion fruit	X
PLANTAGINACEAE		

SCIENTIFIC NAME	COMMON NAME	STATUS
Plantago major L.	broad-leaved plantain	X
POLYGALACEAE		
Polygala paniculata L.	milkwort	X
PRIMULACEAE		
Ardisia elliptica Thunb.	shoebutton ardisia	X
RUBIACEAE		
Paederia foetida L.	maile pilau	X
Spermacoce remota Lam.	buttonweed	X
SAPOTACEAE		
Chrysophyllum oliviforme L.	satin leaf	X
STERCULIACEAE		
Waltheria indica L.	uhaloa	I
URTICACEAE		
Pilea microphylla (L.) Liebm.	artillery plant	X
VERBENACEAE		
Citharexylum caudatum L.	fiddlewood	X
Stachytarpheta jamaicensis (L.) Vahl	Jamaican vervain	X

In addition to the above survey conducted in 2023, a botanical survey was conducted in 2016 by an arborist; their report is attached.

Steve Nimz and Associates Inc.
Consulting Arborist Services
PO BOX 10026 Honolulu, Hawaii 96816
Office # (808) 734-5963 Fax # (808) 732-4433
Email: Steve@stevenimz.com

May 31, 2016

Mike Hunnemann
Kai Hawaii
50 S. Beretania Street # C-119C
Honolulu, Hawaii 96813

Re: Waiahole Bridge

Dear Mr. Hunnemann:

The following comments address vegetation impacted by the new by-pass bridge to be installed on the Makai side of the existing Waiahole Bridge.

No native or endangered trees or plants were identified during my site inspection.

One (1) eight-inch diameter, twenty-five foot tall Monkeypod tree may require removal. The tree is a volunteer planting on the edge of the stream.

If you have any questions, please contact my office at 808-734-5963.

Respectfully yours,

Steve Nimz,
ASCA Consulting Arborist
ISA Certified Arborist # WE- 0314AM
ISA PNW Certified Tree Risk Assessor # 419

APPENDIX D
USFWS IPaC Resource List

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Fish And Wildlife Office
300 Ala Moana Boulevard, Box 50088
Honolulu, HI 96850-5000
Phone: (808) 792-9400 Fax: (808) 792-9580

In Reply Refer To: September 19, 2023
Project Code: 2023-0130791
Project Name: Waiahole Bridge Replacement

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened and endangered species, as well as designated critical habitat that may occur within the boundary of your proposed project and that may be affected by project related actions. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Please contact the Service's Pacific Islands Fish and Wildlife Office (PIFWO) at 808-792-9400 if you have any questions regarding your IPaC species list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may adversely affect threatened and endangered species and/or designated critical habitat.

Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a Biological

Evaluation, similar to a Biological Assessment, be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment or Biological Evaluation are described at 50 CFR 402.12.

Due to the significant number of listed species found on each island within PIFWO's regulatory jurisdiction, and the difficulty in accurately mapping ranges for species that we have limited information about, your species list may include more species than if you obtained the list directly from a Service biologist. We recommend you use the species links in IPaC to view the life history, habitat descriptions, and recommended avoidance and minimization measures to assist with your initial determination of whether the species or its habitat may occur within your project area. If appropriate habitat is present for a listed species, we recommend surveys be conducted to determine whether the species is also present. If no surveys are conducted, we err on the side of the species, by regulation, and assume the habitat is occupied. Updated avoidance and minimization measures for plants and animals, best management practices for work in or near aquatic environments, and invasive species biosecurity protocols can be found on the PIFWO website at: https://www.fws.gov/office/pacific-islands-fish-and-wildlife/library.

If a Federal agency determines, based on the Biological Assessment or Biological Evaluation, that a listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at: http://www.fws.gov/endangered/esa-library/index.

Non-federal entities can also use the IPaC generated species list to develop Habitat Conservation Plans (HCP) in accordance with section 10(a)(1)(B) of the Act. We recommend HCP applicants coordinate with the Service early during the HCP development process. For additional information on HCPs, the Habitat Conservation Planning handbook can be found at https://www.fws.gov/sites/default/files/documents/habitat-conservation-planning-handbook-entire.pdf.

Please be aware that wind energy projects should follow the Service’s wind energy guidelines (http://www.fws.gov/windenergy) for minimizing impacts to migratory birds. Listed birds and the Hawaiian hoary bat may also be affected by wind energy development and we recommend development of a Habitat Conservation Plan for those species, as described above. Guidance for minimizing impacts to migratory birds for projects including communications towers can be found at:

- http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers
- http://www.towerkill.com
- http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation actions that benefit threatened and endangered species into their project planning to further the purposes of the Act in accordance with section 7(a)(1). Please include the Consultation Tracking Number associated with your IPaC species list in any

request for consultation or correspondence about your project that you submit to our office. Please feel free to contact us at PIFWO_admin@fws.gov or 808-792-9400 if you need more current information or assistance regarding the potential impacts to federally listed species and federally designated critical habitat.

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Pacific Islands Fish And Wildlife Office
300 Ala Moana Boulevard, Box 50088
Honolulu, HI 96850-5000
(808) 792-9400

PROJECT SUMMARY

Project Code: 2023-0130791
Project Name: Waiahole Bridge Replacement
Project Type: Bridge - Replacement
Project Description: The State of Hawaii, Department of Transportation Highways Division is planning to replace the existing Waiahole Stream Bridge with a new steel bridge that meets current design standards. Due to community concerns about safety along this section of Kamehameha Highway, HDOT has decided to realign approximately 1,000 lineal feet of the highway and construct the new bridge adjacent to the downstream face of the existing bridge. The intersection of Waiahole Valley Road and Kamehameha Highway will be redesigned to accommodate the new highway alignment.

The topography along the proposed new alignment slopes gently downward toward the Waiahole Stream. To maintain the same roadway elevation as the existing highway alignment, structural fill will be placed along a portion of the alignment. The intention is to make the top of new roadway the same elevation as the existing roadway. However, based on the results of the Hydraulic Study, it may be necessary to raise the elevation of the roadway and bridge deck to provide additional vertical clearance beneath the bridge to allow a certain amount of flood waters to pass.

The new bridge will be a prefabricated steel bridge. The abutments will be cast-in-place concrete, supported by deep foundations (drilled shafts). The new bridge will be designed to carry current AASHTO HL-93 design live loads.

During the construction of the new bridge and highway alignment, the existing bridge will remain open to traffic. Once the new bridge and highway are completed the existing bridge will be demolished. Demolition of the existing bridge will include the removal of the center pier down to the mudline.

The abandoned portion of the existing highway alignment will remain as port of HDOT ROW. The private driveway that currently connects to the existing highway alignment will be re-routed and connected to the new alignment at a location where a safe line-of-sight can be achieved.

One objective of this project is to attempt to increase the flood capacity of the stream channel to reduce some of the overtopping of the stream banks. Because the streambanks, both upstream and downstream are low, any reduction in overtopping may not be feasible. The length of the new bridge will be determined by the results of the Hydraulic Study. To further

increase the flow capacity of the stream the heavy vegetation immediately upstream of the existing bridge will be removed as part of this project.

There is a need to realign the overhead utilities to accommodate the new highway alignment. Also, the existing waterlines will need to be moved closer to the new bridge location.

Immediately upstream of the existing bridge, erosion countermeasures will be added to better direct the flow of the stream waters through the bridge opening. Grouted Rubble Paving (GRP) will likely be used as the countermeasure.

An awai is located parallel to the mauka side of the highway that drains into the Waiahole Stream just upstream of the bridge. This awai is outside of the project limits and will not be affected in anyway during construction. Drainage culverts extend beneath the existing highway that are considered as an extension of the awai system. Because of the new highway alignment, the culverts will be extended further beneath the new highway.

Stockpiling during construction will occur in the City and County of Honolulu park area along the makai side of the highway. Because the proposed stockpile area is a county park, access to the shoreline will be provided at all times, with a designated thoroughfare along one side of the park boundary.

Construction of the new bridge is expected to take approximately one year.

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@21.4816994,-157.8447656303319,14z

Counties: Honolulu County, Hawaii

ENDANGERED SPECIES ACT SPECIES

There is a total of 18 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Hawaiian Hoary Bat *Lasiurus cinereus semotus*	Endangered

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/770
General project design guidelines:
https://ipac.ecosphere.fws.gov/project/BA3SXLHIB5APNKE52URXP7KGXA/documents/generated/6477.pdf

BIRDS

NAME	STATUS

Band-rumped Storm-petrel *Oceanodroma castro* — Endangered
- Population: USA (HI)
- No critical habitat has been designated for this species.
- Species profile: https://ecos.fws.gov/ecp/species/1226
- General project design guidelines: https://ipac.ecosphere.fws.gov/project/BA3SXLHIB5APNKE52URXP7KGXA/documents/generated/6939.pdf

Hawaiian Common Gallinule *Gallinula galeata sandvicensis* — Endangered
- No critical habitat has been designated for this species.
- Species profile: https://ecos.fws.gov/ecp/species/6612
- General project design guidelines: https://ipac.ecosphere.fws.gov/project/BA3SXLHIB5APNKE52URXP7KGXA/documents/generated/6934.pdf

Hawaiian Coot *Fulica alai* — Endangered
- No critical habitat has been designated for this species.
- Species profile: https://ecos.fws.gov/ecp/species/7233
- General project design guidelines: https://ipac.ecosphere.fws.gov/project/BA3SXLHIB5APNKE52URXP7KGXA/documents/generated/6934.pdf

Hawaiian Duck *Anas wyvilliana* — Endangered
- No critical habitat has been designated for this species.
- Species profile: https://ecos.fws.gov/ecp/species/7712
- General project design guidelines: https://ipac.ecosphere.fws.gov/project/BA3SXLHIB5APNKE52URXP7KGXA/documents/generated/6934.pdf

Hawaiian Petrel *Pterodroma sandwichensis* — Endangered
- No critical habitat has been designated for this species.
- Species profile: https://ecos.fws.gov/ecp/species/6746
- General project design guidelines: https://ipac.ecosphere.fws.gov/project/BA3SXLHIB5APNKE52URXP7KGXA/documents/generated/6939.pdf

Hawaiian Stilt *Himantopus mexicanus knudseni* — Endangered
- No critical habitat has been designated for this species.
- Species profile: https://ecos.fws.gov/ecp/species/2082
- General project design guidelines: https://ipac.ecosphere.fws.gov/project/BA3SXLHIB5APNKE52URXP7KGXA/documents/generated/6934.pdf

Newell's Townsend's Shearwater *Puffinus auricularis newelli* — Threatened
- No critical habitat has been designated for this species.
- Species profile: https://ecos.fws.gov/ecp/species/2048
- General project design guidelines: https://ipac.ecosphere.fws.gov/project/BA3SXLHIB5APNKE52URXP7KGXA/documents/generated/6939.pdf

NAME	STATUS
Short-tailed Albatross *Phoebastria (=Diomedea) albatrus*	Endangered

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/433

REPTILES

NAME	STATUS
Green Sea Turtle *Chelonia mydas*	Threatened

Population: Central North Pacific DPS
There is **proposed** critical habitat for this species.
Species profile: https://ecos.fws.gov/ecp/species/6199
General project design guidelines:
https://ipac.ecosphere.fws.gov/project/BA3SXLHIB5APNKE52URXP7KGXA/documents/generated/6929.pdf

FLOWERING PLANTS

NAME STATUS

`akoko *Euphorbia celastroides var. kaenana* Endangered
There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/3842
General project design guidelines:
https://ipac.ecosphere.fws.gov/project/BA3SXLHIB5APNKE52URXP7KGXA/documents/generated/7051.pdf

`ena`ena *Pseudognaphalium sandwicensium var. molokaiense* Endangered
No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/5993
General project design guidelines:
https://ipac.ecosphere.fws.gov/project/BA3SXLHIB5APNKE52URXP7KGXA/documents/generated/7051.pdf

Awiwi *Schenkia sebaeoides* Endangered
There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/7103
General project design guidelines:
https://ipac.ecosphere.fws.gov/project/BA3SXLHIB5APNKE52URXP7KGXA/documents/generated/7051.pdf

Carter's Panicgrass *Panicum fauriei var. carteri* Endangered
There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/5578
General project design guidelines:
https://ipac.ecosphere.fws.gov/project/BA3SXLHIB5APNKE52URXP7KGXA/documents/generated/7060.pdf

Hilo Ischaemum *Ischaemum byrone* Endangered
There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/3903
General project design guidelines:
https://ipac.ecosphere.fws.gov/project/BA3SXLHIB5APNKE52URXP7KGXA/documents/generated/7060.pdf

Ihi *Portulaca villosa* Endangered
No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/4886

Kamanomano *Cenchrus agrimonioides* Endangered
There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/2928
General project design guidelines:
https://ipac.ecosphere.fws.gov/project/BA3SXLHIB5APNKE52URXP7KGXA/documents/generated/7051.pdf

FERNS AND ALLIES

NAME	STATUS
Microlepia strigosa var. mauiensis	Endangered

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/4737
General project design guidelines:
https://ipac.ecosphere.fws.gov/project/BA3SXLHIB5APNKE52URXP7KGXA/documents/generated/7051.pdf

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

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Name: Taylor Chock
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LEAD AGENCY CONTACT INFORMATION

Lead Agency: Hawaii Department of Transportation

APPENDIX E
USFWS Best Management Practices for Work In or Around Aquatic Environments – April 2022

Appendix E

U.S. Fish and Wildlife Service
Recommended Standard Best Management Practices

The U.S. Fish and Wildlife Service (USFWS) recommends the following measures to be incorporated into project planning to avoid or minimize impacts to fish and wildlife resources. Best Management Practices (BMPs) include the incorporation of procedures or materials that may be used to reduce either direct or indirect negative impacts to aquatic habitats that result from project construction-related activities. These BMPs are recommended in addition to, and do not over-ride any terms, conditions, or other recommendations prepared by the USFWS, other federal, state or local agencies. If you have questions concerning these BMPs, please contact the USFWS Aquatic Ecosystems Conservation Program at 808-792-9400.

1. Authorized dredging and filling-related activities that may result in the temporary or permanent loss of aquatic habitats should be designed to avoid indirect, negative impacts to aquatic habitats beyond the planned project area.

2. Dredging/filling in the marine environment should be scheduled to avoid coral spawning and recruitment periods, and sea turtle nesting and hatching periods. Because these periods are variable throughout the Pacific islands, we recommend contacting the relevant local, state, or federal fish and wildlife resource agency for site specific guidance.

3. Turbidity and siltation from project-related work should be minimized and contained within the project area by silt containment devices and curtailing work during flooding or adverse tidal and weather conditions. BMPs should be maintained for the life of the construction period until turbidity and siltation within the project area is stabilized. All project construction-related debris and sediment containment devices should be removed and disposed of at an approved site.

4. All project construction-related materials and equipment (dredges, vessels, backhoes, silt curtains, etc.) to be placed in an aquatic environment should be inspected for pollutants including, but not limited to; marine fouling organisms, grease, oil, etc., and cleaned to remove pollutants prior to use. Project related activities should not result in any debris disposal, non-native species introductions, or attraction of non-native pests to the affected or adjacent aquatic or terrestrial habitats. Implementing both a litter-control plan and a Hazard Analysis and Critical Control Point plan (HACCP – see https://www.fws.gov/policy/A1750fw1.html) can help to prevent attraction and introduction of non-native species.

5. Project construction-related materials (fill, revetment rock, pipe, etc.) should not be stockpiled in, or in close proximity to aquatic habitats and should be protected from erosion (*e.g.*, with filter fabric, etc.), to prevent materials from being carried into waters by wind, rain, or high surf.

6. Fueling of project-related vehicles and equipment should take place away from the aquatic environment and a contingency plan to control petroleum products accidentally spilled during the project should be developed. The plan should be retained on site with the person responsible for compliance with the plan. Absorbent pads and containment booms should be stored on-site to facilitate the clean-up of accidental petroleum releases.

7. All deliberately exposed soil or under-layer materials used in the project near water should be protected from erosion and stabilized as soon as possible with geotextile, filter fabric or native or non-invasive vegetation matting, hydro-seeding, etc.

APPENDIX F
Essential Fish Habitat Assessment

APPENDIX F

Essential Fish Habitat Assessment

ESSENTIAL FISH HABITAT IN THE ACTION AREA

Essential Fish Habitat (EFH) is defined as those waters and substrates necessary for federally managed species to spawn, breed, feed, and/or grow to maturity. "Waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish, and may include aquatic areas historically used by fish where appropriate. "Substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities (NMFS 1999).

Waiahole Stream does not include EFH within the immediate project area but the stream flows into Kaneohe Bay, which is approximately 1,500 feet downstream of the downstream extent of the project. The water column and bottom of Kaneohe Bay are defined as EFH and support various life stages for the management unit species (MUS) identified in the Western Pacific Regional Fishery Management Council's Pelagic and Hawaii Archipelago Fishery Ecosystem Plans. Essential fish habitat in Kaneohe Bay includes:

- Bottom fish and seamount groundfish, including Amberjack/Black Jack/Sea Bass, Blue Stripe Snapper/Gray Jobfish, Giant Trevally, Pink Snapper, Red Snapper/Longtail Snapper, Yellowtail Snapper, Snapper, and Silver Jaw Jobfish/Thicklip Trevally.
- Main Hawaii Islands Coral Reef Ecosystem

The assessment of these EFH groups in the project vicinity involved the following:

- Use of the EFH mapping tool provided on the NOAA website.[1]
- Pre-consultation discussion with NMFS on and USFWS on June 5, 2017.
- Consultation comments for the Draft Environmental Assessment from NMFS on November 3, 2017 and from DLNR DAR on March 6, 2018.
- Site visit and Waiahole Stream surveys on June 5-7, 2017 and September 12, 2023.

POTENTIAL EFFECTS TO EFH

The primary construction activities of concern include habitat degradation and pollution and contamination of EFH, which are related to impacts associated with turbidity plumes or chemical spills from sediment removal from the stream and bridge construction. Staging areas within the Waiahole Beach Park will be close to the marine environment, but no in-water work or resulting impacts to EFH will occur from these staging areas due to the use of appropriate construction best management practices (BMPs). The only in-water work for the project will occur in the immediate vicinity of the Waiahole bridge, which is approximately 1,500 feet upstream of EFH and from where the stream is tidally influenced (i.e., estuary).

A temporary increase in turbidity or sediment can have adverse effects on fish (Israel and Klimley, 2008), corals, and their habitat. Turbidity may increase physiological stress of fish and coral polyps, result in

[1] NOAA, 2023. EFH Mapper. Accessed 5 October 2023. Available online at: https://www.habitat.noaa.gov/apps/efhmapper/efhreport/.

physical injury, limit the ability of fish to forage, and potentially displace rearing juvenile fish (Bisson and Bilby, 1982; Israel and Klimley, 2008). For coral reef ecosystems, high levels of sediment or turbidity in the water column can both limit the potential for zooxanthellae to photosynthesize and reduce the extent to which coral polyps can filter feed. Elevated levels of total nitrogen and phosphorous in the water can lead to eutrophication and plankton blooms, which may deleteriously affect corals. Environmental stress caused by poor water quality can lower reproductive success and may account for low productivity rates of both fish and corals.

The project incorporates BMPs for erosion, sediment control, and chemical spills that would reduce the potential for turbidity or chemicals to enter the stream or be transferred downstream (See Section 2.4, Section 7, and Appendix E for project BMPs). Within the wetted channel, the center piers of the existing bridge will be removed down to the mudline to allow for improved flow in the stream. Former bridge abutments (upstream of the existing bridge) and the existing bridge abutments will remain for the purpose of providing erosion control for the embankments, and for the preservation of bridge elements with historic value. The project will remove vegetation and stream sediment upstream and downstream of the existing bridge to provide a positive stream grade and improved hydraulic flow. The stream embankments beneath the new bridge and immediately downstream of the bridge will be regraded to increase water flow through the channel. Scour protection and erosion countermeasures will be added to the embankments to provide long-term stability. Work conducted to remove the existing mid-channel sediment island and regrade the streambanks below the OHWM line would be isolated by a dewatering BMPs to direct stream flow around the work area. Controls would be removed following in-water or in-channel work. Contractor staging and storage areas in Waiahole Beach Park would be set back at least 60 feet from the water's edge and include appropriate construction BMPs to prevent sediment from entering the ocean.

EFH EFFECT DETERMINATION

Bridge replacement and sediment removal may cause minor, temporary increases in turbidity in Waiahole Stream that could reach EFH downstream. However, with BMPs in place, the possibility of turbidity reaching EFH is unlikely. No long-term loss of shallow littoral or intertidal habitats will occur from the project. Thus, this project will have **no adverse effect** to EFH.

EFH Mapper Report

EFH Data Notice

Essential Fish Habitat (EFH) is defined by textual descriptions contained in the fishery management plans developed by the regional fishery management councils. In most cases mapping data can not fully represent the complexity of the habitats that make up EFH. This report should be used for general interest queries only and should not be interpreted as a definitive evaluation of EFH at this location. A location-specific evaluation of EFH for any official purposes must be performed by a regional expert. Please refer to the following links for the appropriate regional resources.

Pacific Islands Regional Office

EFH

Link	Data Caveats	Species/Management Unit	Lifestage(s) Found at Location	Management Council	FMP
		Amberjack / Black Jack / Sea Bass	Eggs, Post-Hatch	Western Pacific	Bottomfish and Seamount Groundfish
		Blue Stripe Snapper / Gray Jobfish	Eggs, Post-Hatch, Post-Settlement/Sub-Adult/Adult	Western Pacific	Bottomfish and Seamount Groundfish
		Giant Trevally	Eggs, Post-Hatch, Post-Settlement/Sub-Adult/Adult	Western Pacific	Bottomfish and Seamount Groundfish
		Main Hawaiian Islands Coral Reef Ecosystem	ALL	Western Pacific	
		Pink Snapper	Eggs, Post-Hatch	Western Pacific	Bottomfish and Seamount Groundfish
		Red Snapper / Longtail Snapper / Yellowtail Snapper / Pink Snapper / Snapper	Eggs, Post-Hatch	Western Pacific	Bottomfish and Seamount Groundfish
		Silver Jaw Jobfish / Thicklip Trevally	Eggs, Post-Hatch	Western Pacific	Bottomfish and Seamount Groundfish

Pacific Salmon EFH

No Pacific Salmon Essential Fish Habitat (EFH) were identified at the report location.

Atlantic Salmon

No Atlantic Salmon were identified at the report location.

HAPCs

No Habitat Areas of Particular Concern (HAPC) were identified at the report location.

EFH Areas Protected from Fishing

No EFH Areas Protected from Fishing (EFHA) were identified at the report location.

Spatial data does not currently exist for all the managed species in this area. The following is a list of species or management units for which there is no spatial data.
****For links to all EFH text descriptions see the complete data inventory: open data inventory -->**

Albacore - South Pacific,
Baker Island,
Bigeye Scad - Hawaiian Archipelago,
Black Coral - Au'Au Bed,
Black Marlin - Pacific,
CNMI Saipan,
Crustaceans,
Fagatele Bay,
Guam Cocos Lagoon,
Guam Haputo Point,
Guam Jade Shoals,
Guam Orote Point,
Guam Ritidian Point,
Hawaii All CRAMP sites,
Hawaii All long term research sites,
Hawaii Kawaihae Harbor-Old Kona Airport,
Hawaii Kealakekua,
Hawaii Lapakahi Bay,
Hawaii Pauko Bay & Reef,
Hawaii Waialea Bay,
Howard Island,
Indo-Pacific Blue Marlin - Pacific,
Jarvis Island,
Johnson Atoll,
Kauai,
Kaula Rock,
Kawakawa - Tropical Pacific,
Kingman Reef,
Kona Crab - Hawaiian Archipelago,
Lanai Five Needles,
Lanai Halope Bay,
Lanai Manele Bay,
Lobster Complex - Northwestern Hawaiian Islands,
Lobster Complex - other than Northwestern Hawaiian Islands,
Longfin Mako Shark - North Pacific,
Mackerel Scad - Hawaiian Archipelago,
Maui Ahihiki Kinau Natural Area Reserve,
Maui Honolua-Mokuleia Bay,
Maui Molokini,
Maui Olowalo Reef Area,
Molokai,
Moonfish (Opah) - Pacific,
Niihau,
NWHI FFS,
NWHI HAPC 1,
NWHI Laysan,
NWHI Midway,

Spatial data does not currently exist for all the managed species in this area. The following is a list of species or management units for which there is no spatial data.
****For links to all EFH text descriptions see the complete data inventory: open data inventory -->**

Oahu Kaena Point,
Oahu Kahe Reef,
Oahu Kaneohe Bay,
Oahu Makapuu Head/Tide Pool Reef Area,
Oahu Pupukea,
Oahu Shark's Cove,
Oahu Waikiki,
Oceanic Whitetip Shark - Tropical Pacific,
Oilfish Family - Pacific,
Other Tuna Relatives - Tropical Pacific,
Palmyra Atoll,
Pelagics,
Pomfrets - Pacific,
Precious Coral-Auau Channel,
Precious Coral-Brooks Banks bed,
Precious Coral-Makapuu bed,
Precious Corals Multi-Species Complex - Conditional Beds,
Precious Corals Multi-Species Complex - Makapu'u Bed,
Precious Coral-Wespac bed,
Sailfish - Pacific,
Salmon Shark - North Pacific,
Samoa Aua Transect,
Samoa Aunuu Island,
Samoa Larsen Bay,
Samoa Pago Pago,
Samoa Rose Atoll,
Samoa South Coast Ofu,
Samoa Steps Point,
Samoa Tua Island,
Seamount Groundfish Complex - Hancock Seamount,
Shortbill Spearfish - Pacific,
Silky Shark - Tropical Pacific,
Skipjack Tuna - Central Western Pacific,
Striped Marlin - Central Western Pacific,
Yellowfin Tuna - Central Western Pacific,
Wake Atoll,
Wahoo - Pacific

APPENDIX E

Archaeological Inventory Survey for the Waiāhole Bridge Replacement Project

TMKs: (1) 4-8-001, 002,008,009

Waiāhole Ahupua‘a
Ko‘olaupoko District
Island of O‘ahu

DRAFT VERSION

Prepared By:
Carol Oordt, M.A.
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Proposing Agency:
State of Hawai‘i Department of Transportation,
Highways Division

January 2024

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ASM Project Number 28290.00

An Archaeological Inventory Survey for the Waiāhole Bridge Replacement Project

TMKs: TMKs: (1) 4-8-001, 002,008,009

Waiāhole Ahupuaʻa
Koʻolaupoko District
Island of Oʻahu

ASM affiliates

EXECUTIVE SUMMARY

At the request of KAI Hawaii, Inc. on behalf of the State of Hawai‘i Department of Transportation (HDOT), Highways Division, ASM Affiliates has prepared this Archaeological Inventory Survey (AIS) as part of an Environmental Assessment (EA) in support of the Kamehameha Highway, Waiāhole Bridge Replacement project (Project No. BR-083-1[088]). The project area is comprised of 15.7 acres including portions of TMKs: (1) 4-8-001:010, 002:001, 008:018 and :023, and 009:001, and is located where Kamehameha Highway crosses Waiāhole Stream in the *ahupua‘a* of Waiāhole, Ko‘olaupoko District, island of Oahu.

The current document is intended to provide support for the environmental documentation being prepared to comply with Hawai‘i Revised Statues (HRS) Chapter 343 and expected permitting applications in anticipation of the DLNR-SHPD HRS Chapter 6E-8 review of the proposed project. This study was undertaken in accordance with Hawai‘i Administrative Rules (HAR) §13–275 and was performed in compliance with the *Rules Governing Minimal Standards for Archaeological Inventory Surveys and Reports* as contained in HAR §13–276. Compliance with the above standards is sufficient for meeting the initial historic preservation review process requirements of both the Department of Land and Natural Resources and the City and County of Honolulu Department of Planning and Permitting.

Fieldwork for the current study was conducted on October 9th, October 10th, November 28th, and December 5th by Nick Belluzzo, M.A. (Principal Investigator), Carol Oordt, M.A., John Meyer, B.A., Evan Ryder, B.A., Rancestan DeRego-Cabarloc, B.A., Kevin Pico, B.A., and Keeley Toledo, B.A. Fieldwork consisted of an intensive pedestrian survey of the majority of the ground surface of the project area. Several areas were not surveyed due to the presence of dense cane grass fields which prevented any kind of visual inspection of the ground surface and was determined unsafe to survey through. Additionally, three shovel test pits (STP) were manually excavated to determine the potential for subsurface cultural layers or materials within the project area. However, due to the heavy ground saturation, ground water prevented continued testing.

During the pedestrian survey, two previously recorded features and four previously undocumented features associated with SIHP # 50-80-10-6758, a former pond field, were identified. The features consisted of two *‘auwai*, an earthen berm, and three culverts. In addition, two previously undocumented historic properties, including Waiāhole Stream Bridge and a concrete foundation, were identified. The concrete foundation was evaluated as not significant and HDOT will be providing a separate evaluation of significance and determination of effect for the Waiāhole Bridge.

With respect to the historic preservation review process of both the Department of Land and Natural Resources–State Historic Preservation Division (DLNR–SHPD) and HDOT, our recommendation is that the project will result in an effect, with agreed upon mitigation commitment in the form of a preservation and restoration plan and data recovery in the form of archaeological monitoring for SIHP # 50-80-10-6758. Additionally, it is recommended that on-site archaeological monitoring for identification purposes all ground disturbing activities be conducted pursuant to HAR §13-279-3.

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1. INTRODUCTION

At the request of KAI Hawaii, Inc. on behalf of the State of Hawai‘i Department of Transportation (HDOT), Highways Division, ASM Affiliates has prepared this Archaeological Inventory Survey (AIS) as part of an Environmental Assessment (EA) in support of the Kamehameha Highway, Waiāhole Bridge Replacement project (Project No. BR-083-1[088]). The project area is comprised of 15.7 acres including portions of TMKs: (1) 4-8-001: 010, 002:001, 008:018 and :023, and 009:001, and is located where Kamehameha Highway crosses Waiāhole Stream in the *ahupua‘a* of Waiāhole, Ko‘olaupoko District, island of Oahu (Figure 1 through 3).

The current document is intended to provide support for the environmental documentation being prepared to comply with Hawai‘i Revised Statues (HRS) Chapter 343 and expected permitting applications in anticipation of the DLNR-SHPD HRS Chapter 6E-8 review of the proposed project. This study was undertaken in accordance with Hawai‘i Administrative Rules (HAR) §13–275 and was performed in compliance with the *Rules Governing Minimal Standards for Archaeological Inventory Surveys and Reports* as contained in HAR §13–276. Compliance with the above standards is sufficient for meeting the initial historic preservation review process requirements of both the Department of Land and Natural Resources and the City and County of Honolulu Department of Planning and Permitting.

This report contains background information describing the location and environment of the project area, a brief culture-historical context for the project area, a summary of the previous archaeological work conducted in the vicinity of the subject parcel, an explanation of the survey methods, a detailed description of the encountered historic property, along with interpretation, significance evaluations, and proposed treatment recommendations for the identified site. Also presented is a determination of the effect that the proposed development will have on that resource.

PROJECT AREA DESCRIPTION AND PROPOSED PROJECT

The project area is comprised of approximately 15.7 acres and situated along a 0.5-mile section of Kamehameha Highway in Waiāhole (Figure 1 through 3). The portions of the project area situated *makai* of Kamehameha Highway (Figures 4 through 6) are undeveloped and include land owned by the City and County of Honolulu. A City and County park with shoreline access occupies the most northern portion of project area (Figure 4) while several areas of dense cane grasses exist in the north central and southern portions of the project area (Figure 5 and 6). The central portion of the project area, *makai* of the highway, is characterized by a jungle and sporadic areas of dense cane grasses (Figure 7). Waiāhole Stream cuts through the central portion of the project area (Figure 8). The portion of the project area located north of the extant bridge and on the *mauka* side of the highway is occupied by businesses and Waiāhole Valley Road (Figure 9). The project area is located on the coast at an elevation roughly between 9 and 26 feet above sea level. Vegetation within the project area is dominated by non-native species such as monkeypod (*Pithecellobium dulce*) and gunpowder trees (*Trema orientalis*), ironwood (*Casuarina equisetifolia*), breadfruit (*Artocarpus altilis*), *hau* (*Hibiscus tiliaceus*), *koa haole* (*Leucaena leucocephala*), and coconut palms (*Cocos nucifera*), and multiple invasive grass and weed species; as well as some *ti* (*Cordyline fruticose*), *‘ape* (*Alocasia macrorrhiza*), and *kalo* (*Colocasia esculenta*).

The geology underlying the project area is mapped as Alluvium (Qa) (Sherrod et al. 2007) (Figure 10). The soils in the southern portion of the project area are predominantly mapped as Pearl Harbor clay (Ph), while the soils in the northern portion are mapped as Hanalei silty clay with slopes of 0 to 2 percent (Soil Survey Staff 2022) (Figure 11).

Pearl Harbor clays are found in low coastal plains adjacent to the ocean and in level areas. Ph soils are typically used for sugarcane, taro, banana cultivation, and pasture (Foote et al. 1972:112–113). Hanalei silty clay with slopes of 0 to 2 percent are located in flood plains and stream bottoms and like Ph soils, HnA soils are often used for taro, pasture, and sugarcane (Foote et al. 1972:38). The project area receives a mean annual rainfall of approximately 146.9 millimeters (mm) (57.86 inches) of rain with most of the rain occurring during the winter months. The most rain typically occurs in March (196.7 mm/7.74 inches), and the least rain occurs in June (69.8 mm/ 2.75 inches) (Giambelluca et al. 2013).

The extant Waiāhole Bridge (Bridge Number 003000830303459) is a concrete tee beam bridge that comprises two lanes for vehicular travel and measures roughly 66 feet long by 26 feet wide (MKE Associates LLC and Fung Associates, Inc 2013:4–244) (Figures 12 through 15). A wooden pedestrian bridge connected to the outside of the bridge railing spans Waiāhole Stream on the *mauka* side of the bridge (Figure 16). The bridge was constructed in 1922 with alterations made to the structure in 1968. In 2013, the State Historic Bridge Inventory and Evaluation conducted by MKE Associates LLC and Fung Associates, Inc determined that Waiāhole Bridge is generally in good condition with its material intact. Further, they conclude the bridge is a good example of reinforced concrete bridges from the 1920 and its use of materials, method of construction, craftsmanship and design is typical of that period (MKE Associates LLC and Fung Associates, Inc 2013:4–244). Therefore, they evaluated the bridge as eligible for the National Register of Historic Places (NRHP) and the Hawaii Register of Historic Places (HRHP) under Criterion C for its association with early developments in concrete bridge construction in Hawai‘i.

Recent evaluations of Waiāhole Bridge have identified major safety, hydraulic, and structural concerns. The lack of road shoulders on the extant bridge creates unsafe conditions for vehicles and cyclists who share the road, and limits foot traffic to the *mauka* side of Waiāhole Stream. The waters of the perennial Waiāhole Stream (Figures 17) currently flows beneath the bridge through the spaces between the concrete abutments and multi-column bent (see Figure 15). The extant bridge is hydraulically insufficient, as debris often clogs the openings beneath the bridge, which limits stream flow and results in flooding events in which water covers the embankments and the bridge. The extant Waiāhole Bridge is considered structurally deficient and functionally obsolete due to the settlement of the south abutment and resultant sloping of the bridge parapet. This sloping has necessitated the periodically laying of asphalt cement to level out the roadway and maintain the bridge.

The proposed bridge replacement project will replace the Waiāhole Bridge with a new steel bridge that meets modern design standards (Figures 18 and 19). The new bridge will be constructed adjacent to the downstream face of the existing bridge and 1,000 lineal feet of the highway will be realigned to accommodate the new bridge and to address safety concerns with the current highway alignment. The project proposes to infill portions of the new alignment, so the new roadway is at the same elevation as the existing roadway. The existing roadway will remain as a part of the HDOT right of way and the private driveways that connect to the existing highway will be rerouted to connect to the new alignment. In addition, the project proposed to remove the center piers of the existing Waiāhole Bridge to allow for better water flow. The original bridge abutments, located upstream of the existing bridge, as well as the current bridge abutments will remain in place to provide erosion control for the embankments and to preserve the historic elements of the bridge. Vegetation and sediment will be removed from upstream and downstream of the bridges to improve hydraulic flow. During the construction of the new bridge and the realignment of the highway, the existing bridge and roadway will remain open to traffic. Stockpiling for the project will occurring *makai* of the highway in the park area located in the north portion of the project area.

Figure 1. project area location on portion of 2017 USGS Kaneohe quadrangle 7.5-minute topographic map.

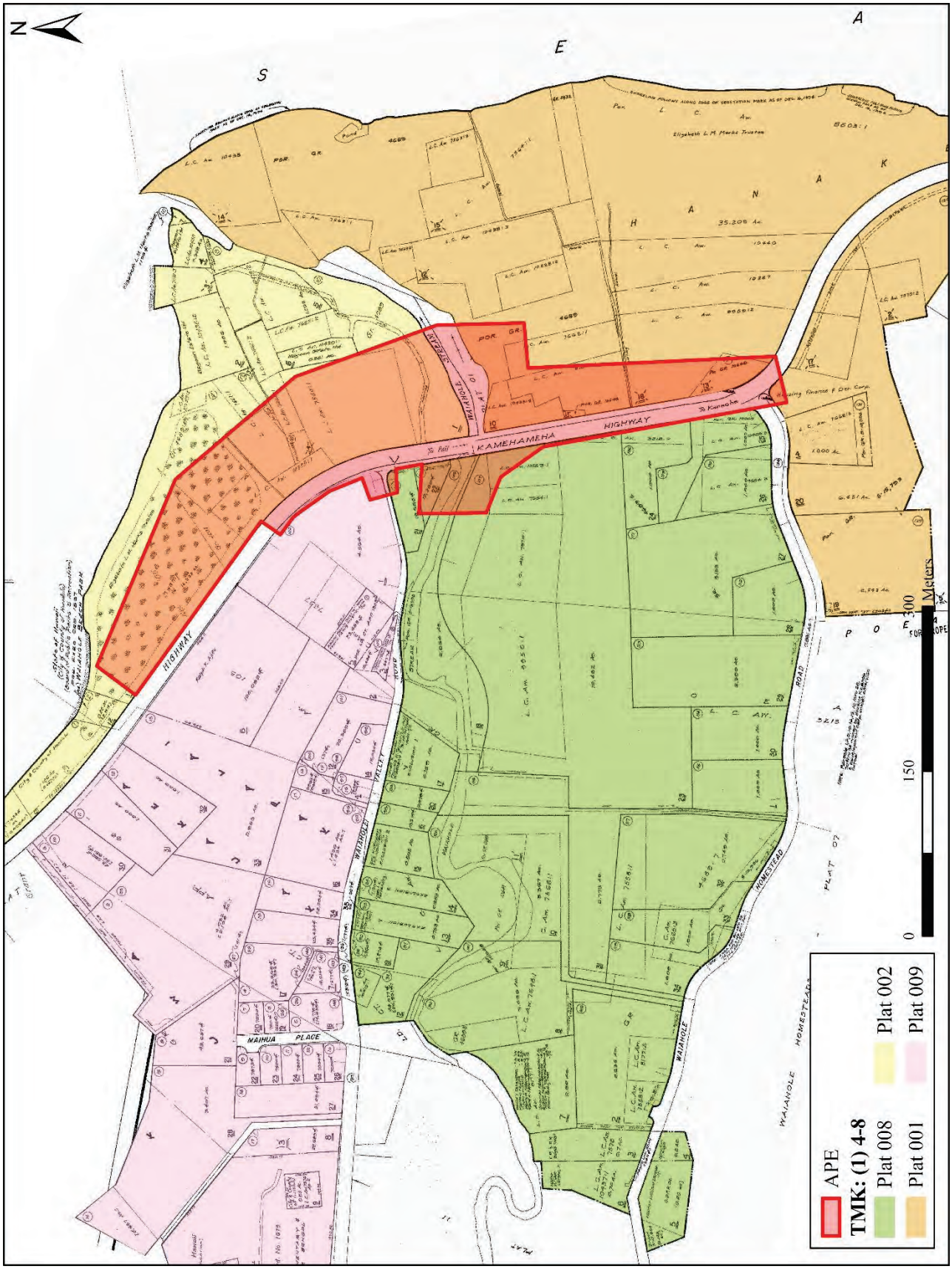

Figure 2. Compilation of TMK plat maps depicting TMK: (1) 4-8: 001, 002, 008 and 009 .

Figure 3. Aerial satellite image of the project area

Figure 4. Northern portion of project area, view to the north.

Figure 5. Cane grass field located in the north central portion of project area *makai* of Kamehameha Highway, view to the east.

Figure 6. Cane grass located in the southern portion of project area *makai* of Kamehameha Highway, view to the southeast.

Figure 7. Example of vegetation in central portion of project area *makai* of Kamehameha Highway.

Figure 8. Waiāhole Stream, view to the southeast.

Figure 9. Kamehameha Highway, Waiāhole Bridge and Waiāhole Poi Factory (view to the northwest).

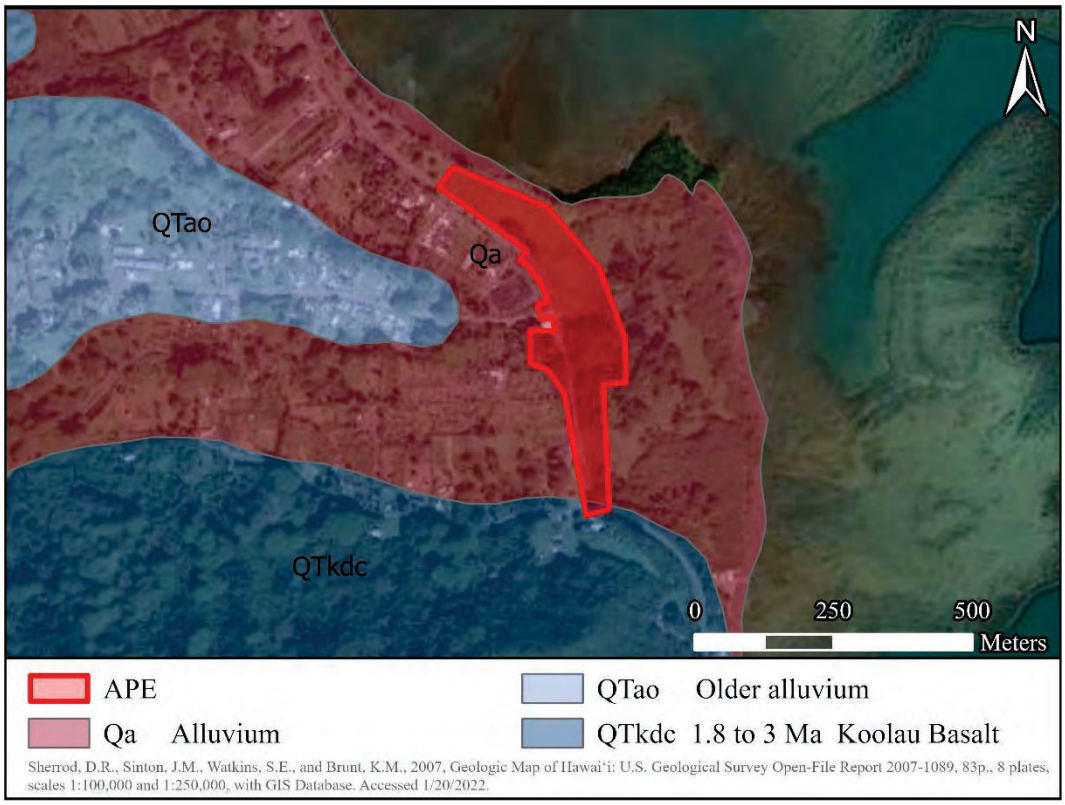

Figure 10. Geology in the vicinity of the project area.

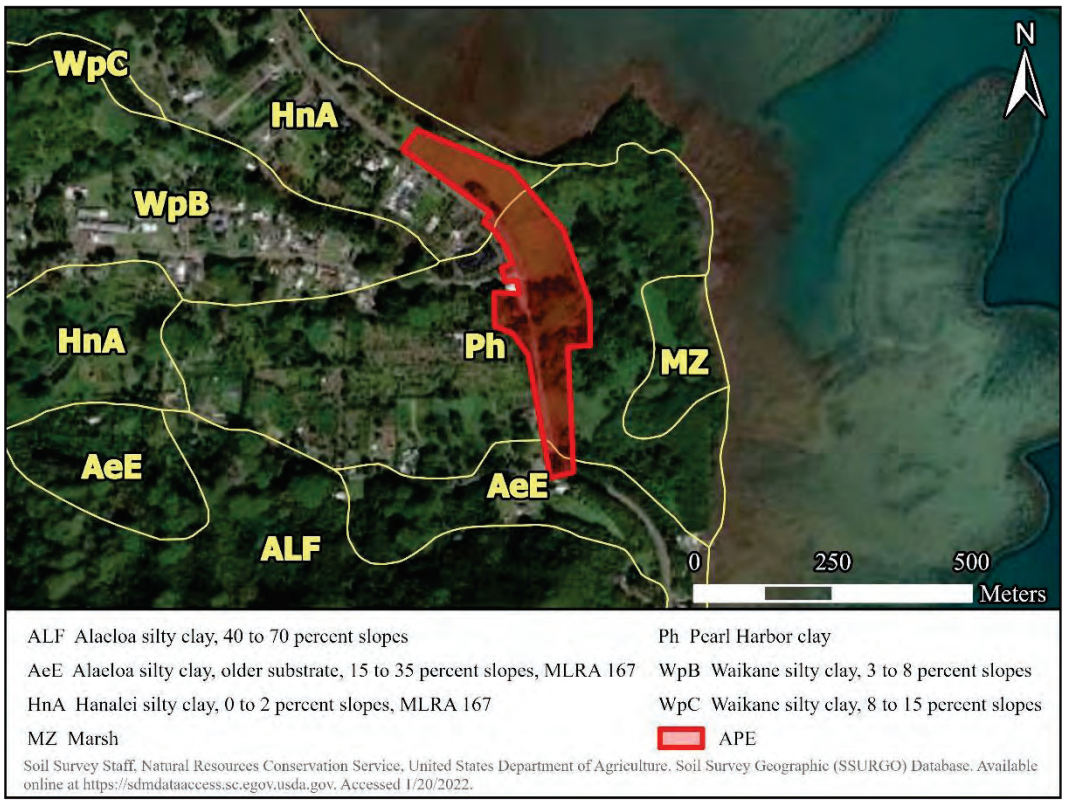

Figure 11. Soils in the vicinity of the project area

Figure 12. Waiāhole Bridge, view to the northeast.

Figure 13. Kamehameha Highway and Waiāhole Bridge, view to the southeast.

Figure 14. *Makai* side of Waiāhole Bridge, view to the northwest.

Figure 15. *Mauka* side of Waiāhole Bridge, view to the northeast.

Figure 16. Pedestrian bridge on *mauka* side of Waiāhole Bridge with Waiāhole Poi Factory beyond, view to the north.

Figure 17. View from pedestrian bridge of Waiāhole Stream on the *makai* side of Kamehameha Highway, view to the southeast.

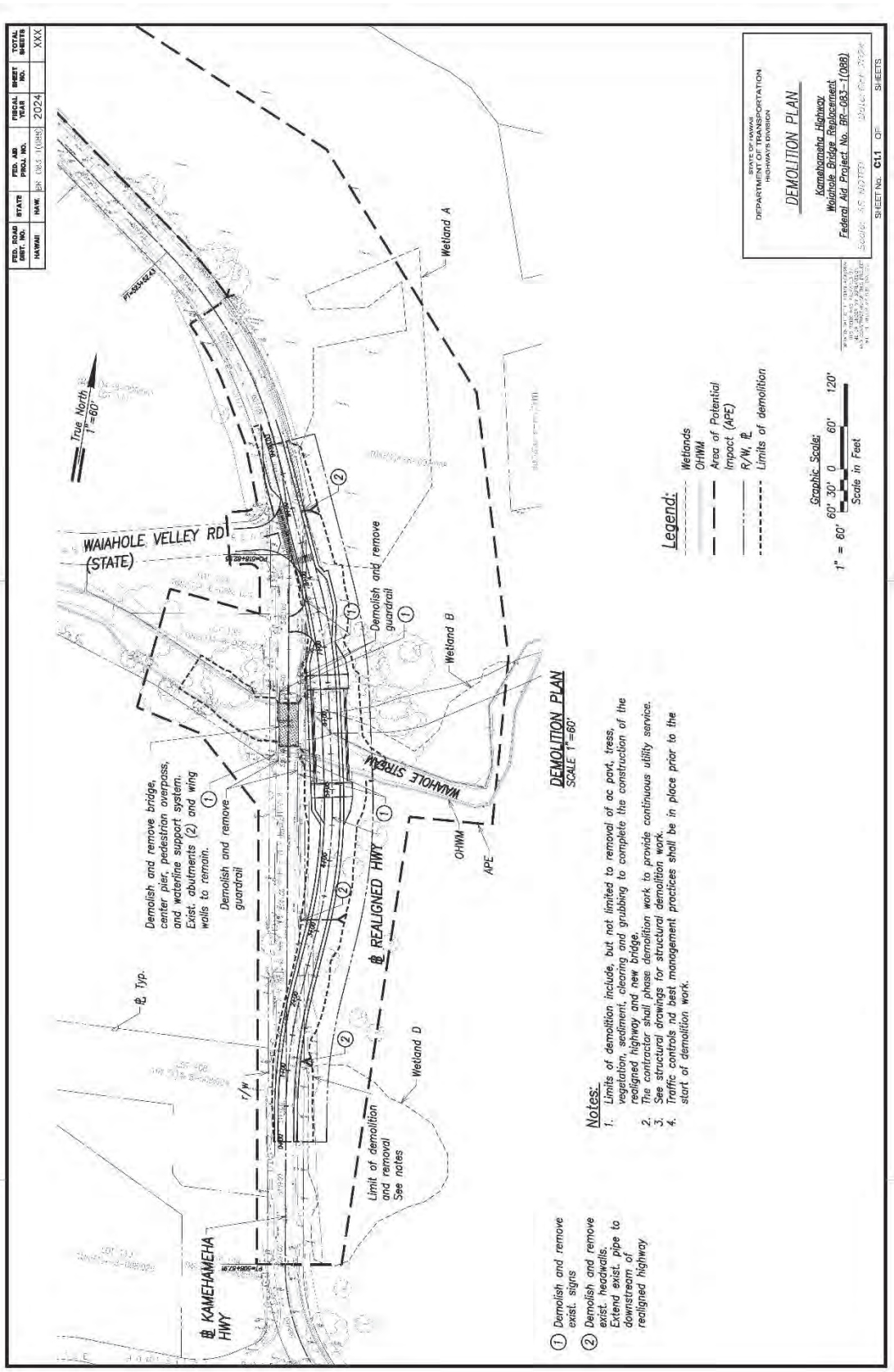

Figure 18. Demolition Plan.

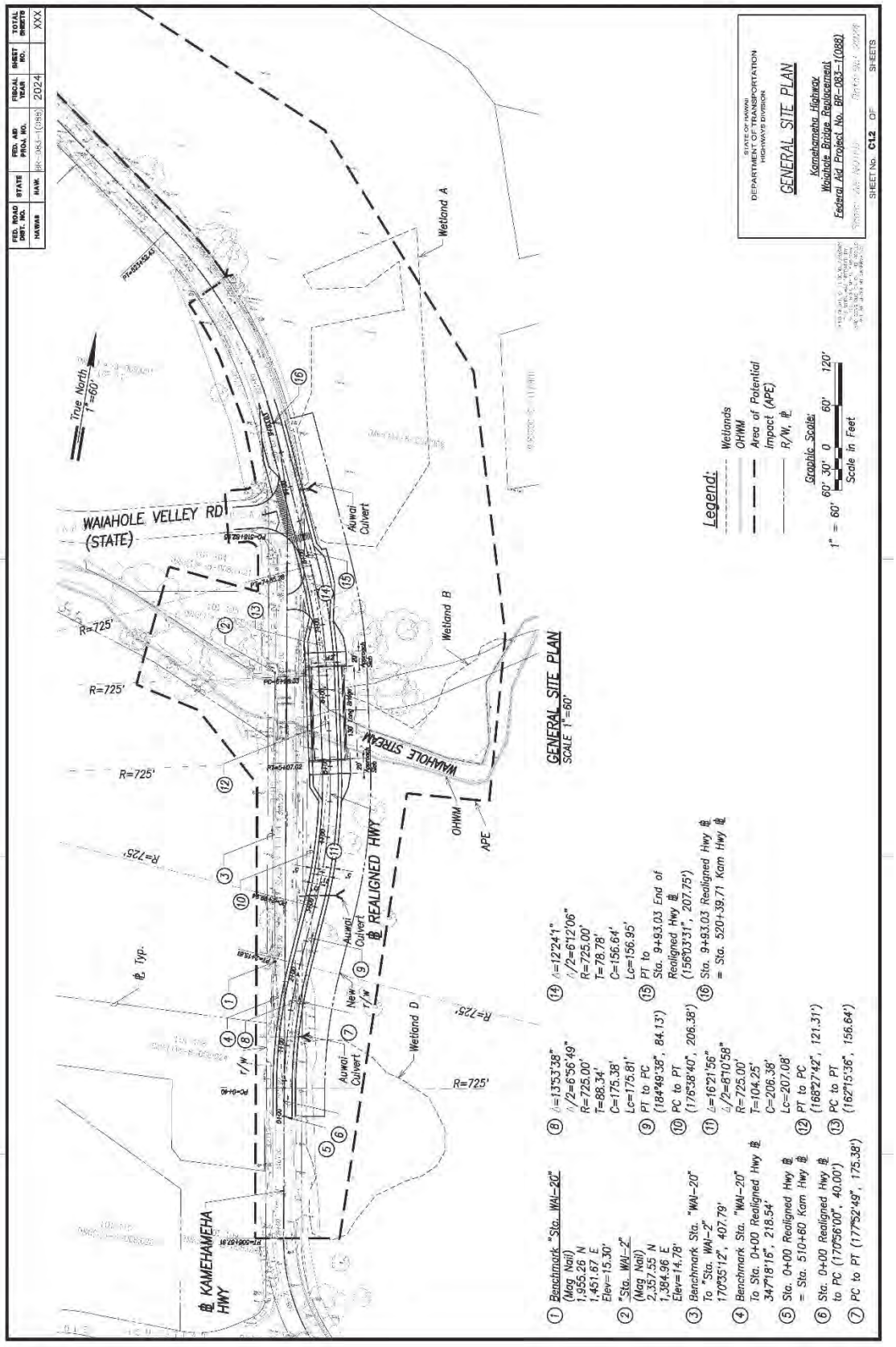

Figure 19. General Site Plan.

2. BACKGROUND

To generate a set of expectations regarding the nature of archaeological resources that might be encountered within the project area, and to establish an environment within which to assess the significance of any such resources, a general culture-historical context for the region relative to the project area and a review of previous archaeological studies in the vicinity of the current project area are presented.

CULTURE-HISTORICAL CONTEXT

Early Hawaiian Settlement Patterns

While the question of when Hawai‘i was first settled by Polynesians remains contested, scholars working in the fields of archaeology, folklore, Hawaiian studies, and linguistics have offered several theories. With advances in palynology and radiocarbon dating techniques, Kirch (2011), Athens et al.(2014), and Wilmshurst et al. (2011) have argued that Polynesians arrived in the Hawaiian Islands sometime between A.D. 1000 and A.D. 1200. Archaeologist Kenneth Emory who worked in the early to mid-20th century reported that the sources of early Hawaiian populations originated from the southern Marquesas Islands (Emory in Tartar 1982). However, Emory’s theory is not universally accepted, as Hawaiian scholars in the past and present have argued for a pluralistic outlook on ancestral Hawaiian origins from Kahiki (Case 2015; Fornander 1916; Kamakau 1866; Kikiloi 2010; Nakaa 1893; Poepoe 1906).

This initial migration on intricately crafted wa‘a kaulua (*double-hulled canoes*) to Hawai‘i from Kahiki, the ancestral homelands of Hawaiian deities and peoples from southern Pacific islands, occurred at least from initial settlement to the 13th century. According to Fornander (1969), Hawaiians brought from their homeland certain Polynesian customs and beliefs: the major gods Kāne, Kū, Lono, and Kanaloa (who have cognates in other Pacific cultures); the kapu system of political and religious governance; and the concepts of pu‘uhonua (*places of refuge*), ‘aumakua (*ancestral deity*), and mana (*divine power*). Over time, a culture that is uniquely Hawaiian evolved. The archaeological record and tools of this period reflect this evolution in that they include some traditional tools but also include some distinctly Hawaiian inventions such as the adze. The ko‘I (*adze*) evolved from the typical Polynesian variations of plano-convex, trapezoidal, and reverse-triangular cross-section to a very standard Hawaiian rectangular quadrangular tanged adze. The two-piece fishhook and the octopus-lure bread loaf sinker are Hawaiian inventions of this period, as are ‘ulu maika stones and lei niho palaoa. The Lei niho palaoa necklace was a status item worn by those of high rank, indicating a trend toward greater stratification in the class or status of people (Kirch 1985).

