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AUG 8 2017

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July 12, 2017

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235 South Beretania Street, Suite 702
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SUBJECT: Final Environmental Assessment
Ali'i Drive Culvert Replacement
Federal Aid Project No. STP-0186(1)
Kailua-Kona, North Kona District, Island of Hawai'i, Kahului 1st and 2nd
Ahupua'a, Tax Map Key (TMK): (3) 7-5-019: 007, 008, 009, 016, 024 & 025

With this letter, the Hawai'i County, Department of Public Works (DPW) hereby transmits the final environmental assessment and finding of no significant impact (FEA-FONSI) for the subject project, for publication in the next available edition of the Environmental Notice.

Enclosed is a completed OEQC Publication Form, one hardcopy of the FEA-FONSI, a CD with an Adobe Acrobat PDF file of the same and an electronic copy of the publication form in MS Word. Please contact Casey Yanagihara of DPW at 961-8004 if you have any questions.

Frank DeMarco

Frank J. De Marco, P.E.
Director of Public Works

enclosures: (as noted above)

cc: Casey Yanagihara (COH-DPW)
Ron Terry, Ph.D., Project Environmental Consultant

AGENCY PUBLICATION FORM

Project Name:	Ali'i Drive Culvert Replacement at Kahului Bay
Project Short Name:	Ali'i Drive Culvert Replacement
HRS §343-5 Trigger(s):	Use of County Land and Funds, Use of State Land and Funds
Island(s):	Hawai'i
Judicial District(s):	North Kona
TMK(s):	(3 rd) 7-5-019:007, 008, 009, 016, 024 & 025 (& ROW of Ali'i Drive)
Permit(s)/Approval(s):	Compliance with NEPA (National Environmental Policy Act) and associated approvals related to Endangered Species Act, Fish and Wildlife Coordination Act, Magnuson-Stevens Fishery Conservation and Management Act, Coastal Zone Management Consistency Determination Historic Sites Review (Section 106 of NHPA and Chapter 6e, HRS) Clean Water Act Section 404, Section 401 Stream Channel Alteration Permit (potential) Special Management Area Permit and Shoreline Setback Variance (potential) Conservation District Use Permit (potential) National Pollutant Discharge Elimination System (NPDES) Permit Community Noise Control Permit Work in County Right-of-Way Subdivision Approval Grading, Grubbing, Excavating and Stockpiling Permits
Proposing/Determining Agency:	County of Hawai'i Department of Public Works
Contact Name, Email, Telephone, Address	Casey Yanagihara, Casey.Yanagihara@hawaiicounty.gov (808) 961-8004 101 Pauahi St #7 Hilo HI 96720
Accepting Authority:	(for EIS submittals only)
Contact Name, Email, Telephone, Address	
Consultant:	Geometrician Associates
Contact Name, Email, Telephone, Address	Ron Terry, rterry@hawaii.rr.com (808) 969-7090 PO Box 396 Hilo HI 96721

Status (select one)☐ DEA-AFNSI**Submittal Requirements**

Submit 1) the proposing agency notice of determination/transmittal letter on agency letterhead, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the DEA, and 4) a searchable PDF of the DEA; a 30-day comment period follows from the date of publication in the Notice.

☒ FEA-FONSI

Submit 1) the proposing agency notice of determination/transmittal letter on agency letterhead, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the FEA, and 4) a searchable PDF of the FEA; no comment period follows from publication in the Notice.

☐ FEA-EISPN

Submit 1) the proposing agency notice of determination/transmittal letter on agency letterhead, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the FEA, and 4) a searchable PDF of the FEA; a 30-day comment period follows from the date of publication in the Notice.

☐ Act 172-12 EISPN
 ("Direct to EIS")

Submit 1) the proposing agency notice of determination letter on agency letterhead and 2) this completed OEQC publication form as a Word file; no EA is required and a 30-day comment period follows from the date of publication in the Notice.

☐ DEIS

Submit 1) a transmittal letter to the OEQC and to the accepting authority, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the DEIS, 4) a searchable PDF of the DEIS, and 5) a

- searchable PDF of the distribution list; a 45-day comment period follows from the date of publication in the Notice.
- _____ FEIS Submit 1) a transmittal letter to the OEQC and to the accepting authority, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the FEIS, 4) a searchable PDF of the FEIS, and 5) a searchable PDF of the distribution list; no comment period follows from publication in the Notice.
- _____ FEIS Acceptance Determination The accepting authority simultaneously transmits to both the OEQC and the proposing agency a letter of its determination of acceptance or nonacceptance (pursuant to Section 11-200-23, HAR) of the FEIS; no comment period ensues upon publication in the Notice.
- _____ FEIS Statutory Acceptance Timely statutory acceptance of the FEIS under Section 343-5(c), HRS, is not applicable to agency actions.
- _____ Supplemental EIS Determination The accepting authority simultaneously transmits its notice to both the proposing agency and the OEQC that it has reviewed (pursuant to Section 11-200-27, HAR) the previously accepted FEIS and determines that a supplemental EIS is or is not required; no EA is required and no comment period ensues upon publication in the Notice.
- _____ Withdrawal Identify the specific document(s) to withdraw and explain in the project summary section.
- _____ Other Contact the OEQC if your action is not one of the above items.

Project Summary. The County of Hawai'i DPW, in partnership with FHWA and HDOT, plans to replace an existing double-cell culvert near the ocean on the Waiaha Drainageway on Ali'i Drive. The 1937-era structure artificially constricts the channel and occasionally floods properties and Ali'i Drive. It supports a narrow road deck with two ten-foot lanes for vehicles and inadequate shoulders for pedestrians and bicyclists. The culvert is rapidly deteriorating and is structurally and functionally obsolete. If not repaired, it may soon require closure, cutting a critical link on Ali'i Drive that would cause traffic detours of up to two miles and lead to severe traffic and socioeconomic disruption. The project would construct a new culvert structure that has a wide culvert opening and a longer, wider bridge above. The drainage channel would be widened 134 feet upstream, with a natural bottom of sand and cobbles. The roadway above would accommodate bike lanes and raised sidewalks. No significant biological, archaeological or cultural resources would be adversely affected, and beach processes would be restored to a more natural condition. Separate environmental documentation is being prepared to satisfy the requirements of NEPA and related laws, regulations and Executive Orders.

Ali'i Drive Culvert Replacement at Kahului Bay

Final Environmental Assessment

TMKs: (3) 7-5-019:007, 008, 009, 016, 024 & 025

Kailua, Island of Hawai'i, North Kona District

County of Hawai'i, State of Hawai'i

FAP No. STP-0186(1)

August 2017

County of Hawai'i
Department of Public Works
101 Pauahi Street, Suite 7
Hilo, Hawai'i 96720



Submitted Pursuant to Chapter 343, Hawai'i Revised Statutes (HRS)

Ali'i Drive Culvert Replacement at Kahului Bay

Final Environmental Assessment

TMKs (3) 7-5-019:007, 008, 009, 024 & 025: 7-5-001:005 & 050

**Kailua, Island of Hawai'i, North Kona District
County of Hawai'i, State of Hawai'i
FAP No. STP-0186(1)**

Prepared for:

County of Hawai'i
Department of Public Works
101 Pauahi Street, Suite 7
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Prepared by:

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Submitted Pursuant to Chapter 343, Hawai'i Revised Statutes (HRS)

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TABLE OF CONTENTS

SUMMARY	iv
PART 1: PROJECT DESCRIPTION, PURPOSE AND NEED AND E.A. PROCESS.....	1
1.1 Project Location and Description of Existing Culvert Structure	1
1.2 Purpose and Need	15
1.3 Environmental Assessment Process.....	16
1.4 Public Involvement and Agency Coordination	17
PART 2: ALTERNATIVES	18
2.1 No Action	18
2.2 Proposed Action	18
2.3 Alternatives Evaluated and Dismissed from Further Consideration.....	20
2.3.1 Repair Culvert Structure Leaving Design Elements in Place	20
2.3.2 Build on New Location Upstream of Existing Culvert.....	20
2.3.3 Enlarged Culvert Openings with No Channel Alterations	20
2.3.4 Enlarged Culvert Openings with Detention Basin.....	21
2.3.5 Enlarged Culvert with Limited Widening and Substantial Deepening.....	22
2.3.6 Enlarged Culvert Openings with Levee	22
PART 3: ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION	23
3.1 Physical Environment	23
3.1.1 Geology, Soils and Geologic Hazard.....	23
3.1.2 Climate and Drainage.	24
3.1.3 Waters of the U.S. and Freshwater and Marine Water Quality/Habitat.....	31
3.1.4 Shoreline Processes and Coastal Erosion	45
3.1.5 Flora, Fauna, and Ecosystems	50
3.1.6 Air Quality	58
3.1.7 Noise	60
3.1.8 Scenic Resources	61
3.1.9 Hazardous Substances, Toxic Materials and Hazardous Conditions	62
3.2 Socioeconomic and Cultural	62
3.2.1 Socioeconomic Characteristics	62
3.2.2 Cultural Resources	65
3.2.3 Historic Properties	71
3.3 Public Facilities and Services	76
3.3.1 Roadways, Traffic and Pedestrian/Bicycle Uses	76
3.3.3 Utilities	78
3.3.3 Other Public Facilities and Services	81
3.4 Secondary and Cumulative Impacts.....	81
3.5 Required Permits and Approvals	83
3.6 Consistency with Laws, Plans and Policies	85
3.6.1 Hawai‘i State Plan	85
3.6.2 Hawai‘i State Land Use Law	85
3.6.3 Hawai‘i County Zoning, Special Management Area and General Plan	86
3.6.4 Kona Community Development Plan	91
3.7 Federal Laws and Executive Orders	93
3.7.1 Coastal Zone Management Act Consistency and Coastal Barriers.....	93
3.7.2 Clean Water Act, as Amended (33 USC 1251 et seq.)	94
3.7.3 Clean Air Act As Amended (42 USC 7401, et seq.)	94
3.7.4 Wild and Scenic Rivers Act (16 U.S.C. 1271-1287)	95
3.7.5 Farmland Protection Policy Act (7 U.S.C. 4201, et seq.)	95

3.7.6	Resource Conservation and Recovery Act (42 USC 6901 et seq.)	95
3.7.7	Executive Order 11988, Floodplain Management (24 May 1977)	96
3.7.8	Executive Order 11990, Protection of Wetlands (24 May 1977)	96
3.7.9	Executive Order 12898, Environmental Justice	96
3.7.10	National Historic Preservation Act (16 U.S.C. 470)	97
3.7.11	Section 4(f)	98
3.7.12	Endangered Species Act (16 USC 1531-1544) and Related Laws	98
PART 4:	DETERMINATION	99
PART 5:	FINDINGS AND REASONS	100
REFERENCES	102

LIST OF FIGURES

FIGURE 1-1	USGS Location Map.....	2
FIGURE 1-2	Aerial Image of Project Location.....	3
FIGURE 1-3	Project Site Photos	5
FIGURE 1-4a	Site Plan: Plan of Overall Work.....	11
FIGURE 1-4b	Site Plan: Elevation View of Proposed Culvert Structure	12
FIGURE 1-4c	Site Plan: Channel Work Upslope of Culvert	13
FIGURE 1-4d	Site Plan: Erosion Control BMP details.....	14
FIGURE 3-1	Flood Insurance Rate Map.....	25
FIGURE 3-2	Flood Zone Near Ali'i Drive Before and After Improvements.....	31
FIGURE 3-3	Boundaries of Waters of U.S.	35
FIGURE 3-4	1984 Certified Shoreline Map.....	48
FIGURE 3-5	Aerial Photos of Shoreline Throughout Late 20 th Century	49
FIGURE 3-6	Area of Potential Effect and Historic Properties.....	72
FIGURE 3-7	Traffic Circulation Routes & Bike Plan Hawaii Designation.....	79
FIGURE 3-8	Projects with Potential to Induce Cumulative Impacts for Project	83

LIST OF TABLES

TABLE 3-1	Plant Species on Project Site.....	52
TABLE 3-2	Selected Socioeconomic Characteristic	64
TABLE 3-3	Archaeological Site Significance and Treatment Recommendations	74
TABLE 3-4	Permits and Approvals	84

LIST OF APPENDICES

APPENDIX 1a	Comments in Response to Early Consultation
APPENDIX 1b	Comments to Draft EA and Responses
APPENDIX 2	Marine Environment Assessment
APPENDIX 3	Archaeological Inventory Survey and Historic Sites Correspondence
APPENDIX 4	Selected Section 404 Clean Water Act Correspondence and Materials
APPENDIX 5	Drainage Report
APPENDIX 6	Phasing Site Plans
APPENDIX 7	Section 7 Endangered Species Act and Related Correspondence

LIST OF ABBREVIATIONS

AAQS	Ambient Air Quality Standards
ALISH	Agricultural Lands of Importance to the State of Hawai‘i
BMP	Best Management Practice
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cfs	cubic feet per second
CDUP	Conservation District Use Permit
CWRM	Hawai‘i State Commission on Water Resources Management
CZMA	Coastal Zone Management Act
DBEDT	Hawai‘i State Department of Business, Economic Development and Tourism
DLNR	Hawai‘i State Department of Land and Natural Resources
DOFAW	Hawai‘i Division of Forestry and Wildlife
DOH-CWB	Hawai‘i Department of Health Clean Water Branch
DPW	Hawai‘i County Department of Public Works
EA	Environmental Assessment
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FFPPA	Federal Farmland Protection Policy Act
FHWA	U.S. Federal Highway Administration
FIRM	Flood Insurance Rate Map
FONSI	Finding of No Significant Impact
GP	Hawai‘i County General Plan
HDOH	Hawai‘i State Department of Health
HDOT	Hawai‘i State Department of Transportation
HAR	Hawai‘i Administrative Rules
HRS	Hawai‘i Revised Statutes
LUPAG	Land Use Pattern Allocation Guide Map
NEPA	National Environmental Policy Act
NEPA-404	MOU Memorandum of Understanding National Environmental Policy Act and Clean Water Act Section 404 Integration Process for Surface Transportation Projects in the State of Hawaii
NOAA-NMFS	National Oceanic and Atmospheric Administration National Marine Fisheries Service
NWP	Nationwide General Permit
REAP	Rain Event Action Plan
SFHA	Special Flood Hazard Area
SHPO	State Historic Preservation Officer
SMA	Special Management Area
SPCC	Spill Prevention, Control, and Countermeasure Plan
SWPPP	Storm Water Pollution Prevention Plan
UH	University of Hawai‘i
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
USNRCS	U.S. Natural Resources Conservation Service
WQS	Water Quality Standards

SUMMARY

The County of Hawai‘i, Department of Public Works, in partnership with the Federal Highway Administration (FHWA) and the Hawai‘i State Department of Transportation (HDOT), plans to replace an existing double-cell culvert on the Waiaha Drainageway on Ali‘i Drive at Kahului Bay in Kailua, North Kona District. The structure was built of concrete and stone in 1937 and has been extensively modified since that time. The structure artificially constricted the channel and causes occasional flooding of adjacent properties and Ali‘i Drive. On the top is a concrete deck supporting two ten-foot lanes for vehicles and narrow shoulders for pedestrians and bicyclists. The culvert structure also supports water lines, and a sewer line runs underground at the crossing. The culvert is rapidly deteriorating and is structurally and functionally obsolete. If not repaired, it may soon require closure, cutting a critical link on Ali‘i Drive that would cause traffic detours of up to two miles and lead to severe traffic and socioeconomic disruption.

The project would construct a new culvert structure that has a wide culvert opening and a longer, wider bridge above. The longer span would permit the culvert openings to allow the 100-year design flood to pass through, and it would approximate the channel’s natural width prior to its narrowing in the 1930s. In addition, the drainage channel would be widened for a distance of 134 feet upstream of the new culvert structure in order to ensure that the 100-year flood is contained within the embankments. The bottom of the channel in this 100-foot section will be left in a natural condition of sand and cobbles, and the channel sides will be lined with grouted rubble paving in order to ensure that the banks do not collapse or erode during high flows. Beyond the 100-foot length that leads to the culvert openings, the channel will be left in a totally natural, vegetated condition. The project would also widen the roadway above to accommodate a bike lane and raised sidewalk, and provide a parking area for recreational use of Kahului Bay south of the channel. The project involves several County properties and a County right-of-way, as well as small portions of private properties that will be used temporarily for erosion control measures during construction.

The project is expected to require a Section 404 Nationwide General Permit from the U.S. Army Corps of Engineers for work in a water of the U.S. Other permits from the Department of Health, the Department of Land and Natural Resources and the County of Hawai‘i involve protection of water quality. The existing culvert structure and archaeological sites have been inventoried and it is expected that the State Historic Preservation Officer will concur with a determination of “no effect” to significant historic sites under the National Historic Preservation Act and an “effect with agreed upon mitigation commitments” under the corresponding State law. No cultural resources or practices will be affected. No threatened or endangered species will be adversely affected, given mitigation measures related to water quality and the timing of vegetation removal. There will be substantial benefit to pedestrian and bicycle safety, flood protection, natural shoreline processes, viewplanes and recreational access.

In addition to County funds, FHWA funds will be used for the design and construction of the project. Separate environmental documentation is being prepared to satisfy the requirements of the National Environmental Policy Act (NEPA) and related laws, regulations and Executive Orders.

PART 1: PROJECT DESCRIPTION, PURPOSE AND NEED AND ENVIRONMENTAL ASSESSMENT PROCESS

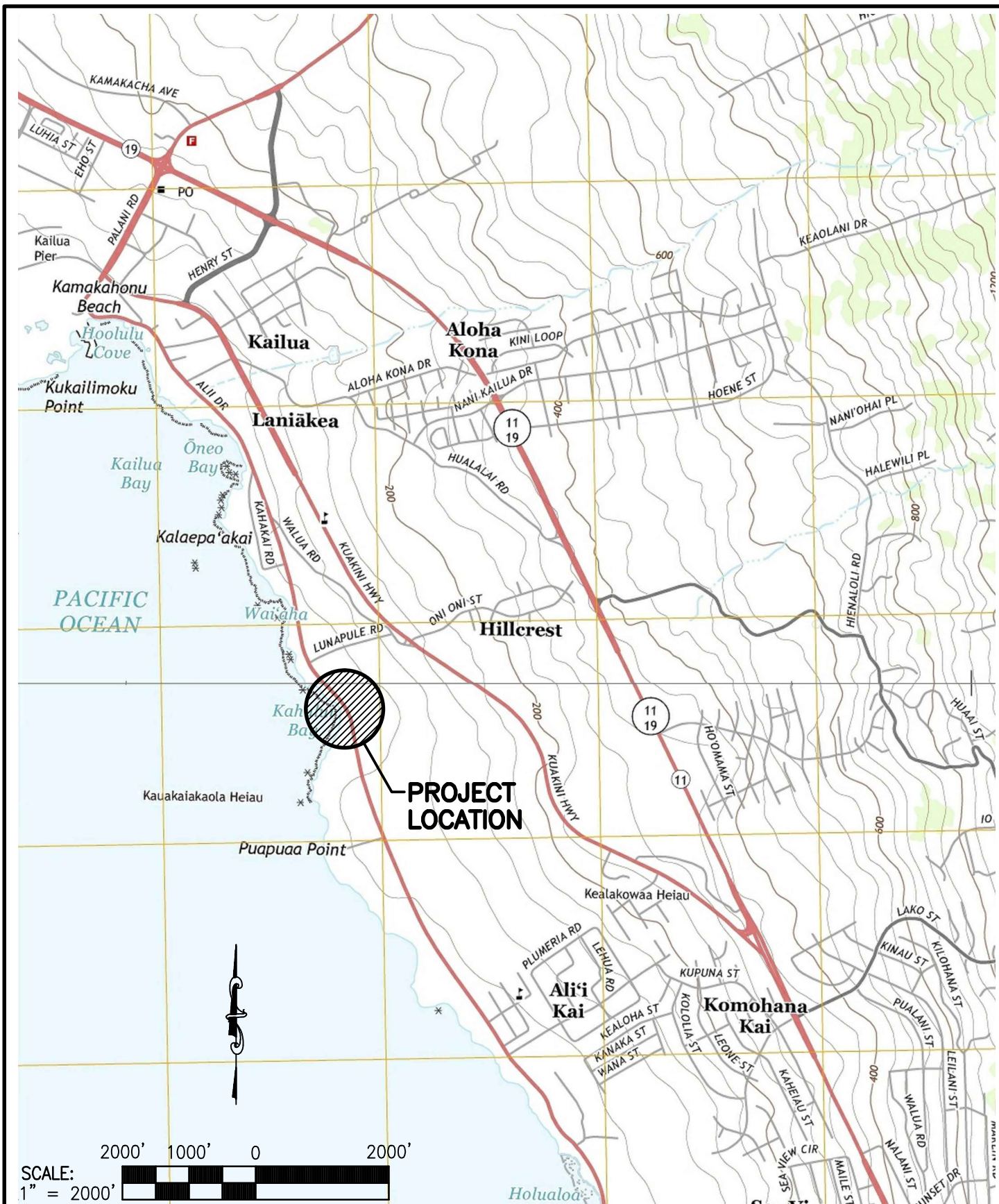
1.1 Project Location and Description of Existing Culvert Structure

A culvert structure bridges the Waiaha Drainageway on Ali‘i Drive (a County road) adjacent to the shoreline at Kahului Bay, in the North Kona District on the island of Hawai‘i (Figures 1-1 to 1-4). As discussed in more detail in Section 2.2, the County of Hawai‘i, Department of Public Works (DPW), proposes to replace the culvert structure (which in this document is also called a bridge, in keeping with the convention of many records on the structure) with a longer structure, expand the flood channel to approximate the channel’s natural width prior to its narrowing in the 1930s, and widen the roadway above to accommodate a bike lane and raised sidewalk.

The site is within the *ahupua‘a* of Kahului, 1.4 miles south of the junction of Ali‘i Drive and Kuakini Highway and the downtown area of Kailua. The latitude and longitude are 19° 37' 33.5" N. Lat., 155° 59' 18" W. Long. The project would primarily take place on several County properties (TMK Plat 3-7-5-019: 007, 008 & 025) and the right-of-way of Ali‘i Drive, a County road. Small portions of several private properties would also be utilized on a temporary basis for erosion control measures during construction: (TMK Plat 3-7-5-019:009 [Kona Hawaiian Vacations Ownership LLC]; 016 [Foo 1980 Trust] and 024 [the Matlock Stores Inc.]).

The existing double-cell culvert structure was originally built of concrete and stone in 1937, although it has been extensively modified since that time. On the top is a concrete deck supporting two ten-foot lanes for vehicles and two narrow shoulders for pedestrians and bicyclists (Figure 1-3). The culvert structure also supports water lines, and a sewer line runs underground at the crossing.

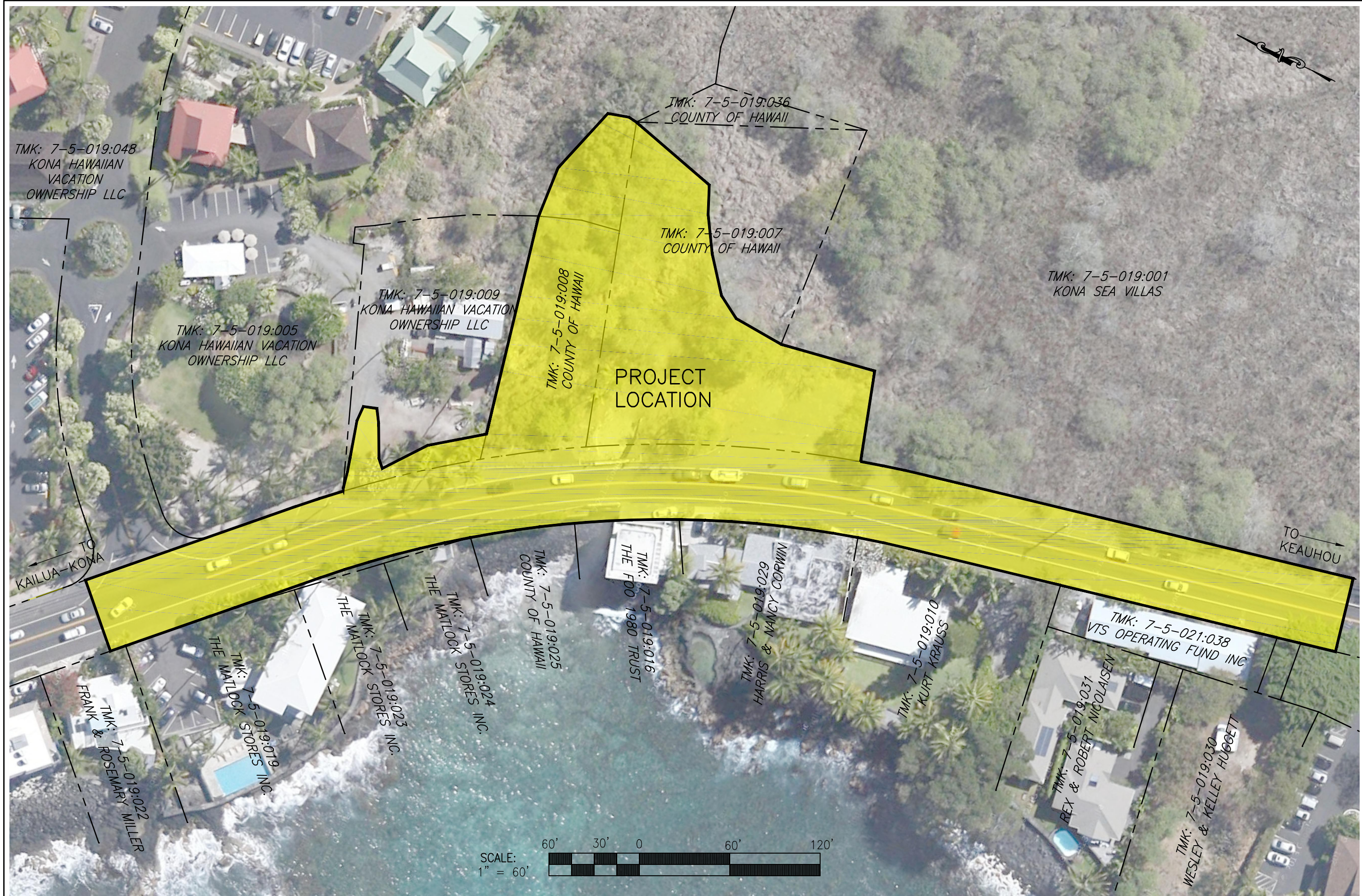
Owing to the era and methods of its construction, it is one of several hundred culvert structures and bridges statewide that were preliminarily evaluated for historic significance and potential eligibility for the State Register of Historic Places in the Hawai‘i State Department of Transportation’s *Hawai‘i State Historic Bridge Inventory & Evaluation* (HDOT 2013). Systematic evaluation of the structure by historic architects concluded that it has degraded to the point where it lacks historic integrity and is not eligible for the State or National Registers, a finding that is being reviewed by the State Historic Preservation Division.



ALI' DRIVE CULVERT REPLACEMENT AT KAHULUI BAY - ENVIRONMENTAL ASSESSMENT

USGS LOCATION MAP

**Figure
1-1**



AL'I DRIVE CULVERT REPLACEMENT AT KAHULUI BAY - ENVIRONMENTAL ASSESSMENT

AERIAL IMAGE OF PROJECT LOCATION

Figure 1-2

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Figure 1-3: Project Site Photos

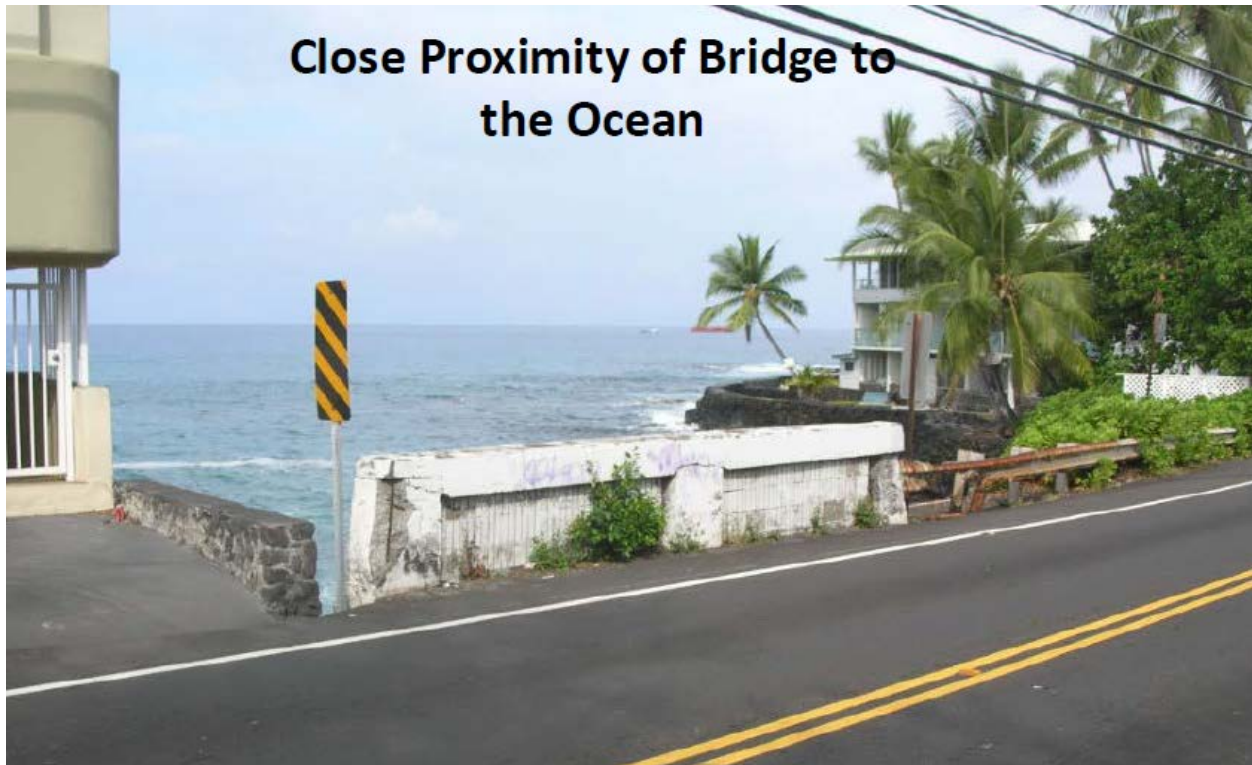
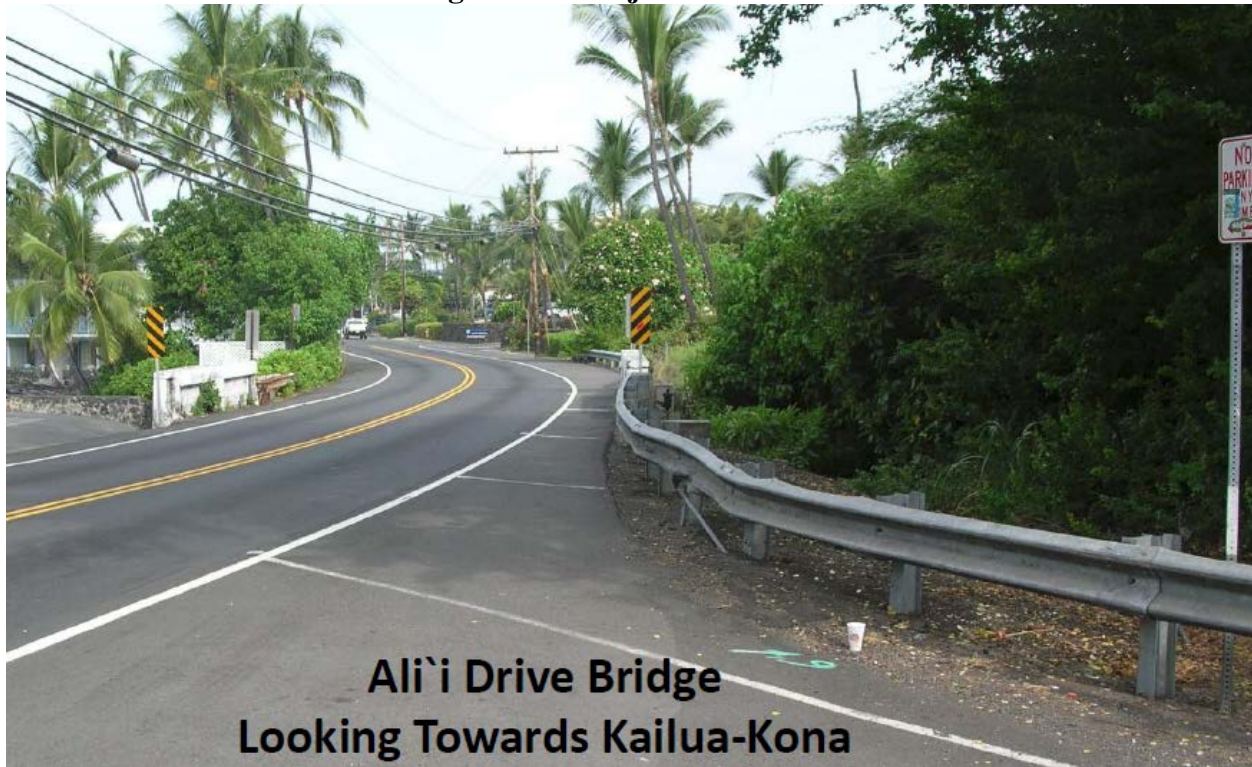


Figure 1-3: Project Site Photos



Figure 1-3: Project Site Photos



Figure 1-3: Project Site Photos

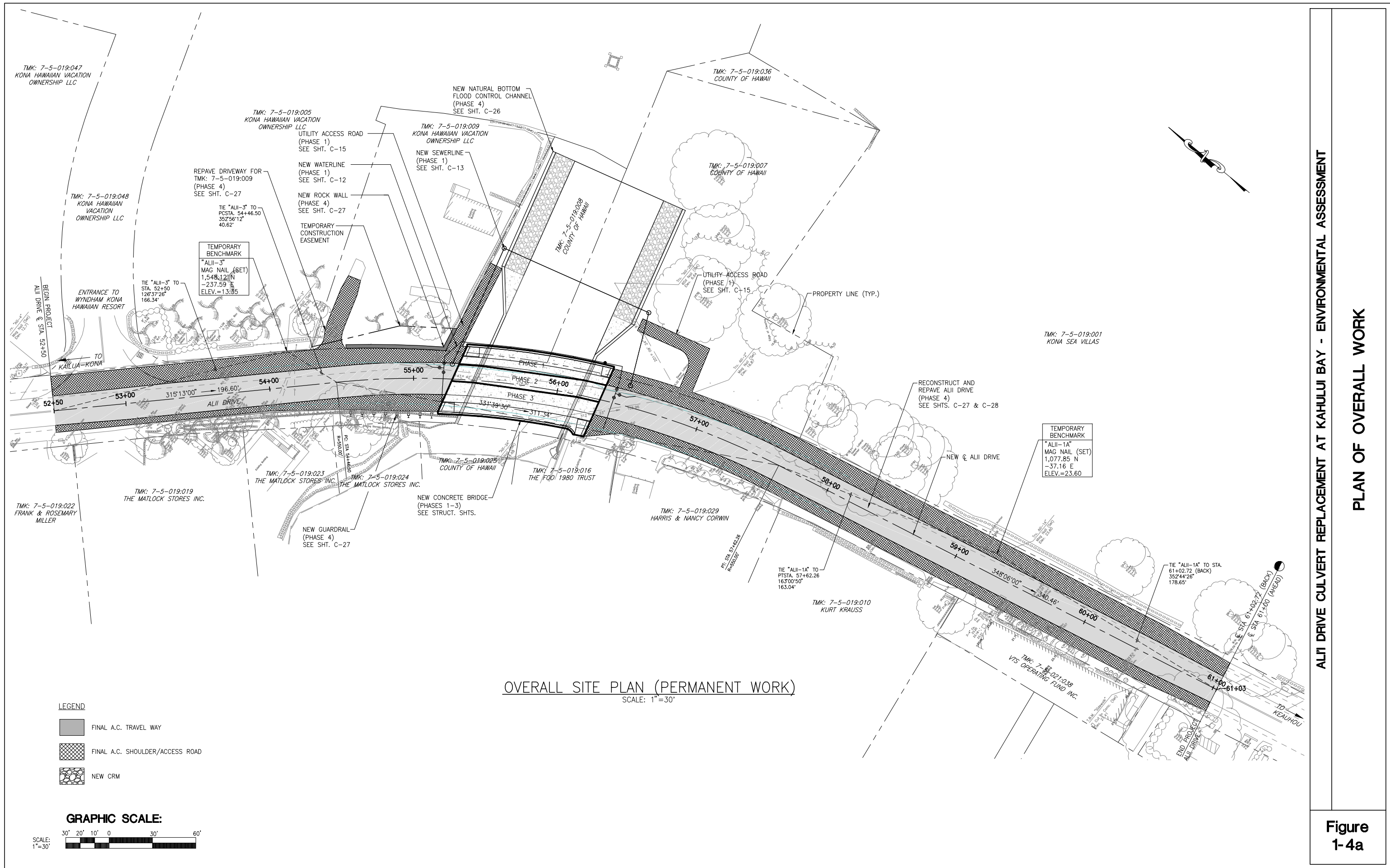


Figure 1-3: Project Site Photos



Figure 1-3: Project Site Photos

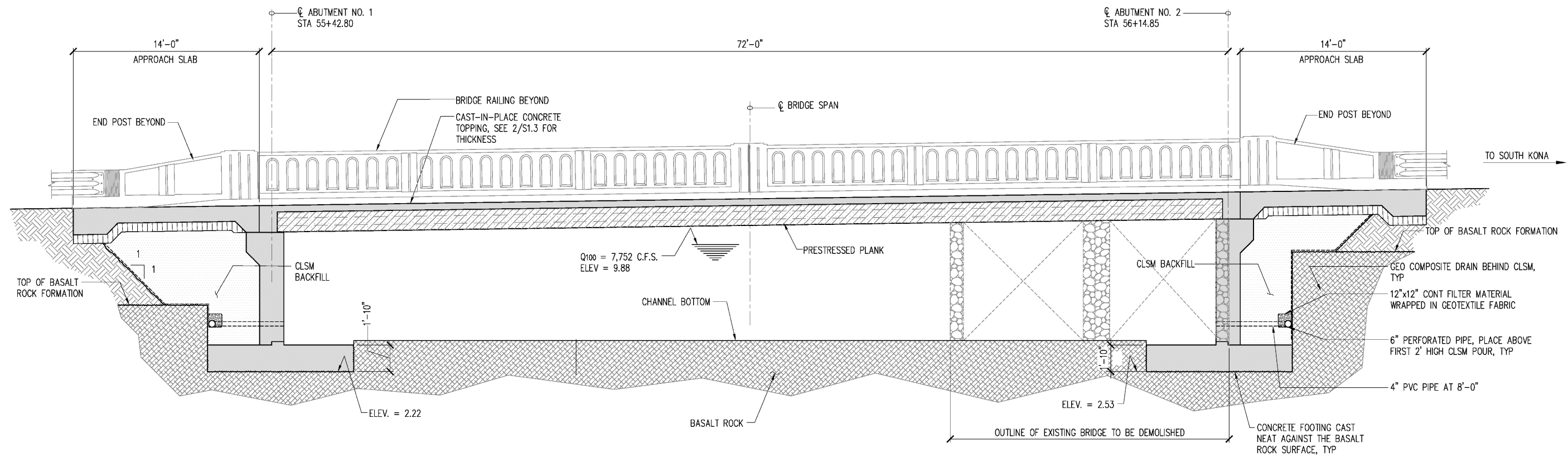




ALII DRIVE CULVERT REPLACEMENT AT KAHULUI BAY - ENVIRONMENTAL ASSESSMENT

PLAN OF OVERALL WORK

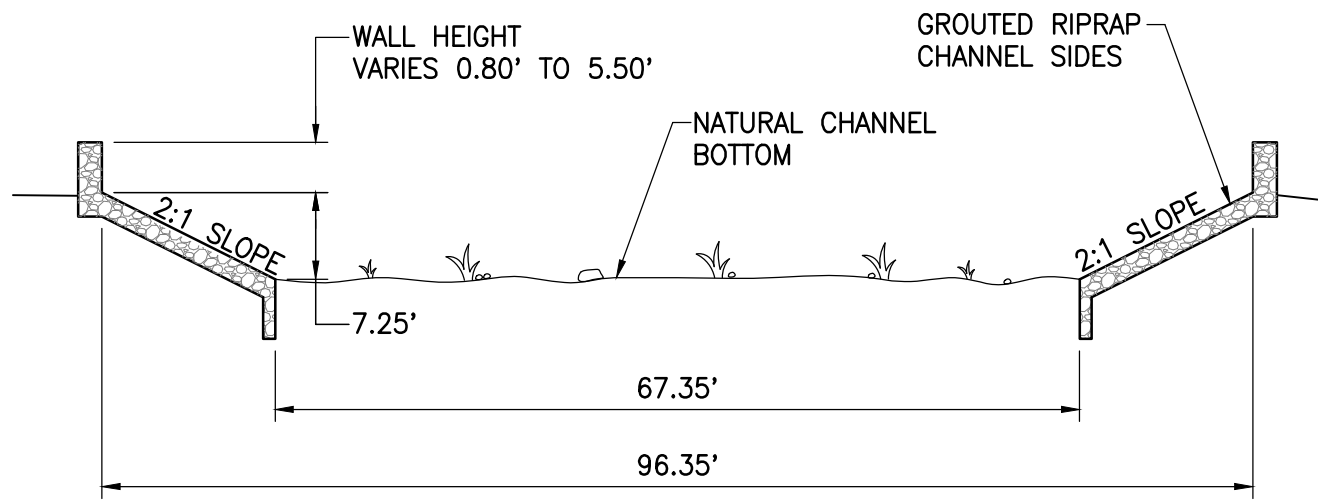
Figure 1-4a



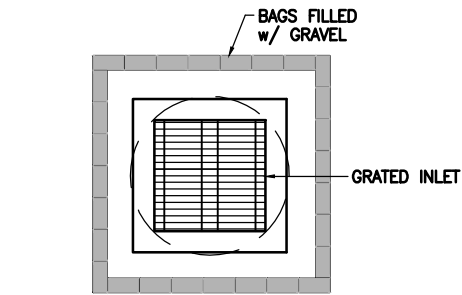
M:\1998\980490 Alii Drive Bridge\Environmental\EA\Fig 1-4c - Channel.dwg PLOT DATE: 1/12/2017



NATURAL CHANNEL WITH HARDENED SIDES
PLAN VIEW

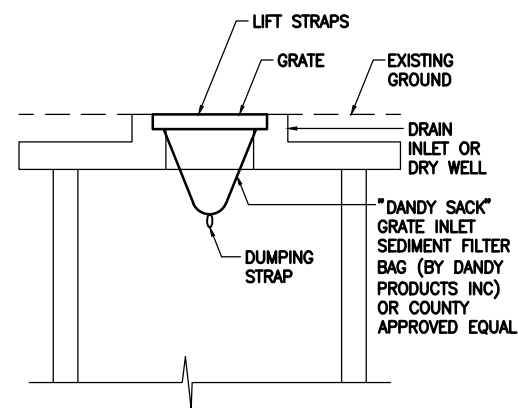


NATURAL CHANNEL WITH HARDENED SIDES
CROSS SECTION

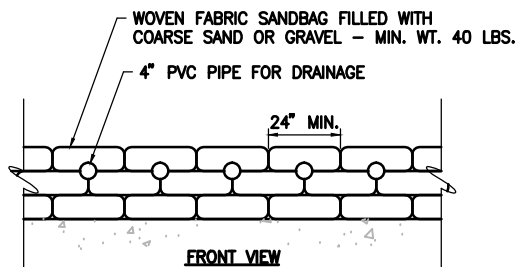
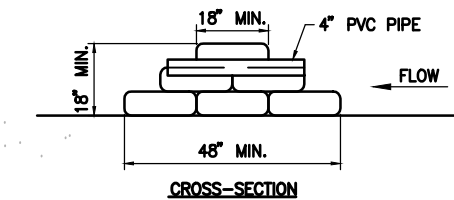


NOTE:
SAND BAGS SHALL BE PLACED SO AS
NOT TO ENCROACH INTO TRAVEL WAY.

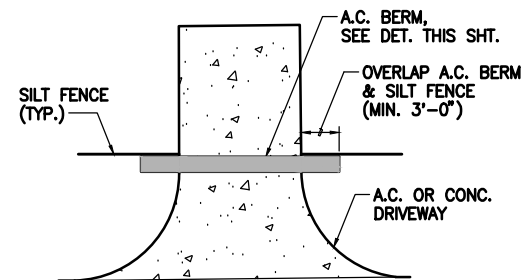
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NOT TO SCALE



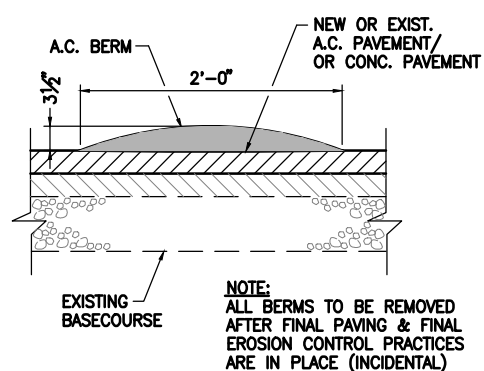
GRATE INLET PROTECTION
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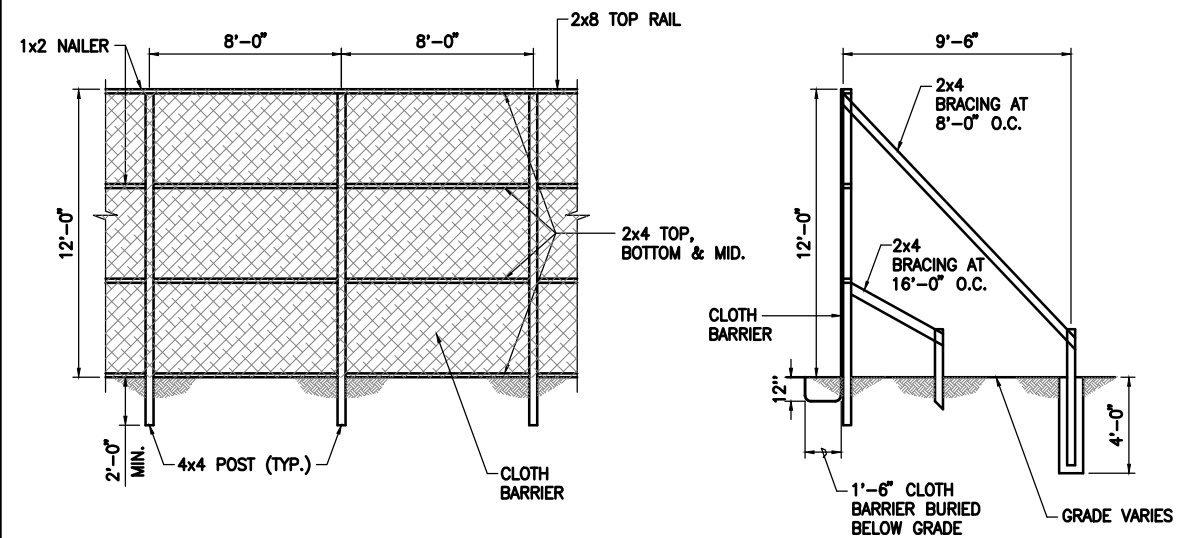
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A.C. BERM PLAN
NOT TO SCALE



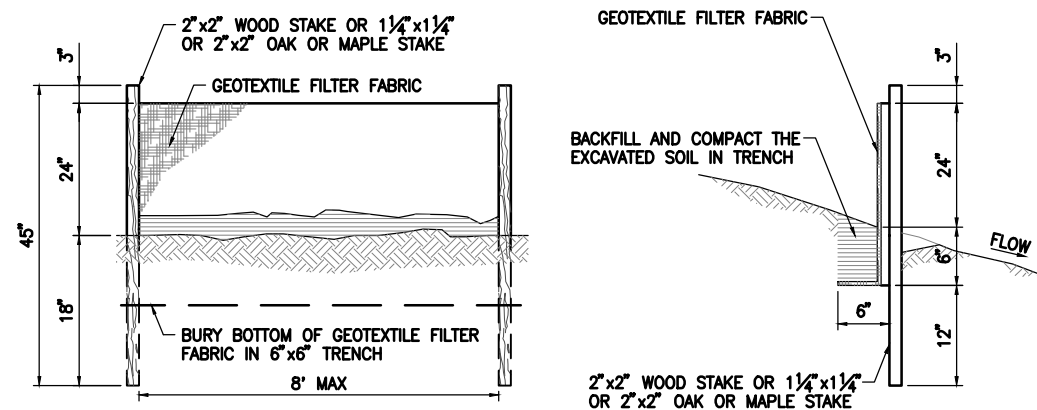
A.C. BERM DETAIL
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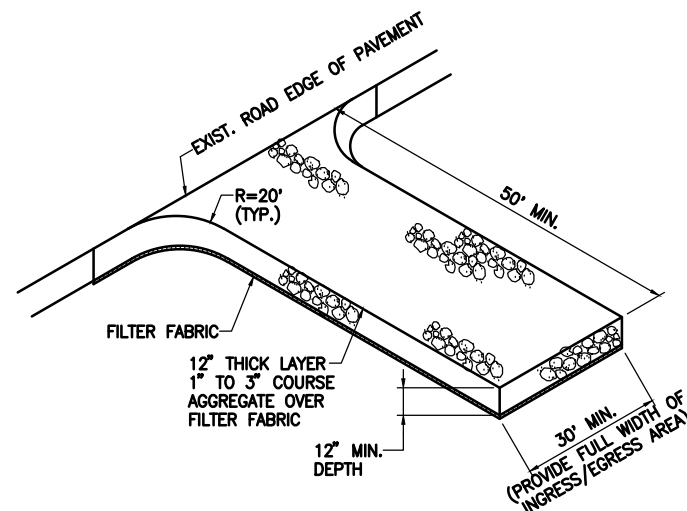
NOTES:

1. CLOTH BARRIER TO BE A "WOVEN GEOTEXTILE" OR "NURSERY SHADE".
2. LUMBER SIZES ARE NOMINAL INCHES.
3. CLOTH BARRIER TO BE BURIED AT BASE TO INDICATED DIMENSIONS.
4. 1"x2" CLOTH BARRIER CAPS TO BE NAILED 12" O.C.
5. BURLAP IS NOT ACCEPTABLE AS THE CLOTH BARRIER.
6. CLOTH BARRIER TO HAVE NO HORIZONTAL SEAMS.
7. VERTICAL SEAMS TO BE MADE OVER UPRIGHTS ONLY.
8. ALL SEAMS TO BE CAPPED WITH MINIMUM OF 1"x2" NAILERS.
9. ALL JOINTS TO BE SECURELY FASTENED BY MECHANICAL MEANS.
10. DUE TO MULTIPLE SCHEDULING AND PHASING NATURE OF THE PROJECT, THE CONTRACTOR AT IS EXPENSE IS SOLELY RESPONSIBLE TO ADD AND/OR MODIFY THE DUST AND SILT CONTROL FENCING TO COMPLY WITH FEDERAL, STATE, AND LOCAL REGULATIONS AND REQUIREMENTS.

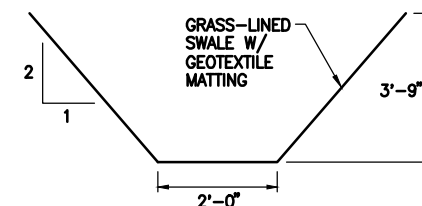
DUST FENCE DETAIL
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SILT FENCE
NOT TO SCALE



**STABILIZED CONSTRUCTION
ENTRANCE/EXIT DETAIL**
NOT TO SCALE



**DIVERSION CHANNEL
CROSS SECTION**
NOT TO SCALE

1.2 Purpose and Need

The Need for the replacement of the culvert structure is based on the following factors.

- The nearly 80-year old structure was not built to accommodate the current heavy traffic on Ali'i Drive and it is heavily degraded and reaching the end of its design life. The County has conducted various structural repairs, but there remain a number of deficiencies, including spalls exposing corroded steel on the underside of the concrete deck, that may render it unsafe in the future (see bridge deterioration photos in Figure 1-3). It is classified as both "Structurally Deficient" and "Functionally Obsolete". Structurally deficient means that the condition of the bridge includes a significant defect which often means that speed or weight limits must be put on the bridge to ensure safety. Engineers determined as part of a preliminary design analysis that repair and maintenance cannot cope with the present structural integrity deficiencies of the culvert structure.
- The structure artificially constricted the drainage channel when it was built in 1937, and the hydraulic capacity of the culvert openings is less than one third the magnitude of the 100-year design flood of 7,110 cubic feet per second. Because of the narrow openings and small cross-sectional area, the stream embankments are often overtopped by the flood waters that inundate the adjacent private properties. The flood waters sheet flow across Ali'i Drive during heavy flooding.
- Finally, the structure is too narrow for adequate pedestrian/bicycle lanes in conformance with current American Association of State Highway Transportation Officials (AASHTO) design guidelines. Ali'i Drive is an important artery for the tourist traffic in Kona and has a heavy volume of not only motor vehicles but also pedestrians, motor scooters and bicyclists. The bottleneck at the bridge leads to safety issues and pedestrian/bicycle/motor vehicle traffic conflicts.

While the Need for the project describes the deficiencies, the project Purpose defines the problem to be solved. Defining the Purpose is necessary to determine the range of alternatives to be considered; each alternative must meet the Purpose and address the identified Need to be considered a viable solution. The Purpose was developed iteratively with the assistance of the U.S. Army Corps of Engineers (USACE), the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS), the U.S. Fish and Wildlife Service (USFWS), and the Environmental Protection Agency (EPA).¹

¹ This occurred during the initial phases of alternative development, when the culvert replacement design appeared to require an Individual Permit under Section 404 of the Clean Water Act. An Individual Permit triggered the need for compliance with the *Memorandum of Understanding, National Environmental Policy Act and Clean Water Act Section 404 Integration Process for Surface Transportation Projects in the State of Hawaii* (or NEPA-404 MOU). As part of this process, agencies jointly concur on the purpose and need, alternatives, impacts and mitigation. Redesign of the culvert to a smaller footprint with a natural channel bottom has likely qualified the project for a Section 404 Nationwide General Permit, which does not require the NEPA-404 MOU process. Because of the project history, the highway agencies continued to inform the NEPA-404 partner agencies of critical steps and decisions and invite comment.

The Purpose of the proposed project is to improve the safety and structural integrity at the crossing of the Waiaha Drainageway on Ali‘i Drive. The specific objectives within the Purpose are to:

- Provide the necessary engineering to replace this functionally obsolete and structurally deficient culvert structure.
- Support current and projected traffic for vehicles, bicycles, and pedestrians, integrating current American Association of State Highway and Transportation Officials design standards, Federal Highways Administration Complete Streets guidance, and the American with Disabilities Act standards.
- Attenuate flooding on adjacent properties to meet the 100-year flood zone standards.
- Accommodate existing electric, telephone, cable TV, sewer, and water utility crossings.

1.3 Environmental Assessment Process

This Environmental Assessment (EA) assesses the potential impacts of the project. An EA is required because County of Hawai‘i funds will be used for the design and construction of the proposed improvements, which occur on County lands. Chapter 343 of the Hawai‘i Revised Statutes (HRS) is the basis for the environmental impact process in the State of Hawai‘i. The content requirements and procedures are specified by Chapter 343, HRS, and its implementing regulations, Title 11, Chapter 200, of the Hawai‘i Administrative Rules (HAR).

An EA is prepared to document the consequences of a proposed action and determine whether the action would produce significant impacts. When an EA supports a Finding of No Significant Impact (FONSI), the EA and its associated FONSI satisfy the proponent’s need to comply with Chapter 343, HRS. When the EA does not support a FONSI, the EA facilitates preparation of an Environmental Impact Statement (EIS). Therefore, if the Determining Agency (in this case, DPW) concludes that no significant impacts would occur from implementation of the proposed action, a FONSI will be prepared and the action will be permitted to proceed to other necessary permits and approvals. If the Determining Agency finds that significant impacts are expected to occur as a result of the proposed action, then an EIS will be prepared. At the present time, a FONSI is anticipated for the project. Part 5 of this EA lists these criteria and DPW’s findings regarding significance.

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

The NEPA environmental documentation process will also address various federal laws, regulations, and Executive Orders, as discussed in more detail in Section 3.7 of this EA. For

clarification purposes, it is important to note that the NEPA process is required to address Section 106 of the National Historic Preservation Act, as amended, as well as the law commonly known as Section 4(f) (49 U.S.C. §303 and 23 U.S.C. §138 implemented by FHWA through regulation 23 CFR 774), established to require consideration of park and recreational lands, wildlife and waterfowl refuges, and historic sites in transportation project development. Because the issue of successfully resolving historic preservation issues has been central to the design of the culvert structure replacement, FHWA and its designees, the Hawai‘i Department of Transportation (HDOT) and DPW, have already been actively engaging in the Section 106 process. This has included consultation with the State Historic Preservation Division, Native Hawaiian organizations, and the community. The historic preservation concerns related to the National Historic Preservation Act and Chapter 6e, HRS, “Historic Preservation”, have been to some degree integrated, although it is recognized that there are distinct processes with their own procedures.

1.4 Public Involvement and Agency Coordination

The following agencies and organizations were consulted through early consultation letters as part of the development of the EA.

Federal:

- Environmental Protection Agency
- National Oceanic and Atmospheric Administration, National Marine Fisheries Service
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service

State:

- Department of Health, Environmental Planning Office
- Department of Land and Natural Resources, Division of Forestry and Wildlife
- Department of Land and Natural Resources, State Historic Preservation Division
- Department of Land and Natural Resources, Office of the Chairperson
- Department of Land and Natural Resources, Division of Aquatic Resources
- Department of Land and Natural Resources, Land Division
- Department of Land and Natural Resources, Engineering Division
- Department of Land and Natural Resources, Commission on Water Resources Mgmt.
- Office of Hawaiian Affairs

County:

- Civil Defense
- County Council
- Fire Department
- Planning Department
- Police Department

Private:

Kailua Village Business Improvement District
Kona Hawaiian Civic Club
Kona-Kohala Chamber of Commerce
Sierra Club
Six neighboring property owners

Copies of written communications received during early consultation and subsequent consultation processes are contained in Appendix 1a. Comments to the Draft EA and responses to these comments are contained in Appendix 1b. A public meeting was held at the West Hawai‘i Civic Center on May 1, 2017, at which comment sheets were provided. Various places in the EA have been modified to reflect input received in comment letters and comment sheets from the meeting; additional or modified non-procedural text is denoted by double underlines, as in this sentence.

PART 2: ALTERNATIVES

This section discusses the alternatives that have been considered in the EA, including no action and the proposed action, as well as alternatives that have been evaluated but dismissed from further consideration because they could not adequately and efficiently address the purpose and need of the project discussed in Section 1.2.

2.1 No Action

The No Action Alternative is the baseline against which the proposed action alternative is compared. Under the No Action Alternative, the culvert structure would not be replaced. The No Action Alternative would not correct the situation that causes the culvert structure to be considered structurally deficient and deteriorated, and it would not allow passage of the 100-year flood, leading to additional flooding. The narrow shoulders with inadequate separation of and accommodation for pedestrian, bicycle and motor vehicle traffic would continue. Eventually, the culvert structure would deteriorate to the point where it would require closure, and then removal, leading to the disruption of the major coastal road in urban Kona and a detour of up to two miles. The No Action Alternative is considered unacceptable by the lead agencies because these conditions pose serious and unacceptable safety hazards to residents, visitors and commercial users of this busy and essential transportation artery in Kailua, the major town in West Hawai‘i.

2.2 Proposed Action

In overview, the proposed action consists of a new culvert structure that has a larger cross-section of culvert openings and a longer, wider bridge above (see plan views, cross-sections and construction details in the four sheets of Figure 1-4). The longer span will permit culvert openings sufficient to allow the 100-year design flood to pass through. The new structure will consist of a single span concrete bridge with a length of 70 feet and a width of 49 feet. The

vertical clearance beneath the bridge will vary from 8 feet at the downstream end to 9 feet at the upstream end of the bridge.

In addition, the drainage channel will be widened for a distance of 100 feet upstream of the new culvert structure in order to ensure that the 100-year flood is contained within the embankments. This widening approximates the channel's natural width prior to its narrowing in the 1930s when the culvert structure was built. The shape of the upstream channel here will be trapezoidal with embankments sloped at 2H:1V, with a bottom width of 67 feet and a top width of 96 feet. The channel bottom will remain unhardened and will consist of naturally occurring boulders and cobbles, which will assist in reducing flow velocity at the ocean outlet. The embankments will be protected from erosion with grouted rubble paving (GRP). Just before the channel meets the culvert, the trapezoidal section will transition to a rectangular section that matches the opening. The transition section of the embankment wall will be constructed of concrete. Beyond the 100-foot length that leads to the culvert openings, the channel will be left in a totally natural, vegetated condition.

The new road crossing over the culvert structure will be designed in accordance with current American Association of State Highway Transportation Officials (AASHTO) design guidelines. In order to accomplish this, the crossing will be widened from an existing width of 25 feet to 49 feet. The additional width will accommodate two 5-foot wide bicycle lanes, and two 7-foot wide raised sidewalks. The widening of the roadway will occur in the *mauka* direction, which means that Ali'i Drive will be slightly realigned for better approach geometry.

After the project is complete, a Conditional Letter of Map Revision (CLOMR) will be submitted to FEMA describing the proposed changes to the flood zone. This will assist in removing portions of properties from the flood zone that was expanded from its natural extent due to the artificial constriction of the channel that occurred when the culvert structure was built in 1937.

Much of the project would occur on TMK 7-5-019:007, a 0.73-acre County property that currently has a cleared and leveled area adjacent to the shoulder of Ali'i Drive, with posts and cables to prevent vehicular entry. The structure fronts a small surf site in Kahului Bay called Tiki's, for which there is currently no parking. The County will utilize some of this property for parking stalls to accommodate the recreational users. Access to the ocean will be through the culverts, as currently, or on the north side of the new structure.

Construction of the project would be phased in order to minimize disturbance to motorists and pedestrians and is expected to last approximately one year. Construction is expected to begin in February 2018. Construction will take place during daytime hours, with two lanes of traffic open at all times. The estimated cost of the proposed action is \$12,000,000.

2.3 Alternatives Evaluated and Dismissed from Further Consideration

The project proponents studied various alternative designs or strategies that had at least some potential to address some or all of the needs and purposes of the project.

2.3.1 Repair Culvert Structure

The County has conducted various structural repairs to extend the useful life of the culvert structure, but issues such as continuing spalls that expose and further corroded reinforcing steel on the underside of the concrete deck have rendered the bridge deck unsafe. As discussed in Section 1.1, the structure is classified both “Structurally Deficient” and “Functionally Obsolete”. Engineers determined as part of a preliminary design analysis that repair and maintenance cannot cope with the present deficiencies of the culvert structure in terms of structural integrity.

Even if the culvert structure were capable of being repaired, it would still have culvert openings too narrow to pass the 100-year design flood. The channel could be dredged to improve performance, but only marginally so without widening of the culvert openings, which would not be possible without weakening the current structure. Furthermore, repair of the culvert structure would not address the need to expand the roadway width to safely accommodate pedestrians and bicycles. The structure is not robust enough to allow a cantilevered bicycle/pedestrian bridge, and therefore a standalone bicycle-pedestrian bridge adjacent to the existing culvert structure would be necessary to provide the needed width unless the culvert structure is replaced. Given the inability to maintain the culvert structure and its hydraulic deficiencies, this would be an expensive and imprudent investment, and it was dismissed from further consideration.

2.3.2 Build on New Location Upstream of Existing Culvert

An alternative to rebuilding the culvert structure in place would be to construct a new structure on a new location upstream of and parallel to the old culvert structure. The culvert is located directly adjacent to the ocean, and therefore any alternative location would need to be *mauka*. However, as shown in Figure 1-2, the north side of the drainageway is fully occupied with single and multi-family homes and there is no rational route to redirect Ali‘i Drive for a crossing *mauka* of the existing one without removing at least one home. In addition, the road geometry of Ali‘i Drive would be degraded by introducing a sharp curve. Private land and at least one home would need to be acquired through purchase or even condemnation to allow this action, adding to the considerable costs. The alternative was considered, but it was determined that the advantages were outweighed by the substantial disadvantages, and it was dismissed from further consideration.

2.3.3 Enlarged Culvert Openings with No Channel Alterations

Enlarging the opening of the culvert without providing channel alterations upstream would allow very limited additional runoff capacity but would not markedly improve the flow, because the existing upstream channel cross section capacity of only 2,240 cubic feet per second (cfs) would

be exceeded by the design flow of 7,110 cfs. Damage to the bridge could occur, and surrounding properties and Ali'i Drive would continue to experience flooding during very large storm events. The other elements of purpose and need related to shoreline processes, structure safety and pedestrian and bicycle traffic would still be satisfied, and the cost as well as visual impacts would be lower. However, because of the failure to satisfy a key element of purpose and need related to flood reduction and bridge safety, the County dismissed this alternative from further consideration.

2.3.4 Enlarged Culvert Openings with Detention Basin

A detention basin with storage of 160 acre-feet would be required to accommodate the runoff of the design storm. At a depth of 15 feet, this basin would take up 10 to 11 acres. It could prevent some of the sediment from the Waiaha Drainageway from reaching the sea, which might be a benefit to coral communities, although it should be noted that under natural conditions this intermittent stream feature has naturally delivered sediment to the ocean throughout its existence. Furthermore, the benefits related to shorelines, structure safety, pedestrians and bicycles, and flooding of adjacent property would still occur.

However, this alternative has many severe disadvantages. It would require an archaeological survey of adjacent private properties beyond the property already owned and previously surveyed by the County of Hawai'i. In this extensive area near the shoreline, it is somewhat likely that archaeological resources would be present that were significant for preservation in place, precluding construction of the reservoir. It would require County acquisition of at least 10 additional acres within an area of very high land values, possibly through eminent domain, a long and contentious process. The area would need to be maintained with very low vegetation and would likely require fencing, and would be a highly unattractive 10-acre feature in the center of residential uses. This could partially be mitigated by landscaping, and some beneficial open-space uses might be possible to combine with the basin. But it would foreclose private residential uses within this acreage for which the area is planned that could substantially contribute to the economy and tax base of the County of Hawai'i. Because of the expense to excavate more than 200,000 cubic yards of material, the cost estimate for this alternative is over \$120 million, as compared to \$12 million for the proposed project alternative. The reasons for the extremely high cost estimate are the substantial excavation in hard basalt and the construction of a large, concrete detention basin and dam structure. As this alternative is extraordinarily costly and is not necessary to solve the problem posed by the dilapidated and undersized culvert structure, it is unlikely that the federal government would share in its cost, which would mean that instead of an estimated \$2.4 million share (based on a 20% County share with an 80% federal match), the County would be required to contribute its share of the culvert improvements plus the cost of the sediment basin, or \$122.4 million. Practically speaking, this would be one of the largest capital projects ever undertaken by the County of Hawai'i and would be difficult to fund. Because of the extremely high cost and substantial environmental impacts, this alternative was dismissed from further consideration.

2.3.5 Enlarged Culvert with Limited Widening and Substantial Deepening

This alternative was conceptualized in order to determine if it would be possible to substantially reduce the 100-foot widening of the inlet of the channel upstream of the culvert. To accommodate the 100-year storm runoff would require a lined channel 16 feet wide and 25 feet deep. However, analysis of the topography indicates that excavation for this channel would result in the channel bottom being over 10 feet below sea level. The channel would thus not be able to drain out, since the channel outlet elevation is the ocean shore, at about 4 feet elevation. There is no practicable way for a channel deepening alternative to pass the runoff of the design storm. It was conceptualized and analyzed to a preliminary level in order to fully investigate different methods for achieving the project's purpose. As it could not meet the project's purpose and need, this alternative was dismissed from further consideration.

2.3.6 Enlarged Culvert Openings with Levee

Installation of a levee along both sides of the existing channel could adequately contain the runoff and prevent overflow for some of the adjacent properties if it were a minimum of 25 feet high. However, the deck of a new roadway crossing at Ali'i Drive is constrained to only 15 feet above the finished ground. Therefore, when the runoff reached Ali'i Drive, its opening size would restrict the flow, which would cause it to overtop the roadway. At that point, the levee would no longer be high enough to contain the channel runoff. There is no practicable way for a levee alternative to pass the runoff of the design storm. In addition, the alternative would cost approximately \$10.7 million more than the proposed action. It was conceptualized and analyzed to a preliminary level in order to fully investigate different methods for achieving the project's purpose. As it could not meet the project's purpose and need, this alternative was dismissed from further consideration.

PART 3: ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES

As discussed in Section 1.1, the site is at the crossing of Ali'i Drive over the Waiaha Drainageway, directly adjacent to the ocean within the *ahupua'a* of Kahului, just south of the downtown area of Kailua (see Figures 1-1 to 1-3). The culvert structure and the immediately surrounding area are referred to throughout this EA as the *project site*. The term *project area* is used flexibly to describe the general environs of Kailua and the North Kona District.

3.1 Physical Environment

3.1.1 Geology, Soils and Geologic Hazards

Environmental Setting

The island of Hawai'i, youngest and largest of the Hawaiian chain, formed from the coalescence of five volcanoes during the last million years. Surface geology at the project site consists of pahoehoe lava flows from Hualālai volcano, which last erupted in 1801. The drainageway at Kahului Bay contains a surface layer of sands, rounded basalt pebbles, cobbles and boulders, and biogenic clasts such as coral chunks and shells.

Soil at the project site *mauka* of the shoreline area is classified within the Waiaha series. These extremely stony silt loams are formed in volcanic ash and occur on 6-12% slopes of Hualālai and Mauna Loa. The surface layer consists of a dark brown, slightly acid, extremely stony silt loam about 4 inches thick. Subsoil is 12-24 inches deep, with several distinct layers, each of which has a fine, granular structure with a variable content of stones that increases with depth. The substratum is pahoehoe lava bedrock. Near sea level, calcium carbonate encrusts the rocks or extends into the cracks of the bedrock (U.S. Soil Conservation Service 1973).

This project (as with all development near Kailua) would be subject to volcanic hazard, particularly lava inundation. According to the U.S. Geological Survey (USGS) hazard classifications, the project area lies within Lava Flow Hazard Zone 4, on a scale of ascending risk 9 to 1. Hualālai erupts less frequently than Kilauea and Mauna Loa. Less than 15 percent of the ground surface within Zone 4 has been covered by lava within the last 750 years (Heliker, 1990:23).

The Island of Hawai'i experiences high seismic activity and is at risk from major earthquake damage (USGS 2000), especially to structures that are poorly designed or built, as the 6.7-magnitude quake of October 15, 2006 demonstrated. The existing culvert was not noticeably damaged as a result of this earthquake. As shown in the photos in Figure 1-3, the channel of the drainageway is generally low and gently sloping, except where artificially elevated to about 10 feet near the roadway. Without retaining walls, this area would be subject to minor sloughing and rockfalls.

Impacts of the No Action Alternative

The No Action Alternative would not avoid geologic hazards and risks, and the culvert structure would be more vulnerable to earthquake shaking if it were not structurally rehabilitated.

Project Impacts and Mitigation Measures

Any construction project on the Island of Hawai'i is subject to at least some hazard from lava flows. There are no practical measures to avoid this impact. A seismic analysis has been conducted as part of the culvert structure design to ensure a sound structure resistant to maximum reasonably expected seismic forces. The culvert structure will be built in conformance with the Uniform Building Code's seismic standards. An improved culvert structure and bridge would provide greater probability of withstanding earthquakes and would help maintain access along this key escape route during natural disasters.

Project design has taken soil properties into account through geotechnical investigations. Drill borings determined that high-quality, non-erodible basalt rock is present. The soil and rock found in the substrate are suitable for construction of the culvert structure and roadway and will pose no special problems nor require extraordinary surface preparation.

3.1.2 Climate and Drainage

The climate in this part of Kona is hot and dry, averaging between 20 and 30 inches of rain annually, with a mean annual temperature of approximately 76 degrees Fahrenheit (U.H. Hilo-Geography 1998:57; Giambelluca et al 2014). Rainfall is highly variable and storms can very occasionally produce significant rainfall in short periods of times, which can cause the normally dry drainages of urban Kona to rise rapidly and flow to the sea.

Floodplain status for the project area has been determined by the Federal Emergency Management Agency (FEMA), which has mapped the area as part of the National Flood Insurance Program's Flood Insurance Rate Maps (FIRM) (Figure 3-1). A summary of applicable Special Flood Hazard Areas (SFHA) designations is as follows:

1. Zone A: SFHAs subject to inundation by the 100-year flood without detailed hydraulic analyses and base flood elevations.
2. Zone AE: SFHAs subject to inundation by the 100-year flood determined in a Flood Insurance Study by detailed methods. Base flood elevations are shown within these zones.
3. Zone X: SFHAs identified in the community flood insurance study as areas of moderate or minimal hazard from the principal source of flood in the area.
4. Zone VE: SFHAs along coast subject to inundation by the 100-year flood with additional hazards due to velocity (wave action). Base flood elevations derived from detailed hydraulic analyses are shown within these zones.



ALI I DRIVE CULVERT REPLACEMENT AT KAHULUI BAY - ENVIRONMENTAL ASSESSMENT

FLOOD INSURANCE RATE MAP

Figure 3-1

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A drainage report was prepared for the project, which is contained in whole as Appendix 5 and is summarized below. The project spans a floodway called Waiaha Drainageway (also called Kahului Drainageway). It has a highly intermittent flow and is unnamed and unmapped on USGS topographical maps. It is a FEMA-studied flood zone from an approximate elevation of 2,000 feet down to its termination at the ocean. Along the way, this drainageway crosses several major thoroughfares including Mamalahoa Highway, Queen Ka‘ahumanu Highway, Kuakini Highway, and Ali‘i Drive. The existing FEMA model shows that this drainageway diverges at three separate locations, creating Waiaha Drainageway Splitflows 1, 2, and 3. Splitflows 1 and 3 eventually converge back to the main Waiaha Drainageway, while Splitflow 2 flows down its own path down to the sea. The entirety of the Waiaha Drainageway can be seen on the FEMA Flood Insurance Rate Map (FIRM) Community-Panel Numbers 155166 0713 D, 155166 0714 C and 155166 0926 E. An AE flood zone that expands to as wide as 800 feet near the coast surrounds the main drainage.