Hawai‘i’s inhabitants were primarily engaged in subsistence-level agriculture and fishing (Handy et al. 1991). Following the initial settlement period, communities clustered in the ko‘olau (*windward*) shores of the Hawaiian Islands where freshwater was abundant. Sheltered bays allowed for nearshore fisheries (enriched by numerous estuaries) and deep-sea fisheries to be easily accessed (McEldowney 1979). Widespread environmental modification of the land also occurred as early Hawaiian kanaka mahi‘ai (*farmers*) developed new subsistence strategies, adapting their familiar patterns and traditional tools to work efficiently in their new home (Kirch 1985; John Pogue 1978). Areas with the richest natural resources became heavily populated over time, resulting in the population’s expansion to the kona (*leeward*) side of the islands and to more remote areas (Cordy 2000). Hommon (1976) argues that an increasing reliance on agricultural products may have caused a shift in social networks and kinship links between coastal settlements disintegrated as those links within the *mauka-makai* settlements expanded to accommodate exchange of agricultural products for marine resources. This shift is believed to have resulted in the establishment of the ahupua‘a system sometime during the A.D. 1400s (Kirch 1985), adding another component to an already well-stratified society. The implications of this model include a shift in residential patterns from seasonal to temporary occupation, to permanent dispersed occupation of both coastal and upland areas (Rosendahl 1972).

By the A.D. 1400s, O‘ahu appears to have been divided into 6 moku (*districts*). The moku were further divided into distinct land units known as ahupua‘a. The ahupua‘a was the principal land division that functioned for both taxation purposes and furnished its residents with nearly all subsistence and household necessities. Ahupua‘a are land divisions that typically include multiple ecozones from mauka (*upland mountainous regions*) to makai (*shore and near-shore regions*), assuring a diverse subsistence resource base (R.T. Hommon 1986). Although the ahupua‘a land division typically incorporated all of the eco-zones, their size and shape varied greatly (Cannelora 1974). The ahupua‘a became the equivalent of a local community, with its own social, economic, and political significance. Ahupua‘a were ruled by ali‘i ‘ai ahupua‘a; who mostly had autonomy over this generally economically self-supporting piece of land. The land was managed by a konohiki who essentially served as an administrator on behalf of the chief. The ali‘i ‘ai ahupua‘a in turn answered to an ali‘i ‘ai moku, a higher chief who ruled over the moku and claimed the abundance of the entire district. Thus, ahupua‘a resources supported not only the maka‘āinana (*commoners*) and ‘ohana (*extended*

families) who lived on the land, but also provided support to the ruling class of higher chiefs and ultimately the crown. The aliʻi and the makaʻāinana were not confined to the boundaries of an ahupuaʻa and Hawaiians often shared food or resources with their neighbor ahupuaʻa ʻohana (Hono-ko-hau 1974). The ahupuaʻa were further divided into smaller sections such as ʻili, moʻoʻāina, paukūʻāina, kīhāpai, kōʻele, hakuone, and kuakua (Robert Hommon 1986; John F. Pogue 1978). The chiefs of these land units gave their allegiance to a territorial chief or mōʻī (king). As religion became more complex and embedded in a sociopolitical climate of territorial competition, heiau building flourished and acted "as visual markers of chiefly dominance" (Kirch 1990:206).

This form of district subdividing was integral to Hawaiian life and the product of advanced natural resource management systems. As populations resided in an area over centuries, direct teaching and extensive observations of an area's natural cycles and resources were retained, well-understood, and passed down orally over the generations. This knowledge informed management decisions that aimed to sustainably adapt subsistence practices to meet the needs of growing populations. The ahupuaʻa system and the highly complex land management system that developed in the islands are but one example of the unique Hawaiian culture that developed in these islands.

Waiāhole Ahupuaʻa and the Greater Koʻolaupoko District

The current project area is located within the moku or district of Koʻolaupoko, formerly Pali Koʻolau (Figure 40). Located along the central eastern coastline of Oʻahu, the ahupuaʻa of Waiāhole is one of nine ahupuaʻa situated around Kānʻeohe Bay. The bay was also divided among the various ahupuaʻa and specific fisheries and/or parts of the fisheries were affiliated with various ʻili within an ahupuaʻa" (Figure 21) (Devaney et al. 1982:5). Waiāhole Valley is comprised nineteen ʻili—nine which have been verified through documentary evidence and ten which are inferred from place names (Miyagi 1963) Most Waiāhole ʻili comprised a mauka and makai lele, which Pūkuʻi and Elbert define as "a detached part or lot of land belonging to one ʻili, but located in another ʻili" (1986:201).

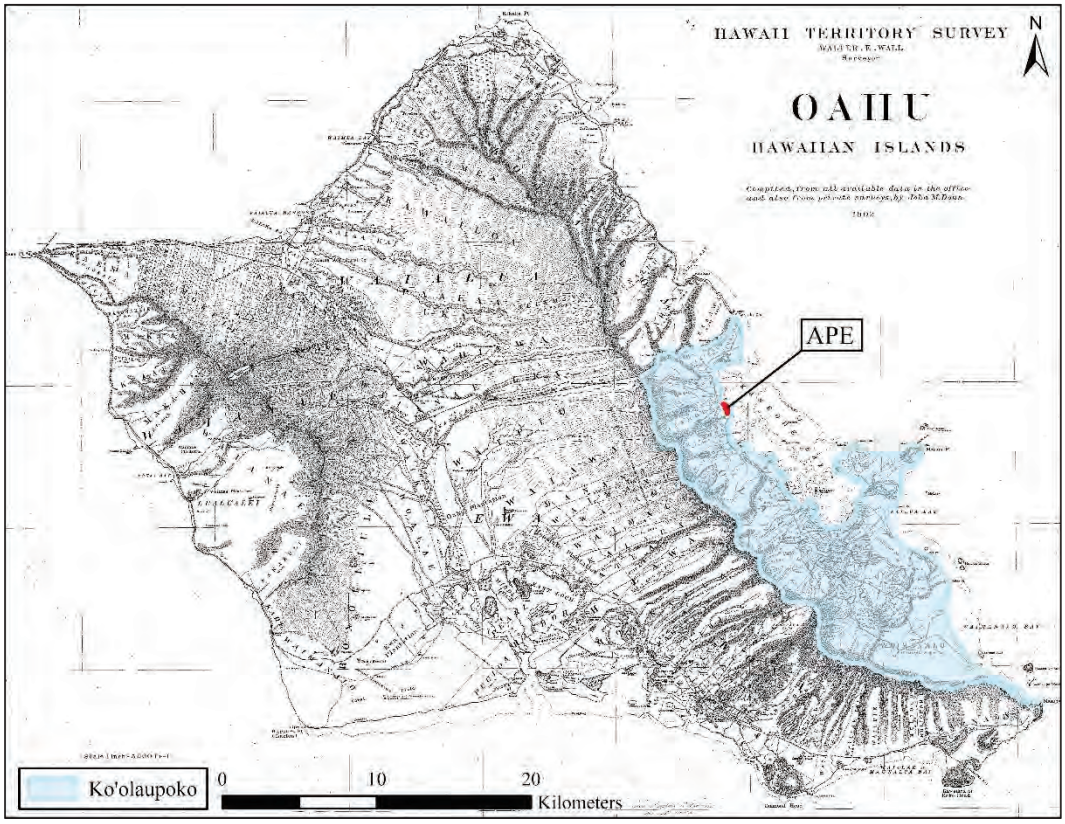

Figure 20. Hawaii Registered Map 455, showing traditional moku of Oʻahu, ca. 1883.

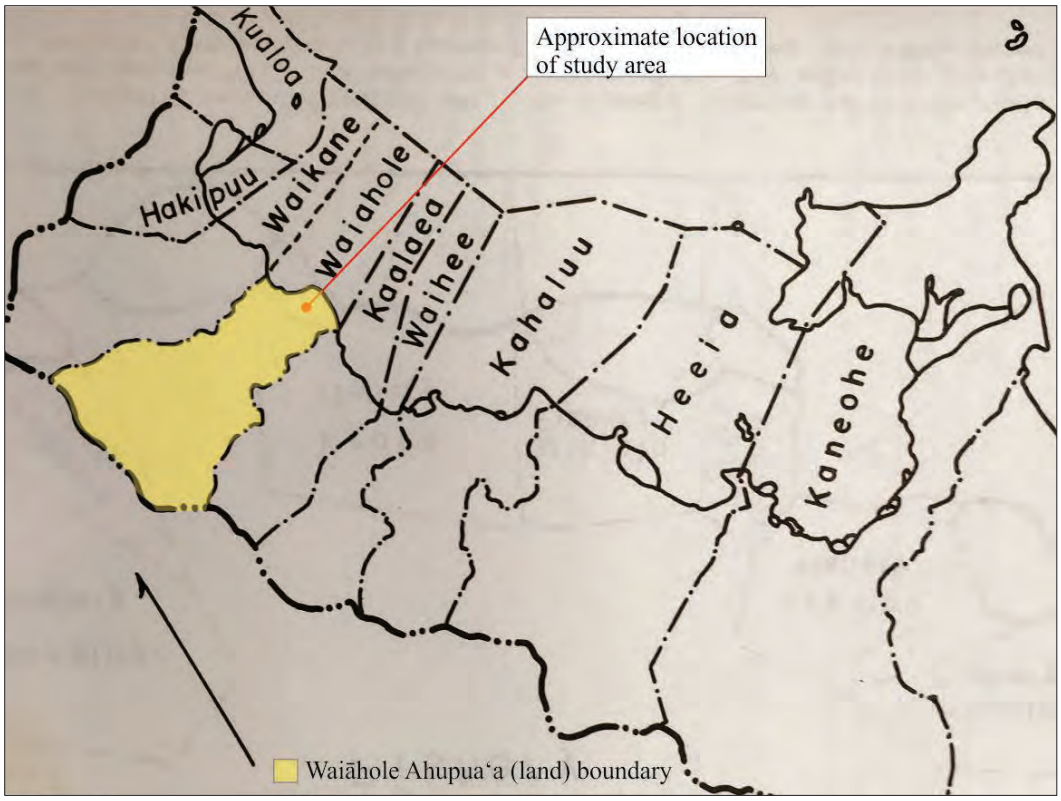

Figure 21. Approximate boundaries of Kāneʻohe Bay fisheries (Devaney et al. 1982:137).

The Traditional Accounts of Waiāhole Ahupuaʻa

Traditional accounts or moʻolelo were passed down orally from one generation to the next, and many such tales featured descriptions of *wahi pana* or legendary places and their origins. These traditional accounts provide a window into the past, lending insight into traditional Hawaiian beliefs, values, and daily life.

The name Waiāhole, is a compound of wai, which means water and āhole, which refers to the mature stage of the endemic āhole (*Kuhlia sandwichensis* [known today as *Kuhlia malo*]) fish, which thrived in fresh and salt water (Pukui et al. 1974:219). According to Pūkuʻi and Elbert "because of the meaning of hole, to strip away, this fish was used for magic, as to chase away evil spirits and for love magic," thus, the phrase "He āhole ka iʻa, hole ke aloha," which translates as "āhole is the fish, love is restless" (Pukui and Elbert 1986:8). Sometimes, āhole fish were used in lieu of pig in ceremonies, and were referred to as "puaʻa kai" or "sea pigs" (Pukui and Elbert 1986:8). Also, because of the pale skin of the āhole fish, the term āhole was sometimes used to refer to light-skinned foreigners (Pukui and Elbert 1986:8). In an article titled "Hawaiian Fish Stories and Superstitions" published in the Hawaiian Annual and Almanac for 1901, the āholehole fish and a belief associated with their consumption is briefly mentioned in a story about the Anae-holo fish, a mullet species (*Mugil cephalus*) of Oʻahu. The excerpt reads as follows:

> Expectant mothers are not allowed to eat of the anae-holo, nor the aholehole, fearing dire consequences to the child, hence they never touch them till after the eventful day. Nor are these fish ever given to children till they are able to pick and eat them of their own accord. (Keliipio 1900:113)

Despite Waiāhole's inherent association with the āhole fish, most traditional accounts of Waiāhole center on kalo (*taro*) cultivated. One such reference to the taro grown in Waiāhole appears in "The Legend of Kapunohu" published in *Fornander Collection of Hawaiian Antiquities and Folk-lore Volume V* Part I (Fornander 1918:214–225). Kapunohu was a great warrior from Hawaiʻi Island known for his feats of strength and for helping establish Chief Niulii of the district of Kohala. Kapunohu journeyed to Oʻahu to visit his sister Konahuanui who lived in Kailua Ahupuaʻa, located to the south of Waiāhole. Upon her brother's arrival, Konahuanui had no food prepared and she took him to Waiāhole where she and her husband Olopana had eight large taro patches. The legend continues thusly (emphasis added):

> Kapunohu then set to work and pulled up all the taro in the eight patches, tied the taro into bundles and carried the whole lot in his two arms to the house, each arm holding the taro of four patches.

> When Kapunohu arrived at the house with the taro his sister looked on and said: "What an idea! I should think you would pull up but one patch, but here you have pulled up all the patches," Kapunohu replied: "This will give us plenty of food; we will not be required to get it in small quantities." Kapunohu then picked up his spear, Kanikiwai, broke off the point and started the fire. When the fire lit, he took some of the taro and cut it up and threw the pieces into the fire and in this way used the taro for firewood. Because of this action of Kapunohu, the saying, "the hard taro of Waiahole," is known from Hawaii to Niihau. (Fornander 1918:220–222)

An alternative explanation for the hard taro associated with Waiāhole is found in an article by Kaehuaea published in 1865 under the headline "*Na mea Kaulana o Waiahole*" in the Hawaiian language newspaper *Ka Nūpepa Kuokoa* and translated for inclusion in *Sites of Oahu* compiled by Sterling and Summers (1978). This account shares some striking parallels with Fornander's version of events presented above, although the names of the protagonists have changed (emphasis added):

> The solid taro of Waiāhole, according to the opinion of the public, was a very hard taro. It was not so, it became famous because of the strange deeds of a man, Kuapunohu, a warrior. He went about Koʻolaupoko to find some one [*sic*] to challenge. His sister was living there with her husband Imaole. She went fishing while he remained at home. The stranger said to the native son, "Have you two any food?" The native son answered, "We have food but standing in the patch." The stranger thought that he was going to have to suffer with hunger so he asked the native, "Where is your patch?" The native gave him specific directions and he went 'til he came to the border of the taro patch. Here he broke off the tip of his spear and used it as a prod. He reached out for two taros, cut them into small pieces and laid them on the fire. He continued doing this 'til he made a big work, clearing up the whole patch of four acres and burning it up like the blowing away of the sea of Ukoa. "Serves him right." said Kuapunohu as he went off. (Sterling and Summers 1978:189)

This concept of hard taro in Waiāhole is also echoed by Raphaelson (1929) in her collection of legendary tales titled *The Kamehameha Highway: 80 Miles of Romance*. Raphaelson states, "Waiahole, where hard taro grows, taro so hard that 'hoi kalopaa i Waiahole' is a catchword that means an obstinate man" (1929:24). This same theme appears in Mary Kawena Pūkuʻi's collection of Hawaiian proverbs and poetical sayings, *ʻŌlelo Noʻeau* as follows: "Ke kalo paʻa o Waiahole. The hard taro of Waiahole" (Pūkuʻi 1983:186). Pūkuʻi explains the proverb as "a reminder not to treat others badly" (Pūkuʻi 1983:186). Based on these accounts, it appears that the hard/solid kalo variety of Waiāhole served as a metaphor for the stubborn nature of mankind. These accounts also underscore the importance of hoʻokipa, the concept of sharing and providing for guests, while at the same time not being wasteful or mai hoʻopohō. In both legends, the visitor is forced to provide for himself as the result of his host's indifference and indolence. Rather than provide for his guest, the host directs Kapunohu/Kuapunohu to where the taro grows and consequently, Kapunohu/Kuapunohu takes more than his share and wastes it by throwing it in the fire instead of eating it. Thus, these legends function as cautionary tales warning against being inhospitable to guests.

Another legendary reference to Waiāhole appears in Chapter V of the "Legend of Halemano" in *Fornander Collection of Hawaiian Antiquities and Folk-lore* (Fornander 1918:255–262). In this tale, Waiāhole is the name of a place as well as the name of a chief of Kualoa Ahupuaʻa, also located in Koʻolaupoko to the north of the project area. The heroin of this tale, Kamalalawalu, was a beautiful princess brought up under strict kapu in Puna, Hawaiʻi Island. She was destined to wed Huaa, king of Puna or Kulukulua, king of Hilo. However, she fell in love with Halemano instead. Thus, they lived in hiding as husband and wife on Oʻahu. Soon after, Aikanaka, the king of Oʻahu set his sights upon Kamalalawalu and the couple were forced to journey from island to island to evade him. Eventually Kamalalawalu decided to leave Halemano. She later wished for him to take her back, but he did not.

Kamalalawalu followed Halemano to Koʻolaupoko Oʻahu where she met an aliʻi named Waiāhole, who "was a single man" and "took [her] as his wife" (Fornander 1918:260). They lived in Kualoa together and soon their union sparked a war between the islands of O'ahu and Hawaiʻi because Huaa and Kulukulua had given Kamalalawalu land to claim her as their wife. Upon hearing of Kamalalawalu and Waiāhole's marriage, Huaa and Kulukulua decided "let us therefore go and make war on those with whom she is now living" (ibid.). Over the next fifty days, the Hawaiʻi chiefs amassed an army of 8,000 canoes and men. The fleet stopped in Maui and Molokaʻi on their way to Oʻahu and while on Molokaʻi, the king's astrologer predicted a victory for the invading army if they were to be greeted by a thick fog. The legend concludes with a mention of Waiāhole as the site of a gruesome battle as follows:

> At the end of the astrologer's predictions, the canoe once more set sail and landed at Makapuu, where the armies were placed in line of battle. In coming across the channel they encountered a thick fog and rain, the signs of victory predicted by the astrologer. After the armies were placed in

> line they advanced overland, going by way of Kaneohe. At Kaneohe proper they met the enemy and the fighting began. Early in the battle Oahu was routed and a great slaughter took place at Waiahole. After the battle Kamalalawalu was found, still alive, and she was taken by the kings of Hawaii, Huaa and Kulukulua, to Hawaii. (Fornander 1918:262)

The Kamehameha Highway: 80 Miles of Romance also mentions "a beautiful tale about Waiāhole and Waikāne" who "were man and wife, it is said" (Raphaelson 1929:24). The story tells that the couple loved each other for many years and "even today their mists embrace in the upper clouds" (Raphaelson 1929:24). However, a review of legendary sources for the preparation of the current document did not reveal any additional reference to corroborate this mythical couple who bear the name of the subject *ahupua'a* and its neighbor.

Also located within Waiāhole Ahupuaʻa was a hilltop that served as a lookout from which a knowledgeable fisherman would send signals to other fisherman out in the ocean to facilitate their success. Known as puʻu kāhea or calling hills, places such as these were known throughout the islands. Pūkuʻi et al. (1974:75) provide the following definition of a puʻu kāhea in their entry for Kalanipuʻu, located on Kauaʻi: "a calling hill (*puʻu kāhea*) from which the movements of fish were called out." Richard Paglinawan describes the activities at the puʻu kāhea of Waiāhole in an article titled "Traditions of Waiahole Valley":

> The signal man would climb this hill on a vantage point so that he could get a clear view of the fishing party in their canoes off Waiahole or Kahaluu areas. ʻAmaʻama (mullet) and ʻawa (milk fish) were sought when the fish schools swam in the area.
>
> The signal man would use his hands, stick, or paddle, or even a piece of rag as a signal. The signals were prearranged and understood by the fishermen. A hand motion in a semi-circular fashion would indicate to the men on the boat to surround the fish school and another signal would mean to drop the nets. (Paglinawan 1964:5)

In exchange for his services, the signal man would receive a larger share of the catch because it was his instructions that allowed for the fish to be caught. Although much of the literature reviewed for the current document mentions Puʻu Kahea as a place unto itself, a review of historical and recent maps did not reveal the location of this signal point. Thus, it is more likely that Paglinawan and others were referring to a puʻu of a different name altogether, upon which the signal man would perform his duties. Based on the mention of the waters of Kahaluʻu, located to the south of Waiāhole, it is likely that the puʻu kāhea was Puʻukauai, which is situated on the border between Waiāhole and Kaʻalea and offers an unobstructed view of the coastline.

Paglinawan shared three other moʻolelo in addition to the puʻu kāhea tradition presented above. Two of these mention activities associated with Waiāhole Stream that are relevant to the current study as it runs underneath Waiāhole Bridge. In one account, a family gathers to collect kupeʻe on a moonless night by torchlight. The adult men held the torches while the young boys did the picking, for they were better suited to spot them and bend over with ease. During their return trip after collecting a good amount of kupeʻe, their dog began to attack an unseen threat to the group; in response, the group leader, Clark, decided to throw some of their catch into the bush towards the invisible menace. Instantly, the dog ceased his attack, and they were able to continue home. It had been clear to Clark that the dog had been reacting to a spirit that only it could see, and that the spirit left them alone only after it got what it wanted, some of their catch.

In the other account, three sisters who live in Waiāhole Valley hike up to the forest reserve boundary and then down to Waiāhole Stream where they set up their nets to catch ʻopae. However, each time they pulled their nets, they came up empty. One of the sisters kept hearing a woman's voice haunting her and then the water started rushing and the girls decided to head further upstream; there, they saw "an old Hawaiian woman with silvery white hair . . . she wore a black kīkepa (*tapa worn by women*). The whiteness of her face matched the color of her hair. She floated above the waters toward them" (Paglinawan 1964:5). The sisters ran swiftly home "up the stream bank, over the cow fence, across an old abandoned taro patch, up the hill to the road, and down the dirt road" (Paglinawan 1964:5).

Although the Precontact royal center for the Koʻolaupoko District was located in Kailua, Waiāhole is known as the birthplace of ruling chief Kualiʻi and as belonging to the kahuna class. According to an article by Kaehuaea published in the Hawaiian language newspaper *Ka Nūpepa Kuokoa* in 1865 under the headline "Na mea Kaulana o Waiahole," and translated for inclusion in Sterling and Summers (1978:190), Kualii was born at Waiomuku at Waiāhole rather than in Kailua as previously thought. Regarding the ruling chiefs of Waiāhole, Kamakau provides information that states Waiāhole belonged to the kahuna class in the following excerpt, which mentions the legendary ruler Kamapuaʻa who was revered as a hog-god, and Kahahana, Kahekili and his son Kalanikupule— rulers of Oʻahu during the late 1700s:

> The chiefs did not rule alike on all the islands. It is said that on Oahu and Kauai the chiefs did not oppress the common people. They did not tax them heavily and they gave the people land where they could live at peace and in a settled fashion. When Oahu came under the rule of Kama-puaʻa, he gave the land containing the word *wai* to the kahuna Lono-a-wohi; but later the land was redistributed by Kahiki-ʻula and the older brothers of Kama-puaʻa because the kahunas had a monopoly of the well-watered lands, and the kahuna class were given the lands of Waimea, Pupukea, Waiahole, and Hakipuʻu in perpetuity, and these were held by them until the days of Ka-hahana. Ka-hekili and Ka-lani-kupule confirmed this gift to the kahunas, and so did Kamehameha. (Kamakau 1992:230–231)

Waiāhole appears in one final legendary context associated with the demi-god Māui. Hawaiian historian Samuel Kamakau recorded the following explanation of how the winding roads of Waiāhole and Waikāne were attributed to Māui:

> Maui, son of Kalana, was one of the ancient chiefs of Maui who made roads twenty centuries ago. The roads in his day were straight, and the people were accustomed to running along straight roads; so when certain persons ran after Maui to kill him he made the road go zigzag and it was called "the zigzag road of Maui." *(ka alanui kikeʻekeʻe a Maui).* One is at Waikane and Waiahole in Koʻolaupoko on Oʻahu. . . (Kamakau 1992:429)

This theme also appears in the following proverb, "Ke ala kīkeʻekeʻe a Māui. *The winding trails of Māui*":

> Trails made by Māui when he was
> Pursued by those who wished to destroy
> Him. One trail was at Waiahole, Oʻahu. . . (Pūkuʻi 1983:180)

Precontact Land Use in Waiāhole Valley

In addition to the legendary accounts presented above, details about traditional Hawaiian land use prior to the arrival of explorers from the West, can be inferred from the results of investigations conducted in Waiāhole and neighboring Waikāne within various disciplines. For instance, in the early 1960s, Michihiro Miyagi undertook a geographical study of Waiāhole Valley in which he documented changes in land use from Precontact through 1961 (Miyagi 1963). Miyagi discovered a paucity of explorer and missionary accounts that made specific references to Waiāhole Valley. Indeed, although such accounts are often encountered during historical research of other locales throughout the Hawaiian Islands, they were hard to find during the preparation of the current document. Thus, Miyagi drew the following conclusion regarding land use prior to the arrival of foreigners from the West based on fieldwork and a review of historical documentation (primarily from the *Māhele ʻAina*): "In the later period of Hawaiian occupancy just before Cook's discovery of the islands in 1778 all the land in the valley suitable for the cultivation of taro was probably so utilized" (1963:78). Miyagi estimated 300 acres in Waiāhole as suitable for taro production and suggested an annual volume per acre of about 12,000 pounds; Figure 22 depicts the probable extent of lands under taro cultivation by the end of the Precontact Period.

These Precontact taro lands were arranged along the banks of Waiāhole Stream, formerly one of the principal streams of Oʻahu and its tributaries, Waianu and Uwao streams, which provided water all year long(Daingerfield 1920). Like many inhabited valleys throughout the archipelago, the makai lowland area was host to a concentration of loʻi watered by a network of ʻauwai that tied the coastal lands to the mountain streams (Handy et al. 1991:453). However, Waiāhole Valley was somewhat exceptional because taro cultivation also extended inland to the more remote reaches of the upper valley. The opportunistic use of small pockets of alluvial soil along upper Waiāhole Stream and its tributaries for taro cultivation suggests that the valley supported a large population. Miyagi proposed that the extent of taro cultivation indicates "the production of lowland taro appears to have reached a maximum" that forced the opportunistic farming inland and "that there was some degree of pressure on the land" (Miyagi 1963:84).

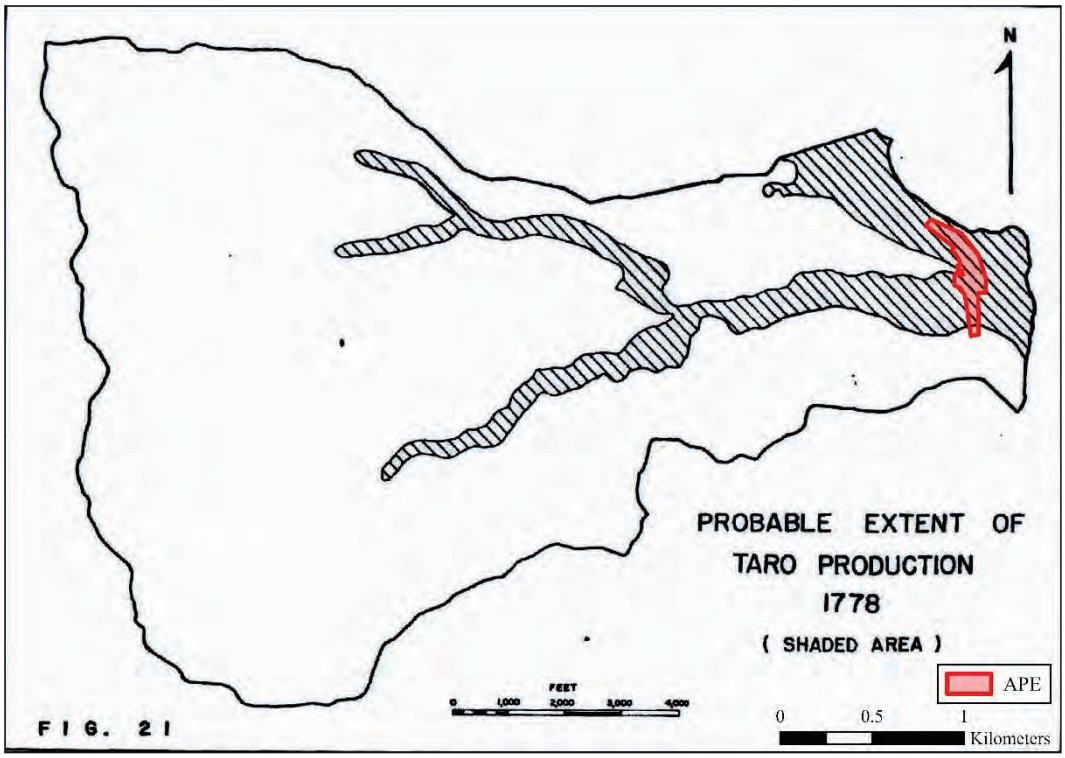

Figure 22. Probable extent of taro production ca. 1778 (Miyagi 1963:79).

In the absence of reliable population figures for Precontact Oʻahu, a dense Precontact population in Waiāhole Valley can be inferred from the extent of taro cultivation and the distribution of house lots, kula, and loʻi as reflected in *Māhele* documents, discussed in further detail in the forthcoming section. In general, settlement was concentrated along the streams from mouth to upper tributaries while the valley fringes, mountains, mountain headlands, and interfluves were largely uninhabited (Miyagi 1963:87). Furthermore, based on the production capacity of the area for taro cultivation, which Miyagi estimated to be 300 acres suitable for taro production and producing an annual volume per acre of about 12,000 pounds acres, Miyagi (1963:85) argued the land could have supported an estimated population of 900, without factoring in the other terrestrial and marine resources that rounded out the traditional Hawaiian diet.

Regarding marine resources, as previously mentioned, the subject ahupuaʻa's namesake āhole/aholehole fish once thrived in the project area vicinity. Handy et al. (1991:271–272) record large saltwater fishponds located along the windward coast beginning with Waikāne and continuing through Waiāhole, Kaʻalaea, Kahaluʻu, Heʻeia, and Kāneʻohe. In their comprehensive study of traditional Hawaiian fishing practices, Maly and Maly (2003) reported that aholehole were among the varieties of fish that were caught using the method known as holahola. Maly and Maly defined holahola as "the stupefying of fish by the use of the poisonous shrub auhuhu (*Cracca purpurea*) applied to the caves or cavities along the reefs or rocky coasts" (2003:195). Holahola is mentioned here because it was likely practiced in the project area vicinity by early residents of Waiāhole Valley.

Although Miyagi (1963:63) remarked that evidence of early Hawaiian occupation in Waiāhole Valley was sparse indicating that that only places names and the remains of taro-patch dikes at the valley head are among the few reminders that the Hawaiians were once the only inhabitants of the area, since the 1960s, archaeologists have successfully recorded cultural resources that corroborate Miyagi's estimates of a dense Precontact population. Remnants of prehistoric loʻi and ʻauwai have been identified along Waiāhole Stream, extending as high as the forest reserve. Archaeologist William Pila Kikuchi described the taro lands of Waiāhole Valley that were watered by Waiāhole and Waianu streams in an article published in the Anthropological Society of Hawaii's newsletter *News from the Pacific* as follows:

> Low dams were thrown across the streams to back the water into ditches which were of higher elevation than the stream beds. Evidence of these dams are still seen in some parts of the valley. The ditches were all carefully designed to allow a full flow of water into the fields, which were walled with large and small rocks and neatly slabbed without mortar or any other binders. Many of these

> channels accurately follow the contours around ridges and hills, indicating an efficient and highly sophisticated knowledge of engineering. (Kikuchi 1964:1)

Kikuchi also recorded evidence of traditional habitation and stone tool manufacture in the upper reaches of the Waiāhole Valley as well as in the coastal lowlands at the mouth of Waiāhole Stream as follows:

> At several upland places in the overgrown fields, there were stone remains suggesting the presence of house sites and possibly a corral for cattle or horses. Many of the stone structures were in a poor state of preservation due to cattle having trampled over much of the area.
>
> During the survey numerous artifacts were found along the length of the valley. These consisted of adze chips, flakes, and a few adze blanks. While searching through a recently bulldozed field, a great number of flakes, chips, and adze blanks were uncovered together with a slingstone, an ʻulumaika, a portion of a grinding stone, and a complete tanged adze.
>
> At the mouth of Wai-āhole Valley, where the stream enters the sea, two house sites were found. The complex was hidden by several large hau trees (hibiscus tiliaceus) whose spreading branches completely covered the sites. The best preserved site consisted of a high mound of dirt, 8-12 inches, high, ringed with a pavement of small pebbles. Portions of the site were delineated by rows of stones marking the house site. A rectangular plot of stones with pavement within the general paved area may possibly be a grave. A wall of stones ran from the site directly into the ocean, numerous adze chips partial blanks were found within the two house sites [State Inventory of Historic Places {SIHP} Site 1086]. The heavy growth hampered any rough mapping of the site. (Kikuchi 1964:1–2)

Based on the presence of adze blanks and debitage associated with stone tool manufacture scattered along the slopes of Waiāhole, from the valley ridges to the makai lowlands, Kikuchi concluded that the tool makers often traveled between the upland basalt quarries and the coastal house lots. The flakes discarded along the slopes of the valley were often larger and less refined than those encountered at the house sites near the ocean. Thus, the raw material was acquired near the valley head and chipped into crude blanks, which underwent further reduction and modification including grinding. Kikuchi found two basalt quarries, which he named Ka-wahi-koʻi- o-Kahekili (Bishop Museum Site 50-Oa-G2-7) and Ka-wahi-koʻi-o-Kalau (Bishop Museum Site 50-Oa-G2-8) in the absence of documentation of original names for these resource procurement sites. Later studies (Dye et al. 1985) would refer to these two basalt sources as the Waiahole Quarry Complex. Eventually the Bishop Museum Sites G2-7 and G2-8 were assigned the SIHP Site designations 50-80-10-2472 and 2475, respectively. Kikuchi's original site description reads as follows:

> …on a ridge leading up to Puʻu-Kuolani our survey party came upon an adze quarry. This quarry is evidently one of the sources of all the chips, flakes, and blanks found in the lowlands. The quarry is a talus of fine-grain bluish basalt which is found in large boulders along its slope. Large flakes had been struck from these boulders and were found strewn over its slopes, as the artisan probably preferred the core to fashion adzes from. A great number of flakes had been chipped and rejected because of imperfections in the basalt, which were in the form of bubbles, cracks, and thick patination. All of the adze blanks were very large, and showed the preliminary rough shaping of the tool. These blanks were found scattered over the slopes, in some cases in groups of two or three. The scattering may be due to the talus sliding both from natural causes and from the trampling by people seeking the mountain apple. All of the stones were patinated a dull grey color.

In addition to the findings from archaeological investigations discussed above, newspaper articles, census data, *Māhele* records, and historical depictions of the project area vicinity as it appeared in the early nineteenth century can provide valuable insight into traditional lifeways practiced prior to the arrival of foreigners. One such depiction that focuses on the similarities between Waiāhole and its four neighbor ahupuaʻa to the south (Waiheʻe, Kaʻalaea, Kahaluʻu, and Heʻeia) offers clues to the Precontact population in the area, as follows:

> All face seaward on the broad calm bay that extends from Kualoa to Kaneʻohe, a bay that is really a very long lagoon within a barrier reef that is far distant from the shore. At low tide a muddy bottom is exposed along the shore and there are no sandy beaches, for the coast line is too far in from the reef for coral sand to wash in, and the water along the landward side of the bay or lagoon is too shallow and too dirty for coral heads to grow, as they do at Kaneʻohe and northward from Kaʻaʻawa. Each of these five districts has a broad coastal plain, which was converted by Hawaiians into an almost continuous expanse of *loʻi* irrigated with water from large streams flowing out of the deep valleys that cut back into the Koʻolau range. The hinterland must have produced great quantities of

> sweet potato, yam, banana, upland taro, *wauke*, *olona*, and *ʻawa*. Undoubtedly the population was large, yet there was here a vacuum so far as lore is concerned, and these districts play no part in tradition or history. The reasons for this may have been the unattractiveness of the shore line and the relatively inferior resources in fishing. (Handy et al. 1991:452)

The above excerpt and those that follow are taken from a comprehensive ethnographic study of traditional Hawaiian cultivation and ritual practices titled *Native Planters in Old Hawaii* (Handy et al. 1991). E.S. Craighill Handy and his wife Elizabeth conducted their research during the 1930s and collaborated with May Kāwena Pūkuʻi to publish the original volume in 1972. This volume contains their observations of the landscape of the Hawaiian Islands as it appeared to them in the early twentieth century as well as details about early Hawaiians' relationship to the land prior to the arrival of foreigners from the West. According to Handy et al., the broad coastal plain of Koʻolaupoko had "arable upland slopes (*kula*) below the sheer mountain wall and rough lower *wau* (forest area)" that extended all the way to the "sheltered mud-flat shore line" of Kāneʻohe Bay (1991:453); this landscape was in sharp contrast with the remaining ahupuaʻa of Koʻolaupoko and Koʻolau District, which were characterized by "deep mountain-sheltered valley land" that lead to the open ocean (ibid.). Handy et al.(1991) also stated that despite the unattractive mud-flat coastline and relatively limited marine resources, Waiāhole and neighboring ahupuaʻa did boast numerous freshwater sources and fertile soils; enough to support a large population in early Oʻahu. The portrayal of the Waiāhole coast as an undesirable mud flat as reported by Handy et al.(1991) contrasts with informant accounts collected by Kikuchi, who "remarked that the beach was once composed of rocks and sand with a clear bottom" (Kikuchi 1964:1). According to Kikuchi (1964:1), as a consequence of the area becoming a "delta of mud…several types of shellfish and sea fauna once found there" were no longer common.

Waiāhole Ahupuaʻa during the Historic Period

During the early Historic Period, missionary census data for 1831-1832 reveals 419 individuals (adults:192 males and 160 females; children: 33 males and 34 females) resided within Waiāhole and neighboring Waikāne Ahupuaʻa combined (Schmitt 1973:19). The total population of the Koʻolaupoko District at this time was roughly 5,000 (Miyagi 1963:90). In an 1835 census of Pali Koolau conducted by B.W. Parker, the population of only Waiāhole was reported 210 residents (adults:90 males and 79 females; children: 23 males and 18 females) and the Koʻolaupoko District having a total population of 4,636 (Schmitt 1973:33). Importantly, these census records cannot be interpreted as representative of Waiāhole's population at the time of the first European Contact in 1778. Rather from the time of European Contact to the time of the missionary's and Parker's census in the early 1830s, the native population had already declined more than 50% suggesting that these census records document already significantly reduced populations (Miyagi 1963:84). Thus, the Precontact population of the Hawaiian Islands was likely much larger than when the American missionaries began conducting the censuses presented above. By the mid-nineteenth century, the populations of all the islands experienced a sharp decline in large part due to a rash of epidemics introduced by foreigners. The population of Koʻolaupoko continued to suffer a staggering decline between 1836 and 1840 of nearly 2,000 people (Miyagi 1963:90).

In addition, the spread of the Euro-American influence that emphasized commercial ventures and associated development forced many native inhabitants to abandon their homes and traditional lifeways for opportunities in more populated areas. By the middle 1800s, "although already much reduced in size, the [Kāneʻohe] Bay area population was second only to growing Honolulu" (Devaney et al. 1982:9). The rise of Honolulu as a commercial center influenced population size during the 1830s, as shown in a touristic account of a journey around Oʻahu penned by Edwin Hall and published in the *Hawaiian Spectator* in 1839:

> The district of Palikoolau, which adjoins Koolauloa on the east, is considerably more populous than the latter,—containing nearly or quite 5,000 inhabitants. . . Its sources of wealth are similar to those of the other districts mentioned; but by being nearer to the commercial centre [Honolulu], its minor resources are, on that account, of more value. In this, as in the others, large tracts of land lie at present uncultivated, which, it is ascertained, could easily be brought under profitable tillage. (Hall 1839:110)

The Māhele Āina of 1848

In addition to the devastating impact foreigners had on the survival rates and traditional lifeways of the Native Hawaiian population, foreign influence transformed the concept of land ownership across the archipelago. The volumes of native registry and testimony collected for the kuleana claims as part of the *Māhele ʻAina* provide a snapshot of life in Waiāhole Valley in the lead-up to the mid-nineteenth century. These volumes contain valuable information such as the names of ʻili within Waiāhole Ahupuaʻa and types of land use within individual parcels (Tables

1 and 2). As a result of the *Māhele*, six Waiāhole ʻili (Makanilua, ʻĀpua, Poahamai, Poea, Ii, and Uau [Uwao]) were reported as Government Land (Devaney et al. 1982); while twoʻili (Hopekea and Makawai) were retained as Crown Lands by King Kamehameha III (Miyagi 1963).

In addition, fifty-eight claimants received Land Commission Awards in Waiāhole including four which comprised entire ʻili awarded to chiefs. The ʻili of Waianu, 225-acre LCAw. 5936 awarded to Puuiki (in two ʻāpana (parcels)), the ʻili of Onouli, 93-acre LCAw. 7137 awarded to Kahoohanohano, and the ʻili of Hanakea, 57.2-acre LCAw. 8603 awarded to Kaniau (in two ʻʻāpana); while the ʻili of Oii (Ohihi/Oi) also referred to as Kapiikokau, 81.6-acre LCAw. 105 (in four ʻāpana), was awarded to a foreigner named William Walker by Governor Kekuanoaoa on behalf of the king in 1848. Walker received this award in as a "life estate" in return for his service aboard the king's man-of-war *Don Quixote*.

The remaining awarded lands (fifty-four kuleana awards) in Waiāhole comprised just over 100 acres that were divided into kuleana parcels that averaged 2.02 acres in size and claimed by Native tenants (Devaney et al. 1982:24). An approximation of the location of the current project area relative to these kuleana (see Figure 23) indicates that nine kuleana show partial or complete correspondence with the project area (see Table 1). Like most kuleana awarded in greater Waiāhole, these kuleana comprise multiple ʻāpana; except for LCAw. 8180 to L. Haole. The project area extends encompasses ʻāpana 4 of LCAw. 10438 awarded to Naeole; and encompasses ʻāpana 1 of LCAw. 10759 awarded to Palaukai, as well as a small portion of ʻāpana 2 of the same award (see Figure 23).

Table 1. *Kuleana* awarded in Waiāhole portions of which are within the project area.

LCAw.	Claimant	ʻili	Area	Notes
7560:1	Kekeaulaau	Umau	2.25	5 *loʻi*, 1 house lot, and *kula* planted with potatoes
7661:1	Kaukalili	Kapalae	0.95	2 *loʻi*, 1 house lot, and 1 *kula*
7662:1	Kaumaka	Opaea	0.8	3 loʻi
7665:1	Kukuinui	Kaaniu	0.2	2 loʻi
8180	Haole	Apau	1.1	6 loʻi
9959:2	Lumai	Poea	3.3	6 *loʻi*, 1 *kula* planted with melons, and 1 house lot
10438:4	Naeole	Kapikookau	0.7	5 loʻi
10759:1	Palaukai	Kalaipakua	0.85	5 *loʻi ai* (in use) and 6 *loʻi nahele* (fallow)
10759:2	Palaukai	Kalaipakua	0.15	House lot

Eleven other ʻāpana kuleana that fall within close proximity but outside of the current project area (see Table 2) are included in this discussion for two reasons: (1) to emphasize the concentration of kuleana located around the mouth of Waiāhole Stream; and (2) because of the likelihood that some of these kuleana may actually correspond with portions of the project area despite discrepancies in the coastline, government road alignment, and stream channel between modern and historical maps. Importantly, a detail within native testimony (N.T. 10-182-183) recorded for LCAW. 7563 to Kaopulupulu revealed the history of land use and occupation were contentious in this area.

Table 2. *Kuleana* awarded in Waiāhole located beyond and in close proximity of the project area.

LCAw.	*Claimant*	*ʻili*	*Area*	*Notes*
105:2	Walker	Oi/Oii	11.66	Life estate to foreigner
7570:1	Kauahipaka	Kauakahipa	1.45	8 *loʻi*, 1 *kula*, 1 house lot
7654:1	Kimo	Kuaiokumu	0.43	3 loʻi
7654:2	Kimo	Kuaiokumu	0.75	*Kula* with potatoes and house lot
7657	Kaukulima	Kapikokaa	2.0	3 l*oʻi* and 1 house lot
10227	Moo I	Kanakahipa	0.98	10 *loʻi*, 2 *kula*, 1 house lot, 1 *māla ʻawa*
10439:1	Nahaina	Kaalae	0.32	1 *loʻi* and house lot
10229:1	Mahule (Malule)	Kuaiokumu	0.5	2-5 *loʻi*
10229:2	Mahule (Malule)	Kuaiokumu	0.48	*Kula* planted with tobacco and house lot
10440	Nika	Hanakea	2.22	7 loʻi, 1 kula
7564	Kauihou	-	2.7	9 *loʻi*, 1 *kula*, 1 house lot, 1 *māla ʻawa*
7563	Kaopulupulu	Kaululoa	1.47	4 loʻi

Four of the kuleana located partially within the current study area list Waiāhole Stream as their Punaluʻu (northern) boundary in *Māhele* records and most listed konohiki lands in all directions. As shown in Tables 1 and 2, many of the kuleana within and near the study area contained loʻi. In some instances, kuleana also included a portion designated as kula within which crops other than kalo were cultivated. For instance, LCAw 10229:2 served as a house lot and cultivated kula, planted with tobacco, while LCAw. 7654:2 and 7570:2 were planted in potatoes. Those ʻāpana that did not include a house lot within the cultivated kula land had separate ʻāpana that served as the house lot, such as LCAw. 10759:1. Additionally, the native register for LCAw. 7570:2 and LCAw. 9959 mentions two māla ʻawa or kava patches for each parcel. Most interestingly, however, was the mention of a house constructed for Kaahumnau, a wife of Kamehameha I, within one of the ʻapana of LCAW. 7563 to Kaopulupulu which was described as two houses on a foundation that she would visit occasionally.

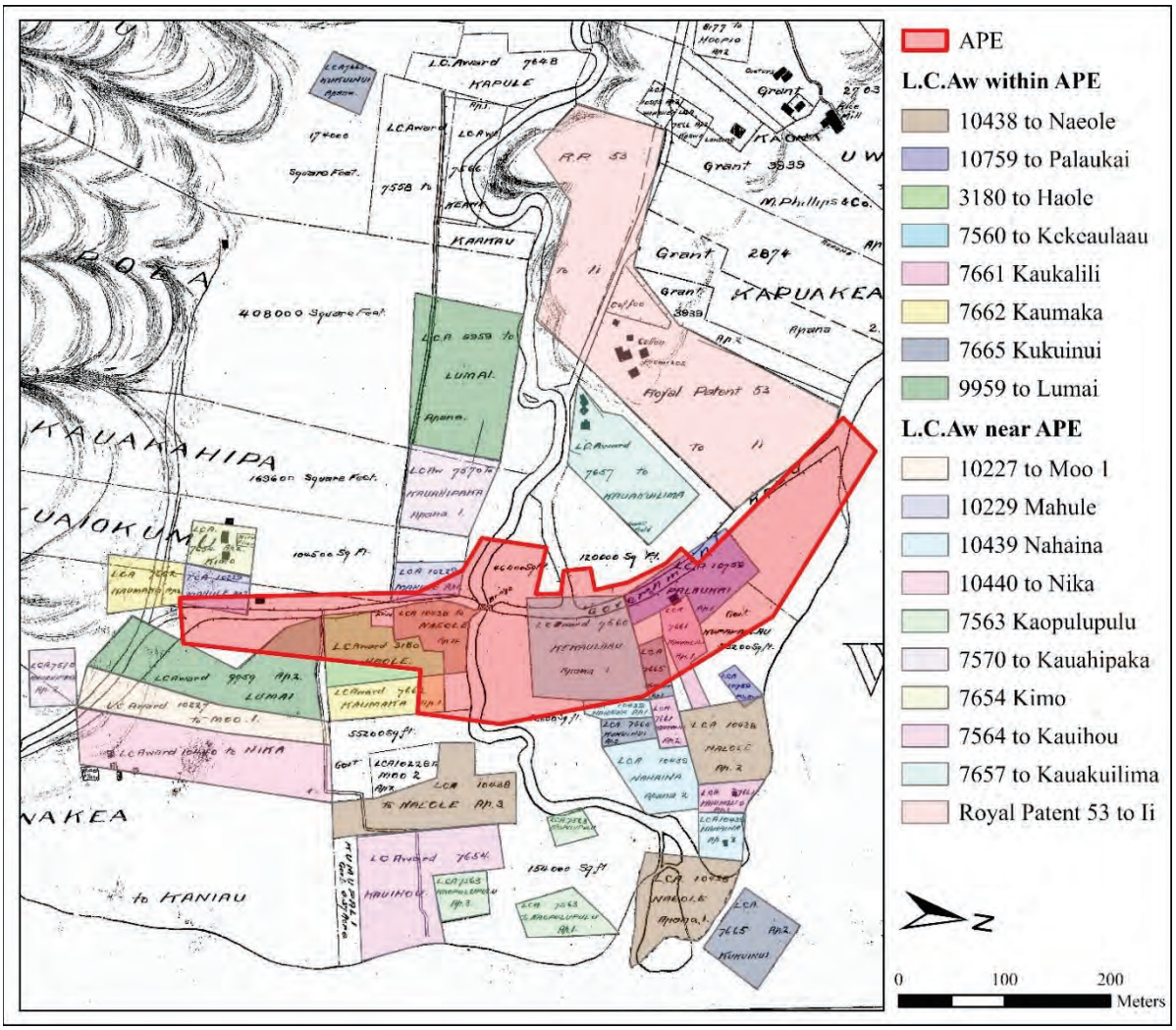

Figure 23. Detail of Registered Map 2130 showing *kuleana* relative to the approximate study area location.

Historic Land Use in Waiāhole Valley

Based on the settlement pattern typified by ʻāpana kuleana clustered along Waiāhole Stream, one can infer that population density was highest in Waiāhole in the alluvial flats of the coastal lowlands—an area well-suited for the cultivation of kalo and other crops, with the added benefit of access to marine resources nearby. One must also keep in mind that "there were probably cultivated areas that were not awarded to kuleana claimants" (Devaney et al. 1982:11) for one reason or another. Thus, when looking at historical maps such as Registered Map Number 2130 of Waiāhole prepared ca. 1897 (Figure 24), the seemingly unoccupied/unutilized areas between kuleana may have been cultivated or utilized as house lots as well, particularly those located along Waiāhole Stream and its tributaries.

Throughout the early Historic Period, the amount of land under cultivation decreased along with the native population. As the nineteenth century progressed, more land went uncultivated, and some was converted to pasture for grazing livestock. According to Devaney et al. (1982:70), there were nearly six hundred horned cattle and numerous goats in Koʻolaupoko, as well as some sheep, horses, mules, and donkeys in the project area vicinity by the mid-1800s. Around the time of the *Māhele*, roaming cattle belonging to large landowners (local chiefs and foreigners) were wreaking havoc on the commoners' land and crops. As a result, "100 or more acres of choice land for tillage is now given up, and the people plant neither corn, beans, potatoes, or anything of the kind, to any extent, lest they be destroyed by the cattle" (Wyllie 1848 in Devaney et al. 1992:12). Thus, by the mid-nineteenth century, some of the land along Kāneʻohe Bay had already fallen out of cultivation due to factors such as "depopulation, roaming cattle, and the requirements of the Kuleana Act" (Devaney et al 1982:12).

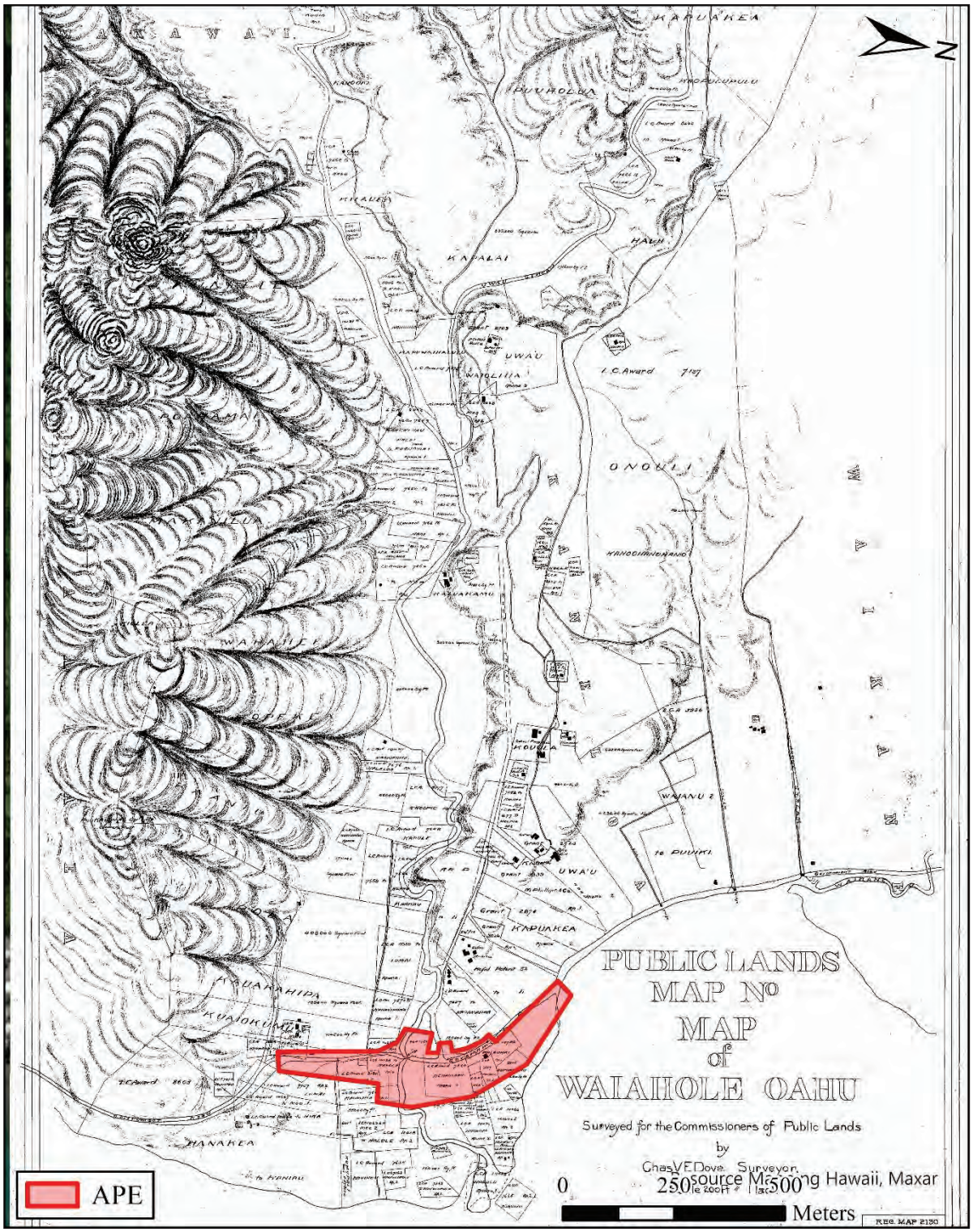

Figure 24. Annotated map of Waiāhole ca. 1897 (Registered Map Number 2130).

At some point during the middle 1800s, Chinese settlers began renting taro lands and converting them to rice paddies, which was an easy transition because rice and taro thrive under similar conditions (Miyagi 1963). The Chinese responsible for initiating the rice industry had originally come to the Hawaiian Islands as laborers to work the sugar plantations and construct the railroad. According to Miyagi, the Chinese rice farmers also expanded the area under cultivation by adding irrigation to previously unirrigated land. A historical account, published in 1862 further

describes taro cultivation and rice farming in Waiāhole and Waikāne valleys, in the years after the *Māhele*; the account is a translation (accessed using the online *nupepa* blog) from a Hawaiian language newspaper article titled "Rice and Gold" (*Ka Raiki a me ke Gula*), which reads as follows:

Waiahole to Kaaawa

> Waiahole is the first place, in our knowledge, that planted rice; when we began to walk upon the soil of that ahupuaa, our hearts were filled with joy at the sights of that place, and reaching Waikane, all the loi were being farmed, as if it was just one huge farm; we thought to ask who was it that was farming the area, and we were told Messrs. Judd and Wilder; so many loi were finely built, and it seemed like almost thirty or more acres; they had thirty-five workers. We see the immediate benefits of growing rice, being that these men were hired, and got paid for their labor, and all this is because of rice; many subjects of the King were provided with jobs, and as a result, perhaps some of those people were prevented from acts which would have caused them to suffer difficulties and problems, because their minds are taken up by work. There are many loi farmed in Waikane, by J. Fuller (J. Pula), and they are being reworked. The road from Waiahole to Waikane is horrible; it is swampy, and we hear that a horse sunk on this street and its throat was cut. The lower part is boggy, but it is dry on the surface of the earth. There is a fine wooden house standing in Kualoa belonging to Charles Hastings Judd, along with a horse shed, and a carriage house; that place is beginning to become a town. (*Ka Nupepa Kuakoa* February 22, 1862:2)

Subsequent to the *Māhele*, three large tracts of land were granted in Waiāhole Ahupuaʻa: Grant No. 702 (243.18 acres) and Grant No. 703 (21.50 acres) to Kekakeiki in 1860; and Grant No. 874 (113.33 acres) to Kaopulupulu in 1862. Then, L.L. McCandless purchased about 185 acres of Government Lands in Waiāhole between 1896 and 1903 (Devaney et al. 1982). Around the 1870s, the population of Koʻolaupoko began to increase, including that of Waiāhole Ahupuaʻa. Miyagi (1963) proposes that this upswing in population may have been linked to the influx of Chinese immigrants engaged in commercial rice cultivation. In contrast, population increases in Oʻahu beyond Koʻolaupoko District were a result of the success of the sugar industry and the corresponding development of Honolulu as a port city. However, the effects of these developments did not take hold in Waiāhole, due to its remote location and overly wet terrain that was unsuitable for sugar cultivation (Miyagi 1963).