The 100-year peak runoff value at the ocean outlet of the Waiaha Drainageway is officially listed as 7,110 cubic feet per second (cfs). A Letter of Map Revision (LOMR) submitted to FEMA on behalf of the County of Hawai‘i pertaining to the Waiaha Drainageway has recalculated the hydrology of the drainageway and a somewhat higher figure resulted. More steps are required before this figure, or another one that may result from additional studies, is accepted, and FEMA recommended using the current runoff value of 7,110 cfs for the culvert replacement project.

The intermittent drainage has a history of flooding properties and structures on Ali‘i Drive during occasional high-rainfall episodes, most recently on September 15, 2015 (see <https://www.youtube.com/watch?v=A3qExMeoSKA>). The large extent of this flood zone can be attributed to some degree to the impediment to drainage represented by Ali‘i Drive, which is insufficiently mitigated by the current arrangement of box culverts. The existing Ali‘i Drive Culvert is a two-cell culvert constructed out of cement rubble masonry (CRM) and reinforced concrete. The County of Hawai‘i has been obliged to install emergency wooden posts in the middle of each cell for structural support. Each cell has a width of approximately 8 feet, a height of approximately 9 feet, and a length of approximately 30 feet. The drainage report calculated that with the existing longitudinal slope of 1%, this culvert has a theoretical maximum capacity of 2,240 cfs, which is clearly inadequate for the 100-year peak flow value of 7,110 cfs.

In addition to the stream flood hazard area, the area seaward of the road at the project site is classified within the VE Zone (Coastal High Hazard Area). This area is subject to high waves and elevated tides during storms, and also to tsunami damage, and lies within a tsunami evacuation area. Pacific Tsunami Warning Center and County Civil Defense Agency maps indicate that all area *makai* and some area directly *mauka* of Ali‘i Drive should be evacuated during tsunami warnings (<http://www5.hawaii.gov/tsunami/maps.asp>). Large extents of Hawai‘i Island, including parts of the Ali‘i Drive, have been struck by highly destructive tsunami in historic times. The April 1, 1946 tsunami had a run-up in the Kailua area of as high as 13 feet above sea level (U.H. Hilo-Geography 1998:77). The March 11, 2011 tsunami caused some damage in Kailua, but it appears that the culvert structure sustained no noticeable damage.

There is a scientific consensus that the earth is warming due to manmade increases in greenhouse gases in the atmosphere, according to the United Nations' Intergovernmental Panel on Climate Change (UH Manoa Sea Grant 2014). Global mean air temperatures are projected to increase by at least 2.7°F by the end of the century. This will be accompanied by the warming of ocean waters, expected to be highest in tropical and subtropical seas of the Northern Hemisphere. Wet and dry season contrasts will increase, and wet tropical areas in particular are likely to experience more frequent and extreme precipitation. For Hawai'i, where warming air temperatures are already quite apparent, not only is the equable climate at risk but also agriculture, ecosystems, the visitor industry and public health. Sea level rise will flood coasts, degrade coastal ecosystems, erode beaches, and ruin infrastructure in low-lying areas.

Impacts of the No Action Alternative

If no culvert enlargement or channel widening is undertaken, the artificial constriction of the opening to the sea that was created in 1937 by the undersized culverts in the structure at Ali'i Drive will continue to constrain the natural flow of drainage and cause stream flooding to adjacent properties and damage to the roadway. Furthermore, the culvert structure would eventually collapse, restricting drainage to an even greater degree and necessitating emergency repairs that could close down Ali'i Drive altogether for several months.

In addition to severe traffic convenience, the loss of this culvert would have consequences for tsunami evacuations. The National Weather Service of the National Oceanic and Atmospheric Administration operates the Pacific Tsunami Warning Center and Alaska Tsunami Warning Center, which monitors sudden earth movements throughout the Pacific Basin. A tsunami from earth movements in South America would allow for as much as 15 hours warning time and events in the Aleutian Islands, 4.5 hours, providing sufficient time for evacuation of island residents. Sudden movement along faults close to Hawai'i are unpredictable, and would allow for a few minutes to perhaps an hour of warning time, and evacuation would be more problematic. Fortunately, warning sirens are present in several locations nearby and are readily audible on all locations on Ali'i Drive. But if this critical segment of Ali'i Drive were closed for an extended period of time after the culvert structure collapsed and before it could be repaired, tsunami evacuation in the area would be problematic.

The culvert structure is located at sea level, and this structure and the busy local road that it carries are thus vulnerable to the effects of climate change. A modest extent of sea level rise of 1 to 3 feet within the 80-year design lifetime of the structure that is currently anticipated for Hawai'i under moderate scenarios (UH Manoa Sea Grant 2014) would not in itself prove immediately damaging, but two factors would exacerbate the impacts. The site is vulnerable to high waves, and sea level rise will expose portions of the already dilapidated structure that normally do not experience stress from the physical impact of wave energy. Secondly, the artificially constricted and narrow culvert openings already have difficulty passing the 100-year flood. A rise in sea level of more than three feet will reduce the effective cross-sectional area of the culvert, further reducing the ability of the existing culvert to pass the storm. Along with sea level rise, climate change may bring more extreme storms with greater runoff that would

invalidate current calculations of 100-year flood events. The No Action Alternative would thus leave the structure highly vulnerable to the effects of sea level rise.

Project Impacts and Mitigation Measures

As described in Section 2.2, and illustrated in Figure 1-4, the structure will utilize a single span concrete bridge with a width of 67.35 feet, a minimum height of 8.13 feet at the downstream end, a minimum height of 9.2 feet at the upstream end, and a centerline length of 51 feet. The channel will be a trapezoidal channel with a bottom width of 67.35 feet, a top width of 96.35 feet, a height of 7.25 feet, 2H:1V side slopes, and a centerline length of 130 feet. Just before the channel meets the culvert, the trapezoidal section will transition to a rectangular section that matches the opening. Both the culvert and the channel will have a longitudinal slope of 1.5%. While the abutments will be constructed out of concrete, the floor of the culvert will be left in a natural condition, with sand and cobbles. The sides of the channel will be constructed of grouted rip-rap (GRP).

According to County of Hawai‘i Standards, (unlined) natural channel bottom (rock, smooth and uniform) has a Manning’s n value of 0.035 with maximum permissible velocity of 15 feet per second, and grouted rip-rap has a Manning’s n value of 0.025, with maximum permissible velocity of 20 feet per second. Hydraflow Express Extension for Autodesk® was utilized to perform an initial check on the characteristics of the flow, with the following results:

Average Channel Velocity	17.06 feet per second
Average Channel Freeboard	8.14 feet
Average Bridge Velocity	18.07 feet per second
Average Bridge Freeboard	8.72 feet

The above numbers show that the average freeboard height in the channel is below the minimum height of the channel (8.50 feet) and the freeboard height of the bridge is above the minimum height of the bridge (8.23 feet). However, Hydraflow® assumes a consistent flow has been reached, which only happens in a straight, consistent cross section. Because of the relatively short length of this channel and bridge, the Hydrologic Engineering Center River Analysis System (HEC-RAS) was used to actually model the flow. The HEC-RAS model shows a hydraulic jump just before the transition from trapezoidal section to rectangular section which exceeds the height of the channel. Therefore, a vertical wall was placed at the top of the channel, and the model was run again.

The HEC-RAS model shows that the flow velocity stays between 9.52 and 23.11 feet per second, and the depth plus freeboard height remains below the top of the channel (with the vertical wall), except in one instance using DPW freeboard on the downstream end of the bridge crossing. At this location, the bridge fails to meet the freeboard by less than one inch. Hawai‘i Department of Transportation (HDOT) minimum freeboard is two feet, which remains below the top of the channel at all locations. The theoretical maximum capacity of the bridge and channel are from 9,973 cfs to 14,190 cfs, respectively, with a maximum velocity of 25.50 feet per second. The

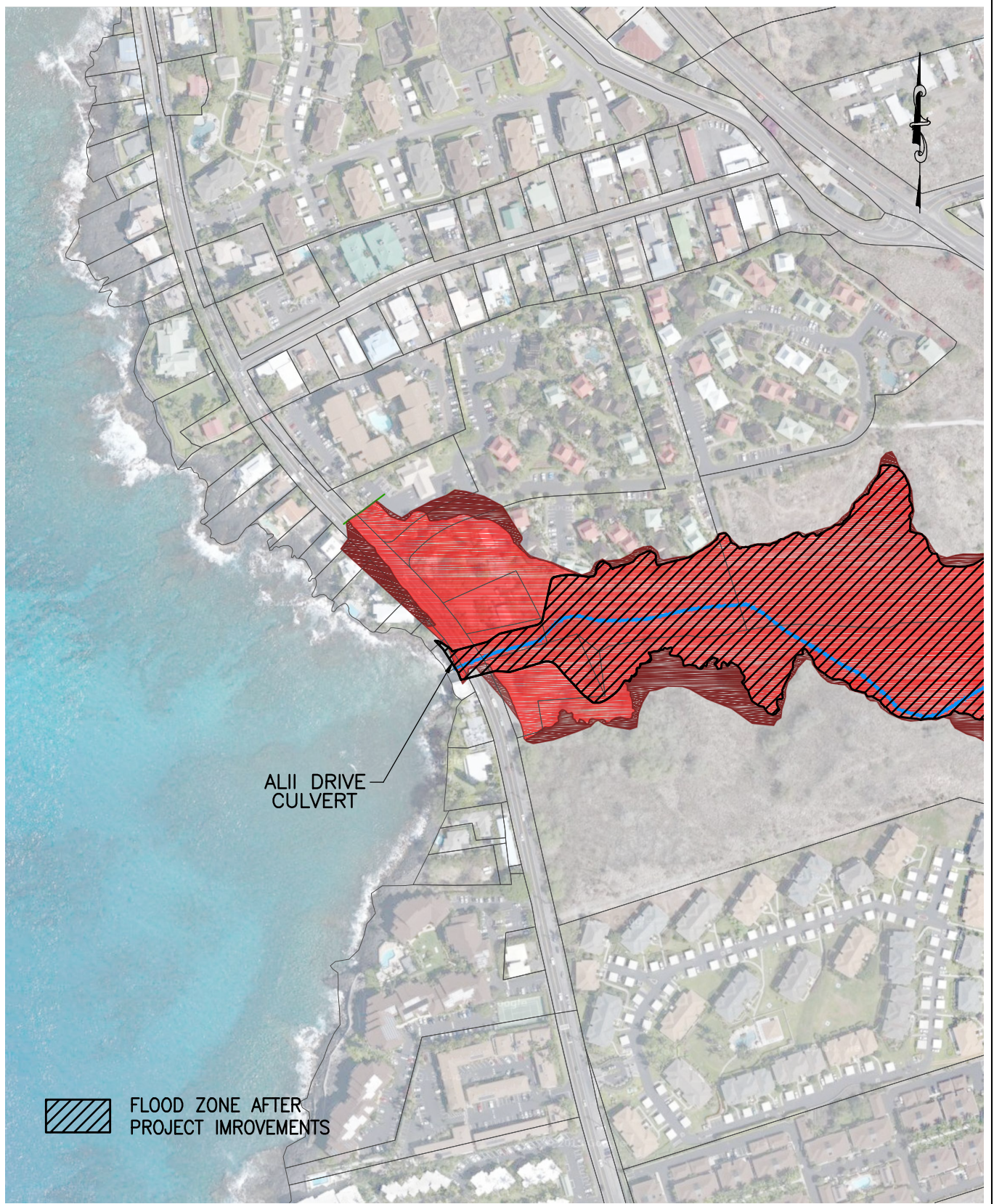
proposed channel and bridge floor will be left unlined, and the design will allow these structures to pass the expected 100-year runoff value of 7,110 cfs within HDOT freeboard criteria. The existing Ali'i Drive Culvert has a capacity of only 2,240 cfs, which is 32% of the capacity needed to convey the flow (not including freeboard).

In terms of its effects on flood control, this expansion of the culvert cross-sectional area would allow higher rates of flow during floods, and grading and reshaping of the channel would promote the proper hydraulic environment for efficient flow through the culverts with minimal turbulence. Modeling conducted as part of the drainage report (see Appendix 5 for details) indicate that the maximum flow velocity would be between 9.39 and 19.32 feet per seconds, and the depth plus freeboard height would remain below the top of the channel. Therefore, it is concluded that the channel and culvert openings will convey the expected 100-year flow as modeled.

This will result in a substantial reduction of the area subject to inundation from the 100-year flood (Figure 3-2). After the project is complete, a Conditional Letter of Map Revision (CLOMR) will be submitted to FEMA describing the proposed changes to the flood zone. It is expected that a Letter of Map Revision (LOMR) would be issued, and that an area as large as 3.8 acres will be removed from the Special Flood Hazard Area and placed in Zone X. No impacts to the Zone VE area is expected.

In addition to the drainage problem which the project is expected to help solve, there is the issue of new structures creating new drainage impacts. In this case, the project will add very minimally to the impermeable surface and will not adversely affect drainage. Construction of this project will add approximately 3,113 square feet of additional pavement to Ali'i Drive, which will result in a 0.21 cfs increase of the 10-year peak flow. This increase is considered to be negligible, and will be allowed to flow off the roadway at the ends of the bridge as it does currently.

Impacts to the natural and beneficial aspects of the stream floodplain associated with the Waiaha Drainageway will not occur. As discussed in Sections 3.1.3 and 3.1.5 below, no stream biota would be affected in any way, as the Waiaha Drainageway is highly intermittent and offers no aquatic habitat. No native aquatic plant species, wildlife, or native or valuable aquatic fauna are present. Except for the use of the culvert to access Tiki's surf site (which will not be permanently affected, as discussed in Sections 3.1.3 and 3.2.1), the drainageway and its floodplain are not used for recreation, scientific study, forestry, agriculture, or hunting. Although alteration of the existing surface will occur, no adverse effects would occur because of this. Groundwater recharge would not be adversely affected, as the area in question is directly adjacent to the sea and does not recharge freshwater aquifers. Most importantly, the ability of the floodplains to moderate floods would be improved.



ALII DRIVE CULVERT REPLACEMENT AT KAHULUI BAY - ENVIRONMENTAL ASSESSMENT

FLOOD MAP BEFORE AND AFTER PROJECT IMPROVEMENTS

**Figure
3-2**

Guidance to federal agencies for addressing climate change issues in environmental reviews was released in August 2016 by the Council on Environmental Quality (US CEQ 2016). The guidance urged that when addressing climate change, agencies should consider: 1) the potential effects of a proposed action on climate change as indicated by assessing greenhouse gas emissions in a qualitative, or if reasonable, quantitative way; and, 2) the effects of climate change on a proposed action and its environmental impacts. It recommends that agencies consider the short- and long-term effects and benefits in the alternatives and mitigation analysis in terms of climate change effects and resiliency to the effects of a changing climate. The State of Hawai‘i encourages a similar analysis, as reflected in Hawai‘i Revised Statutes §226-109.

Energy would be required for production of materials to be used in the new culvert, such as cement and steel, and also in assembling and constructing the project, especially earthmoving with heavy equipment and concrete structure erection. This process would inevitably release greenhouse gases to the atmosphere and contribute to global warming. The County is unaware of any alternate structures or construction methods that would address the project’s purpose and need but accomplish it with lower greenhouse gas emissions.

The proposed culvert replacement would provide a new, robust structure with greater flood outlet capability. This would reduce the vulnerability of the structure and the critical roadway above it and increase resilience to the effects of modest sea level rise and storm runoff.

Extreme climate change could raise sea level by 10 feet or more. The speculative nature of this risk and the long time scenario indicates that it is still prudent to construct the project as planned. This would allow the County to realize its benefits for a period of many decades, rather than fail to implement it and soon lose a critical link on Ali‘i Drive. However, at some point in the future, the entire coastal transportation network may well require relocation to higher elevations.

3.1.3 Waters of the U.S. and Freshwater and Marine Water Quality and Habitat

Water Bodies and Waters of the U.S.

The Waiaha Drainageway is the only freshwater feature in the area, although it generally flows less than once a year and standing water does not persist longer than several hours. No lakes, anchialine ponds, springs or freshwater features are present. The only other water body in the vicinity of the project site is the Pacific Ocean, specifically the embayment of Kahului Bay, directly adjacent to the culvert outlet.

According to the latest EPA guidance (http://www.epa.gov/indian/pdf/wous_guidance_4-2011.pdf), based on the EPA’s interpretation of the Clean Water Act (CWA), implementing regulations and relevant case law, the following waters are considered waters of the U.S. protected by the CWA:

- Traditional navigable waters;
- Interstate waters;

- Wetlands adjacent to either traditional navigable waters or interstate waters
- Non-navigable tributaries to traditional navigable waters that are relatively permanent, meaning they contain water at least seasonally; and
- Wetlands that directly abut relatively permanent waters.

In addition, the following waters are protected by the Clean Water Act if a fact-specific analysis determines they have a “significant nexus” to a traditional navigable water or interstate water:

- Tributaries to traditional navigable waters or interstate waters;
- Wetlands adjacent to jurisdictional tributaries to traditional navigable waters or interstate waters; and
- Waters that fall under the “other waters” category of the regulations.

The U.S. Army Corps of Engineers (USACE) is the agency with jurisdiction over waters subject to the Clean Water Act. The USACE was consulted to determine if it agency had information on waters of the U.S. In a response to early consultation for the EA (see Appendix 1a), the USACE noted that with regard to the specific case:

“For non-tidal waters, the lateral limits of the Corps’ Section 404 jurisdiction extend to the ordinary high water mark [OHWM] and/or the approved delineated boundary of any adjacent wetlands.

In addition, pursuant to Section 10 of the Rivers and Harbors Act of 1899 (“Section 10”; 33 U.S.C. 403) DA authorization is required for any work or structure in, over, under or affecting navigable waters of the United States. Navigable waters are those waters of the U.S. subject to the ebb and flow of the tide (tidally influenced) shoreward to the mean high water mark and/or are presently used, or have been used in the past, or may be susceptible to use to transport interstate or foreign commerce. Section 10 “work” includes any dredging or disposal of dredged material, excavation, filling, or other modification of a navigable water of the U.S. The term “structure” includes any pier, boat dock, boat ramp, wharf, dolphin, weir, boom, breakwater, bulkhead, revetment, riprap, jetty, artificial island, artificial reef, permanent mooring structure, power transmission line, permanently moored floating vessel, piling, aid to navigation, or any other obstacle or obstruction.”

Accordingly, it was necessary to determine: 1) whether Waiaha Drainageway is a water of the U.S., and 2) if the project involves use in areas subject to the ebb and flow of the tide, from the mean high water mark seaward.

The Hawai‘i County DPW and its State and federal partners agencies coordinated with the USACE through a series of emails, letters, meetings and field visits (selected correspondence is contained in Appendix 4). After review of the evidence, DPW determined that the Waiaha Drainageway was a tributary to a traditional navigable water (the sea), which because of the ability to influence water quality in sensitive coastal waters would likely be determined after

systematic review by the USACE to have a significant nexus to the sea. DPW therefore commissioned a stream ecologist to conduct a study of the OHWM and the boundaries of any adjacent wetlands that might be present.

The OHWM is defined in federal regulations [33 CFR 328.3(e)] as:

“... the line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.”

The OHWM of Waiaha Drainageway was delineated on project plans, as shown in Figure 3-3; it was determined that no adjacent wetlands were present. DPW then requested the USACE by letter June 14, 2016 (see Appendix 4) to provide a Preliminary Jurisdictional Determination (PJD) of the limits of jurisdiction based on the results of this study and USACE review. The USACE replied in a letter of August 22, 2016, confirming that it appears waters of the U.S. may be present within the review area in the approximate locations noted on the maps and drawings provided in the June 14, 2016 letter (see Appendix 4).

It was next necessary to calculate the area of waters of the U.S. within the stream channel, between the OHWMs, would be affected by fill or construction, whether permanently or temporarily. As shown in Figure 3-3, this area was calculated at 0.05 acres.

In addition, because the project involves demolition of existing structures and emplacement of new structures near the shoreline, the USACE specified that the mean high water mark should be identified. If any work was occurring seaward of this line, then the Section 404 Permit would also be required to include this area. The mean high water mark is defined by NOAA (<http://www.ngs.noaa.gov/datums/vertical/VerticalDatums.shtml>) as the datum that represents the average of all the high water heights observed over the National Tidal Datum Epoch, which currently extends from 1983 through 2001. Based on topographic survey of the existing and proposed culvert structure on the seaward side, demolition and or construction will not occur seaward of the mean high water mark, meaning that the project does not involve tidal waters that are under the jurisdiction of the USACE (see Figure 3-3). Accordingly, no permit pursuant to Section 10 of the Rivers and Harbors Act should be required for the project.

However, as the project involves fill and construction within 0.05 acres of an intermittent drainage which been preliminary determined to be under the jurisdiction of the USACE under Section 404 of the Clean Water Act, the project will require a Section 404 permit. The USACE Nationwide Permit program is currently undergoing a periodic review. It is expected that the project will apply for Nationwide General Permit No. 14, which applies to Linear Transportation Projects, if this permit type is retained more or less as-is. Currently, based on *Final Notice of Issuance and Modification of Nationwide Permits* published in the Federal Register and authorized on March 19, 2012, this permit covers the following:



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“Activities required for the construction, expansion, modification, or improvement of linear transportation projects (e.g., roads, highways, railways, trails, airport runways, and taxiways) in waters of the United States. For linear transportation projects in non-tidal waters, the discharge cannot cause the loss of greater than 1/2-acre of waters of the United States. For linear transportation projects in tidal waters, the discharge cannot cause the loss of greater than 1/3-acre of waters of the United States. Any stream channel modification, including bank stabilization, is limited to the minimum necessary to construct or protect the linear transportation project; such modifications must be in the immediate vicinity of the project.”

This EA, as well as subsequent NEPA documentation, will be part of materials submitted to comply with these permit requirements.

Marine Water Quality

As stated previously, the Waiaha Drainageway does not have flowing or standing water frequently enough to support wetlands, riparian habitat, seasonal pool complexes, or other water habitat. The main significance of the drainageway is that it funnels runoff into the nearshore waters *makai* of the culvert. The marine area near the culvert is scenic, supports native coral reef based species and recreational activities associated with these, and has the surf break Tiki's. This area is clearly a significant resource that requires protection during the construction and operation of the replaced culvert.

A baseline marine environmental assessment and potential impact analysis of the nearshore areas off the culvert was conducted in March 2014 by Marine Research Consultants, Inc. The report is attached as Appendix 2 and the portion dealing with water quality is briefly summarized in the section below.

To sample water, a survey transect was established seaward of the culvert structure, extending from the shoreline to approximately 800 feet offshore. Water quality was evaluated at 14 locations along the transect (most at two depths) in order to span the greatest range of salinity with respect to potential freshwater efflux at the shoreline. Water quality parameters evaluated included the eleven specific constituents for area-specific criteria for the Kona (West) Coast of the Island of Hawai'i (Chapter 11-54, Section 06 (d) of the State of Hawai'i Department of Health (DOH) Water Quality Standards. These criteria include: total dissolved nitrogen (TDN), nitrate + nitrite nitrogen ($\text{NO}_3^- + \text{NO}_2^-$, hereafter referred to as NO_3^-), ammonium nitrogen (NH_4^+), total dissolved phosphorus (TDP), orthophosphate phosphorus (PO_4^{3-}), Chlorophyll *a* (Chl *a*), turbidity, temperature, pH and salinity. In addition, silica (Si) was also reported because this parameter is a good indicator of groundwater input and mixing.

Results of this baseline study reveal that marine chemistry of the area is dominated by substantial efflux of groundwater at the shoreline, which forms a surface layer of low salinity, high nutrient water. Below the surface layer, water chemistry is essentially oceanic. The values of virtually all the water samples collected exceeded the State Department of Health specific standards for West

Hawai‘i. In some locations, this might signal a large subsidy from human activity such as cesspools, leaking septic tanks, agricultural or urban runoff, etc. However, the natural groundwater is already high in these constituents – low salinity groundwater in Kona typically contains high concentrations of Si, NO₃, and PO₄³. Similar to the patterns of dissolved inorganic nutrients (Si and NO₃-), the distribution of Chl *a* also displays peaks near the shoreline, with a progressively decreasing gradient with distance from shore. Turbidity also displays a pattern of elevated values in the samples collected near the shoreline. However, several values of turbidity in samples collected 100 and 200 feet from shore also displayed high values. Neither Chl *a* or turbidity showed substantial differences between surface and deep samples indicating that these constituents are not a function of groundwater flux. The analysis revealed no evidence of more than negligible input of leachate materials other than from naturally occurring groundwater.

Regulatory Background

The project will be regulated through various permits to ensure that adverse effects to water quality are avoided or fully mitigated. Conformance with conditions of the following permits help to ensure that the proposed improvements achieve their desired effect and that any collateral drainage or water quality impacts associated with the project are mitigated:

- **County Grading and Drainage Plans.** The drainage plan for the project will undergo review, revision and approval by the Hawai‘i County DPW to ensure compliance with laws, regulations and standards related to erosion and sedimentation, storm runoff containment and activities within designated flood zones, pursuant to Chapters 10 and 27 of the Hawai‘i County Code. All projects are required to contain any increase in runoff due to the construction of impermeable surfaces onsite, in conformance with Chapter 27 of the Hawai‘i County Code. Minimal additional impermeable surface will be created by the project. However, in order to minimize the potential for construction phase sedimentation and erosion, the project will be required to conduct earthwork and grading in conformance with Chapter 10, Erosion and Sediment Control, Hawai‘i County Code.
- **Stream Channel Alteration Permit.** Triggered when a project alters stream beds/stream banks in the State, the Department of Land and Natural Resources (DLNR), Commission on Water Resources Management may regulate the project and impose mitigation.
- **National Pollutant Discharge Elimination System Permit.** Stormwater discharges to stream channels are regulated by the EPA and the State Department of Health through Section 402 of the Clean Water Act (CWA) and the National Pollutant Discharge Elimination System (NPDES) program. Because the project will disturb more than an acre of land, and NPDES permit is required. Formulation and description of mitigation measures, including monitoring and maintenance plans, are required.
- **Federal Clean Water Act Permits: Section 401 Water Quality Certification and Department of Army Section 404 Permit.** The project involves the discharge of dredged or fill materials into waters of the United States specifically, the Waiaha Drainageway. It thus would require evaluation and determination by the U.S. Army Corps of Engineers (USACE) of compliance or noncompliance with the Clean Water Act, Section 404(b)(1) Guidelines. None of the proposed construction materials would be

expected to contain any contaminants. A Section 401 Water Quality Certification would also be required from the Department of Health, Clean Water Branch. The Hawai'i State Department of Health classifies the ocean as Class AA waters, the objectives for which are to remain in the natural pristine state as nearly as possible, with an absolute minimum of pollution or alteration of water quality from any human-caused source or action.

As part of all of these plans and permits, a Pollution Control Plan and a Stormwater Pollution Prevention Plan (SWPPP) is being developed as part of preliminary design and will be refined during the final design phase of the project. After approval of the permits listed above, these plans will be implemented prior to, during and after construction. The plans will include general and site-specific best management practices (BMPs).

Impacts of the No Action Alternative

Under the No Action Alternative, no fill in the waters of the U.S. would occur. Sedimentation resulting from construction would not occur, but sedimentation related to water flow during high rainfall events would continue to happen on a very occasional basis.

Project Impacts and Mitigation Measures: Construction-Phase

One of the goals of project design has been to avoid impacts to water quality. However, any project that replaces a culvert within a water of the U.S has the potential, if not properly mitigated, to impact water quality during construction. Contaminants associated with heavy equipment and other sources during construction may impact surface water and groundwater if not mitigated effectively. Construction can also produce uncontrolled excess sediment from soil erosion during and after excavation and construction, which may impact natural watercourses, water quality and flooding.

A variety of best management practices will be implemented to protect waters of the U.S. from stormwater and non-stormwater related discharge or discharge from the construction site.

1. Isolate and confine in-channel construction activities using a stream diversion method that will be chosen by the Contractor.
2. Apply best degree of treatment or control measures to the potential water pollutant discharges associated with the proposed construction activities. This treatment will assure the discharges will meet requirements compatible with the basic water quality criteria applicable to all waters, uses and specific water quality criteria and recreational criteria established for the class of the receiving State waters. Best management practices shall be properly implemented and maintained during the entire construction period.
3. Isolate and confine all upland activity to contain and retain the water pollutants upland and not allow them to enter waters.
4. Collect water pollutants from localized work areas and do not allow these water pollutants to enter or re-enter waters.

5. Contain construction debris and prevent it from entering or re-entering waters. During existing culvert demolition, 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 culvert do fall into the drainage way during demolition, they will be removed from the drainage way without dragging the material along the streambed.
6. Deploy all best management practices around the perimeter of the project prior to the commencement of any construction work. These best management practices will be properly maintained throughout the entire construction period and will not be removed until the work area has returned to its pre-construction condition as demonstrated by the monitoring results (if applicable).
7. Comply with all requirements of the water quality standards (WQS) in the Hawai'i Administrative Rules (HAR), Chapter 11-54, and Section 401 WQC and all information submitted to the Department of Health, Clean Water Branch (DOH-CWB) for compliance with the Notification and Reporting Requirements. Ensure that the activity will not result in non-compliance or violations to the application State WQS. Discharges associated with the proposed construction activities will be conducted in a manner that complies with "Basic Water Quality Criteria Applicable to All Waters" as specified in HAR, Chapter 11-54-4.
8. Immediately cease construction work if water quality monitoring or daily inspection or observation results indicate that noncompliance to HAR, Chapter 11-54-4(a) or Chapter 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. Note: These actions shall not preclude the DOH-CWB from taking enforcement action authorized by law.
9. Do not disturb the area beyond the construction limits. Trees, shrubs, or vegetated areas temporarily damaged by construction operations will be re-vegetated.
10. Apply turf establishment to finished slopes and ditches within 14 days after completion.
11. Provide certified weed free permanent and temporary erosion control measures to minimize erosion and sedimentation during and after construction according to all contract documents (plans, permits, specifications).
12. Protect and care for seeded areas, including watering when needed until final acceptance. Repair all damages to seeded areas by re-seeding, re-fertilizing and re-mulching.
13. Apply permanent soil stabilization as soon as practicable after final grading.
14. Ensure that all temporarily constructed structures, such as silt 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.
15. Ensure that the proposed construction activities related discharges not covered under the any contract documents also comply with State water pollution control permitting

requirements under National Pollutant Discharge Elimination System (NPDES) as established in HAR, Chapter 11-55.

16. Obtain NPDES permit for storm water discharges associated with construction activities when the proposed construction activities will disturb one (1) or more acres of land area before initiating any construction activities.
17. Pesticide application in State water shall comply with HAR, §11-54-4(a), 11-54-4(b), 11-54-4(c), 11-54-4(f) and/or Chapter 11-55, Appendix M – NPDES General Permit Authorizing Point Source Discharges from the Application of Pesticides.
18. Ensure that no concrete truck wash water is disposed by percolation into the ground.
19. Require all contractor(s) performing work covered under this Section 401 WQC, to maintain at the construction site or in the nearby field office, a copy of this letter, all Notification and Compliance Reporting Requirements, and all records demonstrating that every requirement of this Section 401 WQC has been complied with.
20. Ensure that all areas temporarily impacted, either directly or indirectly, by the project construction activities are fully restored to its pre-construction conditions. For example: Incidental construction debris is cleaned up prior to removal of best management practices.
21. Discontinue work during storm events or during flood condition.
22. Modify environmental protection measures, including best management practices and monitoring requirements, when instructed by the DOH-CWB, for corrective and remedial actions.
23. Allow the DOH-CWB to conduct routine inspections of the construction site in accordance with HRS, §342D-8.
24. Complete and submit a Solid Waste Disclosure Form for Construction Sites to the DOH, Solid and Hazardous Waste Branch, Solid Waste Section. The form can be downloaded at: <http://health.hawaii.gov/shwb/files/2013/06/swdiscformnov2008.pdf>.
25. Do not stockpile, store, or place construction material or construction activity-related materials in State waters or in ways that will disturb or adversely impact the aquatic environment.
26. Dispose of construction debris, waste products, vegetation and/or dredged material removed from the construction site at upland State and County approved sites.
27. Contain runoff, return flow, and airborne particulate pollutants from excavated and dredged material dewatering process or stockpile site on land and do not allow to enter or re-enter State waters.
28. Ensure that Contractor discharge activities do 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). The owner of the discharges shall maintain and protect all designated and existing uses.
29. Do not discharge any effluent associated with the proposed construction activities, such as dewatering effluent, effluent resulting from hydroblasting, saw cutting, concrete surface preparation, rock washing, concrete and rock truck washing effluent or any other similar regulated activity(ies). Discharges shall be properly contained, collected and prevented from entering, either directly or indirectly, State waters, except for those

discharges that have received authorization issued by the DOH-CWB under the NPDES Permit, as applicable.

30. Implement appropriate and effective measure(s) to properly contain/collect the potential water pollutant discharges resulting from the application of concrete corrosion inhibitor; or from the scrubbing, chipping, cutting, rebar reinforcing, grouting, filling activities needed for the permitted construction activity(ies).
31. In Hawai‘i, the Commission on Water Resource Management (CWRM) issues permits regulating withdrawals of surface and groundwater. If water drafting is necessary, the Contractor will ensure this water use is approved in accordance with a stormwater use permit obtained from the CWRM (HRS §174C-48(1987)).
32. 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 coffer dams shall be visually monitored daily, especially following precipitation events to ensure these structures are functioning properly.
33. Maintain temporary erosion control measures in working condition until the project is complete or the measures are no longer needed.
34. For dewatering that may be required during excavation or construction of the project, a NPDES General Permit for Construction Activity Dewatering would be required for discharging dewatering effluent into waters of the U.S. The permit will require appropriate best management practices, an erosion control plan, and a water quality monitoring plan to mitigate any impacts on receiving waters.
35. Develop a Rain Event Action Plan (REAP) 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 sensitive waters during the rain event. The REAP will be executed within 48 hours prior to a forecast rain event of 50% chance of precipitation or more. BMPs in the REAP include:
 - a. When the trees are cleared, the slash will be chipped and placed as mulch on the area that has been cleared to prevent raindrop erosion.
 - b. Any area that has soil disturbances will be stabilized prior to rain events with mulch, wood chips, or other protective covers.
 - c. 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.
 - d. Operations will shut down during extreme rain events.
 - e. Fueling and repair areas will be covered and surrounded by a berm.
 - f. Exposed soil will be covered and stabilized.
 - g. Treated materials will be covered or placed in a shed.
 - h. Dumpsters will be covered at all times.
 - i. Drain holes will be plugged.
 - j. Control perimeters will be established around stockpiles of material.
36. Submit a Spill Prevention, Control, and Countermeasure (SPCC) Plan at least two (2) days before beginning work.
 - a. Any spill of petroleum products, hazardous materials, or other chemical or biological products released from stationary sources or construction, fleet, or other support vehicles

shall be properly cleaned, mitigated, and remedied, if necessary. Any spill of petroleum products or a hazardous material shall be reported to the appropriate federal, state, and local authorities, if the spill is a reportable quantity. Response shall occur in accordance with federal, state, and local regulations.

b. In general, when gasoline, diesel fuel, antifreeze, hydraulic fluid or any other chemical contained within the vehicle is released to the pavement or the ground, proper, corrective, clean-up and safety actions specified in the SPCC and SWPPP will be immediately implemented. All vehicles with load rating of two (2) tons or greater will carry, at minimum, enough absorbent materials to effectively immobilize the total volume of fluids contained within the vehicle.

c. Repair leaks immediately on discovery. Equipment that leaks will not be used. Oil pans and absorbent material will be in place prior to beginning repair work. The Contractor will be required to provide the “on-scene” capability of catching and absorbing leaks or spillage of petroleum products including antifreeze from breakdowns or repair actions with approved absorbent materials. A supply of acceptable absorbent materials at the job site in the event of spills, as defined in the SWPPP will be available. Sand and soil are not approved absorbent materials. Soils contaminated with fluids will be removed, placed in appropriate safety containers, and disposed of according to state and/or federal regulations.

d. Collect and dispose of all waste fuels, lubricating fluids, and other chemicals 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 from ordinary high water, and contained properly to ensure that spilled fluids or stored materials do not enter any stream or ocean.

Following selection of a Contractor, additional best management practices may be identified to facilitate different phases of construction. These best management practices will be tracked on the project’s SWPPP.

Some of the structural elements integral to one or more of the BMPS are illustrated in Figure 4d and in Appendix 6. These include:

- 8-foot high dust screen near adjacent homes
- Temporary contractor staging areas with a surrounding silt fence and a stabilized construction entrance
- Sandbags along the stream channel during appropriate phases of construction to prevent entry of construction-related sediment to ocean
- Sandbags along the stream channel bottom at the *makai* (seaward) before seawall and culvert demolition and throughout course of construction to prevent entry of debris construction-related sediment to ocean

These BMPs that will be required of the project in association with permits should ensure that the proposed construction of a culvert and bridge will not have any significant negative or likely even measurable, permanent effects to water quality or marine biota in the neighboring region of Kahului Bay. This conclusion is supported by the fact that the proposed culvert will not alter the conditions that already exist due to the intermittent stream drainage and active wave conditions, which has produced a nearshore boulder-platform with only robust species resistant to stress. Hence, as the proposed project does not represent a unique or different usage, and assuming that best management practices are used during construction work to minimize or eliminate introduction of materials to the ocean, there appears to be little potential for environmental impacts to the marine environment.

Project Impacts and Mitigation Measures: Operational: Water Quality and Sedimentation

It is important to specify that the project consists of simple replacement of an existing culvert, without any other modification of the drainage basin other than reshaping about 0.45 acres at the inlet to protect the structure and allow the water to pass under the bridge without damaging it. No additional sedimentation would be expected as a result of the project. Although the current culvert is inadequately sized to pass larger design flows (i.e., approaching the 100-year event), the area behind the culvert does not offer any substantial floodwater retention space. Even when floodwaters coursing down Waiaha Drainageway overtop adjacent properties, they remain only briefly and exit the culvert within minutes. Because of the steep topography of the drainage way and the slopes on both sides of the channel, there are no storage areas on the sides of the channel such as wetlands or floodplains with deep sediments that ever acted as storage areas for floodwaters. Therefore, floods do not result in ponding behind the culvert that retains sediment.

Coordination with agencies during early consultation and later while determining the permitting pathway for the Section 404 process indicated concern for ongoing sedimentation associated with flood events (see March 8, 2014 letter from the DLNR Division of Aquatic Resources [DLNR-DAR] and the March 7, 2014 letter from the Hawai'i County Planning Department in Appendix 1a; and the minutes of October 8, 2015 NEPA-404 MOU meeting in Appendix 4).

In its letter, the Hawai'i State DLNR-DAR) noted that it had:

...documented several major sedimentation events occurring along the West Hawai'i coastline which resulted in marked coral mortality. These events were apparently triggered by heavy, but not catastrophic (e.g. 100 year events), rainfall compounded by adjacent land alteration.

.....Given that the drainage areas which are served by this culvert are presently largely undeveloped it is even more important to plan for the likely, not too-distant, future when such areas are developed. Such development will almost certainly increase potential threats to nearshore coral reefs by altering the drainage basin and increasing other anthropogenic impacts. Of particular relevancy to the issue of sedimentation impacts on coral reefs is the fact that the Hawaii Administrative Rule governing damage to stony

corals (HAR 13-95) has been amended by DLNR and will presumably shortly be approved by the BLNR. The amended rule now includes penalties for damage to any stony coral by any intentional or negligent activity which was caused by the introduction of sediment, biological contaminants, or pollution into state waters. Both criminal and general administrative penalties can be levied for such damage and fines per specimen may be imposed. For colonial stony corals each damaged head or colony $<1\text{m}^2$ in surface area constitutes a separate specimen. For a coral colony $>1\text{m}^2$ in surface area, each square meter of colony surface area and any fraction remaining constitutes an additional specimen. General Administrative fines can be up to \$1,000 per specimen for a first time violation. Given the ever increasing threats to our highly valuable coral reefs concerted efforts must be taken by the County in this sensitive area to reduce/eliminate the potential deleterious effects of sedimentation events, even if they are infrequent.”

The Hawai‘i County Planning Department stated that “Considerations given to sediment retention during storms should also be examined in the draft EA.”

The minutes from the October 8, 2015 meeting of the NEPA-404 MOU partner agencies indicate that the representatives from NOAA-NMFS explained that hardening of streambeds is a construction method they usually recommend against, as it generally results in an increase in pollutant (sediment) discharge to the marine environment. NOAA-NMFS suggested examination of a design in which the channel geometry could be modified (i.e., become larger) but there would be no artificial hardening.

Each of these comments was carefully considered, and in the end, a design conformant with the suggestions of NOAA-NMFS was developed and selected as the proposed project alternative, as discussed above in Section 2.2. Although the floodwaters will be delivered to the ocean at a slightly faster rate than the current artificially constricted channel allows, there will be a slight lag time due the hydraulic drag of a natural channel bottom as opposed to a concrete bottom. This area also affords a site for deposition of sediment, as currently occurs. The concept of a sediment detention basin was rejected, because it was outside of the project’s scope and did not match the project’s purposes and need, and also would have had severe environmental, scenic, land use and financial costs, as discussed in Section 2.3.4.

3.1.4 Shoreline Processes and Coastal Erosion

It is the policy of Chapter 205, HRS, to discourage all shoreline hardening that may affect access to or adversely alter the configuration of beaches in Hawaii. The discussion in this section focuses on the characteristics of the project and the project site that are relevant to these questions. Importantly, the proposed project 1) *would not harden the shoreline*, and in fact through its widening of culvert cross-sectional area subtracts from the wave-reflective surface and “softens” the shoreline, and 2) *would not affect littoral processes in any adverse way*.

Existing Environment

The shoreline in the area of the culvert, as well as along the coastline within 150 feet to the north and south, is a rocky embayment with a pahoehoe shelf immersed by high tides and/or wave action (see photos in Figure 1-3). typical of the rocky coast environments of Kona. A stone retaining wall about 10 feet high borders Ali'i Drive. The "beach" below contains lag deposits of various sized basalt boulders, coral fragments and small, variable pockets of sand, usually inches in depth. The light-colored sand on this ephemeral beach is derived mainly from steady marine processes, because the very infrequent stream floods provide limited quantities of sediment that are rapidly lost offshore. This area is largely submerged or subject to wave run-up at high tide.

The orientation of the embayment is West, 25 degrees South (or 245 degrees clockwise from true north). Analysis of detailed meteorological data determined that the wave climate in the area is typical of Kona, consisting of extreme waves as high as 23 feet angling in from the southwest, with the most frequent swell at 4 feet and oriented directly towards the bay. The nature of nearshore bathymetry and morphology causes storm waves to break at least 100 feet from the shoreline and culvert. However, substantial longshore and onshore-offshore currents (as great as 15 feet/second) are often generated during high wave episodes, which occur most frequently in the winter but also occur in the summer. In general, the frequent strong waves and currents carry away the small quantity of sand-sized particles that temporarily form a shallow, discontinuous beach, which is most persistent in summer. The tendency for sand to be carried seaward to deeper waters is exacerbated by the massive retaining wall that forms the shoreline here. Currently, the narrow, double-cell culverts provide the only break in this shoreline, which is "hardened" both naturally (lava benches) and artificially (culvert retaining wall). High waves occasionally carry sand, cobbles and coral fragments all the way through the culvert cells and deposit them on the *mauka* side of Ali'i Drive. As the culvert openings tend to reduce wave reflectivity in the retaining wall (and thus reduce current and wave speeds), the sand that does build up in front of the wall often tends to be concentrated near the culverts (see photos in Figure 1-3).

Accounts by longtime residents reveal that a larger beach used to extend much further inland, well *mauka* (inland) of Ali'i Drive, before the 1930s (Curtis Tyler, pers. comm. January 1999; Mike Varney, pers. comm. February 1999; Bobby Command, pers. comm. 2014). The position of the actual shoreline in the 1930s is unknown, but it undoubtedly was *makai* of its current position, as the existence of platted parcels seaward of the road demonstrates (see Figure 1-2). Construction in the 1930s of the roadbed, including the culvert, created a barrier to movement of storm wave water and sediment inland and essentially restricted beach processes to the area *makai* of the road. The effect produced by this barrier and seawalls for homes to the north and south of the culvert probably combined over the years with subsidence of the coastline – which is estimated at about 1.6 inches/decade in this area (UH-Hilo 1998:81) – to cause the shoreline to retreat. The present position of the shoreline is simply the edge of the various seawalls constructed in the mid-20th century (see photos in Figure 1-3). Figure 3-4 is an official map of the shoreline as certified in 1984, with additional locational features superimposed for

orientation. The raised roadbed and its retaining wall have essentially become part of the series of seawalls that form the shoreline here.

Figure 3-5 reproduces portions of aerial photographs from 1970, 1974, 1987, 1993 and 2013. The resolution of the photos does not allow fine calculation of changes in the extent of sand, but it appears that there has been no change in the position of the boulder beach directly adjacent to the culvert structure. Observations since that time indicate that there is a seasonal cycling of the beach profile between bare pahoehoe shelf and boulders in winter and a shallow cover of sand (mostly during summer) appears to be fairly stable and predictable. This is also true at other Kona beaches, notably La‘aloa (aka Magic Sands).

Kahului Bay is also a location for surfing, bodyboarding, and bodysurfing. Locals refer to the area as “Tiki’s” (see photos in Figure 1-3). Waves are generated from a variety of swells, but especially those from the south, which are more prevalent in summer months. The surf break is restricted in area and normally holds one to three surfers (of various types), although the author has seen as many as seven surfers in the water at one time.

Impacts of the No Action Alternative

The No Action Alternative would have no effect on current coastal processes. However, it should be noted that the culvert structure that replaced the existing beach is a highly artificial shoreline feature that promotes wave reflection and prevents the accumulation of sand.

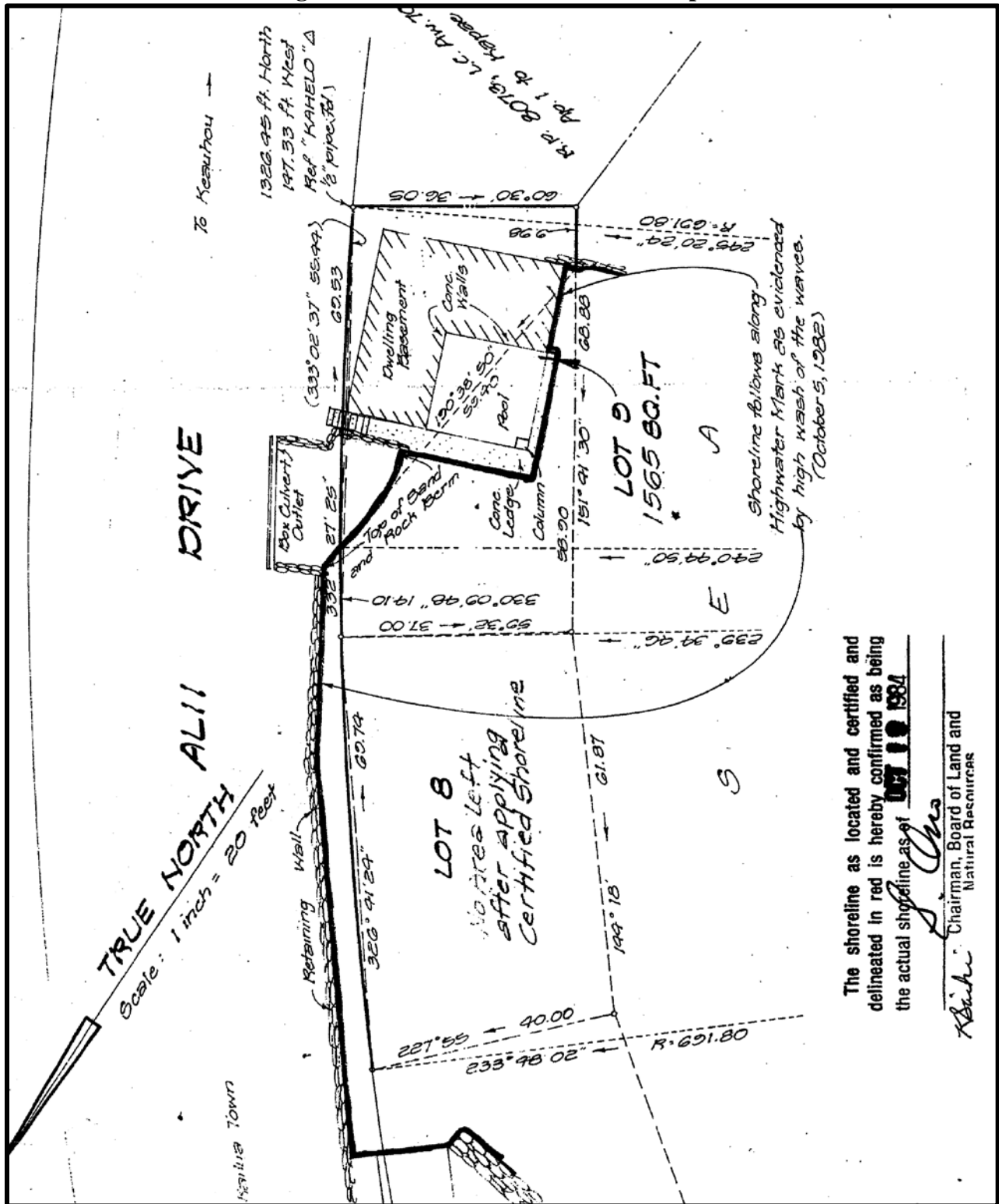
Project Impacts and Mitigation Measures

Accretion/Littoral Transport of Sediment The proposed project essentially consists of a limited “unhardening” of the shoreline. The roadway will retain its current position but there will be a substantial increase in the cross-sectional area of shoreline below it consisting of a culvert openings rather than a wave-reflective seawall (see cross-section of proposed structure in the Site Plan, Figure 1-4b). No appreciable effects are likely, and no adverse effects are anticipated. It is possible that as a result of reduced wave reflection near the new culvert openings, the limited subtidal sand-sized beach deposits that develop and persist for variable amounts of time near the existing culvert will extend north to the area *makai* of the new culvert openings.

Shoreline Position. The shoreline position is currently fixed at the top of the seawall, including the retaining wall of the roadway, and would not change. The proposed project would reconstruct the retaining wall in essentially the same place, albeit with openings that would encourage the deposition and retention of sand *makai* of the fixed shoreline.

Surfing Waves. Modifying the existing culvert structure as proposed would have no influence on the dynamics of wave transformation and thus the location, intensity or other characteristics of surfing waves in the area.

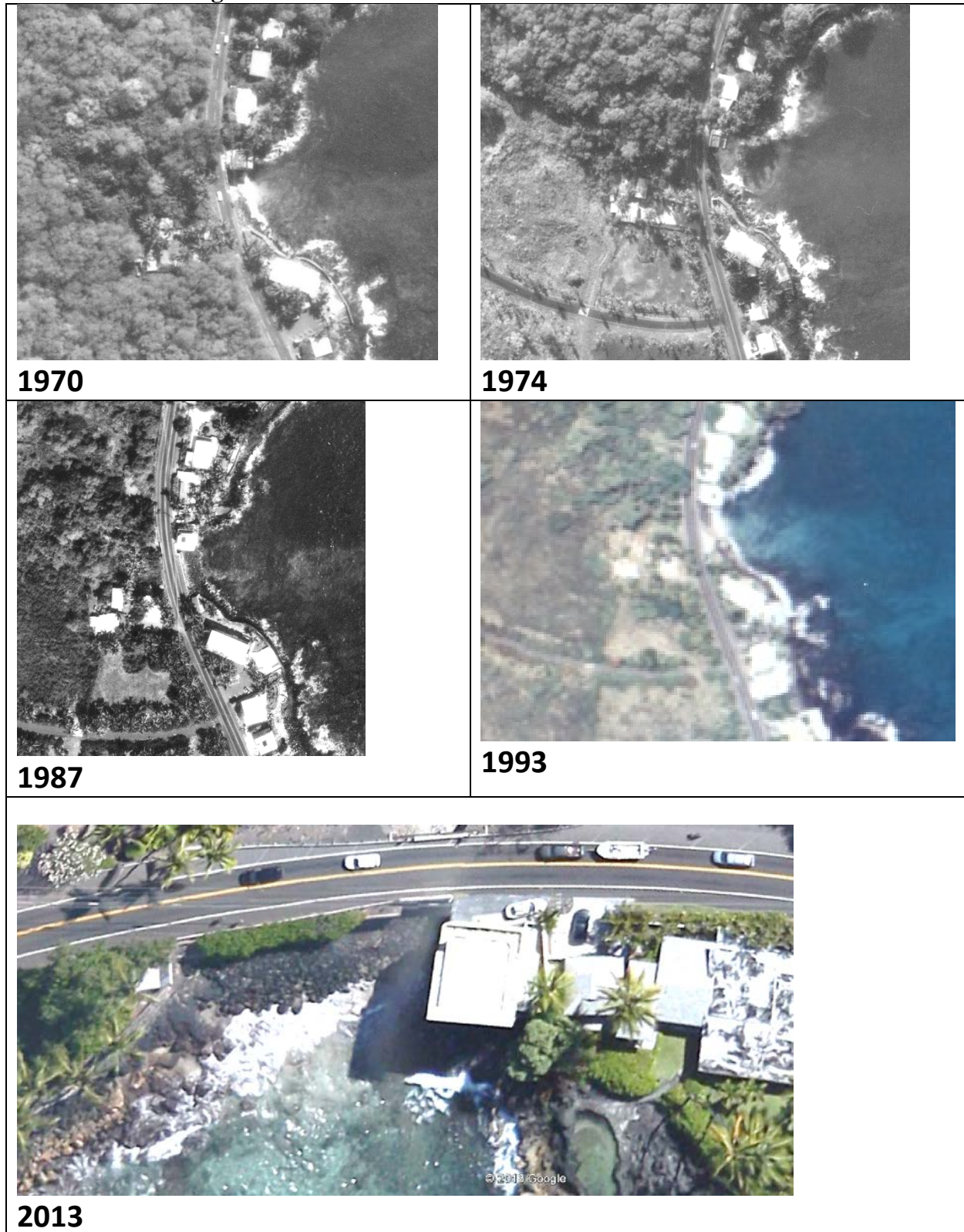
Figure 3-4. 1984 certified shoreline map



The shoreline as located and certified and delineated in red is hereby confirmed as being the actual shoreline as of **October 5, 1984**

[Signature]
Chairman, Board of Land and Natural Resources

Figure 3-5. Aerial Photos of Shoreline at Various Years



Surfing Access. The project will not affect in any permanent way access to the surf site or the tidal area in front of the culvert. During the construction period the culvert, which is one of several ways to access to Tiki's surf site, will be under construction and will not be available for access. Access will continue to be available during construction from the north side of the culvert.

Special Contract Conditions will require the Contractor to maintain a safe and reasonable access way to Tiki's surf site. An alternate access will be provided at all times except during construction activities that for safety reasons prevent such access.

3.1.5 Flora, Fauna and Ecosystems

A terrestrial biological survey of the project site was conducted by Geometrician Associates, LLC. The results of the survey are wholly contained within the section below. A baseline marine environmental assessment and potential impact analysis of the nearshore areas off the culvert was conducted in March 2014 by Marine Research Consultants, Inc. The survey is contained in whole in Appendix 4; portions related to marine biology are summarized in this section. In addition, information and advice were sought from the U.S. Fish and Wildlife Service (USFWS), which provided an initial technical assistance letter of March 24, 2014 (see Appendix 1a) that provided an initial species list, survey recommendations, potential measures to avoid and minimize impacts to federally listed threatened or endangered Hawaiian animals in the project area, and general best management practices for aquatic areas. Many of the best management practices were then incorporated into the project.

Existing Environment: Terrestrial Flora

The original vegetation of the general area was probably Coastal Dry/Mesic Shrubland and/or Forest, per Gagne and Cuddihy (1990), consisting of an open canopy forest of various trees, shrubs, herbs, vines and ferns. The landscape of the Kailua area has been radically changed by centuries of settlement, over a century of grazing, and particularly the development since 1960 of hotels, condominiums, resort homes, commercial centers and associated infrastructure. Alien species invasion has also altered the vegetation such that in many locations native species are few to none. The aliens kiawe (*Prosopis pallida*) and koa haole (*Leucaena leucocephala*) long ago became dominant in the coastal dry forest.

Vegetation in the area to be disturbed by project activities consists of two communities. One is mostly native and is restricted on the project site to a few hundred square feet *mauka* of the culvert opening. The other is alien and dominates the remainder of the project site.

An extent of about 200 square feet of coastal strand vegetation occurs in the ravine behind the culverts, where storm waves that wash through the culvert occasionally deposit sand, wave-worn cobbles, and pieces of coral. Salt derived from such wave episodes and also from aerosols borne through and over the culverts affects the soil here. Plants in the coastal strand vegetation are

mostly natives, including the shrub naupaka (*Scaevola taccada*), the vine pohuehue (*Ipomoea pes-caprae*) and the low-growing 'ilima (*Sida fallax*), with some aliens, including the tree heliotrope (*Tournefortia argentea*) and the indigenous (or possibly Polynesian-introduced) milo (*Thespesia populnea*). This strand flora is common throughout shorelines of Kona and contains no rare species. The extent of strand vegetation found here along with its component species has been observed to vary significantly through time because of wave action under the culvert, droughts and very occasional flow in the drainageway.

The remainder of the project site exhibits the typical alien vegetation of lowland Kona, which is a thorny woodland of kiawe (*Prosopis pallida*), opiuma (*Pithecellobium dulce*), and koa haole (*Leucaena leucocephala*). The understory consists of various alien grasses, shrubs, herbs and vines, notably guinea grass (*Megathyrsus maximus*), fingergrass (*Chloris barbata*), and wild bitter melon (*Momordica charantia*). The native subshrub 'uhaloa (*Waltheria indica*), which is common in disturbed areas, is also present. In addition, the project site includes several landscaped yards or road verges, and areas affected by escapes from cultivation. Bougainvillea (*Bougainvillea glabra*) is the most common such species at the project site.

In all, 27 species of flowering plants, six of them native, were identified from the project site (Table 3-1). No threatened or endangered plants species were found or are expected.

Existing Environment: Terrestrial Fauna

A bird survey conducted on May 18, 2014, from 6:30 to 8:30 AM, included observations on the shoreline, within the gulch, and near the parking lot. Only common, non-native birds were observed, including Japanese white-eye (*Zosterops japonica*), northern cardinal (*Cardinalis cardinalis*), northern mockingbird (*Mimus polyglottos*), common myna (*Acridotheres tristis*), house sparrow (*Passer domesticus*), mourning dove (*Zenaida macroura*), zebra dove (*Geopelia striata*), nutmeg mannikin (*Lonchura punctulata*) and yellow-billed cardinal (*Paroaria capitata*). No native shorebirds were observed, although it would be expected that the three most common native migratory shorebirds, the Pacific golden-plover or kolea (*Pluvialis fulva*), the wandering tattler or 'ulili (*Heteroscelus incanus*) and the ruddy turnstone or 'akekeke (*Arenaria interpres*) would frequently be present *makai* on the rocky shoreline near the culverts. No waterbirds such as ducks, stilts, or night herons were detected in the gulch, nor would they be expected, because of the lack of standing or flowing water during the observation or nearly any other time of the year. The general area completely lacks any freshwater bodies, anchialine pools, wetlands, mudflats or other waterbird resources.

Although not detected during this survey, several endangered birds require discussion. The endangered Hawaiian hawk (*Buteo solitarius*) nests in tall trees and ranges widely around forested, rural and even urban areas. There are no tall trees suitable for nesting sites for Hawaiian hawks at or near the project site.

Table 3-1. Plant Species on Project Site

Scientific Name	Family	Common Name	Life Form	Status*
<i>Abutilon grandifolium</i>	Malvaceae	Hairy abutilon	Herb	A
<i>Asystasia gangetica</i>	Acanthaceae	Chinese violet	Vine	A
<i>Boerhavia coccinea</i>	Nyctaginaceae	Boerhavia	Herb	A
<i>Bougainvillea glabra</i>	Nyctaginaceae	Bougainvillea	Shrub	A
<i>Chamaesyce hirta</i>	Euphorbiaceae	Garden spurge	Herb	A
<i>Chloris barbata</i>	Poaceae	Swollen fingergrass	Grass	A
<i>Clusia rosea</i>	Clusiaceae	Autograph tree	Tree	A
<i>Cocos nucifera</i>	Arecaceae	Coconut	Tree	A
<i>Cordia subcordata</i>	Boraginaceae	Kou	Tree	I
<i>Emilia fosbergii</i>	Asteraceae	Flora's paintbrush	Herb	A
<i>Ficus microcarpa</i>	Moraceae	Chinese banyan	Tree	A
<i>Ipomoea pes-caprae</i>	Convolvulaceae	Beach morning glory	Vine	I
<i>Ipomoea triloba</i>	Convolvulaceae	Little bell	Vine	A
<i>Leucaena leucocephala</i>	Fabaceae	Koa haole	Shrub	A
<i>Megathyrsus maximus</i>	Poaceae	Guinea grass	Herb	A
<i>Momordica charantia</i>	Cucurbitaceae	Wild bitter melon	Vine	A
<i>Pithecellobium dulce</i>	Fabaceae	Opiuma	Tree	A
<i>Pluchea symphytifolia</i>	Asteraceae	Sourbush	Shrub	A
<i>Portulaca oleracea</i>	Portulacaceae	Pig weed	Herb	A
<i>Prosopis pallida</i>	Fabaceae	Kiawe	Tree	A
<i>Ricinus communis</i>	Euphorbiaceae	Castor bean	Shrub	A
<i>Samanea saman</i>	Fabaceae	Monkeypod	Tree	A
<i>Scaevola taccada</i>	Goodeniaceae	Beach naupaka	Shrub	I
<i>Sida fallax</i>	Malvaceae	'Ilima	Herb	I
<i>Sida rhombifolia</i>	Malvaceae	Sida	Herb	A
<i>Thespesia populnea</i>	Malvaceae	Milo	Tree	I
<i>Tournefortia argentea</i>	Boraginaceae	Tree heliotrope	Tree	A
<i>Triumfetta semitriloba</i>	Tiliaceae	Sacramento burr	Herb	A
<i>Waltheria indica</i>	Sterculiaceae	'Uhaloa	Herb	I

* A = alien, E = endemic, I = indigenous, End = Federal and State listed Endangered Species

The endangered Hawaiian petrel (*Pterodroma sandwichensis*) and the threatened Hawaiian subspecies of Newell's shearwater (*Puffinus auricularis newelli*) have been recorded over-flying the general project vicinity between late April and the middle of December each year. The Hawaiian petrel is listed as endangered, and Newell's shearwater as threatened, under both federal and State of Hawai'i endangered species statutes. The primary cause of mortality in both species in Hawai'i is thought to be predation by alien mammalian species at the nesting colonies. Collision with man-made structures is regarded as another cause. Seabirds flying at night, especially fledglings on their way to sea in the summer and fall, can become disoriented by exterior lighting. Disoriented seabirds may collide with manmade structures and, if not killed outright, become easy targets of predatory mammals. No suitable nesting habitat for any seabird species exists at the project site. The principal impact that a construction projects pose to Newell's shearwaters and Hawaiian petrels is potential downing after the birds become disoriented by exterior lighting that might be used for night construction activities, servicing of construction

equipment at night, or streetlights erected for public safety reasons. To reduce the potential for adverse interactions between nocturnally flying seabirds and structures, all external lighting associated with construction is typically properly shielded. It should be noted that a third seabird with somewhat similar habitat and behavior, the band-rumped storm petrel (*Oceanodroma castro*), was listed as endangered in October of 2016.

With the exception of the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*; 'ōpe'ape'a), all terrestrial mammals in Hawai'i are alien species. Mammals were not formally surveyed but were noted when present during the site visits. We saw, heard or detected sign of domestic dogs (*Canis f. familiaris*), feral cats (*Felis catus*), small Indian mongooses (*Herpestes a. auro-punctatus*), various species of rat (*Rattus* spp.) and European house mice (*Mus domesticus*).

The endangered Hawaiian hoary bat was not detected during the course of any surveys. It is, however, probable that this species uses resources within the general project area, as they have been frequently seen on scrub vegetation in kiawe in Kona. The impact that the construction projects pose to bats is during the clearing and grubbing phases of construction. The removal of vegetation may temporarily displace bats that are using the vegetation for roosting. As bats use multiple roosts within their home territories, this disturbance is likely to be minimal. However, during the pupping season, female bats carrying pups may be less able to rapidly vacate a roost site during vegetation removal. Also, adult female bats sometimes leave their pups in the roost tree while they forage, and very small pups may be unable to flee a tree that is being felled. Impact avoidance during construction projects typically consists of avoiding vegetation removal during the pupping season rather than searching for bat roosts, as Hawaiian hoary bats are small and cryptic and very difficult to find in thick vegetation.

Existing Environment: Freshwater Aquatic Biota

As discussed above, the Waiaha Drainageway flows less than once a year, and water generally does not persist longer than several hours. It lacks standing water, riparian habitat, wetlands, springs or known subsurface flow. No stream organisms including fish, molluscs or crustaceans are present. No other special aquatic sites, such as anchialine ponds, are present or adjacent to the area that would be affected by the project.

Existing Environment: Marine Habitat

Overall, the nearshore marine biotic communities in Kahului Bay consist of a well-developed and relatively undisturbed Hawaiian coral reef habitat. The major physical feature of the marine environment is a distinctly zoned marine habitat consisting of a nearshore boulder-platform that is essentially devoid of marine life owing to stress from periodic large surf. With increasing water depth and distance from shore, reef corals occur with increasing density moving seaward. The reef platform terminates at a distinct edge into sand plains. The overarching influence on the reef community structure is the role played by wave impacts. Growth forms of corals all assume robust sturdy forms, and delicate species do not occur.

There are three basic zones. The nearshore boulder and basalt platform zone is essentially devoid of coral growth, as a result of regular periodic seasonal wave stress. A large percentage of the shallow, rocky surface is covered with expansive mats of the purple soft octocoral *Sarcothelia edmondsoni*, which is able to withstand the rigor of wave impact. With increasing offshore distance, boulders become increasingly colonized by corals. The coral that occurs closest to shore is *Pocillopora meandrina*, a sturdy hemispherical coral found throughout shallow boulder zones in West Hawai'i. This species flourishes in zones that are physically too harsh for most other species, particularly due to wave stress. Other early colonizers with respect to distance from shore include *Montipora capitata* and *M. patula*, which assume flat encrusting growth forms. The abundance of corals increases with increasing distance from shore, although species composition is mostly restricted to two primary components, *Pocillopora meandrina* and *Porites lobata*. The latter species occurs as sturdy hemispherical colonies with either smooth or knobby surfaces. *Porites lobata* is the most common coral throughout Hawai'i. It is by far the most common species on the survey reefs in Kahului Bay, covering up to approximately 80% of the solid surface on the outer reef. At the outer edge of the reef platform, fingers of solid rock extending into the sand flats contain the largest colonies of *Porites lobata* on the reef tract.

The other dominant group of macroinvertebrates observed on the reef were sea urchins, the most common of which was *Echinometra matthei*. This small urchin is generally found within interstitial spaces bored into basaltic and substrates. Several crown-of-thorns starfish (*Acanthaster planci*) were observed feeding on colonies of *Pocillopora meandrina*. Numerous sponges were also observed on the reef surface, often under ledges and in interstitial spaces. Frondose benthic algae are conspicuously rare on the outer reefs of West Hawai'i. Several plants were observed, however, in the Kahului Bay survey area. Most common in the surge zone was *Ahnfeltiopsis concinna*, which grew on the shoreline boulders. On the reef, the most common species were the encrusting red calcareous algae (e.g., *Porolithon* spp., *Peysoneilia rubra*, and *Hydrolithon* spp.). These algae were abundant on bared limestone surfaces and on the nonliving parts of coral colonies. Frondose algae were rare on the reef surface. The only common form was the brown alga *Sphacelaria furcigera*.

The reef fish community in Kahului Bay was typical of that found along most of the Kona Coast. In the nearshore surge boulder-platform and boulder sand zones, Acanthurids (surgeonfish) were most common, often occurring in large mixed species schools moving over the reef. Juvenile fish belonged mostly to the family Acanthuridae (surgeon fish), with representatives from the families Labridae (wrasses) and Chaetodontidae (butterfly fish). Planktivorous damselfish, principally of the genus *Chromis*, were most abundant on the outer reef, where coral was most abundant. The blackfin chromis (*Chromis vanderbilti*) was very abundant along the outer edge of the shelf and in deeper water. Black durgon (*Melanichthys niger*) were also observed congregating in the water column over the reef platform. Herbivores normally common on reefs in Kona, primarily the yellow tang (*Zebrasoma flavescens*) and goldring surgeonfish (*Ctenochaetus strigosus*), were also abundant. Few species of "food fish" taken by subsistence and/or recreational fishermen were observed during the survey.

The project site's location, directly offshore of an existing intermittent stream mouth that periodically discharges to the ocean, indicates that the community also experiences episodes of runoff and the effects of associated sediment. These results indicate that the existing communities are pre-adapted to relatively harsh conditions.

Four species of marine animals that occur in Hawaiian waters have been declared threatened or endangered by federal wildlife agencies. The threatened green sea turtle (*Chelonia mydas*) occurs commonly along the Kona Coast, and is known to feed on selected species of macroalgae. Three small green sea turtles were observed swimming in the water during the course of the survey. No basking turtles were observed. The endangered hawksbill turtle (*Eretmochelys imbricata*) is known infrequently from waters off the Kona Coast. Populations of humpback whales (*Megaptera novaeangliae* – recently taken off the endangered species list) winter in the Hawaiian Islands from December to April. The present survey was conducted in March when whales are present in Hawaiian waters. However, the shallow depths of the site in Kahului Bay likely preclude whales from approaching within the direct vicinity of the project site. The Hawaiian monk seal (*Monachus schauinslandi*) is an endangered earless seal that is endemic to the waters off of the Hawaiian Islands. Monk seals commonly haul out of the water onto sandy beaches to rest. As the shoreline in the subject area consists primarily of boulders, it would not appear to present an optimal location for seal haul-out.

Impacts of the No Action Alternative

The No Action Alternative would avoid any disturbance of existing biological conditions. At the same time, however, retaining the artificially constricted channel and its large seawall would continue to minimize the natural shoreline area and the beneficial habitat associated with it.

Project Impacts and Mitigation Measures

The biological effects of the project would be limited to the 0.45 acres directly disturbed by the project in the construction area, in and directly adjacent to the culvert structure and the excavated channel upstream. This involves about 0.05 acres within the jurisdictional limits of the Waiaha Drainageway. Aside from a few common native plants in a 200-square foot area just upchannel from the culvert, the project site is dominated by non-native species, and no rare, threatened or endangered plant species or rare plant communities are present. No disturbance will occur on the shoreline area *makai* of the mean high water mark.

As discussed above, several terrestrial animals or marine animals that utilize shorelines above the mean high water mark and are listed by the federal and State governments as threatened or endangered are present in most areas of the island of Hawai'i. Depending on species, each could potentially overfly, roost, nest, bask or otherwise be present or utilize resources in the project area. These include the Hawaiian hawk, Hawaiian hoary bat, Hawaiian petrel, Newell's shearwater, band-rumped storm-petrel, green sea turtle, hawksbill turtle, and Blackburn's sphinx moth. Information on the habitat and behavior of these animals, along with a draft list of measures that the proponent agencies considered to avoid adverse effects to these species, was

provided in a November 15, 2016, Section 7 Endangered Species Act letter to the USFWS (see Appendix 7). After reviewing the letter, the USFWS issued a Section 7 Informal Consultation letter on December 15, 2016 (see Appendix 7), that included the avoidance and minimization measures along with additional measures. With incorporation of these measures into the project, the USFWS concurred with the agency determination that the proposed project may affect, but is not likely to adversely affect, the Hawaiian hawk, Hawaiian hoary bat, Hawaiian petrel, Newell's shearwater, band-rumped storm-petrel, green sea turtle, hawksbill turtle, and Blackburn's sphinx moth.

The following mitigation measures will be incorporated into the project in order to avoid impacts to these listed species.

- For Hawaiian hoary bats (*Lasiurus cinereus semotus*), no woody plants over 15 feet tall will be removed, cut, or trimmed during the sensitive bat pup-birthing and rearing season of June 1 to September 15. If a bat is present at the project site, the area will be avoided. If a bat arrives in the construction area after work begins, work will cease until the animal leaves on its own accord. No barbed wire will be used for any fencing (temporary or permanent). Field cards with pictures of the Hawaiian hoary bat will be distributed to the Contractor to assist in identifying this species should it occur in the project area.
- For Hawaiian hawks (*Buteo solitarius*), no brush or tree clearing will occur during the hawk nesting season of March through September. If this time period cannot be avoided, a hawk nest search will be conducted by a qualified biologist, within 1,600 feet (500m) of the project site and pre-disturbance surveys will be conducted within 14 days prior to construction activity. If surveys determine the presence of Hawaiian hawks nesting in the action area or within 1,600 feet of the action area, the Service will be contacted immediately to develop appropriate avoidance and minimization measures dependent upon the site-specific information. An environmental awareness sheet with pictures of the Hawaiian hawk (adults, chicks, and juveniles) and nests will be distributed to the Contractor to assist in identifying this species should it occur in the project area. The awareness sheet will also include instructions concerning protocols to avoid and minimize impacts to Hawaiian hawks if they are observed on the site.
- For the endangered Blackburn's sphinx moth (*Manduca blackburnii*), the project area will again be surveyed for the presence of larval host plant immediately prior to the beginning of construction. If possible, this survey will occur approximately four to eight weeks following significant rainfall and during the wettest portion of the year. If larval host plants are found during this second survey the USFWS will be contacted. If the project uses imported gravel or dirt fill at the project location, the fill will be from a source that is certified weed free or a plant survey will be conducted around the area where the fill will be extracted. Field cards with pictures of the Blackburn's sphinx moth, moth larvae, and tree tobacco will be distributed to the Contractor to assist in identifying this species should it occur in the project area.
- For the endangered Hawaiian petrel (*Pterodroma sandwichensis*), the threatened Newell's shearwater (*Puffinus auricularis newelli*), and the endangered band-rumped storm petrel (*Oceanodroma castro*), all outdoor lights will be fully shielded so the bulb

can only be seen from below bulb height and only used when necessary. Nighttime construction will be avoided during the seabird fledging period of September 15 to December 15. Field cards with pictures of seabirds will be distributed to the Contractor to assist in identifying this species should it occur in the project area.