By the late 1800s, much of the uncultivated land of Waiāhole Valley functioned as pasture. A brief touristic account written by George Bowser and published in a chapter about Oʻahu that appears in his "Itinerary of the Hawaiian Islands," published in *The Hawaiian Kingdom Statistical and Commercial Directory and Tourists' Guide, 1880-1881* illustrates the shift in land use from traditional Hawaiian loʻi to rice cultivation and grazing pasture, and paints an inviting picture of the project area vicinity:

> Then we reach another valley presenting no new characteristics of scenery differing from all those already passed through, only in the fact that there is no sugar plantation. There are numerous taro patches and no less than six rice plantations; all the rest of the valley is pasture. The rice plantations are rented by Chinamen. At Waiahole, from which place the valley takes its name, there is a rice mill worked by water power. The place is a delightful one to reside in, with a fine bracing air. In summer, the trade winds are always blowing, and the thermometer, I am told, never ranges higher than 70 degrees (Fahr.). The scenery, as everywhere on this coast, is grand, the pasture splendid—it would be difficult to find a more charming or more healthy place of residence. (Bowser 1880:484)

Twenty years after Bowser reported the presence of at least six rice plantations in Waiāhole Valley, a decade-long peak in commercial rice production began. An 1897 map of Waiāhole shows the location of the rice mill at Waiāhole was known as the Lansing Mill and several rice floors (see Figure 24); and Miyagi (1963) mapped land use in Waiāhole ca. 1900, including the extent of rice and taro cultivation (Figure 25). In addition to commercial rice production, commercial poi production began to take hold across the Hawaiian Islands during the late nineteenth century. According to Olszewski (2000), by 1884 Chinese immigrants began to dominate commercial poi production. In Oʻahu, commercial poi production peaked in 1888 and dominated the marketplace for decades.

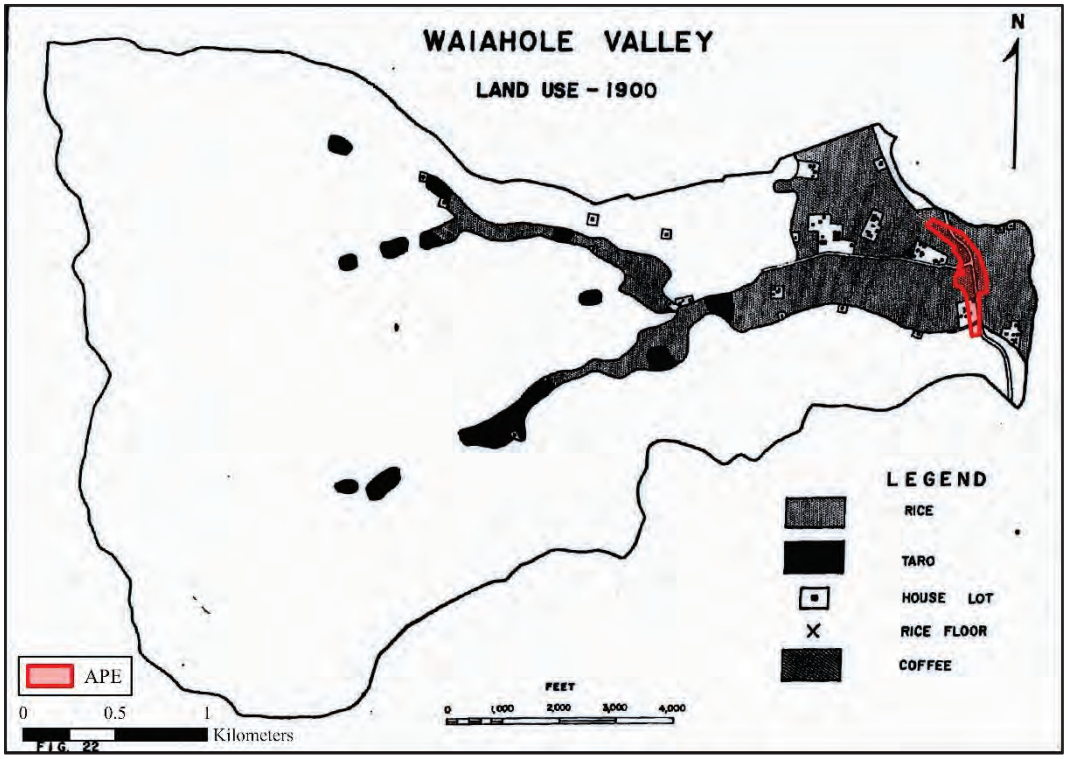

Figure 25. Map of land use in Waiāhole ca. 1900 (Miyagi 1963:110).

After 1910, the rice industry declined rapidly; and by the early 1920s nearly all the Chinese rice fields were abandoned (Miyagi 1963). During the declining years of the rice industry, Japanese immigrants engaged in diversified agriculture and began to replace Chinese immigrants in Waiāhole and the windward side of Oʻahu (Devaney et al. 1982). A 1928 aerial image displays the land within and around the project area as cultivated with some form of agriculture with irrigation ditches running alongside the fields (Figure 26). Despite the increase in diversified agriculture, many residents of Waiāhole continued to practice traditional Hawaiian agriculture and poi preparation as shown in a 1908 photograph (Figure 27).

Figure 26. 1928 aerial imagery of the project area.

Figure 27. Poi pounding at Waiāhole ca. 1908 (photo: R. J. Baker, Bishop Museum Collection; Devaney et al. 1982:39).

Miyagi summed up the intensive land use in Waiāhole Valley and its subsequent decline during the early twentieth century thusly:

> . . . Rice and taro occupied the lowlands, and pineapple the terraces and the lower slopes of the Koolau spurs. Truck crops were grown on the level areas of Kaneloa [Waiāhole Villlage] terrace by Japanese . . . The steeper slopes and parts of the dissected alluvial terraces were used for grazing . . . one could stand at the shore and view the cultivated lands from the sea to the valley head . . . and a railroad extending into the valley head.
>
> The intensive period of land use in the valley was not long lasting. Rice growing declined and pineapple proved only ephemeral. Java plum and guava invaded the abandoned fields. Pasture-choking shrubs reduced the grazing area. Old roads from this period still remain in some sections and abandoned house sites can be noted in the now tree-covered area where pineapple was planted. (1963:116)

The subject of kalo cultivation in Waiāhole appears under the headline "The Stirring and Fluttering of Taro Leaves to Disappear (*E Nalohia Ana Ka Oni Ame Ka Luli Ana O Ka Lau Kalo*)" published in 1911 in a Hawaiian language periodical (Ka Nupepa Kuokoa Home Rula 1911:2). This article focuses on the detrimental impact of urban development on kalo cultivation across Oʻahu. According to the article, loʻi located within Bishop Estate lands in Honolulu and Mānoa Valley were at risk to "be dried and transformed into house lots and sold to people who don't have homes or sold according to the wishes of Bishop's Trustees" (ibid.). The author specifically mentions the threat to taro growers in Waiāhole, which retained active loʻi at the time it was written, as seen in the excerpt below:

> . . . From these things O' Hawaiian people will be our end, when the taro lands are dried up, and when the taro farming disappears, then there will be no places like these lands for the Chinese to grow taro, and if indeed this should come to an end, then the taro farm lands will decrease dramatically. This will result in an increase in the cost of poi from here forward, because from where will taro to make poi be quickly obtained to supply this city? For those people who have taro farm lands, they must continue to plant taro although the profits in that work will not be like those that we speak of when talking about taro farming [in Kona]. And it is not just here where taro leaves will disappear from our sight, but it will no longer be seen at Waikane, Waiahole and Kahana because their waters will eventually be used for sugarcane. What misfortune for us Hawaiians from here forward when we try to obtain taro and poi. Wake up Hawaiians and continue to plant taro lest your stomach go hungry because the fluttering taro leaves will disappear from here forward at Honolulu.

> (Ka Nupepa Kuokoa Home Rula August 18, 1911:2; translation by Lokelani Brandt, M.A., ASM Affiliates)

The article above highlights the importance of taro cultivation and poi production to the Hawaiian people despite the fact that it was Chinese immigrants who were primarily responsible for the taro cultivation in the early twentieth century, rather than Hawaiian farmers. Also, the article mentions that the waters of Waiahole, Waikane and Kahana would be used for sugarcane and that taro cultivation would suffer as a result of the diversion. Indeed, within two years of the publication of this article, the single "largest hydraulic engineering project ever completed in the Territory" (Judd 1918:196), known as the Waiahole Tunnel Project, would be underway. This major feat of engineering was undertaken between January of 1913 and May of 1916 and augmented between 1925 and 1935 to extend 26.5 miles from Kahana Valley in Koʻolaupoko to Kunia in Honouliʻuli, ʻEwa (McElroy and Duhaylonsod 2015). The Waiahole Tunnel diverted water from Waiāhole and neighboring lands across the island of Oʻahu to irrigate the sugarcane fields of ʻEwa, as foretold by the 1911 article.

Waiāhole is briefly mentioned in an article titled "The Story of Hawaii" published in a 1912 edition of *The Mid-Pacific Magazine* in their discussion of the Kāneʻohe Bay region. The excerpt reads as follows:

> Kaneohe bay is ten miles long, the channels to the sea are 90 feet deep. There is always a gentle breeze and sailing of small craft is safer here than anywhere else in the islands for the bay is entirely land and reef locked . . . All along the shore of Kaneohe bay the scenery is charming in the extreme; beyond the mountains come down to the sea. There are valleys that it would pay anyone to explore for days.
>
> At Waiahole a splendid trail leads across the mountain range to Pearl Harbor, a sixteen-mile tramp. (The Mid-Pacific Magazine 1912:394)

Trails in Waiāhole Valley are featured in another article published almost ten years later titled "The Trail that Starts Nowhere" by George Armitage (1921). In this adventurous touristic account, Armitage begins by asking the reader why more people do not visit charming Waiāhole Valley, which he deems as "possibly one of the least frequented of interesting places on the Island of Oahu" as follows:

> . . . And why? It is only about 18 miles from the center of Honolulu. Nowhere in the Hawaiian Islands are cliffs greener or more precipitous. A handsome waterfall sings all day in the inmost recesses of the valley. And an automobile may be driven within a stone's throw of it. Is this not enough to lure hundreds from Honolulu? No? Then here's some more:
>
> On the road up the valley there is a real grass hut, with native Hawaiians actually living therein, tending a taro patch by day and stroking guitars and ukuleles by night. That in itself is now rather a rare sight in Hawaii.
>
> And then there are trails-trails swinging dizzily back and forth across the face of sheer cliffs, now crowding through a maze of green clinging stuff, now but a sickening scratch on the face of the rocks-trails that command an uninterrupted view of earth and sky and sea in all their majestic colorings. . . (1921:48)

Armitage continues with a description of the route to Waiāhole Valley from Honolulu via automobile. As his vehicle approached, he made the following observation:

> . . . At 18.1 miles, just after crossing a bridge over a small stream and, strange as it may seem, in the midst of a short stretch of temporarily repaired good road, the way to Waiahole is taken in a turn to the left towards the mountains. . . (1921:48)

Beyond the mauka turn, about 1.5 miles, is the grass hut Armitage had mentioned, along the left fork of the road, "nestled among shady trees" from this road, a trail leads down "and a pleasant old Hawaiian woman with her grandchild will pose for pictures" (ibid.). He continues thusly:

> The setting of taro patch, pineapple field, tiny charcoal stove, low-hanging thatched lanai used as a kitchen, and with the big hiki-ee—bed—inside the main room, and, leaning against a tree, even the poi board upon which taro is pounded into a pulp after the ancient fashion, all provide a good idea of typical old-time Hawaii. (ibid.)

From this scenic spot, Armitage continued a few more miles until he reached what he called "the famous Waiahole tunnel district," (1921:48) According to Armitage, the roads leading to and from the Waiahole Tunnel were well maintained for access to the infrastructure. Armitage concludes his account of the mysterious "Trail that Starts Nowhere" by describing how it took him and his companions three separate trips to locate the beginning, middle, and end of a trail cutting across the valley slopes, which he had spied during his first visit. During that first visit they were unable to find the upland trail head, "it was a lost trail; a route in the sky with neither head nor tail, and in some places possibly no middle" (ibid:49). They returned and were able to find the trailhead by crossing over the ridge from Waiawa Valley; "but the strangest thing of all was that we lost the trail completely when we had very nearly reached the bottom" (ibid.). On their third and final visit to the valley, they found the lowland entrance to the trail, which extended from "the floor of Waiahole Falls up a narrow concrete stairway, and thence on a contour around points and into ravines" to join with the trail over the mountain (ibid.).

The following excerpt from a 1928 article titled "Geography of the Island of Oahu" also published in *The Mid-Pacific Magazine* provides more details about the Waiahole Tunnel project and how the landscape in Waiāhole Valley had changed since its construction:

> . . . Many years ago men of vision saw how water could be brought from the wet windward side of the Island to the dry leeward. They spent much money and employed many engineers and laborers to drill a hole through the Koolau mountains at the head of the Waiahole valley, at a point about eight hundred feet above the sea. . . Water is brought to this tunnel from the many small streams that trickle down the mountain sides near the valley heads. Small dams were placed across these many streams and the clear, cool water was turned into a long ditch. This ditch winds in and out of the little valleys, always bringing the water toward the tunnel. The water from the union of these many small streams increases as it approaches the great tunnel.
>
> There are several Japanese families living along this long ditch beside which there is a lovely trail, winding around sharp hills, into deep valleys, and under kukui, ohia lehua, koa and hala trees. The Japanese men are the ditch tenders. . . Although the ditch tenders and their families live up in the

> mountains and alone, they are busy and happy. They all have burros to carry their burdens and to bring their food and other necessities from the stores far away on the beach. . .
>
> When the water from all the little streams is finally brought to the great Waiahole tunnel it receives much added water from the walls of the tunnel as it passes through the Koolau range. (Daingerfield 1928:55–56)

In 1922, shortly after the completion of the Waiahole Tunnel project, the extant Waiāhole Bridge was constructed, which brings Kamehameha Highway (Route 83) over Waiāhole Stream, south of Waiāhole Valley Road. The bridge was designed by R.W. Mowry (Thompson 1983) as a two-span reinforced concrete tee beam superstructure with a concrete abutment wall and multi-column bent substructure (Figure 24), underlying a reinforced concrete deck with AC overlay. The bridge parapets are classified as concrete solid panel with cap (MKE Associates LLC and Fung Associates, Inc 2013) The bridge has no shoulders; thus, in 1968 the extant wooden pedestrian walkway was constructed and attached to the mauka side of the bridge.

Figure 28. Mauka side of Waiāhole Bridge showing multi-column substructure and pedestrian walkway; note debris trapped beneath deck in foreground, view to the northeast,

Waiāhole Bridge has undergone multiple evaluations as part of state-wide bridge surveys in 1983, 1996, and 2013. Waiāhole Bridge was deemed as not historically significant in the 1996 State of Hawaii Historic Bridge Inventory and Evaluation report, as documented in an August 14, 1998 letter (LOG NO:22063 DOC NO:9808CO09) from Don Hibbard of SHPD to F.J. Rodriguez of Environmental Communications. SHPD provided comments on draft environmental documentation for an earlier iteration of current project, stating the Waiāhole Bridge "is not cited as a historically significant bridge in the (Draft) State of Hawaii Historic Bridge Inventory and Evaluation report dated May 1996" (ibid.). The State Historic Preservation Officer (SHPO) echoed this no effect determination in a May 18, 2001 letter (LOG NO:27494 DOC NO:0105EJ14) to HDOT. The SHPO provided comments on a draft environmental assessment, stating the Waiāhole Bridge "was determined to be 'not significant' in 1996."

In contrast to the earlier studies and determinations, MKE and Fung (2013) recommended that Waiāhole Bridge was eligible for listing in the National Register of Historic Places under Criterion C "for its association with early developments in concrete bridge construction in Hawaii" (ibid.:4-246). They go on to say, "It is a good example of a 1920's reinforced concrete bridge that is typical of its period in its use of materials, method of construction, craftsmanship, and design" (ibid.).

In a newspaper article titled "Storm-ravaged Nursery Digs Out Once Again" published in the Honolulu Star Advertiser on June 8, 2011, Gregg Kakesako reported that Waiahole Botanicals nursery, located north of Waiāhole Valley Road and mauka of Kamehameha Highway suffered almost $300,000 worth of damage from two storm events. Both episodes of loss were caused by heavy rains that created a "heavy accumulation of storm debris" and caused the water levels of Waiāhole Stream to rise rapidly, "up to 4 feet in some places" (Honolulu Star Advertiser 2011). The first episode occurred in 2006 after forty days of rain, the second occurred after a single night of thunderstorms in June of 2011. At the time this article was written, the State was assessing Waiāhole Bridge and had cleared debris in February and December of 2011. Then-spokesman for HDOT, Dan Meisenzahl went on record to say that "despite reports of cracks in the bridge" the Waiāhole Bridge structure was "sound" (ibid.). Per the article, Meisenzahl said the State planned to replace the bridge in 2015 or 2016 to bring it into compliance with standards. According to the HDOT Highways Program Status website (https://histategis.maps.arcgis.com/apps/MapSeries/ index.html) last updated on January 2, 2018, the extant bridge over Waiāhole Stream is in "poor" condition and has a priority ranking of 28 (out of 50) for "bridges in the State Highway System in need of upgrades or repair" based on "a weighted value that considers bridge condition, mobility, and risk."

Although Waiāhole Bridge has been described as little more than "an important transportation link between Windward communities" because it "does not provide public access vantage points, does not have a view, and is rated aesthetically poor" (HDOT 2004:29), other attractions lured tourists into Waiāhole Valley. For instance, Waiahole Tavern, a resort "located on high land near the sea, and but forty minutes' walk from Waiahole Tunnel and the trail over the mountains" (The Mid-Pacific Magazine 1917:3) appears to have been a popular destination. From a newspaper article about a new camping place for boy scouts at Waiāhole, we found that the Tavern was located 0.75 miles from the beach (Honolulu Star Bulletin 1916b). Another newspaper article titled "Promotionists Find Oahu Owns Many Beauties" described the points of interest as follows:

> At Waiahole Tavern, Mr. and Mrs. Edward Dougherty have a number of interesting things to show. There is the trip to the canyon, which uncovers wonderful scenes of beauty; the swimming pool, the frog farm, and other points. (Honolulu Star Bulletin 1916a)

The swimming pool mentioned above measured twenty-five feet in length and was "filled with cold mountain water" (*Honolulu Star Bulletin* July 7, 1916:10). Among the other points there were "a number of short hikes to be taken from the tavern" and "fresh eggs, chickens, vegetables and groceries" could "be obtained in the neighborhood" (ibid.). The tavern also appeared in advertisements such as the one reproduced as Figure 25 below, which were included regularly in newspapers throughout the early decades of the 1900s.

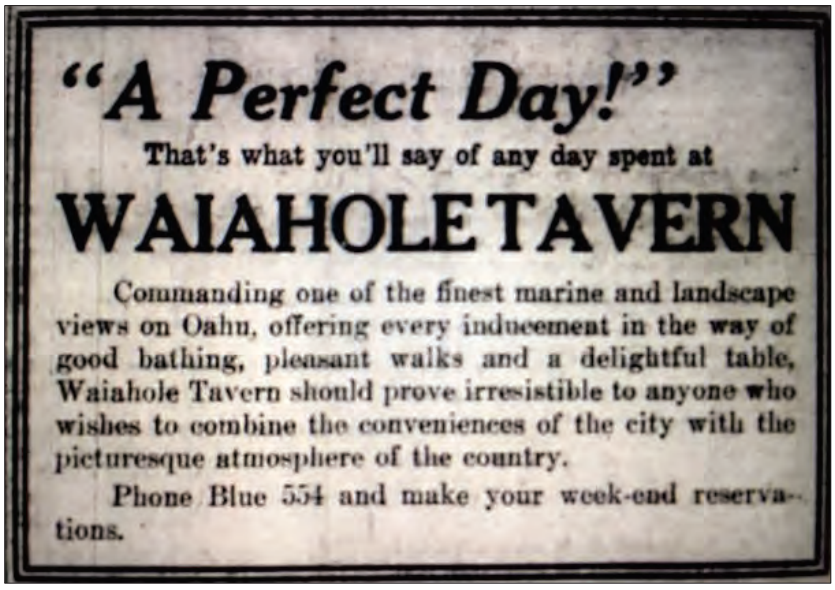

Figure 29. Advertisement from *Honolulu Star Bulletin* (1916c)

In 1918, roughly 1,169 acres in Waiāhole Ahupua'a were set aside as forest reserve (Pinkham 1918:175). This acreage comprised "the government forest lands of Makawai at the upper end of the main Waiahole Valley, the private land of Hanakea, and the adjacent government forest lands of Kapikokau and Waiaanu I to the north," bordered by "various private grants and open public land" on the makai side of the reserve (ibid.:195). The forest reserve was

established in part to protect native forest lands from over grazing livestock. According to an article titled "Waiahole Valley is center of Area with Colorful History" written by the Principal of Waiahole School, Joseph T. Ferreira and published in *Hawaii Farm and Home* magazine in 1940, agriculture was the main industry of the Waiāhole vicinity at that time. He provides the following account of travel from early days until 1940 as follows:

> Travel between the district and Honolulu was difficult, as there were no paved roads. In order to get to Honolulu, the early Hawaiians had to walk over the steep sides of the Pali, Later, many rode on horseback. Travel was so difficult and slow that it took more than a day to go to Honolulu and return. Today it only takes one hour and a half to go to Honolulu and return. (Ferreira 1940:9)

In another article titled "'Over the Pali' – Beauty, Industry" published in the same issue of *Hawaii Farm and Home* magazine as the excerpt above, Honolulu County Extension Agent M.K. Reilly describes agriculture in windward Oʻahu. He states that across Koʻolaupoko and Koʻolauloa, "there are some 500 farmers busily engaged in the production of diversified agricultural commodities" (Riley 1940:9). He goes on to emphasize that the farmers "are of several racial descents, being predominantly Japanese, but there are also Chinese, Hawaiians, Haoles, Filipinos and Koreans" all of whom were "living and farming in close proximity to each other, peacefully and cooperatively" (ibid.). According to Reilly, at the time of his writing, "the greatest major agricultural industry in Windward Oʻahu" was "the dairy enterprise," for five of the sixteen dairies (roughly 2,000 head of dairy cows) in the Hawaiian Territory were located there (ibid.). In addition to dairy cows, 5,000 head of beef cattle belonging to Parker Ranch and Kaneohe Ranch Co. were grazing in Koʻolaupoko, to the north of the current project area beyond Kahuku. Reilly also mentions two other industries that he classifies as "major enterprises" of windward Oʻahu: the then-thriving papaya plantations of Kailua and Lanikai, as well as the fields of apple bananas formerly located along the slopes of the Koʻolau Mountains. Reilly also reports that small farms in windward Oʻahu were the source of much of the "celery, sweet potatoes, dasheen, carrots, Chinese peas, asparagus, onions, strawberries and in short, almost every vegetable found in the Honolulu markets" (ibid.). Multiple-acre truck farms that specialized in some of the crops grown on the smaller farms rounded out the diversified agriculture of windward Oʻahu.

Despite the success of diversified agriculture in windward Oʻahu, taro cultivation was deemed the "most important" industry in the region, in which roughly 190 farmers produced fourteen million pounds of taro annually from 680 acres of taro land; and the region was home to three poi factories (Reilly 1940:9). One of these factories known as Waiāhole Poi Factory still produces hand-pounded poi for locals and visitors alike. The original poi factory building was constructed in 1905 at 48-140 Kamehameha Highway, located adjacent to (mauka of) the central portion of the current project area. It was first owned and operated by Chinese immigrants and later taken over by a Japanese family. Figure 26 below shows Waiāhole Poi Factory ca. 1946, as well as a glimpse of Kamehameha Highway and Waiāhole Valley Road at that time.

Figure 30. Historical photograph of Waiāhole Poi Factory ca. 1946.

Between 1940 and 1950, the population of Koʻolaupoko District experienced an exponential increase of 130 percent—from 9,006 people to 20,779 people; and in 1960 to 60,238 people, an increase of 190 percent (Devaney et al. 1982:12). Such rapid increase is a reflection of the development and urbanization on the windward side of Oʻahu that began after World War II. The legacy of the changes in land use that occurred along Kāneʻohe Bay from the mid-nineteenth century until World War II are succinctly summed up by Devaney et al. as follows:

> As each commercial crop in succession developed toward peak production and maximum land acreage under cultivation, the trend for the largest land owners to increase their holdings and for the small land-owners to decrease in numbers operated throughout the islands. (1982:33)

Waiāhole in Modern Times

Although Reilly insisted that diversified agriculture was a self-sustaining industry, and that farmers were considered "valuable assets to their community" (1940:9), in the 1960s Miyagi (1963) reported that the Waiāhole Valley community comprised Hawaiians, Japanese, Filipinos, and Caucasians who were less engaged in agriculture. Thus, diversified agriculture was in decline (Miyagi 1963). Miyagi listed four major land use categories active in Waiāhole in 1961: diversified agriculture (consisting primarily of bananas, papaya and taro), grazing (primarily dairy, but also beef cattle), residential (homes, schools, a grocer, Waiāhole Poi Factory, and the trout farm), and forest (including wooded areas, waste land, and shrub land), which he depicted on a map (Figure 27). Miyagi's 1961 land use map shows much more diversified agriculture than the 1900 land use map, and less land planted in taro (see Figure 22). By the mid-1950s, commercial poi production declined to levels similar to those of Hawaiʻi Island (Olszewski 2000). By the early 1960s, in Waiāhole Valley "only three Japanese and two Filipino farmers" still planted taro (Miyagi 1963:141).

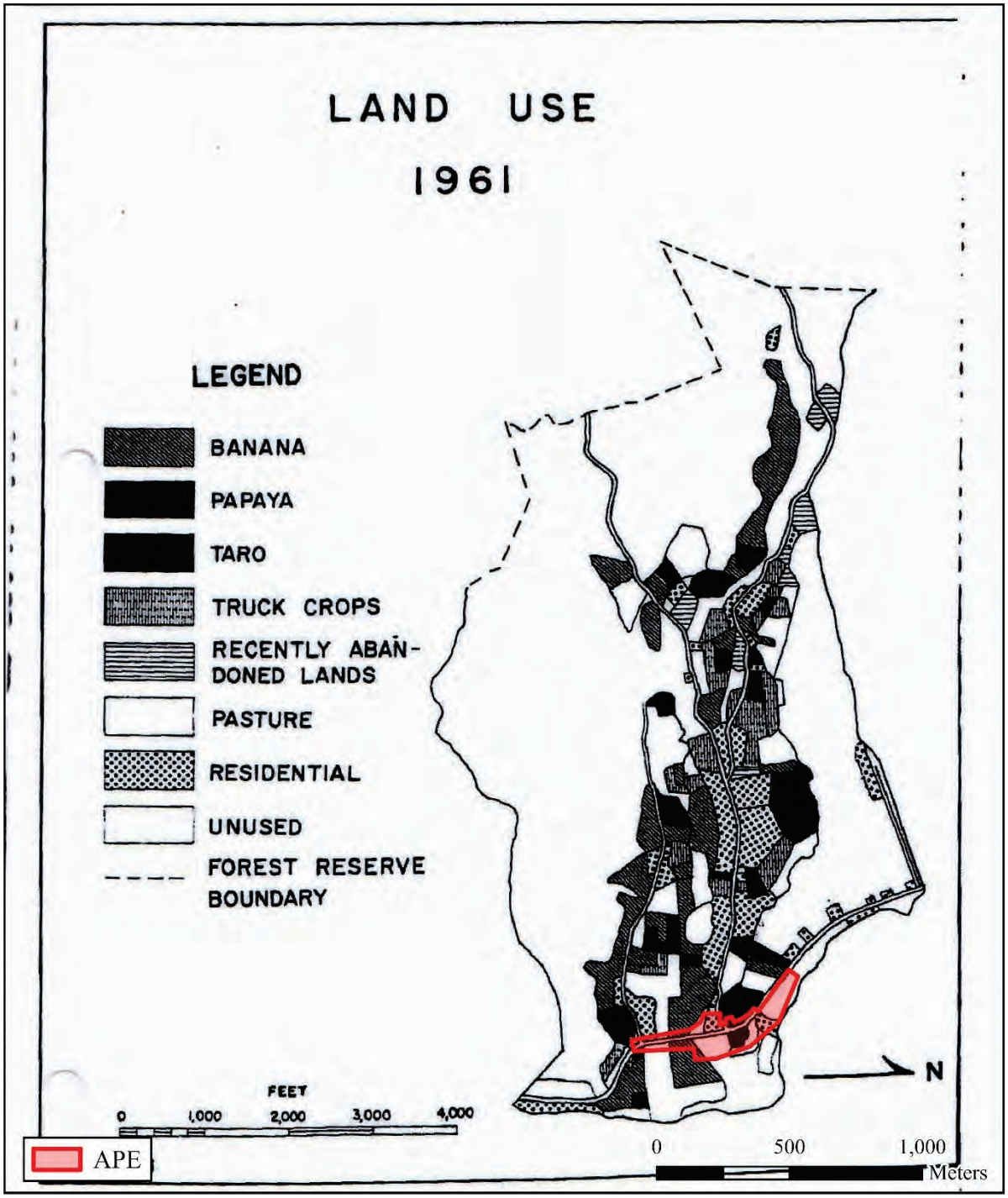

Figure 31. Land Use Map of Waiāhole ca. 1961 (Miyagi 1963:136).

According to the land use map, roughly a quarter of the acreage within the current project area was under cultivation in 1961—banana and taro plantings extended mauka and makai across Kamehameha Highway near the southern end and north-central end of the current project area, respectively; another quarter of the acreage of the project area comprised residential use on the Kāneʻohe (south) side of the intersection of Waiāhole Valley Road and Kamehameha Highway, and on the makai side of the highway near the northern end of the project area. The remaining half of the acreage was either unused or used for grazing. A comparison of aerial photographs taken between 1959 and 1968 (Figure 28) supports the land use pattern depicted by Miyagi's land use map with very little change in the residential and agricultural use areas formerly within the project area.

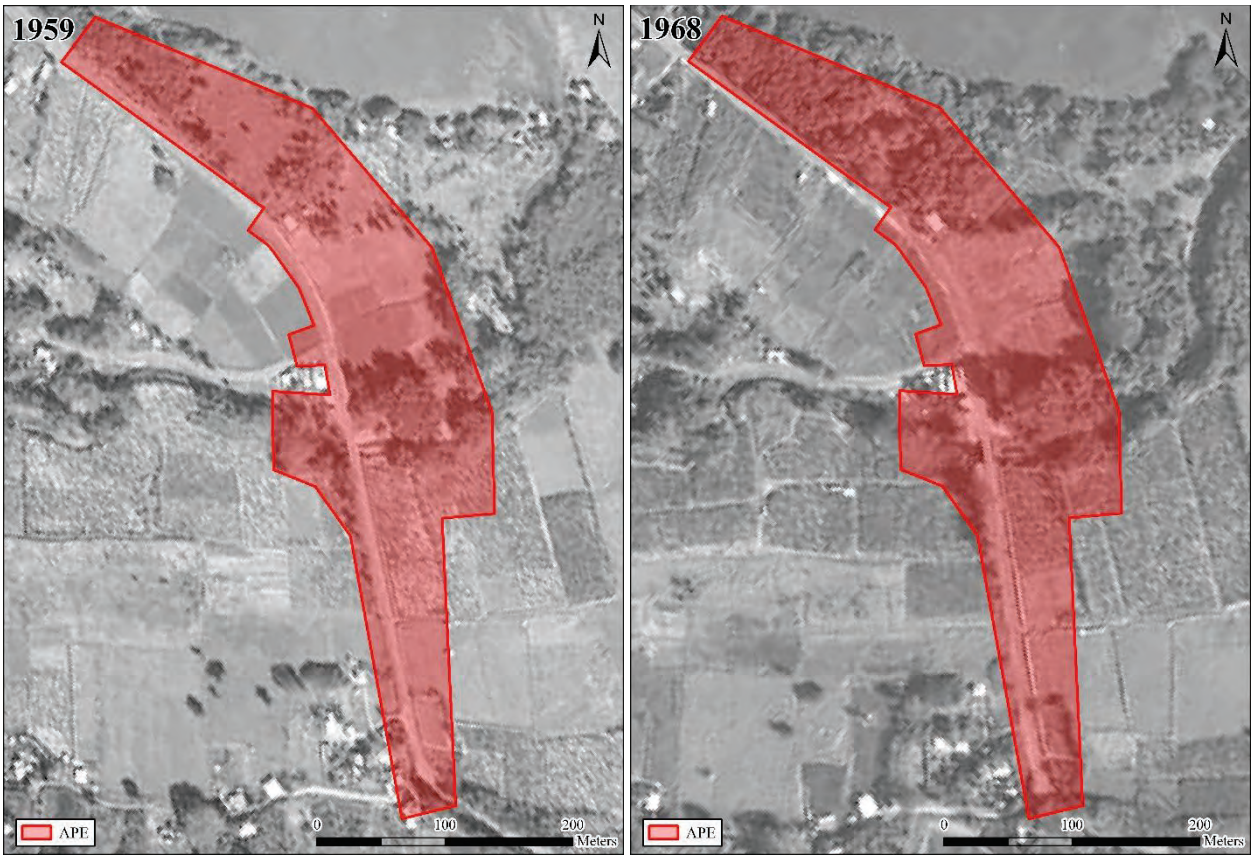

Figure 32. Comparison of USGS aerial photographs with project area shaded red.

The mid-twentieth century decrease in poi production and taro farming was likely a direct result of changes in land ownership within Waiāhole Valley since the Māhele. For instance, by the 1960s, eighty-nine percent (110 acres) of the kuleana acreage owned by Native Hawaiians had become part of larger land holdings owned primarily by non-Hawaiians (Miyagi 1963). The number of Chinese landowners in the valley also dwindled; and the Japanese and Filipino laborers who had been living and working in the valley since the turn of the century did not own land. Miyagi reported that "all the farmers in the valley rent lands from McCandless heirs, the State of Hawaii, or other small land owners" (1963:134). Thus, farming became a less secure livelihood that was dependent on short-termed leases. Miyagi also reported that, at the time of his research, Japanese farmers practiced intensive farming on some of the better lands; while Filipino farmers practiced less intensive farming of the less favorable areas; additionally, a Chinese farmer operated a dairy and used an abandoned rice field to graze his cattle; and Portuguese ranchers grazed their beef cattle on the slopes of the valley head.

In the early 1960s, Waiāhole Poi Factory bought half of its taro from farmers on Kauaʻi and Maui, and the other half from growers on the windward side of Oʻahu (Miyagi 1963). According to Miyagi, the Oʻahu farmers and the poi factory developed an arrangement referred to as "the harvester system" in which "the factory employs a Filipino to harvest the taro without the help of growers" (1963:145) and the harvester receives compensation. This system was apparently preferred by the taro growers at that time. However, when supply overwhelmed demand, farmers were forced to postpone their harvest, which resulted in reduced yield. Miyagi reports "in spite of disadvantages, many farmers consider the selling of taro to be better than the selling of truck products to brokers" (1963:146).

According to Kikuchi (1964), although much of the marine life once common near the mouth of Waiāhole Stream had dwindled, kūpeʻe (*Nerita polita*) and āholehole fish (*Kuhlia malo*) were still found there. These species endured despite the lower volume of flow caused by the diversion of Waiāhole Stream for the aforementioned Waiahole irrigation tunnel. Residents of Koʻolaupoko District engaged in the Hawaiian cultural renaissance of the 1970s united in support of land and water rights for Native Hawaiians, as well as against suburban and commercial development of rural Oʻahu. The Waiāhole-Waikāne Community Association (WWCA) was formed to protect the rights of the tenant farmers and residents of Waiāhole and Waikāne valleys; particularly, in relation to the restoration of the diverted waters of Waiāhole Stream to Waiāhole and other affected communities on the windward side of Oʻahu.

Around 1974, the immediate project area vicinity was the site of a demonstration in which local working-class tenants and their supporters, all from different ethnic backgrounds, united against police-enforced evictions associated with proposed development of Waiāhole and Waikāne. Members of the WWCA organized a march down to Kamehameha Highway and Waiāhole Valley Road to receive their eviction notices, which they promptly burned in the street in peaceful protest of the evictions (Figure 33). About a year later, the community organized the occupation of Waiāhole Valley, and folks set up camp at the valley's head; one night, the demonstrators were warned that the National Guard was coming to evict the occupiers (personal communication Gwen Kim 2018). In response, activists created a blockade across Kamehameha Highway between Waikāne and the Hygienic Store in Kahaluʻu; the blockade lasted for a few hours until those involved heard that the National Guard had been called off (personal communication Gwen Kim 2018). In response to these and other protests/demonstrations, in 1977 the State of Hawaiʻi purchased 600 acres of land in Waiāhole and "designated it for agricultural use for future endeavors" (McElroy and Duhaylonsod 2015:27).

Figure 33. Protesters gathered near Waiāhole Poi Factory against development-related forced evictions in Waiāhole and Waikāne Valleys (*Honolulu Advertiser* August 16, 2009).

In 1971, a few years before the Waiāhole-Waikāne struggle took to the streets in front of Waiāhole Poi Factory, the Shige family sold the poi factory to the current owners, Calvin Hoe and his wife Charlene (Honolulu Magazine 2012). Calvin grew up in the area and has memories of families picking up poi in large wooden barrels from the factory (Myers 2014). Upon purchasing the poi factory, the Hoes operated it as a Hawaiian art gallery, as kalo cultivation was in decline. Thus, during the 1980s, the Hoes and others formed a non-profit organization called Hui Ulu Mea Ai to restore agricultural pursuits in the community (Hervey 2012). Over the coming years some Hui Ulu Mea Ai members would successfully launch small agriculture-based businesses from the poi factory, such as the Reppun family's Waiāhole Poi that they sold at the poi factory one day a week, Homestead Poi, Hale Kealoha Caterers, and Ono Loa Hawaiian Food (ibid.).

Meanwhile, the struggle for water rights that began in the 1970s continued and intensified in the 1990s. In 1994, Oahu Sugar Company, which had diverted Waiāhole Stream to irrigate its leeward cane lots for nearly a century, ceased operations. The current steward of Waiāhole Poi Factory and an active community member, Liko Hoe, was

quoted in an article published in *Honolulu Weekly* regarding the restoration of water to Waiāhole after Oahu Sugar Company closed,

> "We thought that was a good time to return those waters," Liko explains. Led by farmer Charlie Reppun, the Waiahole and neighboring Windward communities united to get the water returned. Today, only 50 percent of the area's water remains diverted.
>
> "That's a significant restoration of water in the streams here," Liko says. "It's an example of the community's position of not going along with the general flow, I guess you could say, speaking their minds and making a statement." (Hervey 2012)

Echoes of the struggle for water in Waiāhole are heard in a song recorded in 1979 by Vic Malo *Ode to Waiahole-Waikane Valley*. This politically charged soul song includes lyrics about paying to see a waterfall when there is no water at all. Another, more widely recognized, song released a few years later also mentions Waiāhole; composed by Gordon Broad, *Sweet Lady of Waiahole* is about Waiāhole resident Fujiko Matayoshi who peddled her fruits on the side of Kamehameha Highway until she passed away in 1985. This song was made famous by Bruddah Walter and has since been performed by many other artists.

Waiāhole Valley has captured the imaginations of residents and visitors alike for centuries as shown in the legends, historical accounts, and songs presented above. Since the 1960s, Waiāhole and neighboring Waikāne have also been the subject of struggles for land and water rights. Since 2009, Waiāhole Poi Factory has become a cultural landmark where local residents and visitors stop to enjoy plate lunches with hand-pounded or machine-milled *poi* made from locally grown *kalo* and browse Hawaiian arts and crafts (Myers 2014). Calvin Hoe and his sons have become stewards of traditional Hawaiian culture for the Waiāhole Valley community and beyond. Three days a week, Liko and his brother bring out the board and stones and pound poi to the delight of visitors from across the Hawaiian Islands and abroad. By actively engaging in traditional cultural practices including music, hula, poi pounding, and outreach/education, the Hoe family is preserving the traditional cultural practices that are valued by the Hawaiian community.

PREVIOUS ARCHAEOLOGICAL STUDIES

The earliest published descriptions of archaeological sites near the current project area were originally presented by McAllister (1933). McAllister's *Archaeology of Oahu* formed the basis for a 1962 Bishop Museum publication called *Sites of Oahu*. This compilation of data from published and unpublished sources and informant testimony was later augmented and reprinted under the same title by Sterling and Summers (1978). The initial survey conducted by McAllister generally focused on sites that were readily visible on the surface, such as heiau platforms, stone mounds, caves, ditches, ponds, and unusual-looking stones. The smaller and less dramatic sites and buried resources were for the most part overlooked in the early studies on the coastal plain. Instead of being based on excavated features and analyses of excavated materials, McAllister described the sites and features in terms of ethnographic accounts that he and Thrum (1906) had collected from people familiar with local history. The orally transmitted traditions recall interesting information about chiefs, priests, fishing, cultivation, deities, myths, rituals, and site functions. Among other things, the stories show how interconnected different parts of the landscape were in the minds of the people and how certain rituals were deemed necessary for subsistence purposes. McAllister (1933) mentions no sites within the vicinity of the current project area.

With the advent of Cultural Resource Management (CRM) in the 1970s as a response to stricter historic preservation laws and increased modern development, archaeologists started to record less noticeable surface sites and test for subsurface deposits in the Waiāhole Valley region of Oʻahu. A number of CRM projects have been conducted within the Waiāhole Valley region, in the vicinity of the current project area. The findings of these previous studies, which are important in generating predictive models for the number and type of archaeological features that may be encountered within the current study are presented below. The locations of the previously surveyed areas, relative to the current project area, are depicted in Figure 34 and Table 3. All previously and newly identified sites have been assigned State Inventory of Historic Places (SIHP) site numbers.

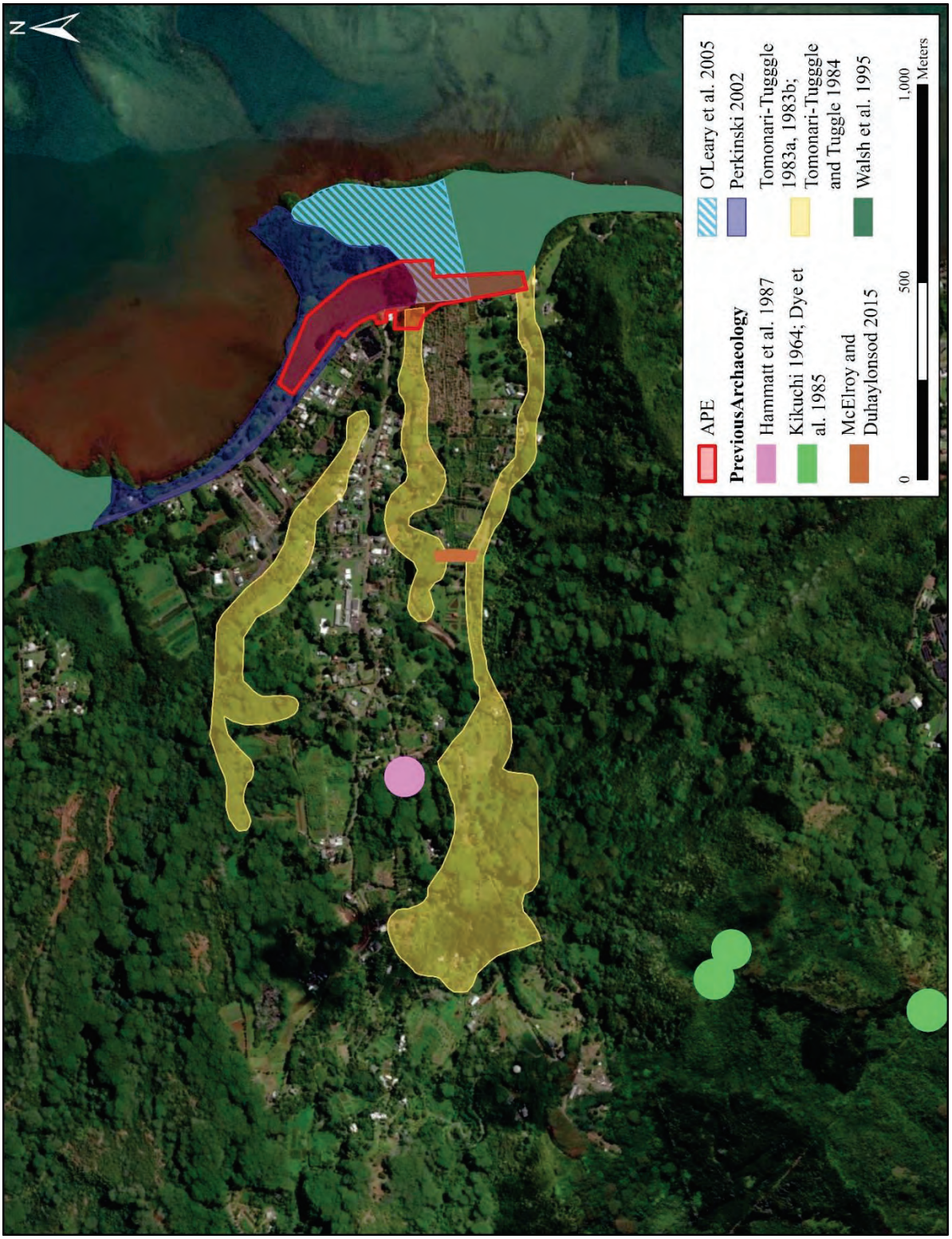

Figure 34. Previous Archaeological Studies conducted within and in the nearby vicinity of the project area.

Table 3. Previous archaeological studies.

Year	Author	Location	Type of Study
1963	Miyagi	Waiāhole Valley	Historic land use study
1964	Kikuchi	Waiāhole Valley	Archaeological survey
1974	Griffin and Pyle	Waiāhole and Waikāne Valleys	Reconnaissance and historical investigation
1983	Tomonari-Tugggle	Waiāhole Valley Agricultural Park	Reconnaissance
1984	Tomonari-Tugggle and Tuggle	Waiāhole Valley	Mapping and excavation report
1985	Dye et al	Puʻu Kuolani, Waiāhole Valley and Molokaʻi	Adze quarry study
1987	Hammatt et al	Central Waiāhole Valley	Archaeological testing
1995	Walsh et al	Coastal Waiāhole and Waikāne Ahupuaʻa	Archaeological assessment of coastal Waiāhole and Waikāne
2002	Perzinski et al	Waiāhole Beach Park	Archaeological inventory survey
2005	O'Leary et al	Coastal Waiāhole	Archaeological inventory survey
2015	McElroy and Duhaylonsod	Central Waiāhole Valley	Archaeological assessment

In 1963, Michihiro Miyagi completed his MA thesis which documented the historic land-use and transformation within Waiāhole Valley during three major time periods: Precontact, 1778-1920, and 1920-1961 (Miyagi 1963). Miyagi detailed two major period of intensive land use within the valley including the late Precontact Period immediately prior to Capt. Cook's arrival in which the valley saw extensive taro cultivation especially in the lowlands and a peak in the population. Mayagi observed that an extensive network of loʻi patches and ʻauwai system existed within the ahupuaʻa, and which may still exist as archaeological resources. Following European Contact, land-use and occupation within the valley declined during the historic period until the 20th century in which rice growers once again started to intensively cultivate within Waiāhole. Miyagi observed that the makai portions of Waiāhole Ahupuaʻa continued to maintain taro loʻi and ʻauwai, the entirety of Waiāhole Valley once maintained an extensive network of loʻi patches and ʻauwai system, which may still exist as archaeological resources.

In 1964, as a result of an early archaeological inventory survey of Waiāhole Valley, the Bishop Museum documented several archaeological sites in the mauka portion of the ahupuaʻa including two adze quarries (SIHP Site 50-80-10-2472 and 2475), an artifact scatter (SIHP Site 50-80-10-2476) and two house sites (Kikuchi 1964 in McElroy and Duhaylonsod 2015). The survey reported evidence on the extensive terracing, loʻi and irrigation ditches which once characterized the landscape. They observe only the makai sections are maintained. In the upland section, they note the stone remains of house sites and animal corrals. The presence of loʻi patches and ʻauwai features was also documented. Lithic workshops at two basalt quarries were identified, as were two house sites and a possible grave site near the coast, protected by a hau grove.

Approximately 10 years following the Bishop Museum's survey, the Archaeological Research Center of Hawaii conducted an archeological reconnaissance of the lower Waiāhole and Waikāne valleys (Griffin and Pyle 1974 McElroy and Duhaylonsod 2015). The survey documented the presence of loʻi and the remains of walls. They were unable to relocate SIHP Site 50-80-10-1089 which was previously identified along the coast.

In 1982, M.J Tomonari-Tuggle conducted an archaeological reconnaissance of portions of Waiahola Valley in support of the Waiāhole Valley Agricultural Park development (Tomonari-Tuggle 1983). As a result of the survey, twenty-eight archaeological sites were recorded. The sites consisted of residential areas, lithic workshops and agricultural features related to both traditional kalo and historic rice cultivation. Seven of these sites were located near the current project area. These include a possible irrigation canal (SIHP Site 50-80-10-3520), an embankment (SIHP Site 50-80-10-3521), a possible road bed (SIHP Site 50-80-10-5322), McCandless Rice Mill (SIHP Site 50-80-10-

3523), irrigation canal and rice fields (SIHP Site 50-80-10-3524), an artifact scatter (SIHP Site 50-80-10-3525), buried cultural deposits (SIHP Site 50-80-10-3526), and an irrigation canal (50-80-103527). In 1984, M.J Tomonari-Tuggle and H.D Tuggle conducted subsequent archaeological field work including excavation and mapping of several sites previously documented during the 1983 archaeological survey (Tomonari-Tuggle and Tuggle 1984). SIHP Sites 50-80-10-3509 (a concrete and cobble feature which likely served as footing for a bridge), -3510 (possible agricultural area), -3511 (possible irrigation structure), -3512 (habitation-agricultural complex), -3513 (modern irrigation canal) and -3526 (probable irrigation deposit) were all located near the confluence of the Waiāhole and Waianu Streams. Site -3526, identified as an irrigation deposit, is located just mauka of the current project area. However, the deposit has been disturbed by modern and historic farming activities. The survey notes that numerous traditional stone artifacts were observed in the plowed agricultural fields adjacent to the stream and along the stream bank. The survey notes that planned construction by the Hawaii Housing Authority will impact all the above-mentioned sites. No further work was recommended with the exception of monitoring and recordation of stratigraphic data during road work and utility installation. It is unknown if any of these sites, including Site -3526, were destroyed or in any way impacted by the development.

In 1993, the Department of Anthropology at the Bernice P. Bishop Museum conducted an inter-island study of adz quarries on Molokaʻi and Oʻahu, including the Waiahole Quarry Complex (Dye et al. 1985). The Waiahole Quarry Complex is comprised of several quarries (SIHP Site 50-80-10-2472, -2475,-and -2476). surrounding Puʻu Kuolani, a major basalt source within the valley. The quarry complex consists of SIHP Site 50-80-10-2472, -2475, -and -2476. The research indicates that the local demand for stone tools compared to the size of the quarry suggests that the quarry complex would have been utilized almost exclusively for local consumption.

In 1987, Cultural Surveys Hawaiʻi, Inc. (CSH) conducted archaeological testing of SIHP Site 50-80-10-3512, a lithic workshop previously identified in the Tomonari-Tuggle (1983) study and subsequently tested by Tomonari-Tuggle and Tuggle (1984) (Hammatt et al. 1987 in McElroy and Duhaylonsod 2015). The site was determined to be primarily utilized for the final stages of lithic reduction. However, evidence of habitation was also observed. One radiocarbon sample was recovered (sample species unknown) and yielded a date of AD 1655-1950, a range largely consistent with dates recovered during the Tomonari-Tuggle and Tuggle's study in 1984.

In 1995, CSH conducted an archaeological survey of a portion of Waiāhole peninsula, including the southern boundary of the current project area (Walsh et al. 1995). The survey reported loʻi -type soils and a possible ʻauwai, a portion of which may lie within the current project area. A buried cultural layer with possible water-worn basalt flakes and charcoal was observed in the southern portion of the project area. No SIHP Site identification numbers were assigned.

In 2002, CSH conducted an archaeological inventory survey including subsurface testing of a twenty-one acre parcel at Waiāhole Beach park on the coast of Waiāhole, including the majority of the land within the current project area (Perzinski et al. 2002). As a result of this survey two historic properties were identified. SIHP Site 50-80-10-1086 consisted of a concentration of rectangular alignments constructed from waterworn and basalt cobbles and interpreted as historic period graves. SIHP Site 50-80-10-6396 comprised a waterworn elongated boulder located within LCAw 7560:1 and interpreted as a possible Pohaku O Kane or 'God Stone.' The survey also identified a modern imu feature. The subsurface testing indicates that the area consisted of alluvial deposits overlayed by modern fill layers. Evidence of lo'i deposits were indicated in each of the test trenches by the presence of mottled silty clays and slay loam with iron staining. A possible buried loʻi wall was also identified. No SIHP identification numbers were given to the loʻi deposits or wall.

In 2005, CSH conducted an archaeological inventory survey with subsurface testing of an 9 acre portion of Waiāhole peninsula, including southern portion of the project area (O'Leary et al. 2005). As a result of the survey three historic properties were identified including SIHP Site 50-80-10-6756, a subsurface structural remnant; SIHP Site 50-80-10-6757, a historic road alignment; and SIHP Site 50-80-10-6758, traditional/historic agricultural field area. Site -6758 consists of three features including a subsurface agricultural stratum, a raised earth berm running parallel to Kamehameha Highway, and the remnants of an ʻauwai running through a culvert under Kamehameha Highway.

In 2015, Keala Pono conducted an archaeological inventory survey and subsurface testing in the central Waiāhole valley to support of the construction of a privately owned barn structure (McElroy and Duhaylonsod 2015). One previously identified archaeological site, SIHP Site 50-80-10-3506, an ʻauwai, was originally believed to be in the project area as suggested by information on file at SHPD. However, the survey relocated the ʻauwai approximately 20 m north of the project area. The survey identified no additional historic properties.

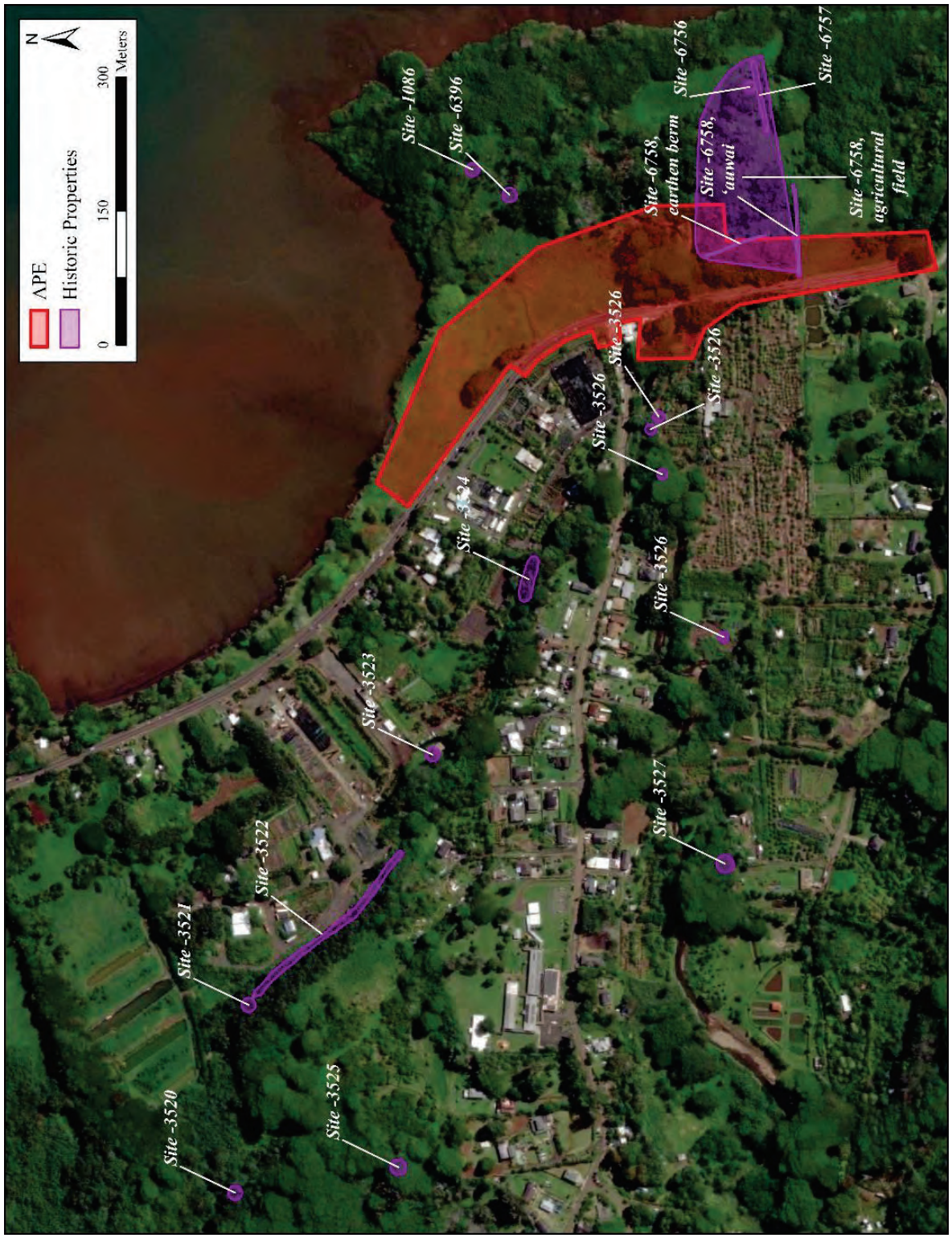

Figure 35. Historical properties previously identified within and in the nearby vicinity of the project area.

3. PROJECT AREA EXPECTATIONS

Archival research indicates that the project area has been utilized almost continuously for agricultural pursuits from the Precontact through the Historic periods. Miyagi (1963) indicated that Waiāhole supported a large population through the extensive cultivation of irrigated taro during the Precontact Period. These taro lands were arranged along the banks of the Waiāhole Strem and include the land within the current project area. Taro cultivation continued through the mid-19th century as indicated by *Māhale* records which described kulena containing numerous *lo'i* along with a few house lots and kula with diverse crops within the project area. Thus, there is a moderate possibility that evidence of this Precontact and early Historic Period agriculture and habitation remains present within the project area. Previous archaeological studies within the vicinity have identified numerous Precontact sites related to agriculture, habitation, and lithic manufacture withing Waiāhole (Kikuchi 1964; Tomonari-Tuggle 1983; Dye et al. 1985; O'Leary et al. 2005). While it is unlikely that Precontact surface archaeology remains present within the project area due to the extensive use of the area for agriculture and pasture lands, subsurface features related to be Precontact agriculture or habitation may also be present. An exception to this may be Precontact agricultural features, such as ʻauwai, which may have been continuously utilized for irrigation through the Historic Period.

During the latter part of the 19th century, much of the taro land in Waiāhole was converted to rice patties by Chinese setters including within the project area. However, the rice industry declined during the first decades of the 20th century and many of the former rice lands were abandoned. However, aerial imagery shows the project area and surrounding lands as cultivated in 1928. It is unclear what crop(s) was being grown. Aerial imagery from 1959 through 1978 indicates portions of the project area were cultivated in wetland agricultural, possibly taro or rice, which other portions remained uncultivated and/or under heavy tree cover. Cultivation of portions of the project area appeared to have ended sometime in the last decades of the 20th century and the land has remained undeveloped. Consequently, there is a high likelihood that surface and subsurface archaeological remains exist within the boundaries of the project area. One known site has previously been recorded within the project area O'Leary et al (2005) identified SIHP Site 50-80-10-6758, a traditional/Historic agricultural field containing three features including an ʻauwai, a subsurface pond field deposit and, an earthen berm. It is anticipated that these features will be relocated within the project area.

4. FIELDWORK

Fieldwork for the current study was conducted between October 9th, October 10th , November 28th, and December 5th by Nick Belluzzo, M.A. (Principal Investigator), Carol Oordt, M.A., John Meyer, B.A., Evan Ryder, B.A., Rancestan DeRego-Cabarloc, B.A., Kevin Pico, B.A., and Keeley Toledo, B.A.. A total of 72 person-hours were expended during the fieldwork.

FIELD METHODS

During the archaeological field survey, the majority of the ground surface of project area was visually inspected by field technicians walking transects spaced at no more than 10 meters apart (Figure 36). The project area contained several areas with dense cane grasses; these areas were not surveyed as the ground surface was not visible during the transects and it determined to be unsafe and unproductive to continue through these sections (Figure 37). These areas are depicted in Figure 38.

When archaeological features were encountered, their positions were plotted on a map of the current project area using EOS Arrow 100 Global Navigation Satellite System (GNSS) receivers connected to handheld tablet computers running ESRI's Collector Application (Collector App). (set to the NAD 83 Zone 4 North), along with areas of previous disturbance, conspicuous landforms, and vegetation patterns. Identified features located within the current project area were then cleared of vegetation, photographed (both with and without a meter stick for scale), depicted on a scaled drafted plan map, and described using standardized feature record forms. Sites that were located near, but outside the current project area, were cleared of vegetation, photographed (both with and without a meter stick for scale), and described using standardized feature record forms; scaled plan view drawings were not made of features located outside the project area.

Three shovel test pits (STPs) were excavated within the project area to test for the presence of subsurface archaeological deposits. Three of the STPs were located within the boundaries of the proposed ground disturbance. An additional two STPS were located just outside the eastern boundary of the central portion of the project area to identify a portion of SIHP # 50-80-10-6758, Feature A, a subsurface agricultural layer previously identified by O'Leary et al. (2005). Subsurface testing did not occur in the northern and southern portions of the proposed ground disturbance area due to the presence of dense cane grasses.

Multiple photographs were taken at each STP and scaled profile drawings were prepared. Soils were described in detail, using standard USDA soil descriptions referencing Munsell color notations. The results of the subsurface testing including a discussion of the stratigraphy encountered in the STPs is presented below.

No cultural material was collected during the current fieldwork, General notes on individual items and surface concentrations of material were included in field documentation.

Figure 36. Example of space between transects, view to the southeast.

Figure 37. Example of cane grasses determined too dense to survey through, view to the east.

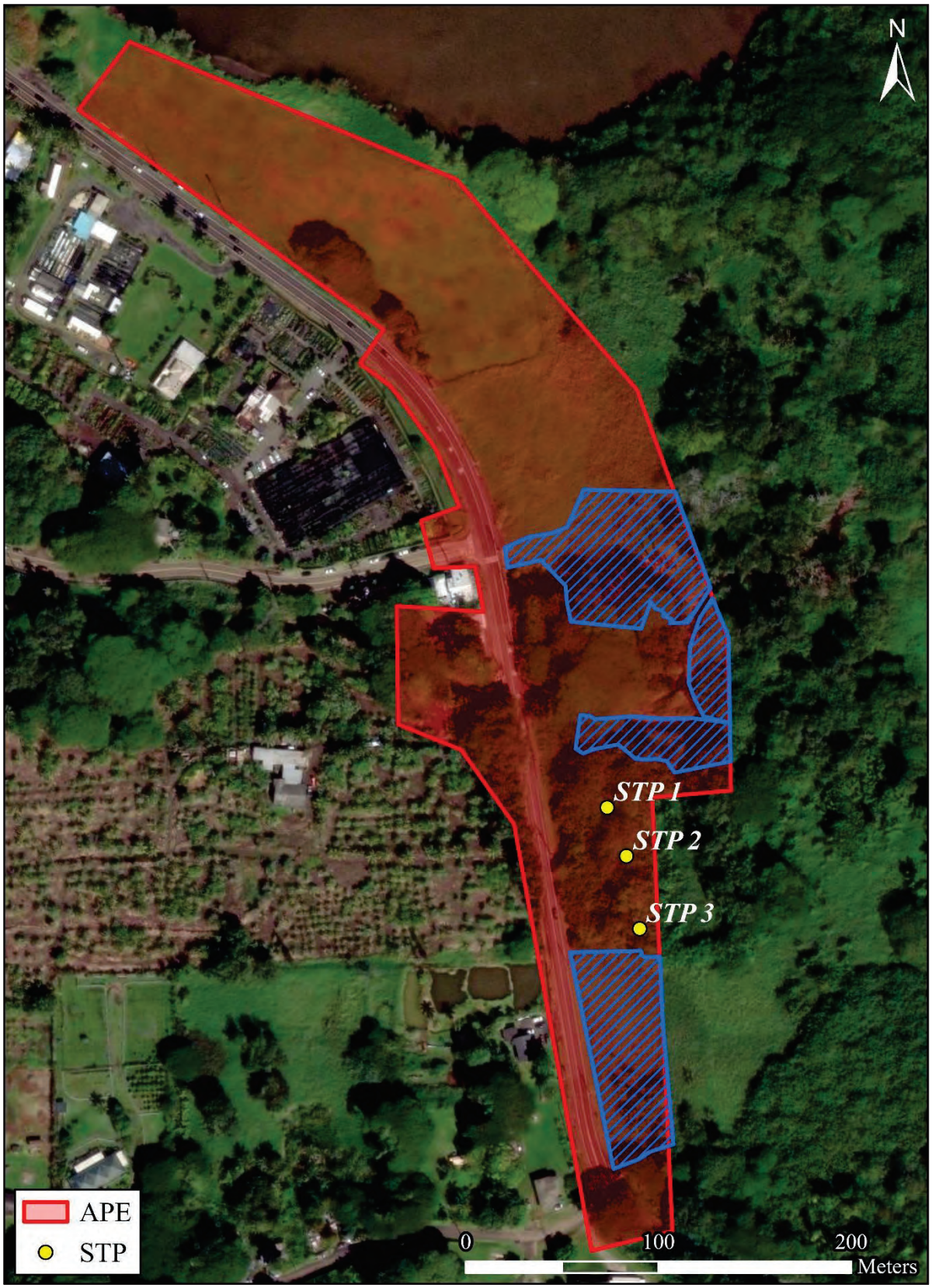

Figure 38. Location of STPs and areas not surveyed within the project area.

FINDINGS

As a result of the fieldwork for the current study, two previously recorded features and four previously undocumented feature associated with SIHP # 50-80-10-6758, a former pond field, were identified. In addition, two previously undocumented archaeological sites were identified. The locations of these sites relative to the current study area is presented in Figure 39. The sites are described below.

Table 4. Historic Properties recorded during the current study.

SIHP Site Number	Type	Function	Age
50-80-10-6758 Feature B	Earthen Berm	Agricultural	Traditional and/or Historic
50-80-10-6758 Feature C	ʻAuwai	Agricultural	Traditional and/or Historic
50-80-10-6758 Feature D	ʻAuwai	Agricultural	Traditional and/or Historic
50-80-10-6758 Feature E	Culvert	Transportation	Historic
50-80-10-6758 Feature F	Culvert	Transportation	Historic
50-80-10-6758 Feature G	Culvert	Transportation	Historic
T-1	Bridge	Transportation	Historic
T-2	Concrete Foundation	Unknown	Historic

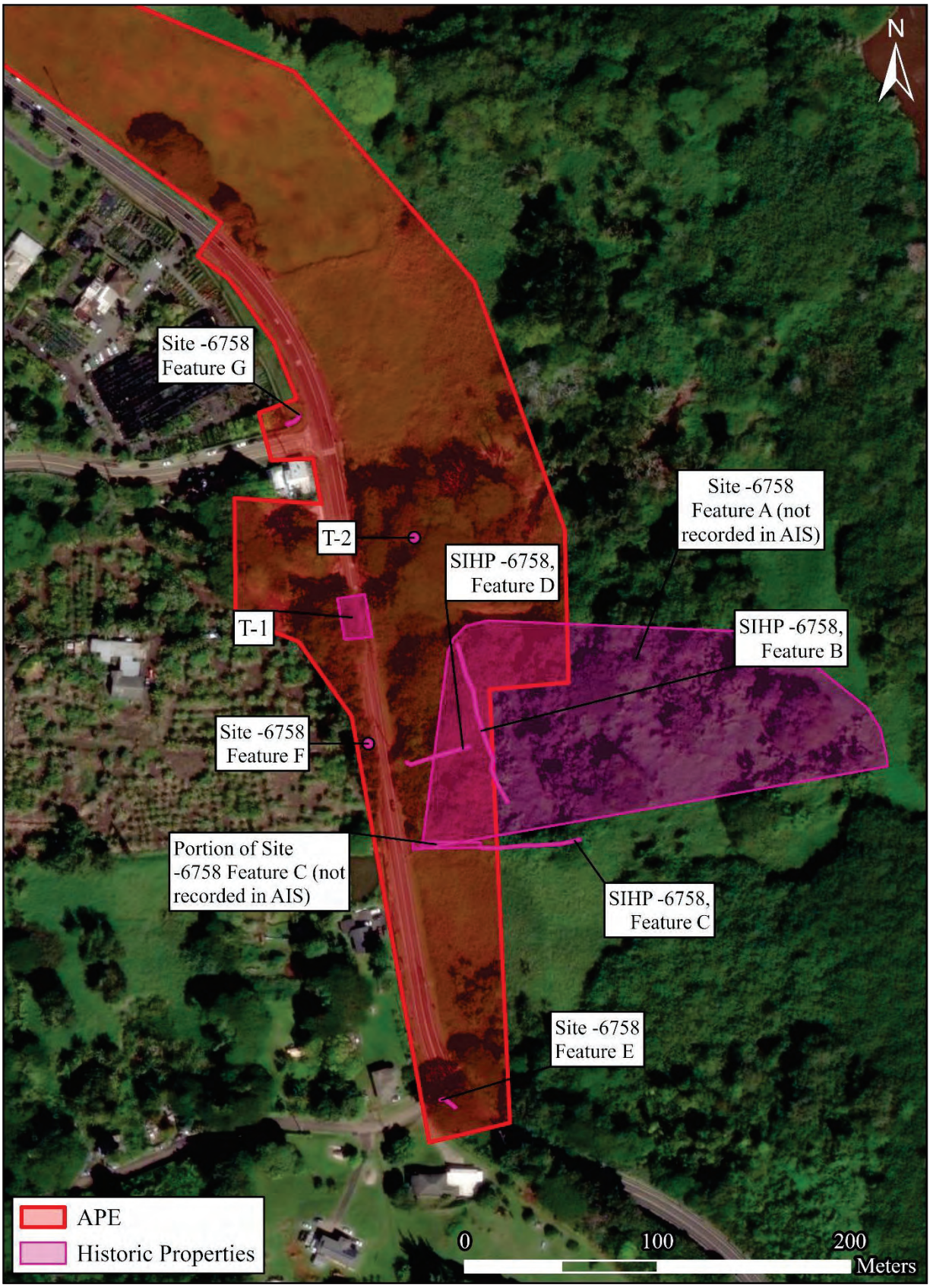

Figure 39. Site location map.

SIHP # 50-80-10-6758

SIHP # 50-80-10-6758 was recorded by O'Leary et al. (2005) as a former pond field consisting of three features: Feature A consisted of a subsurface agricultural deposit, Feature B consisting of an earthen berm, and Feature C consisting of an ʻauwai. During fieldwork Feature B and Feature C were reidentified. In addition, a previously unrecorded feature, Feature D, consisting of the remnants of an ʻauwai was identified.

Feature A consisted of an old agricultural surface used for kalo cultivation. As a result of subsurface testing, O'Leary et al. (2005) identified that this deposit extended 230 meters east-west and 100 meters north-south. The stratum is not homogeneous, ranging between 20 and 50 centimeters thick and containing varying amounts of charcoal flecking. O'Leary et al. (2005) submitted a kukui nut derived from this stratum for ASM 14C dating. The results indicate a 95.4% probability that the kukui nut dies between 1450 and 1650 suggesting that Feature A was established during the Precontact period. Feature A was not observed during the current field work.

Feature B is an earthen berm which runs roughly parallel to Kamehameha Highway and is located approximately 50 meters east of the highway. O'Leary et al. (2005) provide the following site description:

> The berm is earthen, with a few sub-angular basalt cobbles scattered along its upper surface. It is approximately 2-3 meters wide. It retains a level surface to the west and is 50 -70 cm higher in elevation than the level land surface to the east of the berm.

The berm observed during the current fieldwork fits O'Leary et al. (2005)'s description. However, while O'Leary et al. (2005) recorded the berm as approximately 66 meters long, the current survey recorded the berm as roughly 86 meters long. O'Leary et al. (2005) noted that an aerial photograph taken in 1949 displays a raised berm separating two loʻi in the approximate location as the recorded earthen berm and therefore, hypothesize that it is the berm is the same pond wall. This hypothesis is further supported by aerial photographs from 1928 through 1978 which display the same earthen berm dividing loʻi (Figure 41 through 44).

Figure 40. SIHP # -6758 Feature B, Earthen Berm. View to the south.

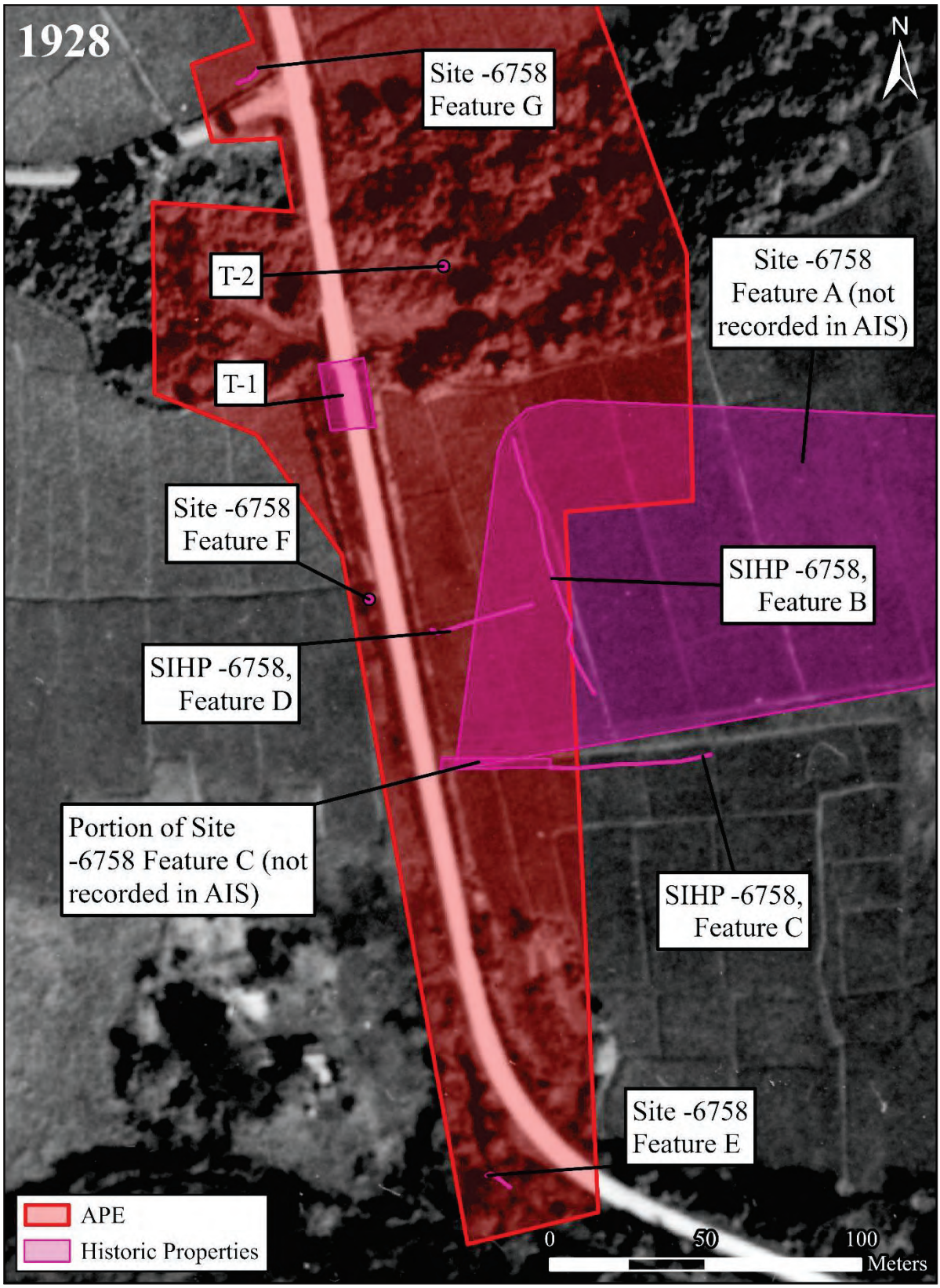

Figure 41. 1928 Aerial overlaid with location of historic properties and archaeological sites identified during current AIS.

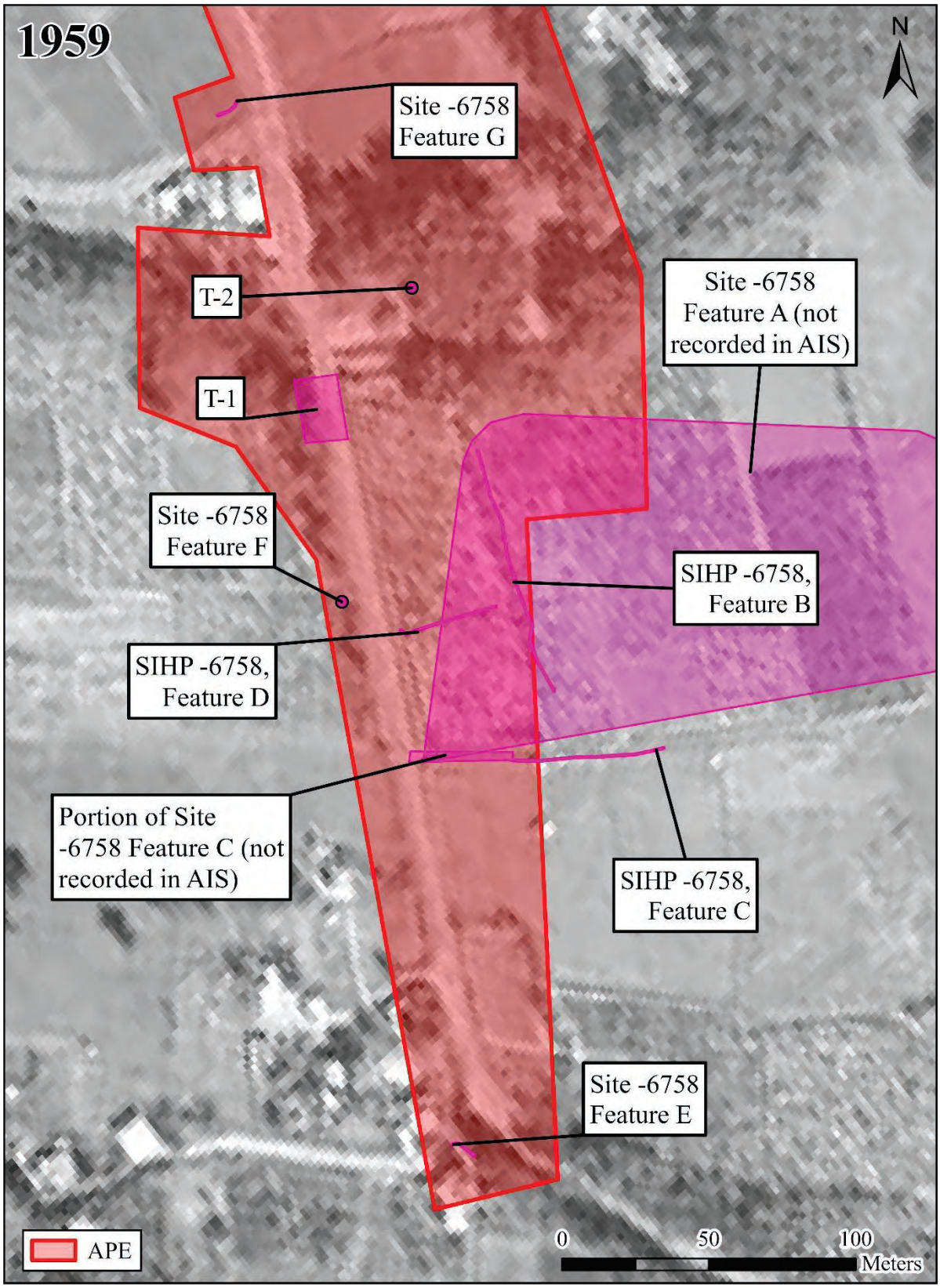

Figure 42. 1959 Aerial overlaid with location of historic properties and archaeological sites identified during current AIS.

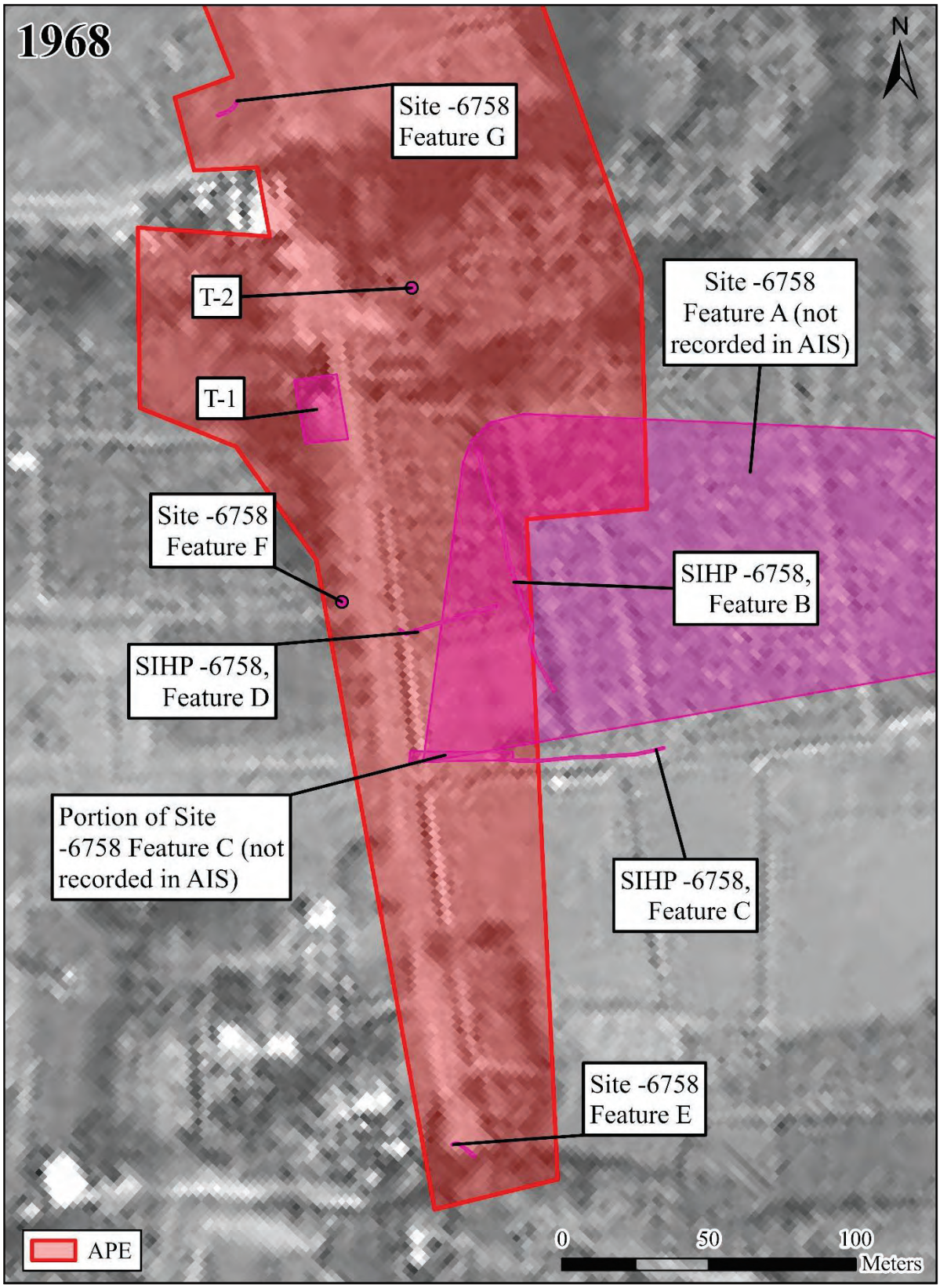

Figure 43. 1968 Aerial overlaid with location of historic properties and archaeological sites identified during current AIS.

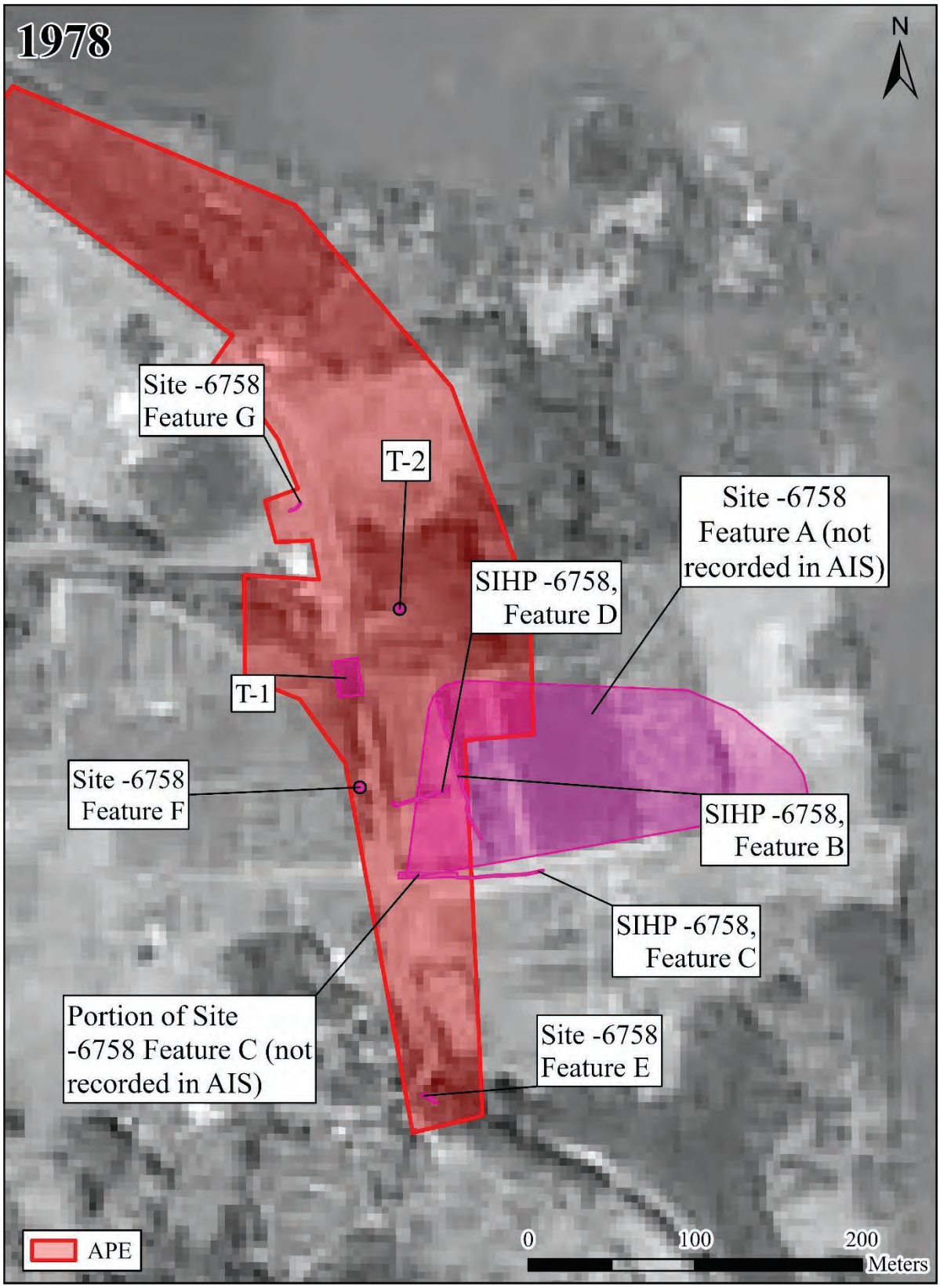

Figure 44. 1978 Aerial overlaid with location of historic properties and archaeological sites identified during current AIS.

Feature C consists of the remnants of an ‘auwai previously identified by O’Leary et al (2005). O‘Leary et al. (2005) records the ‘auwai as originating from a culvert that runs underneath Kamehameha Highway and extending eastward for 120 meters. During the current fieldwork, only a portion of the ‘auwai was observed as cane grass and dense vegetation had overgrown the western extent of the ditch nearest to Kamehameha Highway. The visible portion of the ‘auwai was approximately 52 meters long being approximately 30 meters east of the highway. The ditch was approximately 2.5 meters wide and roughly 45 centimeters deep. Modern PVC pipes were observed running along the top of the ‘auwai. No water flowed through the ‘auwai at the time of the survey but the presence of the PVC pipe suggests that the ditch was used to irrigate the former agricultural fields and lo‘i through the 1970s.

Figure 45. SIHP # -6758 Feature C, ‘auwai. View to the east.

Feature D is a newly identified ʻauwai located in the southern portion of the project area between Kamehameha Highway and Feature B, the earthen berm. The ʻauwai is 34 meters long extending eastward from the highway. It is roughly 160 centimeters wide and 10 centimeters deep. The ʻauwai is roughly parallel to Feature C and perpendicular to Feature B. An aerial image from 1928 displays a faint division in the fields at the same approximate location that T-1 was recorded (Figure 41). It is probable the ʻauwai is the cause of the division. Thus, Feature D was built prior to 1928 and was likely used to irrigate the loʻi within the vicinity. This division can also be seen on aerial imagery through 1978 suggesting the ditch was use for irrigation or at least served as a dividing border between fields through the late 1970s (Figure 42 through 44).

Figure 46. SIHP # -6758 Feature D, ʻauwai. View to the east.

Feature E is a culvert and retaining wall located in the southernmost portion of the project area, mauka of Kamehameha Highway. T-1 is located on a bend in the road. The wall is approximately 6.8 meters long and between 180 and 50 centimeters tall. The culvert pipe is located at the base of the wall and has a diameter of 61 centimeters. The wall is constructed of basalt cobbles and cement. The top course of cobbles appears to be missing from the northern two-thirds of the wall. The wall retains soil between Kamehameha Road and a ditch. It is not clear when the culvert and retaining wall were built. However, their construction is likely associated with the construction of the road.

Figure 47. T-1, culvert and retaining wall. View to the northeast.

Feature F is a culvert located in the south-central portion of the project area mauka of Kamehameha Highway. The culvert is square with a round opening. Unlike the other culverts recorded within the project area (Feature E and G), Feature F does not have a basalt retaining wall and rather is buried solely by soil deposits. The lower half of the culvert's opening of the culvert contained soil and foliage suggesting that the culvert no longer functions.

Figure 48. T-1, culvert and retaining wall. View to the northeast.

Feature G is a culvert and retaining wall located in the central portion of the project area at the intersection of Kamehameha Highway and Waiahole Valley Road. The wall is roughly 8 meters long and 45 centimeters tall. The wall is sloped and constructed from basalt cobbles and cement. The culvert pipe is located on the western extent of the wall and has a diameter of 50 centimeters. It is not clear when the culvert and retaining wall were built. However, their construction is likely associated with the construction of the road.

Figure 49. T-1, culvert and retaining wall. View to the east.

T-1

T-1 is Waiahole Stream Bridge over which Kamehameha Highway crosses Waiahole Stream. The bridge was constructed in 1922. The bridge was designed by R.W. Mowry (Thompson 1983) as a two-span reinforced concrete tee beam superstructure with a concrete abutment wall and multi-column bent substructure (Figure 24), underlying a reinforced concrete deck with AC overlay. The bridge parapets are classified as concrete solid panel with cap (MKE Associates LLC and Fung Associates, Inc 2013) The bridge has no shoulders; thus, in 1968 the extant wooden pedestrian walkway was constructed and attached to the mauka side of the bridge.

T-2

T-2 is a partially intact concrete foundation located in the north central portion of the project area. The foundation is 190 cm long, 110 cm wide, and approximately 10 cm thick. While the site appears to be mostly intact, the northwest side of the foundation consists of a different surface texture and is more deteriorated than the rest of the foundation suggesting that the site may have once been larger or attached to an additional foundation/structure. The date of construction and the function of the foundation is unknown.

Figure 50. T-2, view to the northeast.

Shovel Test Pits

A total of 3 STPs were excavated by hand within the project area (Figure 26 through 53). The STPs were excavated to a depth of at least 5 cm below the water table which was encountered between 45 and 48 cm below the ground surface (cmbs). The total depth of the STPs ranged from between 52 and 73 cmbs. A single soil deposit, Layer I, was encountered in all the STPs. Layer I consists of a very dark grayish brown silty clay loam interpreted as the ground surface deposit located throughout the central portion of the project area. Layer I is correlated with Stratum A identified by O'Leary et al. (2005) during subsurface testing in 2005. O'Leary describes Stratum A as an A-Horizon comprised of 10 YR 2/2, very dark brown silt loam. The difference in textural classification between Layer I and Stratum A (silty clay loam vs silt loam) is interpreted as a consequence of differing field conditions during the projects. Layer I is interpreted as fill used to infill former wetlands at the end of the 20th century.

During the subsurface testing for the current project, the land was extremely saturated due to continuous rain in the days prior to the testing. Figure 54, which depicts Layer I extant within STP 3, provides a representative example of the stratigraphy present in all the STPs. No subsurface cultural deposits or native soil deposits were encountered during the subsurface testing. It is hypothesized that the saturated field conditions due to the rain resulted in raised water table levels which prevented deeper subsurface excavation.

Figure 51. STP 1, view to the north.

Figure 52. STP 2, view to the west.

Figure 53. STP 3, view to northeast.

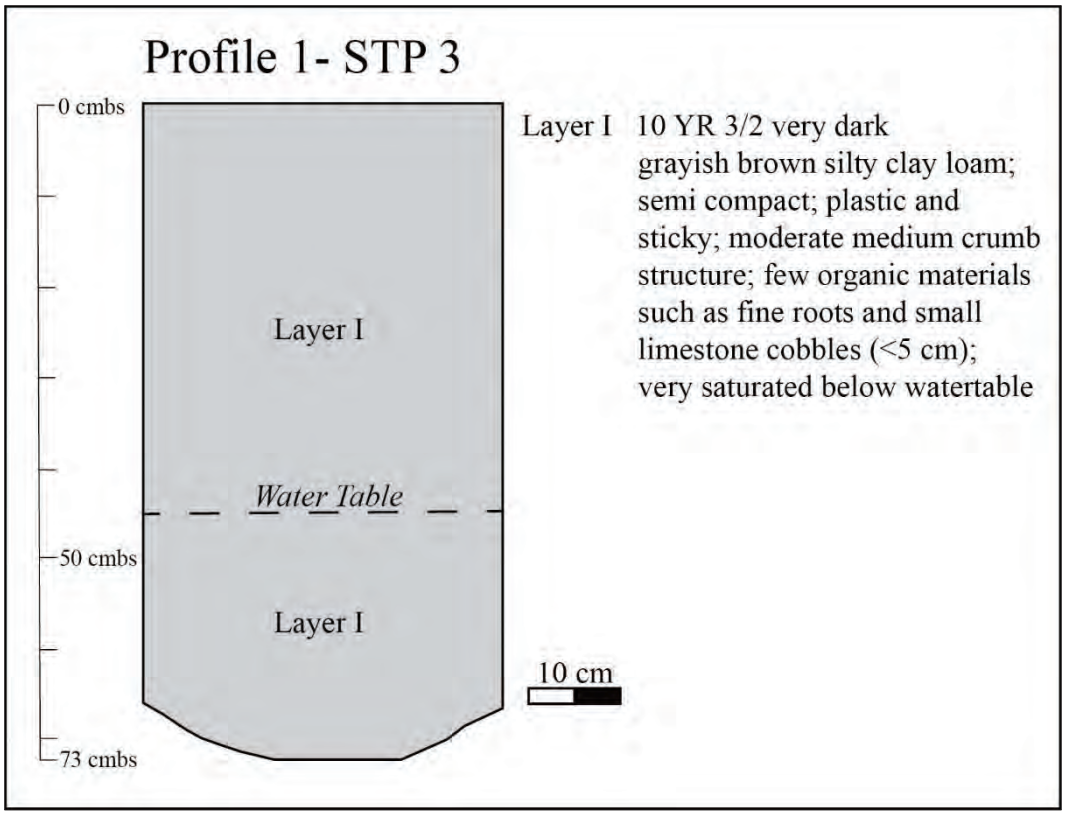

Figure 54. Profile 1 depicting stratigraphy present in STP 3.

5. SIGNIFICANCE EVALUATIONS AND TREATMENT RECOMMENDATIONS

The recorded archaeological site is assessed for its significance based on criteria established and promoted by the DLNR-SHPD and contained in the Hawai‘i Administrative Rules §13-275-6. For a resource to be considered significant it must possess integrity of location, design, setting, materials, workmanship, feeling, and association and meet one or more of the following criteria:

a Be associated with events that have made an important contribution to the broad patterns of our history;

b Be associated with the lives of persons important in our past;

c Embody the distinctive characteristics of a type, period, or method of construction; represent the work of a master; or possess high artistic value;

d Have yielded, or is likely to yield, information important for research on prehistory or history;

e Have an important traditional cultural value to the native Hawaiian people or to another ethnic group of the state due to associations with traditional cultural practices once carried out, or still carried out, at the property or due to associations with traditional beliefs, events or oral accounts—these associations being important to the group’s history and cultural identity.

The significance and recommended treatment for the five recorded sites is presented in Table 5 and discussed below.

Table 5. Site significance and treatment recommendation.

Site #	*Site Type*	*Temporal Affiliation*	*Significance*	*Recommended Treatment*
50-80-10-6758	Agricultural	Precontact/Historic Period	D, E	Preservation Plan, to include restoration, and Data Recovery in the form of Archaeological Monitoring
T-1	Transportation	Historic Period	HDOT will provide separate determination	HDOT will provide separate recommendation
T-2	Foundation	Historic Period	Not Significant	No further work

SIHP # 50-80-10-6758

SIHP # 50-80-10-6758 is a Precontact/Historic Period multicomponent agricultural field. The site had been previously recommended by O’Leary et al. (2005) as eligible for the National and Hawai‘i Registers of Historic Places under criterion D for its informational content and by Gotay and Rechtman (2018) under criterion E, importance to the native Hawaiian people. The agricultural fields encompassed within SIHP # -6758 are a part of a larger lo‘i system within Waiahole which has been documented in mo’olelo, L.C.Aws, and previous archaeological research. Barrera (1982) observed that the entire valley of Waiahole is likely eligible for the State and National Registers of Historic Places as a historical district under criteria A (broad themes of history), C (excellent example of site type) and D (informational content). However, as discussed O’Leary et al. (2005), the site has been extensively disturbed and surface features destroyed. Therefore O’Leary et al. (2005) state that the site lacks the integrity to be significant under criterion A or C. However, the site is still likely to provide information important to research into land-use studies and land-use change over time and therefore, O’Leary et al. (2005) recommend SIHP # -6758 as eligible under criterion D. O’Leary et al. 2005 recommends that data recovery in the form of an archaeological monitoring program is appropriate mitigation measure for effects to the site.

Additionally, when Gotay and Rechtman (2018) conducted a cultural impact assessment (CIA), they additionally found Site 6758 eligible under E. However, at the time of the CIA, no ground disturbing work was proposed at the location of Site 6758, but the CIA indicated the importance the community placed on waterflow in the ‘auwai. Therefore, it is proposed that a preservation plan be prepared pursuant to HAR 13§13-275-8(1)(A) which includes rehabilitation and appropriate cultural use.

SITE T-1

Site T-1 is Waiāhole Bridge which has undergone multiple evaluations as part of state-wide bridge surveys in 1983, 1996, and 2013. Waiāhole Bridge was deemed as not historically significant in the 1996 State of Hawaii Historic Bridge Inventory and Evaluation report, as documented in an August 14, 1998 letter (LOG NO:22063 DOC NO:9808co09) from Don Hibbard of SHPD to F.J. Rodriguez of Environmental Communications. SHPD provided comments on draft environmental documentation for an earlier iteration of current project, stating the Waiāhole Bridge "is not cited as a historically significant bridge in the (Draft) State of Hawaii Historic Bridge Inventory and Evaluation report dated May 1996" (ibid.). The State Historic Preservation Officer (SHPO) echoed this no effect determination in a May 18, 2001 letter (LOG NO:27494 DOC NO:0105EJ14) to HDOT. The SHPO provided comments on a draft environmental assessment, stating the Waiāhole Bridge "was determined to be 'not significant' in 1996."

In contrast to the earlier studies and determinations, MKE and Fung (2013) recommended that Waiāhole Bridge was eligible for listing in the National Register of Historic Places under Criterion C "for its association with early developments in concrete bridge construction in Hawaii" (ibid.:4-246). They go on to say, "It is a good example of a 1920's reinforced concrete bridge that is typical of its period in its use of materials, method of construction, craftsmanship, and design" (ibid.). HDOT will be providing a separate evaluation of significance and determination of effect for T-1, Waiāhole Bridge.

SITE T-2

Site T-2 is a portion of a concrete foundation within an unknown date of construction and unknown function. T-2 lacks integrity of design, setting, materials, workmanship, feeling, and association while it retains integrity of location.

The site was evaluated for significance under Criterion D, informational potential. Site T-2 is a remnant of a poorly constructed concrete foundation. It is of a common construction type and technique and is unlikely to yield information not already documented or more readily accessible in archival materials. As such, the site is not considered significant under any of the criteria outlined in 13§13-275-6. Therefore, Site-1 is evaluated as not significant, and no further work is recommended.

6. DETERMINATION OF EFFECT

The proposed project would involve grubbing, grading, and trenching makai of Kamehameha Highway. The current AIS documented a multicomponent agricultural site (Site 6758) within the proposed extent of the development project. There is a high likelihood that several components of this site, including two ʻauwai and although not identified in the current subsurface testing, a subsurface agricultural layer, will be affected by the proposed project. This study recommends that a preservation plan, to include restoration and appropriate cultural use, be created to mitigate any impact to these features. Additionally, in accordance with O'Leary et al (2005), this study recommends data recovery in the form of archaeological monitoring and to identify any additional subsurface deposits pursuant to HAR §13–279 for all ground-disturbing activity.

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APPENDIX F

A Cultural Impact Assessment for the Waiāhole Bridge Replacement Project

Portions of TMKs: (1) 4-8-001:001 and 010; (1) 4-8-002:001; (1) 4-8-008:018 and 021-025; and (1) 4-8-009:001 and 006

Waiāhole Ahupuaʻa
Koʻolaupoko District
Island of Oʻahu

DRAFT VERSION

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ASM Project Number 28290

A Cultural Impact Assessment for the Waiāhole Bridge Replacement Project

Portions of TMKs: (1) 4-8-001:001 and 010; (1) 4-8-002:001;
(1) 4-8-008:018 and 021-025; and (1) 4-8-009:001 and 006

Waiāhole Ahupua‘a
Ko‘olaupoko District
Island of O‘ahu

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CHAPTERS

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1. INTRODUCTION

At the request of KAI Hawaii, Inc. on behalf of the State of Hawai‘i Department of Transportation, Highways Division, ASM Affiliates has prepared this Cultural Impact Assessment (CIA) as part of an Environmental Assessment (EA) in support of the Kamehameha Highway, Waiāhole Bridge Replacement project (Project No. BR-083-1[37]). The roughly 10.4-acre study area (Figure 1) includes portions of TMKs: (1) 4-8-001:001 and 010, 002:001, 008:018 and 021-025, and 009:001 and 006 (Figure 2); and is located where Kamehameha Highway crosses Waiāhole Stream (Figure 3). The extant Waiāhole Bridge (Bridge Number 003000830303459) comprises two lanes for vehicular travel and measures roughly 66 feet long by 26 feet wide (MKE and Fung 2013:4-244; Figures 4, 5, 6, 7, and 8). In addition, a wooden pedestrian bridge connected to the outside of the bridge railing spans Waiāhole Stream on the *mauka* side of the bridge (Figure 9). The lack of road shoulders on the extant bridge creates unsafe conditions for vehicles and cyclists who share the road, and limits foot traffic to the *mauka* side of Waiāhole Stream even though there are bus stops on the both sides of the highway. The waters of the perennial Waiāhole Stream (Figures 10 and 11) currently flow beneath the bridge through the spaces between the concrete abutments and multi-column bent (see Figure 8). The extant bridge is hydraulically insufficient, as debris often clogs the openings beneath the bridge, which limits stream flow and results in flooding events in which water overtops the embankments and the bridge. The extant Waiāhole Bridge is considered structurally deficient and functionally obsolete with settlement of the south abutment and resultant sloping of the bridge parapet, which has necessitated maintenance in the form of asphalt cement added periodically to level out the roadway.

The proposed bridge replacement project will include the construction of a temporary bypass road and stream crossing located immediately *makai* of the current Kamehameha Highway travel lanes and Waiāhole Bridge between mile posts 34 and 35, the realignment and widening of the stream channel *mauka* of the extant bridge, the use of a staging and laydown area north of the bridge and *makai* of the highway, and the demolition of extant bridge and replacement with a new bridge that meets current design and safety standards (Figure 12). The portions of the study area situated *makai* of Kamehameha Highway (Figures 13, 14, and 15) are undeveloped and include land owned by the City and County of Honolulu. The portion of the study area located north of the extant bridge is bound on the *mauka* side of the highway by a handful of businesses and Waiāhole Valley Road; while the portion of the study area located south of the extant bridge is bordered on the *mauka* side by agricultural land (see Figure 3). Vegetation within the study area (Figure 16) includes ironwood (*casuarina equisetifolia*), breadfruit (*Artocarpus altilis*), *hau* (*Hibiscus tiliaceus*), *koa haole* (*Leucaena leucocephala*), and coconut palms (*Cocos nucifera*), multiple invasive grass and weed species, as well as *ti* (*Cordyline fruticose*), *‘ape* (*Alocasia macrorrhiza*), and *kalo* (*Colocasia esculenta*).

The temporary bridge abutments will be built with Geosynthetic Reinforced Soil rather than concrete to minimize soil disturbance; and will include two travel lanes as well as a temporary pedestrian walkway off one side of the bridge. The replacement bridge will be 85 feet long and 43 feet wide, and will lie entirely outside of Waiāhole Stream. There will be two 12-foot wide travel lanes with two 8-foot wide shoulders to accommodate pedestrians and cyclists. Because the replacement bridge is a single span structure with no piers located within the streambed, it will have increased hydraulic capacity and be able to better accommodate flooding events.

The current report was prepared in support of an Environmental Assessment (EA) in compliance with Hawai‘i Revised Statutes (HRS) Chapter 343, and in accordance with the Office of Environmental Quality Control (OEQC) *Guidelines for Assessing Cultural Impact*, adopted by the Environmental Council, State of Hawai‘i, on November 19, 1997. As stated in Act 50, which was proposed and passed as Hawai‘i State House of Representatives Bill No. 2895 and signed into law by the Governor on April 26, 2000, “environmental assessments . . . should identify and address effects on Hawaii’s culture, and traditional and customary rights . . . native Hawaiian culture plays a vital role in preserving and advancing the unique quality of life and the ‘aloha spirit’ in Hawai‘i. Articles IX and XII of the state constitution, other state laws, and the courts of the State impose on governmental agencies a duty to promote and protect cultural beliefs, practices, and resources of native Hawaiians as well as other ethnic groups.”

The current report contains a detailed background section providing setting and context (cultural, historical, and archaeological) to facilitate a more complete understanding of the significance of the Waiāhole area, and the historic and cultural properties within that landscape. The consultation process is described and the results of consultation are presented, which is followed by a discussion of potential cultural impacts and the appropriate actions and strategies necessary to mitigate any potential impacts.

Figure 1. Study area location on portion of 1998 USGS Kāne‘ohe quadrangle 7.5-minute topographic map.

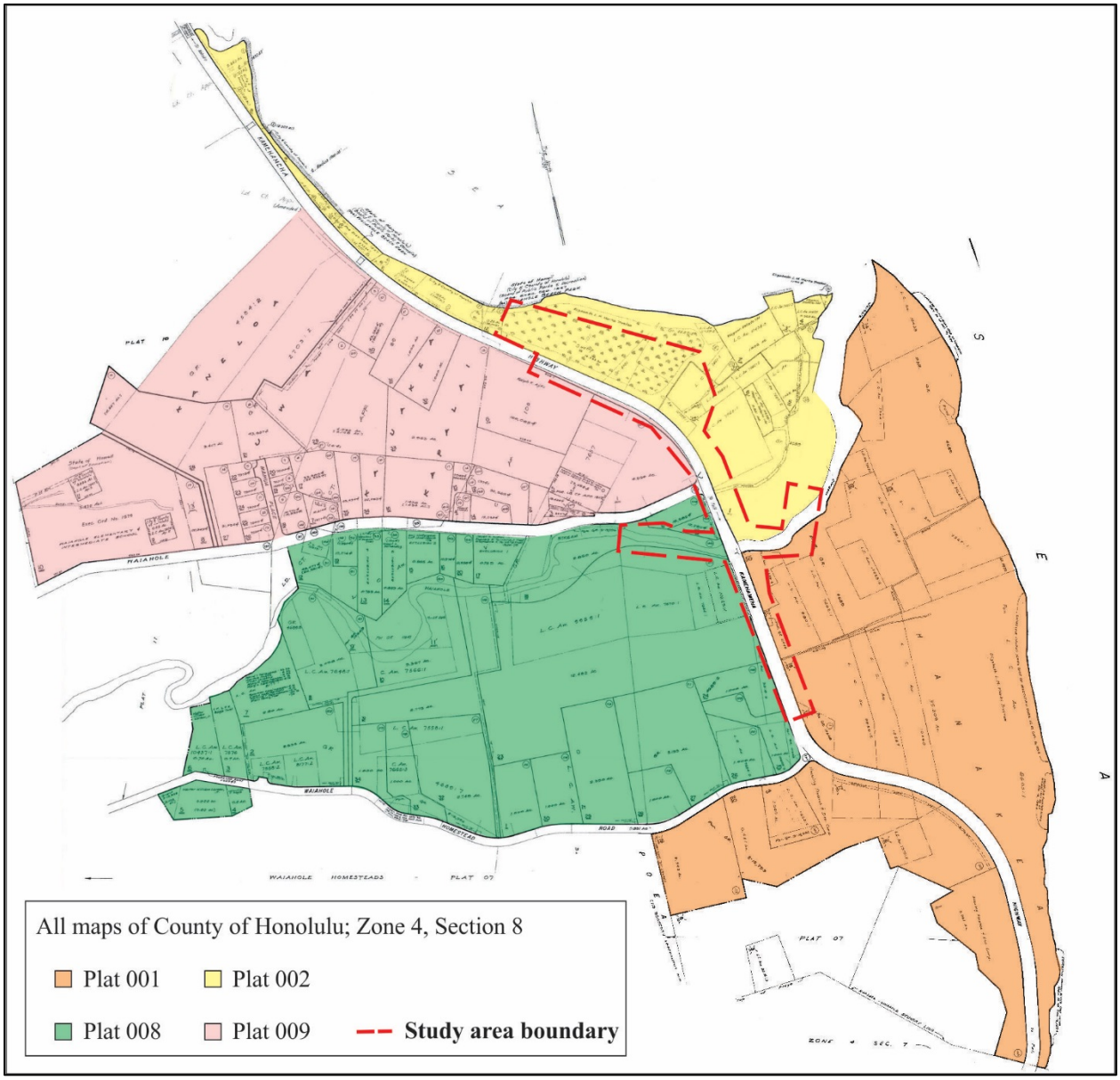

Figure 2. Composite of Tax Map Key (TMK) maps showing study area location.

Figure 3. Satellite image captured January 15, 2013 showing current study area outlined in red.

Figure 4. Waiāhole Bridge (view to the northeast).

Figure 5. Kamehameha Highway and Waiāhole Bridge (view to the northwest).

Figure 6. Kamehameha Highway and Waiāhole Bridge (view to the Southeast).

Figure 7. *Makai* side of Waiāhole Bridge (view to the northwest).

Figure 8. *Mauka* side of Waiāhole Bridge (view to the northeast).

Figure 9. Pedestrian bridge on *mauka* side of Waiāhole Bridge with Waiāhole Poi Factory beyond (view to the north).