In order to reduce impacts to the shoreline and marine environment and the organisms it contains, including threatened green sea turtle (*Chelonia mydas*), the endangered hawksbill turtle (*Eretmochelys imbricata*), the formerly endangered humpback whale (*Megaptera novaeangliae*), and the endangered Hawaiian monk seal (*Monachus schauinslandi*), a number of measures will be undertaken:

- The installation of sand bags *mauka* of the high water mark that is being undertaken to prevent construction-related sediment and debris from entering the ocean during construction activities will be positioned so that no sea turtles may become trapped behind the sand bags and thus restricted from accessing the ocean.
- All construction debris that may pose an entanglement hazard to listed species will be removed from the proposed project site if such materials are not being actively used. All construction debris will be removed at the conclusion of work.
- The project will conserve the maximum area of natural drainage channel to reduce impacts to the marine environment. This will be ensured by avoiding placement of fill or structures in the drainage bed for temporary diversion or construction purposes, and by minimizing any stream hardening (including concrete channelization) associated with the bridge replacement.
- Turbidity and siltation from project-related work will 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.
- Any project-related materials and equipment (dredges, barges, backhoes, etc.) to be placed in the water will be cleaned of pollutants prior to use. It should be noted that no such equipment is currently planned to be used within any water body.
- No project-related materials (fill, revetment rock, pipe, etc.) will be stockpiled in the water (intertidal zones, reef flats, stream channels, wetlands, etc.) or on beach habitats.
- Any debris removed from the marine/aquatic environment will be disposed of at an approved upland site.
- No contamination (trash or debris disposal, non-native species introduction, attraction of non-native pests, etc.) of adjacent habitats (reef flats, channels, open ocean, stream channels, wetlands, beaches, forests, etc.) will be allowed to result from project-related activities.
- Fueling of project-related vehicles and equipment will take place away from the water and a contingency plan to control petroleum products accidentally spilled during the project will be developed. Absorbent pads and containment booms will be stored onsite, if appropriate, to facilitate the clean-up of accidental petroleum releases. Any under-layer fills used in the project will be protected from erosion with stones (or core-loc units) as soon after placement is practicable.

- Any soil exposed near water as part of the project will be protected from erosion (with plastic sheeting, filler fabric, etc.) after exposure and stabilized as soon as practicable (with native or non-invasive vegetation matting, hydroseeding, etc.).

Many of these BMPs have already been specified for the project in order to reduce impacts to water quality, as discussed in Section 3.1.3.

It should be noted that in its first, technical assistance letter of March 24, 2014, the U.S. Fish and Wildlife Service recommended that construction timing also avoid the breeding season of the endangered Hawaiian stilt (*Himantopus mexicanus knudseni*), which is February through August of each year. Because there is no permanent water or any other waterbird habitat associated with the Waiaha Drainageway, no Hawaiian stilts are known to have ever been observed in the area and none are likely to be present.

As part of NEPA documentation, the project proponents are consulting with the National Marine Fisheries Service under the Endangered Species Act and other federal laws, as discussed in Section 3.7.12. Additional avoidance and mitigation measures may be adopted by the project to avoid adverse effects to the humpback whale (*Megaptera novaeangliae*) and the listed marine species discussed above, specifically the threatened green sea turtle (*Chelonia mydas*), the endangered hawksbill turtle (*Eretmochelys imbricata*), and the endangered Hawaiian Monk Seal (*Monachus schauinslandi*).

3.1.6 Air Quality

Existing Environment

As discussed in Section 3.1.2, the climate of the Kailua area can be described as mild and semi-arid due to its location on the leeward side of the island. The most important aspect of the climate in influencing air quality is the wind regime. Winds in the area exhibit a daily reversal, with light sea breezes during the daytime (peaking in the afternoon) and a shallow mountain drainage wind from the east at night. Wind speeds are generally light and seldom exceed an average daily speed of 10 miles per hour. Light and variable westerly “kona” winds occasionally replace this pattern, most often in winter (UH-Manoa, Dept. of Geography 1998).

The state and federal governments periodically monitor air quality to determine whether it meets ambient air quality standards (AAQS). These are specified for pollutants produced by motor vehicles, including particulate matter, sulfur dioxide (SO₂), nitrogen dioxide (NO₂), carbon monoxide (CO), ozone O₃, and lead. Areas that do not meet standards are termed non-attainment areas and are subject to Conformity Rules. These rules were issued by the Environmental Protection Agency (EPA) in response to Section 176 of the 1977 Clean Air Act. Conformity Rules prohibit any federal agency from engaging in any actions that do not conform to a state’s plan to correct nonattainment situations. The entire State of Hawai‘i is considered to have acceptable air quality and is thus an attainment area not subject to application of Conformity Rules.

Air quality in the project area is somewhat affected by emissions from motor vehicles, industry and natural sources. Volcanic emissions of SO₂ from Kilauea Volcano convert into particulate sulfate, forming a volcanic haze, locally called vog. Vog becomes trapped in the Kona atmosphere because of the diurnal wind reversal, which creates a largely closed airshed system. Manmade air pollution sources include oil-fired power plants, which emit SO₂, nitrogen oxides, and particulate matter (PM), and motor vehicles, which emit CO, nitrogen oxides and hydrocarbons (an ozone precursor), as well as smaller amounts of other pollutants.

The State of Hawai‘i operates a network of air quality monitoring stations around the State, including one at Konawaena High School, about 10 miles south of the project site, at one of the areas of Kona most affected by vog. Systematic data are not available for most criteria pollutants in Kona except SO₂ and particulates (PM 2.5, or particulate matter less than 2.5 microns in diameter), which are of concern because of their association with vog. According to the Hawai‘i State Department of Health (HDOH), the average highest monthly 1-hour concentration of SO₂ slightly exceeded the federal 1-hour standard at least once during three months in 2014 (the latest year for which data is fully available). Monthly standards were not exceeded in Kona. Monthly 24-hour PM 2.5 levels did not exceed federal standards, although the standards were approached during several winter months http://health.hawaii.gov/cab/files/2015/09/aqbook_2014.pdf; accessed March 2017). It is generally accepted that other criteria pollutants are well within standards, at least on a regional basis. The excellent air quality for pollutants other than particulates and SO₂ is owing to the isolation of the island from any outside sources of pollution. However, carbon monoxide concentrations may be exceeded on occasion near high-volume intersections during periods when traffic congestion and poor dispersion conditions coincide.

Impacts of the No Action Alternative

The No Action Alternative would have no temporary or permanent effect on existing air quality. However, it should be noted that the No Action Alternative would ultimately lead to closure of the culvert structure, and detours associated with the loss of this critical transportation route during the time necessary for design and construction of the structure would also generate increased fuel use and congestion, with associated air quality impacts. As the County would almost certainly decide to rebuild, the same air quality impacts associated with construction would also eventually occur.

Project Impacts and Mitigation Measures

The culvert structure replacement will not increase or decrease the motor vehicle capacity of the roadway, alter Level of Service, or change the position of the roadway. Therefore no permanent impacts to air quality impact or noise are expected.

Construction-phase impacts have the potential to produce fugitive dust emissions, causing elevated particulates. State of Hawai‘i Air Pollution Control Regulations (Chapter 11-60, HAR) prohibit visible emissions of fugitive dust from construction activities beyond the property line.

Thus, an effective dust control plan for the project construction phase has been developed and will be implemented. Construction plans will require that all areas disturbed by construction activities shall control dust emissions to the maximum extent practicable through the application of BMPs that may include watering with trucks or sprinklers, erection of dust fences, limiting the area of disturbance, and timely grassing of finished areas.

Onsite mobile and stationary construction equipment also would emit air pollutants from engine exhaust. The largest of this equipment is usually diesel powered. Nitrogen oxide emissions from diesel engines can be relatively high compared to gasoline-powered equipment, but the standard for nitrogen dioxide is set on an annual basis and is not likely to be violated by short-term construction equipment emissions. Carbon monoxide emissions from diesel engines, on the other hand, are low and should be relatively insignificant compared to vehicular emissions on nearby roadways.

In addition, to avoid air quality impacts from slow-moving construction vehicles traveling to and from the site on major roadways, heavy construction equipment will be moved on-site during periods of low traffic volume.

3.1.7 Noise

Existing Environment

Noise levels on the site are moderate and are derived mainly from motor vehicles and road maintenance on Ali'i Drive. Other sources include occasional construction, landscape maintenance and other residential activities, and natural sources, including ocean waves. Noise-sensitive receptors within 100 feet of the culvert structure and stream grading area include five residences and a hotel/visitor condominium.

Impacts of the No Action Alternative

The No Action Alternative would involve no construction noise, at least for the time being. However, the No Action Alternative would ultimately lead to closure of the structure, and detours associated with the loss of this critical transportation route during the time necessary for design and construction would also generate traffic noise impacts. As the County would almost certainly decide to rebuild, the same noise impacts associated with the proposed alternative of culvert structure replacement would also eventually occur.

Project Impacts and Mitigation Measures

Noise impacts would occur during removal of portions of the culvert structure, grading of approaches, excavation of the stream channel, and construction of new culvert structure elements. These activities would generate noise exceeding 95 decibels at times, impacting nearby areas. In cases such as here where construction noise is expected to exceed the Department of Health's (DOH) "maximum permissible" property-line noise levels, contractors

are required to obtain a permit per Title 11, Chapter 46, HAR (Community Noise Control) prior to construction. DOH will review the proposed activity, location, equipment, project purpose, and timetable in order to decide upon conditions and mitigation measures, such as restriction of equipment type, maintenance requirements, restricted hours, and portable noise barriers.

3.1.8 Scenic Resources

The Hawai‘i County General Plan (Hawai‘i County 2005:7-12) notes regarding scenic resources in North Kona that:

“The Kona districts have long attracted people because of their natural beauty. Although man-made structures are in some places dominant, the vast expanse of the Kona landscape is still the area's most striking feature. North Kona, in the area called Kekaha, is characterized by a sense of openness created by expansive areas of lava flows. Vegetation on the lava is comprised of low pockets of grasses and scrub trees. From the coastline, the land climbs slowly to the distant saddle plateau between Mauna Kea and Mauna Loa. This long natural grade also contributes to the sense of openness and space. The rest of North Kona is dominated by Hualālai. Its steep slopes provide a green backdrop when viewed from the coast, or spectacular views of the coastline, ocean and horizon from higher elevations. Part of Kona’s natural beauty is also due to the wide range of climatic conditions in a relatively short distance. Such variations extending from the coastal areas to the higher elevations are evidenced by changes in vegetation, producing a wide scope of different physical environments.”

The culvert itself lacks scenic value, but the roadway provides a passing view of an attractive shoreline area and a surfing site (see photos in Figure 1-3). This, along with the more extensive shoreline frontage near Kamo‘a Point (Lyman’s surf spot) and Kahalu‘u County Beach Park, is one of the few stretches along Ali‘i Drive where development does not block ocean views.

Impacts of the No Action Alternative

The No Action Alternative would involve no scenic impacts, for the current time. However, the No Action Alternative would ultimately lead to closure of the culvert structure, and the same temporary construction impacts that would occur under the proposed action would also eventually occur.

Project Impacts and Mitigation Measures

The Hawai‘i County General Plan does not specifically list the view of Kahului Bay as one of the examples of Natural Beauty Sites, but it calls for preserving the quality of areas endowed with natural beauty and protecting scenic vistas and view planes from becoming obstructed (Cross-reference: Section 3.6). Impacts to views will occur during construction, as equipment intrudes and blocks views. These minor and temporary scenic impacts would not require mitigation. Permanent adverse visual impacts, such as interference with scenic views or insertion

of incongruous or clashing visual elements, would not occur. The rebuilt roadway at the top of the culvert structure has been designed so that the guard rails are similar to those historically present and maintain the existing scenic views of the shoreline. This will enhance views through removal of jersey barriers that the County has been obliged to place on the deteriorating bridge for safety purposes.

3.1.9 Hazardous Substances, Toxic Materials and Hazardous Conditions

Existing Environment, Impacts and Mitigation Measures

No known hazardous substances are present. Although it is unlikely that any potentially hazardous, toxic or radioactive waste would be found on the project site, reasonable precautions will be undertaken in the context of the project construction best management practices to include provisions for the appropriate response and remediation should any such hazardous, toxic, or radioactive material be encountered during the construction phase of the project.

3.2 Socioeconomic and Cultural

3.2.1 Socioeconomic Characteristics

Existing Environment

The project would affect and benefit all users of Ali'i Drive in the project area, including residents, visitors, businesses, schools and emergency service providers. Ali'i Drive is the key coastal route of the urban area of Kona, linking various visitor, residential and recreational areas with commercial centers in Kailua and Keauhou.

Kona was an important region in pre-Western Contact Hawai'i, a center of political power and population. After 1850 it became a sleepy rural district of scattered coffee farms and cattle ranches. Tourism was quite modest until the 1960s, when resort hotels and vacation homes began to dot the coastline. Today, the primary economic activities in Kona are tourism (hotels, condominium rentals, and tourism services, concentrated near the coast); industry, retail and service activities; and agriculture concentrated in the uplands in the form of coffee farms, ranches, and macadamia nut, flower and avocado orchards.

Population has grown rapidly in all of West Hawai'i and particularly in North Kona, where residents increased from 4,832 in 1970 to 22,284 in 1990, and to 37,875 in 2010. Of the nine districts on the Big Island, North Kona has sustained the second largest rate of growth (after only Puna) since 1970, at 784%. High growth since 1960s has resulted from the steady stream of new residents lured by Kona's attractions and the employment and entrepreneurial opportunities of the tourism industry. The prevalence of tourism has also increased the visitor share of the de facto population (those actually present on any given day) to about one-fourth of the resident population. Both resident and de facto populations are expected to keep rising, although less sharply, into the foreseeable future.

Table 3-2 provides information on the socioeconomic characteristics of North Kona from the 2010 U.S. Census of Population. In general, North Kona's demographics reflect the diverse population of Hawai'i but with a heavy representation of U.S. mainland retirees. The district's population is relatively older, with a median age of 41.4 years and 13.7% over the age of 65, when compared with the County of Hawai'i as a whole (with a median age of 40.9 years). It also has a greater proportion of white residents (45.6% versus 33.7% for the County as a whole). However, the population in North Kona is still quite diverse, with Native Hawaiians making up 6.7% of the population, and Asians 15.3%. Household sizes and family sizes are relatively low. The very high housing vacancy rates are typical of areas with significant resort housing, which tend to be second or third homes.

The economic base of West Hawai'i underwent a major transition in the last half century. Fifty years ago West Hawai'i was a stable agrarian society, with scattered villages, a resident population of about 14,000, little tourism, and limited commercial and industrial development. All finished products were shipped from O'ahu, there was a relatively simple financial structure with few major retailers, and most of the island's businesses were located on the Hilo side. The last five decades have seen a steady, if somewhat cyclical, trend towards an urban economy, echoing the transitions seen on O'ahu in the 1940s through 1960s, and on Maui in recent years. Today, most of the State's major businesses are represented in West Hawai'i with independent major facilities. Where few base businesses once existed and consumer options were limited, there is now competition and an expanding spirit of local entrepreneurship. While agriculture remains one of the island's prime economic industries – with coffee, macadamia nuts, fruit, foliage and flowers prominent in Kona – tourism remains the prime economic engine and employer for West Hawai'i.

Visitors are an important component of the public on Ali'i Drive. In the Kailua area, the visitor industry dominates not only the economy but also land use and produces large numbers of visitors. Visitor statistics collected and analyzed by the State of Hawai'i (Hawai'i Tourism Authority 2011) indicate that in 2010, six out of ten visitors to Kona stayed in hotels, 19.9% stayed in condominiums, 12.3% stayed in timeshares, 9.6% stayed with friends or relatives and 9% stayed on cruise ships. The average daily census of visitors was 19,958, composing about a third of those present in North Kona at any given time. The largest share of visitors to Kona was from the U.S. West (43.6%), while 27.9 percent was from U.S. East, 12.1% was from Japan and 6.3% was from Canada. Repeat visitors made up 67.7% of the Kona visitors in 2010.

The waters *makai* of the project site are used by surfers, boaters, swimmers, divers, and fishermen, and retention of water quality is essential to the integrity of these recreational uses. The surf break Tiki's attracts some surfers during swells with a westerly component.

Table 3-2. Selected Socioeconomic Characteristics for North Kona District

SUBJECT	NUMBER	PERCENT
Total population	37,875	100.0
Median age (years)	41.4	(X)
16 years and over	30,676	81.0
65 years and over	5,192	13.7
One Race	28,842	76.2
White	17,282	45.6
Black or African American	200	0.5
American Indian and Alaska Native	177	0.5
Asian	5,783	15.3
Chinese	293	0.8
Filipino	2,414	6.4
Japanese	2,085	5.5
Korean	285	0.8
Native Hawaiian	2,548	6.7
Two or More Races	9,033	23.8
Total households	13,966	100.0
Family households (families)	9,154	65.5
With own children under 18 years	3,543	25.4
Female householder, no husband present	1,314	9.4
With own children under 18 years	677	4.8
Nonfamily households	4,812	34.5
Householder living alone	3,320	23.8
Households with persons under 18 years	4,255	30.5
Households with persons 65 years and over	3,755	26.9
Average household size	2.67	(X)
Average family size	3.12	(X)
Total housing units	18,642	100.0
Occupied housing units	13,966	74.9
Vacant housing units	4,676	25.1
Rental vacancy rate (percent)	19.5	(X)
Percent high school graduate	(X)	92.2
Civilian veterans	3,517	11.4
Percent in Labor Force	(X)	70.1
Median Household Income	63,711	(X)
Poverty rate	(X)	8.5%

Source: U.S. Census Bureau, 2010 Census. 2010 Census Redistricting Data (Public Law 94-171) Summary File, Tables P1, P2 P3, P4, H1; and American Community Survey (U.S. Census Bureau American Factfinder Webpage. (<http://2010.census.gov/2010census/data/>). Notes: (X) data not available or applicable. For small populations such as the geographic area above, error estimates are often large.

Impacts of the No Action Alternative

While the No Action Alternative would not require the expenditure of public funds and would not produce any neighborhood impacts, it would obviate public benefit from the project. Ultimately, the structurally deficient and deteriorated culvert structure would degrade to a level that left it unusable. No Action would continue the insufficiency to pass the 100-year flood, leading to additional flooding of adjacent properties. The narrow shoulders with inadequate separation of and accommodation for pedestrian, bicycle and motor vehicle traffic would continue. Each of these situations would have substantial adverse socioeconomic impacts.

Project Impacts and Mitigation Measures

Overall, the project would substantially benefit socioeconomic conditions by providing a safe culvert structure that will continue to allow efficient access for residents, visitors and businesses on an important link in Kona's vehicular and pedestrian transportation system. It would greatly improve safety for pedestrians and bicyclists, which benefits residents and visitors. No relocation of businesses or homes, disruption of local traffic patterns, effects to neighborhood character or integrity, water quality impacts that would affect recreation, or any other social impacts are involved in the proposed action. A few small and temporary construction easements will be required, but there is no need for additional right-of-way acquisition that would have an effect on residents or businesses. The project would provide some short-term construction jobs that would almost certainly be filled by on-island residents and would not induce in-migration.

During the one year period of construction there would be traffic congestion that would impact residents, visitors and businesses. Although pedestrians and bicyclists would be accommodated, there would be some inconvenience. The traffic congestion will be limited because phased construction that will demolish and then reconstruct one lane width at a time will allow two lanes of traffic to be open at all times during construction.

3.2.2 Cultural Resources

Cultural and Historical Background

The first colonization of Hawai'i Island is believed to have occurred on the eastern side by no later than 1000 A.D. Early settlers are thought to have first come to the leeward side of the Hawai'i Island for the procurement of resources during the Early Expansion period up to 1600 A.D. (Cordy 1995). Permanent habitation of Kona began toward the end of that period (Cordy 1995; Schilt 1984).

The Expansion Period was characterized by significant social stratification, socioeconomic changes and land modification. Most of the ecologically favorable zones of the windward and coastal regions of all major islands were settled and the more marginal leeward areas were being developed. The greatest population growth occurred during the Expansion Period, as did efforts to increase upland agriculture. Rosendahl (1972) proposed that settlement at this time was related

to seasonal, recurrent occupation in which coastal sites were occupied in the summer to exploit marine resources, and upland sites were occupied during the winter months, with a focus on agriculture. An increasing reliance on agricultural products may have caused a shift in social networks as well, according to Hommon (1976). Hommon argued that 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 discussed below. The implications of this model include a shift in residential patterns from seasonal, temporary occupation, to permanent dispersed occupation of both coastal and upland areas.

The project site falls within the central region of the traditional *moku* of Kona, in what is today known as North Kona, on the dry leeward side of the island. Kona extends from the shore across the entire volcanic mountain of Hualālai, and continues to the summit of Mauna Loa. Sometime during the A.D. 1400s, the *moku* were further divided into distinct land units known as *ahupua'a* (Kirch 1985). *Ahupua'a* were ideally long wedge-shaped slices of land that incorporated all of the eco-zones from the mountains to the sea and several hundred yards beyond, which afforded their inhabitants unlimited access to a diverse subsistence resource base (Cordy 2000). Entire *ahupua'a*, or portions of the land were managed by appointed *konohiki*, or lesser chiefs, who acted as overseers under the rule of an *ali'i 'ai ahupua'a*. The *moku* of Kona has over 100 *ahupua'a*, and approximately 44 of these fall within the fertile central region of Kona. The majority of the *ahupua'a* in central Kona are fairly narrow and include a combination of forest lands, upland farms, coastal *kula*, and offshore resources.

The project area is located at the coastal edge of the *kula* zone of the Kona Field System, a dryland agricultural complex that extends from the coast to the forested slopes of Kona (Cordy 1995). The system was a nearly continuous series of fields stretching from the Kau *Ahupua'a* in North Kona to Ho'okena in South Kona. Typically used for the cultivation of sweet potatoes, paper mulberry (*wauke*) and gourds, this zone is often marked by mounds from clearing and planting, modified outcrops and planting terraces and depressions (Hammatt and Clark 1980, Hammatt and Folk 1980, Schilt 1984). Habitation areas are scattered through the *kula* zone but are more typically found along the shoreline (Cordy 1995) along with burial, canoe storage, rituals and marine exploitation activities. The shoreline zone was also the typical location for homes for royalty and their supporting activities including *heiau*, *holua* slides and *pu'uhonua*, or places of refuge.

The project site itself is located in the *ahupua'a* of Kahului 1st and 2nd. In a historical study conducted for an archaeological study of a nearby property, ethnographer Kepā Maly (1996) noted that the *ahupua'a* from Lanihau to Puapua'a, which include the project site, provided the food and natural resources to support a 13th century high chief named Pili-a-Ka'aiea (Pili). Maly translated portions of Ka'ao Ho'oniua Pu'uwai No Ka-Miki (The Heart Stirring Story of Ka-Miki), a legendary account of two supernatural brothers, Ka-Miki and Maka-'iole, who traveled around the island of Hawai'i. The account was published in serial form between 1914 and 1917 in a Hawaiian newspaper, *Ka Hoku a Hawai'i*. According to Maly, the account was recorded by Hawaiian historians John Wise and J.W.I. Kihe. This story mentions that the lands of Kahului

were associated with those of neighboring *ahupua'a* Puapua'a and Hinakahua. In particular, the contest and game field or *kahua mokomoko le'ale'a* in Puapua'a and an extensive sweet potato garden or *mala'uala* that extended across the land from Niumalu (Kailua Bay) to Hinakahua, which included the lands of Kahului. Also, the stream of Wai'aha ran within Kahului, "which filled the taro mounds of the sacred prostrations chiefs Kalei'eha, Kapahu (or Kapahu-a-Lo'i), and Ka'alea, who possessed the *kapu* (restrictions) of Lono-Makahiki" (Maly 1998:A-6).

Other early events documented in the Kona regional traditional history are associated with 'Umi-a-Liloa, whose father was the first to unify rule there. Kona was a popular dwelling place of chiefs (Kamakau 1961), and traditional Hawaiian political authority was centered in the area from Kailua to Keauhou from at least the 15th century to the reign of Kamehameha I. Kamehameha embraced foreign trade, including the provisioning of whaling vessels and sandalwood traders (Schilt 1984).

Missionaries first arrived in Kailua in 1820 but stayed only a few months. Upon returning three years later they were allotted land for missions and schools. The earliest detailed historic account of the area south of Kailua Town including Kahului 1st and 2nd Ahupua'a comes from English missionary William Ellis.

"Leaving Kairua [Kailua], we passed through the villages thickly scattered along the shore to the southward. The country around looked unusually green and cheerful, owing to the frequent rains...Even the barren lava, over which we traveled, seemed to veil its sterility beneath frequent tufts of waving grass, or spreading shrubs and flowers. The sides of the hills, laid out for a considerable extent in gardens and fields, and generally cultivated with potatoes, and other vegetables, were beautiful. The number of heiaus, and depositories of the dead, which we passed, convinced us that this part of the island must formerly have been populous. The latter were built with fragments of lava, laid up evenly on the outside, generally about eight feet long, from four to six broad, and about four feet high. Some appeared very ancient, others had evidently been standing but a few years" (Ellis 1969:72-3).

From the 1820s into the 1840s, subsistence farming slowly gave way to a market economy with the introduction of coffee, corn, pumpkins, cotton, pineapple and Irish potatoes. Other crops introduced in the Kailua portion of the *kula* zone of the Kona Field System (SIHP [State Inventory of Historic Places] 6601) (Newman 1970, Kelly 1983, Schilt 1984, Cordy 1995), which extended from the shoreline to the 500-foot elevation, included melons, cabbage, onions, oranges and tobacco.

Profound religious, socioeconomic and demographic changes also took place in the early 1800s that resulted in the establishment of a Euro-American style of land tenure. The *Māhele 'Āina* of 1848 was the vehicle used to divide the land between the crown, government, *konohiki* and native tenants. Prior to this land reformation, all the land and natural resources of Hawai'i were held in trust by the *ali'i* who, in concert with *konohiki* land agents, meted out use rights to the native tenants at will. During the *Māhele* all lands were placed in one of three categories: Crown

Lands (for the occupant of the throne), Government Lands, and *Konohiki* Lands; all three types of land were subject to the rights of the native tenants therein.

The *ali'i* and *konohiki* were required to present their claims to the Land Commission to receive a Land Commission Award (LCAw.) for lands provided to them by Kamehameha III. They were also required to provide commutations to the government in order to receive royal patents on their awards. The lands were identified by name only, with the understanding that the ancient boundaries would prevail until the land could be surveyed. This process expedited the work of the Land Commission and subsequent land transfers (Chinen 1961). In 1862, the Commission of Boundaries (Boundary Commission) was established to legally set the boundaries of all the *ahupua'a* that had been awarded as a part of the *Māhele*. However, boundary descriptions were not collected for all *ahupua'a*.

Native commoners could also register claims for land with the Land Commission, and if substantiated, they would receive awards referred to as *kuleana*. Upon confirmation of a claim, a survey was required before the Land Commission could issue a *kuleana* award. After native tenants were given the right to become private landowners through the *Māhele*, beginning in 1850, foreigners were also given the right to own land upon swearing an oath of loyalty to the Hawaiian Monarchy. According to Kelly (1983) several prominent *konohiki* related in some way to the Kamehameha dynasty received land awards in North Kona District.

In 1848-1849, the *ahupua'a* of Kahului was divided into two sections, Kahului-iki or Kahului 1st to the north, and Kahului-nui or Kahului 2nd to the south. While Kahului 1st was retained as Government Lands, Kahului 2nd *Ahupua'a* was awarded (LCAw. 8516) to Grace Kama'iku'i without commutation by order of the Privy Council (Kelly 1983). As previously described, land was often awarded to individuals with ties to the Kamehameha dynasty; Grace Kama'iku'i was no exception to this trend. Her mother was a niece of Kamehameha I and her father was John Young, one of his trusted advisors. Grace's brother Keoni Ana (John Young II) who assisted Kamehameha III with the preparations for the *Māhele*, served as *kuhina-nui* (premier) from 1845-1854 and held the position of Minister of the Interior until his death in 1857 (Kelly 1983). Grace Kama'iku'i and her second husband Dr. T.C.B. Rooke adopted her niece Emma who grew up to marry Kamehameha IV (Alexander Liholiho) and become Queen.

Several *kuleana* awards were made in the two *ahupua'a* of Kahului, three of which (LCAw. 7086, 7336, and 10373) fall within the project site. These *kuleana* awards were for coastal house lots in the *kula* zone, and two of them (LCAw. 7086 and 7336) also had corresponding *mauka* agricultural *apana* awarded. All three *kuleana* properties are located *mauka* of current Ali'i Drive and list the *Alanui Aupuni* or government road as the *makai* boundary of their properties. Appendix 3 provides a map of these *kuleana* in Figure 10 and describes their claimants.

Following the *Māhele*, the Hawaiian kingdom initiated a grant program in an effort to encourage more native tenants to engage in fee-simple ownership of parcels of land. These parcels consisted primarily of Government lands – those lands given outright by the King, or commuted to the Government by the *ali'i* in lieu of paying the commutation fees on the parcels awarded

them during the *Māhele*. These land grants were quite large, ranging in size from about ten acres to hundreds of acres. When the sales were agreed upon, Royal Patents were issued and recorded following a numerical system that remains in use today.

According to Kelly (1983), large-scale sales of Government Lands in North Kona occurred during 1852-1853. Thirty parcels of land totaling over 2,800 acres were sold, of which 54.5 percent (over 1,500 acres) were purchased by seven individuals with non-Hawaiian surnames. This 1852-1853 surge in land purchases also included two parcels within Kahului 1st: Kapae purchased a 97-acre parcel (Grant 976) and Kipola purchased a 78-acre parcel (Grant 983). In 1855, Kaupena purchased a roughly 97.5-acre parcel (Grant 1868), which covered nearly one third of the Government Lands in Kahului 1st, close to the sea. The historic documents are silent with respect to the land use associated with these grants; however, such properties were typically used for ranching.

Native testimony provided to the Boundary Commission in 1873 by Niniha and Makuakane (Maly 1998) indicated that Kapae was a former *konohiki* of Kahului and the boundary at the shore between Kahului 1st and 2nd is referred to as Kalaii, a *pulu lepo*. This location (Kalaii) may correspond to a portion of the subject drainage and the *pulu lepo* reference may indicate an area of damp soil accumulation associated with the drainage.

The late 19th century brought increasingly rapid changes to all of Hawai‘i, even the relatively sleepy district of Kona. Cattle ranching as well as commercial coffee production changed traditional agricultural practices and necessitated construction of rock walls to control livestock. One of the better-known examples is the Great Wall of Kuakini, which runs roughly parallel to the coastline in the Kailua to Keauhou area. Construction of the wall began in the early 1800s and was completed in the 1850s under the direction of Governor Kuakini.

Beginning in the late 1800s, there was a short-lived attempt at commercial sugar cultivation in central Kona. The Kona Sugar Company, which started in 1899, built a sugar mill in Kona and initially obtained most of its raw cane through purchase from independent growers. Eventually, the company acquired land in Kahului and adjoining Wai‘aha Ahupua‘a. By 1926, the sugar operation ceased and their Kahului and Wai‘aha properties were sold to Manuel Gomes and converted to grazing lands.

Manuel Gomes came to Ka‘ū, Hawai‘i from Portugal around 1883 and moved to Kona shortly thereafter. He leased land in Keahuolu and Honua‘ula before he purchased the lands of Kahului 1st and 2nd and Wai‘aha 1st and 2nd for cattle ranching. He acquired these lands in 1927, when the Kona Sugar Company went out of business. The land extended *mauka* from the shore to the forest reserve. The purchase of the sugar plantation lands included a fresh water source, Wai‘aha Springs, which was vital to the success of the ranching operations due to a severe lack of fresh water in the area. Most ranchers used brackish water pumped from wells to water their

herds. At its peak, the Gomes Ranch had between 2,500 and 2,700 head of cattle on 8,500 acres of land (leased or owned outright).

The next significant change for Kona was the beginning of tourism, marked by the construction in 1928 of Kona's first major hotel, the Kona Inn (Menton 1994). Starting in the 1960s, the area between Kailua-Kona and Keauhou became increasingly dedicated to resort residential land use, as is the case today at the project site, which adjoins several timeshare and vacation rental condos.

In 1959, upon the death of Manuel Gomes, the ranch lands were passed to his son Joe Gomes who took over the ranching operations. Joe Gomes told Maly (1998) about how they used and modified existing earlier built boundary walls to build paddocks. He said that although the modern walls had nicer looking facing, the historic walls were stronger "[so] you can run on top em" (Maly 1998:A-39). Mr. Gomes also spoke of clearing mounds from the sugar plantation and earlier agricultural use. In the lowlands, they hired 3 to 4-man crews (usually Hawaiian and Japanese) to construct rock walls for 40 cents a fathom: six feet in length, four and a half feet high, three feet wide across the bottom, and two and a half feet wide across the top. The last 50 years witnessed the gradual shrinking of ranch lands. By 1998, the Gomes Ranch had dwindled to only 1,500 acres.

Traditional Cultural Resources and Practices on the Project Site

An effort was made to assess potential traditional cultural resources and associated practices that might be present or have taken place in this area of Kona. This occurred through documentary and field research done as part of the archaeological surveys conducted for this project and previously. Consultation done for the EA and also that conducted pursuant to Section 106 of the National Historic Preservation Act, covered in Section 3.3.2, below, also sought to assess resources and practices.

Kahului Bay, with its marine and soil resources, was clearly an area of traditional uses in pre-Western contact and early historical times, as evidenced by the three *kuleana* present here. While the bay continued to be used for fishing and gathering, the inland areas were converted to ranching, choked with kiawe and guinea grass, and no longer offered resources or sites that attracted cultural practices. The construction of the culvert in 1937 and later work for roads and utilities further transformed the site to an urban roadside. There is no current evidence that the project site supports any traditional resource uses *mauka* of the shoreline, nor are there any specific Hawaiian customary and traditional rights or practices known to be associated with affected area.

Impacts of the No Action Alternative

The No Action Alternative would not affect any known cultural resources or practices. However, it would also not help restore the beach at the apex of Kahului Bay, an aspect of the project that supports cultural uses.

Project Impacts and Mitigation Measures

It is reasonable to conclude based on the lack of identified cultural resources or practices that the exercise of native Hawaiian rights, or any ethnic group, related to gathering, access or other customary activities will not be affected by development activities.

The aspect of the project that will help restore the beach area through removing large sections of the seawall will partially bring back the environment as it used to exist, benefitting both natural processes and the cultural practices that thrive in an environment that is better in balance with these processes.

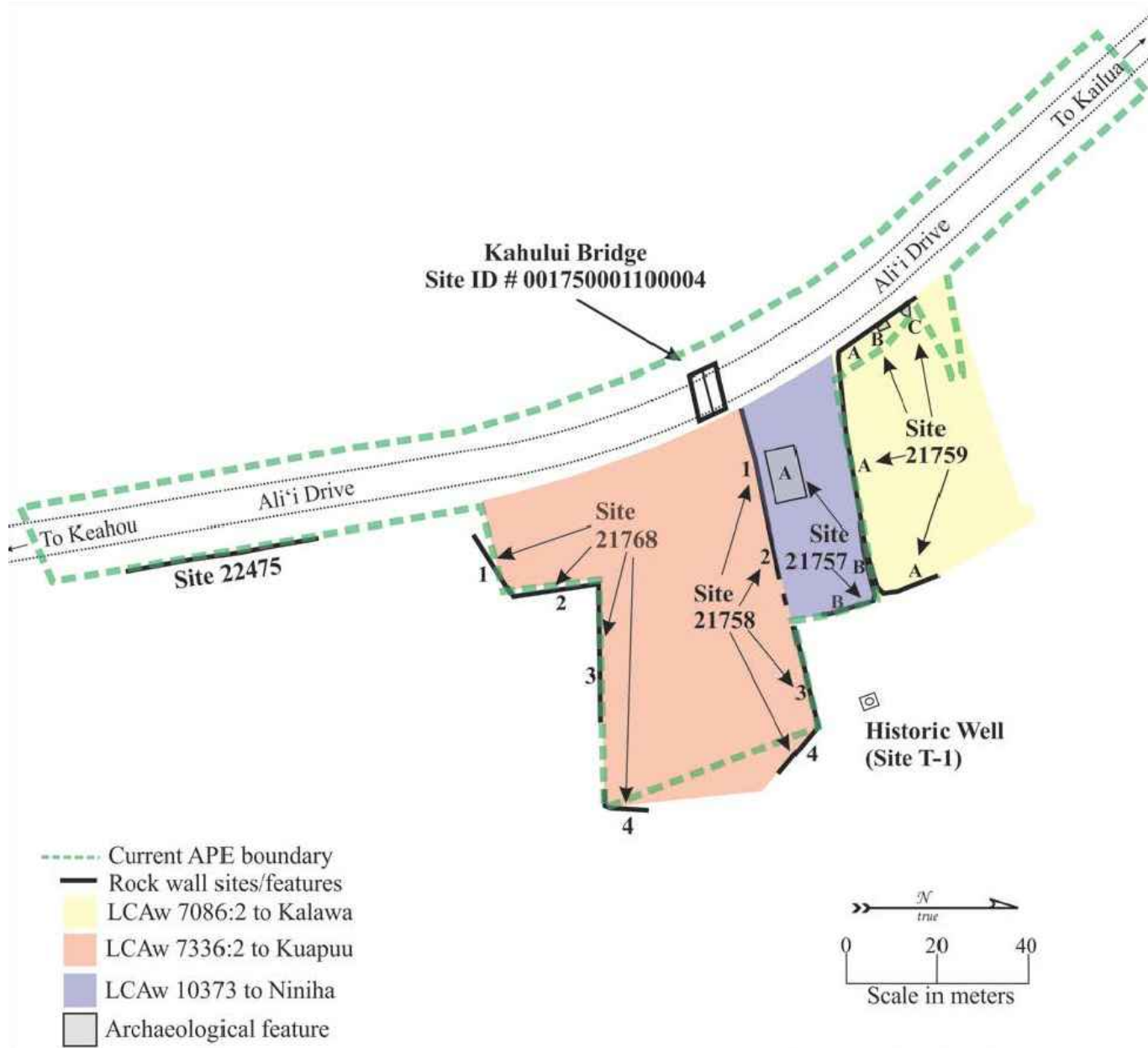
Although there are no indications so far from literature review or consultation with State Historic Preservation Division, the Office of Hawaiian Affairs, or local residents knowledgeable about Hawaiian cultural practices that there are any specific traditional cultural properties or practices on or near the project site, various parties were supplied a copy of the Draft EA in order to help confirm and finalize this finding. The DPW received comments during the May 1, 2017 public meeting, and, later, written comments, indicating high cultural sensitivity in the area. This was due to the historical land use for chiefly residences in near-shoreline areas of Kailua, as well as the presence of an exhumed graveyard. The comments recommended use of a cultural monitor in addition to an archaeological monitor. The DPW has determined that the construction contractor will be required to contract a qualified cultural monitor during initial clearing and earthwork.

3.2.3 Historic Properties

Existing Archaeological Resources

Section 106 of the National Historic Preservation Act (NHPA), requires that federal agencies identify and assess the effects of federally assisted undertakings on historic properties and to consult with others to find acceptable ways to resolve adverse effects. Properties protected under Section 106 are sites, buildings, structures, or objects included on or eligible for listing on the National Register of Historic Places. Eligible properties must generally be at least 50 years old, possess integrity of physical characteristics, and meet at least one of four criteria for significance. Regulations implementing Section 106 (36 CFR Part 800) encourage maximum coordination with the environmental review process required by the National Environmental Policy Act (NEPA) and with other statutes. Hawai'i Revised Statutes 6E, Historic Preservation, which also applies to the project, has similar goals and requirements. As discussed in Chapter 1, although this Environmental Assessment is intended to comply with Chapter 343, HRS, the NEPA process is ongoing, and therefore the study of effects to historic properties has been an integrated effort complying with both Section 106 of the NHPA and Chapter 6e, HRS.

As part of Section 106 compliance (36 CFR 800.4(a)(1)) for this project, a proposed Area of Potential Effects (APE) was established that made up about 2.04 acres. This conservatively delineated area is about double the size of the area to be affected by the project, as it included Ali'i Drive as well as all land at and around the culvert structure, drainage grading area, and staging area that could be impacted in any way (Figure 3-6). The State Historic Preservation Division concurred with the proposed APE by letter of October 3, 2014.



ALI'I DRIVE CULVERT REPLACEMENT AT KAHULUI BAY - ENVIRONMENTAL ASSESSMENT

**AREA OF POTENTIAL EFFECT AND
HISTORIC PROPERTIES**

**Figure
3-6**

Consultation letters that explained the project, solicited information about historic sites, invited participation in the historic preservation process, and included a map of the APE were sent on November 28, 2014, to the following organizations and individuals: the Office of Hawaiian Affairs (OHA); Association of Hawaiian Civic Clubs; Hui Malama I Na Kupuna O Hawaii Nei; Kona Hawaiian Civic Club; La‘i‘ōpua 2020; Hawai‘i Island Burial Council; Ms. Nicole Lui; Mr. Curtis Tyler; Ms. Cynthia Nazara; and Mr. Hiram Rivera. Copies of these letters are contained in sub-Appendix B of Appendix 3. Notices were also published in the *West Hawai‘i Today* newspaper and the OHA newspaper *Ka Wai Ola* inviting the participation of Native Hawaiian organizations and Native Hawaiian descendants with ancestral lineal or cultural ties to, cultural knowledge or concerns for, and cultural or religious attachment to the proposed project area.

Although no letters were received from consulted parties, the process resulted in several oral comments and recommendations, as discussed in the Archaeological Inventory Survey for the project, which was prepared for the highway agencies by ASM Affiliates, Inc. and is contained in Appendix 3.

Previous research conducted within and/or adjacent to the project’s APE was reviewed as part of the archaeological work for the project. It was determined that six historic properties were potentially present in the APE: five previously documented archaeological sites and the Kahului (or Waiaha) Bridge, built in 1937. The archaeological sites were numbered State Inventory of Historic Places (SIHP) Sites 21757, 21758, 21759, 21768, and 22475. Four are Historic Period rock walls, and one (Site 21757) appeared to be a middle nineteenth century traditional house foundation.

It should be noted that archival research and oral testimony indicated that a historic cemetery had once been located in the central portion of the APE. Ethnographer Kepā Maly (1998) interviewed Luciana Ka‘ailehua Makuakāne-Tripp (Aunt Luciana) as part of an earlier historical documentary research and oral history study (O’Hare and Wolforth 1998). Aunt Luciana was raised on her family’s *kuleana* land at Kahului Bay and still resided there with her children at the time of the interviews in 1996-1997. One of Luciana’s ancestors, Makuakane, had provided testimony to the Boundary Commission in 1873 for establishing the boundary of Kahului 2nd Ahupua‘a. Aunt Luciana, born in 1932, was asked about the location of the former Komomua-Kahulamū family cemetery. According to Aunt Luciana, the Niniha *kuleana* belonged to a *tūtū* of the Komomua line (Maly 1998). As Aunt Luciana recounted, “...one of the Komomua descendants wanted to sell the land, so the graves were all supposed to be removed and taken up to Hualālai Cemetery” (Maly 1998:A-24). Aunt Luciana also spoke about how her father had been buried there when the Komomua family decided to sell the land, “...so we took my father out of his grave there and relocated him. I think it was in the late 1970s, that Alfred Asing was contracted to remove all the other graves” (Maly 1998:A-28). A few years after Maly’s interviews, Robert Rechtman, Ph.D. conducted an informal interview with Aunt Luciana and her son Richard and found out that shortly after the cemetery relocation, approximately six feet of road construction fill had been added to the area, which created a sort of parking lot over the former cemetery (Rechtman and Henry 1999). Thus, while it is possible that some remnants of the Komomua-Kahulamū family cemetery may exist, it is highly unlikely,

because all of the known family members buried there were exhumed and the area was filled and graded.

Fieldwork for the archaeological study was conducted by Robert B. Rechtman, Ph.D., Owen Moore, M.A., Genevieve Glennon, B.A., and Teresa Gotay, M.A. As a result of the documentary research, consultation responses and fieldwork, each of the sites discussed above - the Kahului Bridge (State Historic Bridge Inventory # 001750001100004), and five previously recorded archaeological sites (SIHP Sites 21757, 21758, 21759, 21768, and 22475) were confirmed to be present within the current APE. Detailed photographs, drawings, maps and descriptions of each of these sites is contained in Appendix 3 for the interested reader. With respect to the former Komomua-Kahulamū family cemetery area, given that all of the known family members were exhumed and relocated, and the area was filled and graded and that no subsurface work is proposed for this area as a part of the current undertaking, no subsurface testing was conducted in this area. Figure 3-6 includes a general map of the location of the sites.

Once the sites were documented, they were evaluated for significance and eligibility to the National and/or State Historic Register of Historic Places. Chapter 6 of Appendix 3 contains a discussion of the process of significance assessment under State and federal (National Register of Historic Places [NRHP]) criteria that will not be repeated herein. The five archaeological sites had all previously been evaluated as part of other archaeological surveys; the current effort re-evaluated these sites. The potential historic property of the Kahului Bridge, which had never been systematically assessed, was also evaluated. Each site is individually discussed below. Table 3-3 provides a summary of the sites and their significance assessments, along with the treatment recommendations.

Table 3-3. Historic Sites Significance and Treatment Recommendations

SIHP Site #	Site Type	Chapter 6E Significance	Section 106 Significance*	Treatment Recommendation
21757	Habitation terrace	d	D	Data recovery
21758	Rock wall	d	D	No further work
21759	Well/BBQ/rock wall	d	D	No further work
21768	Rock wall	d	D	No further work
22475	Rock wall	Not significant	Not significant	No further work
1750001100004**	Bridge	Not significant	Not significant	No further work

* Criterion d/D indicates significance for information content

** HDOT State Historic Bridge Inventory & Evaluation number (HDOT 2013)

Site 21757 was originally identified and tested by Rechtman and Henry (1999). This nineteenth century house platform was previously determined to be significant under State Criterion d and approved for data recovery. As a result of the archaeological study this site continues to be considered significant under State Criterion d and is also determined eligible for the NRHP under Criterion D. Site 21757, had been previously approved for data recovery. This site will be subject to data recovery in compliance with a data recovery plan prepared in accordance with the *Secretary of the Interior's Standards for Archeological Documentation* and HAR 13§13-278, and submitted to the Hawai'i SHPO/DLNR-SHPD Archaeology Branch for review and approval.

The data recovery will be conducted after approval, and only after fieldwork is complete and approved will construction be allowed to proceed. A data recovery report will follow.

Site 21758, as identified by Rechtman and Henry (1999), is a rock wall that appears to mark the northern and eastern boundaries of TMK: (3) 7-5-019:007 and possible portions of the former LCAw. 10373. Much of this wall has been reworked in modern times and other sections are collapsed. In spite of its condition, this site was previously determined to be significant under State Criterion d with an approved treatment of no further work required. As a result of the archaeological study this site continues to be considered significant under State Criterion d and is also determined eligible for the NRHP under Criterion D. No further work is recommended.

Site 21759 was originally assigned to a rock wall extending along the *mauka* boundary of LCAw. 7086:2 by Rechtman and Henry (1999). While that wall is outside of the current APE, the Site 21759 designation was retained and assigned to a collection of three features (a 19th century boundary wall, a 20th century well, and a 20th century concrete feature) also associated with the use of that *kuleana* parcel. The new features documented during the archaeological study do not alter the prior significance determination for Site 21759, which was assessed as significant under State Criterion d. This site is also determined eligible for the NRHP under Criterion D. No further work is recommended.

Site 21768, a series of connected wall segments that appear to mark the southern and eastern boundaries of LCAw. 10373, was originally recorded by Rechtman and Henry (1999) and later rerecorded by Haun and Henry (2004). This wall is now in poor condition, but when originally recorded it was determined to be significant under state Criterion d. The approved treatment for this site as a result of these previous studies was no further historic preservation work required. As a result of the current study this site continues to be considered significant under state Criterion d, and by correlate federal Criterion D. No further work is recommended.

Site 22475 is a remnant of a twentieth century (post-1927) rock wall that extends along the *mauka* side of Ali'i Drive projecting into the current APE from the south. This site was first recorded by Rechtman and Dougherty (2000) south of the current APE, and later by Haun and Henry (2004) within the current APE. This wall was determined to be significant under state Criterion d in both of these prior studies, with an approved treatment of no further historic preservation work. As a result of the current study, given its present diminished state, this site is no longer considered significant under state Criterion d, nor eligible for the NRHP.

The Kahului Bridge (Inventory #001750001100004) was identified as a historic property during the State Historic Bridge Inventory and Evaluation (MKE and Fung 2013) and determined to be eligible for the NRHP under Criterion C (i.e., it embodied the distinctive characteristics of a type, period, or method of construction; represent the work of a master; or possess high artistic value), and also assessed as significant under State Significance Criterion c. However, as a result of a more recent architectural assessment of its integrity (see sub-Appendix C of Appendix 3), this site no longer has integrity and is thus not eligible for listing in the NRHP under any criteria.

Project Impacts and Mitigation Measures

At the present time, based on the findings of the archaeological inventory survey and results of Section 106 consultation, the highway agencies have preliminarily concluded that in the context of HRS Chapter 6E-8, the proposed culvert replacement project will result in an “effect with agreed upon mitigation commitments,” given the implementation of data recovery for Site 21757. With respect to the undertaking’s effects on historic properties (sites determined eligible for listing in the NRHP), the preliminary conclusion is that the undertaking will result in “no effect” to significant historic sites. The SHPO/SHPD was provided the archaeological inventory survey on March 1, 2017 for review. As of July 1, 2017, there has been no response by this agency.

In the event that unanticipated archaeological resources are unearthed during project activities, work in the immediate vicinity of the finds will be halted and DLNR-SHPD contacted, in compliance with HAR 13§13-280. The County of Hawai‘i has an archaeological monitor who will be on-call during ground-disturbing activities in the event that it is determined that monitoring will be required.

Impacts of the No Action Alternative

The No Action alternative would have no effect upon significant historic sites eligible for the State or National Registers of Historic Places.

3.3 Public Facilities and Services

3.3.1 Roadways, Traffic and Pedestrian/Bicycle Uses

Existing Roadway System

Ali‘i Drive is a fundamental link in the transportation system of the Kailua-Keauhou area of Kona, conducting both residents and visitors to and from major residential, commercial and recreational destinations. According to Hawai‘i County Department of Public Works traffic surveys from 2013, the average daily traffic is about 11,500 motor vehicles (Source: Hawai‘i County DPW Traffic Division). Traffic volume is expected to rise continually into the foreseeable future.

As shown in Figure 3-7, Ali‘i Drive is coastal Kailua’s only through street. Several major roads run north to south, sloping gently uphill, and eventually connect Kuakini Highway and Queen Ka‘ahumanu Highway (State Highway 11). In Kailua, there are just a few minor connector roads that steeply extend *mauka-makai* between the coastal area and these *mauka* highways. The recently completed La‘aloa Avenue Extension provided a critical new leg. Several road construction projects that are being discussed or planned for the next 10 years by the State or County may increase capacity (e.g., widening of Queen Ka‘ahumanu Highway south of Lako Street) or improve the *mauka-makai* connectivity (e.g., completion of the Lako Street Extension).

All such projects are well south of the culvert structure over Waiaha Drainageway on Ali‘i Drive, which will remain a critical juncture in the system. There are no plans for widening of Ali‘i Drive, which would involve significant adverse impacts to adjacent developed properties and possibly to coastal resources.

Existing Pedestrian and Bicycle Traffic

Bicycle and pedestrian traffic is heavy on Ali‘i Drive, which is an integral corridor for exercise and social interaction among residents and visitors alike (see photos in Figure 1-3). Some pedestrians and bicyclists also use Ali‘i Drive to commute or access other important destinations. Ali‘i Drive is the only coastal route for pedestrian and bicycle traffic for all the destinations between Keauhou and Kailua, as there are no roadways, trails or paths that cross the Waiaha Drainageway between Ali‘i Drive and Kuakini Highway.

The *Bike Plan Hawaii* (<http://hidot.hawaii.gov/highways/bike-plan-hawaii-master-plan/>) serves as the guide for implementation of bikeways for the State of Hawai‘i. Last updated in 2002, it contains an inventory of existing bicycle facilities along with objectives and implementing actions. Most important are the maps of proposed bicycle facilities with indications of preferred facility type for the various routes, such as signed shared roadways, bike lanes, and shared use paths. It also identifies priorities and strategies for implementation. According to this plan, Ali‘i Drive is designated as a future proposed signed, shared road, i.e., a roadway that has been designated by signing as a preferred route for bicycle use (Figure 3-7).

Bikeshare program bringing to Kailua a system of publicly accessible bikes that riders use for short trips between a network of unattended bike docking stations launched on August 30, 2016. Three initial stations in the downtown area are envisioned to be the beginning of a robust bikeshare system that will extend around the island.

Impacts of the No Action Alternative

Under the No Action Alternative, no short-term adverse impacts associated with construction would occur. The continuing insufficient bicycle and pedestrian facilities at Waiaha Drainageway would remain in place for the time being.

Ultimately, however, the culvert structure will reach the point where it cannot support vehicular traffic. At the point where it is no longer available for use, northbound traffic on Ali‘i Drive will be required to use Royal Poinciana Drive to Kupuna Street to Lako Street to Queen Ka‘ahumanu Highway to Kuakini Highway to Lunapule Street to access areas directly to the north of the culvert structure (see highlighted street names in Figure 3-7). For southbound traffic, the opposite sequence would be required. For some origin-destination pairs, detours of up to two miles would be required, costing drivers extra time and vehicle wear-and-tear, and imposing more traffic impacts for residents of normally less congested streets.

Project Impacts and Mitigation Measures

Construction will involve a slowdown of vehicular traffic on Ali'i Drive in this vicinity for approximately one year. The following mitigation measures will be in place during construction.

- Special Contract Conditions will include provisions to schedule movement of construction equipment on and offsite during non-peak traffic hours and to maintain traffic control when and where appropriate.
- The demolition of the existing culvert and the construction of the new bridge will be performed in phases. By phasing the construction, two lanes of vehicular traffic will remain open at all stages of the project.
- A temporary pedestrian path and bridge will be constructed to allow safe passage of pedestrians and bicyclists through the project area without having to cross into the heavy areas of construction.

After construction, the sidewalks and bike lanes will significantly benefit multi-modal traffic.

3.3.2 Utilities

Existing Utilities

The right-of-way of Ali'i Drive contains water lines, sewer mains, and electricity/telephone transmission lines. A 6-inch water line is currently attached to the *makai* side of the existing culvert structure. A 36-inch sewer line, installed in 1994 as part of an extension of the wastewater system of the Kailua-Keauhou urban area, is present beneath Waiaha Drainageway just upstream from the bridge.

Impacts of the No Action Alternative

For the time being, the existing water lines that utilize the culvert structure for support would remain in place. Ultimately, as the culvert structure reaches the point where it cannot support vehicular traffic, particularly if it experiences damage, there may be issues that require repair of the structure or alternate structures to conduct the waterlines across Waiaha Drainageway. Electric/telephone lines would remain as-is, with no impacts.

Project Impacts and Mitigation Measures

Electricity/telephone/CATV poles and lines present adjacent to the bridge will require relocation from the *makai* side of the highway to the *mauka* side. This will involve the removal of one utility pole from the *makai* side and installing a new pole on the *mauka* side. The utility lines will be shifted from the existing pole to the new pole. The 6-inch water line currently attached to structure will be replaced with a 12-inch line. The water line, sewer main and several sewer laterals will require temporary disconnection, with stoppage or bypass during the disconnected period, and then reconnection.

LEGEND:

- PROPOSED PATH
- PROPOSED BIKE LANE
- PROPOSED SIGNED SHARED ROADWAY



ALI DRIVE CULVERT REPLACEMENT AT KAHULU BAY - ENVIRONMENTAL ASSESSMENT

BIKE PLAN HAWAII FACILITIES IN PROJECT AREA

**Figure
3-7**

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The following mitigation measures will be undertaken by DPW before and during construction:

- Special Contract Conditions will specify that all construction affecting potable water lines and wastewater facilities will be done in coordination with and according to the requirements of the Hawai‘i County Department of Water Supply and Department of Environmental Management, respectively.
- Special Contract Conditions will require the Contractor to work with utility companies to inform affected residents and businesses about water and electricity/phone/ cable outages and will attempt to schedule them so as to minimize utility customer inconvenience.

3.3.3 Other Public Facilities and Services

Existing Facilities

A police substation is located in Kealahou, about five road miles north. A fire station is located on Palani Road, approximately two miles north, and at Keauhou, about five miles south. EMT services are provided by the Hawai‘i County Fire Department. Acute care services are available at Kona Hospital, approximately ten miles to the south. No schools, parks, community centers, medical centers or other public facilities are present nearby.

Impacts of the No Action Alternative

Maintaining a safe and functioning culvert structure is critical to allowing access by police, fire and emergency medical responders, and to providing access by residents and visitors to other facilities offering public services. Under the No Action Alternative, no short-term adverse impacts associated with construction would occur. Ultimately, however, the culvert structure will reach the point where it cannot support vehicular traffic, and critical access will not be available. Detours of up to two miles would be necessary until the culvert structure were reconstructed.

Project Impacts and Mitigation Measures

No public facilities or services would be affected in any adverse way by the proposed project, although traffic delays during the year-long construction period would affect access times.

3.4 Secondary and Cumulative Impacts

Secondary Impacts

Road or drainage projects can sometimes induce substantial population changes or effects on public facilities, which are examples of secondary impacts. In this case, no such effects are likely to occur. Although the project would provide some short-term construction jobs, these would almost certainly be filled by local residents and would not induce in-migration. No material changes to development potential, travel patterns or varieties or intensities of land use would occur, and no adverse secondary impacts are expected.

Cumulative Impacts

Cumulative impacts encompass the total effect on a natural resource, ecosystem, or human community due to past, present, and future activities or actions of federal, non-federal, public, and private entities (USEPA 1999). For relatively small-scale projects such as the culvert structure replacement, it is most important to focus on the identity and location of resources that may be adversely affected by the project and to determine the joint effect of other actions that could also adversely affect the resource. If so, additional analysis is necessary.

Aside from temporary traffic disruption, no natural or cultural resources would be adversely affected by the proposed project, because of the limited scale of the project and the nature of the particular resources.

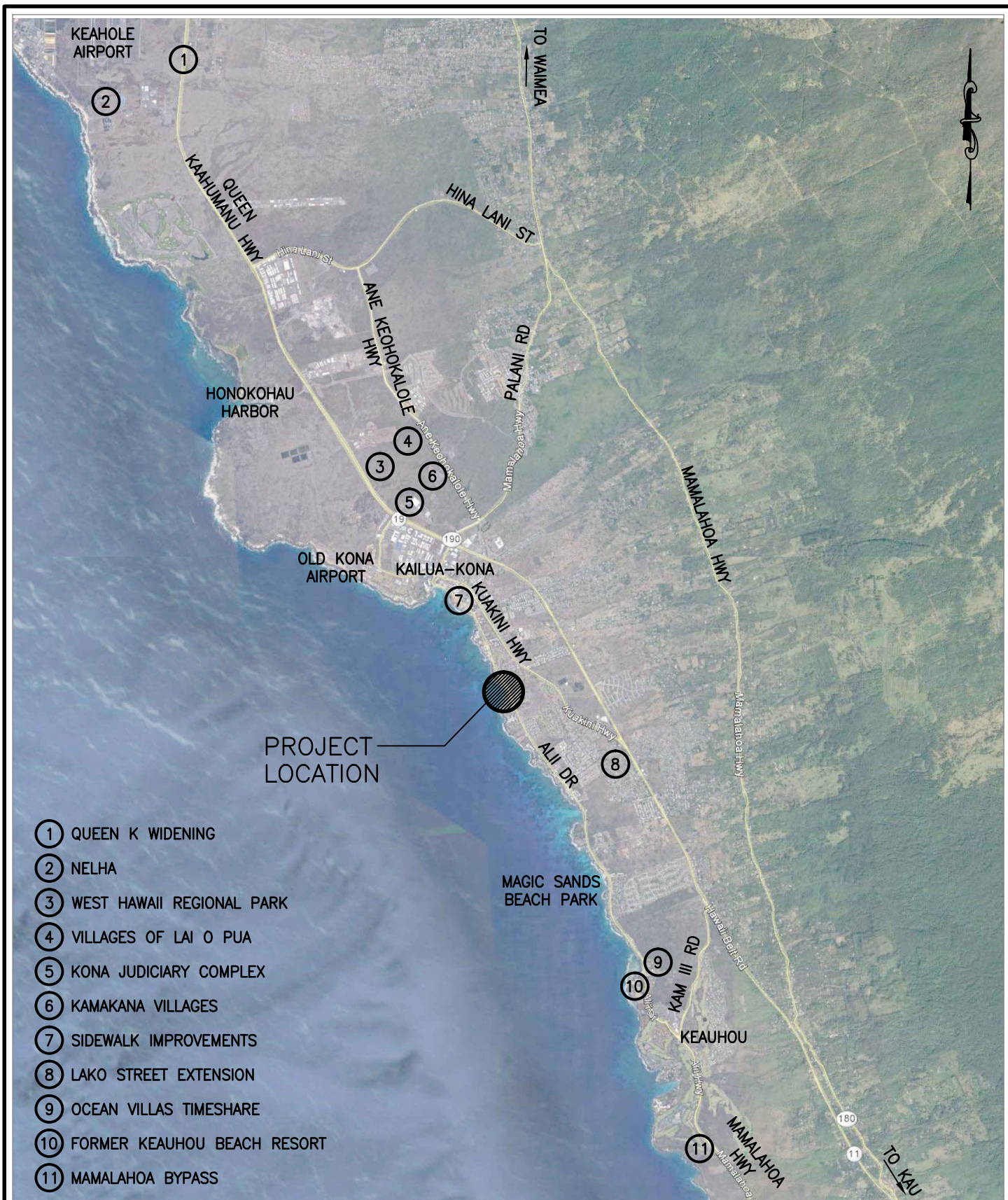
Review of SMA permits and Chapter 343 documents in the *OEQC Environmental Notice* as well as press coverage indicates that there are a number of planned or ongoing projects in North Kona in the 2018 to 2019 timeframe (Figure 3-8). Most major projects here are centered in the growing Kailua to Keahole area, several miles north of the Waiaha Drainageway. These include improvements to Queen Ka'ahumanu Highway and related roads; Kona International Airport; energy facilities, aquaculture facilities road construction at the Natural Energy Laboratory of Hawai'i (NELHA); the Kamakana Villages at Keahuolu; various housing and community facility development at the Villages of La'i'ōpua; the West Hawai'i Regional Park; and the Kona Judiciary Complex. In the south of the Kailua to Keauhou region there is a 320-unit timeshare project at Kahalu'u and demolition, renovations and site repurposing at the former Keauhou Beach Resort; and completion of the Mamalahoa Highway Bypass from Kealakakua to Napo'opo'o.

All of these activities are located two or more miles from the project site and will have little interaction potential for construction-related impacts. The only nearby projects are the Lako Street Extension (1.5 miles to the south) and a sidewalk improvement project on Ali'i Drive in downtown Kailua near the Kona Islander Inn (a mile to the north). Both projects are also under the control of DPW. Discussions with DPW officials indicate that construction phases of these projects will occur in 2017 and are unlikely to overlap. If they do, DPW will need to consider the interaction of traffic congestion from both projects and schedule accordingly.

Aside from traffic, none of the impacts from the project would be expected to accumulate with adverse impacts from any other actions.

3.5 Required Permits and Approvals

Table 3-4 provides a list of major required permits and approvals. After the Chapter 343/NEPA Environmental Assessment and related environmental permits and approvals are completed, DPW will apply for any necessary Special Management Area and Conservation District Use Permits. Once these are obtained, DPW will apply for the construction permits (and subdivision permits if necessary). When these permits are granted, construction may begin.



ALIʻI DRIVE CULVERT REPLACEMENT AT KAHULUI BAY - ENVIRONMENTAL ASSESSMENT

**PROJECTS WITH POTENTIAL TO INDUCE
CUMULATIVE IMPACTS FOR PROJECT**

**Figure
3-8**

Table 3-4. Permits and Approvals

Permit/Approval	Applicable Activities and Sequence	Regulatory Agency
Compliance with NEPA (National Environmental Policy Act) and associated approvals related to Endangered Species Act, Fish and Wildlife Coordination Act, Magnuson-Stevens Fishery Conservation and Management Act, Coastal Zone Management Consistency Determination	Projects with federal aid. Separate review to be completed both during and after Chapter 343, HRS EA.	Federal Highway Administration (FHWA) (<u>approvals other than NEPA and CZM Consistency obtained 2017</u>)
Historic Sites Review (Section 106 of NHPA and Chapter 6e, HRS)	Any construction in the vicinity of a designated historic place or archaeological site. As part of Chapter 343 EA and NEPA.	State DLNR, Historic Preservation Division
Clean Water Act Section 404, Section 401	Construction involving dredge and fill within waters of the U.S. After completion of NEPA and associated processes.	U.S. Army Corps of Engineers (USACE), State Department of Health (DOH), Clean Water Branch (CWB)
Stream Channel Alteration Permit	Change to stream bed/stream banks. After Chapter 343 EA.	State Department of Land and Natural Resources (DLNR), Commission on Water Resources Management
Special Management Area Permit (SMA) and Shoreline Setback Variance (SSV)	Actions with Special Management Area and Shoreline Setback. After Chapter 343 EA.	County Planning Department (<u>SMA Minor required; SSV determined inapplicable</u>)
Conservation District Use Permit	Areas with State Land Use Conservation District. After SMA Permit.	State DLNR, Office of Conservation and Coastal Lands (<u>determined inapplicable</u>)
National Pollutant Discharge Elimination System (NPDES) Permit	Hydrotesting and dewatering, depending on methods selected by Contractor. Prior to construction.	State DOH-CWB (<u>obtained April 2017</u>)
Community Noise Control Permit	Construction with potential to cause noise. Prior to construction.	State DOH, Indoor and Radiological Health (IRH) Branch
Work in County Right-of-Way	Any work. Prior to construction.	County of Hawai'i Department of Public Works (DPW)
Subdivision Approval	Dividing or consolidating parcels of land for right-of-way, if additional ROW required. Prior to construction.	County Planning Department
Grading, Grubbing, Excavating and Stockpiling Permits	Any excavation or fill, removal of vegetation from the surface, or the purposeful accumulation and set-aside of loose soil. Prior to construction.	County DPW

3.6 Consistency with Government Plans and Policies

3.6.1 Hawai‘i State Plan

Adopted in 1978 and last revised in 1991 (Hawai‘i Revised Statutes, Chapter 226, as amended), the Plan establishes a set of themes, goals, objectives and policies that are meant to guide the State’s long-run growth and development activities. The three themes that express the basic purpose of the Hawai‘i State Plan are individual and family self-sufficiency, social and economic mobility and community or social well-being. The project would promote these goals by enhancing public safety through replacing in an environmentally sensitive manner a culvert structure that has degraded to the point where there are serious safety concerns and conditions unsuited to the level of pedestrian and bicycle traffic.

3.6.2 Hawai‘i State Land Use Law

All land in the State of Hawai‘i is classified into one of four land use categories – Urban, Rural, Agricultural, or Conservation – by the State Land Use Commission, pursuant to Chapter 205, HRS. The project site is located in the State Land Use Urban District. The project is consistent with permitted uses within this District.

A goal of the project has been to avoid uses of the area *makai* of the existing seawall, the top of which is assumed to define the shoreline. The provision of larger culvert openings will open up sections of the existing wall and provide a more natural shoreline environment. The area *makai* of the shoreline is usually defined as within the State Land Use Conservation District, which is under the jurisdiction of the Department of Land and Natural Resources, Office of Conservation and Coastal Lands (DLNR-OCCL). Any activities that occur within the Conservation District must undergo an examination for the applicability of the permit process and the consistency with the goals and rules of this district and subzone, per Chapter 13-5, Hawai‘i Administrative Rules.

In general, the activity involves a public transportation improvement being undertaken by a partnership of County, State and federal agencies. Accordingly, the action may be a Public Purpose Use as defined in Section 13-5-22 (P-6, D-1) of the Conservation District rules. The project may also include Subdivision for Public Purposes (P-10, D-1). As part of the Draft EA process, the County sought a boundary interpretation from the State Land Use Commission to determine if any part of the area of work was within the Conservation District. Research determined that the portion makai of the roadway was. DLNR-OCCL determined by letter of April 19, 2017, that a Conservation District Use Permit was not required (see Appendix 1b).

If necessary, the CDUA would include a detailed evaluation of the consistency of the project with the criteria of the Conservation District permit process. Briefly, the proposed action would be expected to be consistent, because it would not affect the natural resources of the State and it would be beneficial to the public health, safety or welfare. The proposed action would not subdivide the property and lead to any increase in intensity of use beyond currently permitted uses within the Conservation District.

3.6.3 Hawai'i County Zoning, Special Management Area and General Plan

Zoning and LUPAG

The specific area that will be utilized for the project is zoned V 1.25 (Resort zoning, minimum rentable unit size 1,250 square feet). Various parts of the area are classified as Open, Resort Node and Medium Density Urban Expansion in the Land Use Pattern Allocation Guide (LUPAG) map component of the General Plan. Public facilities such as roads and culvert structures are permitted and appropriate uses in all of these zoning and General Plan designations.

Special Management Area and Shoreline Setback Variance

The project site is situated within the County's Special Management Area (SMA). Per letter of May 8, 2017, the Planning Department determined that an SMA Minor Permit would be required for the project (see Appendix 1b).

The proposed land use complies with provisions and guidelines contained in Chapter 205A, Hawai'i Revised Statutes (HRS), entitled Coastal Zone Management. The proposed use would be consistent with Chapter 205A because it would not affect public access to recreational areas, historic resources, scenic and open space resources, coastal ecosystems, economic uses or coastal hazards.

The proposed improvements are not likely to result in any substantial adverse impact on the surrounding environment. As the culvert structure represents the shoreline, work in this area cannot be avoided, but it is being undertaken with a number of safeguards in terms of design and best management practices that will avoid adverse impacts. The shoreline profile will benefit from a more natural, wider culvert opening, rather than the narrow, artificial constriction that is currently present. This will lead to less wave reflection and more absorption of wave energy on the floor of the culvert. The project will not permanently restrict any shoreline uses such as hiking, fishing, surfing, diving or other water sports. The addition of parking will meet the needs of recreational users of Kahului Bay who currently lack a place to park in the area. Lateral pedestrian use of the shoreline area will not be impacted and there will be no effect on the public's access to or enjoyment of this shoreline area.

Furthermore, viewplanes will not be adversely impacted, and the improvements will not be unduly visually imposing or out of character. Historic sites and cultural uses have been properly assessed. It is expected that the project will not result in any impact on the biological or economic aspects of the coastal ecosystem. The project site contains few native plants and none that are not extremely common. No effects to marine resources are expected.

The project area involves a use within the Shoreline Setback of the various properties involved. The County DPW intended the Draft EA process to serve as coordination with the Planning

Department that will determine the need for and nature of approvals to replace the structure within the shoreline setback area. Per letter of May 8, 2017, the Planning Department determined that there was no requirement for a Shoreline Setback Variance (see Appendix 1b).

General Plan

The *General Plan* for the County of Hawai‘i is a policy document expressing the broad goals and policies for the long-range development of the Island of Hawai‘i. The plan was adopted by ordinance in 1989 and revised in 2005 (Hawai‘i County Planning Department). The *General Plan* itself is organized into thirteen elements, with policies, objectives, standards, and principles for each. There are also discussions of the specific applicability of each element to the nine judicial districts comprising the County of Hawai‘i. Most relevant to the proposed project are the following Policies, Standards, Goals, and Courses of Action:

FLOOD CONTROL AND DRAINAGE GOALS

- (a) Protect human life.
- (b) Prevent damage to man-made improvements.
- (c) Control pollution.
- (d) Prevent damage from inundation.
- (e) Reduce surface water and sediment runoff.
- (f) Maximize soil and water conservation.

FLOOD CONTROL AND DRAINAGE POLICIES

- (a) Enact restrictive land use and building structure regulations in areas vulnerable to severe damage due to the impact of wave action. Only uses that cannot be located elsewhere due to public necessity and character, such as maritime activities and the necessary public facilities and utilities, shall be allowed in these areas.
- (g) Development-generated runoff shall be disposed of in a manner acceptable to the Department of Public Works and in compliance with all State and Federal laws.

FLOOD CONTROL AND DRAINAGE STANDARDS

- (a) “Storm Drainage Standards,” County of Hawaii, October, 1970, and as revised.
- (b) Applicable standards and regulations of Chapter 27, “Flood Control,” of the Hawaii County Code.
- (c) Applicable standards and regulations of the Federal Emergency Management Agency (FEMA).
- (d) Applicable standards and regulations of Chapter 10, “Erosion and Sedimentation Control,” of the Hawaii County Code.
- (e) Applicable standards and regulations of the Natural Resources Conservation Service and the Soil and Water Conservation Districts.

Discussion: The project spans a floodway called Waiaha Drainageway. It has a highly intermittent flow and is unnamed and unmapped on USGS topographical maps. The 100-year flood is estimated at 7,110 cubic feet per second (cfs). An AE flood zone that expands to as wide as 800 feet near the coast surrounds this drainage. The intermittent stream has a history of flooding properties and structures on Ali'i Drive during occasional high-rainfall episodes. The large extent of this flood zone can be attributed to some degree to the impediment to drainage represented by Ali'i Drive, which is insufficiently mitigated by the current pair of narrow box culverts. In addition to the stream flood hazard area, the area seaward of the road at the project site is classified within the VE Zone (Coastal High Hazard Area). This area is subject to high waves and elevated tides during storms, and also to tsunami damage. The culvert structure replacement will restore more natural flow conditions and reduce flood hazard in the area. All improvements are subject to review to ensure that all relevant standards of Chapter 27 and Chapter 10 are addressed.

TRANSPORTATION – GOALS

- Provide a system of roadways for the safe, efficient and comfortable movement of people and goods.
- Provide an integrated State and County transportation system so that new major routes will complement and encourage proposed land policies.

TRANSPORTATION – POLICIES

- The improvement of transportation service shall be encouraged.
- Support the development of programs to identify and improve hazardous and substandard sections of roadway and drainage problems
- Encourage the development of walkways, jogging, and bicycle paths within designated areas of the community.
- Explore means and opportunities to enhance the shared use of the island's roadways by pedestrians and bicyclists, in coordination with appropriate government agencies and organizations.

Discussion: Maintenance of the safety, function and efficiency of a key road crossing of a drainageway on the principal avenue of traffic for the Kailua to Keauhou corridor is vital to preserving the transportation network of the area and consistent with the goals and policies of the General Plan. Establishment of improved pedestrian and bicycle facilities and conditions is specifically called for.

HISTORIC SITES GOALS

- (a) Protect, restore, and enhance the sites, buildings, and objects of significant historical and cultural importance to Hawaii.
- (b) Appropriate access to significant historic sites, buildings, and objects of public interest should be made available.

HISTORIC SITES POLICIES

- (a) Agencies and organizations, either public or private, pursuing knowledge about historic sites should keep the public apprised of projects.
- (b) Amend appropriate ordinances to incorporate the stewardship and protection of historic sites, buildings and objects.
- (c) Require both public and private developers of land to provide historical and archaeological surveys and cultural assessments, where appropriate, prior to the clearing or development of land when there are indications that the land under consideration has historical significance.
- (d) Public access to significant historic sites and objects shall be acquired, where appropriate.

Discussion: An archaeological inventory survey has assessed historic sites in the Area of Potential Effect, and four significant historic sites are present, each significant for the data they have provided or can provide. A data recovery plan will be developed and implemented to recover data for one site. The inventory survey is currently under review by SHPD. At the present time, the highway agencies have preliminarily concluded that in the context of HRS Chapter 6E-8, the proposed culvert replacement project will result in an “effect with agreed upon mitigation commitments.” With respect to the undertaking’s effects on historic properties (sites determined eligible for listing in the NRHP), the preliminary conclusion is that the undertaking will result in “no effect” to significant historic sites.

ENVIRONMENTAL QUALITY GOALS

- (a) Define the most desirable use of land within the County that achieves an ecological balance providing residents and visitors the quality of life and an environment in which the natural resources of the island are viable and sustainable.
- (b) Maintain and, if feasible, improve the existing environmental quality of the island.
- (c) Control pollution.

ENVIRONMENTAL QUALITY POLICIES

- (a) Take positive action to further maintain the quality of the environment.

ENVIRONMENTAL QUALITY STANDARDS

- (a) Pollution shall be prevented, abated, and controlled at levels that will protect and preserve the public health and well being, through the enforcement of appropriate Federal, State and County standards.
- (b) Incorporate environmental quality controls either as standards in appropriate ordinances or as conditions of approval.
- (c) Federal and State environmental regulations shall be adhered to.

Discussion: The proposed project would not have a substantial adverse effect on the environment and would not diminish the valuable natural resources of the region. It would

restore flow conditions on Waiaha Drainageway to more natural conditions, and offer a less artificially wave-reflective shoreline that would encourage more sand deposition and retention in Kahului Bay. Downstream sediment transport would remain the same. No adverse impacts to any biological resources would occur, and air quality and noise would not be affected. The human environment would improve through widening of lanes for bicycles and pedestrians.

NATURAL BEAUTY GOALS

- (a) Protect, preserve and enhance the quality of areas endowed with natural beauty, including the quality of coastal scenic resources.
- (b) Protect scenic vistas and view planes from becoming obstructed.
- (c) Maximize opportunities for present and future generations to appreciate and enjoy natural and scenic beauty.

NATURAL BEAUTY POLICIES

- (a) Increase public pedestrian access opportunities to scenic places and vistas.
- (b) Develop and establish view plane regulations to preserve and enhance views of scenic or prominent landscapes from specific locations, and coastal aesthetic values.

Discussion: The culvert structure replacement would remove some of the existing seawall mass and restore a more open condition, promoting deposition and retention of sand at Kahului Bay and enhancing natural beauty.

NATURAL RESOURCES AND SHORELINES GOALS

- (a) Protect and conserve the natural resources from undue exploitation, encroachment and damage.
- (b) Provide opportunities for recreational, economic, and educational needs without despoiling or endangering natural resources.
- (c) Protect and promote the prudent use of Hawaii's unique, fragile, and significant environmental and natural resources.
- (d) Protect rare or endangered species and habitats native to Hawaii.
- (e) Protect and effectively manage Hawaii's open space, watersheds, shoreline, and natural areas.
- (f) Ensure that alterations to existing land forms, vegetation, and construction of structures cause minimum adverse effect to water resources, and scenic and recreational amenities and minimum danger of floods, landslides, erosion, siltation, or failure in the event of an earthquake.

NATURAL RESOURCES AND SHORELINES POLICIES

- (a) Require users of natural resources to conduct their activities in a manner that avoids or minimizes adverse effects on the environment.
- (c) Maintain the shoreline for recreational, cultural, educational, and/or scientific uses in a manner that is protective of resources and is of the maximum benefit to the general public.

- (d) Protect the shoreline from the encroachment of man-made improvements and structures.
- (h) Encourage public and private agencies to manage the natural resources in a manner that avoids or minimizes adverse effects on the environment and depletion of energy and natural resources to the fullest extent.
- (p) Encourage the use of native plants for screening and landscaping.
- (r) Ensure public access is provided to the shoreline, public trails and hunting areas, including free public parking where appropriate.
- (u) Ensure that activities authorized or funded by the County do not damage important natural resources.

Discussion: The proposed project avoids impact on shoreline resources by removing some of the existing seawall mass that currently is intensely wave reflective, allowing restoration of a more open condition and promoting deposition and retention of sand at Kahului Bay. Partial restoration of a sandy shoreline will promote growth of native shoreline plants.

RECREATION – GOALS

- Provide a wide variety of recreational opportunities for the residents and visitors of the County.
- Provide a diversity of environments for active and passive pursuits.

RECREATION – POLICIES

- Improve existing public facilities for optimum usage.
- The use of land adjoining recreation areas shall be compatible with community values, physical resources, and recreation potential.
- Adopt an on-going program of identification, designation, and acquisition of areas with existing or potential recreational resources, such as land with sandy beaches and other prime areas for shoreline recreation in cooperation with appropriate governmental agencies.
- Public access to the shoreline shall be provided in accordance with an adopted program of the County of Hawaii.

Discussion: The proposed project satisfies relevant goals, policies, and courses of action related to recreation facilities in Hawai‘i County. The proposed improvements would increase the safety of recreational cycling, running and walking in urban Kailua, and would not affect public access. The addition of parking will meet the needs of recreational users of Kahului Bay who currently lack a place to park in the area.

3.6.4 Kona Community Development Plan

The Kona Community Development Plan (CDP) encompasses the judicial districts of North and South Kona, and was developed under the framework of the February 2005 County of Hawai‘i General Plan. Community Development Plans are intended to translate broad General Plan

Goals, Policies, and Standards into implementation actions as they apply to specific geographical regions around the County. CDPs are also intended to serve as a forum for community input into land-use, delivery of government services and any other matters relating to the planning area.

The General Plan now requires that a Community Development Plan shall be adopted by the County Council as an “ordinance,” giving the CDP the force of law. This is in contrast to plans created over past years, adopted by “resolution” that served only as guidelines or reference documents to decision-makers. The Kona CDP was adopted in September 2008 by the County Council.

The Plan has many elements and wide-ranging implications, but there are several major strategies that embody the guiding principles related to the economy, energy, environmental quality, flooding and other natural hazards, historic sites, natural beauty, natural resources and shoreline, housing, public facilities, public utilities, recreation, transportation and land use.

The culvert replacement and associated improvements are consistent with the Kona CDP, which states that “... future urban development must contribute to a well-connected local transportation network that provides for safe, direct, and convenient access for automobile, bicycle, and pedestrian traffic” (p. 4-5).

The project is also consistent with the transportation network shown in Figure 4-2c of the CDP, and thus Policy TRAN-1.1: Official Transportation Network Map, which shows proposed transit routes, proposed arterials and collectors, and pedestrian/bicycle paths.

The project is consistent with Objective TRAN-2 Street Network Connectivity:

“To develop a system of interconnected roads in Kona that will provide alternative transportation routes that will disperse automobile trips and reduce their length, while not compromising the through functions of arterials and major collectors with excessive intersections. A highly connected transportation system within Kona’s Urban Area (UA) serves to do the following:

- (a) provides safe choices for drivers, bicyclists, and pedestrians;
- (b) promotes walking and bicycling;”

It is also consistent with Policy TRAN-3.4: Retrofit of Existing Streets.

“To the extent practicable, pedestrian improvements and/or bicycle accommodations shall be added to existing public streets when repaving or doing other repair or maintenance work, especially on those streets identified for such multi-modal purposes in the Official Transportation Network Map.”

Furthermore, the project accomplishes the objective of improving flood control and transportation facilities while preserving environmental values and the visual quality and character of the Kailua urban area, which is consistent with many aspects of the Kona CDP.

3.7 Federal Laws and Executive Orders

Section 3.7 discusses for information purposes only federal laws and executive orders that will be addressed in more depth in the NEPA environmental documentation. Some have already been referenced in the context of resource evaluation in other sections of this chapter.

3.7.1 Coastal Zone Management Act (CZMA) and Coastal Barriers

No Coastal Barriers are present in the State of Hawai‘i. The Hawai‘i Coastal Zone Management (CZM) Program was established in 1977 through the adoption of the Coastal Zone Management Act, incorporated in Chapter 205A HRS. Projects with federal involvement significantly affecting areas under jurisdiction of the State CZM Agency must undergo review for consistency with the State’s approved coastal program. The entire State of Hawai‘i is included in the coastal zone for such purposes. The CZM objectives are outlined as follows.

- Recreational Resources. Provide coastal recreational opportunities accessible to the public.
- Historic Resources. Protect, preserve, and, where desirable, restore those natural, man-made historic, and pre-historic resources in the CZM area that are significant in Hawaiian and American history and culture.
- Scenic and Open Space Resources. Protect, preserve, and, where desirable, restore or improve the quality of coastal scenic and open space resources.
- Coastal Ecosystems. Protect valuable coastal ecosystems from disruption and minimize adverse impacts on all coastal ecosystems.
- Economic Use. Provide public or private facilities and improvements important to the State’s economy in suitable locations.
- Coastal Hazards. Reduce hazard to life and property from tsunamis, storm waves, stream flooding, erosion, and subsidence.
- Managing Development. Improve the development review process, communication, and public participation in the management of coastal resources and hazards.
- Public Participation. Stimulate public awareness, education, and participation in coastal management, and maintain a public advisory body to identify coastal management problems and provide policy advice and assistance to the CZM program.
- Beach Protection. Protect beaches for public use and recreation; locate new structures inland from the shoreline setback to conserve open space and minimize loss of improvements due to erosion.
- Marine Resources: Implement the state’s ocean resources management plan.

The County of Hawai‘i, Department of Public Works has evaluated the project and concluded that the project does not appear to impact these coastal zone resources and is consistent with the

objectives of the program. In accordance with consultation with the State Coastal Zone Management Program, the FHWA will conduct a review of the consistency and include the NEPA environmental documentation as part of the materials submitted to the Hawai'i Coastal Zone Management Program for CZMA consistency review.

Chapter 205A also established the *Special Management Area* (SMA), which is an area of particular concern that requires a higher level of management to ensure the coastal resources are appropriately protected and managed. Accordingly, any development proposed within the SMA requires the approval of a minor or major use permit from the County of Hawai'i, depending on the cost and impact of the proposed activity. Consistency with SMA policy is discussed above in Section 3.6.3.

3.7.2 Clean Water Act, as Amended (33 USC 1251 et seq.)

It has been determined through fieldwork and confirmed through consultation with the U.S. Army Corps of Engineers (USACE) (see Appendix 4) that implementation of the project will involve the permanent or temporary discharge of fill materials into an area of 0.05 acres defined as waters of the United States, as discussed in Section 3.1.2, above. It is expected that the project will apply for a Nationwide General Permit (NWP), specifically NWP #14 (Linear Transportation Projects) for the activities. Currently, the entire Nationwide Permit program is undergoing a periodic review of the 50 existing NWPs for work in wetlands and other waters that are regulated by Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act of 1899. The review helps ensure that all issued NWPs cause only minimal adverse environmental effects when performed separately, and will have only minimal cumulative adverse effect on the environment. The new NWPs go into effect in 2017 and will be evaluated based on the new NWP terms and conditions, including any new Honolulu District Regional Conditions. The County of Hawai'i is currently in the process of permit application.

As discussed in Section 3.1.2, the project is expected to disturb more than an acre of overall surface, and dewatering and hydrotesting may be required. Therefore, the project requires a National Pollutant Discharge Elimination System (NPDES) permit from the State Department of Health, pursuant to Section 402 of the Clean Water Act. The best management practices (BMPs) for the permit will be integrated with those associated with the Storm Water Pollution Prevention Plan (SWPPP) that has been prepared for the Section 404 Water Quality Certification that accompanies the NWP and for the permit required by the grading ordinances of the County of Hawai'i. The BMPs will be part of construction documents and implemented during construction. A discussion of BMPs is presented in Section 3.1.2.

3.7.3 Clean Air Act As Amended (42 USC 7401, et seq.)

The Clean Air Act requires states to develop plans, called State Implementation Plans (SIP), for eliminating or reducing the severity and number of violations of National Ambient Air Quality Standards (NAAQS) while achieving expeditious attainment of the NAAQS.

The State of Hawai‘i and the federal government periodically monitor air quality to determine whether it meets the AAQ standards. Areas that do not meet these standards are termed non-attainment areas and are subject to Conformity Rules. These rules were issued by the Environmental Protection Agency (EPA) in response to Section 176 of the 1977 Clean Air Act. Conformity Rules prohibit any federal agency from engaging in any actions that do not conform to a state’s plan to correct nonattainment situations. The entire State of Hawai‘i is considered to have acceptable air quality and is thus an attainment area not subject to application of Conformity Rules.

The project does not increase motor vehicle capacity nor induce development, and it would have no long-term effect on air quality. All equipment used in construction will be required to meet appropriate emission standards.

3.7.4 Wild And Scenic Rivers Act (16 U.S.C. 1271-1287)

The Wild and Scenic Rivers Act (P.L. 90-542, as amended) selected rivers of the Nation that possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural or other similar values. The purpose of the Act is to preserve these rivers in their freeflowing condition, and protect them for the benefit and enjoyment of present and future generations. An inventory, the National Wild and Scenic Rivers System, was established in December 1, 1992 and is published by the Department of the Interior and the Department of Agriculture, Forest Service and can be found at the web site <http://www.nps.gov/rivers/wildriverslist.html#wai> (Accessed March 2017). No rivers in Hawai‘i are on this list, and thus there will thus be no impact to Wild and Scenic Rivers.

3.7.5 Farmland Protection Policy Act (7 U.S.C. 4201, et seq.)

The Farmland Protection Policy Act (Public Law 97-98, Sec. 1539-1549) requires identification of proposed actions that would affect any lands classified as prime and unique farmlands. Agencies must consider alternative actions that could reduce adverse effects and ensure that their programs, to the extent practicable, are compatible with State, local government and private programs and policies to protect farmland. The Agricultural Lands of Importance in the State of Hawai‘i (ALISH), prepared by the State Department of Agriculture, classifies lands into three categories: 1) Prime Agricultural Land, (2) Unique Agricultural Land, and (3) Other Important Agricultural Land. All land in the central area of Kailua-Keauhou, including areas surrounding the project site, is considered as “Urban” and not classified within the ALISH system. No farmland would be lost.

3.7.6 Resource Conservation and Recovery Act (RCRA) (42 USC 6901 et seq.)

RCRA was enacted in 1976 to address the issue of how to safely manage and dispose of municipal and industrial waste, regulate underground storage tanks (USTs) that store petroleum or hazardous substances, establish a system for managing solid (primarily nonhazardous) waste, including household waste, and set forth the framework for EPA’s comprehensive waste management program.

No systematic records evaluation (i.e. Phase I Environmental Site Assessment and subsequent investigations) or intensive field investigation have been undertaken at the project site. However, no known hazardous substances appear to be present on the project site. Although it is unlikely that any potentially hazardous, toxic or radioactive waste would be found on the proposed project site, reasonable precautions will be undertaken in the context of the project's BMP plan to include provisions for the appropriate response and remediation should any such hazardous, toxic, or radioactive material be encountered during the construction phase of the project, in accordance with RCRA or CERCLA requirements. The project is in compliance with RCRA.

3.7.7 Executive Order 11988, Floodplain Management (24 May 1977)

Executive Order 11988 requires federal agencies to avoid, to the extent possible, the long and short-term adverse impacts associated with the occupancy of the floodplain, and to avoid direct and indirect support of floodplain development where there is a practicable alternative. In accomplishing this objective, "each agency shall provide leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by floodplains."

The project involves an existing culvert in a designated floodplain. An element of the project purpose addresses drainage deficiencies that occurred when the culvert was installed in the 1930s, prior to current floodplain laws, regulations and Executive Orders. No additional use of the floodplain will occur, and no beneficial floodplain values will be lost. It is expected that the FHWA will find that the project is not inconsistent with EO 11988.

3.7.8 Executive Order 11990, Protection of Wetlands (24 May 1977)

Executive Order 11990 (and 23 CFR 771.126(a)(1)) state that it is federal policy to avoid long and short-term adverse impacts associated with the destruction or modification of wetlands, and to avoid direct and indirect support of new construction in wetlands where there is a practicable alternative. The Order further directs federal agencies to avoid undertakings in wetlands unless the head of the agency finds that there is no practicable alternative to such construction, and that the proposed action includes all practicable mitigation measures to minimize harm to wetlands which may result from such use. In the case of the project site, inspection of the site and consultation of U.S. Fish and Wildlife Service wetlands maps indicates that no wetlands are present. The drainageway contains water only briefly and flows less than once a year. No coastal mudflats or tidal waters are present, and there are no coastal wetlands.

3.7.9 Executive Order 12898, Environmental Justice

Executive Order 12898 directs every federal agency to identify and address disproportionately high and adverse human health or environmental effects of agency programs and activities on minority and low-income populations.

The project site is located in the Kailua area of North Kona. As discussed in Section 3.2.1, the project area is similar to the island of Hawai‘i as a whole in its diversity, but with a greater proportions of whites and fewer Asians, greater incomes, a lesser poverty rate, smaller households and higher home vacancy rates. Both minority and low-income populations are present, as shown in Table 3-2. On balance, low-income and minority populations would substantially benefit from the project, as would all other socioeconomic groups, because in the event that the culvert structure collapsed, these groups would expend more time and money traveling to medical care, schools, jobs and family. Similarly, the widened roadway allows for safer pedestrian and bicycle conditions, which benefit all. As the project does not have adverse social effects such as extensive right-of-way acquisition or permanent noise impacts, it would not produce disproportionately high and adverse human health or environmental effects for low-income or minority populations, or any other socioeconomic group.

3.7.10 National Historic Preservation Act (16 USC 470 et seq., 110)

The proposed project involves not only County land and funds, but also federal funds, and thus the environmental documentation is being prepared pursuant to the National Environmental Policy Act (NEPA), the implementing regulations of the Council on Environmental Quality (40 CFR 1500-1508), and the U.S. Department of Transportation regulations for NEPA (23 CFR 771). To comply with these environmental regulations with respect to assessing potential impacts to historic properties, the archaeological survey was prepared in accordance with Section 106 of the National Historic Preservation Act (NHPA) (16 USC 470 et seq., 110) and its implementing regulations (36 CFR 800).

Section 106 requires that federal agencies identify and assess the effects of federally assisted undertakings on historic properties and to consult with others to find acceptable ways to resolve adverse effects. Properties protected under Section 106 are sites, buildings, structures, or objects included on or eligible for listing on the National Register of Historic Places. Eligible properties must generally be at least 50 years old, possess integrity of physical characteristics, and meet at least one of four criteria for significance. Regulations implementing Section 106 (36 CFR Part 800) encourage maximum coordination with the environmental review process required by the National Environmental Policy Act (NEPA) and with other statutes. Hawai‘i Revised Statutes 6E, Historic Preservation, also applies to the project.

As discussed above in Section 3.2.4, the project involved preparation of an archaeological inventory survey guided by consultation with the State Historic Preservation Officer (SHPO) and Native Hawaiian organizations (NHOs). An archaeological inventory survey has assessed historic sites in the Area of Potential Effect, and four significant historic sites are present, each significant for the data they have provided or can provide. A data recovery plan will be developed and implemented to recover data for one site. The inventory survey is currently under review by SHPD. At the present time, the highway agencies have preliminarily concluded that in the context of the HRS Chapter 6E-8, the proposed culvert replacement project will result in an “effect with agreed upon mitigation commitments.” With respect to the undertaking’s effects on historic properties in the context of the National Historic Preservation Act, the preliminary

conclusion is that the undertaking will result in “no effect” to significant historic sites. The archaeological report remains under review by SHPD/SHPO.

3.7.11 Section 4(f)

The material in this section references 42 U.S.C. 4332(2)(c), 49 U.S.C. 303, 23 U.S.C. 138, and 23 CFR 774 (referred to as Section 4(f)). These requirements apply to all actions or projects undertaken by agencies of the U.S. Department of Transportation. The purpose of Section 4(f) is to ensure that special efforts are made to protect public parks and recreation lands, wildlife and waterfowl refuges, and historic sites. The law states that the Secretary of Transportation shall approve a project which requires the use of publicly owned land from a public park, recreation area, wildlife or waterfowl refuge, or historic site of significance only if (1) there is no prudent and feasible alternative to such use and (2) the project includes all possible planning to minimize harm to the resource being used. At this point, it does not appear that any use of these resources will occur, as it has been confirmed through fieldwork and consultation of agencies that there are no public parks and recreation lands or wildlife and waterfowl refuges at or near the Ali‘i Drive culvert structure. A full archaeological inventory has assessed historic sites in the Area of Potential Effect, and four significant historic sites are present, each significant for the data they have provided or can provide. No site is significant for preservation in place. As discussed above, the inventory survey is currently under review by SHPD. At the present time, the highway agencies have preliminarily concluded that in the context of HRS Chapter 6E-8, the proposed culvert replacement project will result in an “effect with agreed upon mitigation commitments.” With respect to the undertaking’s effects on historic properties (sites determined eligible for listing in the NRHP), the preliminary conclusion is that the undertaking will result in “no effect” to significant historic sites. FHWA, HDOT, and the County of Hawai‘i anticipate that as there will be no effects to any archaeological site significant for preservation in place, that there will be no “use” of this historic property in the context of Section 4(f). The archaeological report remains under review by SHPD/SHPO. The FHWA will address this in detail in the NEPA environmental documentation for the project.

3.7.12 Endangered Species Act and Related Laws

This section discusses the Endangered Species Act of 1973, as Amended (16 USC 1531-1544) the Migratory Bird Treaty Act and Migratory Bird Conservation Act (16 USC 701-715), the Fish and Wildlife Coordination Act, as Amended (16 USC 661 et seq.), and the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801-1882).

In accordance with the Endangered Species Act, federally funded, constructed, permitted, or licensed projects must take into consideration impacts to federally listed or proposed threatened or endangered species. The Fish and Wildlife Coordination Act requires consultation with the U.S. Fish and Wildlife Service (USFWS) and fish and wildlife agencies of the States when the “waters of any stream or other body of water are proposed or authorized, permitted or licensed to be impounded, diverted . . . or otherwise controlled or modified” by any agency under a federal permit or license. Consultation is to be undertaken for the purpose of “preventing loss of and

damage to wildlife resources.” The Migratory Bird Treaty Act and Migratory Bird Conservation Act makes it illegal for anyone to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or the parts, nests, or eggs of such a bird except under the terms of a valid permit issued pursuant to federal regulations. The migratory bird species protected by the Act are listed in 50 CFR 10.13, and include several native and non-native birds found in Kailua.

As discussed in Section 3.1.3, the USFWS was notified of the project location and action by an early consultation request letter of March 18, 2014, and the USFWS provided a technical assistance letter in response on March 24, 2014 (see Appendix 7). The letter provided information on survey recommendations; measures to preserve aquatic habitat function, avoid and minimize impacts to federally listed, endangered Hawaiian waterbirds, seabirds, and other resources in the project area; and general best management practices for aquatic areas. Many of the best management practices were then incorporated into the project. Since that time, informal consultation under Section 7 of the ESA has been conducted. By letter of December 15, 2016 (see Appendix 7), the USFWS concurred that there will be no adverse effect to listed species given the specified avoidance and minimization measures that have been jointly developed by the highway agencies and USFWS and are being implemented as part of the project.

In addition to ongoing consultation concerning endangered marine species under the Endangered Species Act, the Magnuson-Stevens Fishery Conservation and Management Act requires federal aid recipients to consult with the National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NOAA-NMFS) to determine whether a proposed project may adversely affect Essential Fish Habitat. Several areas of Essential Fish Habitat in nearshore (non-pelagic waters) in the Hawaiian Archipelago have been designated as approved by the Secretary of Commerce. The highway agencies began consultation with NOAA-NMFS as part of the NEPA-404 MOU process described in Section 1.2, above. The NEPA environmental documentation will include the results of the consultation under these laws. This documentation will include the determination of whether the project is likely to adversely affect the resources protected by these laws and discuss any necessary mitigation or permits.

PART 4: DETERMINATION

Based on the findings below, and in consideration of comments received, the Hawai‘i County Department of Public Works has determined that the proposed project will not have any significant effect in the context of Chapter 343, Hawai‘i Revised Statutes and section 11-200-12 of the State Administrative Rules, and has issued a Finding of No Significant Impact (FONSI).

PART 5: FINDINGS AND REASONS

Chapter 11-200-12, Hawai‘i Administrative Rules, outlines those factors State of Hawai‘i agencies must consider when determining whether an Action has significant effects:

1. *The project will not involve an irrevocable commitment or loss or destruction of any natural or cultural resources.* No valuable natural resources would be committed or lost. No threatened or endangered species, aquatic ecosystems or wetlands would be adversely affected. The project replaces an existing culvert structure and avoids impacts to natural resources. An archaeological inventory survey has assessed historic sites in the Area of Potential Effect, and four significant historic sites are present, each significant for the data they have provided or can provide. A data recovery plan will be developed and implemented to recover data for one site. The inventory survey is currently under review by SHPD. At the present time, the highway agencies have preliminarily concluded that in the context of HRS Chapter 6E-8, the proposed culvert replacement project will result in an “effect with agreed upon mitigation commitments.” With respect to the undertaking’s effects on historic properties (sites determined eligible for listing in the NRHP), the preliminary conclusion is that the undertaking will result in “no effect” to significant historic sites.
2. *The project will not curtail the range of beneficial uses of the environment.* No restriction of beneficial uses will occur. The culvert structure replacement and improvement project represents a beneficial use of the environment for essential transportation purposes.
3. *The project will not conflict with the State's long-term environmental policies. The State's long-term environmental policies are set forth in Chapter 344, HRS.* The broad goals of this policy are to conserve natural resources and enhance the quality of life. The project is minor, environmentally beneficial, and fulfills aspects of these policies calling for an improved social environment. It is thus consistent with all elements of the State’s long-term environmental policies.
4. *The project will not substantially affect the economic or social welfare of the community or State.* The project would not have any adverse effect on the economic or social welfare of the County or State. It will improve the social welfare of the community by curing a critical deficiency in the culvert structure infrastructure, improving drainage, and widening a roadway to better and more safely accommodate bicyclists and pedestrians.
5. *The project does not substantially affect public health in any detrimental way.* The project would affect public health and safety in only beneficial ways by continuing to allow residents to access homes, jobs, school and emergency services in a safe and convenient manner, and greatly improving pedestrian and bicycle safety through sidewalks and a widened shoulder.
6. *The project will not involve substantial secondary impacts, such as population changes or effects on public facilities.* The project would involve no population changes or effects on public facilities.
7. *The project will not involve a substantial degradation of environmental quality.* The potential for air water quality impacts during construction will be mitigated, and there will be no substantial degradation of any aspect of environmental quality.
8. *The project will not substantially affect any rare, threatened or endangered species of flora or fauna or habitat.* The project site supports overwhelmingly alien vegetation, and there

will be no impacts to rare, threatened or endangered species of flora. Impacts to wide ranging threatened or endangered terrestrial animals as well as marine turtles and mammals will be avoided through construction timing and practices.

9. *The project is not one which is individually limited but cumulatively may have considerable effect upon the environment or involves a commitment for larger actions.* The adverse effects of the project – very minor and temporary disturbance to air quality, noise, visual and traffic congestion quality during construction – are very limited in severity, nature and geographic scale. Based on the ability of DPW to coordinate schedules for the only nearby projects with the potential for construction traffic interaction, none of the impacts from the project are expected to accumulate with adverse impacts from other projects in the area.

10. *The project will not detrimentally affect air or water quality or ambient noise levels.* No adverse effects on these resources would occur. Mitigation of construction-phase impacts will preserve water quality. Ambient noise impacts due to construction will be temporary and restricted to daytime hours.

11. *The project does not affect nor would it likely to be damaged as a result of being located in environmentally sensitive area such as a flood plain, tsunami zone, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal area.* The project involves an existing culvert in a designated floodplain. An element of the project purpose addresses drainage deficiencies that occurred when the culvert was emplaced in the 1930s, prior to current floodplain laws and regulations. Although the project is located in an area with tsunami, volcanic and seismic risk, the entire coastal area of the Island of Hawai‘i shares this risk, and the project is not imprudent to construct, and employs design and construction standards appropriate to the flood and seismic zones.

12. *The project will not substantially affect scenic vistas and viewplanes identified in county or state plans or studies.* No scenic vistas and viewplanes identified in County or State plans or studies will be adversely affected by the project, and the project will preserve existing viewplanes and enhance them through removal of jersey barriers that the County has been obliged to place on the deteriorating bridge for safety purposes.

13. *The project will not require substantial energy consumption.* The replacement and improvement of the culvert structure will require consumption of energy, but no adverse effects would be expected.

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Ali‘i Drive Culvert Replacement at Kahului Bay

Environmental Assessment

APPENDIX 1a

Comments in Response to Early Consultation

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From: Tomas, Kim (Consultant) [mailto:Kim.Tomas@wyn.com]
Sent: Wednesday, February 19, 2014 9:48 AM
To: rterry@hawaii.rr.com
Cc: Berges, Bob (Consultant)
Subject: Early Consultatin for Ali'i Drive Culvert Replacement

Aloha!

We here at Kona Hawaiian Resort just received a copy of the attached letter and picture. It was sent to our accounting office over on Kauai.

We do wish to receive notice of the availability of the Draft EA when it is completed and to be kept informed of what is going on with the project as it may affect our owners and guests here at the resort. If you would be so kind as to mail information directly to Kona Hawaiian Resort 75-5961 Ali'i Drive, Kailua-Kona, HI 96740. You can also email information to our resort manager, Bob Berges Bob.Berges@wyn.com and copy the assistant resort manager Marie Cabanas Marie.Cabanas@wyn.com and copy me as well.

Mahalos,

Kim

Kim Tomas
Operations Administrator
Kona Hawaiian Resort - Mauna Loa Village
75 5961 Alii Drive
Kailua Kona, HI 96740
808 334 4752 Office
808 640-4879 Cell
kim.tomas@wyn.com

Original Message-----

From: Apana, Elizabeth E CONTRACTOR @ POH [mailto:Elizabeth.E.Apana@usace.army.mil]

Sent: Thursday, February 20, 2014 1:10 PM

To: rterry@hawaii.rr.com

Cc: Apana, Elizabeth E CONTRACTOR @ POH

Subject: POH-2014-00045: Pre App Consult to Replace an Existing Double-Cell Culvert on Ali'i Drive, Kahului Bay, Kailua-Kona, Hawaii (UNCLASSIFIED)

Classification: UNCLASSIFIED

Caveats: NONE

aloha,

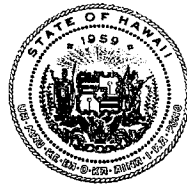
Your application for a Department of the Army Permit has been received, given reference number POH-2014-00045 and is being assigned to a Regulator. Please refer to the reference number POH-2014-00045 in any and all future correspondence to assure a timely response.

Mahalo,

E. Brandilywn Apana, Administrative Assistant Department of the Army U.S. Army Corps of Engineers - Honolulu District Regulatory Office, CEPOH-EC-R Fort Shafter, Hawaii 96858-5440

Classification: UNCLASSIFIED

Caveats: NONE



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

In reply, please refer to:
File:
[EPO 14-038]
[EC Alii Dr Culvert
Replacement]

February 26, 2014

Dear Mr. Ron Terry, Ph.D.
Project Environmental Consultant
Geometrician Associates, LLC
PO Box 396
Hilo, HI 96721
Transmitted via email only to: rterry@hawaii.rr.com

SUBJECT: Early Consultation for Alii Drive Culvert Replacement

The Department of Health (DOH), Environmental Planning Office (EPO), acknowledges receipt of your letter sent 2.14.2014. Thank you for allowing us to review and comment on the letter. EPO recommends that you review the standard comments at: <http://health.hawaii.gov/epo/home/landuse-planning-review-program/>.

You are required to adhere to all standard comments specifically applicable to this application.

EPO also strongly recommends that you consult with other branches and offices within the Department of Health, particularly the Clean Water Branch and our District Health Office in Hilo.

EPO strongly suggests that you examine the following site that provides more information on potential climate change impacts, particularly sea level rise models:

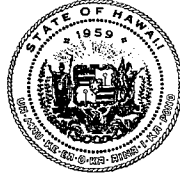
U.H., School of Ocean and Earth Science and Technology: www.soest.hawaii.edu;

We request electronic response confirming receipt of this letter and any other letters you receive from DOH in regards to this project. Please email: epo@doh.hawaii.gov. We anticipate that our letter(s) and your electronic response(s) will be included in any final document. If you have any questions, please contact me at (808) 586-4337 or laura.mcintyre@doh.hawaii.gov

Mahalo,

Laura Leialoha Phillips McIntyre, AICP
Program Manager, Environmental Planning Office

Via email cc to CWB & DHO Hilo



**STATE OF HAWAII
DEPARTMENT OF HEALTH**

P.O. BOX 916
HILO, HAWAII 96721-0916

MEMORANDUM

DATE: February 28, 2014

TO: Mr. Ron Terry, Ph.D.
Geometrician Associates, LLC

FROM: Newton Inouye ✎
District Environmental Health Program Chief

SUBJECT: Early Consultation for Alii Drive Culvert Replacement

Construction activities must comply with the provisions of Hawaii Administrative Rules, Chapter 11-46, "Community Noise Control."

1. The contractor must obtain a noise permit if the noise levels from the construction activities are expected to exceed the allowable levels of the rules.
2. Construction equipment and on-site vehicles requiring an exhaust of gas or air must be equipped with mufflers.
3. The contractor must comply with the requirements pertaining to construction activities as specified in the rules and the conditions issued with the permit.

Should there be any questions on this matter, please contact the Department of Health at 933-0917.

WORD: Alii Drive Culvert Replacement.ni

c: EPO

William P. Kenoi
Mayor



Darren J. Rosario
Fire Chief

Renwick J. Victorino
Deputy Fire Chief

County of Hawai'i
HAWAI'I FIRE DEPARTMENT
25 Aupuni Street • Room 2501 • Hilo, Hawai'i 96720
(808) 932-2900 • Fax (808) 932-2928

February 27, 2014

Mr. Ron Terry
Geometrician Associates
PO Box 396
Hilo, HI 96721

Dear Mr. Terry,

SUBJECT: EARLY CONSULTATION FOR ALII DRIVE CULVERT
REPLACEMENT
TMKs: 7-5-019-:007, 008, 009, and 016
KAILUA-KONA, ISLAND OF HAWAII

The Hawai'i Fire Department does not have any comments to offer at this time regarding the above-referenced early consultation on Environmental Assessment.

Thank you for the opportunity to comment. A copy or Notice of Availability of Environmental Assessment is not needed when completed.

Sincerely,

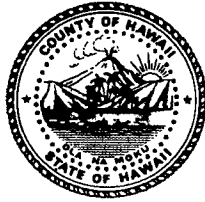
A handwritten signature in black ink, appearing to read "Darren J. Rosario".

DARREN J. ROSARIO
Fire Chief

GA:lc



William P. Kenoi
Mayor



Harry S. Kubojiri
Police Chief

Paul K. Ferreira
Deputy Police Chief

County of Hawai'i

POLICE DEPARTMENT

349 Kapi'olani Street • Hilo, Hawai'i 96720-3998
(808) 935-3311 • Fax (808) 961-2389

March 4, 2014

Mr. Ron Terry
Principal
Geometrician Associates LLC
P.O. Box 396
Hilo, HI 96721

RE: EARLY CONSULTATION FOR ALI'I DRIVE CULVERT REPLACEMENT,
TMKS: 7-5-019:007,008,009 AND 016, KAILUA-KONA, ISLAND OF HAWAI'I,
FAP NO. STP-0186(1)

Dear Mr. Terry:

This is in response to your letter dated February 14, 2014, regarding a request for comments on the replacement of the existing culvert in reference to this early consultation on an environmental assessment at the above mentioned location.

Thank you for allowing the Hawai'i Police Department to make comments regarding this development and repairs. At this time, the Hawai'i Police Department has no comments.

Should you have any questions or concerns, please contact Captain Randal M. Ishii, Commander of the Kona District, at 326-4646, extension 299.

Sincerely,

HARRY S. KUBOJIRI
POLICE CHIEF

PAUL H. KEALOHA JR.
ASSISTANT POLICE CHIEF
AREA II OPERATIONS

RMI
RS140117

NEIL ABERCROMBIE
GOVERNOR OF HAWAII



WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

March 13, 2014

Geometrician Associates
Attention: Mr. Ron Terry
P.O. Box 396
Hilo, Hawaii 96721

via email: rterry@hawaii.rr.com

Dear Mr. Terry:

SUBJECT: Early Consultation for Alii Drive Culvert Replacement, Geometrician Associates, LLC for County of Hawaii Department of Public Works, Applicant, North Kona, Hawaii, TMK: (3) 7-5-019:007, 008, 009 & 016

Thank you for the opportunity to review and comment on the subject matter. The Department of Land and Natural Resources' (DLNR) Land Division distributed or made available a copy of your report pertaining to the subject matter to DLNR Divisions for their review and comments.

At this time, enclosed are comments from the (i) Engineering Division, (ii) Hawaii District Land Office, (iii) Office of Conservation and Coastal Lands, and (iv) Division of Aquatic Resources on the subject matter. Should you have any questions, please feel free to call Kevin Moore at (808) 587-0426. Thank you.

Sincerely,

A handwritten signature in black ink, appearing to read "Russell Y. Tsuji".

Russell Y. Tsuji
Land Administrator

Enclosure(s)

NEIL ABERCROMBIE
GOVERNOR OF HAWAII



WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

February 18, 2014

MEMORANDUM

TO: FR:

DLNR Agencies:

- ☒ Div. of Aquatic Resources
- ☐ Div. of Boating & Ocean Recreation
- ☒ Engineering Division
- ☐ Div. of Forestry & Wildlife
- ☐ Div. of State Parks
- ☐ Commission on Water Resource Management
- ☒ Office of Conservation & Coastal Lands
- ☒ Land Division – Hawaii District
- ☒ Historic Preservation

TO: *fr*
FROM: Russell Y. Tsuji, Land Administrator *VER*
SUBJECT: Early Consultation for Alii Drive Culvert Replacement
LOCATION: South Kona, Hawaii, TMK: (3) 7-5-019:007, 008, 009 & 016
APPLICANT: Geometrician Associates, LLC for County of Hawaii Department of Public Works

Transmitted for your review and comment is information on the above referenced document. We would appreciate your comments on this document. Please submit any comments by March 12, 2014.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Kevin Moore at 587-0426. Thank you.

Attachments

- () We have no objections.
- () We have no comments.
- (☒) Comments are attached.

Signed: *[Signature]*

Print name: Cory S. Chang, Chief Engineer

Date: 2/25/14

cc: Central Files

14 FEB 19 PM 1:36 ENGINEERING

**DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION**

LD/ Russell Y. Tsuji

**REF: Early Consultation for Alii Drive Culvert Replacement, South Kona
Hawaii.009**

COMMENTS

- () We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone ____.
- (X) **Please take note that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zones VE, AE, and X. The National Flood Insurance Program regulates developments within Zones VE and AE as indicated in bold letters below, but not Zone X.**
- () Please note that the correct Flood Zone Designation for the project site according to the Flood Insurance Rate Map (FIRM) is ____.
- (X) **Please note that the project site must comply with the rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal Regulations (44CFR), whenever development within a Special Flood Hazard Area is undertaken. If there are any questions, please contact the State NFIP Coordinator, Ms. Carol Tyau-Beam, of the Department of Land and Natural Resources, Engineering Division at (808) 587-0267.**

Please be advised that 44CFR indicates the minimum standards set forth by the NFIP. Your Community's local flood ordinance may prove to be more restrictive and thus take precedence over the minimum NFIP standards. If there are questions regarding the local flood ordinances, please contact the applicable County NFIP Coordinators below:

- () Mr. Mario Siu Li at (808) 768-8098 or Ms. Ardis Shaw-Kim at (808) 768-8296 of the City and County of Honolulu, Department of Planning and Permitting.
- (X) **Mr. Frank DeMarco at (808) 961-8042 of the County of Hawaii, Department of Public Works.**
- () Mr. Carolyn Cortez at (808) 270-7813 of the County of Maui, Department of Planning.
- () Mr. Stanford Iwamoto at (808) 241-4884 of the County of Kauai, Department of Public Works.

- () The applicant should include project water demands and infrastructure required to meet water demands. Please note that the implementation of any State-sponsored projects requiring water service from the Honolulu Board of Water Supply system must first obtain water allocation credits from the Engineering Division before it can receive a building permit and/or water meter.
- () The applicant should provide the water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update.

() Additional Comments: _____

() Other: _____

Should you have any questions, please call Mr. Dennis Imada of the Planning Branch at 587-0257.

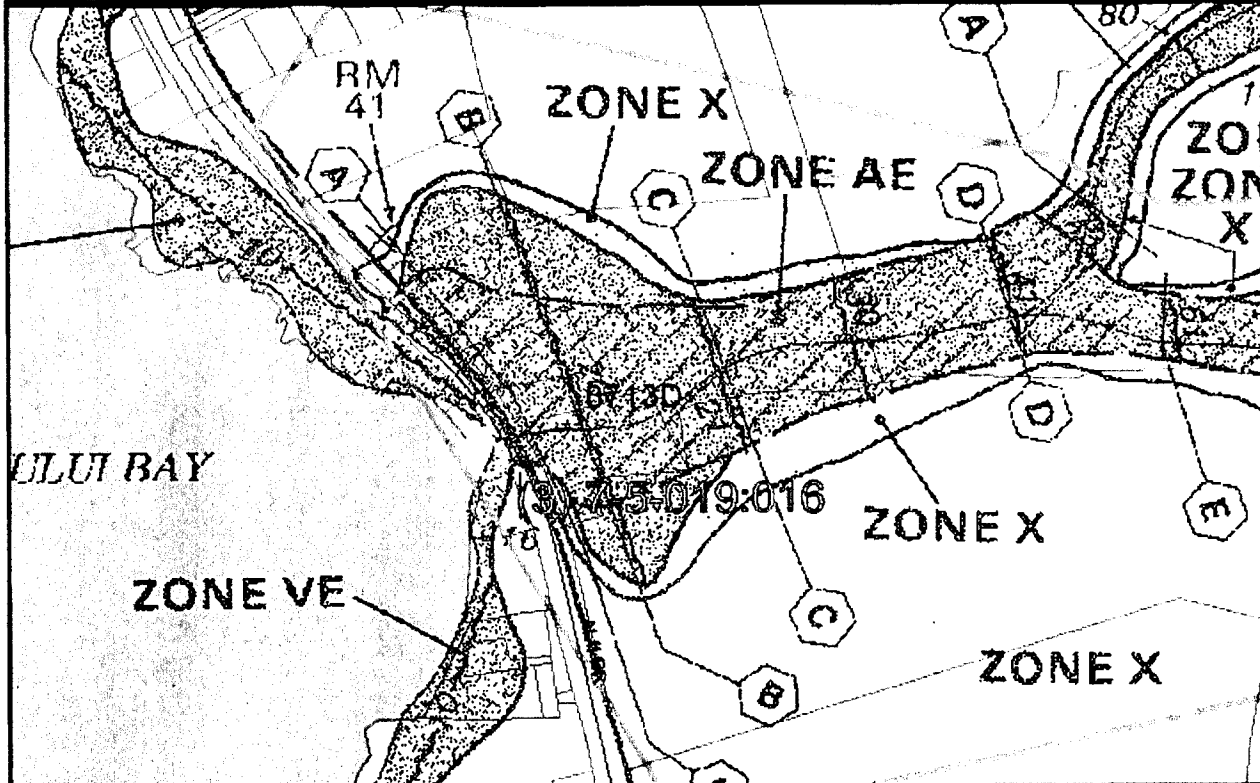
Signed: _____

CARTY S. CHANG, CHIEF ENGINEER

Date: 2/25/14



State of Hawaii FLOOD HAZARD ASSESSMENT REPORT



NATIONAL FLOOD INSURANCE PROGRAM

FLOOD ZONE DEFINITIONS

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD – The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zone A, AE, AH, AO, V, and VE. The Base Flood Elevation (BFE) is the water-surface elevation of the 1% annual chance flood. Mandatory flood insurance purchase applies in these zones:

- **Zone A:** No BFE determined.
- **Zone AE:** BFE determined.
- **Zone AH:** Flood depths of 1 to 3 feet (usually areas of ponding); BFE determined.
- **Zone AO:** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined.
- **Zone V:** Coastal flood zone with velocity hazard (wave action); no BFE determined.
- **Zone VE:** Coastal flood zone with velocity hazard (wave action); BFE determined.
- **Zone AEF:** Floodway areas in Zone AE. The floodway is the channel of stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without increasing the BFE.

NON-SPECIAL FLOOD HAZARD AREA – An area in a low-to-moderate risk flood zone. No mandatory flood insurance purchase requirements apply, but coverage is available in participating communities.

- **Zone XS (X shaded):** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
- **Zone X:** Areas determined to be outside the 0.2% annual chance floodplain.

OTHER FLOOD AREAS

- **Zone D:** Unstudied areas where flood hazards are undetermined, but flooding is possible. No mandatory flood insurance purchase requirements apply, but coverage is available in participating communities.

PROPERTY INFORMATION

COUNTY: HAWAII
TMK NO: (3) 7-5-019-016
PARCEL ADDRESS: 75-5976 ALII DRIVE
KAILUA KONA, HI 96740
FIRM INDEX DATE: APRIL 02, 2004
LETTER OF MAP CHANGE(S): 02-09-1456P
FEMA FIRM PANEL(S): 1551660713D
PANEL EFFECTIVE DATE: MAY 16, 1994

PARCEL DATA FROM: JUNE 2013
IMAGERY DATA FROM: MAY 2005

IMPORTANT PHONE NUMBERS

County NFIP Coordinator
County of Hawaii
Frank DeMarco, CFM (808) 961-8042
State NFIP Coordinator
Carol Tyau-Beam, P.E., CFM (808) 587-0267

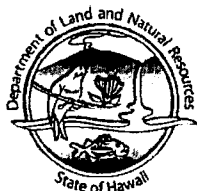
Disclaimer: The Department of Land and Natural Resources (DLNR) assumes no responsibility arising from the use of the information contained in this report. Viewers/Users are responsible for verifying the accuracy of the information and agree to indemnify the DLNR from any liability, which may arise from its use.

If this map has been identified as 'PRELIMINARY' or 'UNOFFICIAL', please note that it is being provided for informational purposes and is not to be used for official/legal decisions, regulatory compliance, or flood insurance rating. Contact your county NFIP coordinator for flood zone determinations to be used for compliance with local floodplain management regulations.

NEIL ABERCROMBIE
GOVERNOR OF HAWAII



WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

RECEIVED
LAND DIVISION
HONOLULU, HAWAII

February 18, 2014

MEMORANDUM

TO:

DLNR Agencies:

- ☒ Div. of Aquatic Resources
- ☐ Div. of Boating & Ocean Recreation
- ☒ Engineering Division
- ☐ Div. of Forestry & Wildlife
- ☐ Div. of State Parks
- ☐ Commission on Water Resource Management
- ☒ Office of Conservation & Coastal Lands
- ☒ Land Division - Hawaii District
- ☒ Historic Preservation

FROM:

fr Russell Y. Tsuji, Land Administrator *WET*

SUBJECT:

Early Consultation for Alii Drive Culvert Replacement

LOCATION:

South Kona, Hawaii, TMK: (3) 7-5-019:007, 008, 009 & 016

APPLICANT:


Geometrician Associates, LLC for County of Hawaii Department of Public Works

Transmitted for your review and comment is information on the above referenced document. We would appreciate your comments on this document. Please submit any comments by March 12, 2014.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Kevin Moore at 587-0426. Thank you.

Attachments

- (☒) We have no objections.
- (☐) We have no comments.
- (☐) Comments are attached.

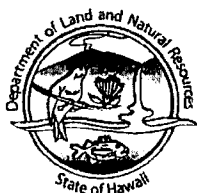
Signed: 

Print name: Gordon C. HEIT

Date: 2/26/14

cc: Central Files

NEIL ABERCROMBIE
GOVERNOR OF HAWAII



17A-14-144



WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

February 18, 2014

MEMORANDUM

TO:

DLNR Agencies:

- ☒ Div. of Aquatic Resources
- ☐ Div. of Boating & Ocean Recreation
- ☒ Engineering Division
- ☐ Div. of Forestry & Wildlife
- ☐ Div. of State Parks
- ☐ Commission on Water Resource Management
- ☒ Office of Conservation & Coastal Lands
- ☒ Land Division – Hawaii District
- ☒ Historic Preservation

FROM:

fr Russell Y. Tsuji, Land Administrator

SUBJECT:

Early Consultation for Alii Drive Culvert Replacement

LOCATION:

South Kona, Hawaii, TMK: (3) 7-5-019:007, 008, 009 & 016

APPLICANT:

Geometrician Associates, LLC for County of Hawaii Department of Public Works

Transmitted for your review and comment is information on the above referenced document. We would appreciate your comments on this document. Please submit any comments by March 12, 2014.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Kevin Moore at 587-0426. Thank you.

Attachments

- () We have no objections.
- () We have no comments.
- (✓) Comments are attached.

Signed:

Print name: K. Tiger Mills

Date: 2-24-2014

cc: Central Files

NEIL ABERCROMBIE
GOVERNOR OF HAWAII



WILLIAM J. MITCHELL, JR.
GOVERNOR OF HAWAII
OFFICE OF LAND AND NATURAL RESOURCES
1555 KALANIANAʻOHE AVENUE, SUITE 1000
HONOLULU, HAWAII 96813

ESTHER KIAMINA
DIRECTOR

WILLIAM M. LAM
DIRECTOR

WILLIAM M. LAM
DIRECTOR
OFFICE OF LAND AND NATURAL RESOURCES
1555 KALANIANAʻOHE AVENUE, SUITE 1000
HONOLULU, HAWAII 96813
TELEPHONE: (808) 587-0382
FAX: (808) 587-0383
WWW.DLN.RH.HAWAII.GOV

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
OFFICE OF CONSERVATION AND COASTAL LANDS
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

REF:OCCL:TM

Correspondence: HIA 14-144

MEMORANDUM

TO: Russ Tsuji, Administrator
Land Division

FROM: Sam Lemmo, Administrator
Office of Conservation and Coastal Lands (OCCL)

SUBJECT: Early Consultation for Ali'i Drive Culvert Replacement Located at Kahului,
North Kona, Island of Hawai'i, TMK: (3) 7-5-019:016

FEB 24 2014

The Office of Conservation and Coastal Lands has reviewed the preliminary information and note it appears that the proposed work may not be within the Conservation District. In this particular area, the shoreline will determine the Conservation District. There is no certified shoreline on record for this parcel. Should proposed work take place makai of the shoreline, further review and potentially further authorization may be required. Therefore please forward a draft Environmental Assessment, preferably on CD, to the OCCL upon completion.

Should there be any questions regarding this memorandum, contact Tiger Mills of our Office at 587-0382.

NEIL ABERCROMBIE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

February 18, 2014

MEMORANDUM

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT



JDAR #4935

TO: **DLNR Agencies:**
☒ Div. of Aquatic Resources
☐ Div. of Boating & Ocean Recreation
☒ Engineering Division
☐ Div. of Forestry & Wildlife
☐ Div. of State Parks
☐ Commission on Water Resource Management
☒ Office of Conservation & Coastal Lands
☒ Land Division – Hawaii District
☒ Historic Preservation

JK ✓
WW

FROM: *fr* Russell Y. Tsuji, Land Administrator *VER*
SUBJECT: Early Consultation for Alii Drive Culvert Replacement
LOCATION: South Kona, Hawaii, TMK: (3) 7-5-019:007, 008, 009 & 016
APPLICANT: Geometrician Associates, LLC for County of Hawaii Department of Public Works

Transmitted for your review and comment is information on the above referenced document. We would appreciate your comments on this document. Please submit any comments by March 12, 2014.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Kevin Moore at 587-0426. Thank you.

Attachments

- ☐ We have no objections.
☐ We have no comments.
☒ Comments are attached.

Signed: *[Signature]*

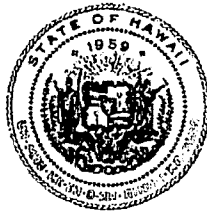
Print name: *McGILVERAY*

Date: *7*

cc: Central Files

MAR - 8 2014

NEIL ABERCROMBIE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF AQUATIC RESOURCES
1151 PUNCHBOWL STREET, ROOM 330
HONOLULU, HAWAII 96813
Telephone: 587-0100

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

ESTHER KIA'AINA
FIRST DEPUTY

WILLIAM M. TAM
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATLAND OCEAN RECREATION
BUREAU OF CONSERVATION
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES PRIORITIZATION
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

Date: (Feb 28, 2014)
DAR # (DAR 4935)

MEMORANDUM

TO: Frazer McGilvray, DAR Administrator (J))
FROM: William J. Walsh Ph.D, Aquatic Biologist (WJW)
THRU: Jo-Anne N. Kushima, Aquatic Biologist
SUBJECT: Early Consultation for Ali'i Drive Culvert Replacement
MAR - 8 2014

Comment	Date	Request	Receipt	Referral	Due Date
	(Feb 28, 2014)	(Feb 18, 2014)	(Feb 20, 2014)	(Feb 22, 2014)	(Mar 12, 2014)

Requested by: Russell Y. Tsuji, Land Administrator

Summary of Proposed Project

Title: Early Consultation for Ali'i Drive Culvert Replacement,

Project by: Geometrician Associates, LLC for County of Hawaii Department of Public Works.

Location: Kailua-Kona, Island of Hawai'i TMKs 7-5-019:007, 008, 009 and 016, FAP No. STP-0186(1)

Brief Description: The County of Hawai'i, Department of Public Works (DPW), proposes to replace an existing double-cell culvert on Ali'i Drive at Kahului Bay in Kailua-Kona with a larger structure, expand the flood channel, and widen the roadway above to accommodate a bike lane and raised sidewalk.

Comments: DAR has substantial concerns regarding potential impacts of sediment transport from intermittent gulches/drainage areas onto nearshore coral reefs. In recent years DAR has documented several major sedimentation events occurring along the West Hawai'i coastline which resulted in marked coral mortality. These events were apparently triggered by heavy, but not catastrophic (e.g. 100 year events), rainfall compounded by adjacent land alteration.

The applicant proposes to replace and enlarge an existing culvert on Ali'i drive directly mauka of Kahului Bay while expanding the flood channel. No mention is made however of what efforts will be taken to address the issue of potential sedimentation transport onto nearby living coral reefs. Given that the drainage areas which are served by this culvert are presently largely undeveloped it is even more important to plan for the likely, not-

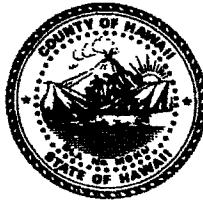
too-distant, future when such areas are developed. Such development will almost certainly increase potential threats to nearshore coral reefs by altering the drainage basin and increasing other anthropogenic impacts.

Of particular relevancy to the issue of sedimentation impacts on coral reefs is the fact that the Hawaii Administrative Rule governing damage to stony corals (HAR 13-95) has been amended by DLNR and will presumably shortly be approved by the BLNR. The amended rule now includes penalties for damage to any stony coral by any intentional or negligent activity which was caused by the introduction of sediment, biological contaminants, or pollution into state waters. Both criminal and general administrative penalties can be levied for such damage and fines *per specimen* may be imposed. For colonial stony corals each damaged head or colony $<1\text{m}^2$ in surface area constitutes a separate specimen. For a coral colony $>1\text{m}^2$ in surface area, each square meter of colony surface area and any fraction remaining constitutes an additional specimen. General Administrative fines can be up to \$1,000 per specimen for a first time violation.

Given the ever increasing threats to our highly valuable coral reefs concerted efforts must be taken by the County in this sensitive area to reduce/eliminate the potential deleterious effects of sedimentation events, even if they are infrequent.

Thank you for providing DAR the opportunity to review and comment on the proposed project. Please provide notice of the availability of the Draft EA when it is completed.

William P. Kenoi
Mayor



Duane Kanuha
Director

Bobby Command
Deputy Director

West Hawai'i Office
74-5044 Ane Keohokalole Hwy
Kailua-Kona, Hawai'i 96740
Phone (808) 323-4770
Fax (808) 327-3563

County of Hawai'i
PLANNING DEPARTMENT

East Hawai'i Office
101 Pauahi Street, Suite 3
Hilo, Hawai'i 96720
Phone (808) 961-8288
Fax (808) 961-8742

March 7, 2014

Mr. Ron Terry
Geometrician Associates, LLC
P.O. Box 396
Hilo, HI 96721

Dear Mr. Terry:

Subject: Pre-Consultation for Draft Environmental Assessment

Project: Ali'i Drive Culvert Replacement

TMKs: (3) 7-5-019:007, :008, :009 & :016; Kahului 1st & 2nd, N. Kona, Hawai'i

Thank you for your letter dated February 14, 2014, requesting comments from this office regarding the preparation of a Draft Environmental Assessment (DEA) for the subject project.

The County of Hawai'i, Department of Public Works proposes the replacement of the existing double-cell culvert under the subject portion of Ali'i Drive with a larger one capable of handling the drainage water of a predicted 100-year flood. The aged structure will be replaced, the drainage channel will be widened, and the bridge will be widened to accommodate vehicular, bicycle, and raised pedestrian lanes.

The subject properties are situated in the State Land Use Urban district, zoned Resort-Hotel (V-1.25) by the County, and designated Open in the project area by the Hawai'i County General Plan Land Use Pattern Allocation Guide (LUPAG) map. The properties are located within the Special Management Area (SMA); parcel (3) 7-5-019:016 abuts the shoreline while all other subject parcels are mauka of Ali'i Drive.

As the project occurs within the SMA, a Special Management Area Use Permit Assessment Application (SMAA) will need to be submitted for the proposal prior to commencement of any work on the subject project. A copy of the final Environmental Assessment should also accompany the SMAA. According to Hawai'i Revised Statutes (HRS), Chapter 205A-22, "development" includes the "*construction, reconstruction, demolition, or alteration of the size of any structure*", however, "development" does not include the "*repair or maintenance of roads and highways within existing rights-of-way*". Therefore, the site plan required as part of a complete Special Management Area Use Permit Assessment Application (SMAA) should clearly indicate the area of potential effect (APE) as well as the extent of the Ali'i Drive right-of-way

(ROW). The valuation of the portion of the project occurring within the APE but outside of the Ali'i Drive ROW will also be required a part of a complete SMAA. Should the valuation of the portion of the project occurring within the APE but outside of the Ali'i Drive ROW exceed \$500,000, the applicant may forego the submission of a SMAA in favor of a Special Management Area (Major) Use Permit Application. The signature of all land-owners within the APE will also be required on any application. Should any work be proposed near the 40' shoreline setback area of parcel (3) 7-5-019:016, a current shoreline survey, certified by the chairperson of the Board of Land and Natural Resources, will be required as part of a complete SMAA for the proposed project.

The County of Hawai'i General Plan 2005 (amended December 2006) is the policy document for the long range comprehensive development of the island of Hawai'i and identifies the visions, values, and priorities important to the people of this County. It can be found electronically at (<http://www.cohplanningdept.com/community-planning/general-plan/>). General Plan policies related to Transportation, and relevant to this EA, include:

- 13.2.3(d) "Support the development of programs to identify and improve hazardous and substandard sections of roadway and drainage problems."
- 13.2.3(o) "Explore means and opportunities to enhance the shared use of the islands road-ways by pedestrians and bicyclists, in coordination with appropriate government agencies and organizations."

The Kona Community Development Plan (Kona CDP), adopted by ordinance in 2008, is the community-specific plan that translates broad statements within the General Plan into specific actions as they apply to the community. Copies of the Kona CDP can be provided upon request. Kona CDP policies relevant to this EA, include:

"Policy TRAN-3.4: Retrofit of Existing Streets. To the extent practicable, pedestrian improvements and/or bicycle accommodations shall be added to existing public streets when repaving or doing other repair or maintenance work, especially on those streets identified for such multi-modal purposes in the Official Transportation Network Map (see Figure 4-2b)."

With respect to the above quoted policy, pedestrian and bicycle accommodations should be designed along both sides of the bridge, space permitting. The existing makai right-of-way, which may currently be used as parking, should be incorporated into the project to allow for the aforementioned pedestrian and bike lanes while avoiding excessive mauka movement of the current path of travel. Considerations given to sediment retention during storms should also be examined in the draft EA.

Mr. Ron Terry
March 7, 2014
Page 3

The Kona CDP Action Committee (KCDPAC) should be consulted in preparation of the EA and afforded an opportunity to comment on the draft document when published. The KCDPAC can be contacted through Planning Department staff planner Terry Dunlap at 323-4774 or by email at tdunlap@co.hawaii.hi.us.

We have no further comments to offer, at this time. However, please keep us informed and provide our department with a copy of the draft Environmental Assessment for our review and comment. If you have any questions or if you need further assistance, please feel free to contact Lucas Mead of this office at 961-8140.

Sincerely,


DUANE KANUHA
Planning Director

LM:

\\coh33\planning\public\wpwin60\Luke\lEA, EA, & EIS Comments\preconsultdraftea Alii_Drive_Culvert_Replacement.doc

NEIL ABERCROMBIE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
STATE HISTORIC PRESERVATION DIVISION
601 KAMOKILA BOULEVARD, ROOM 555
KAPOLEI, HAWAII 96707

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

JESSE K. SOUKI
FIRST DEPUTY

WILLIAM M. TAM
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

March 14, 2014

MEMORANDUM

To: Kevin Moore
Land Division
PO Box 621
Honolulu, HI 96809

LOG NO: 2014.00770
DOC NO: 1403MV14
Archaeology

FROM: Michael Vitousek, Lead Archaeologist, Hawaii Island Section

A handwritten signature in black ink that reads "Mike Vitousek".

SUBJECT: Chapter 6E-8 Historic Preservation Review –
Environmental Assessment Preparation Notice
Ali'i Drive Culvert Replacement at Kahului Bay
Kahului Ahupua'a, North Kona District, Island of Hawai'i
TMK: (3) 7-5-019:007 through :009 & :016

Thank you for early efforts to consult with SHPD on the proposed project. Your letter was received by our office on February 20, 2014. The purpose of this project is for the County of Hawaii Department of Public Works to replace an existing double-cell culvert bridge on Ali'i Drive with a larger structure in order to widen the flood channel and accommodate a bike lane and raised side walk. The letter indicates that the bridge itself was constructed in 1937 and is therefore considered a historic property. A review of our records indicates that this project area was subjected to an archaeological inventory survey by Rechtman and Henry in 1999. This survey did not record the bridge itself and did not conduct any subsurface excavation. Given that this survey was accepted prior to the adoption of the current standards for archaeological inventory surveys established in HAR 13-276, SHPD has determined that no adequate survey exists pursuant to HAR 13-275-5(b)(4). Therefore, we believe that **an addendum AIS should be conducted** in order to bring the previous survey up to current standards. We believe that this addendum survey should utilize subsurface testing in the area of potential effects to examine whether subsurface historic properties exist in the project area. In addition, we believe that the bridge itself should be recorded and assessed for historic significance. We request that the report be submitted to our office prior to EA publication so that we have an opportunity to review and comment on the findings and recommendations.

Please contact Mike Vitousek at (808) 652-1510 or Michael.Vitousek@Hawaii.gov if you have any questions or concerns regarding this letter.

CC:
Ron Terry
Geometrician Associates
PO Box 396
Hilo, HI 96721



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

April 9, 2014

Regulatory Office

Ron Terry, Ph.D.
Project Environmental Consultant
Geometrician Associates, LLC
P.O. Box 396
Hilo, Hawaii 96721

Dear Dr. Terry:

This letter is in response to your February 14, 2014 request for early consultation with the U.S. Army Corps of Engineers (Corps) and input on the County of Hawaii's Environmental Assessment (EA) and Federal Highway Administration's EA that are being prepared pursuant to Chapter 343, Hawaii Revised Statutes and National Environmental Policy Act, respectively, for the proposed Ali'i Drive Culvert Replacement Project located in Kailua-Kona, Island of Hawaii, Hawaii (TMKs 7-5-019:007, 008, 009 and 016). We have assigned Corps file number POH-2014-00045 to this action, which you should refer to in any future communications with our office on this project.

According to your letter, the County of Hawaii, Department of Public Works (DPW) proposes to replace an existing double-cell culvert on Ali'i Drive at Kahului Bay with a larger structure, expand the flood control channel, and widen the roadway to accommodate a bike lane and raised sidewalk. Kahului Bay (Pacific Ocean) is a navigable water of the United States (U.S.) and therefore, certain work or construction activities in, over, under or affecting this waterway requires Department of the Army (DA) authorization.

As you prepare the draft EA and alternatives to the proposed action, I recommend you identify and characterize all aquatic resources that occur within the study area, including but not limited to, streams (perennial, intermittent, ephemeral), gulches, and wetlands. Under Section 404 of the Clean Water Act ("Section 404"; 33 U.S.C. 1344) a DA permit is required for activities that result in the discharge of dredged or fill material into jurisdictional waters of the U.S., including wetlands. Examples of such activities include, but are not limited to: placing rock for bank protection, temporary or permanent stockpiling of excavated material, bridge abutments for road crossings, replacing or enlarging culverts, backfilling for utility line crossings, constructing outfall structures, allowing runoff or overflow from a contained land or water disposal area to re-enter a water of the U.S., and placing pilings when such placement has or would have the effect of a discharge of fill material. For tidally influenced waters, in the absence of adjacent wetlands, the shoreward limit of the Corps' Section 404 jurisdiction extends to the high tide line, which in Hawai'i may be approximated by reference to the mean higher high water mark. For non-tidal waters, the lateral limits of the Corps' Section 404 jurisdiction

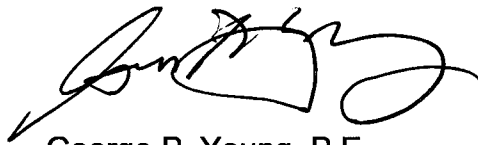
extend to the ordinary high water mark and/or the approved delineated boundary of any adjacent wetlands.

In addition, pursuant to Section 10 of the Rivers and Harbors Act of 1899 ("Section 10"; 33 U.S.C. 403) DA authorization is required for any work or structure in, over, under or affecting navigable waters of the United States. Navigable waters are those waters of the U.S. subject to the ebb and flow of the tide (tidally influenced) shoreward to the mean high water mark and/or are presently used, or have been used in the past, or may be susceptible to use to transport interstate or foreign commerce. Section 10 "work" includes any dredging or disposal of dredged material, excavation, filling, or other modification of a navigable water of the U.S. The term "structure" includes any pier, boat dock, boat ramp, wharf, dolphin, weir, boom, breakwater, bulkhead, revetment, riprap, jetty, artificial island, artificial reef, permanent mooring structure, power transmission line, permanently moored floating vessel, piling, aid to navigation, or any other obstacle or obstruction.

The County of Hawaii, DPW should ensure all practicable steps are taken to avoid and minimize adverse effects to the aquatic environment. Based on our review of the information you have provided, the County of Hawaii, DPW should request a jurisdictional determination to establish the Corps' geographic extent, if any, and determine whether the proposed activities would require DA authorization. For additional permit application information, please visit our website at <http://www.poh.usace.army.mil/EC-R/EC-R.htm>.

If you have any questions or need further assistance, please contact Susan A. Meyer at (808) 835-4599 or susan.a.meyer@usace.army.mil. I encourage you to comment on your experience with Regulatory Division by accessing the Corps web-based customer survey form at http://corpsmapu.usace.army.mil/cm_apex/f?p=regulatory_survey.

Sincerely,

A handwritten signature in black ink, appearing to read "George P. Young", with a stylized flourish at the end.

George P. Young, P.E.
Chief, Regulatory Office

Ali‘i Drive Culvert Replacement at Kahului Bay

Environmental Assessment

APPENDIX 1b

Comments to Draft EA and Responses

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**STATE OF HAWAII
DEPARTMENT OF HEALTH**

P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
File:

EPO 17-076

April 28, 2017

Mr. Ron Terry
Geometrician Associates
P.O. Box 396
Hilo, Hawaii 96721
Email: rterry@hawaii.rr.com

Dear Mr. Terry:

SUBJECT: Draft Environmental Assessment (DEA) for Alii Drive Culvert Replacement, Kailua-Kona, Hawaii
TMK: (3) 7-5-019:007, 008, 009, 016, 024 and 025

The Department of Health (DOH), Environmental Planning Office (EPO), acknowledges receipt of your DEA to our office via the OEQC link:

http://oeqc.doh.hawaii.gov/Shared%20Documents/EA_and_EIS_Online_Library/Hawaii/2010s/2017-04-08-HA-5B-DEA-Alii-Drive-Culvert-Replacement.pdf

We understand from the OEQC publication form project summary that *"The County of Hawai'i DPW, in partnership with FHWA and HDOT, plans to replace an existing double-cell culvert near the ocean on the Waiaha Drainageway on Ali'i Drive. The 1937-era structure artificially constricts the channel and occasionally floods properties and Ali'i Drive. It supports a narrow road deck with two ten-foot lanes for vehicles and inadequate shoulders for pedestrians and bicyclists. The culvert is rapidly deteriorating and is structurally and functionally obsolete. If not repaired, it may soon require closure, cutting a critical link on Ali'i Drive that would cause traffic detours of up to two miles and lead to severe traffic and socioeconomic disruption. The project would construct a new culvert structure that has a wide culvert opening and a longer, wider bridge above. The drainage channel would be widened 134 feet upstream, with a natural bottom of sand and cobbles. The roadway above would accommodate bike lanes and raised sidewalks."*

In the development and implementation of all projects, EPO strongly recommends regular review of State and Federal environmental health land use guidance. State standard comments and available strategies to support sustainable and healthy design are provided at: <http://health.hawaii.gov/epo/landuse>. Projects are required to adhere to all applicable standard comments. EPO has recently updated the environmental Geographic Information System (GIS) website page. It now compiles various maps and viewers from our environmental health programs. The eGIS website page is continually updated so please visit it regularly at: <http://health.hawaii.gov/epo/egis>

In 2015, Hawaii passed Act 97 which amended Hawaii's Renewable Portfolio Standards by setting a goal for Hawaii to become one hundred percent renewable by the year 2045. To reach this goal Hawaii should transform its transportation sector from the use of fossil fuels to renewable fuel, electric vehicles (EV)s, and public transit systems including bikeshare programs. To address "range anxiety" and facilitate the adoption of EVs, it is essential that EV charging stations be added to any planned parking areas open to the EV driving public. All future plans should strive to encourage the use of personal bicycles through the development of designated bike lanes and class A bike trails. All efforts should be made to reduce harmful vehicle emissions, reduce vehicle miles travelled (VMT's), encourage alternative modes of transport and increase physical activity.

Mr. Ron Terry
Page 2
April 28, 2017

EPO also encourages you to examine and utilize the Hawaii Environmental Health Portal at: <https://eha-cloud.doh.hawaii.gov>. This site provides links to our e-Permitting Portal, Environmental Health Warehouse, Groundwater Contamination Viewer, Hawaii Emergency Response Exchange, Hawaii State and Local Emission Inventory System, Water Pollution Control Viewer, Water Quality Data, Warnings, Advisories and Postings.

We suggest you review the requirements of the Clean Water Branch (Hawaii Administrative Rules {HAR}, Chapter 11-54-1.1, -3, 4-8) and/or the National Pollutant Discharge Elimination System (NPDES) permit (HAR, Chapter 11-55) at: <http://health.hawaii.gov/cwb>. If you have any questions, please contact the Clean Water Branch (CWB), Engineering Section at (808) 586-4309 or cleanwaterbranch@doh.hawaii.gov. If your project involves waters of the U.S., it is highly recommended that you contact the Army Corps of Engineers, Regulatory Branch at: (808) 835-4303.

Please note that all wastewater plans must conform to applicable provisions (HAR, Chapter 11-62, "Wastewater Systems"). We reserve the right to review the detailed wastewater plans for conformance to applicable rules. Should you have any questions, please review online guidance at: <http://health.hawaii.gov/wastewater> and contact the Planning and Design Section of the Wastewater Branch (WWB) at (808) 586-4294.

If temporary fugitive dust emissions could be emitted when the project site is prepared for construction and/or when construction activities occur, we recommend you review the need and/or requirements for a Clean Air Branch (CAB) permit (HAR, Chapter 11-60.1 "Air Pollution Control"). Effective air pollution control measures need to be provided to prevent or minimize any fugitive dust emissions caused by construction work from affecting the surrounding areas. This includes the off-site roadways used to enter/exit the project. The control measures could include, but are not limited to, the use of water wagons, sprinkler systems, and dust fences. For questions contact the Clean Air Branch via e-mail at: Cab.General@doh.hawaii.gov or call (808) 586-4200.

If noise created during the construction phase of the project may exceed the maximum allowable levels (HAR, Chapter 11-46, "Community Noise Control") then a noise permit may be required and needs to be obtained before the commencement of work. Relevant information is online at: <http://health.hawaii.gov/irhb/noise> EPO recommends you contact the Indoor and Radiological Health Branch (IRHB) at (808) 586-4700 with any specific questions.