Figure 10. View from pedestrian bridge of Waiāhole Stream on the *mauka* side of Kamehameha Highway (view to the northwest).

Figure 11. View from pedestrian bridge of Waiāhole Stream on the *makai* side of Kamehameha Highway (view to the southeast).

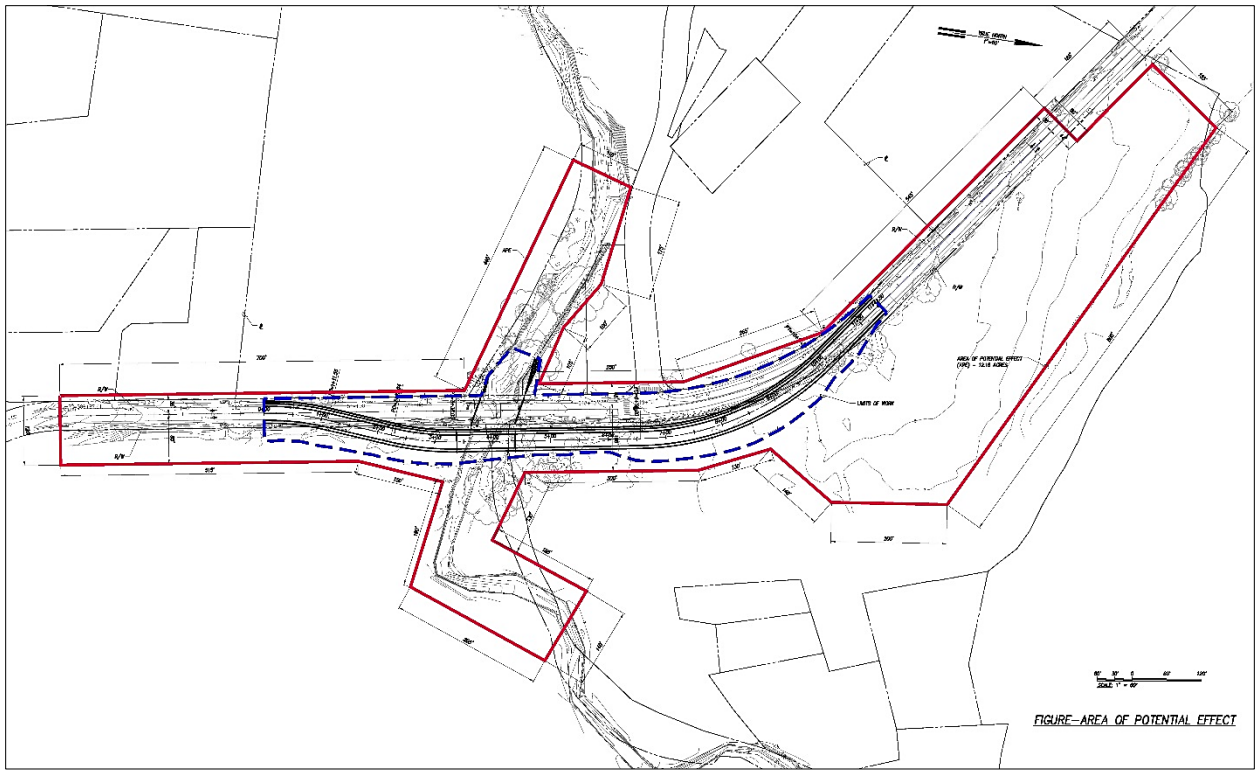

Figure 12. Proposed Waiāhole Bridge Replacement Project plan showing study area outlined in red.

Figure 13. Northern portion of study area from Waiāhole Valley Road (view to the northeast).

Figure 14. Northern portion of study area *makai* of Kamehameha Highway (view to the northwest).

Figure 15. Southern portion of study area *makai* of Kamehameha Highway (view to the southeast).

Figure 16. Vegetation along north bank of Waiāhole Stream, *makai* of Kamehameha Highway (view to the southwest)

2. BACKGROUND

This chapter is a synthesis of prior cultural and historical research relevant to the current study. This contextual discussion includes oral traditions and first-hand historical accounts recorded by visitors about the *ahupua'a* of Waiāhole and the greater Ko'olaupoko District. Also included, is a discussion of land use practices within Waiāhole Valley based on information gathered from historical documents and prior archaeological investigations. The discussion concludes with a review of the findings from prior cultural investigations conducted in the study area vicinity. This information is presented to provide a comprehensive understanding of the cultural significance of the area and to identify any potential impacts to traditional cultural properties or practices therein.

CULTURE-HISTORICAL CONTEXT

Settlement

While the question of the timing of the first settlement of Hawai'i by Polynesians remains unanswered, several theories have been offered that derive from various sources of information (i.e., genealogical, oral-historical, mythological, radiometric). However, none of these theories is today universally accepted (c.f., Kirch 2011). The three most popular theories place the first settlement at around A.D. 300, A.D. 600, and A.D. 1000, respectively. What is more widely accepted is the answer to the question of where Hawaiian populations came from and the transformations they went through on their way to establish a uniquely Hawaiian culture. The initial settlement in Hawai'i is believed to have occurred from the southern Marquesas Islands (Emory in Tatar 1982). In these early times, Hawai'i's inhabitants were primarily engaged in subsistence level agriculture and fishing (Handy et al. 1991). This was a period of great exploitation and environmental modification, when early Hawaiian farmers developed new subsistence strategies by adapting their familiar patterns and traditional tools to their new environment (Kirch 1985; Pogue 1978). Their ancient and ingrained philosophy of life tied them to their environment and kept order; which was further assured by the conical clan principle of genealogical seniority (Kirch 1984). According to Fornander (1969), the Hawaiians brought from their homeland certain universal Polynesian customs and belief: the major gods Kāne, Kū, and Lono; the *kapu* system of law and order; cities of refuge; the *'aumakua* concept; and the concept of *mana*.

The earliest settlement areas in the Hawaiian Islands are believed to be the sheltered bays on the windward sides of islands with populations focused on marine resource procurement and small-scale agriculture. As population increased, so too did the areas of cultivation, first expanding into the windward valleys then to the dryer leeward sides of the islands. Locations like Waiāhole were ideal for habitation and agricultural expansion.

Traditional Accounts of Waiāhole Ahupua'a

Traditional accounts or *mo'olelo* were passed down orally from one generation to the next, and many such tales featured descriptions of *wahi pana* or legendary places and their origins. These traditional accounts provide a window into the past, lending insight into traditional Hawaiian beliefs, values, and daily life.

The name Waiāhole, is itself shrouded in mystical properties. It is a compound of *wai*, which means water and *āhole*, which refers to the mature stage of the endemic *āhole* (*Kuhlia sandwichensis* [known today as *Kuhlia malo*]) fish, which thrived in fresh and salt water (Pūku'i et al. 1974). According to Pūku'i and Elbert "because of the meaning of *hole*, to strip away, this fish was used for magic, as to chase away evil spirits and for love magic" (1986:8); thus, the phrase "*He āhole ka i'a, hole ke aloha*," which translates as "*āhole* is the fish, love is restless" (ibid.). Sometimes, *āhole* fish were used in lieu of pig in ceremonies, and were referred to as "*pua'a kai*" or "sea pigs" (ibid.). Also, because of the pale skin of the *āhole* fish, the term *āhole* was sometimes used to refer to light-skinned foreigners (ibid.). In an article titled "Hawaiian Fish Stories and Superstitions" published in the *Hawaiian Annual and Almanac for 1901*, the *āholehole* fish and a belief associated with their consumption is briefly mentioned in a story about the Anae-holo fish, a mullet species (*Mugil cephalus*) of O'ahu. The excerpt reads as follows:

> Expectant mothers are not allowed to eat of the anae-holo, nor the aholehole, fearing dire consequences to the child, hence they never touch them till after the eventful day. Nor are these fish ever given to children till they are able to pick and eat them of their own accord. (Keliipio translated by Nakuina 1900:113)

Despite Waiāhole's inherent association with the *āhole* fish, most traditional accounts of Waiāhole center on *kalo* (taro) cultivated. One such reference to the taro grown in Waiāhole appears in "The Legend of Kapunohu" published in *Fornander Collection of Hawaiian Antiquities and Folk-lore Volume V* Part I (Fornander 1918-1919:214-225). Kapunohu was a great warrior from Hawai'i Island known for his feats of strength and for helping establish Chief

Niulii as king of the district of Kohala. Kapunohu journeyed to Oʻahu to visit his sister Konahuanui who lived in Kailua Ahupuaʻa, located to the south of Waiāhole in Koʻolaupoko District. Upon her brother's arrival, Konahuanui had no food prepared and she took him to Waiāhole where she and her husband Olopana had eight large taro patches. The legend continues thusly (emphasis added):

> Kapunohu then set to work and pulled up all the taro in the eight patches, tied the taro into bundles and carried the whole lot in his two arms to the house, each arm holding the taro of four patches. When Kapunohu arrived at the house with the taro his sister looked on and said: "What an idea! I should think you would pull up but one patch, but here you have pulled up all the patches," Kapunohu replied: "This will give us plenty of food; we will not be required to get it in small quantities." Kapunohu then picked up his spear, Kanikiwai, broke off the point and started the fire. When the fire lit, he took some of the taro and cut it up and threw the pieces into the fire and in this way used the taro for firewood. Because of this action of Kapunohu, the saying, "the hard taro of Waiahole," is known from Hawaii to Niihau. (Fornander 1918-1919:220-222)

An alternative explanation for the hard taro associated with Waiāhole is found in an article by Kaehuaea published in 1865 under the headline "*Na mea Kaulana o Waiahole*" in the Hawaiian language newspaper *Ka Nūpepa Kuokoa* and translated for inclusion in *Sites of Oahu* compiled by Sterling and Summers (1978). This account shares some striking parallels with Fornander's version of events presented above, although the names of the protagonists have changed (emphasis added):

> The solid taro of Waiāhole, according to the opinion of the public, was a very hard taro. It was not so, it became famous because of the strange deeds of a man, Kuapunohu, a warrior. He went about Koʻolaupoko to find some one [*sic*] to challenge. His sister was living there with her husband Imaole. She went fishing while he remained at home. The stranger said to the native son, "Have you two any food?" The native son answered, "We have food but standing in the patch." The stranger thought that he was going to have to suffer with hunger so he asked the native, "Where is your patch?" The native gave him specific directions and he went 'til he came to the border of the taro patch. Here he broke off the tip of his spear and used it as a prod. He reached out for two taros, cut them into small pieces and laid them on the fire. He continued doing this 'til he made a big work, clearing up the whole patch of four acres and burning it up like the blowing away of the sea of Ukoa. "Serves him right." said Kuapunohu as he went off. (Sterling and Summers 1978:189)

This concept of hard taro in Waiāhole is also echoed by Raphaelson (1929) in her collection of legendary tales titled *The Kamehameha Highway: 80 Miles of Romance*. Raphaelson states, "Waiahole, where hard taro grows, taro so hard that 'hoi kalopaa i Waiahole' is a catchword that means an obstinate man" (1929:24). This same theme appears in Mary Kawena Pūkuʻi's collection of Hawaiian proverbs and poetical sayings, *ʻŌlelo Noʻeau* as follows: "Ke kalo paʻa o Waiahole. The hard taro of Waiahole" (1983:186). Pūkuʻi explains the proverb as, "A reminder not to treat others badly" (ibid.). Based on these accounts, it appears that the hard/solid *kalo* variety of Waiāhole served as a metaphor for the stubborn nature of mankind. These accounts also underscore the importance of *hoʻokipa,* the concept of sharing and providing for guests, while at the same time not being wasteful or *mai hoʻopohō*. In both legends, the visitor is forced to provide for himself as the result of his host's indifference and indolence. Rather than provide for his guest, the host directs Kapunohu/Kuapunohu to where the taro grows and consequently, Kapunohu/Kuapunohu takes more than his share and wastes it by throwing it in the fire instead of eating it. Thus, these legends function as cautionary tales warning against being inhospitable to guests.

Another legendary reference to Waiāhole appears in Chapter V of the "Legend of Halemano" in *Fornander Collection of Hawaiian Antiquities and Folk-lore* (Fornander 1918-1919:255-262). In this tale, Waiāhole is the name of a place as well as the name of a chief of Kualoa Ahupuaʻa, also located in Koʻolaupoko to the north of the study area. The heroin of this tale, Kamalalawalu was a beautiful princess brought up under strict *kapu* in Puna, Hawaiʻi Island. She was destined to wed Huaa, king of Puna or Kulukulua, king of Hilo; however, she fell in love with Halemano instead. Thus, they lived in hiding as husband and wife on Oʻahu. Soon after, Aikanaka, the king of Oʻahu set his sights upon Kamalalawalu and the couple were forced to journey from island to island to evade him. Eventually Kamalalawalu decided to leave Halemano but later wished for him to take her back, which he did not.

Kamalalawalu followed Halemano to Koʻolaupoko Oʻahu where she met an *aliʻi* named Waiahole, who "was a single man" and "took [her] as his wife" (Fornander 1918-1919:260). They lived in Kualoa together and soon their union sparked a war between the islands of O'ahu and Hawaiʻi, for Huaa and Kulukulua had given Kamalalawalu land to claim her as their wife. Upon hearing of Kamalalawalu and Waiahole's marriage, Huaa and Kulukulua decided "let us therefore go and make war on those with whom she is now living" (ibid.). Over the next fifty days, the Hawaiʻi

chiefs amassed an army of 8,000 canoes and "a very large body of men who were armed with all kinds of weapons, both large and small" (ibid.). The fleet stopped in Maui and Molokaʻi on their way to Oʻahu and while on Molokaʻi, the king's astrologer predicted a victory for the invading army if they were to be greeted by a thick fog. The legend concludes with a mention of Waiāhole as the site of a gruesome battle as follows:

> At the end of the astrologer's predictions, the canoe once more set sail and landed at Makapuu, where the armies were placed in line of battle. In coming across the channel they encountered a thick fog and rain, the signs of victory predicted by the astrologer. After the armies were placed in line they advanced overland, going by way of Kaneohe. At Kaneohe proper they met the enemy and the fighting began. Early in the battle Oahu was routed and a great slaughter took place at Waiahole. After the battle Kamalalawalu was found, still alive, and she was taken by the kings of Hawaii, Huaa and Kulukulua, to Hawaii. (ibid.:262)

Raphaelson also mentions "a beautiful tale about Waiāhole and Waikāne" who "were man and wife, it is said" (1929:24). She goes on to report that "They loved each other for many years, and even today their mists embrace in the upper clouds" (ibid.). However, the review of legendary sources for the preparation of the current document did not reveal any additional reference to corroborate this mythical couple who bear the name of the subject *ahupuaʻa* and its neighbor.

Also located within Waiāhole Ahupuaʻa was a hilltop that served as a lookout from which a knowledgeable fisherman would send signals to the fisherman out in the ocean to facilitate their success. Known as *puʻu kāhea* or calling hills, places such as these were known throughout the islands. Pūkuʻi et al. provide the following definition of a *puʻu kāhea* in their entry for Kalanipuʻu, located on Kauaʻi: "a calling hill (*puʻu kāhea*) from which the movements of fish were called out" (1974:75). Richard Paglinawan describes the activities at the *puʻu kāhea* of Waiāhole in an article titled "Traditions of Waiahole Valley" thusly:

> The signal man would climb this hill on a vantage point so that he could get a clear view of the fishing party in their canoes off Waiahole or Kahaluu areas. ʻAmaʻama (mullet) and ʻawa (milk fish) were sought when the fish schools swam in the area.
>
> The signal man would use his hands, stick, or paddle, or even a piece of rag as a signal. The signals were prearranged and understood by the fishermen. A hand motion in a semi-circular fashion would indicate to the men on the boat to surround the fish school and another signal would mean to drop the nets. (1964:5)

In exchange for his services, the signal man "would receive a larger share of the catch because it was he who made the catch possible" (ibid.). Although much of the literature reviewed for the current document mentions Puʻu Kahea as a place unto itself, a review of historical and recent maps did not reveal the location of this signal point. Thus, it is more likely that Paglinawan and others were referring to a *puʻu* of a different name altogether, upon which the signal man would perform his duties. Based on the mention of the waters of Kahaluʻu, located to the south of Waiāhole, it is likely that the *puʻu kāhea* was Puʻukauai, which is situated on the border between Waiāhole and Kaʻalea and offers an unobstructed view of the coastline.

Paglinawan shared three other *moʻolelo* in addition to the *puʻu kāhea* tradition presented above. Two of these, mention activities associated with Waiāhole Stream that are relevant to the current study. In one account, a family gathers to collect *kupeʻe* on a moonless night by torchlight. The adult men held the torches while the young boys did the picking, for they were better suited to spot them and bend over with ease. According to Paglinawan, "The group lit their torches on Kamehameha Highway and proceeded *makai* on the trail to the beach" (1964:3). During their return trip after collecting a good amount of *kupeʻe*, their dog began to attack an unseen threat to the group; in response, the group leader (Clark) decided to throw some of their catch into the bush towards the invisible menace. Instantly, the dog ceased his attack and they were able to continue home. It had been clear to Clark that the dog had been reacting to a spirit that only it could see, and that the spirit left them alone only after it got what it wanted, some of their catch.

In the other account, three sisters who live in Waiāhole Valley hike up to the forest reserve boundary and then down to Waiāhole Stream, where they set up their nets to catch *ʻopae*. However, their attempts were not as fruitful as Clark's folks; for each time they pulled their nets, they came up empty. Worse still, one of the sisters kept hearing a woman's voice haunting her and then the water started rushing and the girls decided to head further upstream; there, they saw "an old Hawaiian woman with silvery white hair . . . she wore a black kīkepa (tapa worn by women). The whiteness of her face matched the color of her hair. She floated above the waters toward them" (Paglinawan 1964:5). The sisters ran swiftly home "up the stream bank, over the cow fence, across an old abandoned taro patch, up the hill to the road, and down the dirt road" (ibid.).

Although the Precontact royal center for the Koʻolaupoko District was located in Kailua, Waiāhole is known as the birthplace of ruling chief Kualiʻi and as belonging to the *kahuna* class. According to an article by Kaehuaea published in the Hawaiian language newspaper *Ka Nūpepa Kuokoa* in 1865 under the headline "Na mea Kaulana o Waiahole," and translated for inclusion in Sterling and Summers (1978:190), Kualii was born at Waiomuku at Waiāhole rather than in Kailua as previously thought. Regarding the ruling chiefs of Waiāhole, Kamakau provides information that states Waiāhole belonged to the *kahuna* class in the following excerpt, which mentions the legendary ruler Kamapuaʻa who was revered as a hog-god, and Kahahana, Kahekili and his son Kalanikupule— rulers of Oʻahu during the late 1700s:

> The chiefs did not rule alike on all the islands. It is said that on Oahu and Kauai the chiefs did not oppress the common people. They did not tax them heavily and they gave the people land where they could live at peace and in a settled fashion. When Oahu came under the rule of Kama-puaʻa, he gave the land containing the word *wai* to the kahuna Lono-a-wohi; but later the land was redistributed by Kahiki-ʻula and the older brothers of Kama-puaʻa because the kahunas had a monopoly of the well-watered lands, and the kahuna class were given the lands of Waimea, Pupukea, Waiahole, and Hakipuʻu in perpetuity, and these were held by them until the days of Ka-hahana. Ka-hekili and Ka-lani-kupule confirmed this gift to the kahunas, and so did Kamehameha. (Kamakau 1992:230-231)

Waiāhole appears in one final legendary context associated with the demi-god Māui; as in the following explanation of how the winding roads of Waiāhole and Waikāne were attributed to Māui recorded by Hawaiian historian Samuel Kamakau:

> Maui, son of Kalana, was one of the ancient chiefs of Maui who made roads twenty centuries ago. The roads in his day were straight, and the people were accustomed to running along straight roads; so when certain persons ran after Maui to kill him he made the road go zigzag and it was called "the zigzag road of Maui." *(ka alanui kikeʻekeʻe a Maui).* One is at Waikane and Waiahole in Koʻolaupoko on Oʻahu. . . (1992:429)

This theme also appears in the following proverb, "Ke ala kīkeʻekeʻe a Māui. *The winding trails of Māui*":

> Trails made by Māui when he was
> Pursued by those who wished to destroy
> Him. One trail was at Waiahole, Oʻahu. . . (Pūkuʻi 1983:180)

Waiāhole Ahupuaʻa during the Precontact Period

The current study area is located within the *moku* or district of Koʻolaupoko, formerly Pali Koʻolau (Figure 17). Located along the central eastern coastline of Oʻahu, the *ahupuaʻa* of Waiāhole is one of nine *ahupuaʻa* situated around Kāneʻohe Bay. According to Devaney et al., "the bay itself was also divided among the various *ahupuaʻa*, as fisheries and parts of the fisheries [Figure 18] were designated as belonging to various *ʻili* [smaller land sections] within an *ahupuaʻa*" (1982:5). Miyagi (1963) found that Waiāhole Valley comprised nineteen *ʻili*—nine that he verified with documentary evidence and ten he inferred from place names. Most Waiāhole *ʻili* comprised a *mauka* and *makai lele*, which Pūkuʻi and Elbert define as "a detached part or lot of land belonging to one *ʻili*, but located in another *ʻili*" (1986:201).

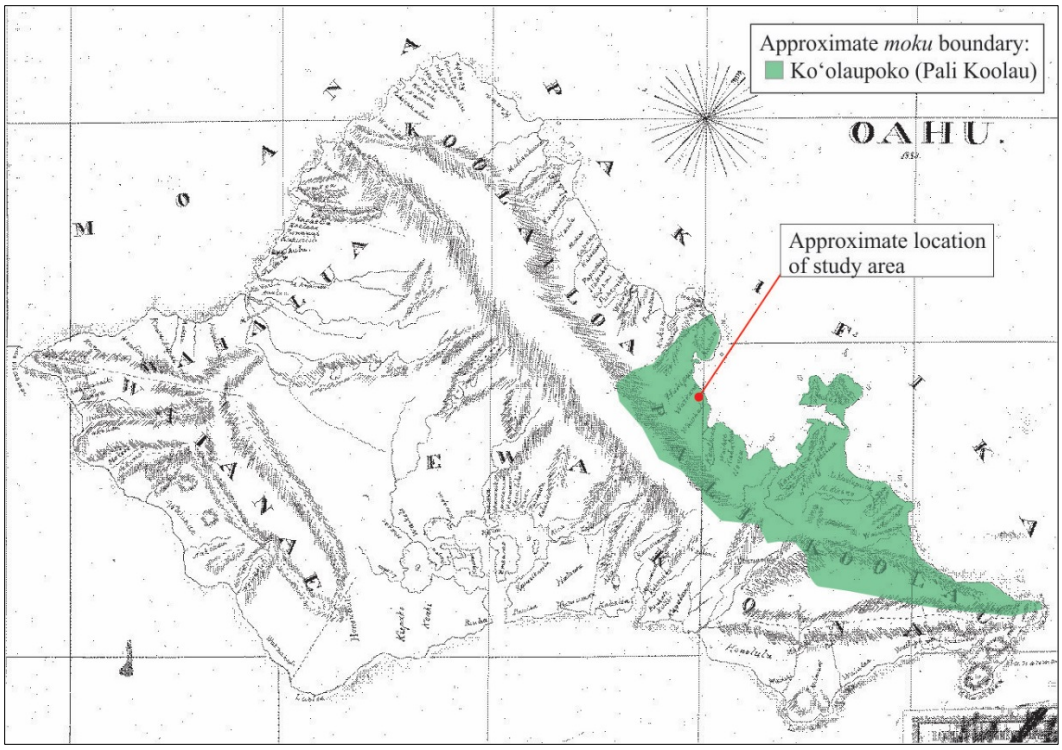

Figure 17. Hawaii Registered Map 455, showing traditional *moku* of O‘ahu, ca. 1883.

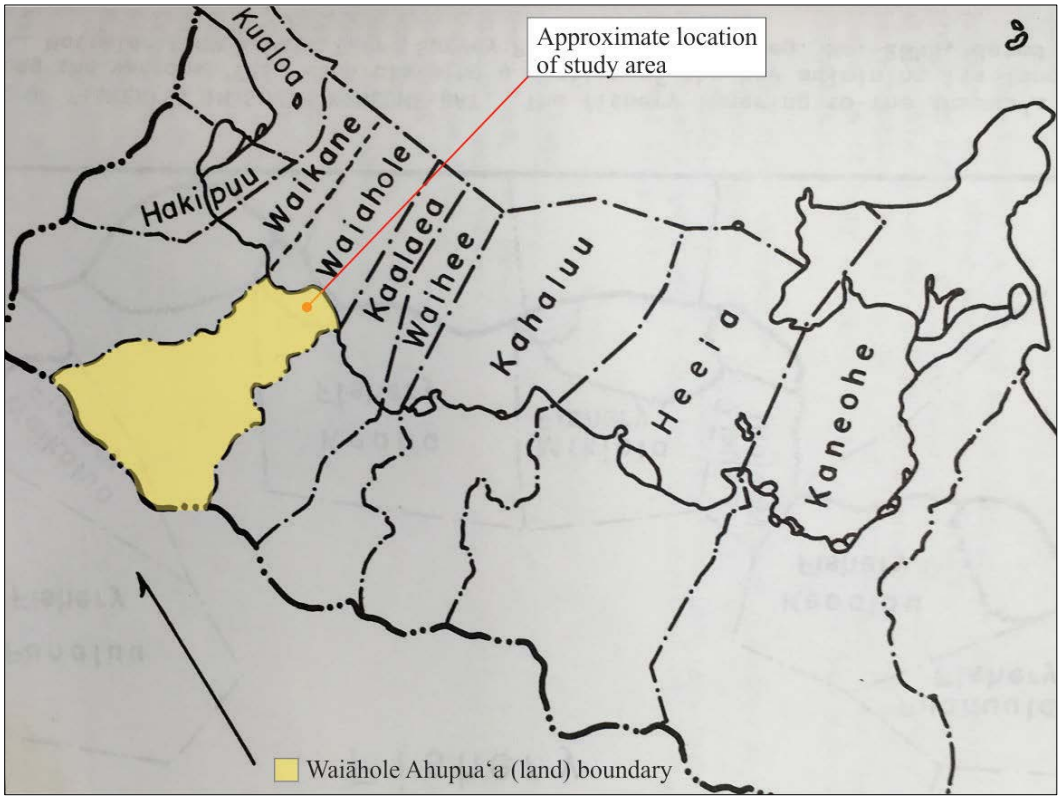

Figure 18. Approximate boundaries of Kāne‘ohe Bay fisheries (Devaney et al. 1982:137).

Precontact Land Use in Waiāhole Valley

In addition to the legendary accounts presented above, details about traditional Hawaiian land use prior to the arrival of explorers from the West, can be inferred from the results of investigations conducted in Waiāhole and neighboring Waikāne within various disciplines. For instance, in the early 1960s, Michihiro Miyagi undertook a geographical study of Waiāhole Valley in which he documented changes in land use from Precontact through 1961 (Miyagi 1963). Miyagi discovered a paucity of explorer and missionary accounts that made specific references to Waiāhole Valley. Indeed, although such accounts are often encountered during historical research of other locales throughout the Hawaiian Islands, they were hard to find during the preparation of the current document. Thus, Miyagi drew the following conclusion regarding land use prior to the arrival of foreigners from the West based on fieldwork and a review of historical documentation (primarily from the *Māhele ʻAina*): "In the later period of Hawaiian occupance just before Cook's discovery of the islands in 1778 all the land in the valley suitable for the cultivation of taro was probably so utilized" (1963:78). Miyagi estimated the extent of taro producing lands utilized as such by early Hawaiians and mapped the probable extent of lands under taro cultivation by the end of the Precontact Period (Figure 19).

These Precontact taro lands were arranged along the banks of Waiāhole Stream, formerly one of the principal streams of Oʻahu (Daingerfield 1920) and its tributaries, Waianu and Uwao streams, which provided water all year long. Like many inhabited valleys throughout the archipelago, the *makai* lowland area was host to a concentration of *loʻi* watered by a network of *ʻauwai* that tied the coastal lands to the mountain streams. However, Waiāhole Valley was somewhat exceptional because taro cultivation also extended inland to the more remote reaches of the upper valley. The opportunistic use of small pockets of alluvial soil along upper Waiāhole Stream and its tributaries for taro cultivation suggests that the valley supported a large population. Miyagi proposed that the extent of taro cultivation indicates "the production of lowland taro appears to have reached a maximum" that forced the opportunistic farming inland and "that there was some degree of pressure on the land" (1963:84).

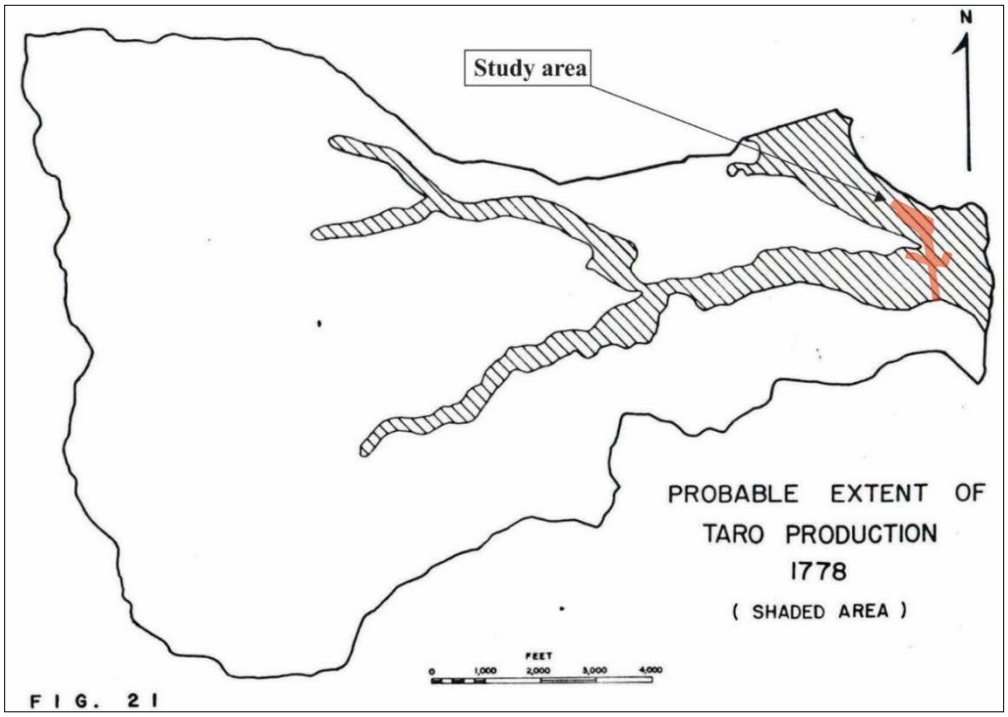

Figure 19. Probable extent of taro production ca. 1778 (Miyagi 1963:79).

In the absence of reliable population figures for Precontact Oʻahu, a dense Precontact population in Waiāhole Valley can be inferred from the extent of taro cultivation and the distribution of house lots, *kula*, and *loʻi* as reflected in *Māhele* documents, discussed in further detail in the forthcoming section. In general, "the patterns of settlement lay along the streams from mouth to upper tributaries; and the valley fringes, mountains, mountain headlands, and interflueves were unoccupied" (Miyagi 1963:87). Miyagi estimated that roughly 300 acres of land in Waiāhole Valley were suitable for taro production; and based on the annual volume per acre of about 12,000 pounds, the land could have supported an estimated population of 900 (1963:85), without factoring in the other terrestrial and marine resources that rounded out the traditional Hawaiian diet.

Regarding marine resources, as previously mentioned, the subject *ahupua'a's* namesake *āhole/aholehole* fish once thrived in the study area vicinity. In their comprehensive study of traditional Hawaiian fishing practices, Maly and Maly (2003) reported that *aholehole* were among the varieties of fish that were caught using the method known as *holahola*. Maly and Maly defined *holahola* as "the stupefying of fish by the use of the poisonous shrub *auhuhu* (*Cracca purpurea*) applied to the caves or cavities along the reefs or rocky coasts" (2003:195). *Holahola* is mentioned here because it was likely practiced in the study area vicinity by early residents of Waiāhole Valley.

Although Miyagi remarked that "few visible evidences exist" of early Hawaiian occupation in Waiāhole Valley and that "Place names on maps and the remains of taro-patch dikes at the valley head are among the few reminders that the Hawaiians were once the only inhabitants" (1963:63); since the 1960s, archaeologists have successfully recorded cultural resources that corroborate Miyagi's estimates of a dense Precontact population. Remnants of prehistoric *lo'i* and *'auwai* have been identified along Waiāhole Stream, extending as high as the forest reserve. Archaeologist William Pila Kikuchi described the taro lands of Waiāhole Valley that were watered by Waiāhole and Waianu streams in an article published in the Anthropological Society of Hawaii's newsletter *News from the Pacific* as follows:

> . . . Low dams were thrown across the streams to back the water into ditches which were of higher elevation than the stream beds. Evidence of these dams are still seen in some parts of the valley. The ditches were all carefully designed to allow a full flow of water into the fields, which were walled with large and small rocks and neatly slabbed without mortar or any other binders. Many of these channels accurately follow the contours around ridges and hills, indicating an efficient and highly sophisticated knowledge of engineering. (1964:1)

Kikuchi also recorded evidence of traditional habitation and stone tool manufacture in the upper reaches of the Waiāhole Valley as well as in the coastal lowlands at the mouth of Waiāhole Stream as follows:

> At several upland places in the overgrown fields, there were stone remains suggesting the presence of house sites and possibly a corral for cattle or horses. Many of the stone structures were in a poor state of preservation due to cattle having trampled over much of the area.
>
> During the survey numerous artifacts were found along the length of the valley. These consisted of adze chips, flakes, and a few adze blanks. While searching through a recently bulldozed field, a great number of flakes, chips, and adze blanks were uncovered together with a slingstone, an ʻulumaika, a portion of a grinding stone, and a complete tanged adze.
>
> At the mouth of Wai-āhole Valley, where the stream enters the sea, two house sites were found. The complex was hidden by several large hau trees (hibiscus tiliaceus) whose spreading branches completely covered the sites. The best preserved site consisted of a high mound of dirt, 8-12 inches, high, ringed with a pavement of small pebbles. Portions of the site were delineated by rows of stones marking the house site. A rectangular plot of stones with pavement within the general paved area may possibly be a grave. A wall of stones ran from the site directly into the ocean, numerous adze chips partial blanks were found within the two house sites [State Inventory of Historic Places {SIHP} Site 1086]. The heavy growth hampered any rough mapping of the site. (1964:1-2)

Based on the presence of adze blanks and debitage associated with stone tool manufacture scattered along the slopes of Waiāhole, from the valley ridges to the *makai* lowlands, Kikuchi concluded that the tool makers often traveled between the upland basalt quarries and the coastal house lots. The flakes discarded along the slopes of the valley were often larger and less refined than those encountered at the house sites near the ocean. Thus, the raw material was acquired near the valley head and chipped into crude blanks, which underwent further reduction and modification including grinding. Kikuchi found two basalt quarries, which he named Ka-wahi-koʻi- o-Kahekili (Bishop Museum Site 50-Oa-G2-7) and Ka-wahi-koʻi-o-Kalau (Bishop Museum Site 50-Oa-G2-8) in the absence of documentation of original names for these resource procurement sites. Later studies (Dye et al. 1985) would refer to these two basalt sources as the Waiahole Quarry Complex. Eventually the Bishop Museum Sites G2-7 and G2-8 were assigned the SIHP Site designations 50-80-10-2472 and 2475, respectively. Kikuchi's original site description reads as follows:

> …on a ridge leading up to Puʻu-Kuolani our survey party came upon an adze quarry. This quarry is evidently one of the sources of all the chips, flakes, and blanks found in the lowlands. The quarry is a talus of fine-grain bluish basalt which is found in large boulders along its slope. Large flakes had been struck from these boulders and were found strewn over its slopes, as the artisan probably preferred the core to fashion adzes from. A great number of flakes had been chipped and rejected

> because of imperfections in the basalt, which were in the form of bubbles, cracks, and thick patination. All of the adze blanks were very large, and showed the preliminary rough shaping of the tool. These blanks were found scattered over the slopes, in some cases in groups of two or three. The scattering may be due to the talus sliding both from natural causes and from the trampling by people seeking the mountain apple. All of the stones were patinated a dull grey color.

In addition to the findings from archaeological investigations discussed above, newspaper articles, census data, *Māhele* records, and historical depictions of the study area vicinity as it appeared in the early nineteenth century can provide valuable insight into traditional lifeways practiced prior to the arrival of foreigners. One such depiction that focuses on the similarities between Waiāhole and its four neighbor *ahupua'a* to the south (Waihe'e, Ka'alaea, Kahalu'u, and He'eia) offers clues to the Precontact population in the area, as follows:

> All face seaward on the broad calm bay that extends from Kualoa to Kane'ohe, a bay that is really a very long lagoon within a barrier reef that is far distant from the shore. At low tide a muddy bottom is exposed along the shore and there are no sandy beaches, for the coast line is too far in from the reef for coral sand to wash in, and the water along the landward side of the bay or lagoon is too shallow and too dirty for coral heads to grow, as they do at Kane'ohe and northward from Ka'a'awa. Each of these five districts has a broad coastal plain, which was converted by Hawaiians into an almost continuous expanse of *lo'i* irrigated with water from large streams flowing out of the deep valleys that cut back into the Ko'olau range. The hinterland must have produced great quantities of sweet potato, yam, banana, upland taro, *wauke*, *olona*, and *'awa*. Undoubtedly the population was large, yet there was here a vacuum so far as lore is concerned, and these districts play no part in tradition or history. The reasons for this may have been the unattractiveness of the shore line and the relatively inferior resources in fishing. (Handy et al. 1991:452)

The above excerpt and those that follow are taken from a comprehensive ethnographic study of traditional Hawaiian cultivation and ritual practices titled *Native Planters in Old Hawaii* (Handy et al. 1991). E.S. Craighill Handy and his wife Elizabeth conducted their research during the 1930s and collaborated with May Kāwena Pūku'i to publish the original volume in 1972. This volume contains their observations of the landscape of the Hawaiian Islands as it appeared to them in the early twentieth century as well as details about early Hawaiians' relationship to the land prior to the arrival of foreigners from the West. According to Handy et al., the broad coastal plain of Ko'olaupoko had "arable upland slopes (*kula*) below the sheer mountain wall and rough lower *wau* (forest area)" that extended all the way to the "sheltered mud-flat shore line" of Kāne'ohe Bay (1991:453); this landscape was in sharp contrast with the remaining *ahupua'a* of Ko'olaupoko and Ko'olau District, which were characterized by "deep mountain-sheltered valley land" that lead to the open ocean (ibid.). Handy et al. also stated that despite the unattractive mud-flat coastline and relatively limited marine resources, Waiāhole and neighboring *ahupua'a* did boast numerous freshwater sources and fertile soils; enough to support a large population in early O'ahu. The portrayal of the Waiāhole coast as an undesirable mud flat as reported by Handy et al. contrasts with informant accounts collected by Kikuchi, who "remarked that the beach was once composed of rocks and sand with a clear bottom" (1964:1). According to Kikuchi, as a consequence of the area becoming a "delta of mud," "several types of shellfish and sea fauna once found there" were no longer common (ibid.).

The following excerpts summarize Precontact land use and settlement patterns in the study area vicinity:

> There were formerly *lo'i* throughout the seaward lowlands of Waiahole. Some were in swampy lands, but most of them were irrigated by the stream from which the *ahupua'a* takes its name. Groups of *lo'i* adjoining Waikāne were planted up into recent times. The land south of the stream, *mauka* of the highway, has reverted to swamp. Some *kuleana* a short way up the main stream, beyond its junction with Waianu, were still cultivated by Hawaiians living in the lower valley in 1935; and small terraces once went well up into what is now forest reserve. There was also a sizable *lo'i* section about half a mile up Waianu stream, with evidence of its having extended at least a mile farther inland along both the north and south branches of Waianu. (ibid.:453)

> Southeastward along the windward coast, beginning with Waikāne and continuing through Waiāhole, Ka'alaea, Kahalu'u, He'eia, and Kane'ohe, were broad valley bottoms and flatlands between the mountains and the sea which, taken all together, represent the most extensive wet-taro area on O'ahu. These taro lands were irrigated from both streams and springs. Along the shores thereabouts were also some very large salt-water fishponds. This whole region must have supported a dense population, but so far as is known it was not noted traditionally or historically as a seat of political power. (ibid.:271-272)

Waiāhole Ahupua‘a during the Historic Period

During the early Historic Period, missionary census data for 1831-1832 reveals 419 individuals (adults:192 males and 160 females; children: 33 males and 34 females) resided within Waiāhole and neighboring Waikāne *ahupua‘a* combined (Schmitt 1973:19), out of a population of roughly 5,000 for Ko‘olaupoko District (Miyagi 1963:90). While the 1835 census of Pali Koolau, conducted by B.W. Parker, reported 210 residents in Waiāhole (adults:90 males and 79 females; children: 23 males and 18 females) out of a population of 4,636 in Ko‘olaupoko (Schmitt 1973:33). The population of Ko‘olaupoko suffered a staggering decline between 1836 and 1840 of nearly 2,000 souls but stabilized with increases and decreases in population of between 100 and 250 people for the remainder of the nineteenth century (Miyagi 1963).

By the mid-nineteenth century, the populations of all the islands experienced a sharp decline in large part due to a rash of epidemics introduced by foreigners. In addition, the spread of the Euro-American influence with an emphasis on commercial ventures and associated development forced many native inhabitants to abandon their homes and traditional lifeways for opportunities in more populated areas. Thus, the Precontact population of the Hawaiian Islands was likely much larger than when the American missionaries began conducting the censuses presented above. By the middle 1800s, “although already much reduced in size, the [Kāne‘ohe] Bay area population was second only to growing Honolulu” (Devaney et al. 1982:9). The rise of Honolulu as a commercial center influenced population size during the 1830s, as shown in a touristic account of a journey around O‘ahu penned by Edwin Hall and published in the *Hawaiian Spectator* in 1839:

> The district of Palikoolau, which adjoins Koolauloa on the east, is considerably more populous than the latter,—containing nearly or quite 5,000 inhabitants. . . Its sources of wealth are similar to those of the other districts mentioned; but by being nearer to the commercial centre [Honolulu], its minor resources are, on that account, of more value. In this, as in the others, large tracts of land lie at present uncultivated, which, it is ascertained, could easily be brought under profitable tillage. (1839:110)

The Māhele Āina of 1848

In addition to the devastating impact foreigners had on the survival rates and traditional lifeways of the Native Hawaiian population, foreign influence transformed the concept of land ownership across the archipelago. The volumes of native registry and testimony collected for the *kuleana* claims as part of the *Māhele ‘Aina* provide a snapshot of life in Waiāhole Valley in the lead-up to the mid-nineteenth century. These volumes contain valuable information such as the names of *‘ili* within Waiāhole Ahupua‘a and types of land use within individual parcels (Tables 1 and 2). As a result of the *Māhele*, six Waiāhole *‘ili* (Makanilua, ‘Āpua, Poahamai, Poea, Ii, and Uau [Uwao]) were reported as Government Land (Devaney et al. 1982); while two *‘ili* (Hopekea and Makawai) were retained as Crown Lands by King Kamehameha III (Miyagi 1963).

In addition, fifty-eight claimants received Land Commission Awards in Waiāhole; four of which, comprised entire *‘ili* awarded to chiefs. The *‘ili* of Waianu, 225-acre LCAw. 5936 awarded to Puuiki (in two *‘āpana*), the *‘ili* of Onouli, 93-acre LCAw. 7137 awarded to Kahoohanohano, and the *‘ili* of Hanakea, 57.2-acre LCAw. 8603 awarded to Kaniau (in two *‘‘āpana*); while the *‘ili* of Oii (Ohihi/Oi) also referred to as Kapiikokau, 81.6-acre LCAw. 105 (in four *‘āpana*), was awarded to a foreigner named William Walker by Governor Kekuanoaoa on behalf of the king in 1848. Walker received this award in as a “life estate” in return for his service aboard the king’s man-of-war *Don Quixote*.

The northernmost portion of the current study area corresponds with the portion of LCAw. 105 located *makai* of Kamehameha Highway (Figure 20). Walker had resided upon the large tract of land since 1836 and intended to live out his life there. The documentation associated with Walker’s claim is somewhat confusing for it is referred to as being situated within the *‘ili* of Oii (Ohihi) and Kapiikokau and as LCAw. 105 and LCAw. 230 in different *Māhele* documents; and the parcel appears only as appears as “R.P. 53 to Ii” in an 1897 map (see Figure 20).

The remaining awarded lands (fifty-four *kuleana* awards) in Waiāhole comprised just over 100 acres that were divided into *kuleana* parcels claimed by Native tenants, which averaged 2.02 acres in size (Devaney et al. 1982:24). An approximation of the location of the current study area relative to these *kuleana* (see Figure 20) indicates that twelve *kuleana* show partial or complete correspondence with the study area (see Table 1). Like most *kuleana* awarded in greater Waiāhole, these *kuleana* comprise multiple *ʻāpana*; except for LCAw. 8180 to L. Haole. The study area extends partially into *ʻāpana* 1 and 2 of LCAw. 10229 awarded to Mahule; encompasses *ʻāpana* 4 of LCAw. 10438 awarded to Naeole and extends across a portion of *ʻāpana* 3 of the same award; and encompasses *ʻāpana* 1 of LCAw. 10759 awarded to Palaukai, as well as a small portion of *ʻāpana* 2 of the same award (see Figure 20).

Table 1. *Kuleana* awarded in Waiāhole portions of which are within the study area.

LCAw.	*Claimant*	*ʻili*	*Area*	*Notes*
105:2	Walker	Oi/Oii	11.66	Life estate to foreigner
7560:1	Kekeaulaau	Umau	2.25	5 *loʻi*, 1 house lot, and *kula* planted with potatoes
7661:1	Kaukaliu	Kapalae	0.95	2 *loʻi*, 1 house lot, and 1 *kula*
7662:1	Kaumaka	Opaea	0.8	3 *loʻi*
7665:1	Kukuinui	Kaaniu	0.2	2 *loʻi*
8180	Haole	Apau	1.1	6 *loʻi*
9959:2	Lumai	Poea	3.3	6 *loʻi*, 1 *kula* planted with melons, and 1 house lot
10229:1	Mahule (Malule)	Kuaiokumu	0.5	2-5 *loʻi*
10229:2	Mahule (Malule)	Kuaiokumu	0.48	*Kula* planted with tobacco and house lot
10438:3	Naeole	Apuu	2.0	5 *loʻi*
10438:4	Naeole	Kapikookau	0.7	5 *loʻi*
10759:1	Palaukai	Kalaipakua	0.85	5 *loʻi ai* (in use) and 6 *loʻi nahele* (fallow)
10759:2	Palaukai	Kalaipakua	0.15	House lot

Six other *ʻāpana kuleana* that fall within close proximity but outside of the current study area (see Table 2) are included in this discussion for two reasons: (1) to emphasize the concentration of *kuleana* located around the mouth of Waiāhole Stream; and (2) because of the likelihood that some of these *kuleana* may actually correspond with portions of the study area despite discrepancies in the coastline, government road alignment, and stream channel between modern and historical maps. Also worthy of note, is a detail that emerged from the native testimony (N.T. 10-182-183) recorded for LCAW. 7563 to Kaopulupulu, of which the history of land use and occupation were contentious. Most interestingly however, was mention of a house constructed for Kaahumnau within one of the *ʻapana* of this awarded land, described as two houses on a foundation, which she would visit occasionally.

Table 2. *Kuleana* awarded in Waiāhole located beyond and in close proximity of the study area.

LCAw.	*Claimant*	*ʻili*	*Area*	*Notes*
7570:1	Kauahipaka	Kauakahipa	1.45	8 *loʻi*, 1 *kula*, 1 house lot
7654:1	Kimo	Kuaiokumu	0.43	3 *loʻi*
7654:2	Kimo	Kuaiokumu	0.75	*Kula* with potatoes and house lot
7657	Kaukulima	Kapikokaa	2.0	3 l*oʻi* and 1 house lot
10228:2	Moo	Kaululoa	0.57	2 *loʻi* or *kula* planted with sugar and bananas and a house lot or a combination of *loʻi*, *kula*, and house lot
10439:1	Nahaina	Kaalae	0.32	1 *loʻi* and house lot

Four of the *kuleana* located partially within the current study area listed Waiāhole Stream as their Punaluʻu (northern) boundary in *Māhele* records and most listed *konohiki* lands in all directions. As shown in Tables 1 and 2, many of the *kuleana* within and near the study area contained *loʻi*. In some instances, *kuleana* also included a portion designated as *kula* within which crops other than *kalo* were cultivated. For instance, LCAw 10229:2 served as a house lot and cultivated *kula*, planted with tobacco, while LCAw. 7654:2 and 7570:2 were planted in potatoes. Those *ʻāpana* that did not include a house lot within the cultivated *kula* land had separate *ʻāpana* that served as the house lot, such as LCAw. 10759:1. Additionally, the native register for LCAw. 7570:2 and LCAw. 9959 mentions two *māla ʻawa* or kava patches for each parcel.

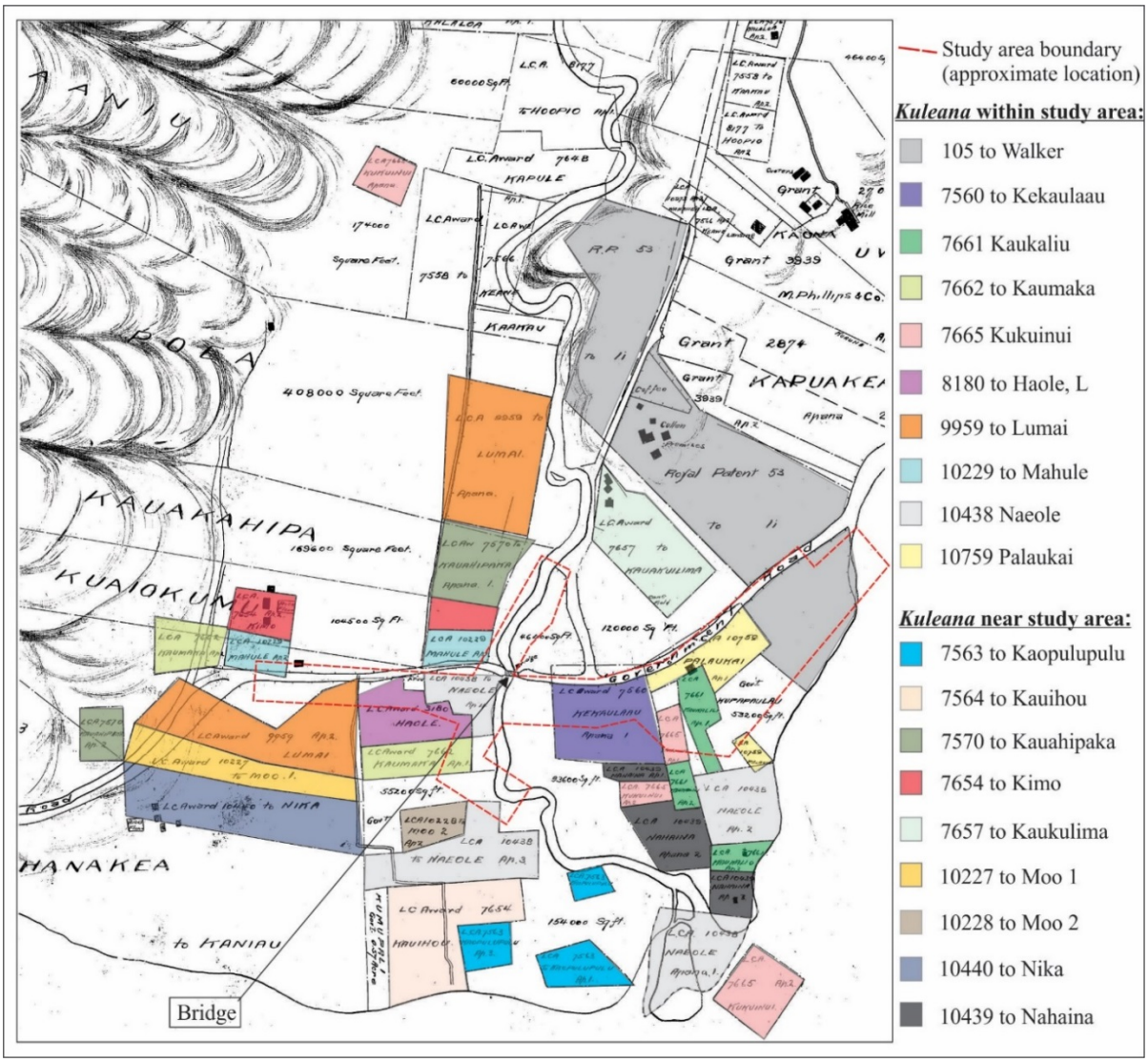

Figure 20. Detail of Registered Map 2130 showing *kuleana* relative to the approximate study area location.

Historic Land Use in Waiāhole Valley

Based on the settlement pattern typified by *ʻāpana kuleana* clustered along Waiāhole Stream, one can infer that population density was highest in Waiāhole in the alluvial flats of the coastal lowlands—an area well-suited for the cultivation of *kalo* and other crops, with the added benefit of access to marine resources nearby. One must also keep in mind that "there were probably cultivated areas that were not awarded to *kuleana* claimants" (Devaney et al. 1982:11) for one reason or another. Thus, when looking at historical maps such as Registered Map Number 2130 of Waiāhole prepared ca. 1897 (Figure 21), the seemingly unoccupied/unutilized areas between *kuleana* may have been cultivated or utilized as house lots as well, particularly those located along Waiāhole Stream and its tributaries.

Throughout the early Historic Period, the amount of land under cultivation decreased along with the native population. As the nineteenth century progressed, more land went uncultivated and some was converted to pasture for grazing livestock. According to Devaney et al. (1982:70), there were nearly six hundred horned cattle and numerous goats in Koʻolaupoko, as well as some sheep, horses, mules, and donkeys in the study area vicinity by the mid-1800s. Around the time of the *Māhele*, roaming cattle belonging to large landowners (local chiefs and foreigners) were wreaking havoc on the commoners' land and crops. As a result, "100 or more acres of choice land for tillage is now given up, and the people plant neither corn, beans, potatoes, or anything of the kind, to any extent, lest they be destroyed by the cattle" (Wyllie 1848 in Devaney et al. 1992:12). Thus, by the mid-nineteenth century, some of the land along Kāneʻohe Bay had already fallen out of cultivation due to factors such as "depopulation, roaming cattle, and the requirements of the Kuleana Act" (Devaney et al 1982:12).

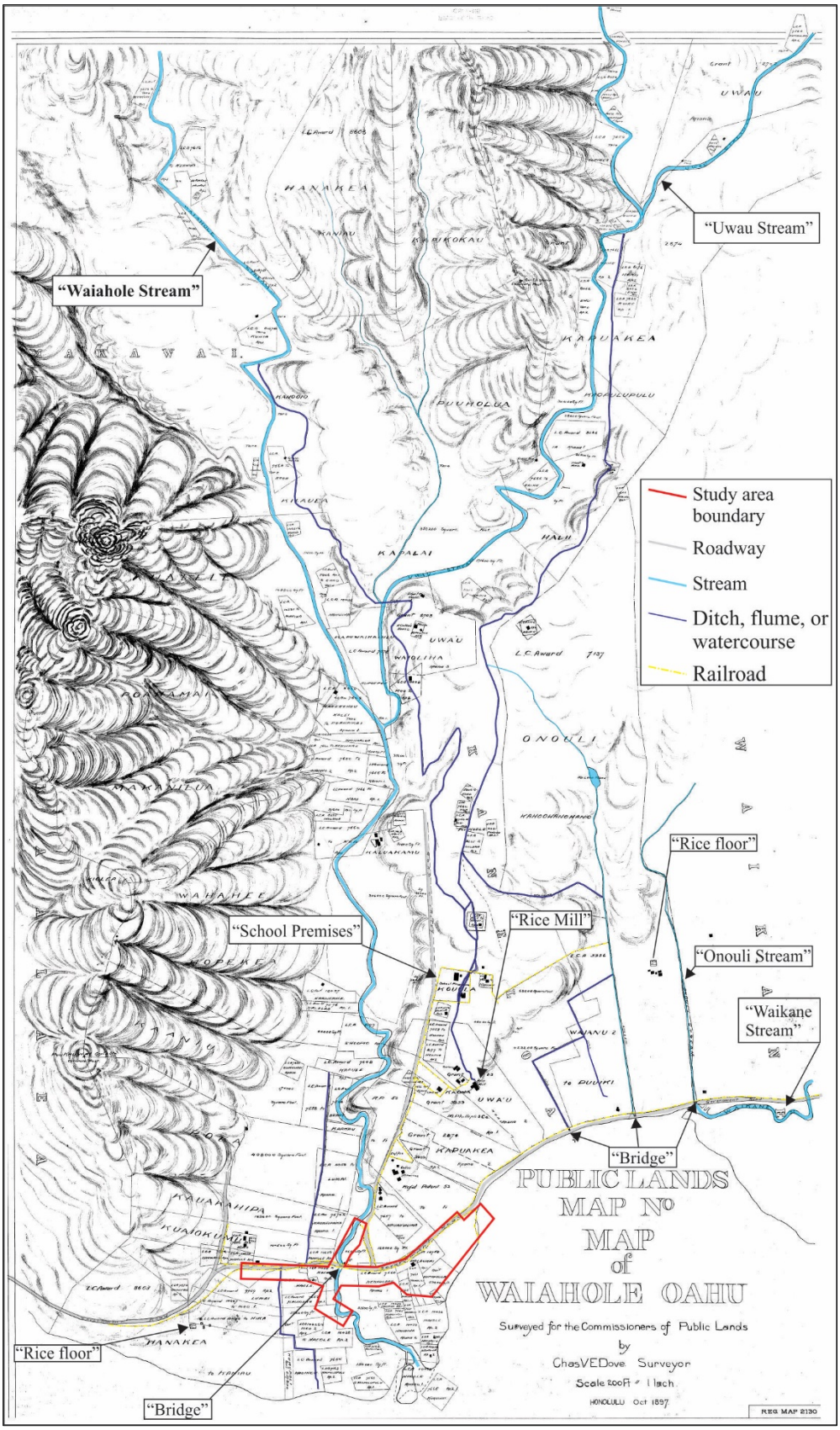

Figure 21. Annotated map of Waiāhole ca. 1897 (Registered Map Number 2130).