You may also wish to review the draft Office of Environmental Quality Control (OEQC) viewer at: <http://eha-web.doh.hawaii.gov/oegc-viewer>. This viewer geographically shows where some previous Hawaii Environmental Policy Act (HEPA) {Hawaii Revised Statutes, Chapter 343} documents have been prepared.

To better protect public health and the environment, the U.S. Environmental Protection Agency (EPA) has developed a new environmental justice (EJ) mapping and screening tool called EJSCREEN. It is based on nationally consistent data and combines environmental and demographic indicators in maps and reports. EPO encourages you to explore, launch and utilize this powerful tool in planning your project. The EPA EJSCREEN tool is available at: <http://www.epa.gov/ejscreen>.

We request that you utilize all this information on your proposed project to increase sustainable, innovative, inspirational, transparent and healthy design. Thank you for the opportunity to comment.

Mahalo nui loa,



Laura Leialoha Phillips McIntyre, AICP
Program Manager, Environmental Planning Office
LM:nn

Attachment 1: Environmental Health Management Web App Snipit of Project Area: <http://health.hawaii.gov/epo/egis>

Attachment 2: Clean Water Branch: Water Quality Standards Map - Hawaii

Attachment 3: OEQC viewer (of some past EA's, EIS's in area)

Attachment 4: U.S. EPA EJSCREEN Report for Project Area

c: Casey Yanagihara, County of Hawaii (via email: Casey.Yanagihara@hawaiicounty.gov)
DOH: DHO HI, CWB, IRHB, CAB, WWB {via email only}

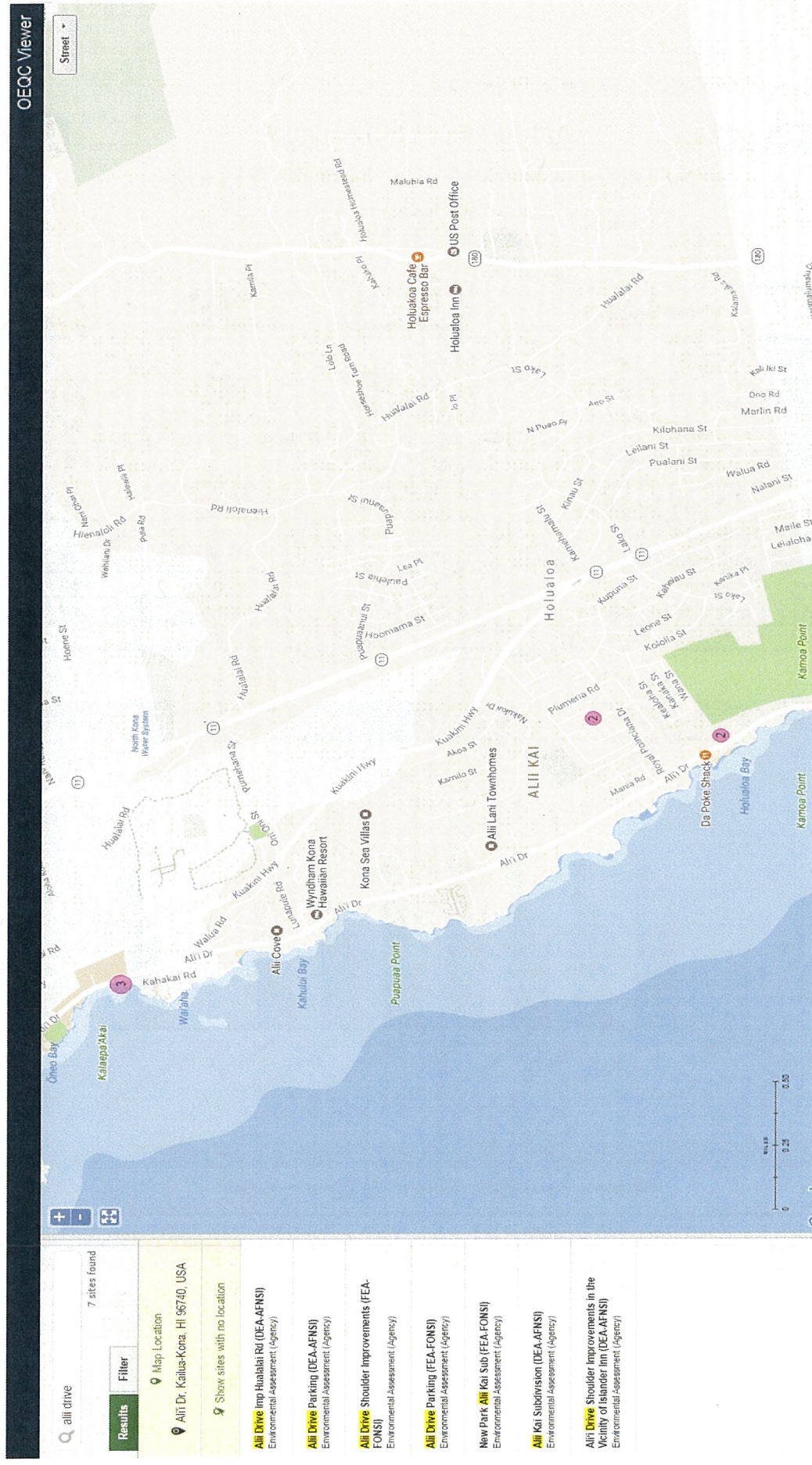
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Attachment 2: Clean Water Branch: Water Quality Standards Map – Hawaii



Attachment 3: OEQC viewer (of some past EA's, EIS's in area)



Attachment 4: U.S. EPA EJSCREEN Report for Project Area



EJSCREEN Report (Version 2016)

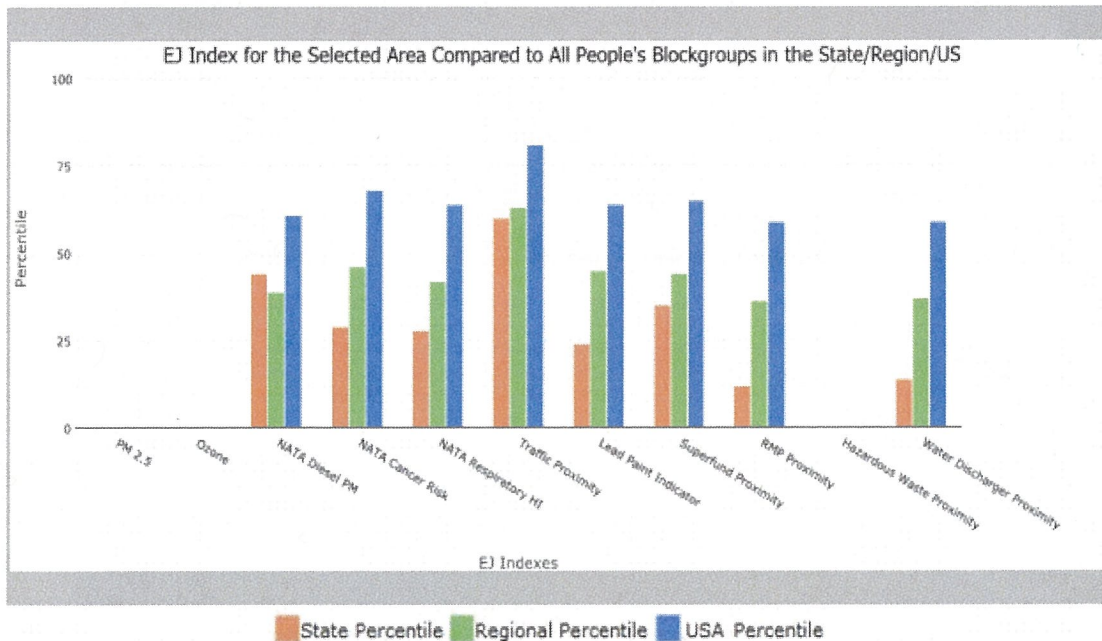


1 mile Ring Centered at 19.624087,-155.984182, HAWAII, EPA Region 9

Approximate Population: 6,053

Input Area (sq. miles): 3.14

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	N/A	N/A	N/A
EJ Index for Ozone	N/A	N/A	N/A
EJ Index for NATA* Diesel PM	44	39	61
EJ Index for NATA* Air Toxics Cancer Risk	29	46	68
EJ Index for NATA* Respiratory Hazard Index	28	42	64
EJ Index for Traffic Proximity and Volume	60	63	81
EJ Index for Lead Paint Indicator	24	45	64
EJ Index for Superfund Proximity	35	44	65
EJ Index for RMP Proximity	12	36	59
EJ Index for Hazardous Waste Proximity*	N/A	N/A	N/A
EJ Index for Water Discharger Proximity	14	37	59



This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

1 mile Ring Centered at 19.624087,-155.984182, HAWAII, EPA Region 9

Approximate Population: 6,053

Input Area (sq. miles): 3.14



Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	0
National Pollutant Discharge Elimination System (NPDES)	0

EJSCREEN Report (Version 2016)

1 mile Ring Centered at 19.624087,-155.984182, HAWAII, EPA Region 9

Approximate Population: 6,053

Input Area (sq. miles): 3.14



Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in $\mu\text{g}/\text{m}^3$)	N/A	N/A	N/A	9.37	N/A	9.32	N/A
Ozone (ppb)	N/A	N/A	N/A	51	N/A	47.4	N/A
NATA* Diesel PM ($\mu\text{g}/\text{m}^3$)	0.156	0.149	72	0.978	<50th	0.937	<50th
NATA* Cancer Risk (lifetime risk per million)	29	34	36	43	<50th	40	<50th
NATA* Respiratory Hazard Index	0.75	1	36	2	<50th	1.8	<50th
Traffic Proximity and Volume (daily traffic count/distance to road)	210	990	53	1100	45	590	63
Lead Paint Indicator (% Pre-1960 Housing)	0.018	0.16	21	0.24	24	0.3	16
Superfund Proximity (site count/km distance)	0	0.098	29	0.15	13	0.13	16
RMP Proximity (facility count/km distance)	0	0.19	3	0.57	1	0.43	1
Hazardous Waste Proximity* (facility count/km distance)	N/A	0.14	N/A	0.14	N/A	0.11	N/A
Water Discharger Proximity (facility count/km distance)	0	0.34	6	0.2	3	0.31	1
Demographic Indicators							
Demographic Index	43%	52%	24	47%	46	36%	67
Minority Population	58%	77%	16	58%	48	37%	73
Low Income Population	28%	26%	60	36%	42	35%	44
Linguistically Isolated Population	2%	6%	44	9%	30	5%	58
Population With Less Than High School Education	9%	9%	59	17%	38	14%	44
Population Under 5 years of age	3%	6%	19	7%	20	6%	22
Population over 64 years of age	17%	15%	62	13%	77	14%	72

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: <https://www.epa.gov/national-air-toxics-assessment>.

+ The hazardous waste environmental indicator and the corresponding EJ index will appear as N/A if there are no hazardous waste facilities within 50 km of a selected location.

For additional information, see: www.epa.gov/environmentaljustice

EJSCREEN is a screening tool for pre-decisional use only. It can help identify areas that may warrant additional consideration, analysis, or outreach. It does not provide a basis for decision-making, but it may help identify potential areas of EJ concern. Users should keep in mind that screening tools are subject to substantial uncertainty in their demographic and environmental data, particularly when looking at small geographic areas. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports. This screening tool does not provide data on every environmental impact and demographic factor that may be relevant to a particular location. EJSCREEN outputs should be supplemented with additional information and local knowledge before taking any action to address potential EJ concerns.

geometrician

ASSOCIATES, LLC
integrating geographic science and planning

phone: (808) 969-7090 PO Box 396 Hilo Hawaii 96721 rterry@hawaii.rr.com

July 14, 2017

Laura Leialoha Phillips McIntyre, AICP
Environment Planning Office Manager
Hawai'i DOH Environmental Health Administration
919 Ala Moana Blvd, Suite 312
P.O. Box 3378
Honolulu HI 96814

Dear Ms. McIntyre:

Subject: Comment to Draft Environmental Assessment (DEA), Ali'i Drive Culvert Replacement at Kahului Bay, North Kona District, Island of Hawai'i, TMKs: (3rd) 7-5-019:007, 008, 009, 016, 024 & 025, & ROW of Ali'i Drive

Thank you for the comment letter dated April 28, 2017, referring us to websites providing DOH standard comments, the eGIS website, the Hawai'i Environmental Portal, the EPA EJSCREEN, Clean Water Branch Administrative Rules, Wastewater Branch Rules, and the OEQC website.

During EA development, many of these sources were consulted, and the website from the HEER office provided important information on the potential for hazardous materials. It should be noted that during construction, the contractor will be required to consult with the Department of Health, and, if appropriate, obtain a permit per Title 11, Chapter 46, HAR (Community Noise Control), and also to conduct all work in conformance with Chapter HAR 11-60.1 (Fugitive Dust).

The project has been designed and impacts analyzed in close coordination with resource agencies with an interest in protecting water quality and aquatic biota, including the U.S. Army Corps of Engineers, Regulatory Branch; the National Oceanic and Atmospheric Administration, National Marine Fisheries Service; the Environmental Protection Agency; and the U.S. Fish and Wildlife Service.

We very much appreciate your review of the document. If you have any questions about the EA, please contact me at (808) 969-7090.

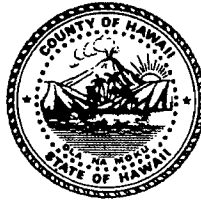
Sincerely,



Ron Terry, Principal
Geometrician Associates

Cc: Casey Yanagihara, DPW; Mike Hunnemann, KAI Hawaii

Harry Kim
Mayor



Paul K. Ferreira
Police Chief

Kenneth Bugado, Jr.
Deputy Police Chief

County of Hawai'i

POLICE DEPARTMENT

349 Kapi'olani Street • Hilo, Hawai'i 96720-3998
(808) 935-3311 • Fax (808) 961-2389

April 24, 2017

Mr. Ron Terry
Principal
Geometrician Associates LLC
P.O. Box 396
Hilo, HI 96721

SUBJECT: EARLY CONSULTATION FOR ALI'I DRIVE CULVERT REPLACEMENT AT
KAHULUI BAY, TMKS: (3RD) 7-5-019:007, 008, 009, 016, 024 & 025
(& ROW OF ALI'I DRIVE, NORTH KONA, HAWAII)

Dear Mr. Terry:

This is in response to your letter informing the Hawai'i Police Department that a Draft Environmental Assessment (DEA) and Anticipated Finding of No Significant Impact (FONSI) prepared pursuant to the EIS law (Hawai'i Revised Statutes, Chapter 343) and the EIS rules (Administrative Rules, Title 11, Chapter 200) is available for review.

Thank you for allowing the Hawai'i Police Department to make comments regarding the above subject. At this time, the Hawai'i Police Department has no comments.

Should you have any questions or concerns, please contact Captain Gilbert Gaspar Jr., Commander of the Kona District, at 326-4646 extension 299.

Sincerely,

PAUL K. FERREIRA
POLICE CHIEF


MITCHELL KANEHAILUA, JR.
ASSISTANT POLICE CHIEF
AREA II OPERATIONS

GG
RS140117

Cc: Casey Yanagihara
County of Hawai'i
Department of Public Works
101 Pauahi St. #7
Hilo, HI 96720

geometrician

A S S O C I A T E S , L L C
integrating geographic science and planning

phone: (808) 969-7090 PO Box 396 Hilo Hawaii 96721 rterry@hawaii.rr.com

July 14, 2017

Paul K. Ferreira, Chief
Hawai'i County Police Department
349 Kapiolani Street
Hilo HI 96720

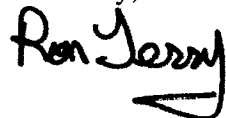
Dear Mr. Ferreira:

Subject: Comment to Draft Environmental Assessment (DEA), Ali'i Drive Culvert Replacement at Kahului Bay, North Kona District, Island of Hawai'i, TMKs: (3rd) 7-5-019:007, 008, 009, 016, 024 & 025, & ROW of Ali'i Drive

Thank you for your comment letter on the Draft EA dated April 24, 2017, in which you stated that at this time, the Police Department does not have any comments.

We very much appreciate your review of the document. If you have any questions about the EA, please contact me at (808) 969-7090.

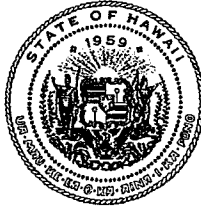
Sincerely,

A handwritten signature in black ink that reads "Ron Terry". The signature is stylized with a large, looped "R" and a cursive "Terry".

Ron Terry, Principal
Geometrician Associates

Cc: Casey Yanagihara, DPW; Mike Hunnemann, KAI Hawaii

DAVID Y. IGE
GOVERNOR OF HAWAII



SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE
MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

May 8, 2017

Geometrician Associates, LLC
Attention: Mr. Ron Terry
P.O. Box 396
Hilo, Hawaii 96721

via email: rterry@hawaii.rr.com

Dear Mr. Terry:

SUBJECT: Draft Environmental Assessment for Ali'i Drive Culvert Replacement at
Kahului Bay

Thank you for the opportunity to review and comment on the subject matter. The Department of Land and Natural Resources' (DLNR) Land Division distributed or made available a copy of your report pertaining to the subject matter to DLNR Divisions for their review and comments.

At this time, enclosed are comments from the (a) Office of Conservation & Coastal Lands, (b) Division of Boating and Ocean Recreation, (c) Land Division – Hawaii District, and (d) Engineering Division on the subject matter. Should you have any questions, please feel free to call Lydia Morikawa at 587-0410. Thank you.

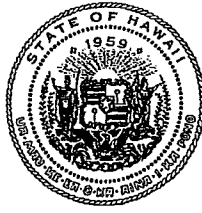
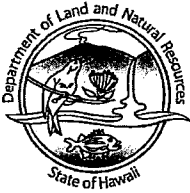
Sincerely,

A handwritten signature in black ink, appearing to read "Russell Y. Tsuji".

Russell Y. Tsuji
Land Administrator

Enclosure(s)
cc: Central Files

DAVID Y. IGE
GOVERNOR OF HAWAII



RE: HA 17-184

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE
MANAGEMENT
OFFICE OF CONSERVATION & COASTAL LANDS

2017 APR 25 A 10:57

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

April 21, 2017

MEMORANDUM

TO:

DLNR Agencies:

- ☒ Div. of Aquatic Resources
- ☒ Div. of Boating & Ocean Recreation
- ☒ Engineering Division
- ☐ Div. of Forestry & Wildlife
- ☐ Div. of State Parks
- ☒ Commission on Water Resource Management
- ☒ Office of Conservation & Coastal Lands
- ☒ Land Division – Hawaii District
- ☒ Historic Preservation

FROM:

Russell Y. Tsuji, Land Administrator

SUBJECT:

Draft Environmental Assessment for Ali'i Drive Culvert Replacement at Kahului Bay

LOCATION:

Kailua, N. Kona, Island of Hawaii; TMK: (3) 7-5-019:007, 008, 009, 016, 024 & 025

APPLICANT:

County of Hawaii, Department of Public Works

Transmitted for your review and comment is information on the above-referenced project. We would appreciate your comments on this project. Please submit any comments by **May 5, 2017**.

The DEA can be found on-line at: <http://health.hawaii.gov/oeqc/> (Click on the Current Environmental Notice in the middle of the page.)

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Lydia Morikawa at 587-0410. Thank you.

Attachments

- ☐ We have no objections.
- ☐ We have no comments.
- ☒ Comments are attached.

Signed:

Print Name:

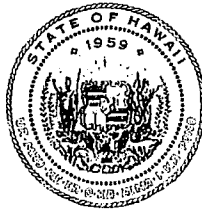
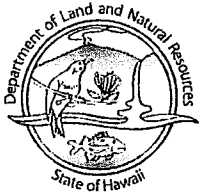
Date:

K. Tiger Mills

4/25/2017

cc: Central Files

DAVID Y. IGE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
OFFICE OF CONSERVATION AND COASTAL LANDS
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

KEKOA KALUHIWA
FIRST DEPUTY

JEFFREY T. PEARSON P.E.
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCE
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:TM

Correspondence: HA 17-184

Ron Terry
Geometrician Associates
PO Box 396
Hilo, HI 96721

APR 19 2017

SUBJECT: Draft Environmental Assessment for the Ali'i Drive Culvert Replacement at Kahului Bay Located at Kailua-Kona, Hawai'i, TMKs: (3) 7-5-019:007, 008, 009, 016, 024 & 025

Dear Mr. Terry:

The Office of Conservation and Coastal Lands (OCCL) has reviewed the subject matter. According to the information presented, a new culvert structure designed with a wider opening, with a natural channel bottom and lined grouted rubble paving on the banks is proposed along with road way improvements above that would include roadway widening to accommodate a bike lane and raised sidewalk along with providing a parking area is proposed. The project will replace the deficient existing culvert structure; bring the roadway up to Federal ADA standards and American Association of State Highway Transportation Officials design guidelines; attenuate flooding on adjacent properties to meet 100-year flood zone standards and accommodate existing utility crossings.

The Conservation District in this particular area would be defined by the shoreline. According to the Environmental Assessment, it was noted that high waves occasionally carry sand, cobbles and coral fragments all the way through the culvert cells and deposit them on the mauka side of Ali'i Drive. However in this particular area, the proposed work will take place within a nonconforming public highway corridor dedicated to the County of Hawai'i.

The proposed work appears to be repair and maintenance of the existing highway structure within the County's right of way. **Therefore the filing of a Conservation District Use Application (CDUA) is not required.**

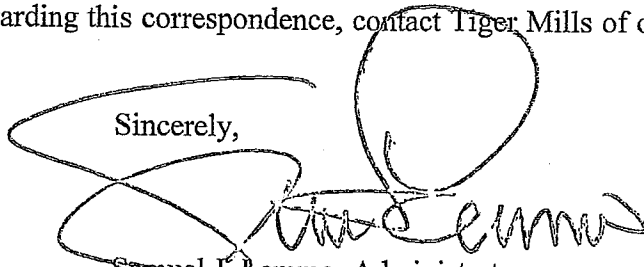
The OCCL appreciates the consideration of sea level rise in the planning for the 80-year design lifetime and the discussion and history of the area's shoreline processes and coastal erosion. In addition, we also appreciate the development of a Pollution Control Plan and a Stormwater Pollution Prevention Plan to be included with the variety of BMPs for the project before, during implementation, and upon construction completion.

Ron Terry
Geometrician Associates

Correspondence: HA 17-184

Should you have any questions regarding this correspondence, contact Tiger Mills of our Office at (808) 587-0382.

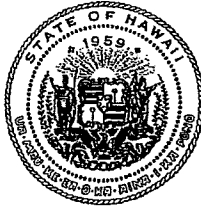
Sincerely,

A large, stylized handwritten signature in dark ink, appearing to read 'Samuel J. Lemmo'. The signature is written over the word 'Sincerely,' and extends to the right, partially overlapping the printed name below.

Samuel J. Lemmo, Administrator
Office of Conservation and Coastal Lands

C: HDLO
County of Hawai'i-Planning

DAVID Y. IGE
GOVERNOR OF HAWAII



SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE
MANAGEMENT

APR25'17PM 3:5180R ADM

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

April 21, 2017

MEMORANDUM

TO: DLNR Agencies:
☒ Div. of Aquatic Resources
☒ Div. of Boating & Ocean Recreation
☒ Engineering Division
☐ Div. of Forestry & Wildlife
☐ Div. of State Parks
☒ Commission on Water Resource Management
☒ Office of Conservation & Coastal Lands
☒ Land Division – Hawaii District
☒ Historic Preservation

FROM: Russell Y. Tsuji, Land Administrator

SUBJECT: Draft Environmental Assessment for Ali'i Drive Culvert Replacement at Kahului Bay

LOCATION: Kailua, N. Kona, Island of Hawaii; TMK: (3) 7-5-019:007, 008, 009, 016, 024 & 025

APPLICANT: County of Hawaii, Department of Public Works

RECEIVED
LAND DIVISION
2017 MAY -2 AM 10:11
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

Transmitted for your review and comment is information on the above-referenced project. We would appreciate your comments on this project. Please submit any comments by **May 5, 2017**.

The DEA can be found on-line at: <http://health.hawaii.gov/oeqc/> (Click on the Current Environmental Notice in the middle of the page.)

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Lydia Morikawa at 587-0410. Thank you.

Attachments

- ☐ We have no objections.
☒ We have no comments.
☐ Comments are attached.

Signed:

Print Name:

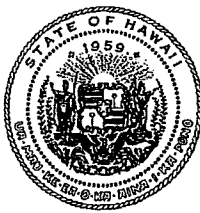
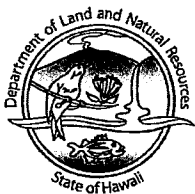
Edward R. Underwood

Date:

4/28/17

cc: Central Files

DAVID Y. IGE
GOVERNOR OF HAWAII



SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE
MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

April 21, 2017

MEMORANDUM

TO: **DLNR Agencies:**
☒ Div. of Aquatic Resources
☒ Div. of Boating & Ocean Recreation
☒ Engineering Division
☐ Div. of Forestry & Wildlife
☐ Div. of State Parks
☒ Commission on Water Resource Management
☒ Office of Conservation & Coastal Lands
☒ Land Division – Hawaii District
☒ Historic Preservation

FROM: Russell Y. Tsuji, Land Administrator

SUBJECT: Draft Environmental Assessment for Ali'i Drive Culvert Replacement at Kahului Bay

LOCATION: Kailua, N. Kona, Island of Hawaii; TMK: (3) 7-5-019:007, 008, 009, 016, 024 & 025

APPLICANT: County of Hawaii, Department of Public Works

RECEIVED
LAND DIVISION
2017 MAY -4 AM 11:01

Transmitted for your review and comment is information on the above-referenced project. We would appreciate your comments on this project. Please submit any comments by **May 5, 2017**.

The DEA can be found on-line at: <http://health.hawaii.gov/oeqc/> (Click on the Current Environmental Notice in the middle of the page.)

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Lydia Morikawa at 587-0410. Thank you.

Attachments

- () We have no objections.
(☒) We have no comments.
() Comments are attached.

Signed: _____

Print Name: _____

Date: _____

GORDON C. HETI
5/2/17

cc: Central Files

DAVID Y. IGE
GOVERNOR OF HAWAII



SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE
MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

April 21, 2017

MEMORANDUM

TO:

DLNR Agencies:

- ☒ Div. of Aquatic Resources
☒ Div. of Boating & Ocean Recreation
From: ☒ Engineering Division
☐ Div. of Forestry & Wildlife
☐ Div. of State Parks
☒ Commission on Water Resource Management
☒ Office of Conservation & Coastal Lands
☒ Land Division – Hawaii District
☒ Historic Preservation

FROM:

SUBJECT:

LOCATION:

APPLICANT:

Russell Y. Tsuji, Land Administrator
Draft Environmental Assessment for Ali'i Drive Culvert Replacement at
Kahului Bay
Kailua, N. Kona, Island of Hawaii; TMK: (3) 7-5-019:007, 008, 009, 016, 024
& 025
County of Hawaii, Department of Public Works

Transmitted for your review and comment is information on the above-referenced project. We would appreciate your comments on this project. Please submit any comments by **May 5, 2017**.

The DEA can be found on-line at: <http://health.hawaii.gov/oeqc/> (Click on the Current Environmental Notice in the middle of the page.)

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Lydia Morikawa at 587-0410. Thank you.

Attachments

- () We have no objections.
() We have no comments.
(X) Comments are attached.

Signed:

Print Name: Cathy S. Chang, Chief Engineer

Date: 5/3/17

cc: Central Files

17 APR 25 PM 08:21 ENGINEERING

**DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION**

LD/Russell Y. Tsuji

**Ref: Draft Environmental Assessment for Ali'i Drive Culvert Replacement at
Kahului Bay**

COMMENTS

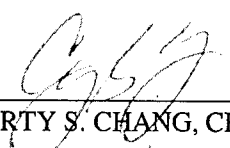
The rules and regulations of the National Flood Insurance Program (NFIP), Title 44 of the Code of Federal Regulations (44CFR), are in effect when development falls within a designated Flood Hazard.

The owner of the project property and/or their representative is responsible to research the Flood Hazard Zone designation for the project. Flood Hazard Zone designations can be found using the Flood Insurance Rate Map (FIRM), which can be accessed through the Flood Hazard Assessment Tool (FHAT) (<http://gis.hawaiiinfip.org/FHAT>).

Be advised that 44CFR reflects the minimum standards as set forth by the NFIP. Local community flood ordinances may take precedence over the NFIP standards as local designations prove to be more restrictive. If there are questions regarding the local flood ordinances, please contact the applicable County NFIP Coordinators below:

- Oahu: City and County of Honolulu, Department of Planning and Permitting (808) 768-8098.
- Hawaii Island: County of Hawaii, Department of Public Works (808) 961-8327.
- Maui/Molokai/Lanai County of Maui, Department of Planning (808) 270-7253.
- Kauai: County of Kauai, Department of Public Works (808) 241-4846.

Signed: _____


CARTY S. CHANG, CHIEF ENGINEER

Date: _____

5/3/17

geometrician

A S S O C I A T E S , L L C
integrating geographic science and planning

phone: (808) 969-7090 PO Box 396 Hilo Hawaii 96721 rterry@hawaii.rr.com

July 14, 2017

Russell Y. Tsuji, Administrator
Hawai'i State DLNR Land Division
P.O. Box 621
Honolulu HI 96809

Dear Mr. Tsuji:

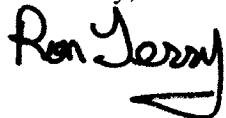
Subject: Comment to Draft Environmental Assessment (DEA), Ali'i Drive Culvert Replacement at Kahului Bay, North Kona District, Island of Hawai'i, TMKs: (3rd) 7-5-019:007, 008, 009, 016, 024 & 025, & ROW of Ali'i Drive

Thank you for your comment letter dated May 8, 2017, on the Draft EA. We first wish to acknowledge the no-comment memos by the Land Division - Hawai'i District and the Division of Boating and Ocean Recreation. Concerning the comment from the Engineering Division related to floodplains, the Hawai'i County Department of Public Works is the responsible agency and is planning the project with consideration for current and potential flood zone designations for the proposed improvements.

We appreciate the response from the Office of Conservation and Coastal Lands acknowledging the extensive efforts of the County to preserve water quality and consider the context of the structure with respect to potential sea level rise. We also acknowledge the determination that the proposed work within the Conservation District appears to be repair and maintenance of the existing highway structure within the County's right of way, which indicates that the filing of a Conservation District Use Application (CDUA) is not required.

We very much appreciate your review of the document, including circulation to various DLNR agencies. If you have any questions about the EA, please contact me at (808) 969-7090.

Sincerely,



Ron Terry, Principal
Geometrician Associates

Cc: Casey Yanagihara, DPW; Mike Hunnemann, KAI Hawaii; and Sam Lemmo, DLNR-OCCL

Dear Sirs-

May 3, 2017

My Name is Nicole "Keaka" Lui and I am a descendant of the Ahupua'a of Kahului through my ancestors namely the Mioi 'ohana. I also knew and visited the residence of the Makuakane 'ohana and the Tripp 'ohana way back in the 70's and I also knew of the cemetery that was once there on the neighboring property.

I have been a Cultural Monitor for the last 7 years and continue to do this type of work on the Kaahumanu Highway widening project. I was the first Cultural Monitor to be contracted by the County of Hawaii during the Keno administration in 2009 and started work April 2010 on the Ane Keohokalole mid-level road. Mayor Billy Keno had a vision and the people asked for a Cultural Monitor and I had the privilege of working as the very first Cultural Monitor. I have since monitored the La'aloa extension, Mamalahoa bypass and at least 10 other projects throughout the district. Every project revealed the need for me to be on site and I learned a great deal.

This letter is written regarding the April 2017 Draft Environmental Assessment for the Ali'i Drive Culvert Replacement at Kahului Bay in the Ahupua'a of Kahului, in the district of North Kona, in the 'okāna of Kona Kai 'Opuā.

1. The Draft EA states, that the Proposed Action 2.2 page 18-19 is to widen the drainage channel at a distance of 100 feet upstream in order to ensure that the 100-year flood will be contained within the embankments.

2. The County property TMK: 7-5-019:007. This area where much of the project will occur and possibly the staging area will be, was once the area where the Komomua and Kahulamu family cemetery once was situated. Though the burials have long since been removed there may be a possibility of cultural material being unearthed in this case 'iwi Kūpuna (ancestral bones).

3. The Draft EA also quotes William Ellis at least twice. William Ellis describes the coast of Kona going South passing through Kahului that it was green and cheerful, owing to the frequent rains... He also comments on the number of heiau and the "depositories of the dead, which we passed, convinced us that this part of the island must formerly have been populous. The latter were built with fragments of lava, laid up evenly on the outside, generally about eight feet long, from six broad, and about four feet high. Some appeared ancient, others had evidently been standing but a few years. The Draft EA also has Aunt Luciana Makuakane-Tripps oral testimony and her connections to the area through her ancestors and it is also mentioned twice in this Assessment.

These three actions and statements raise concerns for me because number one the widening of the culvert 100 feet upstream will entail trenching, possible grubbing or grading, and material removal to another location in the staging area. Number two the County property TMK: 7-5-019:007 where the burial of the Komomua-Kahulamu family once was could reveal the potential for unearthing 'iwi. Number three the fact that burials are mentioned and the fact that there were many burials and possibly some could have been washed down from previous flooding from upstream and were lodged in dirt embankments, trees and so forth downstream. These facts pose the question? Do we need a Cultural Monitor, the answer would be yes

As an NHO and a descendant of this land I highly recommend a Cultural Monitor be part of this project, to work along side the Archeological Monitor, to be the eyes of the Hawaiian Community and the Liason between the various entities involved be it the County, the Contractor, and the Community all the time working in conjuction with the Archaeological firm to mitigate any findings weather it be iwi, artifacts related to burials (moe pū), etc. Also, since this project may be recieving Federal funding it is my determination that it is better to be safe than sorry because of the NAGPRA rules concerning burial issues. Please consider my letter and my desire to protect and speak on behalf of those who cannot speak for themselves at this time. It is also my hope that SHPD will read this document in it's entirety and consider the mention of burials as a cautionary flag to take into considration the need for a Cultural Monitor and also the County and State Highways agencies. This is not to advance my own agenda and career, I have a saying: It is never about us, it is always about 'iwi Kupuna. Our objective is to take care of our past and cultural resources. To say that no cultural resource will be affected is not true 'iwi Kupuna is a cultural resource and we need to make sure we have something in place just in case. I have made my case and I hope that this letter will bring awareness to the issues at hand.

E pū pa'akai kākou, a me ka ha'aha'a,

Nicole K. Lui dba Kaelemakule Services

76-6217 Lehua Rd

Kailua-Kona HI, 96740

808-990-4942

geometrician

A S S O C I A T E S , L L C

integrating geographic science and planning

phone: (808) 969-7090 PO Box 396 Hilo Hawaii 96721 rterry@hawaii.rr.com

July 14, 2017

Nicole K. Lui
76-6217 Lehua Rd
Kailua-Kona HI, 96740

Dear Ms. Lui:

Subject: Comment to Draft Environmental Assessment (DEA), Ali'i Drive Culvert Replacement at Kahului Bay, North Kona District, Island of Hawai'i, TMKs: (3rd) 7-5-019:007, 008, 009, 016, 024 & 025, & ROW of Ali'i Drive

Thank you for your comment letter on the Draft EA dated May 3, 2017. In it you provided information related to historical uses of the land in this area for chiefly residences and burials, including a former cemetery directly on the project site. You cited NAGPRA and cultural considerations in order to support the idea that it would be prudent and appropriate for the County of Hawai'i to employ a cultural monitor during grubbing, grading, and material removal phases of the project.

In response to the concern expressed by you and others, the County DPW has determined that the construction contractor will be required to contract a qualified cultural monitor during initial clearing and earthwork.

We very much appreciate your review of the document and your attendance at the hearing. If you have any questions about the EA, please contact me at (808) 969-7090.

Sincerely,



Ron Terry, Principal
Geometrician Associates

Cc: Casey Yanagihara, DPW; Mike Hunnemann, KAI Hawaii

**Draft Environmental Assessment
Ali'i Drive Culvert Replacement at Kahului Bay**

Comment Form

Please provide your comments on the proposed project and/or Draft Environmental Assessment:

I basically support ☒ do not support; the proposed project (Circle one).

COMMENTS:

Concerned about the possibility of burials (inadvertent) being found during the initial grading and grubbing. I recommend that a Cultural monitor be hired for an interim period to ensure the cultural protection of burials. Also, SHP 21759 Feature C, the Well.

(Use back of form or alternate/additional sheets if desired)

Comments must be received or postmarked by: May 8, 2017 for inclusion into the Final EA.

Please send original comments to:

Ron Terry, Geometrician Associates
P.O. Box 396
Hilo, HI 96721
Or: rterry@hawaii.rr.com

Copies of the comments may also be sent to:

Casey Yanagihara
County of Hawai'i, Department of Public Works
101 Pauahi Street, Suite 7
Hilo, HI 96720

**Note: in order to receive an official reply,
you must provide a name, and mailing or email address.**

if ~~the~~ you could save the concrete block
with the initials and date on it.

Also, if you could consider adding that feature
C into the wall which will be constructed
would be fabulous.

Thank you
~~again~~

Tamara Halliwell

PO BOX 4703

Kailua-Kona, HI 96745

em: tr-kona@yahoo.com .

geometrician

ASSOCIATES, LLC
integrating geographic science and planning

phone: (808) 969-7090 PO Box 396 Hilo Hawaii 96721 rterry@hawaii.rr.com

July 14, 2017

Tamara Halliwell
PO Box 4703
Kailua-Kona HI 96745

Dear Ms. Halliwell:

Subject: Comment to Draft Environmental Assessment (DEA), Ali'i Drive Culvert Replacement at Kahului Bay, North Kona District, Island of Hawai'i, TMKs: (3rd) 7-5-019:007, 008, 009, 016, 024 & 025, & ROW of Ali'i Drive

Thank you for your comment letter on the Draft EA, In answer to your specific comments:

1. *Recommendation for a cultural monitor.* In response to the concern expressed by you and others, the County DPW has determined that the construction contractor will be required to contract a qualified cultural monitor during initial clearing and earthwork.
2. *Saving concrete block with inscriptions of name and date.* The County will salvage that during construction. This feature may be able to be incorporated into the reconstructed wall. The County plans to work with the landowner as well as Nicole Lui, who expressed an interest in it because of her family connection, to determine the disposition of the concrete block.

We very much appreciate your review of the document and your attendance at the hearing. If you have any questions about the EA, please contact me at (808) 969-7090.

Sincerely,



Ron Terry, Principal
Geometrician Associates

Cc: Casey Yanagihara, DPW; Mike Hunnemann, KAI Hawaii

From: Chelsie Javar [mailto:chelsie_javar@fws.gov]
Sent: Tuesday, April 25, 2017 1:52 PM
To: Yanagihara, Casey <Casey.Yanagihara@hawaiicounty.gov>; Ron Terry <rterry@hawaii.rr.com>
Cc: Nadiera McCarthy <nadiera_mccarthy@fws.gov>; Dan Polhemus <dan_polhemus@fws.gov>; Michelle Bogardus <michelle_bogardus@fws.gov>
Subject: RE: Ali'i Drive Culvert Replacement Federal-Aid Project No. STP-0186(001)

Aloha Mr. Yanagihara and Mr. Terry,

The U.S. Fish and Wildlife Service (Service), Pacific Islands Fish and Wildlife Office has reviewed your Draft Environmental Assessment (EA) and do not have additional comments. The Project's Draft EA has incorporated the Service's previous recommendations for the endangered Hawaiian hawk, Hawaiian hoary bat, Hawaiian petrel, Band-rumped storm-petrel, hawksbill turtle, Blackburn's sphinx moth, the threatened Newell's shearwater and green sea turtle; therefore, we do not have additional comments. The Project's Draft EA also incorporated the Service's recommended Best Management Practices regarding sedimentation and erosion in aquatic environments.

Thank you for your efforts to conserve listed species and native habitats. If you have any questions regarding this correspondence, please feel free to contact me.

Sincerely,
Chelsie Javar-Salas

Chelsie Javar-Salas | U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office | 300 Ala Moana Blvd., Room 3-122 Honolulu, HI 96850 | phone: 808-792-9400 | | website: <http://www.fws.gov/pacificislands/>

geometrician

A S S O C I A T E S , L L C

integrating geographic science and planning

phone: (808) 969-7090 PO Box 396 Hilo Hawaii 96721 rterry@hawaii.rr.com

July 14, 2017

Chelsie Javar
chelsiejavar@fws.gov

Dear Ms. Javar:

Subject: Comment to Draft Environmental Assessment (DEA), Ali'i Drive Culvert Replacement at Kahului Bay, North Kona District, Island of Hawai'i, TMKs: (3rd) 7-5-019:007, 008, 009, 016, 024 & 025, & ROW of Ali'i Drive

Thank you for your comment email on the Draft EA dated April 25, 2017, in which you stated that U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office, reviewed the Draft EA and did not have additional comments. Thank you for acknowledging that the Draft EA incorporated the Service's previous recommendations.

We very much appreciate your review of the document. If you have any questions about the EA, please contact me at (808) 969-7090.

Sincerely,



Ron Terry, Principal
Geometrician Associates

Cc: Casey Yanagihara, DPW; Mike Hunnemann, KAI Hawaii

Harry Kim
Mayor



Darren J. Rosario
Fire Chief

Renwick J. Victorino
Deputy Fire Chief

County of Hawai'i
HAWAI'I FIRE DEPARTMENT
25 Aupuni Street • Suite 2501 • Hilo, Hawai'i 96720
(808) 932-2900 • Fax (808) 932-2928

April 10, 2017

Ron Terry
Geometrician Associates
P.O. Box 396
Hilo, Hawai'i 96721

Dear Mr Terry:

SUBJECT: Draft Environmental Assessment (DEA)
Ali'i Drive Culvert Replacement at Kahului Bay
(3) 7-5-019:0087, 008, 009, 016, 024 & 025 (& Row of Ali'i Drive)

We are in receipt of your letter dated April 8, 2017 in regards to a draft Environmental Assessment and Anticipated finding of no significant Impact for the above listed subject.

The Hawai'i Fire Department has no issues or comments with regards to the request for a draft Environmental Assessment – Ali'i Drive Culvert Replacement at Kahului Bay and Anticipated finding of no significant Impact as noted above.

If you should have any questions, please feel free to contact my office at (808)323-4760.

Mahalo,

A handwritten signature in black ink, appearing to read "DR-".

DARREN J. ROSARIO
Fire Chief

CB/ds



geometrician

ASSOCIATES, LLC
integrating geographic science and planning

phone: (808) 969-7090 PO Box 396 Hilo Hawaii 96721 rterry@hawaii.rr.com

July 14, 2017

Darren Rosario, Chief
Hawai'i Fire Department
25 Aupuni St., Suite 2501
Hilo HI 96720

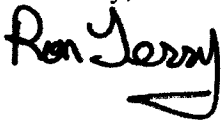
Dear Chief Rosario:

Subject: Comment to Draft Environmental Assessment (DEA), Ali'i Drive Culvert Replacement at Kahului Bay, North Kona District, Island of Hawai'i, TMKs: (3rd) 7-5-019:007, 008, 009, 016, 024 & 025, & ROW of Ali'i Drive

Thank you for your comment letter on the Draft EA dated April 10, 2017, in which you stated that your agency has no issues or comments with respect to the project or the Draft EA.

We very much appreciate your review of the document. If you have any questions about the EA, please contact me at (808) 969-7090.

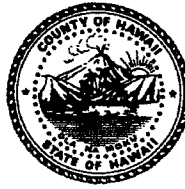
Sincerely,

A handwritten signature in black ink that reads "Ron Terry". The signature is stylized with a large, sweeping "R" and a cursive "Terry".

Ron Terry, Principal
Geometrician Associates

Cc: Casey Yanagihara, DPW; Mike Hunnemann, KAI Hawaii

Harry Kim
Mayor



Michael Yee
Director

Daryn Arai
Deputy Director

West Hawai'i Office
74-5044 Ane Keohokalole Hwy
Kailua-Kona, Hawai'i 96740
Phone (808) 323-4770
Fax (808) 327-3563

County of Hawai'i
PLANNING DEPARTMENT

East Hawai'i Office
101 Pauahi Street, Suite 3
Hilo, Hawai'i 96720
Phone (808) 961-8288
Fax (808) 961-8742

May 8, 2017

Mr. Ron Terry
Geometrician Associates, LLC
P.O. Box 396
Hilo, HI 96721

Dear Mr. Terry:

SUBJECT: Draft Environmental Assessment
Project: Ali'i Drive Culvert Replacement at Kahului Bay, Kailua-Kona
Tax Map Key: (3) 7-5-019:007, 008, 009, 016, 024 & 025

Thank you for your April 5, 2017 letter inviting comments on the subject Draft Environmental Assessment (DEA). The County of Hawai'i, Department of Public Works proposes the replacement of the existing double-cell culvert under the subject portion of Ali'i Drive at Kahului Bay in Kailua-Kona in the North Kona District with a larger culvert capable of handling the drainage water of a predicted 100-year flood. Originally built in 1937, the aged structure will be replaced, the drainage channel will be widened, and the bridge will be widened to accommodate vehicular, bicycle, and raised pedestrian lanes.

The subject properties are situated in the State Land Use Urban District, zoned Resort-Hotel District (V-1.25) by the County of Hawai'i, and designated Open in the project area by the Hawai'i County General Plan Land Use Pattern Allocation Guide (LUPAG) map. The properties are located within the Special Management Area (SMA). Tax Map Key (TMK) parcels TMK: (3) 7-5-019:016, 024 and 025 abut the shoreline while the remaining subject parcels are mauka (towards the mountain) of Ali'i Drive.

The work proposed within the county right-of-way is considered exempt by Planning Commission Rule 9-4(e)(2)(B) for the Special Management Area, which states that development does not include "*Repair or maintenance of roads and highways within existing rights-of-way.*"

Mr. Ron Terry
Geometrician Associates, LLC
May 8, 2017
Page 2

Additionally, the work in the shoreline setback area is considered exempt by Planning Department Rule 11-7(a)(6), which states the following structures or activities may be permitted (and repaired) in the shoreline setback area, including "*Structures which were completed by or activities which commenced prior to June 22, 1970.*"

The work being done outside of the right-of-way has been determined to require a SMA Minor Permit from the County of Hawai'i Planning Department, as the value is estimated to be less than \$500,000. Please note that the SMA Minor Permit process takes about thirty-five (35) days after submitting a complete application.

The Planning Department appreciates the consideration of the SMA requirements, zoning requirements, General Plan values and priorities and the Kona Community Development Plan policies in the planning for the proposed design.

Should you have any questions, please feel free to contact Shancy Watanabe of our office at (808) 961-8144.

Sincerely,



MICHAEL YEE
Planning Director

JWD/shw:mad
P:\wpwin60\CH343\2017\DOT\AliiDriveCulvertReplacementEA.comments.doc

Cc: Department of Transportation, Highways Division, Hawai'i District
Department of Finance, Property Management Division
Department of Public Works

geometrician

A S S O C I A T E S , L L C

integrating geographic science and planning

phone: (808) 969-7090 PO Box 396 Hilo Hawaii 96721 rterry@hawaii.rr.com

July 14, 2017

Michael Yee, Director
Hawai'i County Planning Department
101 Pauahi Street, Suite 3
Hilo HI 96720

Dear Mr. Yee:

Subject: Comment to Draft Environmental Assessment (DEA), Ali'i Drive Culvert Replacement at Kahului Bay, North Kona District, Island of Hawai'i, TMKs: (3rd) 7-5-019:007, 008, 009, 016, 024 & 025, & ROW of Ali'i Drive

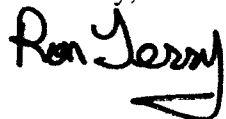
Thank you for your comment letter on the Draft EA dated May 8, 2017, in which you provided information on land use designations that confirms information contained in the Draft EA.

We appreciate the information provided concerning the portions of the work within the county right-of-way considered exempt by Planning Commission per Rule 9-4(e)(2)(B) for the Special Management Area, which states that development does not include "Repair or maintenance of roads and highways within existing rights-of-way." It is understood that the remainder of the work being conducted outside of the right-of-way will require an SMA Minor Permit from the Planning Department. Thank you for providing information on the SMA Minor Permit typical schedule.

Furthermore, we acknowledge your determination that the work in the shoreline setback area is considered exempt by Planning Department Rule 11-7(a)(6), which states the certain structures or activities may be permitted (and repaired) in the shoreline setback area, including "Structures which were completed by or activities which commenced prior to June 22, 1970."

We very much appreciate your review of the document. If you have any questions about the EA, please contact me at (808) 969-7090.

Sincerely,



Ron Terry, Principal
Geometrician Associates

Cc: Casey Yanagihara, DPW; Mike Hunnemann, KAI Hawaii

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Ali‘i Drive Culvert Replacement at Kahului Bay

Environmental Assessment

APPENDIX 2

Marine Environment Assessment

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ASSESSMENT OF THE MARINE ENVIRONMENT
ALI'I DRIVE BRIDGE AND CULVERT REPLACEMENT PROJECT
KAHULU'I BAY, KAILUA-KONA, HAWAII

Prepared for:

Kai Hawaii
50 S. Beretania St., #C-119C
Honolulu, HI 96813

Prepared by:

Marine Research Consultants, Inc.
1039 Waakaua Pl.
Honolulu, HI 96822

July 2014

I. INTRODUCTION AND PURPOSE

The County of Hawai'i, Department of Public Works (DPW), proposes to replace an existing double-cell culvert on Ali'i Drive at Kahalu'i Bay in Kailua-Kona with a larger structure, expand the flood channel, and widen the roadway above to accommodate a bike lane and raised sidewalk. The existing concrete and stone, double-cell structure culvert dates from 1937. On top is a concrete deck supporting two ten-foot lanes for vehicles and a narrow shoulder. The culvert structure has a number of deficiencies, including spalls exposing corroded steel on the underside of the concrete deck, which may render it unsafe in the future. The culvert openings are not large enough to pass the 100-year flood from the gulch that it spans, which has promoted recurrent floods that have damaged adjacent properties. Finally, the bridge is too narrow for adequate pedestrian/bicycle lanes. The purpose of the project is to build a safe, properly sized structure that meets the needs of motorists, pedestrians and bicycles and reduces flood hazard in the area.

Construction will be phased and is expected to last approximately one year. Construction will take place during daytime hours, with two lanes of traffic open at most times. As the project involves County of Hawai'i land and funds, an Environmental Assessment (EA) that complies with Chapter 343, Hawai'i Revised Statutes is required. Federal Highway Administration funds are also involved and the project will include compliance with the National Environmental Policy Act (NEPA) and various federal laws, regulations and executive orders.

While all planning and construction activities will place a high priority on maintaining the existing relatively pristine nature of the coastal and marine environments, it is nevertheless important to address any potential impacts that may be associated with the planned project. None of the proposed land uses includes any direct alteration of the nearshore waters. The potential exists, however, for the project to affect the composition and volume of groundwater and that flow beneath the project site, as well as surface runoff emanating from the culvert. As all groundwater that could be affected by the project subsequently reaches the ocean, it is recognized that there is potential for the project to affect the marine environment. This concern is especially critical for the Kona area owing to the presently pristine nature of the area which represents a valued recreational resource utilized for surfing, swimming and fishing. Therefore, important questions include the potential impacts from proposed land uses which could cause alterations to water quality and marine life.

In the interest of addressing these concerns and assuring maintenance of environmental quality, a baseline marine environmental assessment and potential impact analysis of the nearshore areas off the Ali'i Dr. Bridge and culvert was conducted in March 2014. The rationale of this assessment was to evaluate the existing composition and condition of the existing marine environment, particularly in terms of water chemistry and coral reef community structure. As the existing nature of the marine environment are the result of historically ongoing processes, the characterization involves evaluating the effects that these processes have on water quality at the present time, prior to the commencement of any new construction activities. Results of the evaluation should indicate if, and to what degree, there is the potential for negative effects to the aquatic environments from the proposed project. The present report consists of an assessment of the marine environment in the area fronting the project site to provide a baseline of the present conditions, and to provide the

background to evaluate both potential impacts from the project, and management practices to minimize or eliminate such impacts.

II. CHARACTERIZATION OF WATER CHEMISTRY

A. METHODS

One survey transect was established off of Ali'i Drive Bridge and Culvert site that extended from the highest wash of waves on the shoreline to a distance of approximately 800 feet offshore (Figure 1). Water quality was evaluated at fourteen locations along the sampling transect at distances of 0.1, 1, 5, 10, 25, 34, 50, 100, 175, 250, 350, 500, 700 and 900 feet from shore. Such a sampling scheme was designed to span the greatest range of salinity with respect to potential freshwater efflux at the shoreline. Thus, sampling was more concentrated in the nearshore zone because this area is most likely to show the effects of freshwater input, as well as shoreline modification. At distances greater than 10 feet from the shoreline, samples were collected at two depths; a surface sample was collected within approximately 6 inches of the sea surface, and a bottom sample was collected within 6 inches from the sea floor. At distances of 10 feet from shore or less, a single sample from the center of the water column was collected at each station.

Water quality parameters evaluated included the eleven specific constituents for area-specific criteria for the Kona (West) Coast of the Island of Hawaii (Chapter 11-54, Section 06 (d) of the State of Hawaii Department of Health (DOH) Water Quality Standards. These criteria include: total dissolved nitrogen (TDN), nitrate + nitrite nitrogen ($\text{NO}_3^- + \text{NO}_2^-$, hereafter referred to as NO_3^-), ammonium nitrogen (NH_4^+), total dissolved phosphorus (TDP), orthophosphate phosphorus (PO_4^{3-}), Chlorophyll *a* (Chl *a*), turbidity, temperature, pH and salinity. In addition, silica (Si) was also reported because this parameter is a good indicator of groundwater input and mixing.

All fieldwork was conducted on March 11, 2014 using a 21-foot boat. Surf conditions during the fieldwork were minimal with waves smaller than one-foot breaking on the shoreline. Water sampling was conducted during the period from approximately 0800 to 0930 during a period of low tide (<0.5 feet). Sampling during low tide, with minimal surf conditions represents the conditions that maximize detection of material input from land.

Samples from the shore to 50 feet offshore were collected by a swimmer working from the boat, who opened sampling bottles at the desired locations. All other samples were collected using a Van Dorn-type oceanographic sampling bottle. The bottle is lowered to the desired sampling depth with spring-loaded endcaps held open so water can pass freely through the bottle. At the desired sampling depth, a weighted messenger released from the surface triggers closure of the endcaps, isolating a volume of water.

All water samples were collected in triple-rinsed one-liter linear polyethylene bottles. Subsamples for nutrient analyses were immediately filtered and placed in 125-milliliter (ml) acid-washed, triple rinsed, polyethylene bottles and stored on ice. Analyses for Si, NH_4^+ , PO_4^{3-} , and NO_3^- were performed with a Technicon Autoanalyzer using standard methods for

seawater analysis (Strickland and Parsons 1968, Grasshoff 1983). TDN and TDP were analyzed in a similar fashion following digestion. Total organic nitrogen (TON) and total organic phosphorus (TOP) were calculated as the difference between TDN and dissolved inorganic N ($\text{NO}_3^- + \text{NH}_4^+$), and TDP and dissolved inorganic P (PO_4^{3-}), respectively.

Water for other analyses was subsampled from 1-liter polyethylene bottles and kept chilled until analysis. Chl *a* was measured by filtering 300 ml of water through glass-fiber filters; pigments on filters were extracted in 90% acetone in the dark at -20° C for 12-24 hours. Fluorescence before and after acidification of the extract was measured with a Turner Designs fluorometer. Salinity was determined using an AGE Model 2100 laboratory salinometer with a readability of 0.0001‰ (ppt). Turbidity was determined in the field using a 90-degree nephelometer, and reported in nephelometric turbidity units (NTU) (precision of 0.01 NTU).

In-situ field measurements of continuous vertical profiles of water temperature, salinity, dissolved oxygen and pH were acquired using a RBR Model XR-650 CTD calibrated to factory standards (precision of 0.01°C, 0.001‰, 0.001% O₂ saturation, and 0.001 pH units).

All fieldwork was conducted by Dr. Steven Dollar. All laboratory analyses were conducted by Marine Analytical Specialists located in Honolulu, HI (Labcode: HI 00009). This analytical laboratory possesses acceptable ratings from EPA-compliant proficiency and quality control testing.

B. RESULTS

1. Horizontal and Vertical Stratification

Tables 1 and 2 show results of all water chemistry analyses for samples collected off the Ali'i Drive site on March 11, 2014. Table 1 shows concentrations of dissolved nutrients in micromolar (μM) units; Table 2 shows concentrations in micrograms per liter (μg/L). Concentrations of eight dissolved nutrient constituents in surface and deep ocean samples as well as pond samples are plotted as functions of distance from the shoreline in Figure 2. Values of salinity, turbidity, Chl *a* and temperature as functions of distance from shore are shown in Figure 3.

Several patterns of distribution are evident in Tables 1 and 2 and Figures 2 and 3. It can be seen in Figure 2 that the dissolved nutrients Si, NO_3^- and TN display substantial elevation in concentration in the samples collected close to the shoreline with generally decreasing gradients in concentration moving offshore. Salinity displays the opposite trend, with sharply lower concentrations in the nearshore samples, with increasing values with increasing distance from shore (Figure 3). In addition, concentrations of Si, NO_3^- , and TN in surface waters are consistently elevated above bottom samples, while salinity of surface water is lower than salinity of bottom water (Figures 2 and 3, Tables 1 and 2).

Figure 4 shows vertical profiles of temperature, salinity and dissolved oxygen at water sampling stations between 100 and 800 feet from shore (profiles at stations closer to shore were not possible owing to inaccessibility of the boat). It is clearly evident that there is a surface layer approximately 4 feet thick with steep gradients of increasing temperature and

salinity. Below the surface layer, values of temperature and salinity are near constant through the rest of the water column.

These patterns are a result of concentrated input of groundwater to the ocean at or near the shoreline fronting the Ali'i Drive Bridge site. Low salinity groundwater, which typically contains high concentrations of Si, NO_3^- , and PO_4^{3-} percolates to the ocean at the shoreline, resulting in a nearshore zone of mixing between the two water sources. In many areas of the Hawaiian Islands, particularly off the coast of West Hawaii, such groundwater percolation results in steep horizontal gradients of increasing salinity and decreasing nutrients with distance from shore. In addition, as the groundwater consists of low density freshwater, there is often distinct vertical stratification of the water column with a low salinity surface layer. As groundwater is often cooler than ocean water, the low salinity surface layer is also characterized by gradients of increasing temperature. The magnitude of the gradients is a function of scale of groundwater flux, and physical forces in the receiving environment, particularly wave and wind stirring. The present survey was conducted during a period of calm winds, small surf, and low tide. All of these factors combine to result in minimal mixing conditions which maximize the magnitude of both horizontal and vertical gradients that are evident in the data.

Water chemistry parameters that are not associated with groundwater input (NH_4^+ , TON, TOP) do not show as consistent a pattern of decreasing concentration with respect to distance from the shoreline. While PO_4^{3-} is often found to display similar horizontal and vertical gradients as NO_3^- , this was not the case for the data collected off the Ali'i Dr. Bridge (Figures 2 and 3, Tables 1 and 2).

Similar to the patterns of dissolved inorganic nutrients (Si and NO_3^-), the distribution of Chl *a* also displays peaks near the shoreline with a progressively decreasing gradient with distance from shore (Figure 3, Table 1). Turbidity also displays a pattern of elevated values in the samples collected near the shoreline. However, several values of turbidity in samples collected 100 and 200 feet from shore also displayed high values. Neither Chl *a* or turbidity showed substantial differences between surface and deep samples indicating that these constituents are not a function of groundwater flux (Table 1, Figure 3).

4. Conservative Mixing Analysis

A useful treatment of water chemistry data for interpreting the extent of material input from land is application of a hydrographic mixing model. In the simplest form, such a model consists of plotting the concentration of a dissolved chemical species as a function of salinity (Officer 1979, Smith and Atkinson 1992, Dollar and Atkinson 1992). The concept of using such mixing models which scale nutrient concentrations to salinity has been recently used by the State of Hawaii Department of Health for establishing a unique set of water quality standards for the West Coast of the Island of Hawaii [Hawaii Administrative Rules, §11-54-06 (d)].

Comparison of the curves produced by the distribution of data with conservative mixing lines provides an indication of the origin and fate of the material in question. If the parameter in question displays purely conservative behavior (i.e., no input or removal from any process other than physical mixing), data points should fall on, or near, the conservative mixing line. If

however, external material is added to the system through processes such as leaching of fertilizer nutrients to groundwater, data points will fall above the mixing line. If material is being removed from the system by processes such as biological uptake, data points will fall below the mixing line.

Figure 5 shows plots of the concentrations of Si, NO_3^- , PO_4^{3-} , and NH_4^+ as functions of salinity for the samples collected at each sampling station. Each graph also shows conservative mixing lines constructed by connecting the end-member concentrations of open ocean water collected at the 800 foot from shore stations and average groundwater concentration from the three Department of Water Supply potable wells located upslope of the Kona area (Kahului A, C and D).

Dissolved Si represents a check on the model as this material is present in high concentration in groundwater, but is not a major component of fertilizer. In addition, Si is not utilized rapidly within the nearshore environment by biological processes. It can be seen in Figure 5 that all data points fall in a linear array on the conservative mixing line. Linear regression of the concentrations of Si as a function of salinity indicates that there is a highly significant R^2 (proportion of variation explained) of 0.99 indicating that the concentration of Si is highly dependant on salinity. This result supports the assumption that Si is behaving as a conservative tracer and that well water sampled from the upslope well is similar in composition to groundwater entering the ocean off the Ali'i Drive bridge and culvert site.

The plots of NO_3^- in ocean samples versus salinity show a slightly different distribution than Si (Figure 5). In general, most of the ocean data points for all transects fall above the mixing line. In addition, there is distinct upward concave curvilinearity in the distribution of ocean data points. Such upward curvilinearity suggest biotic uptake within the nearshore ocean. Hence it can be concluded that there is a subsidy of NO_3^- to the ocean other than that originating from unaltered natural groundwater.

PO_4^{3-} is also a major component of fertilizer and sewage. However, PO_4^{3-} is usually not found to leach to groundwater to the extent of NO_3^- , owing to a high absorptive affinity of phosphorus in soils or rock. It can be seen in Figure 5 that most of the PO_4^{3-} data points fall on or below the mixing line. In addition, the R^2 of PO_4^{3-} to salinity of 0.40 indicates there is little dependence of the concentrations of PO_4^{3-} on salinity. This pattern indicates that there are no subsidies of PO_4^{3-} entering the nearshore environment from groundwater.

The other form of dissolved inorganic nitrogen, NH_4^+ , shows a somewhat similar relationship as PO_4^{3-} . Plots of concentrations of NH_4^+ versus salinity exhibit no linear trends with respect to salinity (Figure 5). Linear regression of concentrations of NH_4^+ vs. salinity result in an insignificant R^2 (0.05). The lack of an inverse relationship suggests that the source of most of the NH_4^+ in the nearshore ocean is not from land but rather from biological processes occurring in the ocean. The lack of a linear relationship between salinity and NH_4^+ also is a good indicator that there is little or no input to the ocean from leaching of cesspools or other sources of sewage that might occur in the coastal area.

III. EVALUATION OF BIOTIC COMMUNITIES

A. METHODS

The nearshore marine biotic communities in Kahalu'i Bay off the Ali'i Drive Bridge and culvert consist of a well-developed and relatively undisturbed Hawaiian coral reef habitat. The intent of the present study was to describe the overall physical and biotic setting of the marine environment. The survey area encompassed approximately 500 feet of linear coastline, and extended from the shoreline to a termination of the nearshore reef platform at a water depth of approximately 40 feet. The resulting characterization is intended to provide an overview of the habitat characteristics of the region in order to provide information that will be of value with regard to planning for the Bridge and culvert repair project. The purpose of the study was not to generate an exhaustive species list of all biota occupying the area.

All fieldwork was carried on March 12, 2014 by SCUBA divers working from a 21-ft. boat. In-water survey of the reef consisted of a diver traversing the reef in a zig-zag pattern in the manner of a random swim starting at the shoreline and moving seaward. The dive team consisted of an investigator evaluating reef fish populations, who led the swim in order to minimize disturbance and scattering of fish. A second diver, tasked with characterizing invertebrates and benthic algae followed. During the swims, relative abundance of biota was noted, and all reef areas were photo-documented.

B. RESULTS

1. Physical Structure of the Reef

The structural composition of the marine environment off of Ali'i Drive Bridge and culvert in Kahalu'i Bay is clearly defined by several distinct physical zones. The shoreline is typical of the rocky coast environments of Kona consisting primarily of a "beach" consisting of large rounded basalt boulders, interspersed with pockets of coarse white sand. Boulders extend through the culvert opening behind the shoreline. A mortar/boulder seawall borders the back of the beach and rises to the edge of Ali'i Drive. The orientation of the beach is to the west, providing nearly direct exposure to both north and south long-period swells.

Seaward of the boulder beach, the intertidal and most nearshore zone consists of a seaward extension of the boulder field. In addition, there are areas consisting of a relatively flat basalt platform that extends up to approximately 50 feet from the shoreline (Figure 6, top). At the seaward terminus of the flat platform, bottom composition grades to a zone consisting of boulders embedded in sand (Figure 6 bottom, Figure 7). The northern edge of the nearshore basalt flats are bounded by a distinct undercut ledge that extends approximately 200 feet offshore (Figure 8). From the orientation of the ledge, it is likely that it represents the edge of a drowned stream channel that is the extension of the existing stream bed on land.

With increasing distance from shore basalt platform becomes increasingly covered with living corals and associated limestone deposition (Figures 9 and 10). The reef platform extends approximately 800 feet offshore of the bridge site forming an oval shaped reef. The reef

platform terminates in a sharp boundary with sand plains that extend farther offshore (Figure 11).

2. Biotic Structure

A. Coral Communities

Biotic structure of the offshore environment at Kahalu'i Bay generally conforms to the pattern that has been documented as characterizing much of the west coast of the Island of Hawaii (Dollar 1982, Dollar and Tribble 1992). The exception to the pattern is that the coral community structure of the subject area reflects the overall greater exposure to wave impact which limits species assemblages to components with sturdy skeletal structures capable of withstanding physical forces. In addition, with the location off the mouth of a streambed, it is likely that the area receives periodic input of surface water which may have an effect on community composition.

The zonation scheme consists of three predominant regions. The nearshore boulder and basalt platform zone is essentially devoid of coral growth, likely as a result of regular periodic seasonal wave stress. However, much of the surface of the platform is covered with expansive mats of the purple soft octocoral *Sarcothelia edmondsoni* (Figure 6). This species is apparently able to withstand the rigor of wave impact in the zone, as it covers a large percentage of the exposed rock surfaces.

With distance offshore, boulders become increasingly colonized by corals. The earliest corals to occur are *Pocillopora meandrina*, a sturdy hemispherical coral that commonly occurs throughout shallow boulder zones in West Hawaii (Figure 7). This species is able to flourish in areas that are physically too harsh for most other species, particularly due to wave stress. Other early colonizers with respect to distance from shore include *Montipora capitata* and *M. patula*, which assume flat encrusting growth forms (Figure 7).

With increasing distance from shore abundance of corals continually increases, although species composition is restricted to two primary components, *Pocillopora meandrina* and *Porites lobata*. The latter species occurs as sturdy hemispherical colonies either with smooth or knobby surfaces (Figures 9 and 10). *Porites lobata* is the most common coral throughout Hawaii, and is by far the most common species on the survey reefs in Kahalu'i Bay, covering up to approximately 80% of the solid surface on the outer reef (Figure 10). At the outer edge of the reef platform fingers of solid rock extending into the sand flats contain the larger colonies of *Porites lobata* on the reef tract (Figure 11).

While *Pocillopora meandrina* and *Porites lobata* comprised the large majority of corals, several other species were noted, all of which can be considered rare. These included *Montipora capitata*, *Montipora patula*, *Leptastrea purpurea*, *Porites brighami* and *Fungia scutaria*. Conspicuous by its absence was *Porites compressa*, commonly called finger coral. *Porites compressa* is typically one of the most common species in West Hawaii, occurring in large interconnected mats growing on the deep reef slopes that bound the nearshore reefs.

The lack of such slopes in Kahalu'i Bay, as well as the shallow depth of the reef structures likely result in unsuitable habitat for *Porites compressa*.

B. Other Benthic Macrofauna

The other dominant group of macroinvertebrates observed on the reef were the sea urchins (Class Echinoidea). The most common urchin is *Echinometra matheai*, which occurred throughout the areas where corals occurred. *Echinometra matheai* are small urchins that are generally found within interstitial spaces bored into basaltic and limestone substrata.

Tripneustes gratilla, *Heterocentrotus mammillatus* and *Echinothrix diadema* are other species of urchins that occurred rarely across the reef face. These urchins occur as larger individuals (compared with *E. matheai*) that are generally found on the reef surface, rather than within interstitial spaces.

Several crown-of-thorns starfish (*Acanthaster planci*) were observed feeding on colonies of *Pocillopora meandrina*. Numerous sponges were also observed on the reef surface, often under ledges and in interstitial spaces.

Frondose benthic algae are conspicuously rare on the outer reefs of West Hawaii. Several plants were observed, however, in the survey area. Most common were the surge zone species *Ahnfeltiopsis concinna* growing on the shoreline boulders. Most common on the reef were the encrusting red calcareous algae (e.g., *Porolithon* spp., *Peysonellia rubra*, *Hydrolithon* spp.). These algae were abundant on bared limestone surfaces, and on the nonliving parts of coral colonies. Frondose algae were rare on the reef surface. The only common form was the brown alga *Sphacelaria furcigera*.

The design of the reef survey was such that no cryptic organisms or species living within interstitial spaces of the reef surface were enumerated. However, no dominant communities of these classes of biota were observed during the reef surveys.

C. Reef Fish Community Structure

The reef fish community in Kahalu'i Bay were typical of that found along most of the Kona Coast, as described by Hobson (1974), and Walsh (1984). Reef fish were not quantitatively evaluated, but qualitative observations of reef fish community structure were made by assigning fish species within each reef zone to abundance classes of Rare (<10 individuals); Common (11-50 individuals); Abundant (51-100 individuals) and Very Abundant (>100 individuals)(Table 3).

In the nearshore surge boulder-platform and boulder sand zones, Acanthurids (surgeonfish) were most common, often occurring in large mixed species schools moving over the reef. Juvenile fish belonged mostly to the family Acanthuridae (surgeon fish), with representatives from the families Labridae (wrasses), Chaetodontidae (butterfly fish). Planktivorous damselfish, principally of the genus *Chromis* were most abundant on the outer reef, where coral was most abundant. The blackfin chromis (*Chromis vanderbilti*) were very abundant along the

outer edge of the shelf and in deeper water. Black durgon (*Melanichthys niger*) were also observed congregating in the water column over the reef platform. Herbivores, primarily the yellow tang (*Zebrasoma flavescens*) and goldring surgeonfish (*Ctenochaetus strigosus*) that are normally common on reefs in Kona were also abundant. Few species of "food fish" (taken by subsistence and/or recreational fishermen) were not observed during the survey.

D. Endangered and Protected Species

Three species of marine animals that occur in Hawaiian waters have been declared threatened or endangered by Federal jurisdiction. The threatened green sea turtle (*Chelonia mydas*) occurs commonly along the Kona Coast, and is known to feed on selected species of macroalgae. The endangered hawksbill turtle (*Eretmochelys imbricata*) is known infrequently from waters off the Kona Coast. Three small green turtles were observed during the course of the survey.

Several species of marine animals that occur in Hawaiian waters have been declared threatened or endangered by Federal jurisdiction. The threatened green sea turtle (*Chelonia mydas*) occurs commonly throughout Hawaiian waters, and turtles are frequently observed in West Hawaii. The endangered hawksbill turtle (*Eretmochelys imbricata*) is known infrequently from waters of the state. Three green turtles were observed traversing the area during the course of underwater surveys for the present report.

Populations of the endangered humpback whale (*Megaptera novaeangliae*) winter in the Hawaiian Islands from December to April. The present survey was conducted in March when whales are present in Hawaiian waters. However, the shallow depths of the site in Kahalu'i Bay will likely preclude whales occurring in the direct vicinity of the project site. The Hawaiian Monk Seal, (*Monachus schauinslandi*), is an endangered earless seal that is endemic to the waters off of the Hawaiian Islands. Monk seals commonly haul out of the water onto sandy beaches to rest. As the shoreline in the subject area consists primarily of boulders, it would not appear to present an optimal location for seal haul-out. It is expected that mitigation plans will be developed to ensure no negative effects to seals or turtles during the construction of the shoreline structures.

IV. DISCUSSION and CONCLUSIONS

The purpose of this assessment is to assemble the information to make valid evaluations of the potential for impact to the marine environment from the replacement of an existing double-cell culvert on Ali'i Drive at Kahalu'i Bay in Kailua-Kona with a larger structure, expand the flood channel, and widen the roadway above to accommodate a bike lane and raised sidewalk. The information collected in this study provides the basis to understand some of the important processes that are operating in the marine environment, so as to be able to address any concerns that might be raised in the planning process for the proposed project.

Results of this baseline study reveal that marine chemistry of the area is dominated by substantial efflux of groundwater at the shoreline which forms a surface layer of low salinity, high nutrient water. Below the surface layer, water chemistry is essentially oceanic. However, values of virtually all the water samples collected exceeded the State Department of Health specific standards for West Hawaii, although there is no evidence of input of leachate materials other than from naturally occurring groundwater.

The major physical features of the marine environment consist of a distinctly zoned marine habitat consisting of a nearshore boulder-platform that is essentially devoid of marine life owing to stress from periodic large surf. With increasing water depth and distance from shore, reef corals occur with increasing density moving seaward. The reef platform terminates in a distinct edge into sand plains. The overarching characteristic of the reef community structure is shaping by the physical forces associated with wave impacts. Growth forms of corals all assume robust sturdy forms, and delicate species do not occur. The location of the site, directly offshore of an existing stream mouth that periodically discharges to the ocean indicates that the community also experiences episodes of runoff and the effects of associated sediment. These results indicate that the existing communities are pre-adapted to relatively harsh conditions.

All of these considerations indicate that the proposed construction of a culvert and bridge should not have any significant negative or likely even measurable, permanent effects to water quality or marine biota in the neighboring region of Kahalu'i Bay. This conclusion is supported by the fact that the proposed culvert will not alter the existing drainage conditions to which the marine communities have adapted. Hence, as the proposed project does not represent a unique or different usage, and assuming that best management practices are used during construction work to minimize or eliminate introduction of materials to the ocean, there appears to be little potential for environmental impacts to the marine environment.

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feet 1000
meters 300



FIGURE 1. Satellite image of Kahului Bay offshore of Ali'i Drive Bridge and Culvert showing locations of water sampling stations (red circles). Reef platform appears as dark areas extending from the shoreline.

TABLE 1. Results of water chemistry analyses from ocean sampling stations off Ali'i Drive in Kahului Bay fronting the site of proposed bridge and culvert repair site. Samples were collected on March 11, 2014. Nutrient concentrations are shown in micromolar units (μM). "S" indicates surface sample; "B" indicates bottom sample. See Figure 1 for locations of sampling stations.

SAMPLE STATION	DFS (feet)	DEPTH (feet)	PO_4^{3-} (μM)	$\text{NO}_3^- + \text{NO}_2^-$ (μM)	NH_4^+ (μM)	Si (μM)	TN (μM)	TON (μM)	TP (μM)	TOP (μM)	TURB (ntu)	SALT (o/oo)	pH (std. units)	Chl-a ($\mu\text{g/L}$)	TEMP deg. C	Diss. O_2 % sat.
1-S	0.1	0	0.27	5.87	2.90	49.37	19.36	10.59	0.58	0.31	0.33	32.79	8.01	2.04	25.63	99.60
2-S	1	1	0.34	5.25	0.81	48.19	14.28	8.22	0.62	0.28	0.22	32.87	8.03	0.99	25.61	100.13
3-S	5	1	0.34	5.26	0.24	47.81	11.47	5.97	0.61	0.27	0.22	32.87	8.03	0.74	25.69	98.96
4-S	10	1	0.33	4.77	0.39	43.41	10.51	5.35	0.58	0.25	0.26	33.08	8.03	0.86	25.57	97.40
5-S	25	1	0.29	3.66	0.21	40.74	9.33	5.46	0.56	0.27	0.21	33.17	8.03	0.75	25.74	100.44
5-B	25	4	0.28	3.64	0.40	39.94	10.61	6.57	0.56	0.28	0.15	33.22	8.03	0.99	25.74	97.96
6-S	35	1	0.44	4.41	0.37	43.11	10.68	5.90	0.67	0.23	0.20	33.13	8.03	0.89	25.73	99.62
6-B	35	6	0.23	1.19	0.31	14.98	7.48	5.98	0.49	0.26	0.18	34.26	8.02	0.66	25.86	101.27
7-S	50	1	0.27	3.41	0.32	37.32	9.50	5.77	0.53	0.26	0.17	33.33	8.03	0.66	25.72	100.06
7-B	50	7	0.23	1.07	0.27	13.44	7.43	6.09	0.48	0.25	0.09	34.33	8.02	0.61	25.95	101.38
8-S	100	1	0.31	4.40	0.74	41.72	13.01	7.87	0.57	0.26	0.37	33.15	8.00	0.83	25.44	99.66
8-B	100	8	0.24	1.71	0.34	20.93	7.86	5.81	0.51	0.27	0.19	34.05	8.00	0.88	25.68	95.78
9-S	175	1	0.28	3.51	0.94	35.39	11.03	6.58	0.55	0.27	0.14	33.43	8.00	0.73	25.47	99.87
9-B	175	8	0.30	0.49	0.72	7.37	7.63	6.42	0.56	0.26	0.16	34.56	8.00	0.47	25.73	98.40
10-S	250	1	0.28	3.68	0.62	37.59	10.39	6.09	0.55	0.27	0.25	33.32	8.00	0.54	25.44	99.96
10-B	250	12	0.21	0.38	0.43	5.37	6.45	5.64	0.47	0.26	0.26	34.64	8.01	0.41	25.74	96.55
11-S	350	1	0.28	2.65	0.46	27.94	9.33	6.22	0.53	0.25	0.12	33.73	7.99	0.56	25.52	99.88
11-B	350	16	0.22	0.26	0.39	4.54	6.43	5.78	0.51	0.29	0.11	34.66	8.01	0.55	25.74	96.00
12-S	500	1	0.26	3.06	0.45	32.92	10.60	7.09	0.55	0.29	0.09	33.54	8.00	0.57	25.54	99.85
12-B	500	18	0.31	0.25	0.99	4.16	7.75	6.51	0.57	0.26	0.08	34.68	8.02	0.42	25.60	95.05
13-S	700	1	0.29	3.08	0.82	30.58	9.52	5.62	0.55	0.26	0.14	33.63	7.99	0.48	25.49	100.08
13-B	700	26	0.20	0.27	0.75	4.94	6.67	5.65	0.48	0.28	0.17	34.65	8.01	0.38	25.61	95.38
14-S	900	1	0.30	3.90	0.52	23.08	9.90	5.48	0.55	0.25	0.11	33.91	7.99	0.39	25.73	99.05
14-B	900	37	0.20	0.12	0.37	3.98	6.19	5.70	0.50	0.30	0.09	34.67	8.02	0.40	25.55	95.70

*= Salinity shall not vary more than 10% from natural or seasonal changes considering hydrologic input and oceanographic factors.

**= pH shall not deviate more than 0.5 units from a value of 8.1.

***= Temperature shall not vary more than one degree C. from ambient conditions.

****= Dissolved Oxygen not less than 75% saturation

TABLE 2. . Results of water chemistry analyses from ocean sampling stations off Ali'i Drive in Kahului Bay fronting the site of proposed bridge and culvert repair site. Samples were collected on March 11, 2014. Nutrient concentrations are shown in units of micrograms per liter (µg/L). "S" indicates surface sample; "B" indicates bottom sample. See Figure 1 for locations of sampling stations.

SAMPLE STATION	DFS (feet)	DEPTH (feet)	PO ₄ ³⁻ (µg/L)	NO ₃ ⁻ +NO ₂ ⁻ (µg/L)	NH ₄ ⁺ (µg/L)	Si (µg/L)	TN (µg/L)	TON (µg/L)	TP (µg/L)	TOP (µg/L)	TURB (ntu)	SALT (o/oo)	pH (std. units)	Chl-a (µg/L)	TEMP deg. C	Diss. O ₂ % sat.
1-S	0.1	0	8.37	82.18	40.60	1382.36	271.04	148.26	17.98	9.61	0.33	32.79	8.01	2.04	25.63	99.60
2-S	1	1	10.54	73.50	11.34	1349.32	199.92	115.08	19.22	8.68	0.22	32.87	8.03	0.99	25.61	100.13
3-S	5	1	10.54	73.64	3.36	1338.68	160.58	83.58	18.91	8.37	0.22	32.87	8.03	0.74	25.69	98.96
4-S	10	1	10.23	66.78	5.46	1215.48	147.14	74.90	17.98	7.75	0.26	33.08	8.03	0.86	25.57	97.40
5-S	25	1	8.99	51.24	2.94	1140.72	130.62	76.44	17.36	8.37	0.21	33.17	8.03	0.75	25.74	100.44
5-B	25	4	8.68	50.96	5.60	1118.32	148.54	91.98	17.36	8.68	0.15	33.22	8.03	0.99	25.74	97.96
6-S	35	1	13.64	61.74	5.18	1207.08	149.52	82.60	20.77	7.13	0.20	33.13	8.03	0.89	25.73	99.62
6-B	35	6	7.13	16.66	4.34	419.44	104.72	83.72	15.19	8.06	0.18	34.26	8.02	0.66	25.86	101.27
7-S	50	1	8.37	47.74	4.48	1044.96	133.00	80.78	16.43	8.06	0.17	33.33	8.03	0.66	25.72	100.06
7-B	50	7	7.13	14.98	3.78	376.32	104.02	85.26	14.88	7.75	0.09	34.33	8.02	0.61	25.95	101.38
8-S	100	1	9.61	61.60	10.36	1168.16	182.14	110.18	17.67	8.06	0.37	33.15	8.00	0.83	25.44	99.66
8-B	100	8	7.44	23.94	4.76	586.04	110.04	81.34	15.81	8.37	0.19	34.05	8.00	0.88	25.68	95.78
9-S	175	1	8.68	49.14	13.16	990.92	154.42	92.12	17.05	8.37	0.14	33.43	8.00	0.73	25.47	99.87
9-B	175	8	9.30	6.86	10.08	206.36	106.82	89.88	17.36	8.06	0.16	34.56	8.00	0.47	25.73	98.40
10-S	250	1	8.68	51.52	8.68	1052.52	145.46	85.26	17.05	8.37	0.25	33.32	8.00	0.54	25.44	99.96
10-B	250	12	6.51	5.32	6.02	150.36	90.30	78.96	14.57	8.06	0.26	34.64	8.01	0.41	25.74	96.55
11-S	350	1	8.68	37.10	6.44	782.32	130.62	87.08	16.43	7.75	0.12	33.73	7.99	0.56	25.52	99.88
11-B	350	16	6.82	3.64	5.46	127.12	90.02	80.92	15.81	8.99	0.11	34.66	8.01	0.55	25.74	96.00
12-S	500	1	8.06	42.84	6.30	921.76	148.40	99.26	17.05	8.99	0.09	33.54	8.00	0.57	25.54	99.85
12-B	500	18	9.61	3.50	13.86	116.48	108.50	91.14	17.67	8.06	0.08	34.68	8.02	0.42	25.60	95.05
13-S	700	1	8.99	43.12	11.48	856.24	133.28	78.68	17.05	8.06	0.14	33.63	7.99	0.48	25.49	100.08
13-B	700	26	6.20	3.78	10.50	138.32	93.38	79.10	14.88	8.68	0.17	34.65	8.01	0.38	25.61	95.38
14-S	900	1	9.30	54.60	7.28	646.24	138.60	76.72	17.05	7.75	0.11	33.91	7.99	0.39	25.73	99.05
14-B	900	37	6.20	1.68	5.18	111.44	86.66	79.80	15.50	9.30	0.09	34.67	8.02	0.40	25.55	95.70

*= Salinity shall not vary more than 10% from natural or seasonal changes considering hydrologic input and oceanographic factors.

**= pH shall not deviate more than 0.5 units from a value of 8.1.

***= Temperature shall not vary more than one degree C. from ambient conditions.

****= Dissolved Oxygen not less than 75% saturation

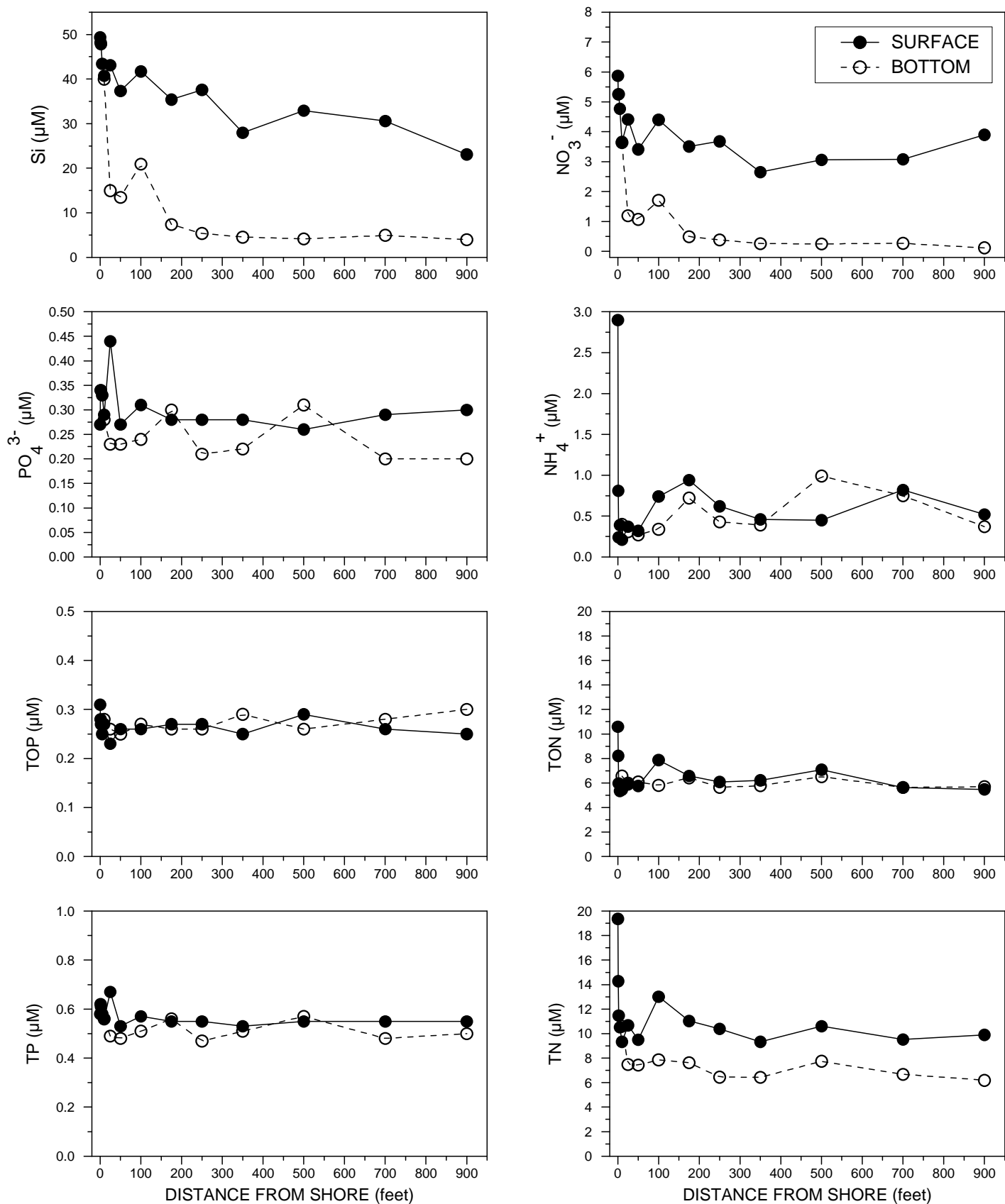


FIGURE 2. Plots of dissolved nutrients in surface (S) and deep (D) samples collected on March 19, 2014 as a function of distance from the shoreline in the waters of Kahului Bay, Island of Hawaii off the Alii Drive Bridge. For site locations, see Figure 1.

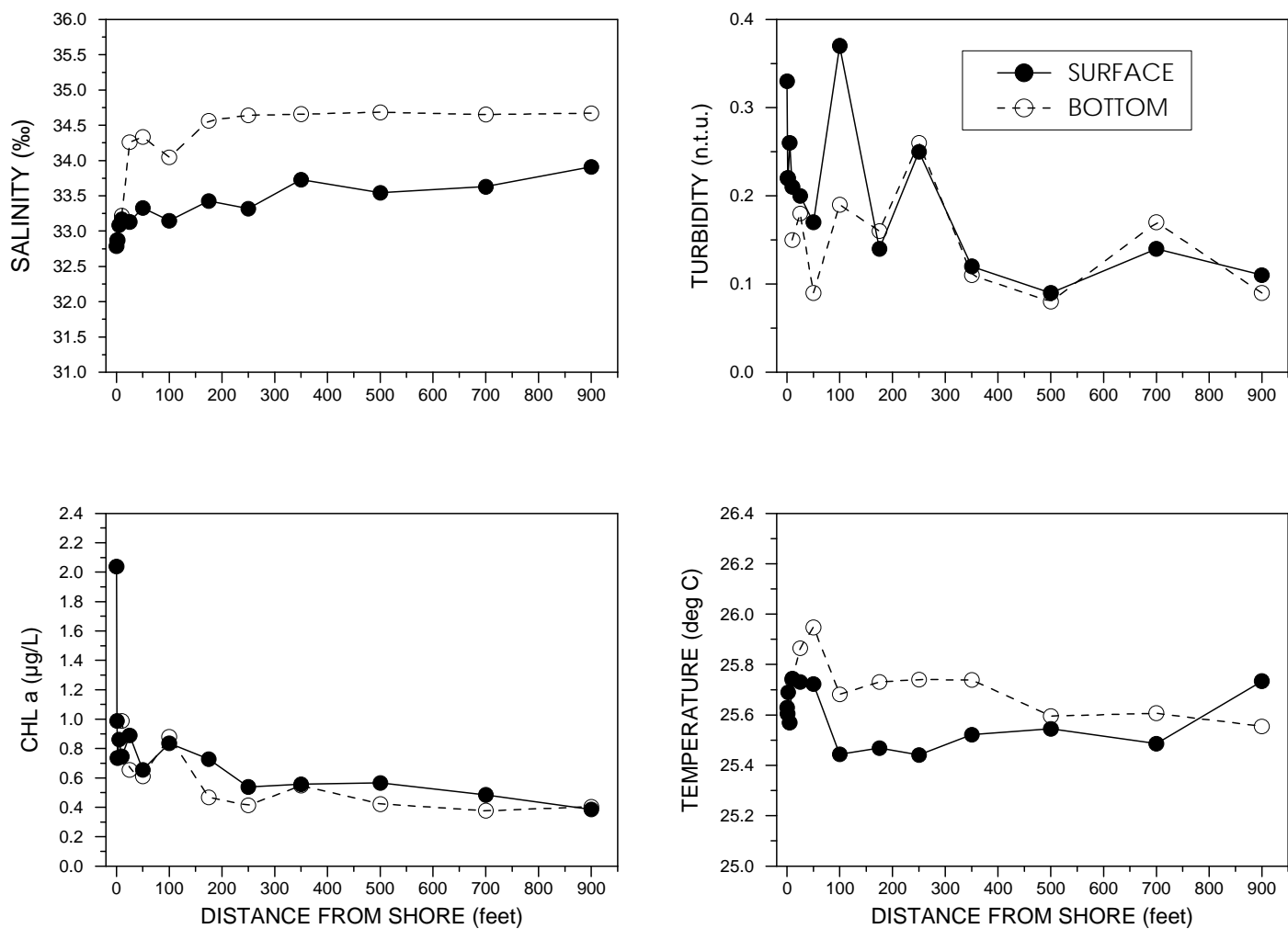


FIGURE 3. Plots of water chemistry constituents in surface) and bottom samples collected in Kahului Bay, Island of Hawaii off the Alii Bridge project site as a function of distance from the shoreline. See Figure 1 for locations of sampling stations.

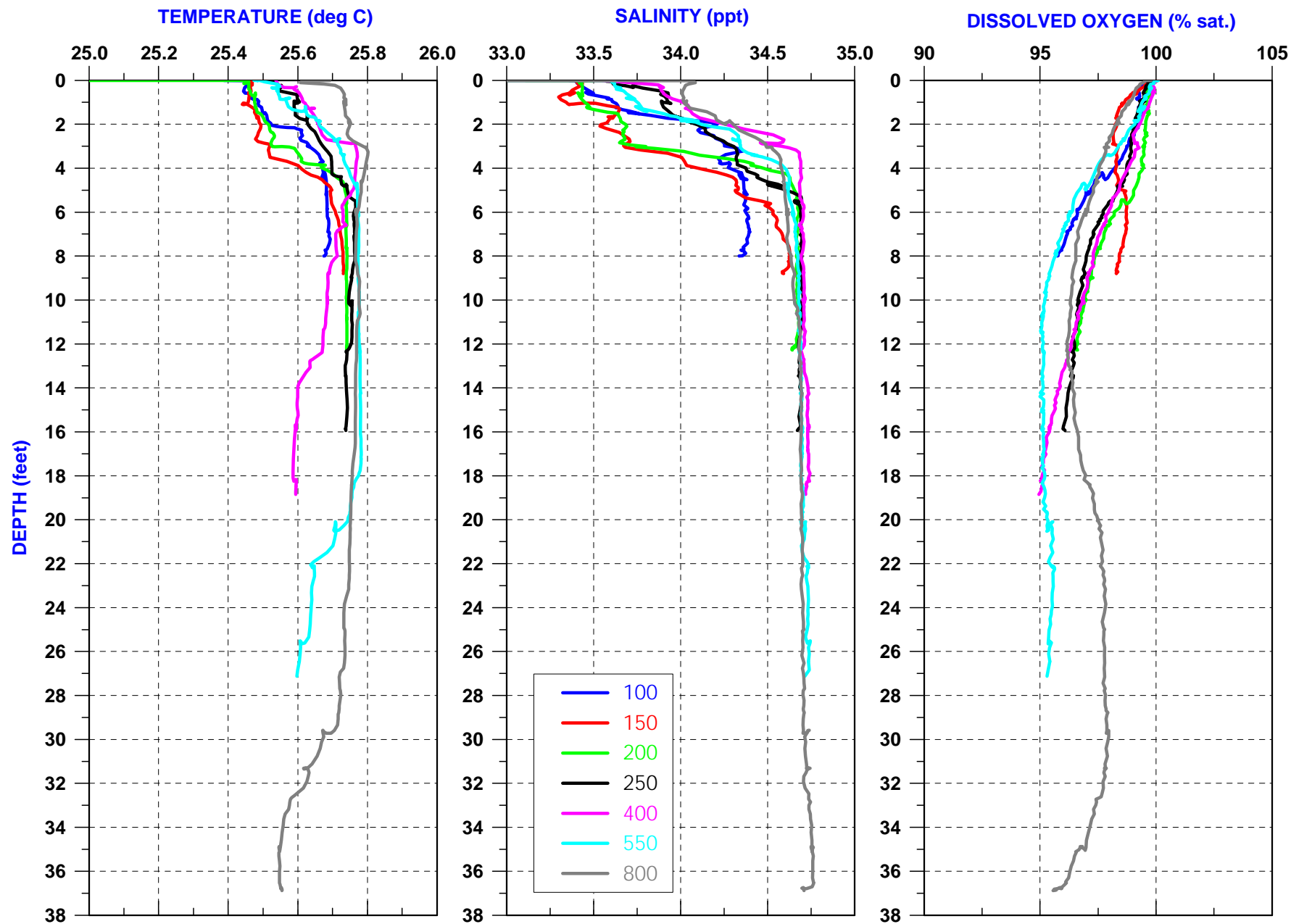


FIGURE 4. Vertical profiles of temperature, salinity and dissolved oxygen at water sampling stations in Kahului Bay, Island of Hawaii off the Alii Dr. bridge site sampled on March 11, 2014. Values in legend indicate feet from the shoreline. See Figure 1 for locations of sampling stations.

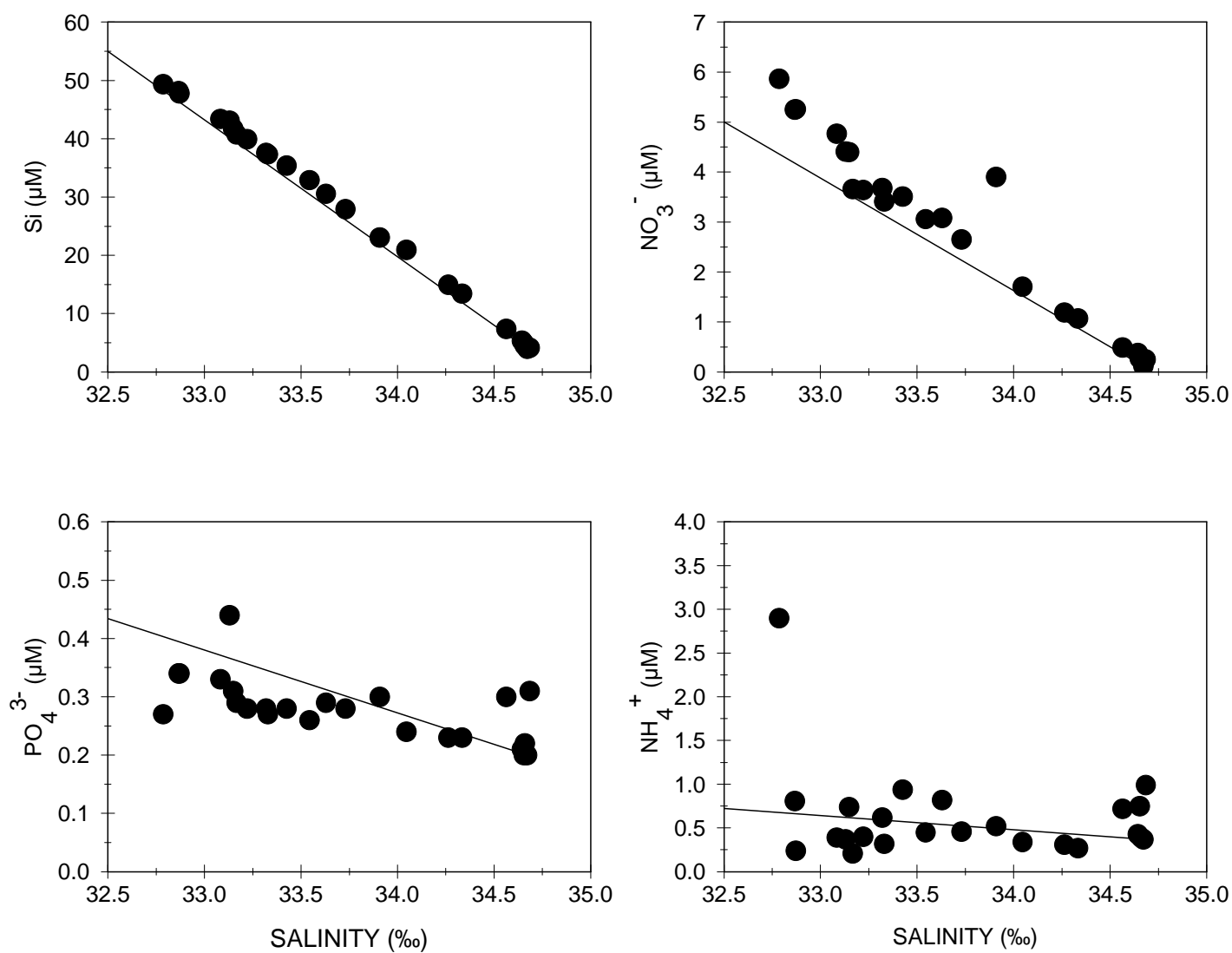


FIGURE 5. Mixing diagram showing concentration of dissolved nutrients from samples collected offshore of the Ali'i Dr. bridge and culvert in Kahului Bay, North Kona. Straight line in each plot is conservative mixing lines constructed by connecting the concentrations in open ocean water with water from three DWS drinking water wells upslope of the sampling area. For sampling locations, see Figure 1.

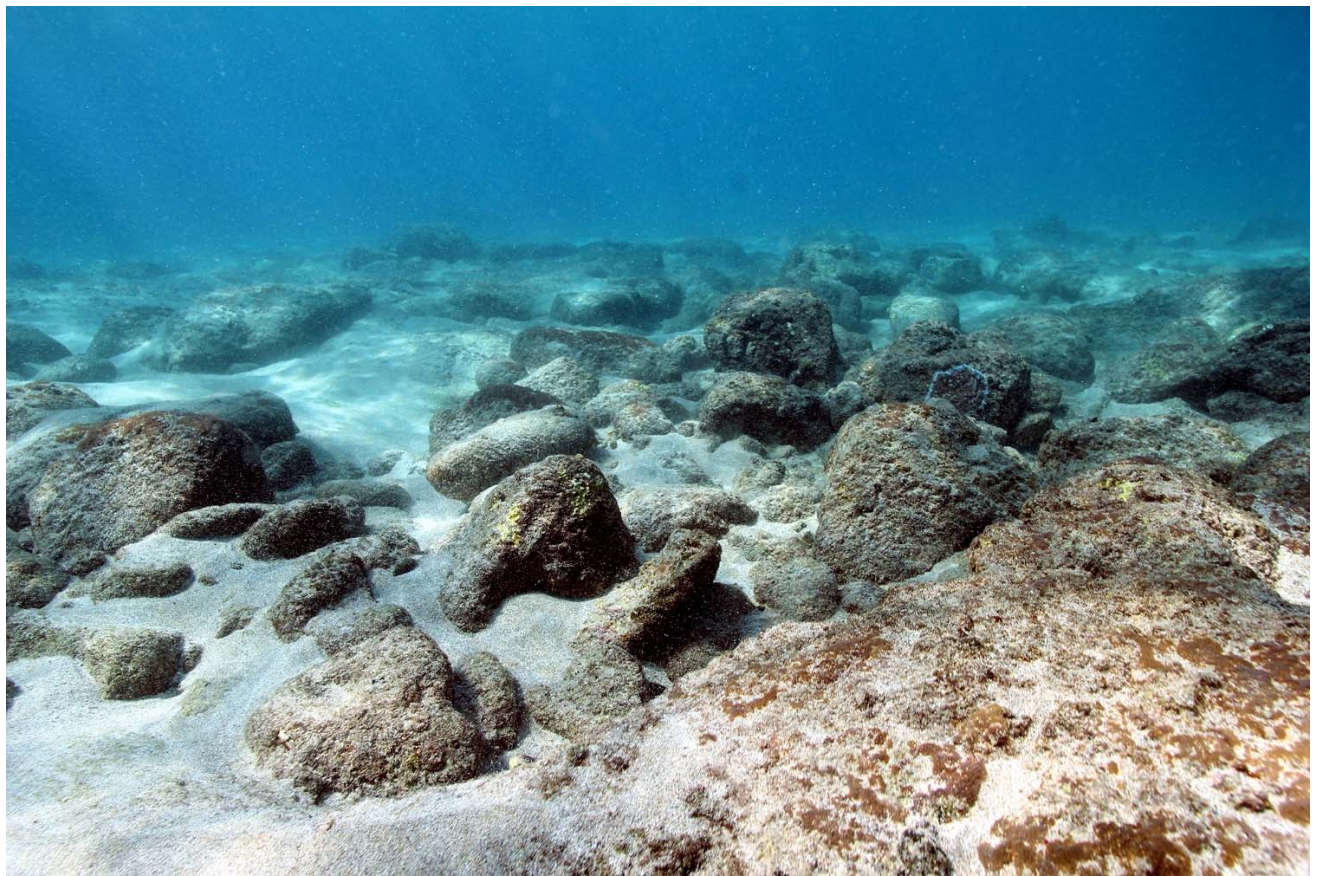


FIGURE 6. Photographs of nearshore reef rock platform zone. Upper photo shows flat basaltic pavement that extends from the shoreline of the Alii Drive bridge to a distance of approximately 50 feet seaward. Purple covering on pavement are mats of the octocoral *Sarcothelia edmondsoni*. At the terminus of the pavement, bottom composition grades into a mix of coarse sand and rounded basaltic boulders (bottom photo). Water depth is approximately 5 feet in upper photo and 8 feet in bottom photo.



FIGURE 7. Solitary corals growing on boulders in the sand-boulder zone in the mid-reef zone of the nearshore reef in Kahului Bay off the Ali'i Drive bridge-culvert site. Coral in top photo is *Montipora capitata*; corals in bottom photo are *Pocillopora meandrina*. Water depth in both photos is approximately 10 feet.



FIGURE 8. Photographs of limestone ledge on northern side of drowned stream channel off shoreline of the Ali'i Drive bridge. The inner region of the ledge consists of an undercut with the upper surface consisting on a flat pavement. Further offshore, the vertical face of the ledge is covered with live corals (bottom photo). Water depth is approximately 6 feet in upper photo and 10 feet in bottom photo.

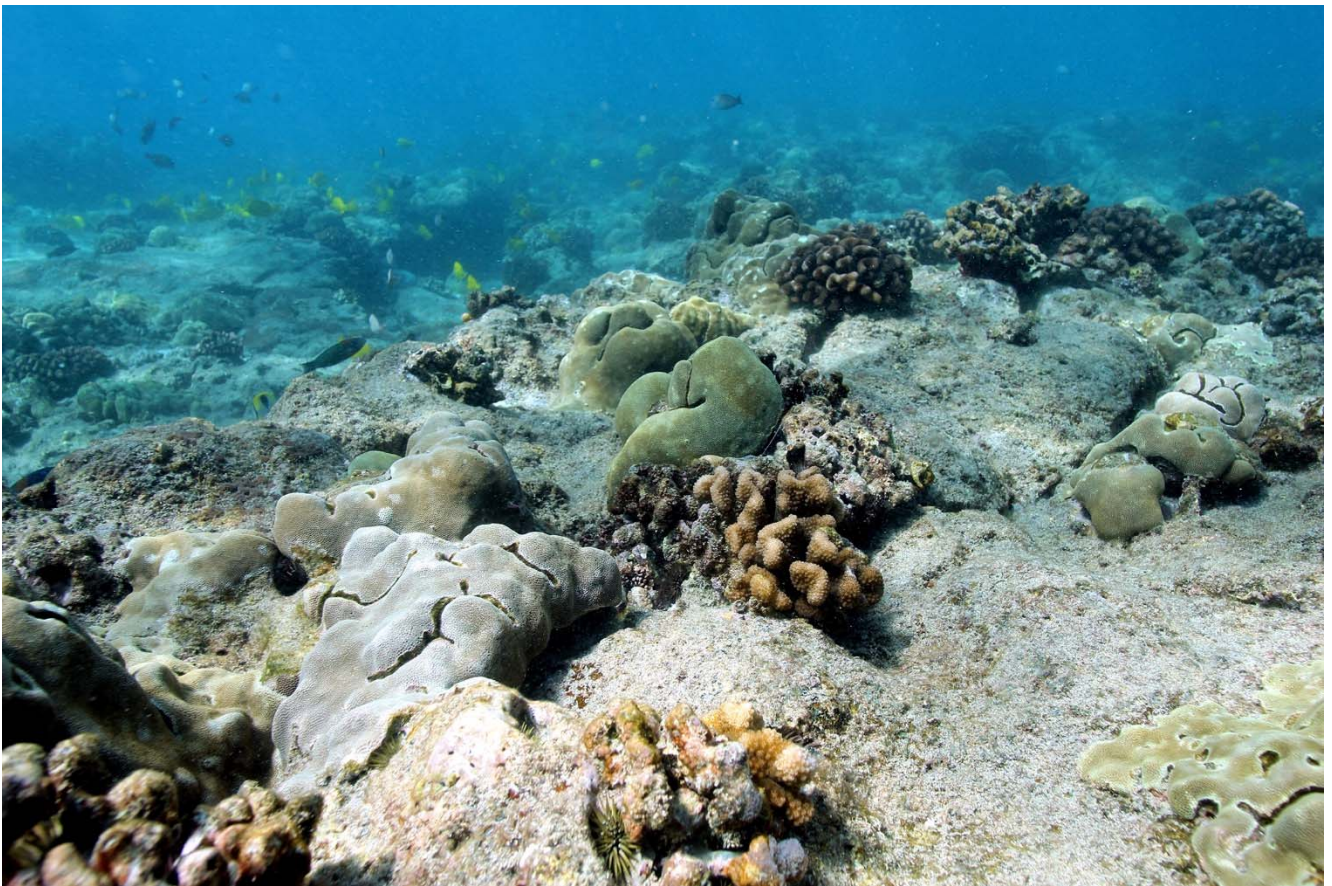


FIGURE 9. Mix of corals, primarily *Pocillopora meandrina* and *Porites lobata* on inner reef platform zone of the nearshore reef in Kahului Bay off the Ali'i Drive bridge-culvert site. Water depth in both photos is approximately 18 feet.

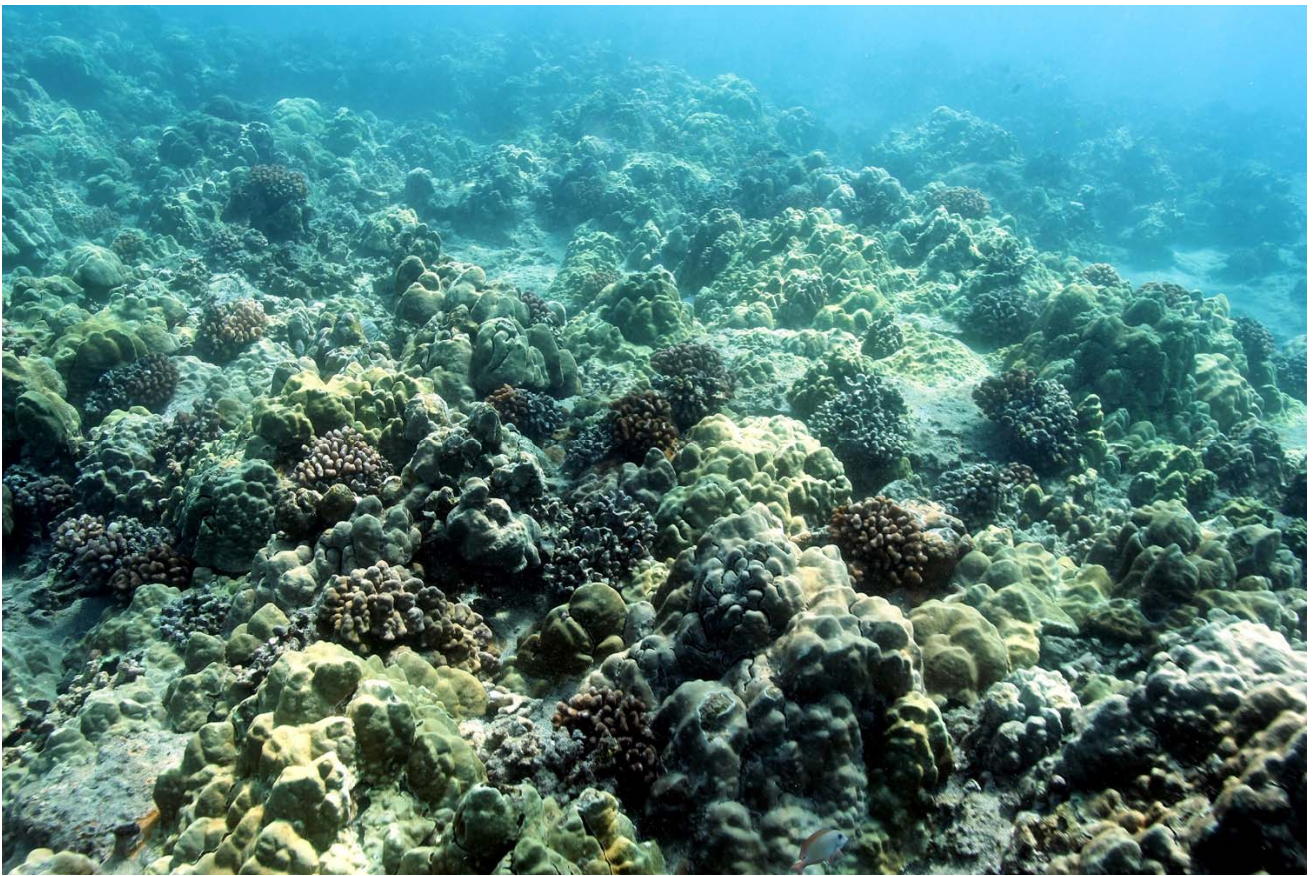


FIGURE 10. Photographs of the well-developed *Porites lobata* reef building zone comprising the outer reef off the Ali'i Drive bridge site. Water depth in both photos is approximately 25 feet.



FIGURE 11. Reef Platform at the seaward terminus of the nearshore reef in Kahului Bay off the Ali'i Drive bridge-culvert site. Solid limestone reef structure grades into plains of coarse white sand that can be seen in the background of both photos. Water depth in both photos is approximately 30 feet.

TABLE 3. Reef fish abundance by reef zone in Kahului Bay off the Ali'i Drive Bridge and Culvert. Abundance classes are: Rare (R) <10 individuals; Common (C) 11-50 individuals; Abundant (A) 51-100 individuals; Very abundant (VA) >100 individuals.

<u>ZONE</u>	<u>SPECIES</u>	<u>FAMILY</u>	<u>ABUNDANCE CLASS</u>
BOULDER PLATFORM	<i>Acanthurus triostegus</i>	Acanthuridae	R
	<i>Zebrasoma flavescens</i>	Acanthuridae	A
	<i>Acanthurus olivaceous</i>	Acanthuridae	R
	<i>Thalassoma duperrey</i>	Labridae	C
	<i>Chromis ovalis</i>	Pomacentridae	C
BOULDER SAND	<i>Acanthurus nigrofuscus</i>	Acanthuridae	VA
	<i>Acanthurus triostegus</i>	Acanthuridae	R
	<i>Naso lituratus</i>	Acanthuridae	R
	<i>Zebrasoma flavescens</i>	Acanthuridae	A
	<i>Melichthys niger</i>	Balistidae	VA
	<i>Chaetodon auriga</i>	Chaetodontidae	R
	<i>C. quadrimaculatus</i>	Chaetodontidae	R
	<i>Thalassoma duperrey</i>	Labridae	R
	<i>Chlorurus spilurus</i>	Labridae	R
	<i>Thalassoma duperrey</i>	Labridae	R
	<i>Plectroglyphidodon imparipennis</i>	Pomacentridae	R
	<i>Rhinecanthus rectangulus</i>	Rhinecanthus	R
	<i>Zanclus cornutus</i>	Zanclidae	R
REEF PLATFORM	<i>Acanthurus nigrofuscus</i>	Acanthuridae	A
	<i>Zebrasoma flavescens</i>	Acanthuridae	R
	<i>Melichthys niger</i>	Balistidae	R
	<i>Rhinecanthus aculeatus</i>	Balistidae	R
	<i>Chaetodon ornatissimus</i>	Chaetodontidae	R
	<i>Paracirrhites arcatus</i>	Cirrhitidae	A
	<i>Thalassoma duperrey</i>	Labridae	R
	<i>Gomphosus varius</i>	Labridae	R
	<i>Plectroglyphidodon imparipennis</i>	Pomacentridae	R
	<i>Chromis ovalis</i>	Pomacentridae	R
	<i>Chromis vanderbilti</i>	Pomacentrinae	VA

Ali'i Drive Culvert Replacement at Kahului Bay

Environmental Assessment

APPENDIX 3

Archaeological Inventory Survey and Historic Sites Correspondence

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Harry Kim
Mayor

Wil Okabe
Managing Director



Frank J. De Marco, P.E.
Director

Allan G. Simeon, P.E.
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March 1, 2017

Ms. Suzanne Case, Chairperson
State Historic Preservation Division
Department of Land and Natural Resources
State of Hawaii
Kakuhihewa Building
601 Kamokila Blvd, Suite 555
Kapolei, HI 96707

Attention: Dr. Alan Downer, Assistant State Historic Preservation Officer
Dr. Susan Lebo, PhD., Archaeological Branch Chief

SUBJECT: Section 106 National Historic Preservation Act (NHPA) Consultation
Ali'i Drive Culvert Replacement
Federal Aid Project No. STP-0186(1)
Kailua Kona, North Kona District, Island of Hawai'i, Kahului 1st and 2nd
Ahupua'a, Tax Map Key (TMK): (3) 7-5-019: 007, 008, 009 and 016
Log No. 2015.03877

On behalf of the Federal Highway Administration (FHWA) and the State of Hawai'i, Department of Transportation (HDOT), the County of Hawaii, Department of Public Works (COH) is transmitting herewith two copies of the draft Archaeological Inventory Survey (AIS) for the Ali'i Drive Culvert Replacement Project, dated February 2017 (revised), and prepared by ASM Affiliates, Inc. for the subject project. The draft AIS is prepared pursuant to National Historic Preservation Act (NHPA) Section 106 and Title 36 of the Code of Federal Regulations (CFR), Part 800, to identify and evaluate historic properties that could potentially be affected by the subject federal undertaking ("project"). The draft AIS is also prepared to comply with State of Hawai'i environmental and historic preservation review legislation, Hawai'i Revised Statutes (HRS) Section 343, HRS Section 6-E and Hawai'i Administrative Rules (HAR) Section 13-275.

This AIS supersedes the draft Archaeological Assessment (AA) for the Ali'i Drive Culvert Replacement Project, prepared by ASM Affiliates, Inc. in July 2015 and submitted by COH to SHPD on October 28, 2015. This draft AIS addresses comments on the draft AA received from Dr. Alan S. Downer, SHPD, by letter to Robert B. Rechtman, PhD of ASM Affiliates, Inc., dated February 23, 2016, (Log No. 2015.03877; Doc. No. 1602KM25) requesting additional research and documentation of several of the sites.

We respectfully request your comment and acceptance of the draft AIS. The FHWA will conclude the NHPA Section 106 consultation process and issue an effect determination based on the final AIS and the results of the consultation process with Native Hawaiian organizations (NHO) and other consulting parties.

The HDOT project manager for the subject project is Robert Sun and can be contacted at (808) 692-7578 or by e-mail at robert.sun@hawaii.gov. The County of Hawai'i project engineer is Casey Yanagihara and can be contacted at (808) 961-8004, or by e-mail at cyanagihara@hawaiicounty.gov. Please call either of them for additional information.



Frank J. De Marco, P.E.
Director of Public Works

MPH/CKY

Enclosure: Draft Archaeological Study in Compliance with Section 106 of the National Historic Preservation Act and HRS Chapter 6E-8 for the Ali'i Drive Culvert Project

cc: Casey Yanagihara (COH)
Meesa Otani (FHWA)

Archaeological Study in Compliance with Section 106 of the National Historic Preservation Act and HRS Chapter 6E-8 for the Ali'i Drive Culvert Replacement Project

TMK: (3) 7-5-019: 007, 008, 009 and 016

Kahului 1st and 2nd Ahupua'a
North Kona District
Island of Hawai'i

DRAFT VERSION



Prepared By:

Robert B. Rechtman, Ph.D.
and
Teresa Gotay, M.A.

Prepared For:

County of Hawaii
Department of Public Works
Aupuni Center
101 Pauahi Street, Suite 7
Hilo, HI 96720

July 2015
(revised February 2017)

ASM Project Number 21550.00

ASM 
affiliates
Archaeology • History • Ethnography • Architectural History
Office: (808) 969-6066 • Fax: (808) 443-0065

Archaeological Study in Compliance with Section 106 of the National Historic Preservation Act and HRS Chapter 6E-8 for the Ali‘i Drive Culvert Replacement Project

TMK: (3) 7-5-019:007, 008, 009 and 016

Kahului 1st and 2nd *ahupua‘a*
North Kona District
Island of Hawai‘i



EXECUTIVE SUMMARY

On behalf of the County of Hawai‘i Department of Public Works (DPW), State of Hawai‘i Department of Transportation (HDOT) and the Federal Highway Administration (FHWA), ASM Affiliates conducted an archaeological study of a roughly 2 acre Area of Potential Effect (APE) being portions of TMKs: (3) 7-5-019:007, 008, 009, and 016 in Kahului 1st and 2nd *ahupua‘a*, North Kona District, Island of Hawai‘i. DPW and HDOT anticipate federal funding from FHWA for the Ali‘i Drive Culvert Replacement Project (the undertaking). The potential use of federal funds necessitates compliance with Section 106 of the National Historic Preservation Act and its implementing regulation (36 CFR 800). FHWA has delegated their Section 106 authority to HDOT, who has taken responsibility for the determination process. In a review of an earlier draft of this report, the Hawai‘i SHPO/DLNR-SHPD requested that this document also address project effects under Hawai‘i Revised Statutes (HRS) Chapter 6E-8. The proposed undertaking addresses issues with an existing double-cell culvert, also known as Kahului Bridge, located within the Ali‘i Drive right-of-way at Kahului Bay in Kahului 1st and 2nd *ahupua‘a*, North Kona District, Island of Hawai‘i. Kahului Bridge consists of a concrete deck that supports two ten-foot lanes for vehicles with only a narrow shoulder for non-vehicular traffic. The underside of the concrete deck has spalls in the concrete with exposed corroded steel. Additionally, the two culvert openings are insufficient for drainage, which has resulted in the flooding of adjacent properties and Ali‘i Drive itself during heavy rains causing potentially hazardous road conditions. The concrete and stone culvert and bridge was constructed in 1937, has been more recently reinforced with 12 inch x 12 inch wooden post and beam support framing, although the bridge is considered a historic property, it is functionally obsolete by today’s standards.

In compliance with Section 106 of the National Historic Preservation Act, consultation letters were sent to the following organizations and individuals: Association of Hawaiian Civic Clubs; Hui Malama I Na Kupuna O Hawaii Nei; Kona Hawaiian Civic Club; La‘i‘ōpua 2020; Hawai‘i Island Burial Council; Ms. Nicole Lui; Mr. Curtis Tyler; Ms. Cynthia Nazara; Mr. Hiram Rivera. We also published a notice in *West Hawaii Today* and the OHA newspaper *Ka Wai Ola* inviting the participation of Native Hawaiian organizations and Native Hawaiian descendants with ancestral lineal or cultural ties to, cultural knowledge or concerns for, and cultural or religious attachment to the proposed project area. Based on the findings of previous research within the current APE, and a review of the prior archaeological studies conducted adjacent to the current APE, we know that in addition to the 1937 Kahului Bridge (SIHP Site 30614) there have been five archaeological sites (SIHP Sites 21757, 21758, 21759, 21768, and 22475) documented within the current APE; four of these are Historic Period rock walls and one (Site 21757) appears to be a middle nineteenth century traditional house foundation. Archival research and oral testimony indicates that a historic cemetery (Komomua-Kahulamū family) was located in the central portion of the APE. However, it is unlikely that remnants of the Komomua-Kahulamū family cemetery still exists as all of the known family members buried there were exhumed and the area was filled and graded.

Archaeological fieldwork for the current study was conducted by Robert B. Rechtman, Ph.D., Owen Moore, M.A., Genevieve Glennon, B.A., and Teresa Gotay, M.A. As a result of the current fieldwork, in addition to the Kahului Bridge (SIHP Site 30614) five previously recorded sites (SIHP Sites 21757, 21758, 21759, 21768, and 22475) were identified within the current APE. Site 21757 was originally identified and tested by Rechtman and Henry (1999). This nineteenth century house platform was previously determined to be significant under state Criterion d and approved for data recovery. As a result of the current study this site continues to be considered significant under state Criterion d and is also determined eligible for the NRHP under Criterion D.

Site 21758, as identified by Rechtman and Henry (1999), is a rock wall that appears to mark the northern and eastern boundary of TMK: (3) 7-5-019:007 and possible portions of the former LCAw. 10373. Much of this wall has been reworked in modern times and other sections are collapsed. In spite of its condition, this site was previously determined to be significant under state Criterion d with an approved treatment of no further historic preservation work required. As a result of the current study this site continues to be considered significant under state Criterion d, and by correlate federal Criterion D, with a previously approved no further work determination.

Site 21759 was originally assigned to a rock wall extending along the *mauka* boundary of TMK: (3) 7-5-019:009 (LCAw. 7086:2) by Rechtman and Henry (1999). While that wall is outside of the current APE, the Site 21759 designation was retained and assigned to a collection of three features (a nineteenth century boundary wall, a twentieth century well, and a twentieth century concrete feature) also attributed to the activities associated with the use of that *kuleana* parcel. The new features that were documented during the current study do not alter the prior significance determination for Site 21759, which was assessed as significant under state Criterion d, and by correlate federal Criterion D, with a previously approved no further work determination.

Site 21768 was originally recorded by Rechtman and Henry (1999) and later rerecorded by Haun and Henry (2004). This site is a series of connected wall segments that appear to mark the southern and eastern boundaries of TMK: (3) 7-5-019:007 (LCAw. 10373). This wall is currently in poor condition, but when originally recorded it was determined to be significant under state Criterion d. The approved treatment for this site as a result of the Rechtman and Henry (1999) and the Haun and Henry (2004) studies was no further historic preservation work required. As a result of the current study this site continues to be considered significant under state Criterion d, and by correlate federal Criterion D, with a previously approved no further work determination.

Site 22475 is a remnant of a twentieth century (post-1927) rock wall that extends along the *mauka* side of Ali'i Drive projecting into the current APE from the south. This site was first recorded by Rechtman and Dougherty (2000) south of the current APE, and later by Haun and Henry (2004) within the current APE. This wall was determined to be significant under state Criterion d as a result of both of these prior studies, with an approved treatment of no further historic preservation work required. As a result of the current study, given its present diminished state, this site is no longer considered significant under state Criterion d, nor is it determined eligible for the NRHP.

The Kahului Bridge (Site 30614) was identified as a historic property during the *State Historic Bridge Inventory and Evaluation* (MKE and Fung 2013) and determined to be eligible for the NRHP under Criterion C; it was also assessed as significant under state significance Criterion c. As a result of the current study this site is no longer assessed as significant under state Criterion c and likewise is determined not eligible for listing in the NRHP.

In the context of HRS Chapter 6E-8, the current proposed culvert replacement project will result in an “effect with agreed upon mitigation commitments.” Site 21757 has already been approved for data recovery under the Chapter 6E process, thus this site will be subject to data recovery in compliance with a data recovery plan prepared in accordance with HAR 13§13-278, and submitted to the DLNR-SHPD Archaeology Branch for review and approval. In the context of NHPA Section 106, with respect to the current undertaking’s effects on historic properties (sites determined eligible for listing in the NRHP), it is the conclusion of the current study that the undertaking will result in “no effect,” as all of the potential historic properties within the APE have been previously mitigated (no further work required), or in the case of Site 21757 will be subject to data recovery.

CHAPTERS

	Page
1. INTRODUCTION	1
THE PROPOSED UNDERTAKING, PROJECT AREA DESCRIPTION, AND AREA OF POTENTIAL EFFECT (APE)	1
2. BACKGROUND.....	7
CULTURE-HISTORICAL CONTEXT	7
Environment and Settlement Patterns in the Vicinity of the APE	7
Kahului 1 st and 2 nd Ahupua‘a	10
The <i>Māhele Āina</i> of 1848.....	11
Kahului 1 st and 2 nd Ahupua‘a in the Early Twentieth Century	14
Modern Land Use	14
PREVIOUS ARCHAEOLOGICAL STUDIES	15
Studies Associated with the Proposed Ali‘i Highway Corridor.....	17
Studies to the South and East of the Current APE	18
Studies to the North and East of the Current APE	20
Studies within the Current APE	21
3. CONSULTATION.....	22
4. PROJECT AREA EXPECTATIONS.....	23
5. ARCHAEOLOGICAL FIELDWORK	24
METHODS.....	24
FINDINGS	24
Kahului Bridge (SIHP Site 30614).....	27
SIHP Site 21757	28
SIHP Site 21758	35
SIHP Site 21759	38
SIHP Site 21768	44
SIHP Site 22475	47
SUMMARY	49
6. SIGNIFICANCE EVALUATION, DETERMINATION OF EFFECTS, AND TREATMENT RECOMMENDATIONS	49
REFERENCES CITED.....	51
APPENDIX A – Land Commission Testimony from the <i>Māhele</i>	55
APPENDIX B – Section 106 Consultation Letters	61
APPENDIX C – Integrity Assessment for the Kahului Bridge on Ali‘i Drive	104

FIGURES

	Page
1. USGS topographic map (portions of Kailua, HI 1996 and Kealahou, HI 1996) showing location of current APE.	2
2. Tax Map Key (TMK) Map (3) 7-5-019 with current APE shaded red.	3
3. Current Google Earth™ image showing current APE outlined in red.	4
4. Culvert and bridge structure, view to the west.	5
5. Kahului Bridge showing existing travel lanes and narrow shoulder.	5
6. Detail of underside of Kahului Bridge deck showing concrete spalls with exposed iron.	6
7. Recently installed wooden post and beam support structure below bridge, view to the northwest.	6
8. Map (ca. 1885) of APE vicinity showing Kahului 1 st and 2 nd <i>ahupua</i> ‘a, with approximated APE in red.	8
9. Hawai‘i Registered Map 1280 showing approximate boundaries and grants within Kahului 1 st and 2 nd	12
10. Hawai‘i Registered Map 1676 showing <i>kuleana</i> parcels within current APE.	13
11. Locations of prior archaeological studies in the vicinity of the current APE.	16
12. Portion of Haun and Henry (2004:19) site location map showing partial current APE.	19
13. Previously recorded site location map (O’Hare and Wolfarth 1998) with current APE in red.	21
14. Rechtman and Henry (1999) Site location map with current APE approximated in red.	23
15. Archaeological site location map showing plan view of current APE.	25
16. Plan view of Site T-1, historic well located outside of the current APE, to the east.	26
17. Site T-1, historic well outside of current APE, view to the north.	27
18. SIHP Site 21757, view to the west (Rechtman and Henry 1999:12).	29
19. SIHP Site 21757 recorded by Rechtman and Henry showing test unit locations (1999:11).	30
20. Profile of TU-1 of SIHP Site 21757 recorded by Rechtman and Henry (1999:13).	31
21. SIHP Site 21757 TU-1 west wall profile (Rechtman and Henry 1999:14).	31
22. Selection of artifacts recovered from Stratum I of TU-1 excavated by Rechtman and Henry (1999: 12).	32
23. Inventory of cultural remains recovered from Stratum I of TU-1 at SIHP Site 21757 reported by Rechtman and Henry (1999:10).	32
24. Profile of TU-2 of SIHP Site 21757 recorded by Rechtman and Henry (1999:16).	33
25. Inventory of cultural remains recovered from Strata I, II, and III of TU-2 at SIHP Site 21757 reported by Rechtman and Henry (1999:15).	34
26. SIHP Site 21757 Feature B, view to the west.	35
27. SIHP Site 21758 Segment 1 attached to Kahului Bridge abutment, view to the northwest.	36
28. SIHP Site 21758 Segment 2, view to the northeast.	36
29. SIHP Site 21758 Segment 2 at intersection with subject drainage, view to the northeast.	37
30. SIHP Site 21758 Segment 3, view to the north.	37
31. <i>Mauka</i> portion of SIHP Site 21759 Feature A, view to the south.	38

	Page
32. <i>Makai</i> portion of SIHP Site 21759 Feature A (note Feature C at left foreground), view to the west.	39
33. Plan view of SIHP Site 21759 Feature B.	40
34. SIHP Site 21759 Feature B, view to the southwest.	41
35. Plan view of SIHP Site 21759 Feature C, historic well along <i>mauka</i> side of Ali'i Drive.	42
36. SIHP Site 21759 Feature C historic well with wood well cover in place also showing portion of Feature A.	43
37. Detail view of inside of historic well SIHP Site 21759 Feature C.	43
38. Detail view of inscription on northeast segment of historic well cap SIHP Site 21759 Feature C.	44
39. Segment 1 of SIHP Site 21768, vehicle travelling north on Ali'i Drive, view to the west.	45
40. Remnant Portion of Segment 2 of SIHP Site 21768, view to the west.	46
41. Segment 4 of SIHP Site 21768, view to the southeast.	46
42. Portion of SIHP Site 22475 to the south of the current APE from Rechtman and Dougherty (2000: 16).	47
43. Segment of SIHP Site 22475 within current APE from Haun and Henry (2004:44).	48
44. Portion of SIHP Site 22475 within current APE, view to the north.	48

TABLES

	Page
1. Traditional Hawaiian agricultural zones (Kelly 1983; Johnson and Wolforth 2006).	9
2. Land Commission Awards within current APE.	12
3. Previous archaeological studies near the current APE (Kahului 1 st and 2 nd).	17
4. Archaeological sites identified during the current study.	24
5. Site significance and effect.	50

1. INTRODUCTION

On behalf of the County of Hawai‘i Department of Public Works (DPW), State of Hawai‘i Department of Transportation (HDOT) and the Federal Highway Administration (FHWA), ASM Affiliates conducted an archaeological study of a roughly 2 acre Area of Potential Effect (APE) being portions of TMKs: (3) 7-5-019:007, 008, 009, and 016 in Kahului 1st and 2nd *ahupua‘a*, North Kona District, Island of Hawai‘i (Figures 1, 2 and 3). DPW and HDOT anticipate federal funding from FHWA for the Ali‘i Drive Culvert Replacement Project (the undertaking). The potential use of federal funds necessitates compliance with Section 106 of the National Historic Preservation Act and its implementing regulation (36 CFR 800). FHWA has delegated their Section 106 authority to HDOT, who has taken responsibility for the determination process. In a review of an earlier draft of this report, the Hawai‘i SHPO/DLNR-SHPD requested that this document also address project effects under Hawai‘i Revised Statutes (HRS) Chapter 6E-8.

An earlier iteration of this undertaking was conducted in 1999, and an archaeological study (Rechtman and Henry 1999) was completed for a slightly different APE. The results of that study are applicable to the current investigation and are discussed in detail below. The current report contains summary background information concerning the project area’s physical setting, culture-historical context, previous archaeological work, and current survey expectations based on the previous work. Also presented is an explanation of the project’s methods, descriptions of the archaeological features encountered, interpretation and evaluation of those resources, and treatment recommendations for the sites documented within the APE. Consultation was carried out as part of this study and is also a part of the overall National Environmental Policy Act (NEPA) compliance. Section 106 provides for concurrent compliance with NEPA as outlined in 36 CFR § 800.3(b).

THE PROPOSED UNDERTAKING, PROJECT AREA DESCRIPTION, AND AREA OF POTENTIAL EFFECT (APE)

The proposed undertaking addresses issues with an existing double-cell culvert, also known as Kahului Bridge, located within the Ali‘i Drive right-of-way at Kahului Bay in Kahului 1st and 2nd *ahupua‘a*, North Kona District, Island of Hawai‘i (Figure 4). Kahului Bridge consists of a concrete deck that supports two ten-foot lanes for vehicles with only a narrow shoulder for non-vehicular traffic (Figure 5). The underside of the concrete deck has spalls in the concrete with exposed corroded steel (Figure 6). Additionally, the two culvert openings are insufficient for drainage, which has resulted in the flooding of adjacent properties and Ali‘i Drive itself during heavy rains causing potentially hazardous road conditions. The concrete and stone culvert and bridge was constructed in 1937, has been more recently reinforced with 12 inch x 12 inch wooden post and beam support framing (Figure 7), and is considered to be functionally obsolete by today’s standards.

To remedy these problems, the proposed project will involve the demolition of the existing culvert and bridge, mechanical reengineering of the flood plain and drainage channel, the redesign and relocation of new travel lanes, and the construction of a temporary staging area. The proposed improvements will expand the flood channel to reduce flood hazard in the area and comply with a 100-year storm scenario, as well as widen the roadway in order to accommodate both a raised sidewalk for pedestrians and a bicycle lane.

The installation of the new bridge abutments will require excavation of the bedrock along the drainage channel at the bridge location to a depth of approximately three feet below the surface. While the existing elevation of the remainder of the drainage channel should remain approximately the same. No direct or indirect effects are expected beyond the limits of a roughly 2 acre area (see Figure 3) constituting the APE as determined by FHWA and concurred with by the Hawai‘i SHPO (Oct. 3, 2014, Log No.: 2014.03872, DOC No.: 1409MV30). The current APE consists of the area occupied by the existing culvert, portions of three contiguous parcels (TMK: (3) 7-5-019:007, 008, and 009) situated along the *mauka* side of Ali‘i Drive, a portion of one parcel (TMK: (3) 7-5-019:016) on the *makai* side of Ali‘i Drive, and approximately 850 feet of roadway within the Ali‘i Drive right-of-way extending both to the north and south of the aforementioned parcels. Elevation within the APE ranges from sea level to roughly 30 feet (9 meters) above sea level. Exposed bedrock is evident on the surface across some of the project area and pockets of soil are also present. This shallow, well-drained organic soil is classified as Waiaha extremely stony silt loam (Sato et al. 1973). The underlying *pāhoehoe* lava flows originated from Hualālai Volcano more than 10,000 years B.P. (Wolfe and Morris 1996). Vegetation in the APE includes a thorny woodland of *kiawe* (*Prosopis pallida*), *opiuma* (*Pithecellobium dulce*), and *koa haole* (*Leucaena leucocephala*), with an understory of various alien grasses, shrubs, herbs and vines, most notably fingergrass (*Chloris barbata*), wild bitter melon (*Momordica charantia*), and the common native *‘uhaloa* (*Waltheria indica*). In addition, the APE landscaped yards and areas affected by escapes from cultivation, with Bougainvillea (*Bougainvillea glabra*) common along the Ali‘i Drive portions of the APE. The average annual rainfall within this portion of Kona is 30 inches (Giambelluca et al. 2013).

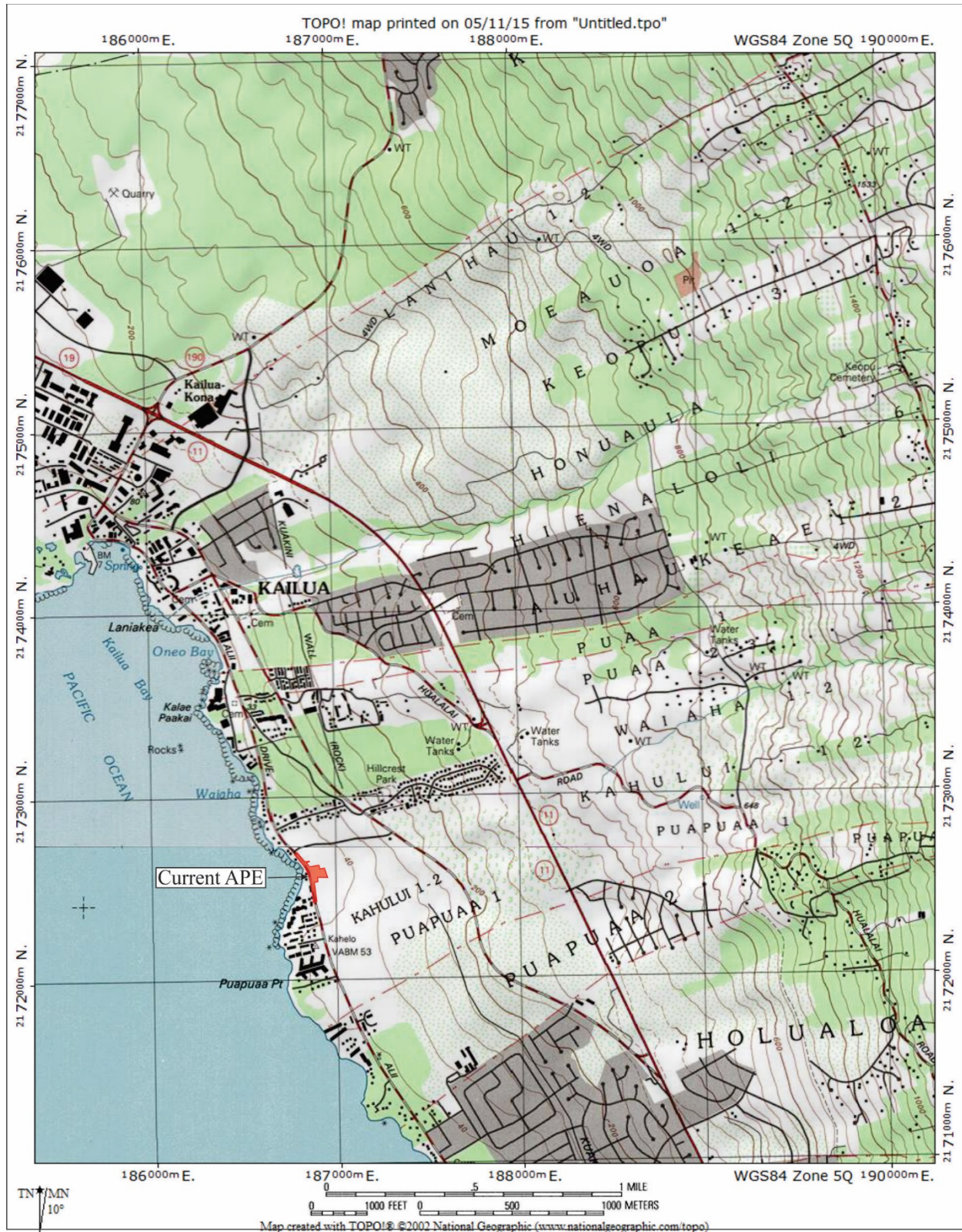


Figure 1. USGS topographic map (portions of Kailua, HI 1996 and Kealahou, HI 1996) showing location of current APE.



Figure 2. Tax Map Key (TMK) Map (3) 7-5-019 with current APE shaded red.



Figure 3. Current Google Earth™ image showing current APE outlined in red.



Figure 4. Culvert and bridge structure, view to the west.



Figure 5. Kahului Bridge showing existing travel lanes and narrow shoulder.



Figure 6. Detail of underside of Kahului Bridge deck showing concrete spalls with exposed iron.



Figure 7. Recently installed wooden post and beam support structure below bridge, view to the northwest.

2. BACKGROUND

This section of the report includes a discussion of the cultural-historical background for the region in addition to a synthesis of prior archaeological and historical research relevant to the current APE. This information is provided in order to generate a set of expectations regarding the nature of cultural resources that might be encountered within the APE, and to establish a basis for the assessment of the significance of any such resources.

CULTURE-HISTORICAL CONTEXT

Environment and Settlement Patterns in the Vicinity of the APE

The conventional wisdom has been that first inhabitants of Hawai‘i Island probably arrived by at least A.D. 300, and focused habitation and subsistence activity on the windward side of the island (Burtchard 1995; Kirch 1985; Hommon 1986). However, there is no archaeological evidence for occupation of Hawai‘i Island (or perhaps anywhere in Hawai‘i) during this initial settlement, or colonization stage of island occupation (A.D. 300 to 600). More recently, Kirch (2011) has convincingly argued that Polynesians may not have arrived to the Hawaiian Islands until at least A.D. 1000, but expanded rapidly thereafter. The implications of this on the currently accepted chronology (Kirch 1985) would alter the timing of the Settlement, Developmental, and Expansion Periods, possibly shifting the Settlement Period to A.D. 1000 to 1100, the Developmental Period to A.D. 1100 to 1350, and the Expansion Period to A.D. 1350 to 1650.

The initial settlement in Hawai‘i is believed to have occurred from the southern Marquesas Islands. 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. Order 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: the major gods Kāne, Kū, and Lono; the *kapu* system of law and order; cities of refuge; the *‘aumakua* concept; various epiphenomenal beliefs; and the concept of *mana*. Initial permanent settlements in the islands were established at sheltered bays with access to fresh water and marine resources. Communities shared extended familial relations and there was an occupational focus on the collection of marine resources. Over a period of several centuries the areas with the richest natural resources became populated and perhaps even crowded, and there was an increasing separation of the chiefly class from the common people. As the environment reached its maximum carrying capacity, the result was social stress, hostility, and war between neighboring groups (Kirch 1985). Soon, large areas of Hawai‘i were controlled by a few powerful chiefs.

The Developmental Period brought about a uniquely Hawaiian culture. The portable artifacts found in archaeological sites of this period reflect not only an evolution of the traditional tools, but some distinctly Hawaiian inventions. The adze (*ko‘i*) evolved from the typical Polynesian variations of plano-convex, trapezoidal, and reverse-triangular cross-section to a very standard Hawaiian rectangular quadrangular tanged adze. A few areas in Hawai‘i produced quality basalt for adze production. Mauna Kea, on the island of Hawai‘i, possessed a well-known adze quarry. The two-piece fishhook and the octopus-lure breadloaf sinker are Hawaiian inventions of this period, as are *‘ulu maika* stones and *lei niho palaoa*. The latter was a status item worn by those of high rank, indicating a trend toward greater status differentiation (Kirch 1985).

The Expansion Period is characterized by the greatest social stratification, major socioeconomic changes, and intensive land modification. Most of the ecologically favorable zones of the windward and coastal regions of all major islands were settled and the more marginal leeward areas were being developed. The greatest population growth occurred during the Expansion Period as did efforts to increase upland agriculture. Rosendahl (1972) has proposed that settlement at this time was related to seasonal, recurrent occupation in which coastal sites were occupied in the summer to exploit marine resources, and upland sites were occupied during the winter months, with a focus on agriculture. An increasing reliance on agricultural products may have caused a shift in social networks as well, according to Hommon (1976). Hommon argues that 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. The implications of this model include a shift in residential patterns from seasonal, temporary occupation, to permanent dispersed occupation of both coastal and upland areas.

2. Background

By this time the Island of Hawai‘i appears to have been divided into six traditional districts or *moku* (Cordy 2000). The current APE falls within the central region of the traditional *moku* of Kona, in what is today known as North Kona, on the dry leeward side of the island. Kona extends from the shore across the entire volcanic mountain of Hualālai, and continues to the summit of Mauna Loa. Sometime during the A.D. 1400s, the *moku* were further divided into distinct land units known as *ahupua‘a* (Kirch 1985). *Ahupua‘a* were ideally long wedge-shaped slices of land that incorporated all of the eco-zones from the mountains to the sea and several hundred yards beyond, which afforded their inhabitants unlimited access to a diverse subsistence resource base (Cordy 2000). Entire *ahupua‘a*, or portions of the land were managed by appointed *konohiki*, or lesser chiefs, who acted as overseers under the rule of an *ali‘i ‘ai ahupua‘a*. 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 *moku* of Kona has over 100 *ahupua‘a*, and approximately forty-four of these fall within the fertile central region of Kona, including Kahului 1st and 2nd, where the current APE is located (Figure 8). The majority of the *ahupua‘a* in central Kona are fairly narrow and include a combination of forest lands, upland farms, coastal *kula*, and offshore resources.

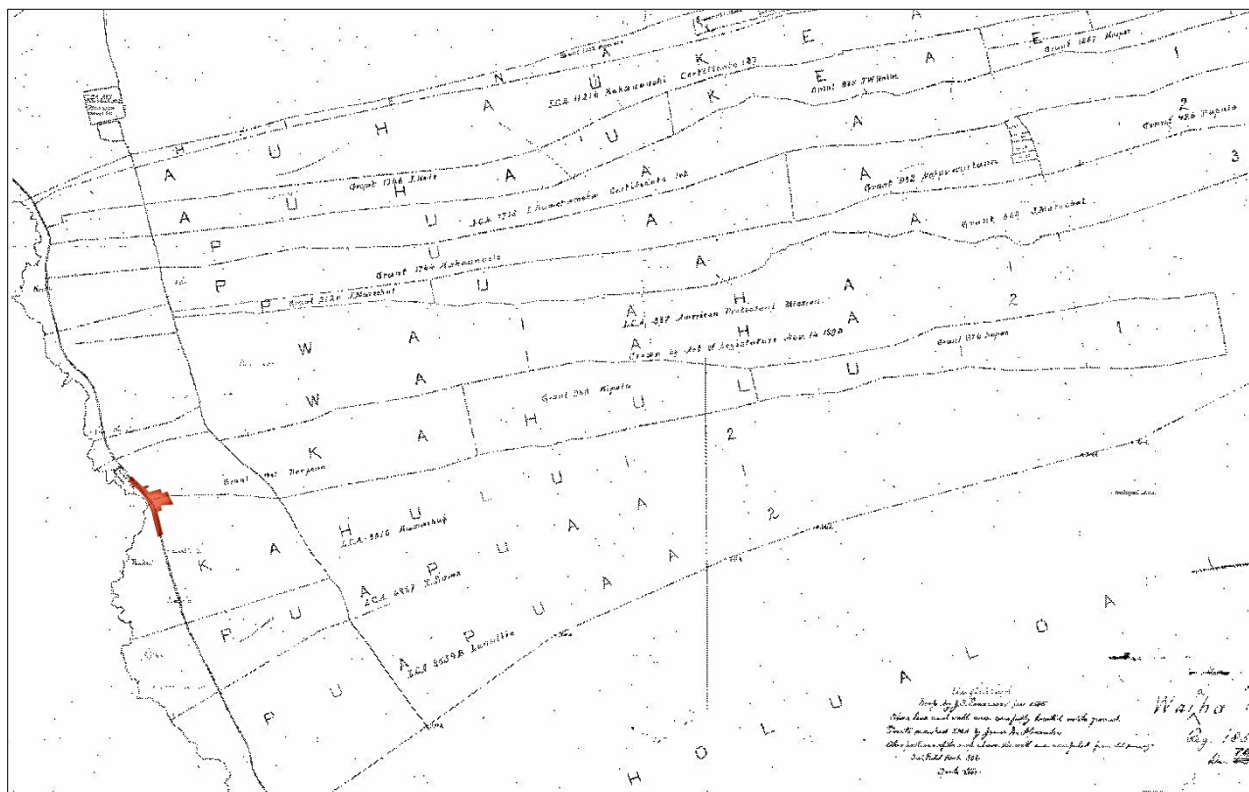


Figure 8. Map (ca. 1885) of APE vicinity showing Kahului 1st and 2nd *ahupua‘a*, with approximated APE in red.