At some point during the middle 1800s, Chinese settlers began renting taro lands and converting them to rice paddies, which was an easy transition because rice and taro thrive under similar conditions (Miyagi 1963). The Chinese responsible for initiating the rice industry had originally come to the Hawaiian Islands as laborers to work the sugar plantations and construct the railroad. According to Miyagi, the Chinese rice farmers also expanded the area under cultivation by adding irrigation to previously unirrigated land. A historical account, published in 1862 further describes taro cultivation and rice farming in Waiāhole and Waikāne valleys, in the years after the *Māhele*; the account is a translation (accessed using the online *nupepa* blog) from a Hawaiian language newspaper article titled "Rice and Gold" (*Ka Raiki a me ke Gula*), which reads as follows:

Waiahole to Kaaawa

> Waiahole is the first place, in our knowledge, that planted rice; when we began to walk upon the soil of that ahupuaa, our hearts were filled with joy at the sights of that place, and reaching Waikane, all the loi were being farmed, as if it was just one huge farm; we thought to ask who was it that was farming the area, and we were told Messrs. Judd and Wilder; so many loi were finely built, and it seemed like almost thirty or more acres; they had thirty-five workers. We see the immediate benefits of growing rice, being that these men were hired, and got paid for their labor, and all this is because of rice; many subjects of the King were provided with jobs, and as a result, perhaps some of those people were prevented from acts which would have caused them to suffer difficulties and problems, because their minds are taken up by work. There are many loi farmed in Waikane, by J. Fuller (J. Pula), and they are being reworked. The road from Waiahole to Waikane is horrible; it is swampy, and we hear that a horse sunk on this street and its throat was cut. The lower part is boggy, but it is dry on the surface of the earth. There is a fine wooden house standing in Kualoa belonging to Charles Hastings Judd, along with a horse shed, and a carriage house; that place is beginning to become a town. (*Ka Nupepa Kuakoa* February 22, 1862:2)

Subsequent to the *Māhele,* three large tracts of land were granted in Waiāhole Ahupuaʻa: Grant No. 702 (243.18 acres) and Grant No. 703 (21.50 acres) to Kekakeiki in 1860; and Grant No. 874 (113.33 acres) to Kaopulupulu in 1862. Then, L.L. McCandless purchased about 185 acres of Government Lands in Waiāhole between 1896 and 1903 (Devaney et al. 1982). Around the 1870s, the population of Koʻolaupoko began to increase, including that of Waiāhole Ahupuaʻa. Miyagi (1963) proposes that this upswing in population may have been linked to the influx of Chinese immigrants engaged in commercial rice cultivation. In contrast, population increases in Oʻahu beyond Koʻolaupoko District were a result of the success of the sugar industry and the corresponding development of Honolulu as a port city. However, the effects of these developments did not take hold in Waiāhole, due to its remote location and overly wet terrain that was unsuitable for sugar cultivation (Miyagi 1963).

By the late 1800s, much of the uncultivated land of Waiāhole Valley functioned as pasture. A brief touristic account written by George Bowser and published in a chapter about Oʻahu that appears in his "Itinerary of the Hawaiian Islands," published in *The Hawaiian Kingdom Statistical and Commercial Directory and Tourists' Guide, 1880-1881* illustrates the shift in land use from traditional Hawaiian *loʻi* to rice cultivation and grazing pasture, and paints an inviting picture of the study area vicinity:

> Then we reach another valley presenting no new characteristics of scenery differing from all those already passed through, only in the fact that there is no sugar plantation. There are numerous taro patches and no less than six rice plantations; all the rest of the valley is pasture. The rice plantations are rented by Chinamen. At Waiahole, from which place the valley takes its name, there is a rice mill worked by water power. The place is a delightful one to reside in, with a fine bracing air. In summer, the trade winds are always blowing, and the thermometer, I am told, never ranges higher than 70 degrees (Fahr.). The scenery, as everywhere on this coast, is grand, the pasture splendid—it would be difficult to find a more charming or more healthy place of residence. (Bowser 1880:484)

Twenty years after Bowser reported the presence of at least six rice plantations in Waiāhole Valley, a decade-long peak in commercial rice production began. An 1897 map of Waiāhole shows the location of the rice mill at Waiāhole was known as the Lansing Mill and several rice floors (see Figure 21); and Miyagi (1963) mapped land use in Waiāhole ca. 1900, including the extent of rice and taro cultivation (Figure 22). In addition to commercial rice production, commercial *poi* production began to take hold across the Hawaiian Islands during the late nineteenth century. According to Olszewski (2000), by 1884 Chinese immigrants began to dominate commercial *poi* production. In Oʻahu, commercial *poi* production peaked in 1888 and dominated the marketplace for decades.

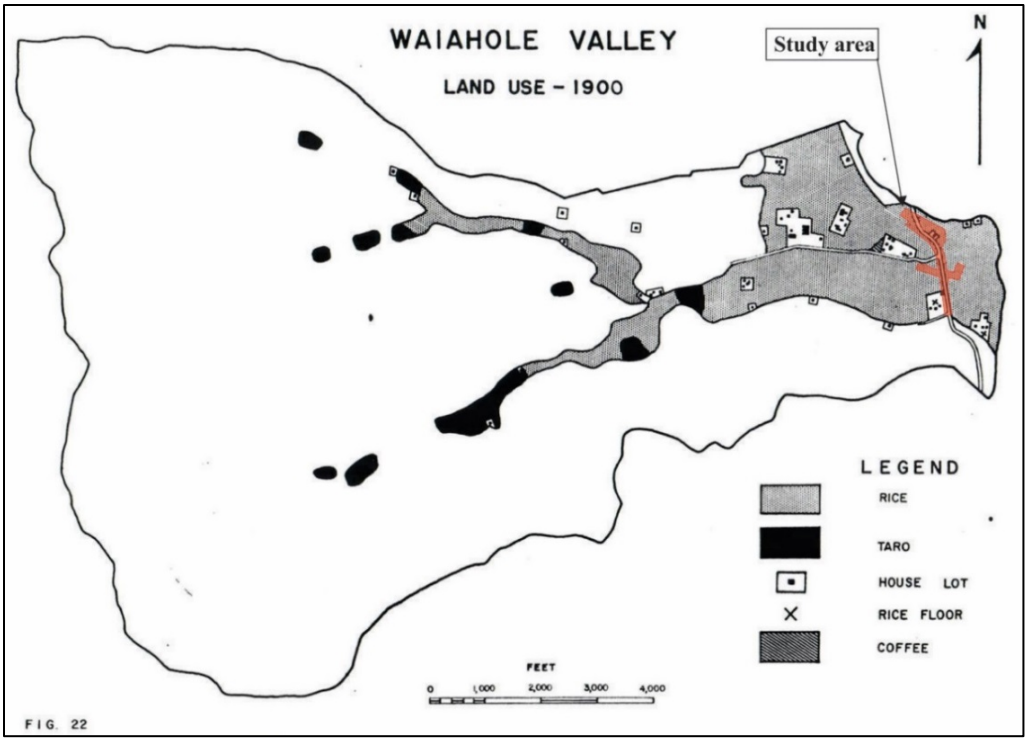

Figure 22. Map of land use in Waiāhole ca. 1900 (Miyagi 1963:110).

After 1910, the rice industry declined rapidly; and by the early 1920s nearly all the Chinese rice fields were abandoned (Miyagi 1963). During the declining years of the rice industry Japanese immigrants, engaged in diversified agriculture, began to replace Chinese immigrants in Waiāhole and the windward side of O‘ahu (Devaney et al. 1982). Despite the increase in diversified agriculture, many residents of Waiāhole continued to practice traditional Hawaiian agriculture and *poi* preparation as shown in a 1908 photograph (Figure 23).

Figure 23. *Poi* pounding at Waiāhole ca. 1908 (photo: R. J. Baker, Bishop Museum Collection; Devaney et al. 1982:39).

Miyagi summed up the intensive land use in Waiāhole Valley and its subsequent decline during the early twentieth century thusly:

> . . . Rice and taro occupied the lowlands, and pineapple the terraces and the lower slopes of the Koolau spurs. Truck crops were grown on the level areas of Kaneloa [Waiāhole Villlage] terrace by Japanese . . . The steeper slopes and parts of the dissected alluvial terraces were used for grazing . . . one could stand at the shore and view the cultivated lands from the sea to the valley head . . . and a railroad extending into the valley head.
>
> The intensive period of land use in the valley was not long lasting. Rice growing declined and pineapple proved only ephemeral. Java plum and guava invaded the abandoned fields. Pasture-choking shrubs reduced the grazing area. Old roads from this period still remain in some sections and abandoned house sites can be noted in the now tree-covered area where pineapple was planted. (1963:116)

The subject of *kalo* cultivation in Waiāhole appears under the headline "The Stirring and Fluttering of Taro Leaves to Disappear (*E Nalohia Ana Ka Oni Ame Ka Luli Ana O Ka Lau Kalo*)" published in 1911 in a Hawaiian language periodical (Ka Nupepa Kuokoa Home Rula August 18, 1911:2). This article focuses on the detrimental impact of urban development on *kalo* cultivation across O'ahu. According to the article, *lo'i* located within Bishop Estate lands in Honolulu and Mānoa Valley were at risk to "be dried and transformed into house lots and sold to people who don't have homes or sold according to the wishes of Bishop's Trustees" (ibid.). The author specifically mentions the threat to taro growers in Waiāhole, which retained active *lo'i* at the time it was written, as seen in the excerpt below:

> . . . From these things O' Hawaiian people will be our end, when the taro lands are dried up, and when the taro farming disappears, then there will be no places like these lands for the Chinese to grow taro, and if indeed this should come to an end, then the taro farm lands will decrease dramatically. This will result in an increase in the cost of poi from here forward, because from where will taro to make poi be quickly obtained to supply this city? For those people who have taro farm lands, they must continue to plant taro although the profits in that work will not be like those that we speak of when talking about taro farming [in Kona]. And it is not just here where taro leaves will disappear from our sight, but it will no longer be seen at Waikane, Waiahole and Kahana because their waters will eventually be used for sugarcane. What misfortune for us Hawaiians from here forward when we try to obtain taro and poi. Wake up Hawaiians and continue to plant taro lest your stomach go hungry because the fluttering taro leaves will disappear from here forward at Honolulu. (Ka Nupepa Kuokoa Home Rula August 18, 1911:2; translation by Lokelani Brandt, M.A., ASM Affiliates)

The article above highlights the importance of taro cultivation and *poi* production to the Hawaiian people despite the fact that it was Chinese immigrants who were primarily responsible for the taro cultivation in the early twentieth century, rather than Hawaiian farmers. Also, the article mentions that the waters of Waiahole, Waikane and Kahana would be used for sugarcane and that taro cultivation would suffer as a result of the diversion. Indeed, within two years of the publication of this article, the single "largest hydraulic engineering project ever completed in the Territory" (Judd 1918:196) known as the Waiahole Tunnel Project would be underway. This major feat of engineering was undertaken between January of 1913 and May of 1916 and augmented between 1925 and 1935 to extend 26.5 miles from Kahana Valley in Ko'olaupoko to Kunia in Honouli'uli, 'Ewa (McElroy and Duhaylonsod 2015). The Waiahole Tunnel diverted water from Waiāhole and neighboring lands across the island of O'ahu to irrigate the sugarcane fields of 'Ewa, as foretold by the 1911 article.

Waiāhole is briefly mentioned in an article titled "The Story of Hawaii" published in a 1912 edition of *The Mid-Pacific Magazine* in their discussion of the Kāne'ohe Bay region. The excerpt reads as follows:

> Kaneohe bay is ten miles long, the channels to the sea are 90 feet deep. There is always a gentle breeze and sailing of small craft is safer here than anywhere else in the islands for the bay is entirely land and reef locked . . . All along the shore of Kaneohe bay the scenery is charming in the extreme; beyond the mountains come down to the sea. There are valleys that it would pay anyone to explore for days.
>
> At Waiahole a splendid trail leads across the mountain range to Pearl Harbor, a sixteen-mile tramp. (1912:394)

Trails in Waiāhole Valley are featured in another article published almost ten years later titled "The Trail that Starts Nowhere" by George Armitage (1921). In this adventurous touristic account, Armitage begins by asking the reader why more people do not visit charming Waiāhole Valley, which he deems as "possibly one of the least frequented of interesting places on the Island of Oahu" as follows:

> . . . And why? It is only about 18 miles from the center of Honolulu. Nowhere in the Hawaiian Islands are cliffs greener or more precipitous. A handsome waterfall sings all day in the inmost recesses of the valley. And an automobile may be driven within a stone's throw of it. Is this not enough to lure hundreds from Honolulu? No? Then here's some more:
>
> On the road up the valley there is a real grass hut, with native Hawaiians actually living therein, tending a taro patch by day and stroking guitars and ukuleles by night. That in itself is now rather a rare sight in Hawaii.
>
> And then there are trails-trails swinging dizzily back and forth across the face of sheer cliffs, now crowding through a maze of green clinging stuff, now but a sickening scratch on the face of the rocks-trails that command an uninterrupted view of earth and sky and sea in all their majestic colorings. . . (1921:48)

Armitage continues with a description of the route to Waiāhole Valley from Honolulu via automobile. As his vehicle approached he made the following observation:

> . . . At 18.1 miles, just after crossing a bridge over a small stream and, strange as it may seem, in the midst of a short stretch of temporarily repaired good road, the way to Waiahole is taken in a turn to the left towards the mountains. . . (1921:48)

Beyond the *mauka* turn, about 1.5 miles, is the grass hut Armitage had mentioned, along the left fork of the road, "nestled among shady trees" from this road, a trail leads down "and a pleasant old Hawaiian woman with her grandchild will pose for pictures" (ibid.). He continues thusly:

> The setting of taro patch, pineapple field, tiny charcoal stove, low-hanging thatched lanai used as a kitchen, and with the big hiki-ee—bed—inside the main room, and, leaning against a tree, even the poi board upon which taro is pounded into a pulp after the ancient fashion, all provide a good idea of typical old-time Hawaii. (ibid.)

From this scenic spot, Armitage continued a few more miles until he reached what he called "the famous Waiahole tunnel district," (1921:48) According to Armitage, the roads leading to and from the Waiahole Tunnel were well maintained for access to the infrastructure. Armitage concludes his account of the mysterious "Trail that Starts Nowhere" by describing how it took him and his companions three separate trips to locate the beginning, middle, and end of a trail cutting across the valley slopes, which he had spied during his first visit. During that first visit they were unable to find the upland trail head, "it was a lost trail; a route in the sky with neither head nor tail, and in some places possibly no middle" (ibid:49). They returned and were able to find the trailhead by crossing over the ridge from Waiawa Valley; "but the strangest thing of all was that we lost the trail completely when we had very nearly reached the bottom" (ibid.). On their third and final visit to the valley, they found the lowland entrance to the trail, which extended from "the floor of Waiahole Falls up a narrow concrete stairway, and thence on a contour around points and into ravines" to join with the trail over the mountain (ibid.).

The following excerpt from a 1928 article titled "Geography of the Island of Oahu" also published in *The Mid-Pacific Magazine* provides more details about the Waiahole Tunnel project and how the landscape in Waiāhole Valley had changed since its construction:

> . . . Many years ago men of vision saw how water could be brought from the wet windward side of the Island to the dry leeward. They spent much money and employed many engineers and laborers to drill a hole through the Koolau mountains at the head of the Waiahole valley, at a point about eight hundred feet above the sea. . . Water is brought to this tunnel from the many small streams that trickle down the mountain sides near the valley heads. Small dams were placed across these many streams and the clear, cool water was turned into a long ditch. This ditch winds in and out of the little valleys, always bringing the water toward the tunnel. The water from the union of these many small streams increases as it approaches the great tunnel.
>
> There are several Japanese families living along this long ditch beside which there is a lovely trail, winding around sharp hills, into deep valleys, and under kukui, ohia lehua, koa and hala trees. The

> Japanese men are the ditch tenders. . . Although the ditch tenders and their families live up in the mountains and alone, they are busy and happy. They all have burros to carry their burdens and to bring their food and other necessities from the stores far away on the beach. . .
>
> When the water from all the little streams is finally brought to the great Waiahole tunnel it receives much added water from the walls of the tunnel as it passes through the Koolau range. (Daingerfield 1928:55-56)

In 1922, shortly after the completion of the Waiāhole Tunnel project, the extant Waiāhole Bridge was constructed, which brings Kamehameha Highway (Route 83) over Waiāhole Stream, south of Waiāhole Valley Road. The bridge was designed by R.W. Mowry (Thompson 1983) as a two-span reinforced concrete tee beam superstructure with a concrete abutment wall and multi-column bent substructure (Figure 24), underlying a reinforced concrete deck with AC overlay. The bridge parapets are classified as concrete solid panel with cap (MKE and Fung 2013:4-245). The bridge has no shoulders; thus, in 1968 the extant wooden pedestrian walkway was constructed and attached to the *mauka* side of the bridge.

Figure 24. *Mauka* side of Waiāhole Bridge showing multi-column substructure and pedestrian walkway; note debris trapped beneath deck in foreground (view to the northeast)

Waiāhole Bridge has undergone multiple evaluations as part of state-wide bridge surveys in 1983, 1996, and 2013. Waiāhole Bridge was deemed as not historically significant in the 1996 State of Hawaii Historic Bridge Inventory and Evaluation report, as documented in an August 14, 1998 letter (LOG NO:22063 DOC NO:9808co09) from Don Hibbard of SHPD to F.J. Rodriguez of Environmental Communications. SHPD provided comments on draft environmental documentation for an earlier iteration of current project, stating the Waiāhole Bridge "is not cited as a historically significant bridge in the (Draft) State of Hawaii Historic Bridge Inventory and Evaluation report dated May 1996" (ibid.). The State Historic Preservation Officer (SHPO) echoed this no effect determination in a May 18, 2001 letter (LOG NO:27494 DOC NO:0105EJ14) to HDOT. The SHPO provided comments on a draft environmental assessment, stating the Waiāhole Bridge "was determined to be 'not significant' in 1996."

In contrast to the earlier studies and determinations, MKE and Fung (2013) recommended that Waiāhole Bridge was eligible for listing in the National Register of Historic Places under Criterion C "for its association with early developments in concrete bridge construction in Hawaii" (ibid.:4-246). They go on to say, "It is a good example of a 1920's reinforced concrete bridge that is typical of its period in its use of materials, method of construction, craftsmanship, and design" (ibid.).

In a newspaper article titled "Storm-ravaged Nursery Digs Out Once Again" published in the Honolulu Star Advertiser on June 8, 2011, Gregg Kakesako reported that Waiaholoe Botanicals nursery, located north of Waiāhole Valley Road and *mauka* of Kamehameha Highway suffered almost $300,000 worth of damage from two storm events. Both episodes of loss were caused by heavy rains that created a "heavy accumulation of storm debris" and caused the water levels of Waiāhole stream to rise rapidly, "up to 4 feet in some places" (Kakesako 2011). The first episode occurred in 2006 after forty days of rain, the second occurred after a single night of thunderstorms in June of 2011. At the time this article was written, the state was assessing Waiāhole Bridge and had cleared debris in February and December of 2011. Then-spokesman for HDOT, Dan Meisenzahl went on record to say that "despite reports of cracks in the bridge" the Waiāhole Bridge structure was "sound" (ibid.). Per the article, Meisenzahl said the state planned to replace the bridge in 2015 or 2016 to bring it into compliance with standards. According to the HDOT Highways Program Status website (https://histategis.maps.arcgis.com/apps/MapSeries/ index.html) last updated on January 2, 2018, the extant bridge over Waiāhole Stream is in "poor" condition and has a priority ranking of 28 (out of 50) for "bridges in the State Highway System in need of upgrades or repair" based on "a weighted value that considers bridge condition, mobility, and risk."

Although Waiāhole Bridge has been described as little more than "an important transportation link between Windward communities" because it "does not provide public access vantage points, does not have a view, and is rated aesthetically poor" (HDOT 2004:29), other attractions lured tourists into Waiāhole Valley. For instance, Waiahole Tavern, a resort "located on high land near the sea, and but forty minutes walk from Waiahole Tunnel and the trail over the mountains" (*The Mid-Pacific Magazine* 1917:3) appears to have been a popular destination. From a newspaper article about a new camping place for boy scouts at Waiāhole, we found that the Tavern was located 0.75 miles from the beach (*Honolulu Star Bulletin* July 7, 1916:10). Another newspaper article titled "Promotionists Find Oahu Owns Many Beauties" described the points of interest as follows:

> At Waiahole Tavern, Mr. and Mrs. Edward Dougherty have a number of interesting things to show. There is the trip to the canyon, which uncovers wonderful scenes of beauty; the swimming pool, the frog farm, and other points. (*Honolulu Star Bulletin*. June 26, 1916:2)

The swimming pool, mentioned above measured twenty-five feet in length and was "filled with cold mountain water" (*Honolulu Star Bulletin* July 7, 1916:10). Among the other points there were "a number of short hikes to be taken from the tavern" and "fresh eggs, chickens, vegetables and groceries" could "be obtained in the neighborhood" (ibid.). The tavern also appeared in advertisements such as the one reproduced as Figure 25 below, which were included regularly in newspapers throughout the early decades of the 1900s.

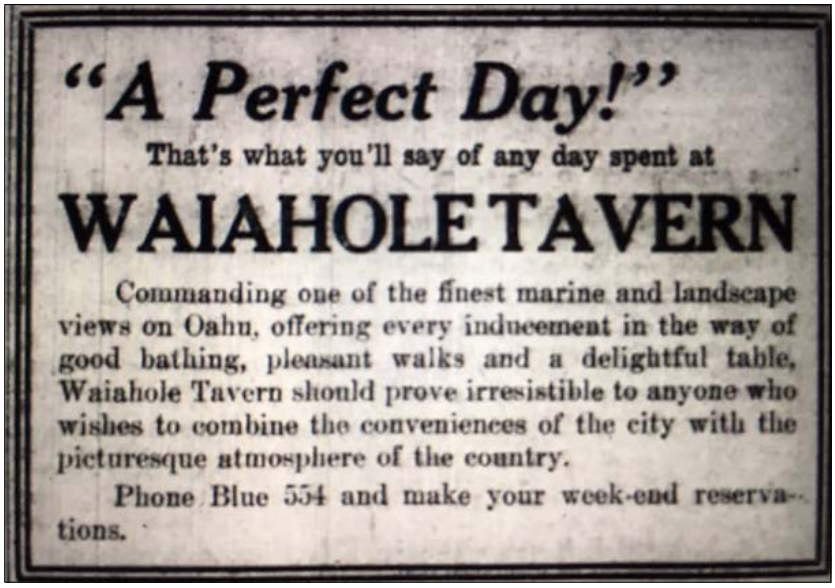

Figure 25. Advertisement from *Honolulu Star Bulletin* (October 19, 1916:8).

In 1918, roughly 1,169 acres in Waiāhole Ahupua'a were set aside as forest reserve (Pinkham 1918:175). This acreage comprised "the government forest lands of Makawai at the upper end of the main Waiahole Valley, the private land of Hanakea, and the adjacent government forest lands of Kapikokau and Waiaanu I to the north," bordered by "various private grants and open public land" on the *makai* side of the reserve (ibid.:195). The forest reserve was

established in part to protect native forest lands from over grazing livestock. According to an article titled "Waiahole Valley is center of Area with Colorful History" written by the Principal of Waiahole School, Joseph T. Ferreira and published in *Hawaii Farm and Home* magazine in 1940, agriculture was the main industry of the Waiāhole vicinity at that time. He provides the following account of travel from early days until 1940 as follows:

> Travel between the district and Honolulu was difficult, as there were no paved roads. In order to get to Honolulu, the early Hawaiians had to walk over the steep sides of the Pali, Later, many rode on horseback. Travel was so difficult and slow that it took more than a day to go to Honolulu and return. Today it only takes one hour and a half to go to Honolulu and return. (Ferreira 1940:9)

In another article titled "'Over the Pali' – Beauty, Industry" published in the same issue of *Hawaii Farm and Home* magazine as the excerpt above, Honolulu County Extension Agent M.K. Reilly describes agriculture in windward Oʻahu. He states that across Koʻolaupoko and Koʻolauloa, "there are some 500 farmers busily engaged in the production of diversified agricultural commodities" (1940:9). He goes on to emphasize that the farmers "are of several racial descents, being predominantly Japanese, but there are also Chinese, Hawaiians, Haoles, Filipinos and Koreans" all of whom were "living and farming in close proximity to each other, peacefully and cooperatively" (ibid.). According to Reilly, at the time of his writing, "the greatest major agricultural industry in Windward Oʻahu" was "the dairy enterprise," for five of the sixteen dairies (roughly 2,000 head of dairy cows) in the Hawaiian Territory were located there (ibid.). In addition to dairy cows, 5,000 head of beef cattle belonging to Parker Ranch and Kaneohe Ranch Co. were grazing in Koʻolaupoko, to the north of the current study area beyond Kahuku. Reilly also mentions two other industries that he classifies as "major enterprises" of windward Oʻahu: the then-thriving papaya plantations of Kailua and Lanikai, as well as the fields of bluefield and apple bananas formerly located along the slopes of the Koʻolau Mountains. Reilly also reports that small farms in windward Oʻahu were the source of much of the "celery, sweet potatoes, dasheen, carrots, Chinese peas, asparagus, onions, strawberries and in short, almost every vegetable found in the Honolulu markets" (ibid.). Multiple-acre truck farms that specialized in some of the crops grown on the smaller farms rounded out the diversified agriculture of windward Oʻahu.

Despite the success of diversified agriculture in windward Oʻahu, taro cultivation was deemed the "most important" industry in the region, in which roughly 190 farmers produced fourteen million pounds of taro annually from 680 acres of taro land; and the region was home to three *poi* factories (Reilly 1940:9). One of these factories known as Waiāhole Poi Factory still produces hand-pounded *poi* for locals and visitors alike. The original *poi* factory building was constructed in 1905 at 48-140 Kamehameha Highway, located adjacent to (*mauka* of) the central portion of the current study area. It was first owned and operated by Chinese immigrants and later taken over by a Japanese family. Figure 26 below shows Waiāhole Poi Factory ca. 1946, as well as a glimpse of Kamehameha Highway and Waiāhole Valley Road at that time.

Figure 26. Historical photograph of Waiāhole Poi Factory ca. 1946.

Between 1940 and 1950, the population of Koʻolaupoko District experienced an exponential increase of 130 percent—from 9,006 people to 20,779 people; and in 1960 to 60,238 people, an increase of 190 percent (Devaney et al. 1982:12). Such rapid increase is a reflection of the development and urbanization on the windward side of Oʻahu that began after World War II. The legacy of the changes in land use that occurred along Kāneʻohe Bay from the mid-nineteenth century until World War II are succinctly summed up by Devaney et al. as follows:

> As each commercial crop in succession developed toward peak production and maximum land acreage under cultivation, the trend for the largest land owners to increase their holdings and for the small land-owners to decrease in numbers operated throughout the islands. (1982:33)

Waiāhole in Modern Times

Although Reilly insisted that diversified agriculture was a self-sustaining industry, and that farmers were considered "valuable assets to their community" (1940:9), in the 1960s Miyagi (1963) reported that the Waiāhole Valley community comprised Hawaiians, Japanese, Filipinos, and Caucasians who were less engaged in agriculture; thus, diversified agriculture was in decline (Miyagi 1963). Miyagi listed four major land use categories active in Waiāhole at in 1961: diversified agriculture (consisting primarily of bananas, papaya and taro), grazing (primarily dairy, but also beef cattle), residential (homes, schools, a grocer, the Waiāhole Poi Factory, and the trout farm), and forest (including wooded areas, waste land, and shrub land), which he depicted on a map (Figure 27). Miyagi's 1961 land use map shows much more diversified agriculture than the 1900 land use map, and less land planted in taro (see Figure 22). By the mid-1950s, commercial *poi* production declined to levels similar to those of Hawaiʻi Island (Olszewski 2000). By the early 1960s, in Waiāhole Valley "only three Japanese and two Filipino farmers" still planted taro (Miyagi 1963:141).

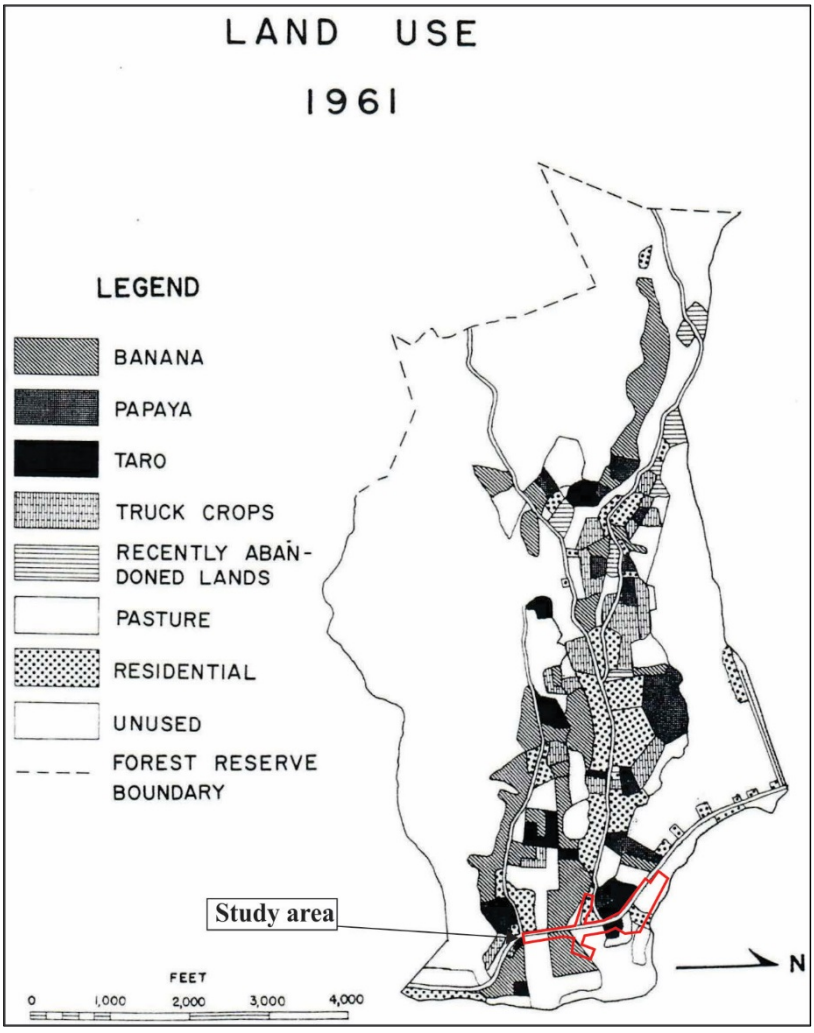

Figure 27. Land Use Map of Waiāhole ca. 1961 (Miyagi 1963:136).

According to the land use map, roughly a quarter of the acreage within the current study area was under cultivation in 1961—banana and taro plantings extended *mauka* and *makai* across Kamehameha Highway near the southern end and north-central end of the current study area, respectively; another quarter of the acreage of the study area comprised residential use on the Kāneʻohe (south) side of the intersection of Waiāhole Valley Road and Kamehameha Highway, and on the *makai* side of the highway near the northern end of the study area. The remaining half of the acreage was either unused or used for grazing. A comparison of aerial photographs taken between 1959 and 1968 (Figure 28) supports the land use pattern depicted by Miyagi's land use map with very little change in the residential and agricultural use areas formerly within the study area.

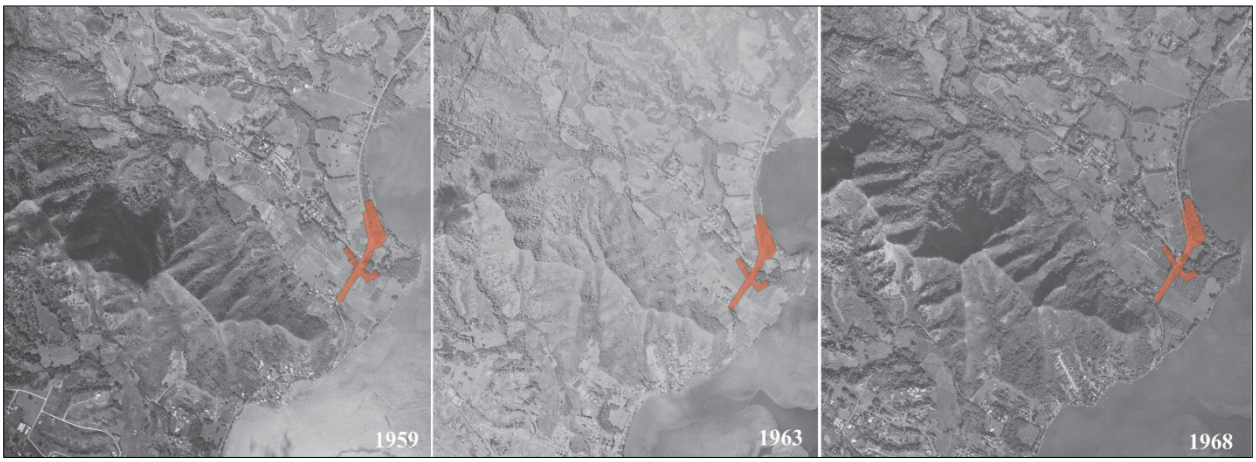

Figure 28. Comparison of USGS aerial photographs with study area shaded red.

The mid-twentieth century decrease in *poi* production and taro farming was likely a direct result of changes in land ownership within Waiāhole Valley since the *Māhele*. For instance, by the 1960s, eighty-nine percent (110 acres) of the *kuleana* acreage owned by Native Hawaiians had become part of larger land holdings owned primarily by non-Hawaiians (Miyagi 1963). The number of Chinese landowners in the valley also dwindled; and the Japanese and Filipino laborers who had been living and working in the valley since the turn of the century did not own land. Miyagi reported that "all the farmers in the valley rent lands from McCandless heirs, the State of Hawaii, or other small land owners" (1963:134). Thus, farming became a less secure livelihood that was dependent on short-termed leases. Miyagi also reported that, at the time of his research, Japanese farmers practiced intensive farming on some of the better lands; while Filipino farmers practiced less intensive farming of the less favorable areas; additionally, a Chinese farmer operated a dairy and used an abandoned rice field to graze his cattle; and Portuguese ranchers grazed their beef cattle on the slopes of the valley head.

In the early 1960s, the Waiāhole Poi Factory bought half of its taro from farmers on Kauaʻi and Maui, and the other half from growers on the windward side of Oʻahu (Miyagi 1963). According to Miyagi, the Oʻahu farmers and the Poi Factory developed an arrangement referred to as "the harvester system" in which "the factory employs a Filipino to harvest the taro without the help of growers" (1963:145) and the harvester receives compensation. This system was apparently preferred by the taro growers at that time. However when supply overwhelmed demand, farmers were forced to postpone their harvest, which resulted in reduced yield. Miyagi reports "in spite of disadvantages, many farmers consider the selling of taro to be better than the selling of truck products to brokers" (1963:146).

According to Kikuchi (1964), although much of the marine life once common near the mouth of Waiāhole Stream had dwindled, *kūpeʻe* (*Nerita polita*) and *āholehole* fish (*Kuhlia malo*) were still found there. These species endured despite the lower volume of flow caused by the diversion of Waiāhole Stream for the aforementioned Waiahole irrigation tunnel. Residents of Koʻolaupoko District engaged in the Hawaiian cultural renaissance of the 1970s united in support of land and water rights for Native Hawaiians, as well as against suburban and commercial development of rural Oʻahu. The Waiāhole-Waikāne Community Association (WWCA) was formed to protect the rights of the tenant farmers and residents of Waiāhole and Waikāne valleys; particularly, in relation to the restoration of the diverted waters of Waiāhole Stream to Waiāhole and other affected communities on the windward side of Oʻahu.

Around 1974, the immediate study area vicinity was the site of a demonstration in which local working-class tenants and their supporters, all from different ethnic backgrounds, united against police-enforced evictions associated with proposed development of Waiāhole and Waikāne. Members of the WWCA organized a march down to

Kamehameha Highway and Waiāhole Valley Road to receive their eviction notices, which they promptly burned in the street in peaceful protest of the evictions (Figure 29). About a year later, the community organized the occupation of Waiāhole Valley, and folks set up camp at the valley's head; one night, the demonstrators were warned that the National Guard was coming to evict the occupiers (personal communication Gwen Kim 2018). In response, activists created a blockade across Kamehameha Highway between Waikāne and the Hygienic Store in Kahaluʻu; the blockade lasted for a few hours until those involved heard that the National Guard had been called off (personal communication Gwen Kim 2018). In response to these and other protests/demonstrations, in 1977 the State of Hawaiʻi purchased 600 acres of land in Waiāhole and "designated it for agricultural use for future endeavors" (McElroy and Duhaylonsod 2015:27).

Figure 29. Protesters gathered near Waiāhole Poi Factory against development-related forced evictions in Waiāhole and Waikāne Valleys (*Honolulu Advertiser* August 16, 2009 http://the.honoluluadvertiser.com/article/2009/Aug/16/ln/hawaii908160330.html, internet resource accessed January 2, 2018).

In 1971, a few years before the Waiāhole-Waikāne struggle took to the streets in front of Waiāhole Poi Factory, the Shige family sold the *poi* factory to the current owners, Calvin Hoe and his wife Charlene (Honolulu Magazine 2012). Calvin grew up in the area and has memories of families picking up *poi* in large wooden barrels from the factory (Myers 2014). Upon purchasing the *poi* factory, the Hoes operated it as a Hawaiian art gallery, as *kalo* cultivation was in decline. Thus, during the 1980s, the Hoes and others formed a non-profit organization called Hui Ulu Mea Ai to restore agricultural pursuits in the community (Hervey 2012). Over the coming years some Hui Ulu Mea Ai members would successfully launch small agriculture-based businesses from the *poi* factory, such as the Reppun family's Waiāhole Poi that they sold at the *poi* factory one day a week, Homestead Poi, Hale Kealoha Caterers, and Ono Loa Hawaiian Food (ibid.).

Meanwhile, the struggle for water rights that began in the 1970s continued and intensified in the 1990s. In 1994, Oahu Sugar Company, which had diverted Waiāhole Stream to irrigate its leeward cane lots for nearly a century, ceased operations. The current steward of the Waiāhole Poi Factory and an active community member, Liko Hoe was quoted in an article published in *Honolulu Weekly* regarding the restoration of water to Waiāhole after Oahu Sugar Company closed,

> "We thought that was a good time to return those waters," Liko explains. Led by farmer Charlie Reppun, the Waiahole and neighboring Windward communities united to get the water returned. Today, only 50 percent of the area's water remains diverted.
>
> "That's a significant restoration of water in the streams here," Liko says. "It's an example of the community's position of not going along with the general flow, I guess you could say, speaking their minds and making a statement." (Hervey 2012)

Echoes of the struggle for water in Waiāhole are heard in a song recorded in 1979 by Vic Malo *Ode to Waiahole-Waikane Valley*. This politically charged soul song includes lyrics about paying to see a waterfall when there is no water at all. Another, more widely recognized, song released a few years later also mentions Waiāhole; composed by Gordon Broad, *Sweet Lady of Waiahole* is about Waiāhole resident Fujiko Matayoshi who peddled her fruits on the side of Kamehameha Highway until she passed away in 1985. This song was made famous by Bruddah Walter and has since been performed by many other artists.

Waiāhole Valley has captured the imaginations of residents and visitors alike for centuries as shown in the legends, historical accounts, and songs presented above. Since the 1960s, Waiāhole and neighboring Waikāne have also been the subject of struggles for land and water rights. Since 2009, the Waiāhole Poi Factory has become a cultural landmark where local residents and visitors stop to enjoy plate lunches with hand-pounded or machine-milled *poi* made from locally grown *kalo* and browse Hawaiian arts and crafts (Myers 2014). Calvin Hoe and his sons have become stewards of traditional Hawaiian culture for the Waiāhole Valley community and beyond. Three days a week, Liko and his brother bring out the board and stones and pound *poi* to the delight of visitors from across the Hawaiian Islands and abroad. By actively engaging in traditional cultural practices including music, *hula*, *poi* pounding, and outreach/education, the Hoe family is preserving the traditional cultural practices that are valued by the Hawaiian community.

PRIOR STUDIES

Archaeological Studies

The earliest published descriptions of archaeological sites in the Kāne'ohe Bay area were originally recorded and published in *Archaeology of Oahu* by McAllister (1933). McAllister's survey focused on sites that were readily visible on the surface based on ethnographic accounts that he and T.G. Thrum had collected from people familiar with local history; such as *heiau* platforms, stone mounds, caves, ditches, ponds, and stones. Less visible sites and buried resources such as *'auwai* and *lo'i* terrace walls were often overlooked in the early studies of the coastal plain where the study area is situated. Thus, in the absence of any major ceremonial structures or *wahi pana* in coastal Waiāhole, it is no surprise that McAllister (1933) did not record any sites within the vicinity of the current study area. Devaney et al. (1982) add that much of the sites formerly found within the lowlands and plains along Kāne'ohe Bay had been plowed over and otherwise destroyed by the 1930s; although some "agricultural terraces, stone walls, stone pavements, and irrigation ditches, are still unrecorded," however these are "tucked away in the recesses of the valley heads, hidden by forest growth" (Devaney et al. 1982:4), rather than in the coastal flats like the study area.

Much of the land of central and lower Waiāhole Valley situated *mauka* of Kamehameha Highway has undergone prior archaeological study (Kikuchi 1964; Barrera 1982; Tomonari-Tuggle 1983; Tomonari-Tuggle and Tuggle 1984; Dye et al. 1985; Hammatt et al. 1987; Kawachi and Griffin 1990; McElroy and Duhaylonsod 2015, among others). Cultural resources encountered as a result of these investigations include residential areas, lithic procurement sites, and agricultural features *(lo'i* and *'auwai)* often related to both traditional *kalo* and Historic rice cultivation. Of these prior studies, only three (Barrera 1982; Tomonari-Tuggle 1983; Tomonari-Tuggle and Tuggle 1984) that share the same discontinuous study area may overlap with a tiny portion of the current study area, along the stream, *mauka* of Kamehameha Highway. However, the only cultural resources recorded during the fieldwork for these studies are located well *mauka* of the current study area and comprise abandoned taro terraces associated with LCAw. 10230.

The coastal lands of Waiāhole, located *makai* of Kamehameha Highway have also undergone archaeological study (Griffin and Pyle 1974; Walsh et al. 1995; Perzinski et al. 2002; and O'Leary et al. 2005), the study areas of which include portions of the current study area (Figure 30). The first of these studies was conducted in the early 1970s by Archaeological Research Center Hawaii (Griffin and Pyle 1974) and focused on a 2.5-square-mile *makai* portion of Waiāhole and Waikāne *ahupua'a*. Cultural Surveys Hawaii (CSH) summarized their results in a later report as follows:

> Griffin and Pyle's (1974) reconnaissance of the lower one-third of Waiāhole-Waikāne found a number of *lo'i* and miscellaneous walls *mauka* and *makai* of the highway. They found no evidence

of the habitation sites identified by Kikuchi [1964]. They remarked that "it was evident that much of the sites within the study area have been destroyed, otherwise obliterated, or are in an advanced stage of deterioration" (1974:4). Griffin and Pyle summarized their findings as follows:

The results were, from an archaeologist's point of view, disappointing. The beach area revealed only a low seawall at the edge of the beach-turf line. This wall is undatable and may be of recent origin. In a few locations taro *lo'i* are still observable behind the beach. In general the disturbance of the various site predicted areas are bad. Pasturage of cattle seems to have eradicated even the *lo'i* in most cases. . . it is as if someone has taken an eraser and wiped clean the reminders of the former Hawaiian occupation of this part of Waiāhole and Waikāne. (Griffin and Pyle 1974:15-16 in Bushnell et al, 2002:40)

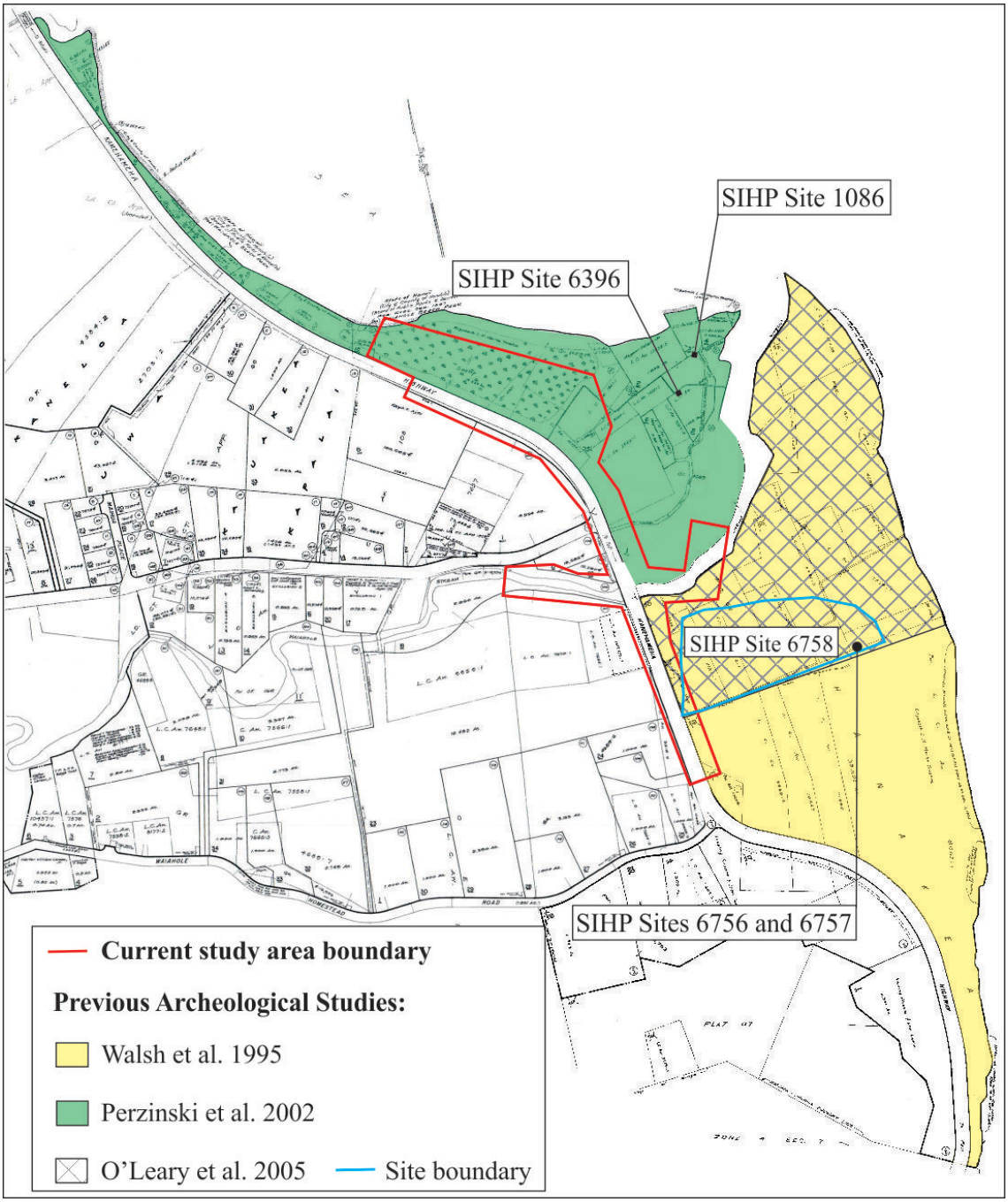

Figure 30. Locations of previous studies and findings relative to the current study area location (all site numbers preceded by prefix SIHP Site 50-80-10).

In 1995, CSH conducted the second study, an archaeological assessment (Walsh et al. 1995) of two parcels in Waiāhole and Waikāne *ahupua'a*, the southernmost portion of the current study area, *makai* of the highway, extends slightly into their Waiāhole study area (see Figure 30). According to Bushnell et al., CSH noted "vaguely defined fields with *lo'i* type soils and a possible *'auwai*" in addition to "a possible buried cultural layer with possible water-worn basalt flakes and charcoal" (2002:42).

In late 2001, CSH conducted an Archaeological Inventory Survey (Perzinski et al. 2002) of a roughly 21-acre area, located *makai* of Kamehameha Highway (see Figure 30). Six of the sixteen backhoe test trenches they excavated (trenches [TR] 1-5 and 12) were situated within the northernmost portion of the current study area (Figure 31). All the test trenches within the current study area, except for Trench 5, revealed fills directly beneath the surface to depths ranging between 30 centimeters and 149 centimeters below the surface over culturally sterile soils above and below the water table; trench 5 comprised hard clay over water rounded gravels with a piece of Historic ceramic in the uppermost stratum (0-35 centimeters below surface) and charcoal in Stratum II (35-55 centimeters below surface). Perzinski et al. reported that the artifacts they encountered during the AIS "are comprised of only post-1950 trash" (2002:55). As a result of their fieldwork, CSH recorded two sites: a Historic cemetery with six rectangular graves (SIHP Site 50-80-10-1086), which was likely associated with a former church located within LCAw. 7761:3; and a possible *Pōhaku O Kāne* or God Stone located along a former *'auwai* near the boundary between LCAw. 10439:2 and LCAw. 7661:2 (SIHP Site 50-80-10-6396).

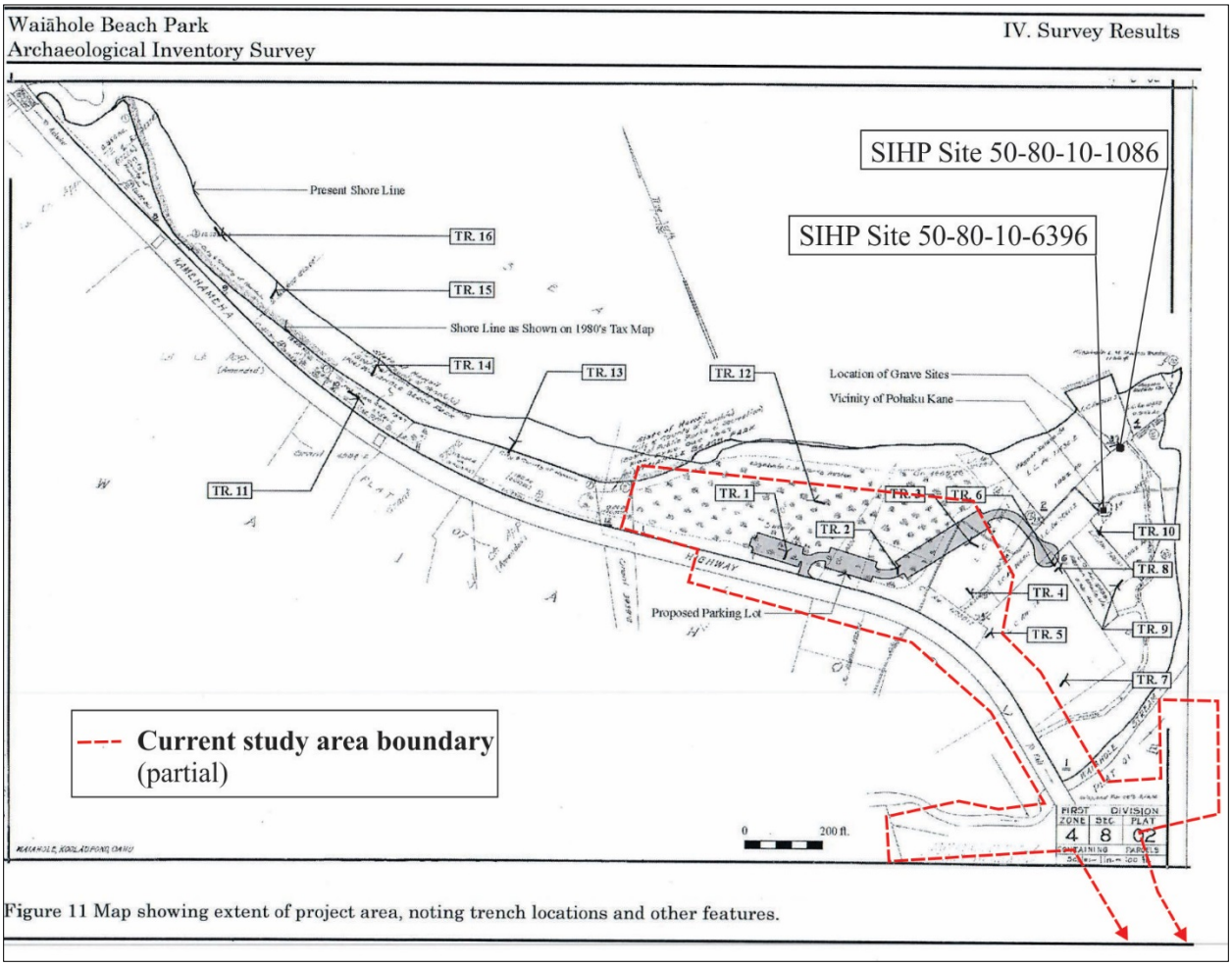

Figure 31. Current study area boundary mapped onto Perzinski et al. (2002:30) trench location map.

In late 2004, CSH conducted an Archaeological Inventory Survey (O'Leary et al. 2005) of a roughly 9-acre property for the then-proposed wetland and *lo'i* restoration project (see Figure 30). CSH conducted pedestrian survey and subsurface testing using backhoe trenching; none of the test trenches or scrape areas were situated within the current study area. As a result of their testing, they identified three historic properties: a habitation site occupied during the late Precontact through early Historic Period (SIHP Site 50-80-10-6756); a historic road with boulder kerbing that partially overlies Site 6576 (SIHP Site 50-80-10-6757); and scant traces of a former *lo'i* system (SIHP Site 50-80-10-6758) that comprise an agricultural soil surface (Feature A), an earthen berm (Feature B), and an *'auwai* (Feature C). O'Leary et al. note that the surface features of this site had been obliterated by modern land use.

As illustrated in Figure 32 below, SIHP Sites 6756 and 6757 are located well beyond the current study area; while a portion of the *'auwai*, Feature C of SIHP Site 6758, appears to cross into a portion of the study area near Kamehameha Highway. It is possible that the agricultural layer (Feature A of SIHP Site 6758) may extend into the portion of the current study area along the *makai* side of Kamehameha Highway and the south bank of Waiāhole Stream; however, fluvial action and modern land disturbance lessens the potential for intact subsurface deposits in that area.