The current APE is situated in the coastal edge of the Kona Field System (Cordy 1995, Newman 1970, Schilt 1984). This area extends north at least to Kaū Ahupua‘a and south to Hōnaunau, west from the coastline and east to the forested slopes of Hualālai (Cordy 1995). A large portion of this area is designated in the Hawai‘i Register of Historic Places as Site 50-10-37-6601 and has been determined eligible for inclusion in the National Register of Historic Places. The basic characteristics and elevationally delimited zones (Table 1) within this agricultural/residential system as presented in Newman (1970) have been confirmed and elaborated on by archaeological (Kelly 1983; Cordy 1995; Johnson and Wolforth 2006) and ethnohistorical investigations (Kelly 1983).

Table 1. Traditional Hawaiian agricultural zones (Kelly 1983; Johnson and Wolforth 2006).

<i>Zone</i>	<i>Annual Rainfall (cm.)</i>	<i>Elevation (m.)</i>	<i>Primary Crops</i>
<i>Kula</i>	75-125	Sea level-150	<i>Uala, wauke, and ipu</i>
<i>Kalu'ulu</i>	100-140	150-300	<i>Ulu, uala, and wauke</i>
<i>Āpa'a</i>	140-200	300-750	Dry land <i>kalo, uala, kī</i> and <i>kō</i>
<i>Āma'u</i>	> 200	750-1,200	<i>Maia</i> (both plantain and banana)

Cordy (1995) presents a summary of archaeological settlement patterns for Kona that is based on previous archaeological work as well as on observations made by explorers and missionaries during the late eighteenth and early nineteenth centuries. Cordy bases his reconstruction on the Hawaiian terms for the major vegetation zones used to define and segregate space within an *ahupua'a*. It was these native terms (*kula*, *kalu*, *āpa'a* and *āma'u*) that were used during the *Māhele Āina* of 1848 in the description of land claims. Cordy also describes a narrow shoreline zone within the *kula* that included the lands at the immediate coastline, which typically fell outside the four traditional agricultural zones, "where most houses were located and which is rarely identified in the records as crop land" (1995:4). Cordy further defined the zone as follows:

Shoreline: This land is considered here to be that above the high-tide line extending inland 200 meters or so (600+ feet). Typically in Kailua this is from the shore back to Ali'i Drive and perhaps 100 meters farther inland. (Cordy 1995:4)

The current APE is located within this primarily residential shoreline portion of the Kona Field System, which may be interpreted as a *makai* division of the larger *kula* zone. The *kula* zone is the area from sea level to 150 meters in elevation. This lower elevation zone is traditionally associated with habitation and the cultivation of *wauke*, *ipu*, and *uala*. The settlers in the Kona district developed agricultural techniques suited for the dry environment and produced staple and supplemental crops by exploiting all the *ko kula kai* (coastal) and *ko kula uka* (upland slopes) had to offer (Maly 1998). These dryland techniques included planting taro in built up mounds known as *pu'epu'e* and planting in small holes or larger pits known as *umoki* and *mākālua*, respectively (Maly 1998).

According to the archaeological record, historic documentation and legendary accounts, the shoreline zone of the Kona Field System was home to many *ali'i* and *konohiki*. Their associated habitation sites typically consisted of complexes of various, separate structures associated with specific functions often based on gender divisions. The *maka'āinana* (commoners) also lived in residential complexes during prehistoric times, albeit with fewer structures of reduced size compared to those of the *ali'i* and *konohiki*.

In addition to permanent habitation, the shoreline zone was used primarily for non-agricultural activities during prehistoric times, such as recreation, ceremonial practices, canoe storage, fishing and related rituals and burials (Johnson and Wolforth 2006). Smaller temporary habitations associated with fishing activities were also common along the shore (Cordy 1995). Numerous ceremonial structures such as fishing shrines and traditional places of worship or *heiau* used to be located along the Kona coastline (Stokes and Dye 1991). Precontact burial practices in central Kona were most commonly performed along the shore and the lower *kula* zone, with few scattered burial sites further inland and still less with an increase in elevation (Cordy 1995). Furthermore, according to Cordy:

In the case of coastal housing in Central Kona often burials are found behind and among the houses in small square platforms – nicely made and too small for houses. Occasionally, burials are in low mounds, or below pavings flush with the ground. Usually in Central Kona burials are in small clusters – one to perhaps 10 or 15 structures. Occasionally, larger sets of burials are present together in one place . . . Typically, however, large cemeteries do not seem to be the norm in Central Kona. (Cordy 1995:14)

The district of Kona figures prominently as a royal center in the Proto-Historic Period. Beginning around A.D. 1600-1620, Hawaiian royalty resided within the shoreline zone of central Kona at Kailua, Hōlualoa, Kahalu'u, and Keauhou; all locales within 5 miles of the current APE. Such royal and high chiefly centers included dwellings for chiefs, their court, and local *maka'āinana* in addition to public structures, such as *heiau*, sporting grounds and places of refuge (Cordy 1995). As a result of the presence of these royal and high chiefly centers, population size increased for a time, as did the density of habitations and public structures within the *makai* area of the *kula* zone.

However, during the early nineteenth century, following the death of Kamehameha I and the adoption of Western introduced religious practices, *heiau* no longer held their significance as elements of a state-sponsored religion. In fact, at many of these sites in central Kona, the wooden god images were burned and the structures themselves were dismantled (Kelly 1983). The stones of the destroyed *heiau* were often used for other building projects such as the Kuakini Wall and Mokuaiakaua Church (Kelly 1983), which is located on Ali'i Drive about 1.2 miles north of the current APE.

The settlement patterns described above persisted into the early Historic Period, but with the introduction of new crops and rapid population loss in the early 1800s, major changes were well underway. During the nineteenth century, the traditional Hawaiian residential complexes evolved into multi-room structures built on stone platforms with clearly defined internal divisions. (O'Hare and Wolforth 1998). Historic Period burials often incorporated historic-era artifacts and architecture, such as mortar and corrugated tin as part of isolated structures or internments within stone platforms (O'Hare and Wolforth 1998). Another change to the landscape came with the introduction of cattle ranching to the *kula* zone in the middle 1800s, which persisted well into the twentieth century in much of central Kona, including within Kahului 1st and 2nd *ahupua'a*.

Kahului 1st and 2nd Ahupua'a

Legendary Accounts

According to Maly (1998), only a few legendary accounts mention Kahului Ahupua'a specifically. One of these native historical accounts published in the Hawaiian newspaper *Ka Hōkū o Hawai'i* (1914-1917) titled "*Ka'ao Ho'oniua Pu'uwai no Ka-Miki*" (The Heart Stirring Story of Ka-Miki) mentions that the lands of Kahului were associated with those of neighboring *ahupua'a* Puapua'a and Hinakahua. In particular, the contest and game field or *kahua mokomoko le'ale'a* in Puapua'a and an extensive sweet potato garden or *mala'uala* that extended across the land from Niumalu (Kailua Bay) to Hinakahua, which included the lands of Kahului. Also, the stream of Wai'aha ran within Kahului, "which filled the taro mounds of the sacred prostrations chiefs Kalei'eha, Kapahu (or Kapahu-a-Lo'i), and Ka'alea, who possessed the *kapu* (restrictions) of Lono-Makahaiki." (Maly 1998:A-6)

Post-Contact Missionary Accounts

Much of the Hawaiian Island historic data available for review comes from the early post-contact writings of missionaries and explorers generated during the first half of the nineteenth century. The following excerpts from British missionary William Ellis' journals originally published in 1825 offer important glimpses into the central Kona region in the vicinity of the current APE at that time, including the history and legends he heard spoken during his visit.

In 1823, Ellis, accompanied by Joseph Goodrich and Reverends Asa Thurston and Artemas Bishop, toured the Island of Hawai'i seeking out communities in which to establish church centers and schools for the Calvinist mission. On July 18, 1823 Ellis and his missionary companions started their tour of Hawai'i heading south along the coast of the district of Kona. Ellis made the following observations of the countryside to the south of Kailua, where the current APE is located:

Leaving Kairua [Kailua], we passed through the villages thickly scattered along the shore to the southward. The country around looked unusually green and cheerful, owing to the frequent rains, which for some months past have fallen on this side of the island. Even the barren lava, over which we travelled, seemed to veil its sterility beneath frequent tufts of tall waving grass, or spreading shrubs and flowers.

The sides of the hills, laid out for a considerable extent in gardens and fields, and generally cultivated with potatoes, and other vegetables, were beautiful.

The number of heiaus, and depositories of the dead, which we passed, convinced us that this part of the island must formerly have been [populous. The latter were built with fragments of lava, laid up evenly on the outside, generally about eight feet long, from four to six broad, and about four feet high. Some appeared very ancient, others had evidently been standing but a few years. (2004:98-99)

Of the overall environment of the district of Kona, Ellis opined that:

Kona is the most populous of the six great divisions of Hawai'i, and being situated on the leeward side, would probably have been the most fertile and beautiful part of the island had it not been overflowed by flood of lava... (2004:174).

Ellis (2004) went on to describe the central Kona region as an area of dense population with extensive cultivation inland compared to the southern reaches of Kona, which supported smaller populations made up mostly of fishermen. According to Ellis, during their walk from Kailua to Keauhou they generated a population estimate based on the following observations:

We counted six hundred and ten houses, and allowed one hundred more for those who live among the plantations on the sides of the hills. Reckoning five persons to each house, which we think not

far from a correct calculation, the population of the tract though which we have travelled today will be about 3550 souls (2004:104)

In their travels between Kailua and Keauhou, Ellis' group "passed nineteen heiaus, of different dimensions" (Ellis 2004:104). Ellis also noted various smaller temples (likely fishing shrines) along the coast where fishermen made offerings to the gods of the sea. The only *heiau* they encountered in the vicinity of the APE was located in Puapua'a 1st Ahupua'a just south of Kahului 2nd Ahupua'a, Ellis described the *heiau* as follows:

At Ruapua [Puapua'a 1st] we examined an interesting heiau, called Kauaikaharoa, built of immense blocks of lava, and found its dimensions to be 150 feet by 70. At the north end was a smaller enclosure, sixty feet long and ten wide, partitioned off by a high wall, with but one narrow entrance. The places where the idols formerly stood were apparent... The spot where the altar had been erected could be distinctly traced; it was a mound of earth, paved with smooth stones, and surrounded by a firm curb of lava. The adjacent ground was strewn with bones of the ancient offerings. The natives informed us that four principal idols were formerly worshipped there, one of stone, two of wood, and one covered with red feathers. One of them, they said was brought from a foreign country. Their names were Kanenuiakea, (great and wide spreading Kane) who was brought from Tauai [Kaua'i], Kaneruruhonua, (earth-shaking Kane), Roramakaeha, and Kekuaaimanu. (2004:99)

Also of interest to this report are Ellis' portrayals of Governor Kuakini, who is oft associated with an expansive rock wall that extends through central Kona known as *Pa Kuakini* (Kuakini Wall), Governor Adam's Wall or the Great Wall (Maly 1998:A-15); the remains of which can still be found *mauka* of the current APE in Kahului 1st and 2nd and beyond. According to Maly (1998), construction of the Great Wall likely began in the early 1800s in response to the growing population of grazing cattle and goats and wild boar. Although no specific historic documentation that Governor Kuakini ordered the construction of the Great Wall has been found, the final configuration was attributed to him. The Great Wall appears to have incorporated portions of existing boundary walls within the Kona Field System. Governor Kuakini acted as host to Ellis and his companions and helped them secure guides, food, and water for their journey.

The *Māhele Āina* of 1848

Profound religious, socioeconomic, and demographic changes also took place in the early 1800s that resulted in the establishment of a Euro-American style of land tenure, and the *Māhele Āina* of 1848 or Great *Māhele* was the vehicle used to divide the land between the crown, government, *konohiki*, and native tenants. Prior to this land reformation, all the land and natural resources of Hawai'i were held in trust by the *ali'i* who, in concert with *konohiki* land agents, meted out use rights to the native tenants at will. During the *Māhele* all lands were placed in one of three categories: Crown Lands (for the occupant of the throne), Government Lands, and *Konohiki* Lands; all three types of land were subject to the rights of the native tenants therein.

The *ali'i* and *konohiki* were required to present their claims to the Land Commission to receive a Land Commission Award (LCAw.) for lands provided to them by Kamehameha III. They were also required to provide commutations to the government in order to receive royal patents on their awards. The lands were identified by name only, with the understanding that the ancient boundaries would prevail until the land could be surveyed. This process expedited the work of the Land Commission and subsequent land transfers (Chinen 1961). In 1862, the Commission of Boundaries (Boundary Commission) was established to legally set the boundaries of all the *ahupua'a* that had been awarded as a part of the *Māhele*. However, boundary descriptions were not collected for all *ahupua'a*.

Native commoners could also register claims for land with the Land Commission, and if substantiated, they would receive awards referred to as *kuleana*. Upon confirmation of a claim, a survey was required before the Land Commission could issue a *kuleana* award. After native tenants were given the right to become private landowners through the *Māhele*, beginning in 1850, foreigners were also given the right to own land upon swearing an oath of loyalty to the Hawaiian Monarchy. According to Kelly (1983) several prominent *konohiki* related in some way to the Kamehameha dynasty received land awards in North Kona District.

In 1848-1849, the *ahupua'a* of Kahului was divided into two sections (Figure 9) Kahului-iki or Kahului 1st to the north, and Kahului-nui or Kahului 2nd to the south. While Kahului 1st was retained as Government Lands, Kahului 2nd Ahupua'a were awarded (LCAw. 8516) to Grace Kama'iku'i without commutation by order of the Privy Council (Kelly 1983). As previously described, land was often awarded to individuals with ties to the Kamehameha dynasty, Grace Kama'iku'i was no exception to this trend. Grace Kama'iku'i's mother was a niece of Kamehameha I and her father was John Young, one of his trusted advisors. Grace's brother Keoni Ana (John Young II) who assisted Kamehameha III with the preparations for the *Māhele*, served as *kuhina-nui* (premier) from 1845-1854 and held the position of Minister of the Interior until his death in 1857 (Kelly 1983). Grace Kama'iku'i and her second husband Dr. T.C.B. Rooke adopted her niece Emma who grew up to marry Kamehameha IV (Alexander Liholiho) and become Queen.

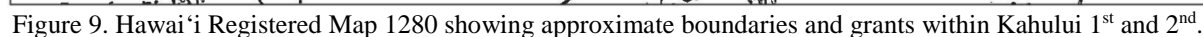


Table 2. Land Commission Awards within current APE.

LCAw. No.	Awardee	Ahupua'a	Corresponding TMK parcel	Royal Patent
7086:2	Kalawa	Kahului 1 st	(3) 7-5-019:009	5225
7336:2	Kuapuu	Kahului 2 nd	(3) 7-5-019:008	3740
10373	Niniha	Kahului 2 nd	(3) 7-5-019:007	8060

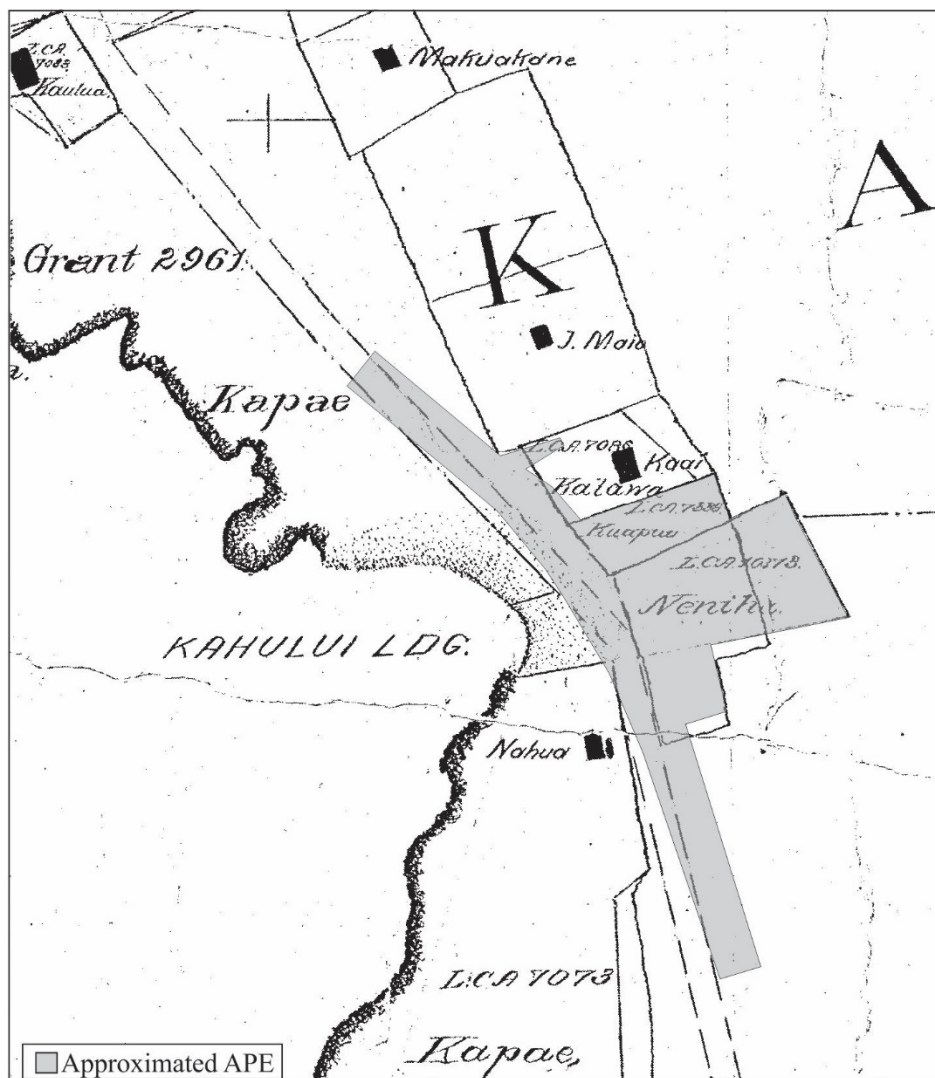


Figure 10. Hawai'i Registered Map 1676 showing kuleana parcels within current APE.

LCAw. 7086:2 to Kalawa is the northernmost *kuleana* within the APE (see Figure 10). As described in the *Māhele* testimony, LCAw. 7086:2 was bordered *mauka* by idle land, *makai* by *konohiki* land, Ka'u (to the south) by the Kuapuu *kuleana* (LCAw. 7336:2), Kohala (to the north) by the Nalawaia *kuleana* (LCAw. 10374:2), and *makai* by the Government Road. According to the Native Register (N.R. 419v8) and the Native Testimony (N.T. 557v4), LCAw. 7086:2 was Kalawa's house lot, 42 fathoms in circumference and enclosed with two houses, one for Kalawa and one for Kaili.

LCAw. 7336:2 to Kuapuu is located entirely within the current APE (see Figure 10). As described in the Native Testimony (N.T. 500v4), LCAw. 7336:2 was bordered Kohala (to the north) by the previously described Kalawa *kuleana* (LCAw. 7086:2), Ka'u (to the south) by Niniha's *kuleana* (LCAw. 10373), *mauka* by idle land, and *makai* by the Government Road. According to the Native Register (N.R. 424v8) and Native Testimony (N.T. 500v4), LCAw. 7336:2 was Kuapuu's house lot, 43 fathoms in circumference and enclosed with one house where Kuapuu, himself resided; the land belonged to Kuapuu's wife, given to her by her parents at the time of Kamehameha I and held unopposed since then.

LCAw. 10373 to Niniha is the southernmost *kuleana* within the APE (see Figure 10). As described in the *Māhele* testimony LCAw. 10373 was bordered Kohala (to the north) by the previously described Kuapuu *kuleana* (LCAw. 7336:2), *mauka* and Ka'u (to the south) by idle land, and *makai* by "sand and road" (N.T. 533v4). According to the Native Register (N.R. 479v8) and Native Testimony (N.T. 533v4), LCAw. 10373 was Niniha's house lot, 110 fathoms in circumference and had an enclosure built by Niniha with one house where Niniha, himself resided; the land had been given to Niniha by his wife whose family had held it, unopposed, since the time of Kamehameha I.

Following the *Māhele*, the Hawaiian kingdom initiated a grant program in an effort to encourage more native tenants to engage in fee-simple ownership of parcels of land. These parcels consisted primarily of Government lands—those lands given outright by the King, or commuted to the Government by the *aliʻi* in lieu of paying the commutation fees on the parcels awarded them during the *Māhele*. These land grants were quite large, ranging in size from approximately ten acres to many hundreds of acres. When the sales were agreed upon, Royal Patents were issued and recorded following a numerical system that remains in use today.

According to Kelly (1983), during 1852-1853 the first upsurge of sales of North Kona district Government Lands occurred. Thirty parcels of land, totaling over 2,800 acres, were sold, of which 54.5 percent (over 1,500 acres) were purchased by seven individuals with non-Hawaiian surnames. This 1852-1853 surge in land purchases also included the sale of two parcels within Kahului 1st (see Figure 9): Kapae purchased a 97 acre parcel (Grant 976) and Kipola purchased a 78 acre parcel (Grant 983). In 1855, Kaupena purchased a roughly 97.5 acre parcel (Grant 1868), which covered nearly one third of the Government Lands in Kahului 1st, close to the sea (see Figure 9). The historic documents are silent with respect to the land use associated with these grants; however, such properties were typically used for ranching.

According to native testimony provided to the Boundary Commission in 1873 by Niniha and Makuakane (Maly 1998), Kapae was a former *konohiki* of Kahului and the boundary at the shore between Kahului 1st and 2nd is referred to as Kalaii, a *pulu lepo*. This location (Kalaii) may correspond to a portion of the subject drainage and the *pulu lepo* reference may indicate an area of damp soil accumulation associated with the drainage.

Kahului 1st and 2nd Ahupuaʻa in the Early Twentieth Century

Beginning in the late 1800s, there was a short-lived attempt at commercial sugar cultivation in the central Kona area. The Kona Sugar Company, which started in 1899, built a sugar mill in Kona and initially obtained most of its raw cane through the purchase from independent growers. Eventually, they acquired land in Kahului and adjoining Waiʻaha *ahupuaʻa*. By 1926, the sugar operation ceased and their Kahului and Waiʻaha properties were sold to Manuel Gomes and converted to grazing lands.

Manuel Gomes came to Hawaiʻi from Portugal around 1883 and moved to Kona from Kaʻū shortly thereafter. He leased land in Keahuolu and Honuaʻula before he purchased the lands of Kahului 1st and 2nd and Waiʻaha 1st and 2nd for cattle ranching. He acquired these lands in 1927, when the Kona Sugar Company went out of business. The land extended *mauka* from the shore to the forest reserve. The purchase of the sugar plantation lands included a fresh water source, Waiʻaha Springs, which was vital to the success of the ranching operations due to a severe lack of fresh water in the area. Most ranchers used brackish water pumped from wells to water their herds. At its peak, the Gomes Ranch had between 2,500 and 2,700 head of cattle on 8,500 acres of land (leased and owned outright).

In 1959, upon his death, the ranch lands were passed to his son Joe Gomes who took over the ranching operations. Joe Gomes told Maly (1998) about how they used and modified existing earlier built boundary walls to build paddocks and that although the modern walls had nicer looking facing, the historic walls were stronger “you can run on top em” (Maly 1998:A-39). Mr. Gomes also spoke of clearing mounds from the sugar plantation and earlier agricultural use. In the lowlands, they hired 3 to 4 man crews to construct rock walls, usually Hawaiian and Japanese men for 40 cents a fathom: six feet in length, four and a half feet high, three feet wide across the bottom, and two and a half feet wide across the top. By 1998, the Gomes Ranch had dwindled to only 1,500 acres.

Modern Land Use

Since the 1960s, development in the Kona District has altered the landscape, particularly along the coast. The development of coastal Kona as a tourist destination has resulted in the construction of hotels and condominiums and the construction and upgrading of roadways beginning in the 1970s. Ongoing residential and resort development has taken over many of the beachfront properties in the vicinity of the current APE.

PREVIOUS ARCHAEOLOGICAL STUDIES

Over the past 100 plus years, numerous studies have been conducted in the *ahupua'a* of Kahului 1st and 2nd. The following discussion begins with findings from the earliest attempts at archaeological documentation of *heiau* and prehistoric sites in the coastal region of central Kona. This is followed by a discussion of relevant prior fieldwork in the vicinity of the APE from the 1970s until today.

In 1906, Stokes (Stokes and Dye 1991) conducted fieldwork traversing the same tour around Hawai'i Island that the Missionary Ellis took in 1823 with the sole purpose of recording *heiau* for the Bishop Museum. Although Stokes observed and recorded no less than 25 *heiau* in the Kona district, none of these temple ruins were located in the vicinity of the current APE or within Kahului 1st or 2nd *ahupua'a*. Kauakaiaakaola Heiau in Puapua'a Ahupua'a to the south of Kahului 2nd Ahupua'a, was the *heiau* recorded by Stokes in closest proximity to the current APE (Ellis also described this *heiau* in detail) According to Stokes, Kauakaiaakaola Heiau was located "80 feet from the sea and 10 feet above mean tide" (Stokes and Dye 1991:54) and reportedly built by Kamehameha I. Stokes recounted:

One of the most noticeable features of this place was the almost vertical wall enclosing the north, east, and south sides. This was made possible by the use of broken pāhoehoe slabs with which an even and close facing was formed. (Stokes and Dye 1991:54)

Around 1930, John Reinecke conducted one of the earliest archaeological studies in the vicinity of the current APE, on behalf of the Bishop Museum as part of a comprehensive survey of the western coast of Hawai'i. Reinecke (n.d.) described nine sites (Sites 55-59 and 61-64) in the coastal lands of Kahului 1st and Kahului 2nd, the majority of which were house sites with associated terraces, walls, pens and platforms. He also recorded three *papamū* (one at Site 55 and two at Site 63) and mentioned the gate to a graveyard (Site 63). Two of the sites (Sites 59 and 62) were fishing *heiau*. Reinecke described Site 59 as follows:

At Puu Kini, overlooking the sea 50' away is a fishing heiau HALEOKOLIA. The floor is 23½ x 14½, the middle third being slightly raised and better paved. The walls are 3½ -4' high inside, 3-6' high outside mauka; 3-4' thick. The north end is raised about 5' above ground on a platform. The makai side is broken down. There are *puoa* near. (Reinecke n.d.:37)

North of Haleokolia, Reinecke recorded Site 61: "About 200 yards of boulders and platform-like ruins" (n.d.: 37). The following is the description of Site 62:

HEIAU HEKELINUI, a fishing heiau. It is a platform fairly well built, about 4' high, 105' long, 40' wide at the south end but partly washed away at the north. A recent yard wall cuts off the N.E. corner. There are recent graves at the South end. (Reinecke n.d.:37)

No relevant cultural resource reports were produced during the decades between Reinecke's early work and the implementation of environmental review as an integral part of construction and development on Hawai'i Island in the 1970s. During the past 40 years, multiple archaeological studies have been conducted in Kahului 1st and 2nd in the vicinity of the current APE (Figure 11 and Table 2). The majority of these studies are revisits of earlier surveys that occurred in the 1970s and early 1980s. These previous studies have concentrated on three general areas surrounding the current APE, studies associated with the proposed Ali'i Highway Corridor (Ching et al. 1973; Dunn and Rosendahl 1991; Haun et al. 1998), a series of studies conducted on adjoining parcels to the south and east of the current APE (Soehren 1976; Rechtman and Henry 2000; Haun and Henry 2004), and a succession of studies (Hammatt and Tomonari-Tuggle 1978; Hammatt and Meeker 1979; O'Hare and Wolforth 1998) conducted on the adjoining parcels to the north and east of the current APE. Additionally, there are two prior studies (Rechtman and Henry 1999; MKE/Fung 2013) that address resources located within the current APE.

The results of these studies are summarized below. All previous archaeological study areas are located within TMK parcels that correspond with plat (3) 7-5-019, unless otherwise specified.

2. Background

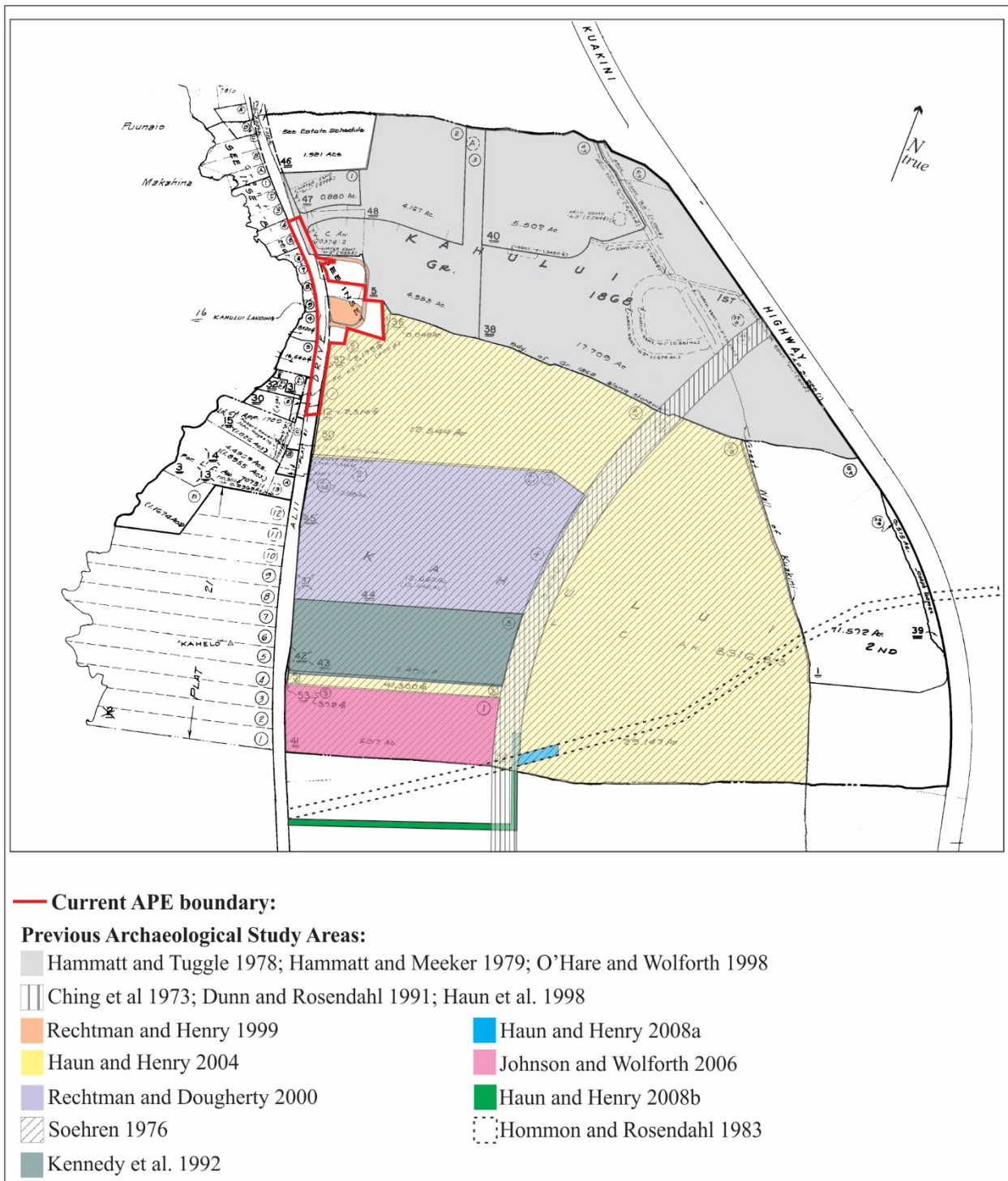


Figure 11. Locations of prior archaeological studies in the vicinity of the current APE.

Table 3. Previous archaeological studies near the current APE (Kahului 1st and 2nd)

Year	Author	Study Type	TMK:(3)7-5-019:
1973	Ching et al.	Reconnaissance Survey	005, 038, 040
1976	Soehren	Reconnaissance Survey	001
1978	Hammatt and Tomonari-Toggle	Inventory Survey	005, 038, 040
1979	Hammatt and Meeker	<i>Heiau</i> Restoration	005, 038, 040
1983	Hommon and Rosendahl	Reconnaissance Survey	Various
1991	Dunn and Rosendahl	Reconnaissance Survey	Various
1992	Kennedy et al.	Inventory Survey	043
1992	Kennedy and Denham	Preservation Plan	043
1998	O'Hare and Wolforth	Inventory Survey	005, 038, 040
1998	Haun et al.	Inventory Survey	Various
1999	Rechtman and Henry	Inventory Survey	005,007-009
1999a	Rechtman	Preservation Plan	005,038,040 and (3)7-5-018:006
1999b	Rechtman	Data Recovery Plan	005,038,040 and (3)7-5-018:006
1999	Rechtman and Wolforth	Burial treatment Plan	005,38,040 and (3)7-5-018:006
2000	Rechtman and Dougherty	Inventory Survey	044,045
2004	Haun and Henry	Inventory Survey	001
2006	Johnson and Wolforth	Inventory Survey	041
2008a	Haun and Henry	Inventory Survey	001
2008b	Haun and Henry	Inventory Survey	001 and (3)7-5-020:001

Studies Associated with the Proposed Ali'i Highway Corridor

In 1973, Archaeological Research Center Hawaii (ARCH) conducted the initial fieldwork (Ching et al. 1973) for the proposed Ali'i Highway project. Ching et al (1973) performed a reconnaissance survey of a corridor measuring 5.5 kilometers (3.4 miles) long by 91 meters (300 feet) wide, which extended between Kuakini Highway and a point *mauka* of the county beach park at Kahalu'u. As a result of this study, 122 sites with 285 features were recorded. The proposed corridor passed through parcels adjacent to the current APE roughly a quarter mile (440 meters) southeast of the current APE (see Figure 11). Four of the 122 sites had been previously recorded, and State Inventory of Historic Places (SIHP) Site designations were assigned to the remaining 116 sites (Sites 6300 through 6416).

Ten years later, Paul H. Rosendahl, Ph.D., Inc. (PHRI) and Science Management, Inc. conducted a reconnaissance survey (Hommon and Rosendahl 1983) of additional alternative corridors measuring 91 meters (300 feet) wide by 6.3 kilometers (3.9 miles) long (see Figure 11). The investigation also included the revisit of some previously surveyed portions of the Ching et al. (1973) study corridor. As a result of this survey, 68 new sites were recorded and assigned 9800-series SIHP Site numbers. The results of the revisit to the Ching et al. (1973) corridor yielded the following findings: 80 intact sites, one voided designation, 15 completely destroyed sites, 14 partially destroyed sites and 13 sites that were either partially or entirely outside the study corridor.

In response to the results of these early studies, a memorandum of agreement was generated, which resulted in the County of Hawai'i's segregation of the Archaeological Intensive Survey into 5 subphases. PHRI carried out the fieldwork between 1991 and 1998. Phase 1a consisted of a site identification survey (Dunn and Rosendahl 1991) of the initial proposed corridor (see Figure 11) and resulted in the identification of 136 sites with 535 features, which included three previously unrecorded sites. As a result of an archaeological inventory survey conducted by Haun et al. (1998) as part of the Phased Mitigation Program, 36 sites were identified within the proposed Ali'i Highway corridor within the Kahului *ahupua'a*. These sites included agricultural complexes, burial platforms, temporary and permanent habitation sites, ranch walls, and boundary walls.

In 2003, Haun and Associates (Haun and Henry 2008a) conducted an archaeological inventory survey of a 115-meter-long by 33-meter-wide linear corridor for a proposed flood channel located inland of the proposed Ali'i Highway corridor (TMK parcel 001), southeast of the current APE (See Figure 11). Two sites were recorded consisting of a temporary habitation shelter within a lava tube (SIHP Site 9837), which was initially identified by Hommon and Rosendahl (1983); and three clearing mounds from an agricultural complex (SIHP Site 23919) previously recorded by Haun and Henry (2004) during their survey (discussed below) of land to the south and east of the current APE.

In 2007, Haun and Associates conducted an archaeological inventory survey (Haun and Henry 2008b) of an 18.2 meter (60 foot) wide by 436 meter (1,430 foot) long corridor through parts of the *ahupua'a* of Kahului 2nd and Puapua'a, located to the south of the current APE (see Figure 11). As a result of this study, Haun and Henry (2008b) reported that although a total of six sites had been previously identified and recorded within their project area, only three remained intact enough for observations (SIHP Sites 6334, 23919 and 14447/24981). SIHP Site 23919 has been described above. SIHP Site 14447/24981 is a complex of five features: three platforms (Features A, C, and D) that were interpreted as foundations for roofed structures, a lava tube that may have functioned as a sleeping or storage area (Feature B) and discontinuous wall segments that were not assigned a feature designation. Haun and Henry (2008b) also recorded the destruction of two previously recorded sites located within the proposed Ali'i Highway corridor (SIHP Sites 9838 and 6372). SIHP Site 9838 was an agricultural complex consisting of four features, initially identified by Hommon and Rosendahl (1983) while SIHP Site 6372 was an agricultural complex consisting of seventeen features, originally identified by Ching et al. (1973).

Studies to the South and East of the Current APE

In 1976, Soehren conducted an archaeological reconnaissance survey of the land formerly delineated as TMK parcel 001, immediately adjacent of the current APE to the south between the Kuakini Wall and Ali'i Drive (see Figure 11). Soehren reported that the parcel had been bulldozed within the two years leading up to his investigation, which resulted in the total obliteration of an unknown number of features and severe damage to those that were observable at that time – twenty-one features in all. All evidence of habitation structures, whether temporary or permanent, had been compromised, however Soehren recorded nine habitation features (Features 1, 3-5, 8, 13, 14, 20 and 21) that consisted of concentrations of coral, shell fragments and waterworn pebbles. Soehren also recorded eight stone platforms (Features 2, 7, 9, 10, 12, and 17-19) and suggested that they may be burial monuments. Other features included three stone-walled enclosures (Features 6, 15, and 16) and a *papamū* (Feature 11) found on a sloping *pāhoehoe* surface. These features did not receive formal SIHP Site numbers until subsequent investigations were conducted in parcels within the original Soehren (1976) study area.

In 1992, Archaeological Consultants of Hawaii, Inc. (ACH) conducted an inventory survey and subsurface testing (Kennedy et al. 1992) of 5.5 acres referred to as the Watson property (TMK Parcel 043), located at the southwest corner of Soehren's 1976 study area (see Figure 11), approximately 225 meters south of the current APE. As a result of this investigation, three sites (SIHP Sites 16155, 16156, and 16157) were documented. SIHP Site 16155, originally recorded by Soehren (1976) as Feature 10, contained two burial features, recorded by Kennedy et al. (1992) as Features A and C. Feature A was classified as a burial platform while Feature C, a modified outcrop or platform, may have served as a temporary habitation in addition to containing a burial. The remaining two sites were previously unrecorded. SIHP Site 16156 consisted of a clearing mound related to agriculture and SIHP Site 16157, a modified outcrop or platform, was interpreted as a temporary habitation structure based on the presence of shell midden and coral deposits. Of these three sites, only Features A and C of SIHP Site 16155 were evaluated as significant. Subsequently, in 1992, ACH prepared a preservation plan (Kennedy and Denham 1992) for the two burial platforms within SIHP Site 16155.

In 2000, Rechtman Consulting conducted an archaeological inventory survey (Rechtman and Dougherty 2000) of approximately 12 acres (TMK parcels 044 and 045), located roughly 50 meters south of the current APE along Ali'i Drive. The study area was located immediately to the north of the Kennedy et al. (1992) study area within the *makai* portion of the original Soehren (1976) study area (see Figure 11). The purpose of the survey was the proper documentation, according to the then current survey standards, of five of Soehren's previously recorded features (Features 8, 9, 11, 12, 13). As a result of this study, five archaeological sites were identified, including three SIHP Site designations for four of the features recorded by Soehren (1976). The potential burial features, Feature 9, 11, and 12 from Soehren (1976) were interpreted as permanent habitation platforms when test units did not reveal the presence of human remains. Features 9 and 11 were designated as SIHP Site 22426 and Feature 12 as SIHP Site 22427; while Feature 13 from Soehren (1976), a modified outcrop, was interpreted as a temporary habitation and newly designated as SIHP Site 22428. The bulldozed remains of Feature 8 from Soehren (1976) were observed during this study but the location was not assigned a SIHP Site number due to its lack of integrity. As a result of this survey, two features (Features N and O) of SIHP Site 6331, which had been previously recorded during the aforementioned Ali'i Highway fieldwork, were recorded. Additionally, a newly recorded boundary wall was designated SIHP Site 22475. SIHP Site 22475 is a wall that bordered their study area along Ali'i Drive and extended to the north and south beyond their study area. The wall is a core-filled construction consisting of boulders and cobbles that was most likely built after 1927 and associated with the Gomes cattle ranch.

In 2003 and 2004, Haun and Associates conducted an archaeological inventory survey (Haun and Henry 2004) of 35 acres in Kahului 2nd (TMK parcel 001) immediately adjacent to the south and east of the current APE. This study area covers roughly a third of the Soehren (1976) study area at its northern end in addition to approximately half of the Soehren study area along the *mauka* part of the property. As a result of this study, thirteen sites were identified, including two newly recorded sites and eleven previously recorded sites. The two newly identified sites: SIHP Site 23918, a midden deposit interpreted as a temporary habitation site; and SIHP Site 23919, a complex of seventy-three agricultural features consistent with elements of the Kona Field System including forty-eight modified outcrops, twenty mounds, four terraces and one *kuaiwi*. In addition, Haun and Henry (2004) documented the destruction of four previously recorded sites identified by Soehren (1976) as Features 1, 2, 3, and 21. Four of the eleven previously recorded sites consisted of features originally recorded by Soehren (1976), which were assigned SIHP Site numbers during their study. Features 5 and 6 became SIHP Site 23914; Feature 7 became SIHP Site 23915; Feature 14 became SIHP Site 23916; and Feature 4 became SIHP Site 23917. Five of the remaining seven previously recorded sites consisted of SIHP Sites 6302, 6306, 6331, 6332, and 6334 initially recorded by Ching et al (1973). SIHP Site 6302 corresponds with the Kuakini Wall and SIHP Sites 6306 and 6334 are stone boundary walls between the Kahului *ahupua'a* and Kahului 2nd and Puapua'a *ahupua'a*, respectively. SIHP Sites 6331 and 6332 are complexes consisting of multiple features classified as permanent habitations with burials, both of which had been partially destroyed at the time of the survey.

The remaining two previously recorded sites from the Haun and Henry (2004) study are SIHP Site 21768 identified by Rechtman and Henry (1999) and SIHP Site 22475 identified by Rechtman and Dougherty (2000). SIHP Sites 21768 and 22475 are located within the current APE (Figure 12). SIHP Site 21768 was originally recorded by Rechtman and Henry (1999) during an inventory survey as part of an earlier proposed bridge replacement project located within the current APE. The results of the Rechtman and Henry (1999) study will be presented in further detail in the discussion of previous archaeological studies within the current APE at the end of this chapter. However, of particular relevance to the current study is the observation reported by Haun and Henry (2004) that the segment of wall recorded as Segment A by Rechtman and Henry (1999) has been disturbed since it was recorded. Furthermore, no remnants of Segment C were identified during the 2003/2004 fieldwork and Segment D was mostly collapsed.

As previously mentioned, SIHP Site 22475 is a rock wall that runs along the *mauka* side of Ali'i Drive, which was originally recorded by Rechtman and Dougherty (2000) in the parcel immediately adjacent to the south of the current APE. Haun and Henry (2004) interpret the portion of the rock wall in the northwestern portion of their study area as a continuation of SIHP Site 22475, which falls within the southern portion of the current APE (Figure 12).

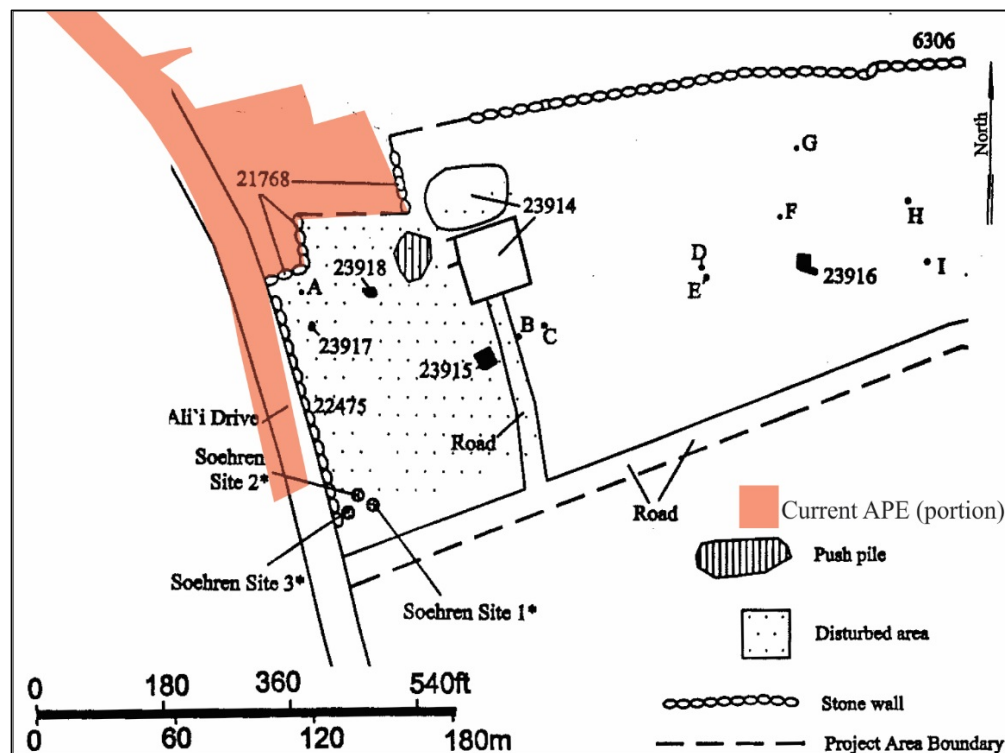


Figure 12. Portion of Haun and Henry (2004:19) site location map showing partial current APE.

According to Haun and Henry (2004), the wall originates on the north side of a *mauka-makai* bulldozed road and extends north-northwest for a distance of 102 meters and terminates five meters south of the *makai* end of another wall designated as SIHP Site 21768. The condition of the wall was described as poor to fair, “portions of the wall have collapsed and the south-southwestern end has been destroyed by recent construction” (Haun and Henry 2004:43). The wall is of stacked core-filled construction with intact sections measuring between 95 and 105 centimeters wide at the base and between 80 and 90 centimeters wide at the top; and between 80 centimeters and 1 meter high. In 2006, Scientific Consultant Services, Inc. conducted an archaeological inventory survey (Johnson and Wolforth 2006) of 6 acres in Kahului 2nd (TMK parcel 041), approximately 325 meters south of the current APE (see Figure 11). Two sites (SIHP Sites 6334 and 22475) had been previously recorded (refer to their descriptions above). The study revealed one previously unrecorded site, SIHP Site 24993, which consisted of two agricultural mounds.

Studies to the North and East of the Current APE

During the 1970s, the 32 acre “Gomes Property” in Kahului 1st *Ahupua‘a* (TMK parcels 005, 038, and 040) located immediately adjacent to the current APE to the north and east was studied extensively by different researchers. The first survey conducted in the Gomes property was associated with the previously discussed proposed Ali‘i Highway corridor, which crossed the northeast corner of the Gomes property. Ching et al. (1973) identified eight sites (SIHP Sites 6300-6306 and 6322) within the Gomes property, which included ranch walls, boundary walls, platforms, one terrace, and a *heiau* (SIHP Site 6322).

Then in 1978, ARCH conducted an archaeological surface survey (Hammatt and Tomonari-Tuggle 1978) of the Gomes property. Hammatt and Tomonari-Tuggle (1978) noted evidence of recent extensive bulldozing of the project area and the resultant poor preservation of the sites encountered during their study. As a result of this study, four of the eight sites previously recorded by Ching et al. (1973) were relocated (SIHP Sites 6302, 6304, 6305, and 6322) and ten unrecorded sites, of both prehistoric and historic age, were identified (SIHP Sites 6480-6489). The fourteen sites included multiple stone house platforms, burial platforms, paved areas, rock ranch walls, a small rectangular stone foundation, and the *heiau*.

The following year, ARCH returned to the Gomes property and conducted excavations (Hammatt and Meeker 1979) at seven of the fourteen sites previously recorded by Hammatt and Tomonari-Tuggle (1978); and stabilized the *heiau* (SIHP Site 6322). As a result of the subsurface testing, four stone platforms were interpreted as temporary historic habitation platforms (SIHP Sites 6481, 6486, 6488, and 6489), a burial crypt (SIHP Site 6305), a platform of unknown function (SIHP Site 6304), and a stone foundation was interpreted as a structure for sleeping or storage based on an absence of cultural residue (SIHP Site 6487). Hammatt and Tomonari-Tuggle (1978) suggest that limited amount of cultural material encountered in the test units combined with the structural development of the site indicate that the sites were utilized for short-term ceremonial or perhaps political gatherings related to the nearby *heiau*.

Almost twenty years later, PHRI conducted an archaeological inventory survey (O’Hare and Wolforth 1998) of the Gomes Property, in which they attempted to relocate all eighteen previously recorded sites on the 32 acre parcel (eight sites from Ching et al. (1973) and ten sites from Hammatt and Tomonari-Tuggle (1978)). Their investigation revealed that two previously recorded sites had been completely destroyed: SIHP Sites 6303 and 6484 (Figure 13). O’Hare and Wolforth re-examined and described the sixteen remaining previously recorded sites and performed additional subsurface testing of some of them. The sites consisted of the following: three boundary walls (SIHP Sites 6300, 6301 and 6306); three ranch walls (SIHP Site 6480, 6483, and 6485); a portion of the Kuakini Wall (SIHP Site 6302); five platforms (SIHP Sites 6304, 6305, 6481, 6486, and 6489); a platform with an enclosure (SIHP Site 6487); a platform with a walled sink (SIHP Site 6488A/B); a *heiau* (SIHP 6322); and a historic tomb (SIHP Site 6482).

SIHP Site 6481 is located in close proximity to the north end of the current APE, within neighboring LCAw. 10374:2. Hammatt and Tomonari-Tuggle (1978) originally described SIHP Site 6481 as a habitation platform made of boulders and beach cobbles with pebble paving at the center and branch coral, midden, and porcelain on the surface. O’Hare and Wolforth (1998) encountered human remains in one of their supplemental excavations and concluded from their reexamination that the cobble and pebble paving was the floor of a pole and thatch *hale* from the Historic Period. Subsequently, in 1999, as part of an archaeological mitigation program for the development of the Kona Hawaiian Village on the Gomes parcel property, PHRI prepared an archaeological site preservation and interpretation plan (Rechtman 1999a) for SIHP Sites 6302 and 6322, in conjunction with a burial treatment plan (Rechtman and Wolforth 1999) for SIHP Sites 6322, 6481, and 6487-6489, and a data recovery plan for SIHP Site 6482 (Rechtman 1999b). As a result, the burial feature at SIHP Site 6481, is currently preserved along with a protective buffer within a newly constructed enclosure.

In addition, the stone wall designated as SIHP Site 6306 (originally recorded by Ching et al. in 1973), along the southern boundary of the Gomes property study area appears to fall within a portion of the current APE (see Figure 13). Although originally recorded as a cattle wall, O'Hare and Wolforth (1998) opine that the wall marks the boundary between the Kahului *ahupua'a* and that the portion at the *makai* end corresponds with *kuleana* parcel boundaries, which they suggest indicates the wall dates to when the property boundary was established. They further note that some portions of the core filled wall have been bulldozed while several long sections were still intact at the time of their study.

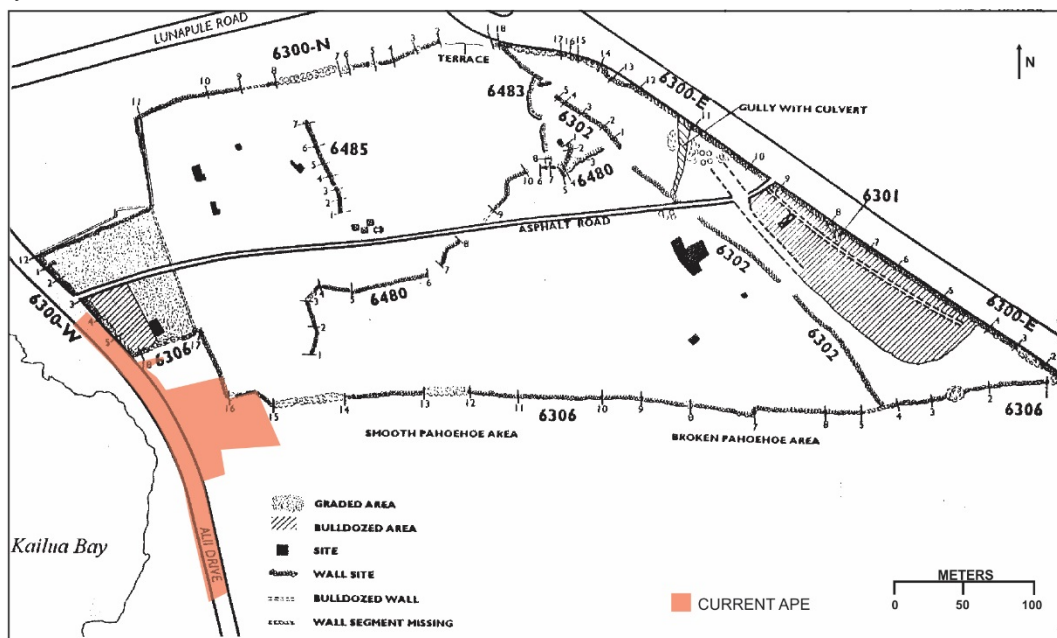


Figure 13. Previously recorded site location map (O'Hare and Wolforth 1998) with current APE in red.

Studies within the Current APE

In 1999, PHRI conducted an archaeological inventory survey and test excavations (Rechtman and Henry 1999) associated with an earlier iteration of the current culvert replacement project. Although the APE for that project differed from the current APE, PHRI recorded four sites that are located within the current APE. Three of these sites (SIHP Sites 21758, 21759, and 21768) were identified as Historic Period rock walls and one site (SIHP Site 21757) was identified as a permanent habitation terrace. Site 21757 was described as a level terraced area defined at its southern and eastern side by an L-shaped wall with two low piles of stone at the north end of the leveled area. Two test units were excavated: Test Unit 1 (TU-1) was situated along the external surface of the eastern wall near the southeast corner of the L-shaped feature. Test Unit 2 (TU-2) was also placed near the southeast corner of the L-shaped feature within the stone terrace approximately one meter to the west of TU-1. Based on the subsurface testing, Site 21757 was interpreted to represent a middle to late twentieth century house site.

As a result of the Rechtman and Henry (1999) study, no further work was the SHPD-approved treatment for the three rock wall sites and data recovery was the approved treatment for Site 21757. The culvert itself was not identified as a historic property during the 1999 PHRI study.

In 2013, MKE Associates LLC and Fung Associates, Inc. (2013) conducted a statewide inventory and evaluation of historic bridges. As a result of that study, the current subject culvert was identified as Kahului Bridge. It was assigned a bridge identification number (# 001750001100004) and determined to be eligible for listing in the National Register of Historic Places under Criterion C as a good example of a 1930s reinforced concrete bridge.

3. CONSULTATION

Consultation letters (Appendix B) were sent to the following organizations and individuals: Association of Hawaiian Civic Clubs; *Hui Malama I Na Kupuna O Hawaii Nei*; Kona Hawaiian Civic Club; La‘i‘ōpua 2020; Hawai‘i Island Burial Council; Ms. Nicole Lui; Mr. Curtis Tyler; Ms. Cynthia Nazara; Mr. Hiram Rivera. We also published a notice in *West Hawaii Today* and the OHA newspaper *Ka Wai Ola* inviting the participation of Native Hawaiian organizations and Native Hawaiian descendants with ancestral lineal or cultural ties to, cultural knowledge or concerns for, and cultural or religious attachment to the proposed project area. The only response from either the general or specific consultation notices came from Ms. Nicole Lui. She thought that the culvert replacement would be a good thing as long as it didn’t adversely affect any of the known traditional sites in the immediate area. She also expressed that an archaeological monitor should be present in the area of the former Komomua/Kahulamū Cemetery if any subsurface disturbance was to be performed.

While not considered direct consultation with respect to the current undertaking, a couple of prior interviews with Luciana Ka‘ailehua Makuakāne-Tripp (now deceased), former resident of TMK: (3) 7-5-019:009 and a descendant of the *kuleana* recipient of LCAw. 7086, are worth mentioning here.

Kepa Maly (1998) interviewed Luciana Ka‘ailehua Makuakāne-Tripp (Aunty Luciana) as part of an earlier historical documentary research and oral history study (O’Hare and Wolforth 1998). Aunty Luciana was raised on her family’s *kuleana* land (LCAw. 7086:2) and still resided there with her children at the time of the interview in 1996-1997. One of Luciana’s ancestors, Makuakane had provided testimony to the Boundary Commission in 1873 for establishing the boundary of Kahului 2nd Ahupua‘a. Aunty Luciana, born in 1932, recalled how when she was young “the beach came up with sand and rocks into the yard, and there used to be an old canoe and boat landing in front,” and that the area at the shore had been filled in to build Ali‘i Drive and the Kona Tiki Hotel (Maly 1998:A-22). Furthermore, according to Luciana, on the other side of the wall between her and the Kapae’s *kuleana*, “... not too far from our house, is a small rock platform that’s built up. That’s a Kipapa family grave, my dad’s family” (Maly 1998:A-24). This Kipapa family burial corresponds with SIHP Site 6481 found to the north of the current APE. Maly showed Aunty Luciana Hawai‘i Registered Map 1676 (see Figure 10), and she explained that all of the families named were related, with Kapae as a common ancestor between her great-great grandparents and grandparents generations; her father’s grandmother was Kawa‘a Kialoa O Kamehameha and she brought together the Kialoa and Kapae lines. When asked about the cattle ranching in the area, Aunty Luciana related that, “as a child, we were always having problems with the rancher. We built and fixed walls around our place to keep the cattle out, and they’d always get busted down. We always had to chase the cattle out of our area.” (Maly 1998:A-24).

Maly also asked about the Niniha *kuleana* parcel (LCAw. 10373) and the location of the former Komomua-Kahulamū family cemetery. According to Aunty Luciana, the Niniha *kuleana* belonged to a *tūtū* of the Komomua line (Maly 1998). Aunty Luciana recounted, “one of the Komomua descendants wanted to sell the land, so the graves were all supposed to be removed and taken up to Hualālai Cemetery” (Maly 1998:A-24). Aunty Luciana also spoke about how her father had been buried there when the Komomua family decided to sell the land, “so we took my father out of his grave there and relocated him. I think it was in the late 1970s, that Alfred Asing was contracted to remove all the other graves.” (Maly 1998:A-28). A few years after Maly’s interviews, as part of the fieldwork for the earlier iteration of the current project, Robert Rechtman, Ph.D. conducted an informal interview with Aunty Luciana and her son Richard and found out that shortly after the cemetery relocation, approximately six feet of road construction fill had been added to the area, which created a sort of parking lot over the former cemetery (Rechtman and Henry 1999). Aunty Luciana also shared the following observations of how the Kahului Landing area (the area *makai* of the subject culvert/bridge) had changed over the last hundred years:

You know how Kahului was an important landing, before days...The landing is all changed now. But look [referring to an 1890 photograph of the landing], there are so many people, all Hawaiians down on the shore. Now almost all the families are gone. Our house would be just off the picture here. Now, all these walls and house sites are gone too. (Maly 1998:A-22)

4. PROJECT AREA EXPECTATIONS

Based on the findings of previous research within the current APE (MKE/Fung 2013; Rechtman and Henry 1999), and a review of the prior archaeological studies conducted adjacent to the current APE, we know that in addition to the 1937 Kahului Bridge there have been five archaeological sites (SIHP Sites 21757, 21758, 21759, 21768, and 22475) documented within the current APE (Figure 14). Four of these are Historic Period rock walls and one (Site 21757) appears to be a middle nineteenth century traditional house foundation. Portions of the current APE had not been surveyed before and other possible features that could be encountered include: Precontact habitation and burial features, features associated with the former land use identified in *Māhele* records (habitation or burial related), and features associated with the post-1927 use of the area by the Gomes Ranch.

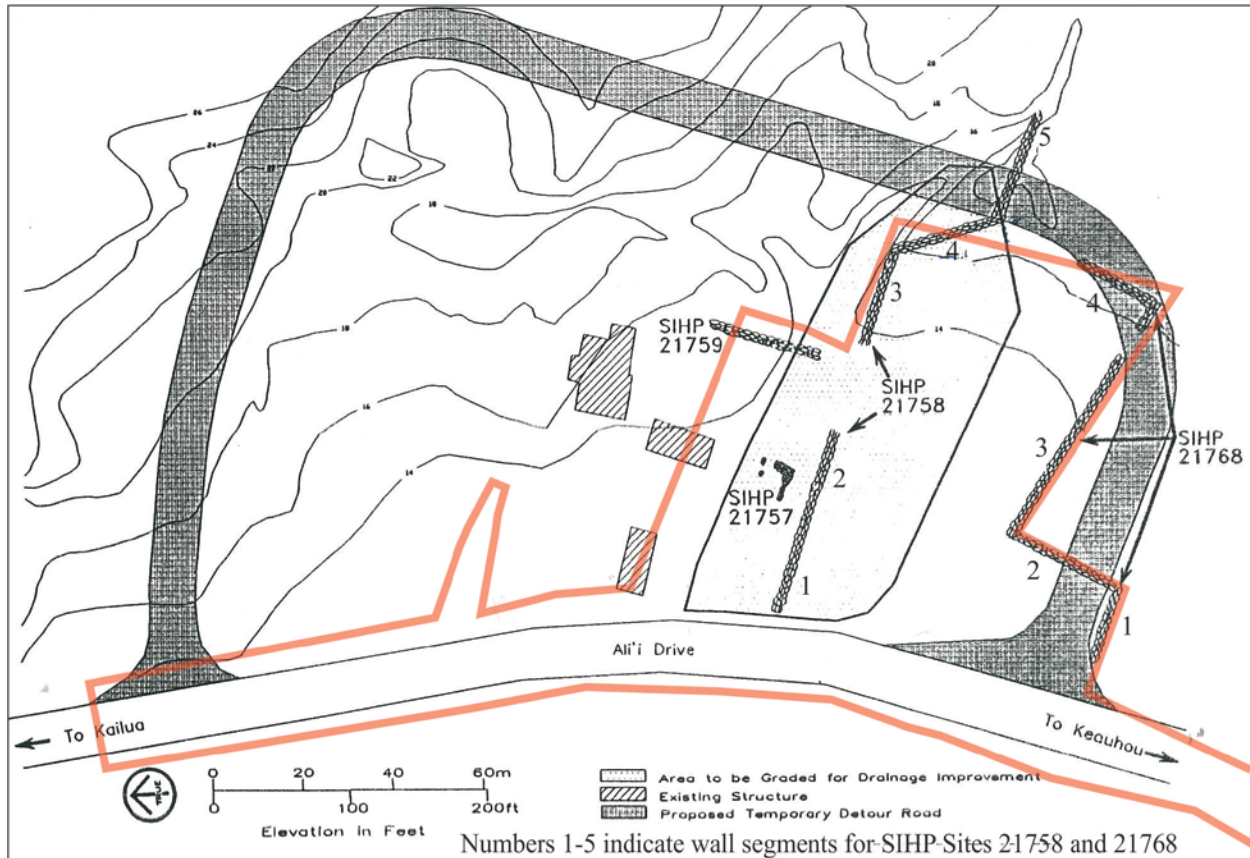


Figure 14. Rechtman and Henry (1999) site location map with current APE approximated in red.

5. ARCHAEOLOGICAL FIELDWORK

Archaeological fieldwork for the current study was conducted by Robert B. Rechtman, Ph.D., Owen Moore, M.A., and Genevieve Glennon, B.A. on May 13-14, 2014; and on June 20, 2015 by Robert B. Rechtman, Ph.D. and Teresa Gotay, M.A.

METHODS

During the first field session the entire APE was subject to north/south pedestrian transects with 10 meter spacing. Vegetation cover was light and ground visibility was good. All observed archaeological features were marked on a map that had been prepared by a land surveyor, which had many of the archaeological features already accurately plotted. Placing the features that had not been previously identified or plotted on the map was a simple matter given the details of the surveyor map. Identified features were compared to known sites and the original sites numbers were retained. The few features that had not been previously recorded were assigned to existing sites based on their location and associations. Newly identified features were cleared of vegetation and recorded using standard archaeological techniques, including photography and where appropriate scaled plan views. During the second field session, the sites were revisited to make sure conditions were unchanged as nearly a year had passed since the first field session, and to clarify some boundary relationships. A habitation feature recorded as Site 21757 had undergone subsurface testing during an earlier study (Rechtman and Henry 1999). That work is summarized below and was sufficient to characterize age and function; no additional testing was deemed necessary. With respect to the former Komomua-Kahulamū family cemetery area, given that all of the known family members were exhumed and relocated, and given that the area was filled and graded and that no subsurface work is proposed for this area as a part of the current undertaking, no subsurface testing was conducted in this area.

FINDINGS

As a result of the current fieldwork, in addition to the Kahului Bridge (SIHP Site 30614) five previously recorded sites (SIHP Site 21757, 21758, 21759, 21768, and 22475) were identified (Table 4, Figure 15) within the current APE.

Table 4. Archaeological sites identified during the current study.

<i>SIHP Site No.</i>	<i>Site Type</i>	<i>Functional Interpretation</i>	<i># of Features</i>	<i>Age</i>
21757	Habitation terrace	<i>Kuleana</i> Residence	2	Historic
21758	Rock wall	<i>Kuleana</i> boundary	1	Historic
21759	Well/BBQ/rock wall	Residential	3	Historic
21768	Rock wall	<i>Kuleana</i> boundary	1	Historic
22475	Rock wall	Ranching	1	Historic
30614	Bridge	Transportation	1	Historic

* SIHP numbers preceded by 50-10-37.

While no new sites were identified within the APE during the current study, a new feature was added to Site 21757 and two new features were added to Site 21759. Also one new site was identified that is located just outside the northwestern corner of the current APE (see Figure 15). This site is a Historic Period well (Figures 16 and 17) likely associated with cattle ranching activities. Beginning in 1927, the property in which the well is located (TMK: (3) 7-5-019: 005) was operated as the Gomes Ranch. The Kahului Bridge and the five previously recorded sites identified during the current archaeological fieldwork are discussed in detail below.

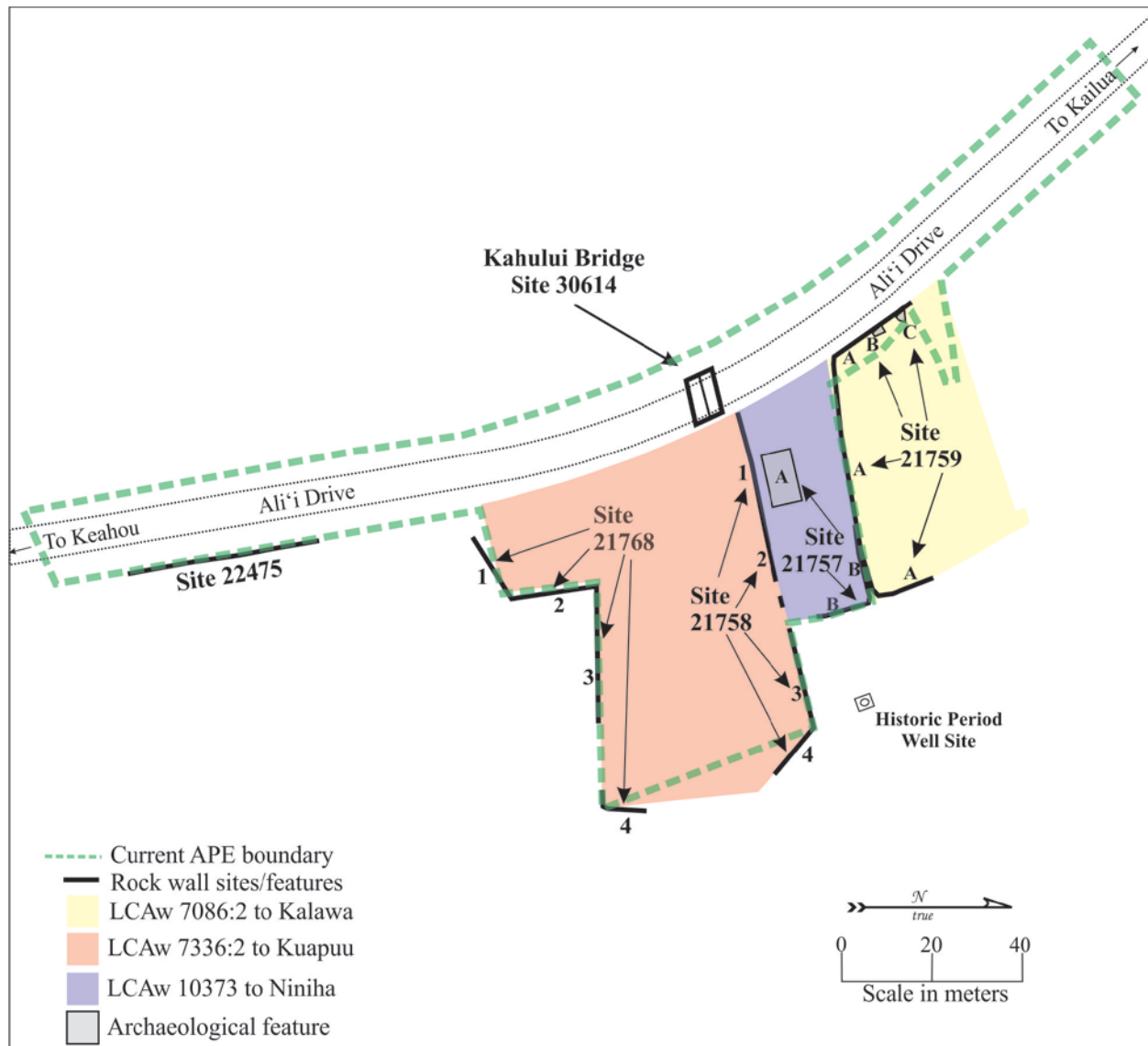


Figure 15. Archaeological site location map showing plan view of current APE.

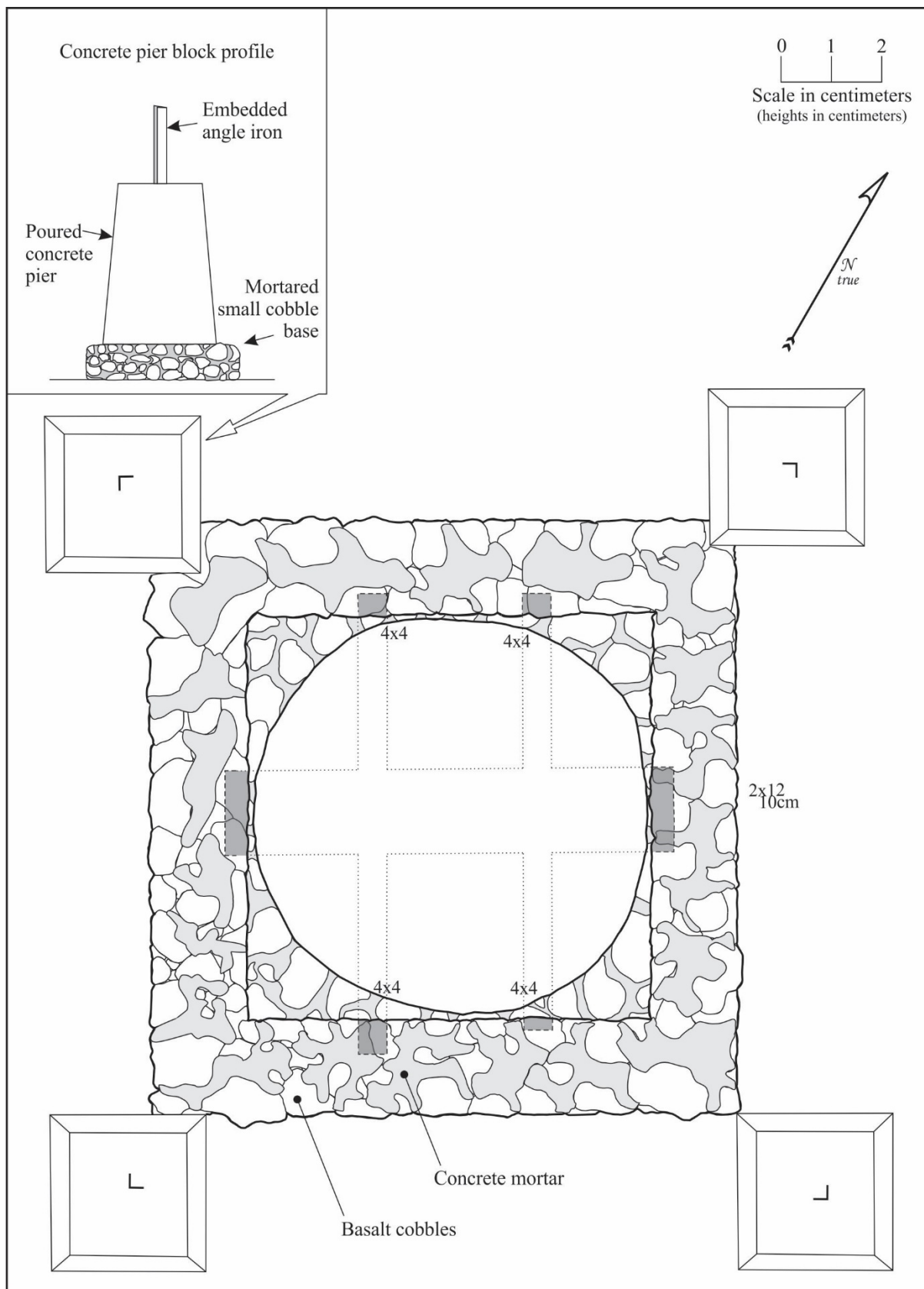


Figure 16. Plan view of Historic Period well located outside of the current APE, to the east.