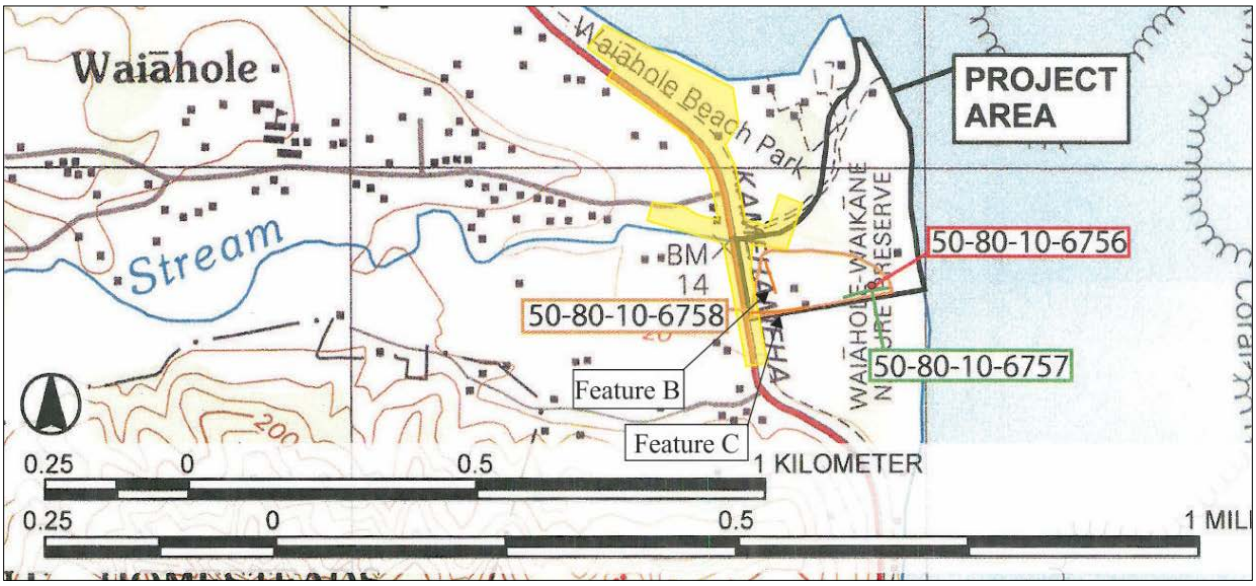

Figure 32. Site location map from O'Leary et al. (2005:73) with current study area shaded yellow.

Cultural Studies

In 2001, CSH prepared a cultural impact assessment (Bushnell et al. 2002) for a 78-acre area located along the Waiāhole and Waikāne coastline for the then-proposed Waiāhole Beach Park expansion project. Their project area included the study areas of those of Walsh et al. (1995), Perzinski et al. (2002), and O'Leary et al. (2005) and includes the portions of the current study area located *makai* of Kamehameha Highway to the north and south of Waiāhole Stream (see Figure 30). CSH staff conducted historical research and interviewed nine informants with knowledge of their study area. According to Bushnell et al., nearly all the informants spoke about "fishing, crabbing or gathering shellfish or *limu* along the shoreline of the study area" (2002:116). They continue, "the community also communicated a strong tradition of gathering in the near shore environment adjacent to the study area," (ibid.) which was rich in *'ōpae lōlō* and various species of crabs (*kūhonu*, *'ala'ek*e, and *mo'ala)* and *limu* (*manauea, 'ele'ele,* and *līpe'epe'e*), as well as edible marine snails (*kūpe'e* and *'ōlepe*). Informants spoke of throwing nets for mullet in Kāne'ohe Bay near the mouth of Waiāhole stream and provided the following description of a place near the current study area referred to as Kaneloa Bay

> Kaneloa: the little bay separating the *makai* lands of Waiāhole and Waikāne. This bay includes stream mouths of the Waiāhole and the Waike'eke'e/Waikāne Rivers. Only one informant refers to this area by name, although several others know it as an excellent fishing ground. More than one informant recall using the *huki huki* net or drag net in this bay. With the estuary like conditions creating a rich eco-system, many tyes of fish, crustaceans and seaweeds were collected from this area. Kaneloa is also the name of the *'ili* just *muaka* of the bay. (ibid.:76)

Regarding Waiāhole and Waikāne streams, those interviewed emphasized the importance of these water sources to the community "not only because of the *ʻāholehole*, *ʻōpae* and *ʻoʻopu* that are caught there but also as a main artery to the health of the valley and as a source of recreation and [a] gathering place" (Bushnell et al. 2002:118). Bushnell et al. reported that water from *ʻauwai* was used until the 1950s "for household consumption, drinking water and in irrigation," and that the community showed "interest in restoring the *ʻauwai* for the taro revitalization efforts," which had taken hold in the "last few decades" (ibid.). Although CSH did not record any fishponds within Waiāhole, informant Richard Paglinawan spoke about the practice of transforming taro *loʻi* into *loko iʻa* or fishponds as follows:

> As a matter of fact, in some of the *loʻi kalo* over here (in the study area in Waiāhole south of the stream), when you *huki* [pull] out the taro, you would convert it to fishpond. And they would grow *awa* [milkfish] and mullet. They would grow it in there. I guess, part of it, the *kūkae* [excrement] and everything, they rejuvenate the soil. And then replant again. So they would have it inside this area, all in this area. And there was a lot of—the fern that was called *hōʻiʻo*. . . the fronds they would eat it. . . They would eat those ferns. Plenty in this area. (ibid.:83)

Specific cultural recommendations for the Waiāhole portion of their study area included the identification and preservation of *ʻauwai* as well as the avoidance of known burial sites such as the aforementioned Historic cemetery (SIHP Site 50-80-10-1086) and the *kuahu* (altar) associated with the *pōhaku o kāne* (SIHP Site 50-80-10-6396), which are located *makai* of the study area.

In 2003, CSH prepared a cultural impact assessment (Chiogioji et al. 2003) in support of an earlier iteration of the current project. As part of their study, Chiogioji et al. conducted interviews with four individuals with knowledge of the current study area vicinity. Richard Paglinawan (1936-2015) spent his childhood in Waiāhole and recalled that he and other children used to swim under the bridge and another spot located closer to the Waiāhole Poi Factory:

> . . . we kids, from the bridge, would jump off into the stream because we dammed the water and we could jump either way. And, for fun, we'd splash water on oncoming cars. When we got cold, because the river water is cold, we'd lie down on the concrete and go to sleep. Because they hardly had any traffic at that time.
>
> The Waiāhole poi shop one was a favorite swimming hole for the whole community, all the way from Kahaluʻu to Hakipuʻu. So that was a famous swimming hole. The only name we had for it was "the Dam." . . . I believe the dam is really a concrete roadway that crossed over Waiāhole Stream And what it is: water flows over it but you can drive onto it. There are three such roadways in the streambed: one right behind the poi shop, one up where Shige Sakai used to live ant then one up by where the Koki family used to live. . . These dam roadways would give the farms access across the stream. The reason why I say that is I suspect that one right by the poi shop used to be the old road before the bridge was constructed in 1922. (2003:22)

Paglinawan also stated that a primary concern related to the then-proposed bridge replacement was that "the water quality be maintained" because "run-off may pollute the lower area, which is a good fishing ground area" (Chiogioji et al. 2003:24). In addition, he recalled the damage sustained by the bridge because of flooding in 1965 and the subsequent repairs, which destroyed the swimming holes of his youth as follows:

> Back in 1965, the Keapuka flood, also hit Waiāhole and it damaged the bridge causing the center section to collapse. And traffic couldn't go over so they stopped traffic for several days. Then, what they did, as a temporary measure, was to fill in between the collapsed middle portion of the bridge with hard top, the black top, to level it off. Eventually they straightened the alignment of the bridge by "jacking" it up and reinforcing the middle section of the bridge. (ibid:23)

Chiogioji et al. stated that although Paglinawan realized traffic safety problems might be alleviated by the bridge project, he was still concerned about the "new bridge's social impact on the area" (2003:23). To that end, he opined,

> I'd like to see the area kept rural. What I'm afraid of: if the new bridge is widened it will bring more traffic down there which may impact the rural character of the place. . . and the other problem: the highway is a death trap. Of course the highway was built to 1922 specifications. And now modern cars are traveling so fast. When fatalities occur they interfere with the flow of traffic, especially when people are going to work. But I think people down there they're willing to live with [that] I think what they're afraid of is more traffic and more development that might result from that kind of project. I don't know if the bridge is going to serve that purpose. But potentially it can" (ibid.).

CSH also interviewed Waiāhole Poi Factory's then owner, Calvin Hoe (b. 1945 in Hakipu'u Ahupua'a). Hoe has family ties to the Kaanana family *kuleana* in Waiāhole and was involved with the Hakipu'u Learning Center. Hoe recalled high waters in Waiāhole Stream after heavy rains in the 1980s and 1990s, and that people jumped off the bridge when the water was high until they put up the "no jumping" warning signs. He did not recall the swimming holes near the bridge that Paglinawan spoke of but he did "remember fishing over there" (Chiojiogi et al 2003:24). Hoe went on as follows:

> . . . The aholehole used to come up the stream because it was deep enough and from the bridge to the ocean is not too far. So fish like the aholehole could swim up. I kind of remember people saying that the stuff from the poi factory, when they clean the taro, went into the stream so I think that attracted some of the fish to come up. (ibid.)

Hoe mentioned that folks in Waiāhole wished to plant community taro patches *makai* of the highway near the bridge, "where families could have their own small taro patches to learn how to plant taro" (Chiojiogi et al 2003:24). He viewed the land's proximity to the highway as a positive thing that would allow ease of access and provide an opportunity to perpetuate Hawaiian agricultural practices. Hoe also mentioned former *lo'i* located in the bridge vicinity,

> I think there were taro patches on both sides of the road, at least the makai side of the highway, on the left side, there were taro patches over there. I don't remember taro patches makai on the right side of the stream. But I know there are taro patches over there, old taro patches over there. Mauka of the road had taro patches. . .
>
> But I don't know who took care of the taro patches by the bridge. I think Shige [former Poi Factory owner] took care [of] the taro patches on the north side. Although this guy Kaya and his family, they took care of a lot of the taro patches in Waiāhole. (ibid.:25)

Regarding the bridge replacement, Hoe recognized the need for the construction of a new bridge because of flooding and unsafe conditions but stated "concern was for the taro patch" located *makai* of the highway when he imagined the then-proposed temporary bridge thusly:

> . . . Over there are taro patches that, I think, need to be preserved. A few yards from the stream, on the south side and going mauka/makai, there's a culvert. There are several culverts going across the road, I think. There's a big 'auwai system that comes off of Waiāhole Stream and it used to feed all of that area. The community, the people from the mauka lo'i, kalo pa'a gang, help to keep the 'auwai system running. So that – I noticed that there's water down by the Picansos' house. That's towards the south side of the valley. And that water needs to go back to the stream now. I think the 'auwai that's close to the stream needs to keep going now and, basically, forever. Because the land, the taro patch land that's all makai of the highway, on the south side of the stream, is valuable taro patch land. (Chiogioji et al. 2003:25)
>
> So, in the construction of the bridge, I think care needs to be taken to make sure that the 'auwai that's close to the stream, maybe twenty-five yards from the stream. . . and the other one by the Picanso place, there is another one that feeds the areas further south, makai side of the highway, those need to be preserved – the 'auwai and the culverts. . . Hopefully, I guess, the city knows that that's a very old lo'i area and they will take precautions not to disturb the lo'i area. . . If they start putting rocks inside there, and even if they're going to take them out, how are they going to restore the area? There needs to be a plan for accommodating. I think, as a resident of the valley but also as someone whose family has lived in these valleys for centuries, I'm very concerned that the taro patches are taken care of. . . (ibid.:27)

CSH interviewed another Waiāhole resident John Reppun together with water quality expert Kaipo Ferris. Reppun recalled his "introduction to taro" happened while driving over the bridge and seeing "poi factory to your left, taro patches to the right," as well as water buffalo in the lo'i (Chiogioji et al. 2003:39). He also spoke of seeing kids jumping off the bridge, folks floating by under the bridge, and people fishing off the bridge up through the 1960s. According to Faris and Reppun, since the flow of Waiāhole Stream was restored in 1995 life had returned to the stream and converted it into a well-studied habitat. This resurgence of life includes the stream and valley's namesake *āholehole* fish as well as native stream species such as *hihiwai*.

Regarding the bridge replacement project, Reppun and Faris shared the same opinion and recommendation—that the extant bridge be left as is and a new bridge constructed in lieu of a temporary bridge, on the *makai* side of the extant bridge. By building the new bridge further away from the Poi Factory and the intersection of the highway with Waiāhole Valley Road, Reppun opined that safety and traffic congestion could be improved. Reppun suggested that the original bridge could be retained as is, or modified into a pedestrian and bicycle only bridge. He also mentioned the Waiāhole-Waikāne park, that was in the planning stages at the time of the interview, and meant for the publicly owned land located *makai* of the extant bridge; in particular, the component of the park that was to be used for the revitalization of taro farming. Reppun stated that the area *makai* of the extant bridge was "one of the best areas for growing taro" because of a combination of "plenty of sun" and "plenty of cold water" (Chiogioji et al. 2003:44). He suggested that any plans for the highway also consider ingress and egress to the future destination of the park as well as access to the existing destination of the Poi Factory, which he referred to as their "small little economic zone" and "a meeting place" (ibid.:43). Thus, the planners should include the areas beyond the extant bridge—not only towards Kahuku and Kāneʻohe, but *mauka* and *makai* of Kamehameha Highway as well.

Reppun and Faris also expressed their concern about the impact to Waiāhole Stream from construction related activities such as tree removal and the addition of concrete, both of which would cause a temperature increase in the stream. The native species need cold water to thrive and the loss of shade and introduction of heat conductors would upset the delicate balance of the riparian ecosystem.

3. CONSULTATION

When assessing potential cultural impacts to resources, practices, and beliefs; input gathered from community members with genealogical ties and/or long-standing residency relationships to the project area is vital. It is precisely these individuals who ascribe meaning and value to traditional resources and practices. Community members may also possess traditional knowledge and beliefs that are unavailable elsewhere in the historical or cultural record of a place. As stated in the OEQC Guidelines for Assessing Cultural Impacts, the goal of the oral interview process is to identify potential cultural resources, practices, and beliefs associated with the affected project area.

Therefore it is the researcher's responsibility to gather the interviewees project- or site-specific knowledge and use it to assess the significance of any traditional cultural properties that may be identified. The interviewees' *manaʻo* (beliefs and opinions) should also provide the basis for our understanding of potential cultural impacts and appropriate mitigation. To that end, on December 18, 2017, ASM submitted the following public notice electronically to the Office of Hawaiian Affairs (OHA) for publication in their monthly newspaper *Ka Wai Ola o OHA*:

> PUBLIC NOTICE
>
> ASM Affiliates is preparing a Cultural Impact Assessment (CIA) for the Kamehameha Highway, Waiahole Bridge Replacement Project on a roughly 12.2-acre property (Portions of TMKs: [1] 4-8-001:001 and 010; 002:001; 008:018 and 021-025; and 009:001 and 006), located between mile markers 34 and 35 of Kamehameha Highway, and extending to the north and *makai* of the extant bridge in Waiāhole Ahupuaʻa, Island of Oʻahu. The State of Hawaii Department of Transportation, Highways Division plans to replace the existing Waiāhole Bridge with a new bridge that has two travel lanes and two road shoulders. The project also includes the construction of a temporary bypass road and bridge located *makai* of the extant bridge; as well as the demolition of the extant bridge and walkway. We are seeking consultation with community members with knowledge of or ongoing involvement in traditional cultural use of this area, which may be impacted by the proposed project. If you are willing to share such information please contact Teresa Gotay tgotay@asmaffiliates.com or Bob Rechtman brechtman@asmaffiliates.com, phone (808) 439-8089, mailing address ASM Affiliates 820 Mililani St. Suite 700, Honolulu, HI 96813.

To date, OHA has not acknowledged receipt of the submission nor published the notice. We are hopeful that the public notice will appear in a forthcoming issue and the results of any additional consultation will be included in the final version of the current study.

As part of the current investigation the primary author contacted eight individuals (Paul, Charlie, and John Reppun, Gwen Kim, Bobby Fernandez, Emil Wolfgramm, and Calvin and Liko Hoe) and one organization (Koʻolaupoko Civic Club) with ties to the study area as potential interviewees. A representative of the Koʻolaupoko Civic Club was unable to offer any information beyond suggesting Waiāhole resident, Bobby Fernandez be contacted. The interview with Bobby Fernandez was also attended by his wife Betty and daughter Yvette, who participated in our talk-story session. During a visit to the study area, the author encountered another participant who wished to remain anonymous. To date, the author has met with nine members of the Waiāhole community who were willing and

able to provide insight regarding the potential impact of the Waiāhole Bridge Replacement Project on cultural practices, properties, and beliefs within the study area. All interviews were conducted by Teresa Gotay as informal talk-story sessions in person or over the telephone between January 2, 2018 and January 23, 2018. These interviews were not tape recorded, but rather memorialized in handwritten notes.

PAUL REPPUN

On February 2, 2018 Paul answered the telephone at the family farm in Waiāhole and agreed to be interviewed; he also provided contact information for his two brothers (Charlie and John), whose interviews are summarized below. Paul and his brother Charlie operate Waianu Farm in Waiāhole Valley, and reside on the property; they have been engaged in taro farming for over forty years. When asked about cultural impacts from the proposed project, Paul stated that there is no farming near the bridge currently; but on the *mauka* side of the bridge, a Filipino farmer has a spot—but it will not be impacted too much. He then suggested that the biggest cultural impact will be to the Waiāhole Poi Factory, a business with which Paul has a long history. In the late 1980s, as part of the non-profit Hui Ulu Mea Ai, Paul helped rebuild the structure and recalled making *poi* there. For the next twenty years, the *poi* factory acted as a business incubator, but according to Paul the venture was ahead of its time; unlike today, thanks to advertising and increased tourism "lots more people stop" and the business is really active. Paul opined that even though the *poi* is mostly for the benefit of the tourists, the successful business has provided continuity for the *poi f*actory and in turn helps the whole valley.

According to Paul, the *poi* factory location is famous as a place for accidents; vehicles colliding with parked cars and the cement planters currently in front of the *poi* factory are a regular occurrence; furthermore, the building itself has been hit by a car in the past. Paul used to live in a building behind the *poi* factory beginning in the mid-1970s and recalls waking up in the middle of the night after hearing screeching tires and going out to the road to see if he could help people involved in collisions. He emphasized that the loss of life, injuries, and damages arising from decades of unsafe conditions of Kamehameha Highway within the study area are detrimental to the community and Hawaiian culture as a whole.

The extant bridge and highway are unsafe as is and it is sensible to realign the highway and promote the business activities that help the whole valley. He suggested that the planning for the bridge replacement lacked imagination and creativity, especially considering that the bridge and the surrounding lands are government owned. He (and others) propose that HDOT construct a permanent bridge *makai* of the extant bridge and realign the highway in such a way that it is widened in front of the poi factory for parking and secure access, which will provide a safer environment for the business, which in the long run will save money and save lives.

CHARLIE REPPUN

On January 3, 2018 Charlie spoke over the telephone and mostly echoed his brother Paul's statements above. When asked about his memories of land use in the study area, Charlie said he does not remember ever seeing *lo'i* actively used *makai* of highway. Regarding the presence of traditional cultural properties in the study area, he said that there is an easement for an *'auwai* from the stream to the *makai lo'i* on the Kāne'ohe side of bridge, although he is not sure where. He clarified that Hui Ulu Mea Ai rebuilt the *poi* factory and made it into a certified kitchen during the 1980s.

Charlie recalled when the water was restored to the stream from the former ditch in 1993 or 1994, and how folks watched as the water levels stayed about the same but the volume of flow/speed increased greatly. He said it had a huge impact on exotics growing in the stream that were unable to handle the flow.

Like Paul, Charlie also lived behind the *poi* factory building and expressed disappointment in the proposed project. He stated that "we" think their idea is mistaken; "why not make the temporary bridge permanent and realign/widen the road to make it safer in front of *poi* factory?"

When asked about potential impact to cultural properties, practices, or beliefs Charlie responded by saying he did not know of any such things and suggested that his brother John might.

JOHN REPPUN

On January 8, 2018 John was interviewed in person at KEY Project community center, where he is the Community Resource Development and Executive Director Emeritus. Mr. Reppun was interviewed as part of the consultation process for the CIA prepared for the earlier iteration of the current project; thus, he reiterated some of his prior contributions. John has been with KEY Project for thirty years, since the early days of Hui Ulu Mea Ai, whose locus was the *poi* factory. Raised in Kahulu, he learned community involvement from his parents. His father was a physician and often invited into people's homes; John sometimes went along and saw firsthand that "our community was under

cultural/environmental duress." He became involved in community activism as a teenager, when development pressure threatened to displace local cultures. He recalls that agriculture was going on back then but his parents were not engaged in farming. When he and his brothers were boys, John's father made arrangements with a local taro farmer for him, Charlie, and Paul to work in restoring a *lo'i*, to keep them occupied and out of trouble. It was this experience that paved the way for Charlie and Paul to become key figures in the ongoing resurgence of taro cultivation in Waiāhole.

When asked about his memories of land use in the study area vicinity, John recalled an *'auwai* that extended alongside Waiāhole Valley Road and crossed from one side to the other in places. He also remembered active *lo'i* on the *makai* side of Kamehameha Highway to the north of the bridge with a few shacks nearby.

When asked about potential impact to cultural properties, practices, or beliefs John responded by saying that Waiāhole Valley is home to a multicultural community that includes Okinawan, Hawaiian, Chinese, and Filipino farmers united in the cultivation of wetland taro, which was already familiar to the farmers from Okinawa. He referred to the culture of growing wetland taro and spoke of immense growth in expertise of a "next generation of farm managers and cultural practitioners" with a command of the Hawaiian language who have been engaged in *lo'i* restoration since about 1995, which coincides with the fight for stream restoration.

John also stated that Waiāhole is seeing a renaissance for *poi* and taro growing and that he is hopeful about the community becoming more self-sufficient. He spoke of how there used to be a lot of small *poi* factories prior to World War II and that during the war they were broken down and used for parts and/or combined into a larger factory. These small factories are starting to come back. He stated that the Waiāhole Poi Factory is a cultural center and that the project needs to be developed in this context not just to move people further down the highway, for the *poi* factory is a destination in and of itself and should be treated as such. He suggested that the bridge project should include realignment of the highway (further *makai*), which would widen the parking area for the *poi* factory, in addition to improved safe access to the *poi* factory and the intersection of Waiāhole Valley Road and Kamehameha Highway.

Regarding the bridge replacement project itself, John admitted that "we want to share the road" with cyclists and pedestrians and that the extant bridge is inadequate. He also mentioned that Kualoa Ranch is considering expanding their hours of operation, which will likely result in increased traffic over the bridge. John stated that the bridge is the heart of a community, not just a piece of concrete or infrastructure used to get people up and down the coast. Thus, it is the project planners' responsibility to find a place for this project within the agricultural and cultural context of Waiāhole Valley. In his opinion, the bridge needs to be engineered to function *mauka-makai* not just north-south within the highway corridor.

John mentioned the strategic plan for Waiāhole being prepared by SMS, and proposed that the bridge project needs to concur with the strategic plan and that all the agencies (State, DOT, City and County, DLNR) and entities (HHFDC, OHA, HACBED and neighborhood board) involved should come together. He also suggested that HDOT needs to consider the mom and pop stores with frontage on the highway that are promoting locally grown and sourced Hawaiian products. If the project is done right, it can enhance local economy, if done wrong it will simply bypass that. He recommended that HDOT replace Waikāne and Waiāhole bridges under the same contract to streamline the process and minimize time and cost—share a single setup and breakdown, equipment, resources, traffic control, etc.

He continued by saying that if done correctly, the bridge replacement project could present the opportunity to help preserve and enhance small farm agriculture in Waiāhole; and that it could have a positive impact on the community—it could improve what Reppun calls the economic zone, which is critical to the future of Waiāhole; as well as create a better trajectory for the health and human services of the community. He opined that the current state of the bridge replacement project is too limited in its scope, but it could be successful if it takes advantage of the following opportunities:

- Provide a safer intersection, and parking and access to the Waiāhole Poi Factory.
- Help reconnect the *mauka-makai 'auwai* currently interrupted by the highway, which would in turn enhance the wetland.
- Anticipate ingress/egress for the planned *lo'i* restoration area on the *makai* side of Kamehameha Highway.
- Enhance wetland/riparian zone to help move the needle towards *lo'i* restoration with the eventual goal of a healthier more wholesome community.

The *lo'i* restoration on the *makai* side of the highway, for which a plan already exists, would provide a tremendous educational opportunity in which participants would learn traditional wetland agricultural techniques, as well as the importance of fresh water meeting salt water in the bay; while rekindling the cultural connection to the land and fostering stewardship of the land. The resultant educational benefits would accompany food production, which would

help the local economy. He suggested that DLNR or OHA take over ownership of the *makai* park lands to facilitate *loʻi* restoration, with the goal of getting kids back in touch with the cultural resources of their area whilst reconnecting the various constituent cultures of the Waiāhole Valley community— "*loʻi* is the common ground."

ANONYMOUS

On January 8, 2018, while visiting the study area, an individual who has resided near the bridge for over twenty years wanted to voice his concerns regarding flooding at the extant Waiāhole Bridge. He suggested that the stream channel needs to be deeper to reduce the blockage caused by debris that gets stuck underneath the bridge. When asked about the presence of traditional Hawaiian sites along the stream, they said they had not observed sites *mauka* of the highway; but there might be walls in the currently overgrown area *makai* of Waiāhole Bridge and south of the stream. The resident also emphasized how five years ago he could still walk to the bay, but now that everything is overgrown they do not go there; furthermore, the dense vegetation at the mouth of the stream is blocking the fish from coming upstream. Having recalled seeing *āholehole* and mullet in the water near the bridge in the past, the resident explained that today there are "none at all/no more not even one."

When asked about the project's potential impacts to cultural practices or properties, the anonymous interviewee responded that they were unaware of any such practices or properties and thus saw no negative impact to traditional practices or properties.

GWEN KIM

On January 9, 2018, Gwen was interviewed over the telephone. She is 75 years old and resides in Kaʻaʻawa; her mother and aunty taught at Waiāhole School, where she attended kindergarten and 1st grade before her family relocated to Kāneʻohe, but she was brought up close to the land "the *kuaʻāina* [rural/rustic/country] way." She became part of the sixties movement and recalled that the forced evictions in Kalama Valley triggered the Hawaiian Renaissance when people started questioning long-standing land use practices. Gwen got involved in the Waiāhole-Waikāne struggle and remembers the demonstration ca. 1974 (see Figure 29), her deceased husband Soli Niheu appears in the image (front row white t-shirt with fist raised). Of her husband, Gwen stated "He was key organizer in Kalama Valley eviction struggle 1971." Of the image, she stated "This is front line of Waiāhole-Waikāne Eviction struggle."

When asked about traditional cultural practices in the bridge vicinity, she admitted that she was unaware of the existence of a bridge by the *poi* factory and was not familiar with any cultural practices or properties along the highway or Waiāhole Valley Road, which she travels often. She did want to go on record regarding the following: the area is known for people getting into accidents and dying; she has frequent memories of loss of life and that should be taken into consideration in the design of the bridge project.

ROBERT "BOBBY" FERNANDEZ, BETTY FERNANDEZ, AND YVETTE FERNANDEZ LIKE

On January 10, 2018 an in-person talk story interview was conducted at KEY Project community center with Waiāhole Valley native Bobby Fernandez and his wife Betty Fernandez and their daughter Yvette Fernandez Like (b. 1967). Bobby stressed with pride that he was born and raised in Waiāhole and still resides there with Betty "six houses up from the *poi* factory" on Waiāhole Valley Road. A portion of Waiāhole Stream runs through their backyard. He is of Portuguese, Irish and Hawaiian descent, and his property was passed to him by his great grandmother (she was Irish, English, and Hawaiian). His ancestors were ranchers who had land in Waiāhole.

When asked about their memories of the study area, all three of them recalled that folks would swim and jump from Waiāhole Bridge into deeper and wider and cleaner water of Waiāhole Stream. They said that floods clean it out and leave deeper spots in some areas. Bobby said that about sixty years ago the area by the bridge was one of the good swimming spots but the river has changed a lot over the passing decades. They went on to say that Waiāhole Stream is not the same as it used to be for there are no *ʻōpae* anymore because of accumulations of silt eroded from up *mauka* combined with the introduction of prawns into the stream in the late 1990s. In contrast to the anonymous individual's observations near Waiāhole Bridge, Bobby, Betty, and Yvette related that *āholehole* still come up the river based on their have observations of them in the stream in their backyard. Bobby said the *ʻōpae* were good as bait for *ʻoʻopu* and *āholehol*e fish, and Yvette and Betty added that they were good to eat as well.

Also, in relation to Waiāhole Stream, they said that people planted *hau* bush as a kind of flood barrier along the banks of the stream. Bobby recalled how debris would get caught in the *hau* bush, which acted like a filter, and when he went out to gather *pepe au* mushrooms they would observe all sorts of things along the streambanks.

When asked about land use in the study area vicinity, they recalled pasture and farming land on the *makai* side of the highway to the south of the stream. Betty and Bobby recalled they still had water buffalo and used them to plow taro patches. When shown Miyagi's 1961 land use map, they were able to corroborate that there was "banana everywhere" filling up "the whole hillside." They also recalled *ʻauwai* located *mauka* and *makai* of the highway, and that one crossed beneath the highway on the north side of Waiāhole Stream. Additionally, Bobby recalled an *ʻauwai* that ran through the Waiāhole school grounds but he remembered it was only "a trickle."

Regarding the Waiāhole-Waikāne community association demonstrations, Bobby stated that he was a former president of the association and that when the government served the eviction notices, "we were so organized that we invited then to the poi factory" where they burned their eviction notices in the road. The demonstration was planned and peaceful even though the photo looks like a riot. Bobby said he was off camera with the other leaders speaking to sheriffs and other officials when the photo was taken.

When asked about the project's potential impacts to cultural practices or properties, all three of them responded that they were unaware of any such practices or properties and thus saw no negative impact to traditional practices or properties. They did opine that the *poi* factory business would be impacted. Otherwise, Bobby stated that the replacement was long overdue and that a new bridge would benefit the community. He and Betty said that it would be better because the project addresses safety concerns at least for the short-term in their inclusion of wider lanes and space for pedestrians and cyclists; although the future/long-range effects are unknown. They spoke of how people get distracted and suggested that a realignment of the road for better visibility would be a good improvement.

EMIL WOLFGRAMM

On January 11, 2018, Emil Wolfgramm was interviewed at Waiāhole Poi Factory. He was born in 1941, in Tonga, and during the 1980s he resided in Waiāhole Valley and raised his children there; his wife's family still has land on the Kāneʻohe side of the Homestead Road. He currently resides in Kāneʻohe and was consulted for this study based on the recommendation from other interviewees, who mentioned him as a resource thanks to his wide breadth of knowledge of Hawaiian legends. Regarding the study area specifically, Emil did not know of any legends that specifically refer to the immediate Waiāhole Bridge area. He did say that the trails attributed to Māui connect the east side of Oʻahu to Lualualei in the west; and that the Kualoa peaks and those of the Koʻolaus can be pointed out from the sea. When told about the Kaopulupulu *kuleana* claim that mentioned Kaahumanu stayed there when she visited the area, he stated that Kaopulupulu is not just a common name but also a traditional name with a mythic attachment, the name of a hero figure.

He did not communicate any knowledge of traditional cultural practices or properties within the study area. When asked about the replacement project's potential cultural impacts, he emphasized the importance of perpetuating the knowledge of traditional Hawaiian stories and suggested that monthly on-site story-telling focused on the *wahi pana* of Waiāhole-Waikāne and their connection to the other islands of Hawaiʻi should be incorporated into the *loʻi* restoration project as a means of tying people to the land. He also suggested that the new bridge be named after a hero or god of the native culture.

CALVIN HOE AND LIKO HOE

(Interview pending.)

4. DISCUSSION AND RECOMMENDATIONS

The OEQC guidelines identify several possible types of cultural practices and beliefs that are subject to assessment, including subsistence, commercial, residential, agricultural, access-related, recreational, religious, and spiritual; in addition to the types of potential cultural resources associated with cultural practices and beliefs that are subject to assessment. Essentially, these are natural features of the landscape and historic sites, including traditional cultural properties. In the Hawai‘i Revised Statutes–Chapter 6E the following definition is provided.

> "Traditional cultural property" means any historic property associated with the traditional practices and beliefs of an ethnic community or members of that community for more than fifty years. These traditions shall be founded in an ethnic community's history and contribute to maintaining the ethnic community's cultural identity. Traditional associations are those demonstrating a continuity of practice or belief until present or those documented in historical source materials, or both.

The origin of the concept of traditional cultural property is found in National Register Bulletin 38 published by the U.S. Department of Interior-National Park Service. "Traditional" as it is used, implies a time depth of at least 50 years, and a generalized mode of transmission of information from one generation to the next, either orally or by act. "Cultural" refers to the beliefs, practices, lifeways, and social institutions of a given community. The use of the term "Property" defines this category of resource as an identifiable place. Traditional cultural properties are not intangible, they must have some kind of boundary; and are subject to the same kind of evaluation as any other historic resource, with one very important exception. By definition, the significance of traditional cultural properties should be determined by the community that values them.

It is however with the definition of "Property" wherein there lies an inherent contradiction, and corresponding difficulty in the process of identification and evaluation of potential Hawaiian traditional cultural properties, because it is precisely the concept of boundaries that runs counter to the traditional Hawaiian belief system. The sacredness of a particular landscape feature is often cosmologically tied to the rest of the landscape as well as to other features on it. To limit a property to a specifically defined area may actually isolate it from what makes it significant in the first place. However offensive the concept of boundaries may be, it is nonetheless the regulatory benchmark for defining and assessing traditional cultural properties.

As the OEQC guidelines do not contain criteria for assessing the significance for traditional cultural properties, this study will adopt the state criteria (HAR §13-275-6) for evaluating the significance of historic properties, of which traditional cultural properties are a subset. To be significant the potential historic property or traditional cultural property must possess integrity of location, design, setting, materials, workmanship, feeling, and association and meet one or more of the following criteria:

a Be associated with events that have made an important contribution to the broad patterns of our history;

b Be associated with the lives of persons important in our past;

c Embody the distinctive characteristics of a type, period, or method of construction; represent the work of a master; or possess high artistic value;

d Have yielded, or is likely to yield, information important for research on prehistory or history;

e Have an important value to the native Hawaiian people or to another ethnic group of the state due to associations with cultural practices once carried out, or still carried out, at the property or due to associations with traditional beliefs, events or oral accounts—these associations being important to the group's history and cultural identity.

While it is the practice of the DLNR-SHPD to consider most historic properties significant under Criterion d at a minimum, traditional cultural properties would also be significant under Criterion e. A further analytical framework for addressing the preservation and protection of customary and traditional practices specific to Hawaiian communities resulted from the *Ka Pa‘akai O Ka‘āina* v. Land Use Commission court case. The court decision established a three-part process for the evaluation of potential impacts: first, to identify whether any valued cultural, historical, or natural resources are present and identify the extent to which any traditional and customary native Hawaiian rights are exercised; second, to identify the extent to which those resources and rights will be affected or impaired; and third, to specify any mitigation actions to be taken to reasonably protect native Hawaiian rights if they are found to exist.

The following discussion is based on the background research and consultation presented above and the findings of prior archaeological (Walsh et al. 1995; Perzinski et al. 2002; O'Leary et al. 2005) and cultural studies (Bushnell et al. 2002), which included portions of the current study area; as well as the findings of the Final Environmental Assessment (HDOT 2004) prepared for an earlier iteration of the current project and the Cultural Impact Assessment contained therein (Chiogioji et al. 2003).

As a result of the first archaeological study (Walsh et al. 1995) to include the southernmost portion of the current study area, *makai* of the highway, no cultural resources were identified. Additionally, no intact cultural resources or traditional cultural properties were discovered on the surface or during subsurface testing as a result of a prior AIS (Perzinski et al. 2002) conducted within the northern/*makai* portion of the study area. However, the most recent archaeological study to include portions of the current study area (O'Leary et al 2005) did identify scant traces of a former *lo'i* system (SIHP Site 50-80-10-6758) that comprise an agricultural soil surface (Feature A) and an earthen berm (Feature B),both outside of the current study area, and an *'auwai* (Feature C). A short section of the *'auwai* (Feature C) appears to cross into a portion of the study area near Kamehameha Highway, to the south of Waiāhole Stream, traveling through an extant culvert. In addition, while it is possible that the agricultural layer (Feature A) may extend into the portion of the current study area along the *makai* side of Kamehameha Highway and the south bank of Waiāhole Stream, substantial fluvial action and modern land disturbance diminishes the potential for intact subsurface deposits in that area. The portion of the *'auwai* (Site 6758 Feature C) within the current study area is evaluated as significant under Criterion e as it is associated with traditional agricultural practices.

Concern for the preservation of *'auwai* and *lo'i* formerly located *makai* of the current study area also emerged from consultations conducted as part of two prior cultural impact studies (Bushnell et al. 2002, Chiogioji et al. 2003; the latter study was prepared for the earlier iteration of the current project). In 2004, HDOT addressed these concerns in the "Cultural Resources" subsection of the "Social and Community Impacts" section of the Final Environmental Assessment as follows:

> The adjacent loi area and auwai will not be affected by the proposed project. The adjacent auwai [Feature C of SIHP Site 50-1080-6758] located mauka of Kamehameha Highway flows through a pipe culvert, beneath Kamehameha Highway, to makai loi area. This pipe culvert will be extended to ensure that any roadway work will not affect stream flow. (HDOT 2004:31)

In response to a request for comments on environmental documentation in support of two earlier iterations of the current project, DLNR-SHPD responded with a no effect determination each time. In an August 14, 1998 letter DLNR stated concurrence that "the replacement project should have 'no effect' on any known historic resources" (LOG NO:22063 DOC NO:9808co09.). And in a May 18, 2001 letter (LOG NO:27494 DOC NO:0105EJ14) from SHPD to HDOT, the State Historic Preservation Officer stated:

> Although there were extensive wet land agriculture and Land Commission Awards (LCA) in close proximity to the bridge location, we concur that the impact of land alteration associated with road and bridge construction and with historic rice cultivation in this area suggest that intact cultural deposits are unlikely to remain. Therefore, we believe that the Waiahole Bridge replacement will have "no effect" on significant historic sites. (ibid.)

The results of the consultation process performed for the current study echoed those of the interviewees from the Chiogioji et al. (2003) study. In particular, the need for improvements to the extant bridge and highway corridor due to flooding and safety issues; the preservation of the integrity of Waiāhole Stream and the wetlands; and the preservation of traditional Hawaiian agricultural practices to include avoidance/preservation of any extant *'auwai* and *lo'i*, as well as to facilitate future *lo'i* restoration projects.

When asked about potential cultural impacts, six of the nine interviewees responded in the negative; i.e. they communicated no knowledge of former or ongoing traditional cultural practices or the existence of historic properties within the study area (Gwen Kim; Anonymous; Bobby and Betty Fernandez; Yvette Fernandez Like; and Emil Wolfgramm). Thus, the majority of those who contributed to the current consultation did not identify any potential cultural impacts associated with the proposed bridge replacement project.

The remaining three interviewees (Charlie, Paul, and John Reppun) responded that Waiāhole Poi Factory would sustain the greatest cultural impact. They defined Waiāhole Poi Factory as a cultural center actively engaged in perpetuating traditional Hawaiian agriculture and a vital element of the Waiāhole Valley community and economy for over a century. Waiāhole Poi Factory can be defined as a traditional cultural property valued by the community and significant under Criterion e. While the Waiāhole Poi Factory falls outside of the current project limits and will not be directly impacted by the proposed bridge replacement project, there is an opportunity for the replacement project to impart a positive cultural impact on this traditional property. The community members who contributed to the current

study voiced their concerns regarding the dangerous conditions in front of the *poi* factory and the intersection of Waiāhole Valley Road and Kamehameha Highway. According to the results of the current consultation, many incidents have occurred in which vehicles collided with parked cars, the planters in front of the *poi* factory building, or the building itself; these incidents have not only resulted in property damage, but in some cases injury and loss of life.

A condition of the proposed project is that travel along both lanes of Kamehameha Highway will remain open at all times, which necessitates the construction of the temporary bypass road. Thus, business at Waiāhole Poi Factory should not be interrupted as a result of the proposed bridge replacement. It is our recommendation that rather than simply not interrupt the *poi* factory's business, the proposed project endeavor to enhance access to this cultural landmark, by providing safety enhancements such as space for parking and pedestrian access that do not encroach on the highway ROW and keep people out of harm's way. The long-range effects of such efforts would be a vital contribution to the survival/longevity of the *poi* factory and the preservation of traditional Hawaiian cultural practices as well as beneficial to the community's economy.

In sum, the background research conducted for the current study in concert with the consultation process produced no evidence of specific traditional cultural properties or practices within the current study area. As a result of prior archaeological and cultural studies a portion of an *'auwai* (Feature C of SIHP Site 50-80-10-5768) currently contained within a pipe culvert (Figure 33) was identified within the current study area. This pipe culvert passes beneath Kamehameha Highway near the southern extreme of the study area located beyond the footprint for the proposed bypass road and outside of the area slated for ground disturbance, thus will not be impacted by the proposed road construction. In the event that road construction extends into the area occupied by the pipe culvert, it "will be extended to ensure that any roadway work will not affect stream flow" (HDOT 2004:31).

Figure 33. Recent photograph of Feature C of SIHP Site 50-80-10-5768 where it crosses beneath Kamehameha Highway.

Given the negative findings of the current study with respect to the identification of any traditional cultural practices and properties within the current study area; beyond the *'auwai* that will be avoided, it is concluded that the proposed Waiāhole Bridge replacement project will not have a significant cultural impact on any specific valued cultural, historical, or natural resources. Due to the proximity to the traditional cultural property known as Waiāhole Poi Factory, it is our recommendation that enhancements to parking and access to the *poi* factory be included in the planning and development of the project to ensure the safety of visitors and employees and the preservation of this vital cultural landmark.

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APPENDIX A

INTERVIEW CONSENT FORMS

ASM affiliates
Hilo Office: (808) 969-6066 Fax: (808) 443-0065
507-A E. Lanikaula Street, Hilo, HI 96720

Honolulu Office: (808) 439-8089 Fax: (808) 439-8087
820 Mililani Street, Suite 700, Honolulu, HI 96813

On behalf of ASM Affiliates, we thank you for your time and contribution to improving our understanding of culturally significant practices and places. Your participation in this study is entirely voluntary and if you wish to change your responses, you may do so at any time by contacting the interviewer or a staff member at our office at the phone numbers listed above.

Informal "Talk Story" Interview Consent Form

I agree to take part in this interview for the purposes of the historical/anthropological study of ASM Affiliates. The purpose and nature of the interview has been explained to me. I consent to the use of the information gathered in this interview by ASM Affiliates for the purposes explained to me.

☒ I agree that my name may be used for the purposes of this investigation and cited in subsequent professional reports.

☐ I do not wish that my name may be used or cited, and prefer to remain anonymous in this investigation and in subsequent professional reports.

Print name of Interviewee: John L Reppun

Signature of interviewee: John L Reppun

Date: 1/8/18

I have explained the purpose of the current investigation and the implications of being interviewed to the interviewee and I believe that the consent is informed and that he/she understands the implications of participating in this study.

Print name of interviewer: TERESA GOTAY

Signature of interviewer:

Date: 1/8/2018

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Hilo Office: (808) 969-6066 Fax: (808) 443-0065
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☐ I do not wish that my name may be used or cited, and prefer to remain anonymous in this investigation and in subsequent professional reports.

Print name of Interviewee: ROBERT J. FERNANDEZ

Signature of interviewee: R. J. Fernandez

Date: 1-10-18

I have explained the purpose of the current investigation and the implications of being interviewed to the interviewee and I believe that the consent is informed and that he/she understands the implications of participating in this study.

Print name of interviewer: TERESA GOTAY

Signature of interviewer: TG

Date: 1/10/2018

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Hilo Office: (808) 969-6066 Fax: (808) 443-0065
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☐ I do not wish that my name may be used or cited, and prefer to remain anonymous in this investigation and in subsequent professional reports.

Print name of Interviewee: BETTY FERNANDEZ

Signature of interviewee: Betty Fernandez

Date: 1-10-18

I have explained the purpose of the current investigation and the implications of being interviewed to the interviewee and I believe that the consent is informed and that he/she understands the implications of participating in this study.

Print name of interviewer: TERESA GOTAY

Signature of interviewer: T

Date: 1/10/2018

ASM affiliates
Hilo Office: (808) 969-6066 Fax: (808) 443-0065
507-A E. Lanikaula Street, Hilo, HI 96720

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☑ I agree that my name may be used for the purposes of this investigation and cited in subsequent professional reports.

☐ I do not wish that my name may be used or cited, and prefer to remain anonymous in this investigation and in subsequent professional reports.

Print name of Interviewee: Yvette Fernandez Like

Signature of interviewee: Yvette Like

Date: 1-10-18

I have explained the purpose of the current investigation and the implications of being interviewed to the interviewee and I believe that the consent is informed and that he/she understands the implications of participating in this study.

Print name of interviewer: TERESA GOTAY

Signature of interviewer:

Date: 1/10/2018

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Hilo Office: (808) 969-6066 Fax: (808) 443-0065
507-A E. Lanikaula Street, Hilo, HI 96720

Honolulu Office: (808) 439-8089 Fax: (808) 439-8087
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On behalf of ASM Affiliates, we thank you for your time and contribution to improving our understanding of culturally significant practices and places. Your participation in this study is entirely voluntary and if you wish to change your responses, you may do so at any time by contacting the interviewer or a staff member at our office at the phone numbers listed above.

Informal "Talk Story" Interview Consent Form

I agree to take part in this interview for the purposes of the historical/anthropological study of ASM Affiliates. The purpose and nature of the interview has been explained to me. I consent to the use of the information gathered in this interview by ASM Affiliates for the purposes explained to me.

☒ I agree that my name may be used for the purposes of this investigation and cited in subsequent professional reports.

☐ I do not wish that my name may be used or cited, and prefer to remain anonymous in this investigation and in subsequent professional reports.

Print name of Interviewee: Emil Wolfgramm MSNS

Signature of interviewee: Emil Wolfgramm

Date: 1/11/2018

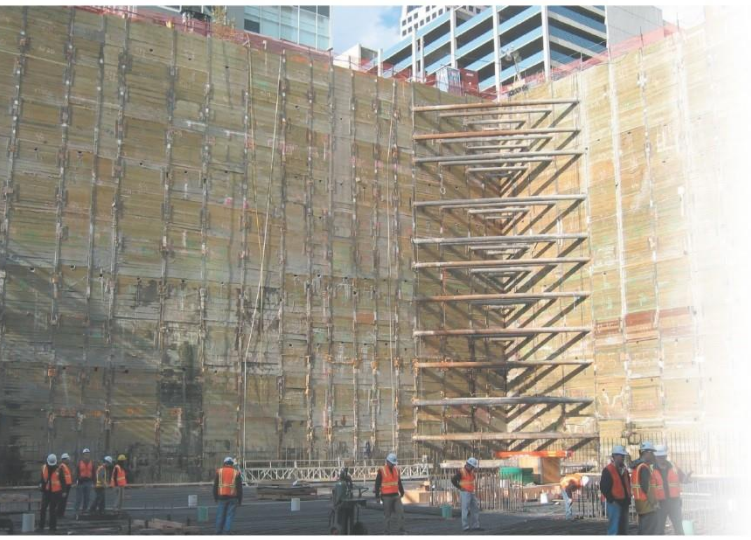
I have explained the purpose of the current investigation and the implications of being interviewed to the interviewee and I believe that the consent is informed and that he/she understands the implications of participating in this study.

Print name of interviewer: TERESA GOTAY

Signature of interviewer:

Date: 1/11/2018

APPENDIX G



DRAFT

Endangered Species Act Biological Evaluation

Waiāhole Bridge Replacement Project

Kāneʻohe, Hawaiʻi

HDOT Project No. BR-083-1(37)

March 2018

3100005001

HARTCROWSER

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March 2018

Prepared by

Hart Crowser, Inc.

3100005001

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Best Management Practices

Waiāhole Bridge Replacement Project

Kāneʻohe, Hawaiʻi

1.0 INTRODUCTION

The State of Hawaiʻi Department of Transportation (HDOT) Highways Division proposes to replace the existing Waiāhole Bridge, No. 003000830303459, with a new bridge that will meet current design standards. Waiāhole bridge carries Kamehameha Highway over the Waiāhole Stream at Milepost 34.59 on Route 83. The bridge is located 0.04 miles south of Waiāhole Valley Road (Figure 1).

Figure 1 – Site vicinity map

Waiāhole Bridge was built in 1922, measures 65.9 feet long and 26.2 feet wide, and consists of concrete tee beams and is overlaid with asphalt pavement (Appendix A Photographs).

1.1 Project Purpose

The purpose of this project is to replace the existing bridge structure over the Waiāhole Stream. This bridge has been identified as structurally deficient and functionally obsolete based on the HDOT bridge management data. The existing bridge does not meet current standards with regards to roadway width, vehicular load capacity, pedestrian traffic, and bridge railings. In addition, water flow in the stream often overtops the embankments because of the insufficient hydraulic capacity of the bridge.

1.2 Federal Nexus

Hart Crowser prepared this biological evaluation (BE) to help the HODT Highways Division assess the potential effects of the proposed Waiāhole Bridge Replacement project on fish and wildlife species listed as threatened or endangered under the Endangered Species Act (ESA). Section 7 of the ESA requires that any action by a federal agency is "not likely to jeopardize the continued existence of any [listed] species or result in the destruction or adverse modification of habitat of such species…." Funding for the project from the Federal Highway Administration (FHWA) qualifies as such an action. Under ESA Section 7(c), the lead federal agency (in this case, FHWA) must provide a BE or biological evaluation of the action's potential influence on listed species and their critical habitat. Depending on the conclusion, the FHWA may be required to confer formally with US National Oceanic and Atmospheric Administration (NOAA) Fisheries or US Fish and Wildlife (FWS) regarding the project.

The proposed project requires ESA review of listed species that may occur in the project vicinity to determine potential negative construction-related effects. The ESA status of each of these species, as well as the effects determination of this BE, are summarized in Table 1.

Hart Crowser biologists also evaluated the effects of the proposed project on essential fish habitat (EFH), pursuant to the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) as amended by the 1996 Sustainable Fisheries Act (SFA). EFH in the project vicinity and the effects of the proposed project on EFH are addressed in Appendix B.

Table 1 – ESA-Listed Species with the Potential to Occur in the Waiāhole Bridge Project Vicinity

Species	Listing Status	ESA Agency	Effects Determination	Critical Habitat in Action Area*	Critical Habitat Effects Determination
Hawaiian petrel (*Pterodroma sandwichensis*)	Endangered	USFWS	NLTAA	No	--
Newell's Townsend's shearwater (*Puffinus auricularis newelli*)	Threatened	USFWS	NLTAA	No	--
Band-rumped storm-petrel (*Oceanodroma castro*)	Endangered	USFWS	NLTAA	No	--
Hawaiian stilt (*Himantopus mexicanus knudseni*)	Endangered	USFWS	NLTAA	No	--
Hawaiian coot (*Fulica alai*)	Endangered	USFWS	NLTAA	No	--
Hawaiian gallinule (*Gallinula galeata sandvicensis*)	Endangered	USFWS	NLTAA	No	--
Hawaiian duck (*Anas wyvilliana*)	Endangered	USFWS	NLTAA	No	--
Hawaiian hoary bat (*Lasiurus cinereus semotus*)	Endangered	USFWS	NLTAA	No	--
Blackburn's Sphinx Moth** (*Manduca blackburni*)	Endangered	USFWS	No effect	No	
Hawaiian monk seal (*Monachus schauinslandi*)	Endangered	NMFS	NLTAA	Yes	NLTAA
Green sea turtle (*Chelonia mydas*)**	Endangered	NMFS	No effect	No	
Hawksbill sea turtle (*Eretmochelys imbricate*)**	Endangered	NMFS	No effect	No	--
Olive Ridley sea turtle (*Lepidochelys olivacea*)**	Threatened	NMFS	No effect	No	--
Leatherback sea turtle (*Dermochelys coriacea*)**	Endangered	NMFS	No effect	No	--

Notes:
* Action area is the area where direct or indirect effects of the proposed action may occur,
** Species presence unconfirmed and no suitable or critical habitat present. Not discussed further in this document.
NE – No effect
NLTAA – Not likely to adversely affect

Either there are no suitable habitats for, or there are no recent documented occurrences of, the following species in the action area: Blackburn's Sphinx Moth *(Manduca blackburni*), Green sea turtle (*Chelonia mydas*), Hawksbill sea turtle (*Eretmochelys imbricate*), Olive Ridley sea turtle (*Lepidochelys olivacea*), and Leatherback sea turtle (*Dermochelys coriacea*) (USFWS 2017). This project will have **no effect** on these species or their critical habitat and they will not be discussed further in this document. In addition, no work is proposed within the marine environment (i.e., sea turtle habitat). Only staging areas are located near the shoreline and will be setback at least 50 feet from the shoreline as discussed in Section 2.0.

1.3 Consultation History

Hart Crowser staff met informally with USFWS and NMFS staff on June 5, 2017 to discuss the project and what ESA species and EFH might be impacted by the project. At this meeting, we also discussed best management practices and minimization measures appropriate for the project to avoid and minimize impacts to ESA species and EFH. We also received an email from NOAA Fisheries Pacific Island Regional Office on December 4, 2017 after requesting comments on the preparation of an Environmental Assessment for the bridge replacement (Appendix C).

2.0 PROJECT DESCRIPTION

The FHWA is providing funding to HDOT to replace the existing Waiāhole Bridge with a bridge that meets current design standards. The new bridge is designed to carry current AASHTO HL-93 design live loads with precast/pretensioned concrete I-beam girders and a concrete deck. The new bridge will be approximately 85 feet long and will be widened to 43 feet (Appendix D Engineer Drawings). Two 12-foot wide travel lanes will be provided with two 8-foot wide shoulders to accommodate pedestrians and bicyclists.

The new bridge will be designed to accommodate a greater flooding event than the existing bridge. In addition to lengthening the bridge from 65.9 ft. to 85 ft., the upstream channel will be realigned and widened to provide the stream flow a more direct and unobstructed path through the bridge. The abutments will be skewed to match the angle of the stream with respect to the highway. The center pier will be removed and the new bridge will be a one-span structure with no piers. The combination of longer span, wider stream channel, and no pier is designed to allow more water to pass beneath the bridge before it overtops the stream banks.

2.1 Construction Approach

The FHWA assumes that the following will be necessary for the construction of the replacement Waiāhole Stream Bridge. HDOT will construct a temporary bridge just makai of the Waiāhole Stream Bridge to provide vehicular bypass during construction. Portions of the bridge construction area would be dewatered before in-stream work using an instream isolation and confinement structure or other method, as appropriate for the location.

The existing bridge would then be demolished and the new abutments and bridge installed. After completion of the new bridge, HDOT will remove the temporary bridge, and all instream isolation and confinement structures and other temporary structures. All heavy equipment and construction will be done from land. The proposed project would involve typical roadway and bridge construction activities including the following:

- Installing temporary erosion control measures and BMPs;
- Installing temporary roadways and bridge;
- Relocating utilities;
- Demolishing existing bridge structure;
- Erecting structural members such as beams and columns;
- Pouring concrete;

- Excavating, placing fill, grading, and paving;
- Constructing retaining walls;
- Installing permanent erosion control measures;
- Revegetating disturbed areas; and
- Installing highway appurtenances such as signing, roadside barriers, and pavement markings

The proposed project would construct the new bridge and demolish the existing bridge in three stages. The first would involve implementing BMPs, including installing erosion and sedimentation control measures, constructing the temporary bypass road and stream crossing, and routing traffic to that temporary bypass. The second would demolish the existing bridge and construct the new bridge and roadway approaches. The third would involve routing traffic to the new bridge, removing the temporary bypass road and stream crossing, complete permanent erosion control devices, and revegetate disturbed areas.

Staging of construction equipment and materials will occur in the Waiāhole Beach Park area along the east side of the highway, just north of the Waiāhole Stream (Figure 2). Because the proposed stockpile area is a County park, public access to the shoreline will be provided at all times, with a designated thoroughfare along one side of the park boundary. Stockpiling and staging of equipment will occur as far away from the shoreline as possible, but no less than 50 feet, to avoid impacts to the marine environment.

2.2 Project Equipment

Construction equipment anticipated for construction of the bridge foundations, abutments, and superstructure includes the following:

- Bulldozers
- Augers for foundation construction
- Excavators
- Cranes
- Dump trucks
- Hydraulic rams
- Dewatering pumps and hoses

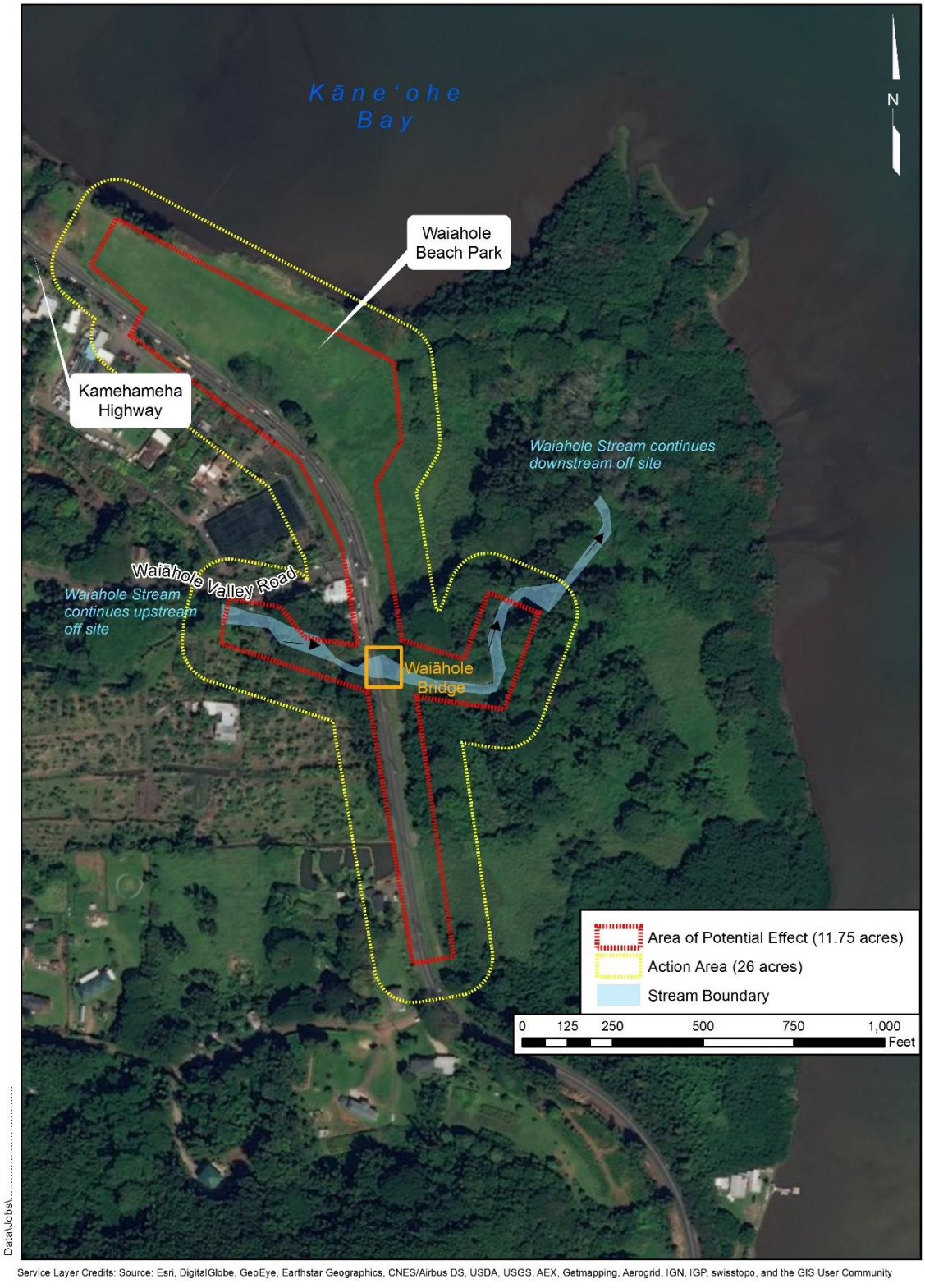

Figure 2 –Action Area

2.3 Project Timing

The Project will occur upon receipt of all required permits. Construction of the new bridge is expected to take approximately one year. Timing restrictions to minimize impacts on ESA listed species are described in Section 2.5.

2.4 Best Management Practices and Conservation Measures

Conservation measures and best management practices (BMPs) will be employed during construction to avoid or minimize potential adverse impacts to ESA listed species and habitat. Overall, implementing BMPs for in-water work will reduce the potential for sediment or pollutants to reach downstream waters. Small plumes of sediment may occur during installation or removal of any dewatering and isolation structures; however, any turbidity released as a result of construction activities would be minimal and expected to dissipate quickly.

The project would involve demolition, excavation, grading, and construction in the stream and on the streambanks. Impacts because of in-water construction would be minimized and mitigated through BMPs,including the use of barriers to isolate and confine in-water work areas to prevent sediment,

> petroleum products, chemicals, and other liquids and solids from entering Waters of the U.S. The contractor will utilize appropriate methods to minimize or reduce sediments and turbidity in the river, to the extent practicable.

Erosion would be reduced by implementing BMPs during construction. An approved Storm Water Pollution Prevention Plan would be developed for the site.

BMPs to protect water quality include the following:

- Minimize sedimentation via onsite drainage through BMPs or erosion control devices.
- Stabilize all disturbed areas with erosion control measures.
- Revegetate disturbed area as soon as practical after construction.
- Stabilize construction entrances to avoid offsite tracking of sediment onto roadways.
- Ensure that all project-related materials and equipment placed in the water are free of pollutants.
- Fuel vehicles and equipment at least 50 feet away from the water, preferably over a bermed impervious surface.

See Appendix E for specific examples of BMPs used on a similar bridge replacement project funded by FHWA (CH2MHill 2017).

Accidental spills or releases of hazardous materials during construction could degrade the quality of stormwater runoff and reach Waiāhole Stream. Temporary stormwater control measures would be implemented to protect water quality in the stream. The potential for accidental spills or releases is low and, if they did occur, they would be cleaned up immediately.

Federal (Section 404/401) permits will be needed for fill or dredging in regulated waters. A State Stream Channel Alteration Permit (SCAP) will be needed for proposed alteration of the stream near the bridge. Dewatering operations would be conducted in accordance with applicable permit requirements.

■

2.5 Action Area

The action area refers to the area directly or indirectly affected by the proposed action. This area is larger than the bridge replacement project footprint. The action area, where direct or indirect effects of the proposed action may occur, encompasses terrestrial and in-water areas to account for general construction noise, project staging, vegetation clearing, and localized turbidity effects from bridge demolition. The action area for the project extends to the distance at which construction noise or turbidity attenuates to background levels. We estimate the action area to extend about 100 feet beyond the project footprint to account for terrestrial noise and possible turbidity effects in Waiāhole Stream from the bridge demolition.

3.0 ENVIRONMENTAL BASELINE CONDITIONS

Environmental baseline conditions were determined from site visits on June 5 through 7, 2017 and August 21, 2017, and a literature review. A habitat survey was conducted in action area (Figure 2). The project footprint is approximately 11.75 acres and includes a portion of Waiāhole Beach Park to be used as a staging area. No lakes or ponds exist in the action area but there are five wetlands in the project area, including one adjacent to Waiāhole Stream. Further detailed information on Wetlands can be found in the Wetland and Stream Report (Hart Crowser 2017).

3.1 Topography

Topography near the Waiāhole Bridge is flat and consists of fallowed agriculturally zoned lands (Figure 3). Elevation around the bridge project site is approximately 10 feet above mean sea level. North of the project the area designated as “Urban” is the TMK for Waiāhole Poi Factory and parking area adjacent of the existing bridge. Mauka of the project site along Waiāhole Valley Road there is also an Urban designated area consisting of residential homes.

Figure 3 – Land use near in the vicinity of the project (Image credit: HoLIS).

Elevations vary from approximately 20 feet above mean sea level (MSL) at the southern extent of the proejct, 10 feet above MSL at the bridge and 3 feet above MSL at the northern extent of the projec t. The maximum elevation on the project's eastern extent is 13 feet above MSL and 5 feet above MSL at the western extent.

3.2 Soils

The near-surface soils at the site are mapped by the U.S. Department of Agriculture (USDA) as found on the US Department of Agriculture Web Soil Survey website. The near-surface soils at the site have been previously mapped as Hanalei silty clay at the northern end of the site, and Pearl Harbor clay encompassing the rest of the site. Hanalei silty clay forms on flood plains on valley floors with a parent material of Alluvium derived from basalt. The typical soil profile for the Hanalei silty clay consists of silty clay over silty clay loam to at least 26 inches. Pearl Harbor clay forms on coastal plains with a parent material containing alluvium. The typical soil profile for the Pearl Harbor clay consists of clay over muck to at least 31 inches.

Substrates in Waiāhole Stream are dominated by cobble and gravel in the vicinity of the bridge with lesser amounts of sand and silt. The bridge has caused aggradation of cobble and gravel upstream and some degradation of substrates downstream.

3.3 Hydrology

The project is in the Waiāhole Stream watershed, Hydrologic Unit Code 20060000. Water in the project footprint flows as overland flow into Waiāhole Stream, is impounded by wetlands that occur within the

project footprint, or is absorbed into the ground and enters the stream via hyporheic exchange. Waiāhole Stream flows into Kaneohe Bay approximately 2,000 feet makai of the bridge.

A USGS stream gage (16294100) is located mauka of the Waiāhole bridge. Mean monthly discharge (cubic feet per second) for Waiāhole Stream for October 2001 to February 2017 is presented in Figure 4.

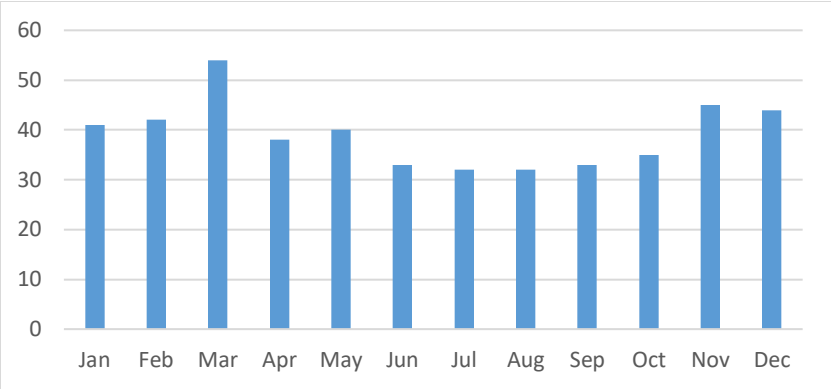

Figure 4. Mean of Monthly Discharge (cubic feet per second) for Waiāhole Stream (USGS gage 16294100) for October 2001 to February 2017.

During our habitat survey in June and August we delineated five wetlands within the project footprint (Figure 5).

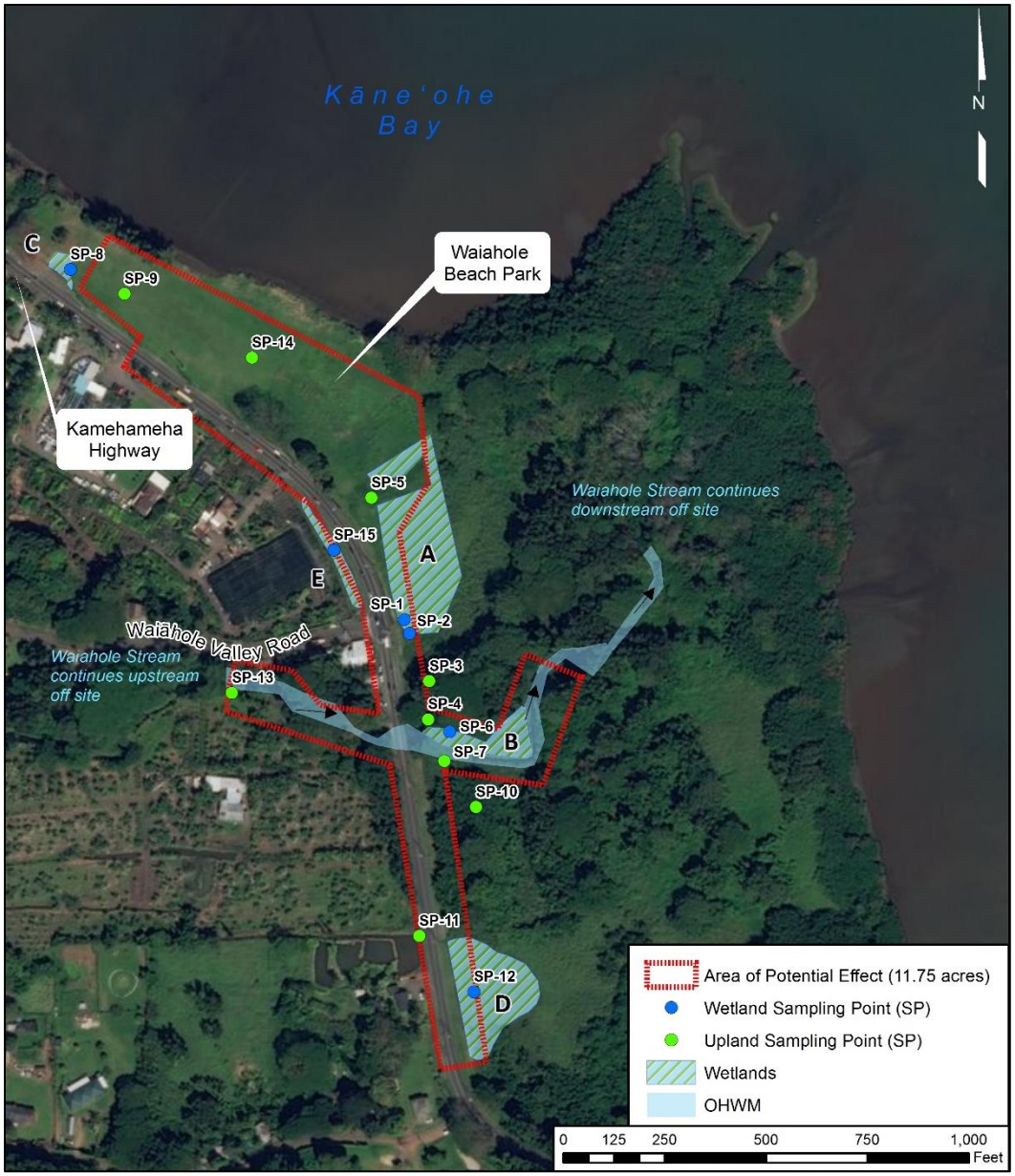

Figure 5 – Wetland delineation results within the action area

No standing or ponded water was observed during our surveys but local residents told us that, during heavy rain events, Wetlands A and E fill partially with stormwater runoff from the highway. During heavy rain events Waiāhole Stream jumps its banks near SP-13 (see Figure 5) and flows down Waiāhole Valley Road into Wetland A and E.

3.4 Flora and Fauna

No threatened or endangered species were observed during our habitat surveys. The vegetation in the survey area is dominated by non-native species including elephant grass (*Cenchrus purpureus*), monkeypod

(*Pithecellobium dulce*), and gunpowder tree (*Trema orientalis*). Terrestrial fauna recorded in the area is predominantly non-native birds. The federally endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*) and state endangered Hawaiian short-eared owl or pueo *(Asio flammeus sandwichensis*) may inhabit or transverse the area. Endangered waterbirds may occur in areas that become ponded during storms and may pass through the area, including Hawaiian duck (*Anas wyvilliana*), Hawaiian stilt (*Himantopus mexicanus knudseni*), Hawaiian coot (*Fulica alai*), and Hawaiian gallinule (*Gallinula chloropus sandvicensis*). Finally, seabirds, particularly the endangered Hawaiian petrel (*Pterodroma sandwichensis*) and threatened Newell's shearwater (*Puffinus auricularis newelli*), may fly over the project area at night.

The State of Hawai'i Office of Planning provides a Threatened and Endangered (T&E) Plants layer that represents digitization of Division of Forestry and Wildlife 1992 T&E plant species maps. The T&E layer was overlaid on the action area and had a value of little or no T&E species. A botanical resources assessment was conducted for the Waiāhole Bridge project by Char & Associates in August 1998 and the report summarized the site as "dominated by introduced plants such as elephant grass California grass (*Brachiaria mutica*), Java Plum (*Syzygium cumini*), Guinea grass (*Megathyrsus maximus*), etc.". During the 2017 wetland field assessments, no T&E species or habitat were found in the action area. A certified arborist with Steve Nimz and Associates, Inc. conducted a site visit and did not observe any native or endangered tree or plant species.

4.0 ENDANGERED SPECIES AND CRITICAL HABITAT IN THE ACTION AREA

The ESA-listed species that may occur in the action area (Table 1) are the

- Hawaiian hoary bat
- Hawaiian seabirds including the Hawaiian petrel, Newell's shearwater, and band-rumped storm petrel
- Hawaiian waterbirds including the Hawaiian stilt, Hawaiian coot, Hawaiian gallinule, and Hawaiian duck
- Hawaiian monk seal and monk seal critical habitat

In the following sections we briefly describe the potential of each of these species to occur in the action area and some measures to avoid and minimize impacts. Table 2 provides a summary of information on species and there timing in the action area.

Table 2. ESA listed species groups and occurrence in the Action Area.

Species	Timing in Action Area	BMPs during timing in action area
Hawaiian Hoary Bat	Birthing and pup rearing season June 1 through September 15	• Woody plants greater than 15 feet tall should not be disturbed, removed, or trimmed. • Barbed wire should not be used for fencing.
Hawaiian Seabirds	May traverse the project area at night during the breeding season March 1 to December 15	• All outdoor lights should be fully shielded. • Automatic motion sensor switches or lights should be turned off. • Nighttime construction should be avoided. • If outdoor lighting is used, use light shields.
Hawaiian Waterbirds	Year around	See Section 4.3
Hawaiian Monk Seal	Year around	See Section 4.4

4.1 Hawaiian Hoary Bat

The Hawaiian hoary bat (*Lasiurus cinereus semotus*) roosts in both exotic and native woody vegetation across all islands and will leave young unattended in trees and shrubs when they forage. Numerous large trees occur in the action area near the bridge and in the riparian zone of Waiāhole Stream. If trees or shrubs 15 feet or taller are cleared during bat pupping season, there is a risk that young bats could inadvertently be harmed or killed. Additionally, Hawaiian hoary bats forage for insects from as low as three feet to higher than 500 feet above the ground and can become entangled in barbed wire used for fencing.

To minimize impacts to the endangered Hawaiian hoary bat:

- Woody plants greater than 15 feet tall should not be disturbed, removed, or trimmed during the bat birthing and pup rearing season (June 1 through September 15).
- Barbed wire should not be used for fencing.

4.2 Hawaiian Seabirds

Hawaiian seabirds, including the Hawaiian petrel (*Pterodroma sandwichensis*), Newell's shearwater (*Puffinus auricularis newelli*), and band-rumped storm petrel (*Oceanodroma castro*), may traverse the project area at night during the breeding season (March 1 to December 15). Breeding habitat is reported

to occur outside of the action area higher in the mountains to the west (Environmental Response Management Application 2017).

Outdoor lighting could result in seabird disorientation, fallout, and injury or mortality. Seabirds are attracted to lights and, after circling the lights, they may become exhausted and collide with nearby wires, buildings, or other structures or they may land on the ground. Downed seabirds are subject to increased mortality due to collision with automobiles, starvation, and predation by dogs, cats, and other predators. Young birds (fledglings) traversing the project area between September 15 and December 15, in their first flights from their mountain nests to the sea, are particularly vulnerable.

To minimize potential project impacts to the Hawaiian seabirds:

- All outdoor lights should be fully shielded so the bulb can only be seen from below bulb height and only used when necessary.
- Automatic motion sensor switches and controls should be installed on all outdoor lights or lights should be turned off when human activity is not occurring in the lighted area.
- Nighttime construction should be avoided during the seabird fledging period, September 15 through December 15.
- If outdoor lighting is used, use light shields that are completely opaque, appropriately sized, and positioned so that the bulb is only visible from below and that light from the shielded source cannot be seen.

4.3 Hawaiian Waterbirds

Listed Hawaiian waterbirds include the Hawaiian stilt (*Himantopus mexicanus knudseni*), Hawaiian coot (*Fulica alai*); Hawaiian gallinule (*Gallinula galeata sandvicensis*), and Hawaiian duck (*Anas wyvilliana*). Listed Hawaiian waterbirds are found in fresh and brackish-water marshes and natural or man-made ponds. Hawaiian stilts may also be found wherever ephemeral or persistent standing water may occur. No ponds or brackish-water marshes are found in the action area. The mouth of Waiāhole stream does contain a small amount of brackish-water marsh habitat. However, impacts to this brackish habitat from the bridge replacement will not occur. Ephemeral standing water does occur in Wetland A in the action area. However, we did not observe any Hawaiian stilt during our site visits nor have they been documented in the action area (Hart Crowser 2017; Pacific Aquatic Environmental, Inc. 1998). Hawaiian waterbird presence in the action area is expected to be rare. Threats to these species include non-native predators, habitat loss, and habitat degradation.

To minimize and avoid potential project impacts to listed Hawaiian waterbirds:

- In areas where waterbirds are known to be present, reduced speed limits should be posted and implemented, and project personnel and contractors informed about the presence of endangered species on-site.
- If water resources are located within or adjacent to the project site, water quality best management practices (see Appendix C and E) regarding sedimentation and erosion in aquatic environments should be incorporated into the project design.

- A biological monitor that is familiar with the species' biology should conduct Hawaiian waterbird nest surveys where appropriate habitat occurs within the vicinity of the proposed project site immediately prior to start of construction. Surveys should be repeated within three days of construction start and after any subsequent delay of work of three or more days (during which the birds may attempt to nest). If a nest or active brood is found:
    - Pacific Islands Fish and Wildlife Office (PIFWO) should be contacted within 48 hours for further guidance.
    - A 100-foot buffer should be established and maintained around all active nests and/or broods until the chicks/ducklings have fledged. No potentially disruptive activities or habitat alteration should occur within this buffer.
    - A biological monitor that is familiar with the species' biology should be present on the project site during all construction or earth moving activities until the chicks/ducklings fledge to ensure that Hawaiian waterbirds and nests are not adversely impacted.

4.4 Hawaiian Monk Seals

Hawaiian monk seals are wide-ranging, air-breathing aquatic carnivores that spend a majority of their time in the ocean, but continue to rely on terrestrial (land) habitat throughout all life stages. Marine habitat use includes foraging, socializing, mating, resting, thermo-regulating and traveling. Terrestrial habitat use includes resting, avoiding predators, molting (shedding), pupping (give birth), and nursing. Hawaiian monk seals could forage within the action area just off Waiāhole Beach Park. However, Hawaiian monk seal presence in the action area is expected to be rare because the nearest terrestrial critical habitat, where resting, avoiding predators, molting (shedding), pupping (give birth), and nursing occurs, is over 12 miles away.

During construction of the bridge human interactions could occur from noise created in the staging area of Waiāhole Beach Park. Suitable habitat for Hawaiian monk seal foraging occurs near the staging area in Waiāhole Beach Park. To minimize and avoid potential project impacts to listed Hawaiian monk seal:

- Setting the staging area 50 feet back from the edge of the shoreline.

4.4.1 Critical Habitat

Critical habitat is based on the habitat features that are essential for the survival and recovery of a species. The essential features for the Hawaiian monk seal include:

- Significant coastal areas where seals haul out for resting, molting, socializing and avoiding predators;
- Preferred coastal and marine nursery grounds where seals haul out for pupping and nursing; and
- Marine areas where seals hunt and feed.

Critical habitat in the action area includes marine habitat that extends from the shoreline out to the 200-meter depth contour, but only includes the seafloor and marine habitat 10 meters in height. Terrestrial

habitat for monk seals, which extends five meters inland from the shoreline, is not considered as critical habitat in the action area.

5.0 EFFECTS ANALYSIS

The effects of the proposed project on listed species and their critical habitat are described in this section. As stated earlier, Blackburn's Sphinx Moth, Green sea turtle, Hawksbill sea turtle, Olive Ridley sea turtle, and Leatherback sea turtle are not expected to be present in the action area. No direct, indirect, or cumulative impacts of the project are expected to affect these species. Therefore, the effects analysis below discussing direct and indirect effects of project activities in the action areas does not address these species further.

In the following sections, potential effects are described as discountable or insignificant. *Discountable* effects are those that are extremely unlikely to occur. *Insignificant* effects relate to the size or magnitude of the impact and should never reach the scale where they could be meaningfully measured.

5.1 Direct Effects

Potential direct, short-term, adverse effects of the project include exposure of listed species to disturbance, noise and suspended sediment. Direct, long-term, adverse effects are not expected to ESA listed species or their habitat. Construction activities have the potential to effect listed species through noise, outdoor lighting, and vegetation clearing.

5.1.1 Noise

Construction noise has the potential to affect Hawaiian monk seal and Hawaiian waterbird foraging. This noise disturbance could come from the staging area in Waiāhole Beach Park due to the proximity to the shoreline and Wetland A which has ephemeral ponding. The bridge bypass road will also temporarily impact Wetland A and bring vehicle traffic closer to Wetland A. However, even though suitable habitat for these species exists in the action area, their occurrence is expected to be rare because ponding in Wetland A is temporary and the nearest terrestrial critical habitat for Hawaiian monk seals, where resting, avoiding predators, molting (shedding), pupping (give birth), and nursing occurs, is over 12 miles away. In addition, the BMPs discussed in Section 4.3 and 4.4 will be in place to minimize noise effects. For these reasons, the noise effects to Hawaiian monk seal and Hawaiian waterbirds are discountable.

5.1.2 Outdoor Lighting

Outdoor lighting from construction could result in Hawaiian seabird (Hawaiian petrel, Newell's shearwater and band-rumped storm petrel) disorientation, fallout, and injury or mortality as discussed in Section 4.2. However, despite the unlikely but possible occurrence of Hawaiian seabirds in the action area outdoor lighting effects will be discountable after implementing BMP discussed in Section 4.2.

5.1.3 Vegetation Clearing

Vegetation clearing for the temporary bypass bridge could affect the Hawaiian hoary bat by harassing roosting bats and their young. However, only a few trees over 15 feet will be removed as a result of vegetation clearing for the bypass bridge. In addition, the BMP listed in Section 4.1 will be implemented to

minimize potential effects. For these reasons vegetation clearing effects will be discountable after implementing BMP.

5.1 Indirect Effects

Potential indirect effects of the project include changes in traffic, impacts on prey, and changes to habitat. The project will not result in net change for traffic in the area, as no new facilities are being built. Proposed construction will be on a small scale and temporary. The project is not likely to adversely affect prey of any listed species and is not anticipated to have a measurable effect on prey quality. The project will provide long-term beneficial effects, through the realignment and widening of the new bridge to allow more natural hydrologic and sediment transport processes, as well as addressing the safety concerns of the existing bridge.

6.0 CRITICAL HABITAT EVALUATION

Critical habitat in the action area includes marine habitat where Hawaiian monk seals hunt and feed. This critical habitat will only be temporarily impacted by noise from construction staging areas. No long-term impacts to critical habitat are anticipated. For these reasons noise effects to critical habitat are discountable.

7.0 EFFECTS DETERMINATIONS

The effects determination is the conclusion of the analysis of potential direct or indirect effects of the proposed activity on listed species and critical habitat. Hart Crowser used regulatory guidance from the document "Final Section 7 Consultation Handbook" (USFWS and NMFS 1998) to make the effects determination for the proposed activity, as described below.

The conclusions that could result from the effects analysis for the effects determination include:

- **No Effect**. The appropriate conclusion when the action agency determines its proposed action will not affect listed species or critical habitat.
- **May Affect, is Not Likely to Adversely Affect**. The appropriate conclusion when effects on listed species are expected to be discountable, insignificant, or completely beneficial. Beneficial effects are contemporaneous positive effects without any adverse effects on the species. Insignificant effects relate to the size of the impact and should never reach the scale at which take occurs. Discountable effects are those extremely unlikely to occur. Using best judgment, a person would not (1) be able to meaningfully measure, detect, or evaluate insignificant effects or (2) expect discountable effects to occur.
- **May Affect, is Likely to Adversely Affect**. The appropriate conclusion if any adverse effect to listed species may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effect is not discountable, insignificant, or beneficial (see definition of "may affect, is not likely to adversely affect").

A key factor in making an effect determination and distinguishing between a significant and insignificant effect is determining whether the effect would be significant enough to cause a take. "Take," as defined by the ESA, includes activities that harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct (ESA §3(19)). "Harm" is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. "Harass" is further defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns that include, but are not limited to, breeding, feeding, or sheltering (50 Code of Federal Regulations [CFR] §17.3).

7.1 Hawaiian Hoary Bat

Based on the guidance and definitions provided above and the previously discussed project effects, the effect determination for the Hawaiian hoary bat is **may affect, not likely to adversely affect**. The project **may affect** Hawaiian hoary bat because:

- Suitable habitat occurs in the action area; and
- Vegetation clearing of a few trees over 15 feet for the temporary bypass bridge.

The project **is not likely to adversely affect the** Hawaiian hoary bat because:

- Only a few trees over 15 feet will be cleared;
- Woody plants greater than 15 feet tall will not be disturbed, removed, or trimmed during the bat birthing and pup rearing season (June 1 through September 15); and
- Barbed wire will not be used for fencing.

7.2 Hawaiian Seabirds

Based on the guidance and definitions provided above and the previously discussed project effects, the effect determination for Hawaiian seabirds (Hawaiian petrel, Newell's shearwater, and band-rumped storm petrel) is **may affect, not likely to adversely affect**. The project **may affect** Hawaiian seabirds because:

- Hawaiian seabirds may traverse high over the action area; and
- Lighting from construction may disorient Hawaiian seabirds.

The project **is not likely to adversely affect the** Hawaiian seabirds because:

- All outdoor lights will be fully shielded so the bulb can only be seen from below bulb height and only used when necessary;
- Automatic motion sensor switches and controls will be installed on all outdoor lights or lights should be turned off when human activity is not occurring in the lighted area;

- Nighttime construction will be avoided during the seabird fledging period, September 15 through December 15; and
- If outdoor lighting is used, light shields will be used that are completely opaque, appropriately sized, and positioned so that the bulb is only visible from below and that light from the shielded source cannot be seen.

7.3 Hawaiian Waterbirds

Based on the guidance and definitions provided above and the previously discussed project effects, the effect determination for the Hawaiian waterbirds is **may affect, not likely to adversely affect**. The project **may affect** Hawaiian waterbirds because:

- Suitable habitat occurs in the action area (i.e., ephemeral ponding in Wetland A); and
- Noise impacts to Wetland A from temporary bypass road.

The project **is not likely to adversely affect the** Hawaiian water birds because:

- Reduced speed limits will be posted and implemented for the temporary bypass road, and project personnel and contractors will be informed about the possible presence of endangered species on-site.
- Water quality best management practices (see Appendix C and E) regarding sedimentation and erosion in aquatic environments will be incorporated into the project design.
- A biological monitor that is familiar with the species' biology will conduct Hawaiian waterbird nest surveys where appropriate habitat occurs within the vicinity of the proposed project site prior to project initiation. Surveys will be repeated within three days of project initiation and after any subsequent delay of work of three or more days (during which the birds may attempt to nest). If a nest or active brood is found within the action area:
    - Pacific Islands Fish and Wildlife Office (PIFWO) will be contacted within 48 hours for further guidance.
    - A 100-foot buffer will be established and maintained around all active nests and/or broods until the chicks/ducklings have fledged. No potentially disruptive activities or habitat alteration will occur within this buffer.
    - A biological monitor that is familiar with the species' biology will be present on the project site during all construction or earth moving activities until the chicks/ducklings fledge to ensure that Hawaiian waterbirds and nests are not adversely impacted.

7.4 Hawaiian Monk Seal

Based on the guidance and definitions provided above and the previously discussed project effects, the effect determination for the Hawaiian monk seal is **may affect, not likely to adversely affect**. The project **may affect** Hawaiian monk seal because:

- Suitable foraging habitat occurs in the action area; and
- Noise impacts from the construction staging area extend into the suitable habitat.

The project **is not likely to adversely affect the** Hawaiian monk seal because:

- Hawaiian monk seal presence in the action area is expected to be rare because the nearest terrestrial critical habitat, where resting, avoiding predators, molting (shedding), pupping (give birth), and nursing occurs, is over 12 miles away; and
- The construction staging area will be set back 50 feet from the edge of the shoreline.

7.4.1 Hawaiian Monk Seal Critical Habitat

Critical habitat for Hawaiian monk seal occurs in the action area. Based on the guidance and definitions provided above and the previously discussed project effects, the effect determination is that this project **may affect, but is not likely to adversely affect**, designated critical habitat Hawaiian monk seals. These determinations and conclusions are justified below.

The project **may affect** Hawaiian monk seal critical habitat because:

- Critical habitat, Marine areas where seals hunt and feed, occurs in the action area
- Noise impacts from the construction staging area extend into the critical habitat

The project **is not likely to adversely affect the** Hawaiian monk seal because:

- Noise impacts from construction are temporary; and
- The construction staging area will be set back 50 feet from the edge of the shoreline to minimize noise impacts.

8.0 REFERENCES

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APPENDIX A

Photographs

Photograph 1. Waiāhole Stream from mauka side of bridge.

Photograph 2. Bridge and pedestrian deck (mauka).

Photograph 3. Waiāhole Stream under the bridge. Note cobble and gravel substrates.

Photograph 4. Waiāhole Stream from makai side of bridge. Wetland B on the right.

Photograph 5. Mouth of Waiāhole Stream 2,000 feet downstream of the bridge.

Photograph 6. Shoreline and Kaneohe Bay facing north from mouth of Waiāhole Stream.

APPENDIX B

Essential Fish Habitat

ESSENTIAL FISH HABITAT IN THE ACTION AREA

EFH is defined as those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity. "Waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish, and may include aquatic areas historically used by fish where appropriate. "Substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities (NMFS 1999).

The water column and bottom of Kaneohe Bay adjacent to Waiāhole Stream are defined as EFH and support various life stages for the management unit species (MUS) identified in the Western Pacific Regional Fishery Management Council's Pelagic and Hawai'i Archipelago Fishery Ecosystem Plans (Appendix C). Additionally, Kaneohe Bay is identified as a Habitat Area of Particular Concern (HAPC). HAPCs are subsets of EFH that merit special considerations to conserve the habitat. Essential fish habitat occurs in Kaneohe Bay and includes:

- Bottom fish and seamount groundfish
- Pelagic fishery
- Crustaceans
- Coral reef systems

The presence of these EFH groups in the project vicinity was determined by the following:

- Pre-consultation discussions with NMFS
- Use of the EFH mapping tool provided on the NOAA website (NMFS 2017)
- A site visit and Waiāhole Stream survey on June 5-7, 2017

POTENTIAL EFFECTS TO EFH

The primary construction activities of concern include habitat degradation and pollution and contamination of EFH, which are related to impacts associated with turbidity plumes or chemical spills from bridge demolition and construction. Some staging areas within the Waiāhole Beach park will be close to the marine environment but no in-water work or resulting impacts to EFH will occur from these staging areas. The only in-water work for the project will occur in the immediate vicinity of the Waiāhole bridge over 1,000 feet upstream of EFH where the stream is tidally influenced (i.e., estuary).

A temporary increase in turbidity or sediment can often have adverse effects on fish (Israel and Klimley 2008), corals, and their habitat. Turbidity may increase physiological stress of fish and coral polyps, result in physical injury, limit the ability of fish to forage, and potentially displace rearing juvenile fish (Bisson and Bilby 1982; Israel and Klimley 2008). For coral reef ecosystems, high levels of sediment or turbidity in the water column can both limit the potential for zooxanthellae to photosynthesize and reduce the extent to which coral polyps can filter feed. Elevated levels of total nitrogen and phosphorous in the water can lead to eutrophication and plankton blooms, which may deleteriously affect corals. Environmental stress caused by poor water quality can lower reproductive success and may account for low productivity rates of both fish and corals.

The project incorporates BMPs for erosion and sediment control that would reduce the potential for turbidity to enter the stream or be transferred downstream (See Section 2.3 and Appendix E for project BMPs). Within the wetted channel, all work conducted to remove the existing mid-channel pier and regrade the streambanks would be isolated by a dewatering structure. All work conducted below the ordinary high water line would be temporary and occur in the dry, further reducing the potential for sediment as a result of project construction to enter flowing water. Cofferdams would be removed following in-water or in-channel work, at which time the period for increased sedimentation would likely be at its highest; however, the potential for this to result in substantial harm to the habitat is considered discountable, as the area would be re-watered slowly in a manner designed to minimize the mobility of disturbed substrates. Furthermore, EFH is located over 1,000 feet downstream of project activities and turbidity plumes will likely dissipate before reaching this far downstream. Also, staging areas in the Waiāhole Beach Park near the marine environment would be set back at least 50 feet from the water's edge.

EFH EFFECT DETERMINATION

Bridge removal and replacement may cause minor, temporary increases in turbidity in Waiāhole Stream that could reach EFH downstream. However, with BMPs in place, the possibility of turbidity reaching EFH is unlikely. No long-term loss of shallow littoral or intertidal habitats will occur from the project. Thus, this project will have **no adverse effect** to EFH.

APPENDIX C

Preliminary NMFS and USFWS Technical Assistance Correspondence

APPENDIX D

Preliminary Engineer Drawings

APPENDIX E

Best Management Practices for Waiāhole Stream Bridge Replacement Project

GENERAL GUIDELINES

As part of the Best Management Practices (BMPs) and Stormwater Pollution Prevention Plan (SWPPP), the contractor and designer, respectively, will prepare an erosion control and restoration plan to control short- and long-term erosion and sedimentation effects, and to restore vegetation and stabilize soils in areas affected by construction activities. The plan will include necessary requirements regarding erosion control, and will implement BMPs for erosion and sediment control as required. Following construction, restoration would occur to temporary work areas disturbed during construction. Only appropriate native plant material will be used for erosion control and restoration. BMPs will be placed on all disturbed slopes and material storage sites, as indicated by the FHWA Erosion Control Plan.

The project would involve demolition, excavation, grading, and construction in the stream and on the streambanks. Maintain and require all contractor(s) and subcontractor(s) performing work covered under the applicable permits to maintain at the construction site or in the nearby field office, a copy of all permits, all Notification and Compliance Reporting Requirements, and all records demonstrating that every requirement of the permits have been complied with. The contractor will be required to follow the project specifications, which are consistent with the following:

- Section 404 Permit and Section 401 Water Quality Certification~~, and a stream channel alteration permit,~~ from the U.S. Army Corps of Engineers (USACE).
- NPDES General Permit for Storm Water Associated with Construction Activity as administered by the HDOH-CWB.
- Hawai'i Commission on Water Resources Management (Stream Channel Alteration Permit?).
- Additionally, State and County water quality regulations governing grading, excavation, and stockpiling.
- Water Pollution and Erosion Controls Specifications in Section 209 of the "Hawai'i Standard Specification for Road, Bridge and Public Works Construction."
- Water quality monitoring shall be performed in accordance with the 401 Water Quality Certification issued for the project by the HDOH.

CONSTRUCTION BEST MANAGEMENT PRACTICES

The contractor shall inspect the BMPs at the start of the day's construction to assess their condition and shall monitor the effectiveness of the BMPs throughout the construction period and immediately cease the portion of the construction work if water quality monitoring or daily inspection or observation result(s) indicates that noncompliance to HAR, §11-54-4(a) or §11-54-4(b), will occur or is occurring. The construction activity shall not resume until adequate measures are implemented and appropriate corrective actions are taken and water quality monitoring demonstrates that the non-compliance has ceased.

The contractor shall modify environmental protection measures, including BMPs and monitoring requirements, when instructed by the HDOH-CWB for corrective action/remedial actions. Allow the USACE, HDOH-CWB, or other regulatory agencies to conduct routine inspections of the construction site in accordance with applicable permits and HRS, §342D-8. Ensure that discharge activity shall not interfere with or become injurious to any designated uses (HAR, §11-54-1 and HAR, §11-54-3), or existing uses (HAR, § 11-54-1 and HAR, § 11-54-1 .1).

- Dust generation shall be minimized by using water to dampen the surfaces to be demolished when feasible. Requirements of Hawai'i Administrative Rules, Title 11, Chapter 60.1 (HAR 11-60.1) for Air Pollution Control shall be followed for preventing the release of dust during construction activities. Measures shall be taken to reduce and eliminate sediment from leaving the jobsite whether it is airborne or in the form of silty water.

- No concrete truck wash water may be disposed by percolation into the ground. A temporary concrete washout facility shall be used to contain concrete washout or waste, and shall be constructed with sufficient size / volume to contain all liquid and concrete waste generated by concrete washout operations. The facility shall be lined with plastic lining material that shall be free of holes, tears, or other defects that may compromise the impermeability of the material.

- Hauling trucks exiting the site shall be inspected to ensure they are clean and do not track materials when entering or exiting the project site. Trucks shall be cleaned to prevent the tracking of mud or debris over roads or parking lot.

- The Contractor will be responsible for proper handling and disposal of construction waste, including hazardous waste, and for preparing a waste disposal plan that specifies proper removal and disposal of all debris from the project area. For all project-generated waste, the Contractor will decide whether the waste is classified as hazardous waste, universal waste, excluded waste, wastewater, or solid waste. Dispose of construction debris, waste products, vegetation and/or dredged material removed from the construction site at upland state and county approved sites. Prior to construction, the Contractor will complete and submit a Solid Waste Disclosure Form for Construction Sites to the HDOH, Solid Waste Section.

- Construction, building and waste materials and containers shall be stored in designated areas indoors or in covered areas, where practical, that are protected from rainfall and contact with storm water runoff. When it is necessary to store materials and containers outdoors, the containers and materials shall be covered with a tarp, plastic, or other suitable covering, wherever practical.

- All containers shall be closed, securely fastened, stored neatly, and properly labeled or retained in their original containers. Very large items may be stored in the open in the materials storage area; however, such materials shall be elevated on wood blocks or placed on higher ground to minimize contact with stormwater.

- Ensure that all construction debris is contained and prevented from entering or re-entering state waters. During bridge removal, construct structurally adequate debris shields to contain debris. Do not

permit debris to enter waterways, travel lanes open to public traffic, or areas designated not to be disturbed. If portions of the existing bridge do fall into a stream during demolition, they will be removed from the stream without dragging the material along the streambed.

- Structures designed to minimize sediment and pollutant runoff from sensitive areas such as settling ponds, vehicle and fuel storage areas, hazardous materials storage sites, erosion control structures, and cofferdams, shall be visually monitored daily, especially following precipitation events, to ensure these structures are functioning property.

- Drainage inlets for the site civil works shall be covered with a non-woven geotextile to prevent the migration of fines into the drain lines as appropriate. Gravel, debris, fines, etc. shall be removed from geotextile filters regularly.

- Appropriate measures shall be taken to ensure that incompatible chemicals are not stored next to each other. Safety Data Sheets, an inventory of the material, and emergency numbers shall also be kept near the storage area. All products shall be used in accordance with the manufacturer's specifications and directions for handling, storage, and disposal.

- Precautions shall be taken to prevent spills of oil and other hazardous substances from entering the water. All waste and hazardous materials shall be properly managed, stored and handled, and secondary containment shall be provided as applicable. Fueling, lubricating, and maintenance of equipment, motor vehicles, and vessels shall be conducted in such a manner to prevent spills, and these shall not be conducted over water unless secondary containment is provided. Bulk fuel storage containers shall be provided with a secondary containment system. Appropriate materials to contain and clean potential oil/fuel spills shall be stored at the work site and be readily available.

- Contractor must submit a Spill Prevention, Control, and Countermeasure (SPCC) Plan at least 2 days before beginning work.

- All waste fuels, lubricating fluids, and other chemicals will be collected and disposed of in a manner that ensures that no adverse environmental impact will occur. Construction equipment will be inspected daily to ensure hydraulic, fuel and lubrication systems are in good condition and free of leaks to prevent these materials from entering any stream. Vehicle servicing and refueling areas, fuel storage areas, and construction staging and materials storage areas will be sited a minimum of (50 feet) 15 meters from the HTL, and wetlands, and contained properly to ensure that spilled fluids or stored materials do not enter any stream or wetland.

- Fueling of land-based vehicles and equipment shall take place at least 50 feet away from surface waters over an impervious surface with drip pans.

- Turbidity and siltation from project-related work shall be minimized and contained through the appropriate use of erosion control practices and the curtailment of work during adverse weather and tidal/flow conditions. Erosion control practices shall include a silt fence around all disturbed areas landward of the existing shoreline. A double layer of sediment control BMPs (for example, two rows of

sediment control such as silt fence) shall be maintained adjacent to surface waters where suitable vegetative buffers are not obtainable.

- Discontinue work during storm events or during flood condition.
- Existing vegetation shall be preserved to the extent possible to avoid any unnecessary disturbance to native resources.
- At the completion of work, hydraulic mulch or hydroseed shall be applied to unpaved areas to encourage re-establishment of vegetation. Turf establishment will be applied to finished slopes and ditches within 14 days after completion.
- Clearing and grubbing will be held to the minimum necessary to complete the work.
- Temporary soil stabilization shall be applied on areas that will remain unfinished for more than 14 calendar days. Vegetated areas temporarily impacted will be revegetated by planting and seeding with native trees, shrubs and/or herbaceous perennials and annuals. Permanent soil stabilization shall be applied as soon as practicable after final grading.
- Ensure that all temporarily constructed structures, such as the silt containment device(s), floating oil and grease as well as construction debris containment device(s), berm, cofferdam, sheet pile, stream flow diversion structure(s), and/or sediment and soil erosion control structure(s), etc., are properly removed immediately after the completion of the construction work and when the affected water body has returned to its pre-construction condition or better, as demonstrated by the monitoring results, including color photographs.
- ~~A Rain Event Action Plan (REAP) will be developed prior to Notice to Proceed. The REAP will be reviewed and structured to address project-specific actions that are needed to prevent pollutants from reaching surface waters during the rain event. The REAP will be executed within 48 hours prior to a forecast rain event of 50% chance of precipitation one half (0.5) inches or more. BMPs in the REAP include:~~
  - ~~Place temporary stabilization BMPs (such as mulch) on the area that has been cleared to prevent raindrop erosion.~~
  - ~~Any area that has soil disturbances will be stabilized prior to rain events with mulch, wood chips, or other protective covers.~~
  - ~~Sediment traps will be placed to collect the water and allow sediment to settle out. If sediment traps are not possible, other settling and filtering devices will be used to slow water down and remove sediments~~

IN-WATER AND ABOVE-WATER WORK BEST MANAGEMENT PRACTICES

Isolate and confine all upland activity to contain/retain water pollutants in the upland and not allow it to enter state waters, including the designated in-water work area. When it is necessary to conduct in-water work, the workspace shall be isolated to avoid construction activities in flowing water in compliance with the following manual: *An Integrated Storm Water Management Approach and a Summary of Clear Water Diversion and Isolation Best Management Practices for Use in the State of Hawai'i*, by the FHWA-CFLHD and HDOT, Practitioners Guide. Prior to construction activities, the workspace would be isolated from flowing water to prevent sedimentation and turbidity and avoid impacts to aquatic organisms and water quality. The diversion or isolation BMPs shall remain in place throughout the entire period of in-water work; and not be removed until the water quality in the in-water work area has returned to its pre-construction condition. In-water BMPs shall be removed immediately after work is completed in a manner that would allow flow to resume with the least disturbance to the substrate.

Ensure contractor and subcontractor compliance with all requirements of the Section 401 Water Quality Criteria (WQC); Water Quality Standards (WQS) in Hawai'i Administrative Rules (HAR), Chapter 11-54; and all information submitted to the HDOH-CWB for compliance with the Notification and Reporting Requirements. Ensure that the activity will not result in non-compliance or violations to the applicable state WQS. Ensure that all discharges associated with the proposed construction activities are conducted in a manner that will comply with "Basic Water Quality Criteria Applicable to All Waters," as specified in HAR, §11-54-4.

- Only use BMPs that are inert and not sources of pollution itself. (Examples of inappropriate in-water BMPs include, but are not limited to: compost biosocks since it is a source of nutrients; silt fence since the material is porous; and a soil berm since the soil particles will erode away). Ensure that all material(s) placed or to be placed in state waters are free of waste material, heavy metals, organic materials, debris and any water pollutants at toxic or potentially hazardous concentrations to aquatic life as specified in HAR, §11-54-4(b).

- Construct and maintain barriers to isolate and confine in-water work areas to prevent sediment, petroleum products, chemicals, and other liquids and solids from entering Waters of the U.S.

- Allow unimpeded flow around the isolated and confined in-water work area to allow for aquatic animal migration and/or to prevent downstream flooding situations. The unimpeded flow shall be equivalent to a 2-year, 24-hour duration storm event and/or the existing flow capacity of the river, stream, ditch, or gulch, whichever is smaller.

- Collect water pollutants (including, but not be limited to, airborne particulate; dust, concrete slurry, concrete chips, concrete surface preparation washing effluent, construction debris, etc.) from localized work areas and not allow these water pollutants to enter or re-enter state waters, including the in-water work area.

ESA LISTED SPECIES AND PROTECTED SPECIES BEST MANAGEMENT PRACTICES (NMFS & USFWS)

The National Marine Fisheries Service, Pacific Islands Regional Office recommends that the following measures, as appropriate and germane to specific projects, be incorporated into projects to minimize impacts on protected resources. These supplement, but do not supersede the BMPs above.

- Turbidity and siltation from project-related work should be minimized and contained to within the vicinity of the site through the appropriate use of effective silt containment devices and curtailment of work during adverse tidal and weather conditions.
- Any construction-related debris that may pose an entanglement hazard to marine protected species must be removed from the project site if not actively being used and / or at the conclusion of the construction work.
- All project-related materials and equipment placed in the water should be free of pollutants.
- No project-related materials (fill, revetment rock, pipe, etc.) should be stockpiled in the water (stream channels, etc.).
- No contamination (trash or debris disposal, alien species introductions, etc.) of aquatic environments (reef flats, lagoons, open ocean, etc.) adjacent to the project site should result from project-related activities.
- Fueling of project-related vehicles and equipment should take place away from the water. A contingency plan to control the accidental spills of petroleum products at the construction site should be developed. Absorbent pads, containment booms, and skimmers will be stored onsite to facilitate the cleanup of petroleum spills.
- Return flow or run-off from material stored at inland dewatering or storage sites must be prevented.
- Floating booms shall be installed around barges, if applicable, to contain floating debris from construction.

The U.S. Fish and Wildlife Service recommends that the measures below be incorporated into projects to minimize the degradation of water quality and minimize the impacts to fish and wildlife resources.

- Turbidity and siltation from project-related work shall be minimized and contained within the vicinity of the site through the appropriate use of effective silt containment devices and the curtailment of work during adverse tidal and weather conditions.
- Dredging/filling in the marine environment shall be scheduled to avoid coral spawning and recruitment periods and sea turtle nesting and hatching periods.

- Dredging and filling in the marine/aquatic environment shall be designed to avoid or minimize the loss special aquatic site habitat (beaches, coral reefs, wetlands, etc.) and the function of such habitat shall be replaced.

- All project-related materials and equipment (dredges, barges, backhoes, etc.) to be placed in the water shall be cleaned of pollutants prior to use.

- No project-related materials (fill, revetment rock, pipe, etc.) should be stockpiled in the water (intertidal zones, reef flats, stream channels, wetlands, etc.) or on beach habitats.

- All debris removed from the marine/aquatic environment shall be disposed of at an approved upland or ocean dumping site.

- No contamination (trash or debris disposal, non-native species introductions, attraction of non-native pests, etc.) of adjacent habitats (reef flats, channels, open ocean, stream channels, wetlands, beaches, forests, etc.) shall result from project-related activities. This shall be accomplished by implementing a litter-control plan and developing a Hazard Analysis and Critical Control Point Plan (HACCP – see http://www.haccpnrm.org/Wizard/default.asp) to prevent attraction and introduction of non-native species.

- Fueling of project-related vehicles and equipment should take place away from the water and a contingency plan to control petroleum products accidentally spilled during the project shall be developed. Absorbent pads and containment booms shall be stored onsite, if appropriate, to facilitate the clean-up of accidental petroleum releases.

- Any under-layer fills used in the project shall be protected from erosion with stones (or core-loc units) as soon after placement as practicable.

- Any soil exposed near water as part of the project shall be protected from erosion (with plastic sheeting, filter fabric etc.) after exposure and stabilized as soon as practicable (with native or non-invasive vegetation matting, hydroseeding, etc.).

APPENDIX H

JOSH GREEN, M.D.
GOVERNOR

DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
ENVIRONMENTAL DESIGN SECTION, ROOM 688A
HIGHWAY DESIGN SECTION, ROOM 609
HYDRAULIC DESIGN SECTION, ROOM 636
TECHNICAL DESIGN SECTION, ROOM 688

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IN REPLY REFER TO:

HWY-DS 2.2177

October 12, 2023

TO: DAWN N. S. CHANG, CHAIRPERSON
DEPARTMENT OF LAND AND NATURAL RESOURCES

ATTENTION: ALAN S. DOWNER, Ph.D.
ADMINISTRATOR AND DEPUTY STATE HISTORIC PRESERVATION OFFICER
STATE HISTORIC PRESERVATION DIVISION

FROM: HENRY KENNEDY *Henry Kennedy*
ENGINEERING PROGRAM MANAGER
DESIGN BRANCH

SUBJECT: HAWAII REVISED STATUES (HRS) § 6E-8 AND
HAWAII ADMINISTRATIVE RULES (HAR) CHAPTER 13-275-5(b)(2)
NO HISTORIC PROPERTIES AFFECTED DETERMINATION,
KAMEHAMEHA HIGHWAY, WAIAHOLE BRIDGE REPLACEMENT
WAIAHOLE AHUPUAA, DISTRICT OF KOOLAUPOKO,
ISLAND OF OAHU, FEDERAL-AID PROJECT NO. BR-083-1(088)
TAX MAP KEYS: (1) 4-8-001:010, AND (1) 4-8-002:001, (1) 4-8-008:022, (1) 4-8-008:023

In accordance with HRS § 6E-8 and HAR Chapter 13-275-5(b)(2), the Hawaii Department of Transportation (HDOT) requests the State Historic Preservation Division's (SHPD) (re)concurrence with its previous 'not significant' evaluation for the Waiahaole Bridge.

Waiahole Bridge Description (Bridge No. 003000830303459)

The existing Waiahole Stream Bridge is located on Kamehameha Highway (Route 83) at milepost 34.59, south of Waiahole Valley Road and adjacent to the Waiahole Poi Factory. It is a 2-span bridge constructed in 1922 and measures 65.9 feet long by 26.2 feet wide. The superstructure consists of concrete tee beams and is overlaid with asphalt pavement. The abutments are constructed of concrete as well as the multi-column pier. The bridge railing is a concrete solid panel with a cap. A timber pedestrian bridge with timber railings was added to 1 side of the bridge in 1968. The pedestrian bridge is connected to the upstream bridge railing with metal brackets.

There have been no improvements or upgrades to the bridge since its construction in 1922.

SHPD's Historical Ineligibility Status of Waiahole Bridge

In 1997, HDOT proposed the Waihaole Bridge Replacement project. The project included the replacement of the Waiahole Bridge with a longer and wider bridge to accommodate windward population growth. The construction of a temporary bypass road/culvert to be used during the installation of the new replacement bridge.

In a letter dated August 14, 1998 (Log No. 22063, Doc No. 9808co09), SHPD's Administrator, Deputy Historic Preservation Officer, and Secretary of Interior's Professional Qualified Architectural Historian, Don Hibbard, concurred that the replacement project should have no effect on any known historic resources as the bridge was not cited as being historically significant per the State of Hawaii Historic Bridge Inventory and Evaluation (1996).

In early 2001, a draft environmental assessment was submitted to the Department of Land and Natural Resources's Chairperson, Gilbert Coloma-Aragan. It was received by SHPD on April 2, 2001. In response to the proposed bridge removal and bypass road, SHPD in a letter dated May 18, 2001 (Log No. 27494, Doc No. 0105EJ14), indicated again that the Waiahole Bridge was "not significant." SHPD also stated that the impacts from historical agricultural activities, and activities associated with the construction of Kamehameha Highway and Waiahole Bridge suggests that intact cultural deposits are unlikely to remain.

Waiahole Bridge Structural Status

Waiahole Bridge has a sufficiency rating of 38.3 percent and is deemed structurally deficient as well as functionally obsolete requiring replacement. There is considerable settlement of the south abutment, resulting in obvious sloping of the bridge parapet. The settlement area has been filled with asphalt pavement over the years to make the roadway level.

There is also insufficient hydraulic capacity of the stream at the bridge location caused by the increased volume of downstream flow. In addition, the center pier "catches" and pins debris up against the column causing a dam effect. Waterflow in the stream often overtops the embankments as a result, flooding the highway and nearby properties.

For these reasons, HDOT is anticipating replacing the Waiahole Bridge initiated in 1998.

Supporting Evidence

The Waiahole Bridge constructed in 1922 was previously evaluated by SHPD in 1998 and again in 2001 and was determined to be 'not significant'. There have been no rehabilitation, restoration, or reconstruction efforts on the bridge to reverse SHPD's 'not significant' ruling.

Pursuant to HAR §13-13-275-6(d), SHPD shall agree or disagree with the above significance evaluation within 45 days of receipt timestamped on the Hawaii Cultural Resource Information System confirmation transmittal. If SHPD disagrees with its 1998 and 2001 assessment of significance, a letter shall be sent to HDOT justifying a new significance evaluation with supporting evidence to the contrary. In the absence of SHPD's response within 45 days, pursuant to HAR §13-13-275-6(e), the HDOT will presume SHPD's concurrence and will proceed with project planning with a 'not significant' ruling for Waiahole Bridge.

Should you have any questions, please contact our Project Manager, Evan Kimoto, at (808) 692-7551, of our Design Branch, Technical Design Services Section, or by email at evan.kimoto@hawaii.gov and reference letter number HWY-DS 2.2177 as noted above.

Enclosure