Figure 17. Historic Period well site located outside of current APE, view to the north.

Kahului Bridge (SIHP Site 30614)

The Kahului Bridge (SIHP Site 30614) is the subject of the current proposed undertaking and carries Ali'i Drive across the subject drainage in the central portion of the current APE (see Figures 4-7 and 15). The Kahului Bridge was recently included in the Hawai'i State Historic Bridge Inventory and Evaluation (MKE and Fung 2013) and given the following associated bridge inventory number: 001750001100004. The Kahului Bridge was identified as a reinforced-concrete slab bridge of the flat slab variety, built in 1937. According to MKE and Fung (2013), these simple concrete slab bridges were constructed in Hawai'i from 1908 until about 1937, when they were replaced by "moment-resisting concrete rigid-frame bridges" (MKE and Fung 2013: 1-32).

According to the inventory, the bridge "is in its original location but in poor condition" (MKE and Fung 2013:6-256). The Kahului Bridge like all concrete slab bridges, was cast on site and further described as follows:

The bridge has concrete solid panel parapets with flat caps [for railings]. The concrete deck is supported by concrete masonry rubble pier wall and abutments. The workmanship of the bridge has not been obscured and the simple design of the bridge retains its historic feeling. The bridge is programmed for replacement in 2016. (MKE and Fung 2013:6-256)

The concrete deck is 30.7 feet wide with two 8-foot spans and a total length of 20 feet that run across a double cell culvert (see Figures 4, 5 and 7). Wooden pier and beam supports set in concrete were observed beneath the deck within each culvert cell on both sides of the original central support column (see Figure 7). This wooden support structure is a modern addition to the bridge structure. Four wing wall abutments (two *mauka* and two *makai*) of mortared stone construction (see Figures 4 and 7), extend from beneath the bridge along the northern and southern edges of the drainage. These walls, which extend roughly 5 meters *mauka* of the bridge and 3 meters *makai*, show evidence of more recent modification/repair.

As a result of the Historic Bridge Inventory, Kahului Bridge was evaluated as "Eligible" within the classification matrix developed for the inventory. This classification matrix organized the significance of historic bridges into three basic categories based on their degree of preservation value as follows:

Eligible – High Preservation Value: Bridges within this category include those that are generally unique or possess characteristics of a type and exhibit high degrees of historic integrity. These are recommended for listing on the Hawai‘i or National Register of Historic Places...

Eligible: ... include those that are not the best example of a type and are not unique. HDOT should consider maintaining bridges in this category as through attrition these may become rare examples of a type at some point in time.

Not Eligible: ... include those that have lost considerable historic integrity or do not exhibit any quality that relays historic significance. (2013:1-10,11)

According to MKE and Fung (2013) Kahului Bridge is a typical 1930s reinforced concrete bridge and therefore significant under Criterion C/c for its association with early developments in concrete bridge construction in Hawai‘i. Additionally, it is a good example of the design, use of materials and method of construction common during the 1930s. This historic bridge was the subject of a more recent study conducted in June 2016 by Tonia Moy (Appendix C), one of the primary authors of the MKE and Fung (2013) study. In this study (see Appendix C) she concludes:

The Kahului Bridge (Inventory #0017500001100004) was identified as eligible in the *2013 State Historic Bridge Inventory and Evaluation* (MKE and Fung 2013) under Criterion C. However, further research indicates that multiple changes to the bridge have affected its historic and structural integrity to a point where the bridge no longer retains enough of its character-defining features to be considered eligible for the NRHP.

SIHP Site 21757

Site 21757 was originally identified by Rechtman and Henry (1999) as a level, terraced area (Figure 18) west of Ali‘i Drive located above and to the north of the current subject drainage channel. Rechtman and Henry described the site in detail:

The level area is approximately 10.15 meters long (N/S) by 8.25 meters wide, and is retained on the south and east sides by a low L-shaped wall. The southern portion of the L-shaped wall is 8.25 meters long and 0.75 to 2.3 meters wide. The interior, northern side of the wall is level with the soil surface of the terrace and the exterior, southern side is elevated 0.5 to 0.55 meters above the surrounding ground surface. The western end of this wall section is buried beneath a pile of large boulders likely deposited during grading work along Ali‘i Drive.

The eastern portion of the L-shaped wall is 6.15 meters long and 1.75 to 2.25 meters wide. It ranges in height from ground surface at its northern end to 0.5 meters at its southern end. The wall is constructed of stacked and pile weathered *pāhoehoe* cobble and boulders. Several pieces of waterworn coral and marine shell were observed on the surface of the terrace.

There are two low piles of stones on the terrace surface, north of the L-shaped wall. The first is at the northeast end of the terrace. It is 1.5 meters long (E/W), 0.5 meters wide, and 0.2 to 0.6 meters high. The second pile is 2.0 meters west of the first, and is 0.75 meters long (E/W), 0.5 meters wide, and 0.3 meters high. The location of these piles suggests they may have functioned as the northern boundary of the terraced area. (Rechtman and Henry 1999:9)



Figure 18. SIHP Site 21757, view to the west (Rechtman and Henry 1999:12).

In addition to recording the surface features, Rechtman and Henry (1999) excavated two test units. Test Unit 1 (TU-1) was excavated adjacent to the southeastern exterior corner of the L-shaped terrace and Test Unit 2 (TU-2) was excavated within the stone layer inside the southeastern corner of the terrace (Figure 19).

TU-1 measured 2.0 meters by 0.5 meters and reached sterile soil at a maximum depth of 30 centimeters below the surface. Two distinct soil layers were encountered (Figures 20 and 21). Stratum I (0 to 18-25 centimeters below surface) consisted of dark yellowish brown (10YR 4/4) sandy silt, which contained a variety of marine shell species, sea urchin spines, waterworn coral and basalt cobbles, ceramic fragments, glass fragments, and metal fragments (Figures 22 and 23). Within Stratum I, Rechtman and Henry (1999) recovered several ceramic fragments with red and green stamped or cut-sponge applied decorations (see Figure 22), which they identified as having been produced between 1840 and 1870. Stratum II (18-25 to 30 centimeters below surface) consisted of dark yellowish brown (10YR 3/4) clay silt and did not yield any cultural remains. Rechtman and Henry (1999) suggested that the stone structure was built prior to the accumulation of the Stratum I deposit because the architectural layer of the L-shaped terrace wall extended through the Stratum I deposit and into the culturally sterile Stratum II soil.

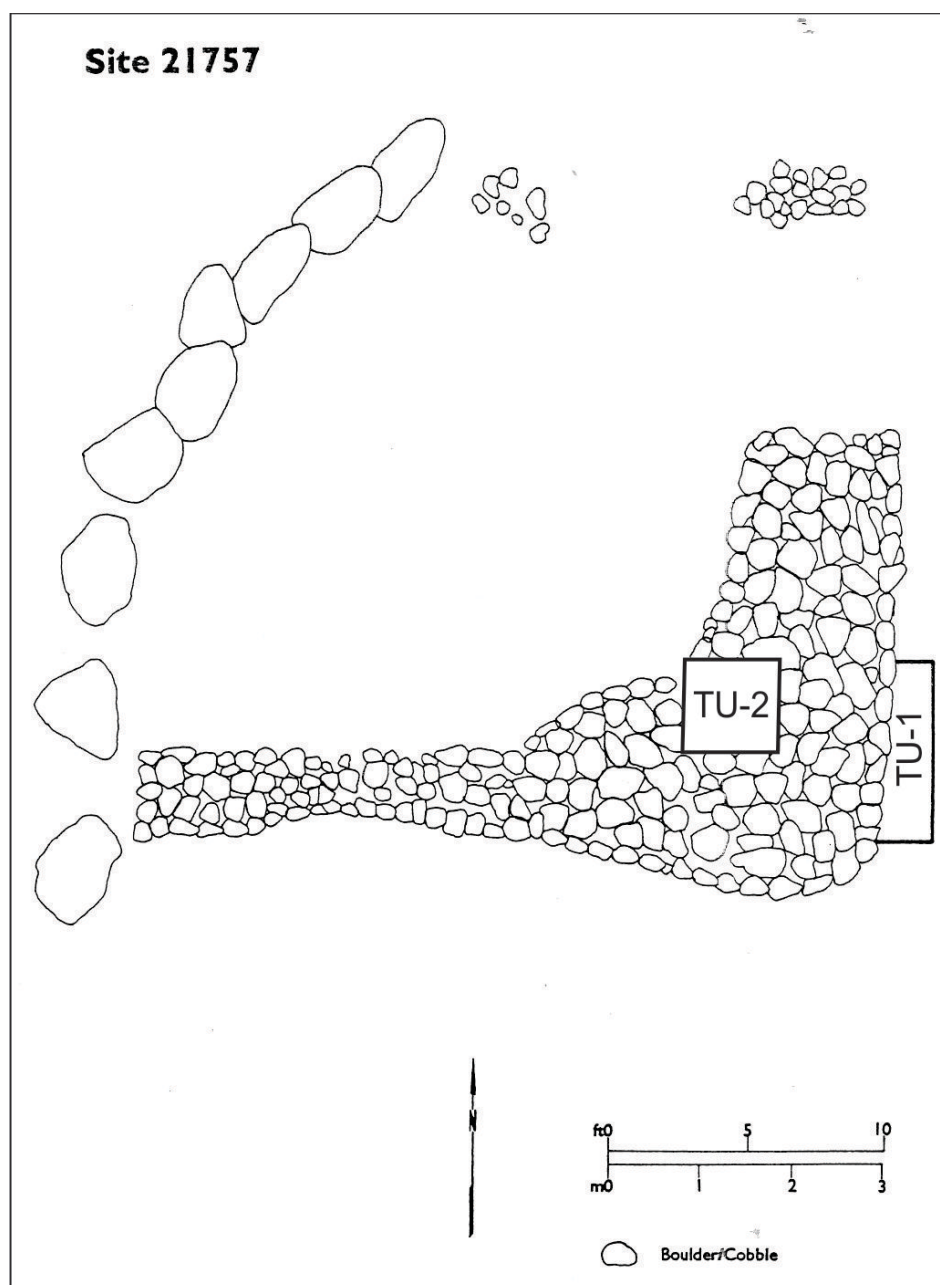


Figure 19. SIHP Site 21757 recorded by Rechtman and Henry (1999:11) showing test unit locations.

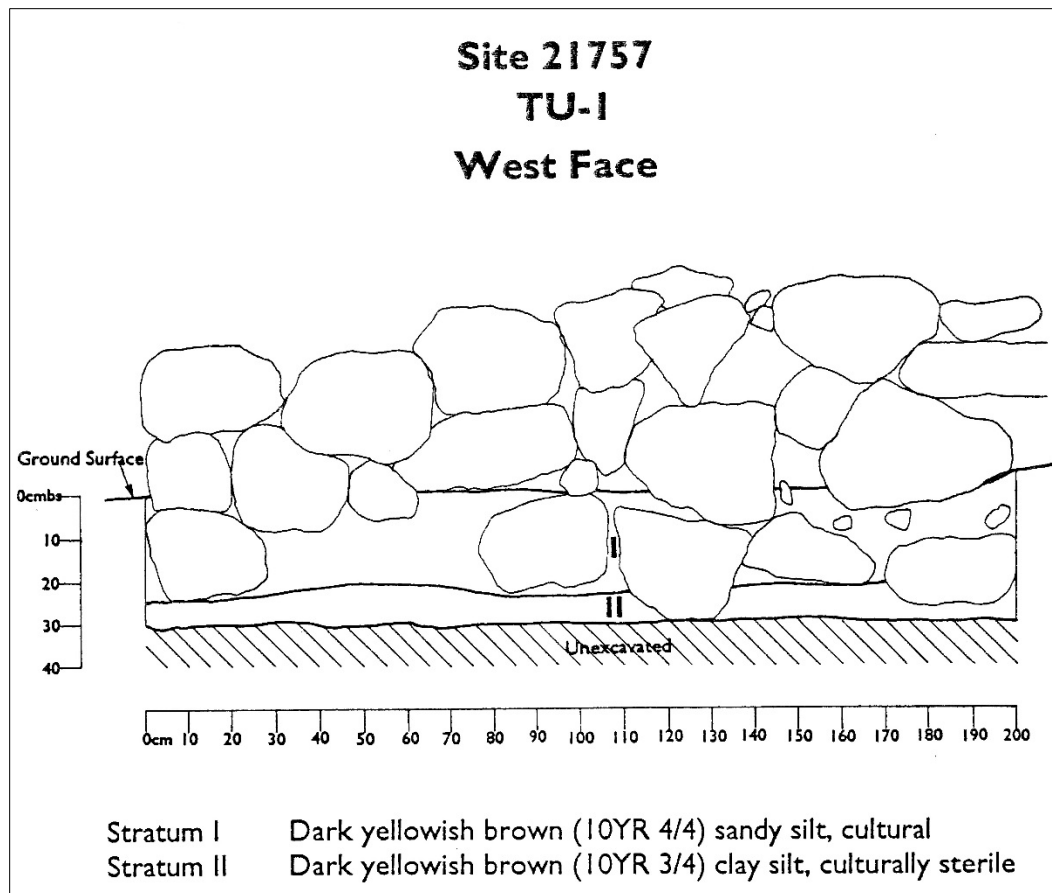


Figure 20. Profile of TU-1 of SIHP Site 21757 recorded by Rechtman and Henry (1999:13).



Figure 21. SIHP Site 21757 TU-1 west wall profile (Rechtman and Henry 1999:14).



Figure 22. Selection of artifacts recovered from Stratum I of TU-1 excavated by Rechtman and Henry (1999:12).

Table 1. Site 21757, TU-1, Stratum I, Inventory of Recovered Remains

Type	Family	Species	Weight*	NISP	MNI
Gastropod	Patellidae	<i>Cellana</i> sp.	122.59	173	71
Gastropod	Cypraeidae	<i>Caputserpentis</i>	14.67	7	2
Gastropod	Cypraeidae	<i>C. maculifera</i>	153.89	8	-
Gastropod	Cypraeidae	<i>Cypraea</i> sp.	35.67	16	1
Gastropod	Cypraeidae	<i>C. childreni</i>	2.82	2	2
Gastropod	Cypraeidae	<i>C. mauritiana</i>	0.49	1	-
Gastropod	Conidae	<i>Conus</i> sp.	111.18	21	8
Gastropod	Thaididae	<i>Thaididae</i> sp.	1.35	3	-
Gastropod	Thaididae	<i>Drupa morum</i>	15.28	7	6
Gastropod	Thaididae	<i>Drupa ricina</i>	41.93	15	15
Gastropod	Thaididae	<i>Drupa rubusidaeus</i>	24.43	18	18
Gastropod	Thaididae	<i>Purpura aperta</i>	41.04	14	14
Gastropod	Thaididae	<i>Neothais harpa</i>	2.49	2	2
Gastropod	Thaididae	<i>Thais intermedia</i>	25.29	4	4
Gastropod	Neritidae	<i>N. picea</i>	89.05	352	349
Gastropod	Neritidae	<i>N. polita</i>	16.48	11	6
Gastropod	Vermetidae	<i>Vermetid</i> sp.	1.23	1	-
Gastropod	Littorinidae	<i>L. pintado</i>	0.15	1	1
Gastropod	Unident.	-	30.16	26	-
Bivalve	Isognomonidae	<i>Isog.</i> sp.	0.13	1	1
Other	Echinoidea	-	1.40	8	1
Other	Crustacea	-	0.41	2	-
Fish	Unident.	-	24.21	-	-
Vegetal	<i>Kukui</i>	-	3.42	4	-
Vegetal	Charcoal	-	43.55	-	-
Artifact	Shell button	-	0.39	1	-
Artifact	Glass fragments	-	44.44	11	-
Artifact	Metal fragments	-	47.52	22	-
Artifact	Glazed ceramics	-	79.82	10	-

* All weights in grams

Figure 23. Inventory of cultural remains recovered from Stratum I of TU-1 at SIHP Site 21757 reported by Rechtman and Henry (1999:10).

TU-2 measured 1.0 meter by 1.0 meter (see Figure 19) and reached sterile soil at maximum depths ranging between 18 and 72 centimeters below the surface. Three distinct soil layers were encountered beneath a stone architectural layer (Figure 24). Stratum I (0 to 15-72 centimeters below surface) consisted of a layer of loosely packed boulders and weathered *pāhoehoe* cobbles, which contained charcoal and a variety of marine shell species in addition to fragments of burned coconut shell, bottle glass fragments, metal fragments, and ceramic fragments (Figure 25). Stratum II (25 to 45 centimeters below surface) consisted of very dark grayish brown (10YR 3/2) sandy silt, which contained a variety of marine shell species (some modified), fish bones, sea urchin spines, *kukui* nut, charcoal, glazed ceramic fragments, bottle glass fragments, and metal fragments. This cultural deposit was limited to the western 2/3 of the test unit. Stratum III (40 to 67 centimeters below surface) consisted of dark yellowish brown (10YR 4/4) sandy silt and contained marine shell, fish bones, sea urchin spines, charcoal, *kukui* nut, glass fragments, and metal fragments. This soil layer, originated below Stratum I in the eastern portion of the test unit and below Stratum II in the western 2/3 of the test unit (see Figure 24). A thin pocket of black (10YR 2/1) sandy silt was noted at the northwestern corner of the test unit at the interface of Strata II and III, which contained charcoal. According to Rechtman and Henry (1999) although this soil lens was not a hearth feature it may represent the fringe of such a feature that may have been located outside of the test unit to the north or west. Stratum IV (50-67 to 74 centimeters below surface) consisted of very dark grayish brown (10YR 3/2) sandy silt with several large waterworn basalt cobbles and contained no cultural material.

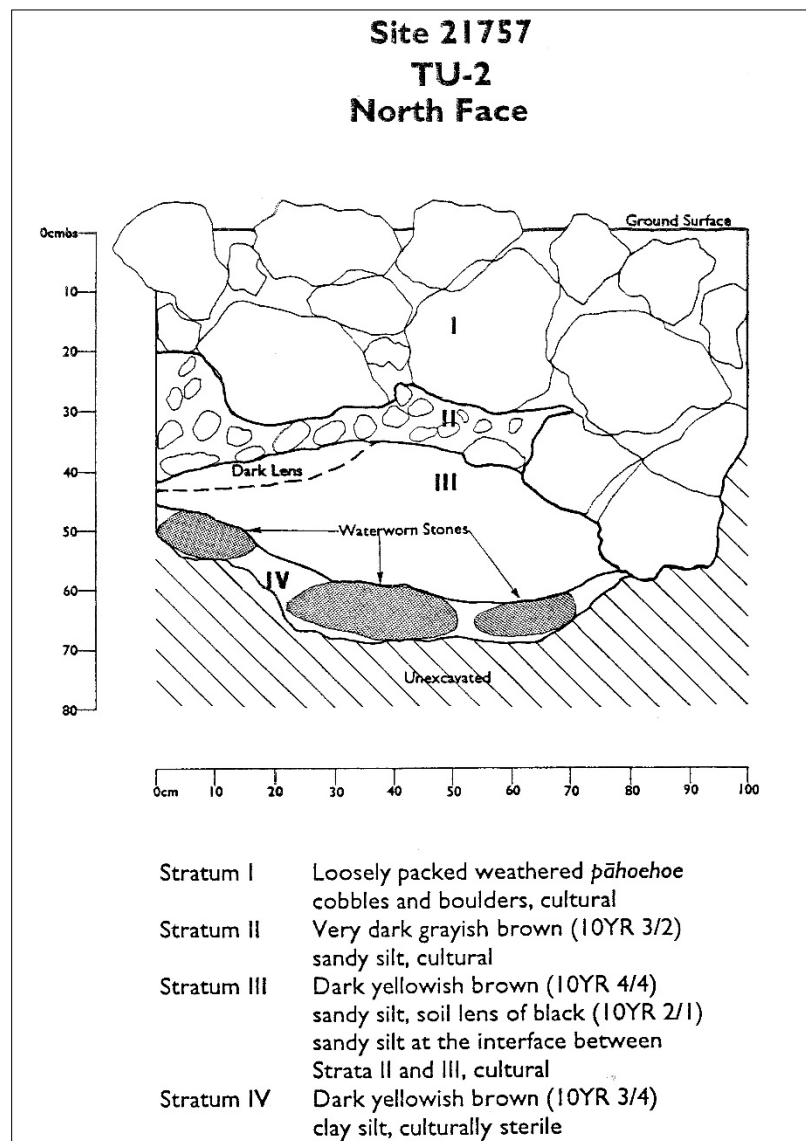


Figure 24. Profile of TU-2 of SIHP Site 21757 recorded by Rechtman and Henry (1999:16).

Table 2. Site 21757, TU-2, Inventory of Material Remains

Type	Family	Species	Stratum I			Stratum II			Stratum III			Total		
			Wt*	NISP	MNI	Wt*	NISP	MNI	Wt*	NISP	MNI	Wt*	NISP	MNI
Gastropod	Patellidae	<i>Cellana</i> sp.	3.21	14	3	-	-	-	39.79	47	26	43.00	61	29
Gastropod	Cypraeidae	<i>Caputserpentis</i>	2.8	1	-	7.02	4	2	-	-	-	9.82	5	-
Gastropod	Cypraeidae	<i>C. maculifera</i>	2.98	1	-	14.25	5	1	0.6	1	-	17.83	7	-
Gastropod	Cypraeidae	<i>Cypraea</i> sp.	-	-	-	4.62	4	-	4.32	5	-	8.94	9	-
Gastropod	Cypraeidae	<i>C. tigris</i>	-	-	-	0.99	1	1	-	-	-	0.99	1	-
Gastropod	Conidae	<i>Conus</i> sp.	3.53	2	1	45.67	14	11	8.12	6	4	57.32	22	4
Gastropod	Thaididae	<i>Thaididae</i> sp.	-	-	-	0.47	1	-	0.4	1	-	0.87	2	-
Gastropod	Thaididae	<i>Drupa morum</i>	-	-	-	-	-	-	1.97	1	1	1.97	1	1
Gastropod	Thaididae	<i>Drupa ricina</i>	-	-	-	9.46	3	3	4.91	2	2	14.37	5	2
Gastropod	Thaididae	<i>D. rubusdaeus</i>	-	-	-	4.5	2	2	3.72	3	3	8.22	5	3
Gastropod	Thaididae	<i>Purpura aperta</i>	-	-	-	0.77	2	2	6.05	4	4	6.82	6	4
Gastropod	Thaididae	<i>Neothais harpa</i>	-	-	-	3.11	2	2	-	-	-	3.11	2	-
Gastropod	Neritidae	<i>N. picea</i>	0.71	4	4	9.63	43	43	43.28	169	169	53.62	216	169
Gastropod	Neritidae	<i>N. polita</i>	-	-	-	3.09	3	2	3.83	3	2	6.92	6	2
Gastropod	Littorinidae	<i>L. pintado</i>	-	-	-	-	-	-	0.7	1	1	0.70	1	1
Gastropod	Unident.	-	-	-	-	2.32	5	-	8.06	3	-	10.38	8	-
Other	Echinoidea	-	-	-	-	1.13	5	-	1.11	8	-	2.24	13	-
Other	Crustacea	-	-	-	-	0.73	1	-	0.25	2	-	0.98	3	-
Fish	Unident.	-	-	-	-	5.34	-	-	15.54	-	-	20.88	-	-
Vegetal	Charcoal	-	16.81	-	-	25.72	-	-	0.39	-	-	42.92	-	-
Vegetal	Coconut shell	-	1.98	1	-	-	-	-	-	-	-	1.98	1	-
Vegetal	Kukui	-	-	-	-	0.96	-	-	0.4	1	-	1.36	1	-
Artifact	Glass fragments	-	9.15	-	-	6.87	-	-	8	-	-	24.02	-	-
Artifact	Modified shell	-	-	-	-	7.07	2	-	-	-	-	7.07	2	-
Artifact	Metal fragments	-	-	-	-	21.23	-	-	14.8	-	-	36.03	-	-
Artifact	Glazed ceramics	-	-	-	-	44.84	-	-	-	-	-	44.84	-	-

* All weights in grams

Figure 25. Inventory of cultural remains recovered from Strata I, II, and III of TU-2 at SIHP Site 21757 reported by Rechtman and Henry (1999:15).

The presence of the stratified deposit below the architectural layer within the terrace indicates multiple episodes of use and a single construction phase. Analysis of the architectural remains, stratigraphy, ecofacts and Historic artifacts recovered from the two test units led Rechtman and Henry (1999) to interpret this structure to be a house foundation that was built and occupied during the middle and late nineteenth century.

During the current study, Site 21757 was identified (now labeled Feature A), and although covered with vegetation, was found to be as described by Rechtman and Henry (1999). This site retains integrity of location, design, setting, materials, workmanship, and association. As a *kuleana* house platform it is still within the discrete parcel that was awarded during the *Māhele*, and its location, setting, and association along the former *ala loa* in the vicinity of other *kuleana* parcels remains. Test excavations revealed intact stratigraphy documenting the site's integrity of design, materials, and workmanship; and attesting to the site's potential to yield specific data that addresses important research questions.

Site 21757 Feature A appears to represent the foundation for the house belonging to Kuapuu, as described in the *Māhele* testimony (LCAw. 7336:2 see discussion above). In addition to the residential terrace, during the current fieldwork a core-filled rock wall was documented along portions of the northern and eastern boundaries of TMK: (3) 7-5-019:008 (former LCAw. 7336:2 to Kuapuu), and recorded as Feature B of Site 21757 (see Figure 15). This wall is mostly collapsed and extends for 18 meters in the eastern portion of the northern parcel boundary, and turns to the south and extends for 10 meters along the eastern parcel boundary where it has been removed by flooding action associated with the subject drainage. In this area the wall averages 1.4 meters wide, is 90 centimeters tall on its *mauka* side and 65 centimeters tall on its *makai* side (Figure 26). The 10 meter long southern extension of this feature was previously described as a portion of Site 21759, however an examination of the wall junctions at the common *mauka* corner of TMKs: (3) 7-5-019:008 and 009 clearly indicates that the wall recorded by Rechtman and Henry (1999) as Site 21759 does not extend "6 meters" along the eastern boundary of the Kuapuu *kuleana*, but rather turns *makai* at the parcels' corner along the Kalawa *kuleana* and abuts a second wall (Feature B) along a portion of the northern boundary of the Kuapuu *kuleana*.



Figure 26. SIHP Site 21757 Feature B, view to the west.

SIHP Site 21758

Rechtman and Henry (1999) originally identified SIHP Site 21758 as a stacked rock wall located south of SIHP Site 21757, which extends inland to the east-southeast. Rechtman and Henry recorded the wall as several sections and provided the following description:

The wall originates on the northern side of the small drainage at Ali'i Drive and extends inland to the east-southeast. The western 20-meter long section [Segment 1] of this wall has been recently modified into a concrete and stone retaining wall used to channel water within the drainage. The top of the wall in this area is level with the ground surface on the north side and has been built up to a height in excess of 2 meters on the south side.

The wall continues inland from the modified section a distance of 21 meters where it stops at a bend in the drainage. This section [Segment 2] of wall consists of stacked, face, and core-filled *pāhoehoe* cobbles and boulders. It ranges in width from 1.1 to 1.5 meters at the base and from 0.7 to 0.77 meters at the top, with a height of roughly 1.05 meters.

The wall continues on the eastern side of this drainage section, extending to the east-southeast for about 22 meters [Segment 3]. It then angles to the south-southeast for 24 meters [Segment 4] . . . These *mauka* wall sections are partially collapsed, with intact sections averaging 0.75 meters wide and 0.55 meters tall. They are built of stacked and piled *pāhoehoe* cobbles and boulders. No cultural remains were found in association with this wall . . . (Rechtman and Henry 1999:17)

During the current archaeological fieldwork, Segments 1, 2, and 3 were observed and recorded within the APE, while Segment 4 lies outside of the current APE (see Figure 15). Segment 1 (Figure 27) appears to be a completely modern version of the wall tied into the northern wing wall of the bridge abutment, with mortared joints and a concrete cap. Segment 2 is dry-stacked and core filled standing to a maximum height of 1.2 meters (Figure 28). The basal width of Segment 2 is 90 centimeters and the width across to the top is 70 centimeters making for a trapezoidal cross-section. Where Site 21758 intersects the subject drainage it was concrete reinforced (Figure 29) in the past, but has been damaged and partially washed away at the southeastern corner of the Kuapuu *kuleana* (TMK: (3) 7-5-019:008). Segment 3, which extends on the *mauka* side of the subject drainage (see Figure 15) is of stacked construction and not trapezoidal in cross-section, it too shows evidence of more recent modifications (Figure 30), likely during the Gomes Ranch era (1927-1980) of property use. Segments 1 and 2 of this site appear to correspond with the southern boundary of the Kuapuu *kuleana* parcel (LCAw. 7336:2), while Segments 3 and 4 appear to extend along the northern boundary of the Niniha *kuleana* (LCAw. 10373). Although in a degraded state, this site retains sufficient integrity of location, design, materials, and association to have yield specific data that addresses important research questions.



Figure 27. SIHP Site 21758 Segment 1 attached to Kahului Bridge abutment, view to the northwest.



Figure 28. SIHP Site 21758 Segment 2, view to the northeast.



Figure 29. SIHP Site 21758 Segment 2 at intersection with subject drainage, view to the northeast.



Figure 30. SIHP Site 21758 Segment 3, view to the north.

SIHP Site 21759

Rechtman and Henry (1999) originally assigned the site designation SIHP Site 21579 to a section of a rock wall located east of SIHP Site 21757. They described the site as follows:

Only a 6-meter long section of this wall is within the current project area, with the remainder extending outside the survey area to the north-northeast, behind the Makuakāne-Tripp property [LCAw. 7086:2/TMK (3) 7-5-019:009]. The portion within the project area is 1.2 meters wide and 1.1 meters tall, and built of pāhoehoe cobbles and boulders. It is core-filled, with stacked and faced sides. This wall corresponds with the Kuapu‘u LCA mauka boundary wall. (Rechtman and Henry 1999:17)

As discussed above the “6-meter long section of this wall” was reassigned as Feature B of Site 21757. The Site 21759 designation was retained for the wall along the *mauka* boundary of LCAw. 7086:2/TMK (3) 7-5-019:009, and this wall was found to extend along the southern and *makai* boundaries of the parcel as well (see Figure 15). As a result of the current study this wall was assigned the designation of Feature A of Site 21759.

Feature A

Feature A (see Figure 15) is a core-filled dry stacked rock wall that corresponds with the southern boundary, and portions of the *mauka* and *makai* boundaries of the Kalawa *kuleana* (see Figure 15). The *mauka* portion of Feature A is only present for about 15 meters extending northward from the southeastern corner of TMK (3) 7-5-019:009 (outside of the current APE). At the southeastern corner, the wall makes a continuous radial turn to the west and extends along the entire length (roughly 50 meters) of the parcel. Along this boundary the wall is 1.4 meters wide and stacked only three courses high measuring 85 centimeters (Figure 31). At the southwestern corner of the parcel, the wall makes a radial turn again and extends for roughly 20 meters to the north along the *makai* boundary of the parcel. In this area the wall measures approximately 1 meter wide and 90 centimeters high (Figure 32) and is constructed with small to large cobbles and small boulders, some of which are waterworn. This portion of Feature A has been incorporated into the *mauka* edge of Ali‘i Drive as a retaining wall, and the top layer of this wall has been recently concreted.

This rock wall appears to correspond with the southern, *mauka* and *makai* boundaries of the Kalawa *kuleana* parcel (LCAw. 7086:2) and likely had its origins as a nineteenth century *kuleana* boundary wall, which has been maintained (see past oral information from Luciana Makuakāne-Tripp present above) and modified over the past 150 years.



Figure 31. *Mauka* portion of SIHP Site 21759 Feature A, view to the south.



Figure 32. *Makai* portion of SIHP Site 21759 Feature A (note Feature C at left foreground), view to the west.

As a result of the current fieldwork, two additional features were recorded and designated to be part of SIHP Site 21759. The previously unrecorded features (Features B and C) within the current APE are described in detail below.

Feature B

Feature B is a basalt cobble and concrete construction extending out from the *mauka* face of the *makai* portion of Feature A, approximately 3 meters south of Feature C (see Figure 15).

This feature is rectangular and consists of two roughly square, stacked cobble constructions on either side of a square concrete slab, which is bordered on three sides by a concrete sill (Figure 33). The overall dimensions of Feature B are 2.2 meters long (north/south) by 0.83 meters wide (east/west) with a maximum height of 0.7 meters above the ground surface (at the north end). The concrete slab and sill appear to have been poured in place. The slab measures 82 centimeters long (east/west) by 62 centimeters wide (north/south), and is bordered on its north, south, and east sides by a 12-centimeter-high by 10-centimeter-wide sill. The roughly U-shaped arrangement of the concrete sill creates a depressed area that opens to the south; the exterior edges of the concrete sill are painted red (Figure 34).

The cobbles below the slab that are visible on the eastern side of the feature are mortared together. While the cobbles north and south of the concrete slab are a dry stack construction. Both roughly square stone constructions measure about 0.8 meters wide (north/south) by 0.83 meters long (east/west). The cobble construction south of the slab shows more evidence of collapse with jumbled large cobbles on its upper surface, and is nearly level in elevation with the slab. In contrast, the cobble construction on the north end is built up higher, and is roughly the same elevation as the adjacent wall feature (Site 21759 Feature A). Accumulated soil was removed from the interior of the U-shaped sill lined area, which contained an abundance of charcoal fragments suggesting that Feature B was some sort of barbeque or cooking feature. Given the similarity of the concrete to Feature C (discussed below) it is likely that Feature B was built contemporaneously or more recently than Feature C post 1930.

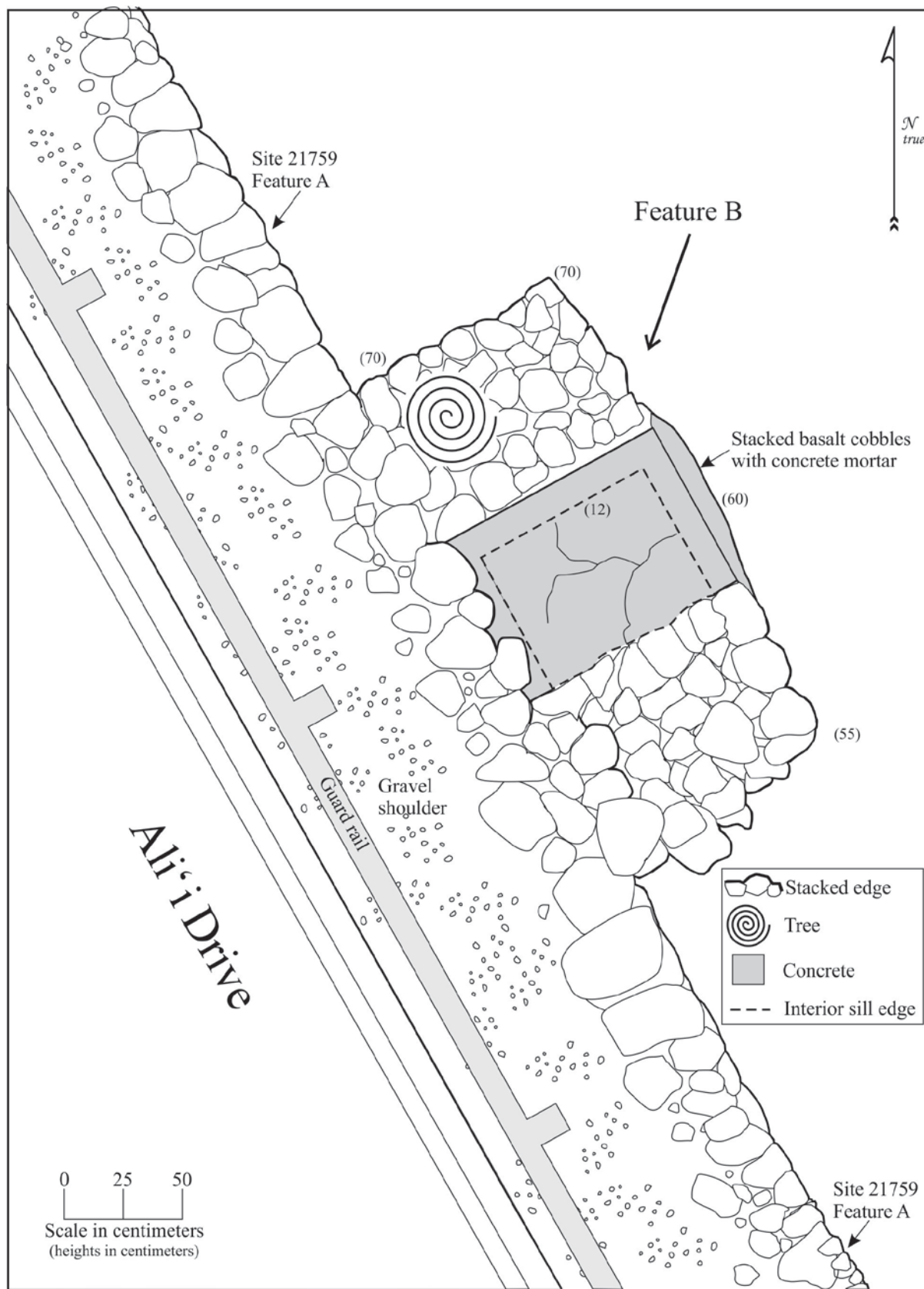


Figure 33. Plan view of SIHP Site 21759 Feature B.



Figure 34. SIHP Site 21759 Feature B, view to the southwest.

Feature C

Feature C is a square-shaped water well with an irregularly shaped concrete surface slab (Figures 35 and 36) that protrudes from the *mauka* face of the *makai* portion of Feature A (see Figure 28). The feature is situated near the northernmost end of Feature A, approximately 3 meters south of the driveway that accesses TMK: (3) 7-5-019:009 (see Figure 15).

The well opening (Figure 37) is square measuring 50 centimeters on a side and is set within a rectangular cap that measures 70 centimeters by 65 centimeters with an inset plywood cover. The well reaches a depth of 3 meters to the surface of the water within (maximum depth of the well was not measured). The concrete well cap extends 23 centimeters above the ground surface and bears the following inscription “Made 3-18-31 JKM” etched on the upper surface of its northern side (Figure 38). The initials “JKM” likely refer to John K. Makuakāne, Auntie Luciana’s father, who apparently initially built the well structure in 1931.

Three concrete fabrications radiate from the well cap to the west, east, and north, all of which appear to be additions that postdate the original well construction. These extensions were likely the base/foundation for a pump apparatus that was used to draw water from the well. The block-like additions that extend to the south and east of the well shaft have indentations, slots, holes, and a projection built directly into their surface that likely acted as a means to secure machinery or equipment that is no longer extant.

Site 21759 retains integrity of location, design, setting, materials, workmanship, and association. As a former *kuleana* parcel that was awarded during the *Māhele*, its location, setting, and association along the former *ala loa* in the vicinity of other *kuleana* parcels remains. Archaeological documentation revealed integrity of design, materials, and workmanship with respect to the newly identified features, and attests to the site’s potential (realized through this study) to yield specific data that addresses important research questions.

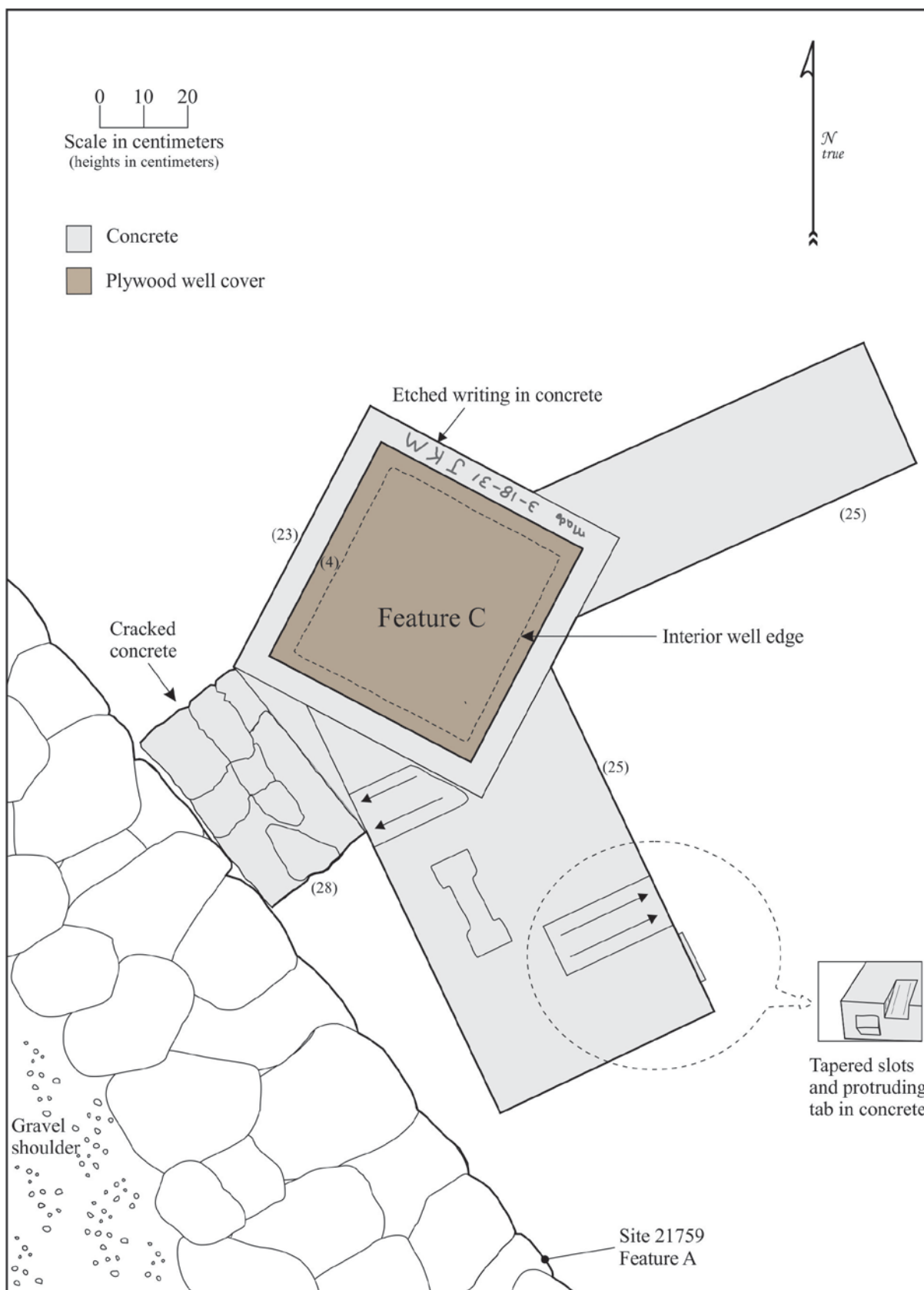


Figure 35. Plan view of SIHP Site 21759 Feature C, historic well along *mauka* side of Ali'i Drive.



Figure 36. SIHP Site 21759 Feature C historic well with wood well cover in place also showing portion of Feature A.



Figure 37. Detail view of inside of historic well SIHP Site 21759 Feature C.



Figure 38. Detail view of inscription on northeast segment of historic well cap SIHP Site 21759 Feature C.

SIHP Site 21768

Rechtman and Henry (1999) originally identified Site 21768 as a rock wall that consisted of four segments at the southern end of their study area (see Figure 14), which falls within the current APE (see Figure 15). They described the wall as core-filled with faced sides, constructed of *pāhoehoe* boulders and cobbles stacked on the upper portion. They noted that Segment 1 was mostly intact with some minor collapse of the top portion of the wall and that Segment 2 was mostly collapsed with large amounts of asphalt and modern debris incorporated into the associated rubble. Of Segment 3, they reported that it was in relatively good condition at its *makai* end and that a 6.5 meter wide opening framed with wooden fence posts was observed at the eastern end of this segment, from which the wall extended *mauka* of the opening. They further noted that although some top wall collapse was observed, the base of Segment 3 was largely intact and that hog-wire fencing had been stretched over this wall portion. Segment 4 was markedly disturbed with only the base intact at the southern end of the segment; jumbled boulders and debris were observed at the northern end of the segment attributed to recent clearing of the area to the west of the site, which destroyed this (northern) portion of the wall segment. Rechtman and Henry (1999) determined that SIHP Site 21768 corresponded with the property boundaries of the Niniha *kuleana* parcel (LCAw. 10373:2.TMK (3) 7-5-019:007).

During a subsequent inventory study, Haun and Henry (2004) revisited Site 21768 and recorded the site as altered and in poor condition:

The wall originates 7.0 m inland of Ali'i Drive and extends 17.0 m to the east-northeast. This portion of the wall was recorded as Segment A [1] by Rechtman and Henry (1999). It ranges in width from 1.0 to 1.2 m at the base, 0.7 to 0.8 meters at the top, and 0.7 to 0.9 m in height. This segment has been disturbed since it was recorded by Rechtman and Henry (1999). . .

The wall angles to the north-northwest at the inland end of Segment A [1] and extends to the north for 21.0 m. This section of wall was recorded as Segment B [2] by Rechtman and Henry (1999). This section [has] been significantly impacted by modern bulldozer activity likely associated with the construction of the parking area; however, an intact section is located at the Segment A [1] intersection. The majority of the wall is collapsed and contains fragments of concrete and asphalt. It is 1.4 to 2.0 m wide and 0.6 to 0.8 m in height. . . .

Rechtman and Henry (1999) observed a section of wall that originated at the northern end of Segment B [2] and which extended 47 m to the east (Segment C [3]), terminating at the southern end of Segment D [4] (discussed below). No remnants of this section [Segment 3] were identified during the present study, indicating it has been destroyed since this earlier study...

According to Rechtman and Henry (1999), Segment D [4] originally extended from the eastern end of Segment C [3] a distance of 21.0 m, terminating in a disturbed area at the northern end. The southern end of this section, at the Segment C/D [3/4] intersection, has been destroyed since the earlier study. The portion that remains is 20.0 m long (north-south) and is mostly collapsed. The base of the wall is relatively intact, ranging in width from 0.7 to 0.8 m and in height from 0.4 to 0.6 m. Hog-wire fencing extends across the top of Segment D [4]. . . (Haun and Henry 2004:41)

Haun and Henry interpreted SIHP Site 21768 as “a permanent habitation ancillary feature that enclosed a residential yard” (2004:41). During the current study, remnants of each of the extant segments (1, 2, and 4) of Site 21768 were relocated (Figures 39, 40, and 41) in various stages of preservation. Segment 2 in particular, appeared markedly collapsed (see Figure 40).



Figure 39. Segment 1 of SIHP Site 21768, vehicle travelling north on Ali‘i Drive, view to the west.

Despite the fact that portions of this site have collapsed, it still retains integrity of location, design, setting, materials, workmanship, and association. As a set of features associated with a *kuleana* parcel that was awarded during the *Māhele*, its location, setting, and association along the former *ala loa* in the vicinity of other *kuleana* parcels remains. Archaeological documentation revealed integrity of design, materials, and workmanship, attesting to the site’s potential (realized through this study) to yield specific data that addresses important research questions.



Figure 40. Remnant Portion of Segment 2 of SIHP Site 21768, view to the west.



Figure 41. Segment 4 of SIHP Site 21768, view to the southeast.

SIHP Site 22475

Site 22475 is a core-filled wall that borders the *mauka* side of Ali'i Drive near the southern end of the current APE (see Figure 15). Portions of the wall were recorded as a result of two previous studies. As previously discussed, Rechtman and Dougherty (2000) first recorded a portion of this wall along the *makai* boundaries of TMK: (3) 7-5-019:044 and 045, immediately south of the current APE (Figure 42). Within their project area, SIHP Site 22475 was removed and replaced by a modern concrete and rock wall. They described the wall as follows:

Site 22475 is a wall that borders the property along Ali'i Drive. Built on a slightly elevated bedrock surface above the roadway, this wall extends beyond the project area boundaries in both directions. The wall is of core-filled construction incorporating boulders and cobbles. Width ranges from 75 centimeters to 1 meter and height ranges up to 1.2 meters. ...[S]ections of this wall have collapsed, particularly along the northern part of the project area. This site is interpreted as a ranch wall originally built after 1927, when Manuel Gomes purchased the Kahului and Wai'aha *ahupua'a* and established a cattle ranch. (Rechtman and Dougherty 2000:16)

Four years later, Haun and Henry (2004) documented another section of wall (Figure 43) along the *makai* boundary of TMK: (3) 7-5-019:001, at the southern end of and within the current APE, which they identified as a northern extension of the earlier recorded SIHP Site 22475. This portion of the rock wall was described as follows:

Site 22475 is a stone wall that borders the inland side of Ali'i Drive, in the northwestern portion of the project area. A portion of this wall was previously identified by Rechtman and Dougherty (2000) during a survey of a parcel located adjacent to the present project area to the south-southeast. The southern end of the wall originates on the northern side of a bulldozed road that parallels the project area boundary in this area. It extends to the north-northwest a distance of 102.0 m, terminating 5.0 m south of the seaward end of the Site 21768 wall. Large portions of the wall have collapsed and the south-southwestern end has been destroyed by recent construction. Intact sections are present ranging in width at the base from 0.95 to 1.05 m and at the top from 0.8 to 0.9 m. The height of the intact sections of wall ranges from 0.8 to 1.0 m. It is built of stacked cobbles and small boulders with a core-filled interior of cobbles. (Haun and Henry 2004:43)

Haun and Henry (2004) interpreted SIHP Site 22475 to be a livestock control feature and remarked on the poor condition of the site.



Figure 42. Portion of SIHP Site 22475 to the south of the current APE from Rechtman and Dougherty (2000:16).



Figure 43. Segment of SIHP Site 22475 within current APE from Haun and Henry (2004:44).

During the current study, the portion of SIHP Site 22475 that was recorded by Haun and Henry (2004) within the current APE was located and found to be in a further diminished state. Currently there is only roughly 55 meters of extant wall, which terminates in the north roughly 30 meters south of SIHP Site 21768 (see Figure 15). This section of wall currently looks more like a linear rubble pile than it does a core-filled rock wall (Figure 44), with a maximum height of 65 centimeters and a maximum base width of 1 meter. Given its current diminished state, Site 22475 does not retain enough elements of integrity to warrant evaluation.



Figure 44. Portion of SIHP Site 22475 within current APE, view to the north.

SUMMARY

As a result of the current archaeological fieldwork six archaeological sites, all dating from the Historic Period, were identified with the project APE. One of these, Site 30614, is the Kahului Bridge (built in 1937) that is the subject of the undertaking. Feature A of Site 21757 is a nineteenth century residential terrace, and Features B and C of Site 21759 are associated with twentieth century residential use. Site 21758, 21768, and 22475, and Site 21759 Feature A, and Site 21757 Feature B are rock walls associated with middle nineteenth century *kuleana* parcels and later twentieth century ranching activities. Site 21759 Feature A was originally constructed as the boundary wall for the Kalawa LCAw. This feature was maintained by descendants of the *Māhele* awardee throughout the twentieth century. The *makai* portion of this feature was incorporated as a retaining wall into present-day Ali'i Drive. Site 21757 Feature B along with Segments 1 and 2 of Site 21758 were originally constructed in the middle nineteenth century as the boundary wall for the Kuapuu LCAw. The Site 21758 portions of this boundary wall were modified during the twentieth century. Site 21768 along with Segments 3 and 4 of Site 21758 were originally built in the middle nineteenth century to surround the Niniha LCAw. All of these walls and Site 22475 appear to have been modified during the twentieth century (post-1927) as part of the activities associated with the Gomes ranch. The significance of all six potential historic properties is discussed below.

6. SIGNIFICANCE EVALUATION, DETERMINATION OF EFFECTS, AND TREATMENT RECOMMENDATIONS

All six archaeological sites that exist within the current APE have already been assessed for their significance and treatment recommendations have been offered; in all cases the assessments and treatments were confirmed by a formal DLNR-SHPD determination as part of earlier HRS Chapter 6E reviews. As part of the current study the significance of all six sites are reassessed and the treatments revisited. With respect to the Chapter 6E process, the assessments are based on criteria contained in the Hawai'i Administrative Rules 13§13-275-6. The significance of these sites is presented below. For resources to be significant they 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.

With respect to the Section 106 process, to determine the effects that the proposed undertaking will have on historic properties, the sites recorded during the current study are also assessed for their eligibility for listing in the National Register of Historic Places (NRHP). The criteria (similar to those in the Hawai'i Administrative Rules) for NRHP evaluation are contained in 36 CFR 60.4, and are presented below. For a resource to be considered significant, and thus a historic property, it must possess integrity of location, design, setting, materials, workmanship, feeling, and association and must be characterized by one or more of the following criteria:

- A It must be associated with events that have made a significant contribution to the broad patterns of our history;
- B It must be associated with the lives of persons significant in our past;
- C It must embody distinctive characteristics of a type, period, or method of construction; or represent the work of a master; or possess high artistic value or represent a significant and distinguishable entity whose components may lack individual distinction; or
- D It must have yielded, or may be likely to yield, information important in prehistory or history.

With the exception for the Kahului Bridge and Site 22475, the recorded sites retain sufficient integrity relative to having yielded or likely to yield important research information. The significance of the sites recorded during the current study along with potential effects and treatment recommendations are discussed below and listed in Table 5.

Table 5. Site significance, and treatment recommendations.

<i>SIHP Site #</i>	<i>Site Type</i>	<i>Ch. 6E Sig.</i>	<i>Section 106 Sig.</i>	<i>Treatment Rec.</i>
21757	Habitation terrace	d	D	Data recovery*
21758	Rock wall	d	D	No further work*
21759	Well/BBQ/rock wall	d	D	No further work*
21768	Rock wall	d	D	No further work*
22475	Rock wall	Not significant	Not significant	No further work*
30614	Bridge	Not significant	Not significant	No further work

*Previously approved Chapter 6E determination.

Site 21757 was originally identified and tested by Rechtman and Henry (1999). This nineteenth century house platform was previously determined to be significant under state Criterion d and approved for data recovery. As a result of the current study this site continues to be considered significant under state Criterion d and is also determined eligible for the NRHP under Criterion D. This site will be subject to previously approved and agreed upon mitigation in the form of data recovery.

Site 21758, as identified by Rechtman and Henry (1999), is a rock wall that appears to mark the northern and eastern boundary of TMK: (3) 7-5-019:007 and possible portions of the former LCAw. 10373. Much of this wall has been reworked in modern times and other sections are collapsed. In spite of its condition, this site was previously determined to be significant under state Criterion d with an approved treatment of no further historic preservation work required. As a result of the current study this site continues to be considered significant under state Criterion d, and by correlate federal Criterion D, with a previously approved no further work determination.

Site 21759 was originally assigned to a rock wall extending along the *mauka* boundary of TMK: (3) 7-5-019:009 (LCAw. 7086:2) by Rechtman and Henry (1999). While that wall is outside of the current APE, the Site 21759 designation was retained and assigned to a collection of three features (a nineteenth century boundary wall, a twentieth century well, and a twentieth century concrete feature) also attributed to the activities associated with that *kuleana* parcel. The new features that were documented during the current study do not alter the prior significance determination or treatment for Site 21759, which was assessed as significant under state Criterion d, and by correlate federal Criterion D, with a previously approved no further work determination.

Site 21768 was originally recorded by Rechtman and Henry (1999) and later rerecorded by Haun and Henry (2004). This site is a series of connected wall segments that appear to mark the southern and eastern boundaries of TMK: (3) 7-5-019:007 (LCAw. 10373). This wall is currently in poor condition, but when originally recorded it was determined to be significant under state Criterion d. The approved treatment for this site as a result of the Rechtman and Henry (1999) and the Haun and Henry (2004) studies was no further historic preservation work required. As a result of the current study this site continues to be considered significant under state Criterion d, and by correlate federal Criterion D, with a previously approved no further work determination.

Site 22475 is a remnant of a twentieth century (post-1927) rock wall that extends along the *mauka* side of Ali'i Drive projecting into the current APE from the south. This site was first recorded by Rechtman and Dougherty (2000) south of the current APE, and later by Haun and Henry (2004) within the current APE. This wall was determined to be significant under state Criterion d as a result of both of these prior studies, with an approved treatment of no further historic preservation work required. As a result of the current study, given its present diminished state, this site is no longer considered significant under state Criterion d, nor is it determined eligible for the NRHP.

The Kahului Bridge (Site 30614) was identified as a historic property during the *State Historic Bridge Inventory and Evaluation* (MKE and Fung 2013) and determined to be eligible for the NRHP under Criterion C; and also assessed as significant under state significance Criterion c. However, as a result of a more recent assessment of its integrity (see Appendix C), this site is no longer considered a significant resource and therefore, it is not eligible for listing in the HRHP nor the NRHP under any criteria.

In the context of HRS Chapter 6E-8, the current proposed culvert replacement project will result in an "effect with agreed upon mitigation commitments." Site 21757 has already been approved for data recovery under the Chapter 6E process, thus this site will be subject to data recovery in compliance with a data recovery plan prepared in accordance with HAR 13§13-278, and submitted to the DLNR-SHPD Archaeology Branch for review and approval. In the context of NHPA Section 106, with respect to the current undertaking's effects on historic properties (sites determined eligible for listing in the NRHP), it is the conclusion of the current study that the undertaking will result in "no effect," as all of the potential historic properties within the APE have been previously mitigated (no further work required), or in the case of Site 21757 will be subject to data recovery.

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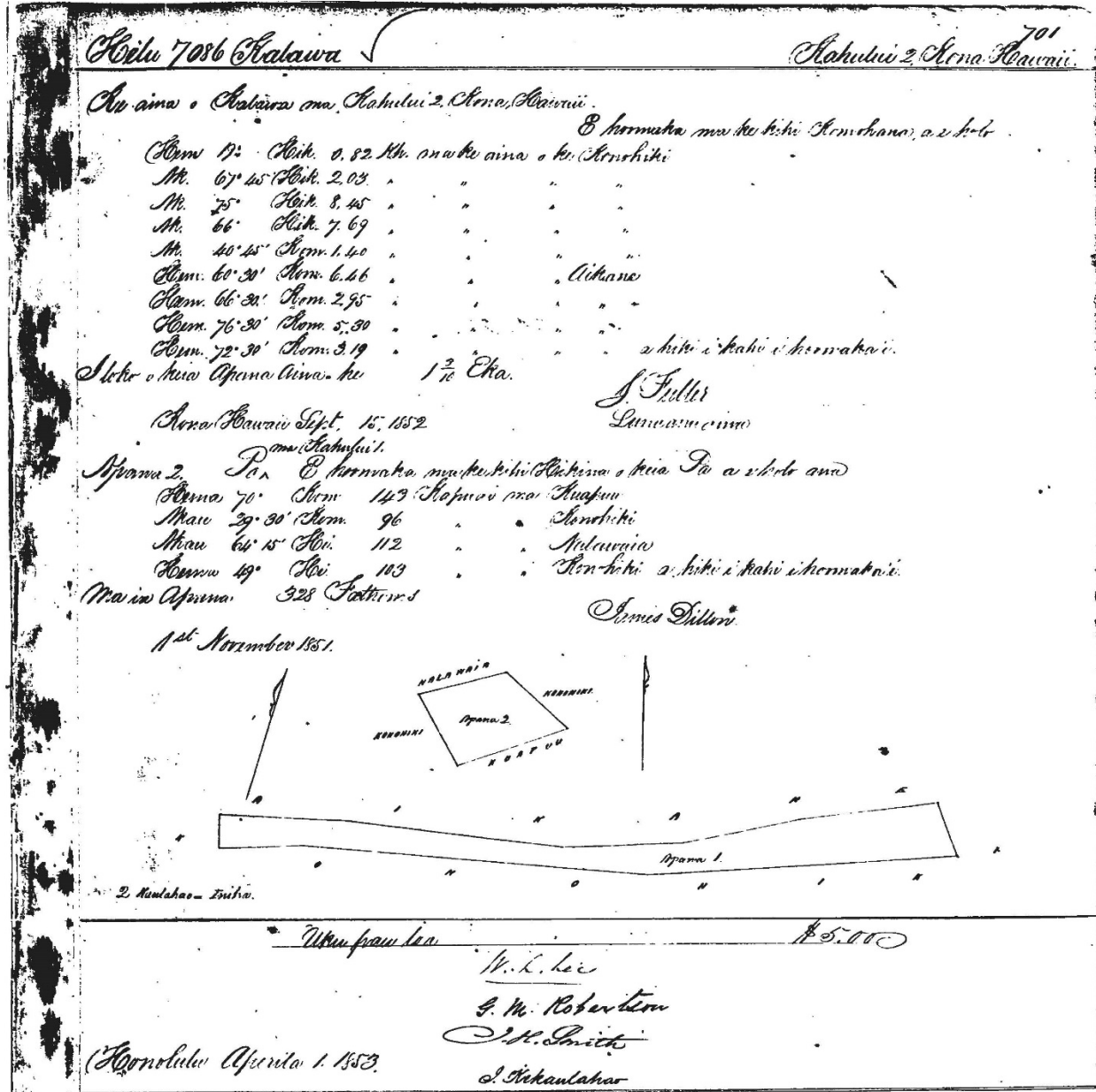
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APPENDIX A – Land Commission Testimony from the Māhele

LCAw. 7086 awarded to Kalawa



LCAw. 7086 to Kalawa.

7086 Kalawa Jan. 1829

Maile M. Hoochikua Ma ike au aia i ka ili aia
i Puka. Hupuna Mahulani 2. 3 Apana

1 Maaka Honohiki. Ma Kuu Pafika ili aia. Maikai he
pa fupi. Ma Kihala. Oluia ili aia. I Kihapai aole i ma
hina.

2 Maaka Honohiki. Ma Kuu Pafika ili aia. Maikai
Oluia ili aia. Ma Kihala. Oluia ili aia. I Kihapai na
ma hina.

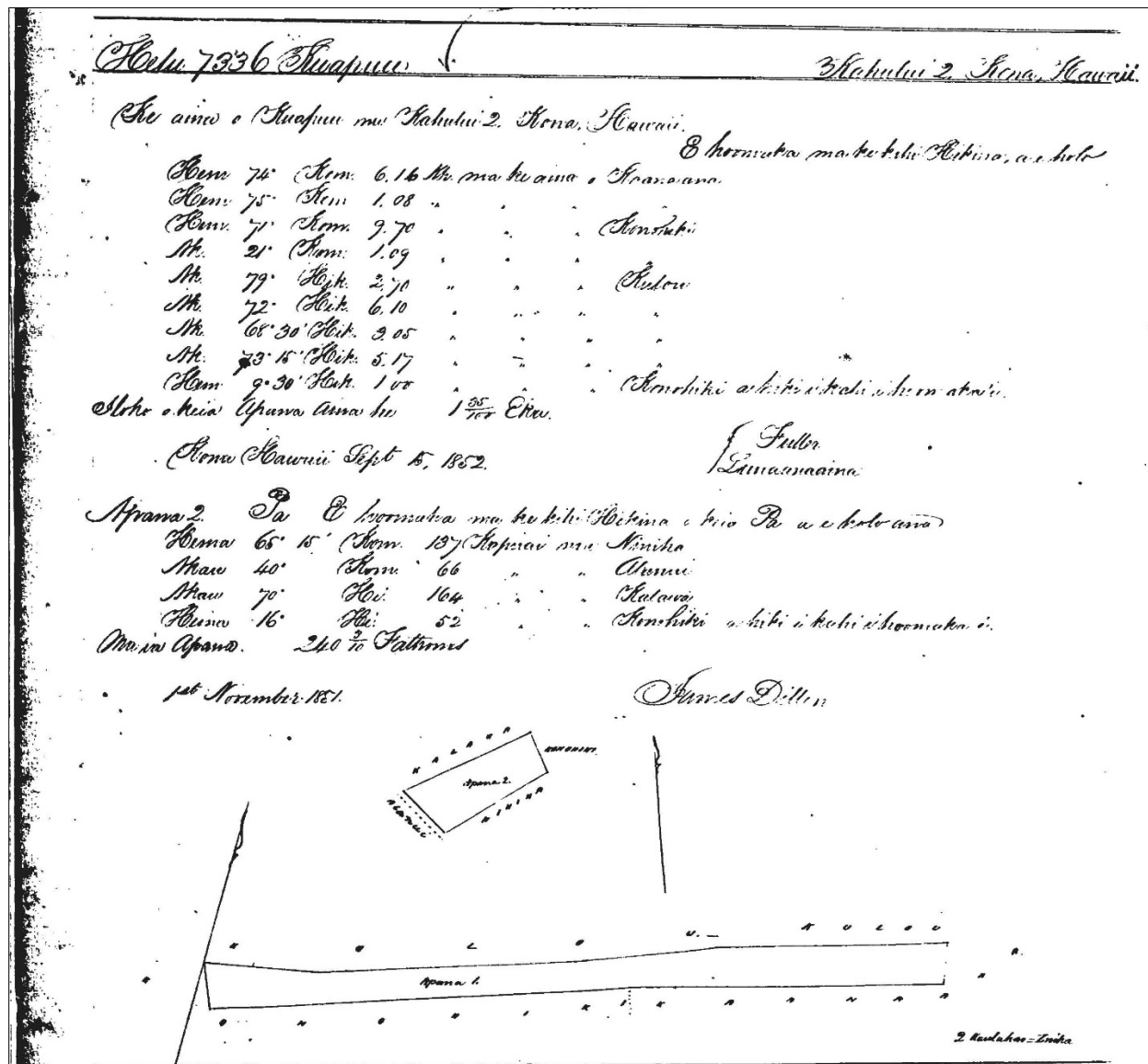
3 Puhale. Maaka he wahi wahi wahi. Ma Kuu he Kuu
pua. Maikai he Alana i Hupuna. Ma Kihala he
Kalahua pa. Ma pa i ka pa. 2 hale. 1 o Kalawa.
I hale aia, he hulaana hale Kuu ma hula aia. Kalawa
he pa he hulaana hale Kuu ma hula aia, mai ka wa o ka ma-
hina. I ma i ka hiki i ka wa, Kuu ma hula aia.
Kuaaana Hoochikua Ma ike no he ma ike.

Native Testimony for LCAw. 7086 to Kalawa.

7086 Malana
M. Aloha ekeu e ma lona heema aia, he hui aku me au iia ekehu i
hoio Malana aia, pua; Puka aia mai he fapipi a Malahui-
ka, o ka loa 500 auana, ka lala 5 auana, Puka aia mai he
Malawana a Malahui, o ka loa 570, ka lala 5 auana, Malana
puka, aia me makai e Malahui he ahuana, o ka loa. a ma
ka lala 42 auana. Oka mai Puka aia i hea Malahui ma-
lana aia me ka Malahui he ahuana, ka lala o kaia
aia e Malahui e ma, he ahu, e Puka ma ka lona, o ka Pa-
piti ma he Malahui, e Malahui ma ka lona.

Native Register for LCAw. 7086 to Kalawa.

LCAw. 7336 awarded to Kuapuu



LCAw. 7336 to Kuapuu.

580
 ✓ 7336 Kuapuu 2. Dec. 1848
 Kaili W. Hoohikua. Ua iho au aia i ka
 ili aia. o Kahuki, Ahupuaa o Kahului 2. ʻIkaʻIka.
 1. Pahale. Mauka aia waiho wale. Ma Hau he Kihika
 pa. Makai he Alanui Opeuni. Ma Hehala o he
 Malama pa, he paia i hale muna, he waho oia
 no malaila.
 2. Mauka o Papipi. Mauka he wahi waiho wale. Ma
 Kani o Kihikaia. aia. Makai he papipi, Ma Hehala
 o Kahuki aia. I kihapai na malaila.
 3. Kahulu. Mauka he waiho wale. Ma Hau o Kihika
 aia. Makai he waiho wale, Ma Hehala o Kahuki
 aia.
 4. i Healakena. Mauka Hehohiki. Ma Hau Kihika
 aia. Makai Hehohiki Ma Hehala o Kahuki aia.
 5. He alala. Mauka aia waiho wale, Ma Hau Kihika
 aia. Makai Hehohiki, Ma Hehala Ma
 Kahuki aia.
 6. Ua i ka ili aia o Kihikaia. Mauka Hehohiki,
 Ma Hau Oha aia. Makai Hehohiki, Ma Hehala
 o Kihikaia. I kihapai na malaila.
 7. Mauka Hehohiki, Ma Hau Oha aia. Makai he
 papipi, Ma Hehala o Kihikaia 2. I kihapai
 na malai hapaia.
 He aia kahiko ma kua waiho mai oia
 Mauna mai i ka wa o Kamahameha I. oia
 ma kua.
 Kamahamehuli Hoohikua Ua like kua
 ika i na ma a pau ma ka Kaili i haawi
 i hoi aia.

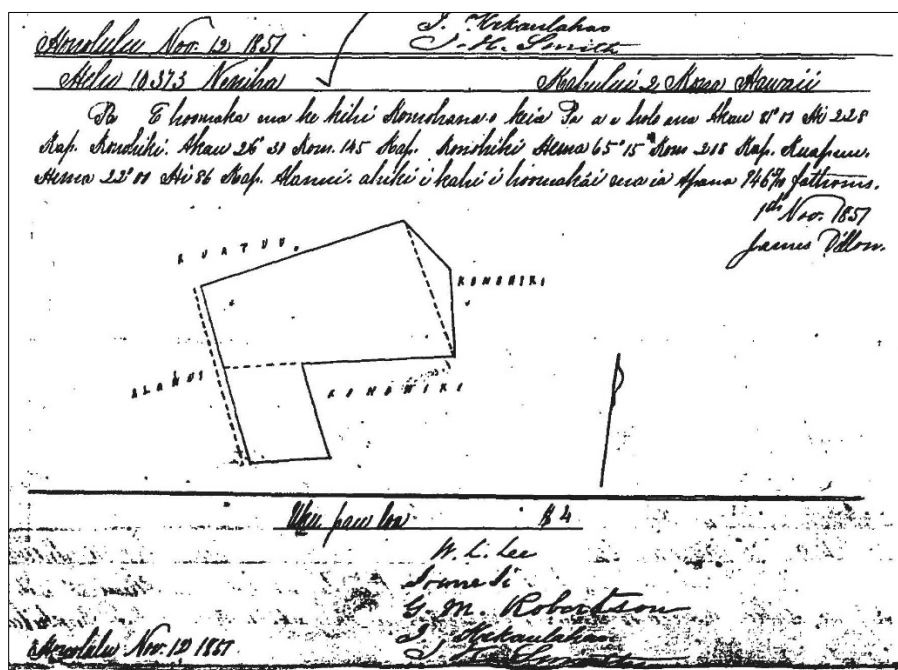
Native Testimony for LCAw. 7336 to Kuapuu.

424
 7336
 Kuapuu. Mahele Januari 26. 1848
 I kaha oukou a ma luna he ona aia, he kai aku aia in ou-
 kou i kahi kulanā pūale, aia ma i mākei o Kahului 2 he
 ahupuaa. Oka he, a me he lāula 5 anana, Oka kulanā
 aia ma Kahului 2, pūale he hōma pūale aia; o ka
 he 5 anana, he lāula 5 anana. Pūale aia mahele aia
 a lūki o Kahului, o ka he 300 anana, he lāula 5 anana,
 Pūale aia, ma Kahalakoua a lūki o Maunaloa, o ka he
 400 anana, he lāula 5 anana. Pūale aia mahele o Ka-
 lalon, o ka he 100 anana, he lāula 5 anana - Oka pūale o
 kahi mau Pūale aia o Kahului 1 ma he aia, o Kihiaiole
 ma he hōma, he Pūale aia ma he hōma, Kāhuna ma
 he Kihiaiole. Pūale aia ma Kihiaiole 2, o ka he 500
 anana, he lāula 6 anana. Pūale aia mahele aia ma
 Pahoa, a Kamahehewa, he lāula 300 anana, he lāula
 5 anana. Oka pūale o kahi aia, o Kihiaiole 1 ma he
 aia, Oka ma he hōma, he Pūale aia ma he hōma,
 Kamahehewa ma he Kihiaiole.

Ma Kuapuu

Native Register for LCAw. 7336 to Kuapuu.

LCAw. 10373 awarded to Niniha



LCAw. 10373 to Niniha.

[illegible]

Native Testimony for LCAw. 10373 to Niniha

10, 3 1/3 74 Ninkha
 Aloho outkon e na luna hirona aia, he hai ahi mi au e outkon
 i kua kuleana fakale, pumi; o kua loa, a me ka lala 110 aia
 na oia he anafumi; o kua kuleana fakale, aia mo makai ma
 Kahuhi 2 oia he ahupuaa. No Ninkha

Native Register for LCAw. 10373 to Niniha.

APPENDIX B – Section 106 Consultation Letters

NEIL ABERCROMBIE
GOVERNOR



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

ROSS M. HIGASHI
INTERIM DIRECTOR

Deputy Directors
JEFFREY CHANG
RANDY GRUNE
AUDREY HIDANO
JADINE URASAKI


IN REPLY REFER TO:

HWY-DD 2.8019

November 28, 2014

TO: THE HONORABLE WILLIAM J. AILA JR., CHAIRPERSON
DEPARTMENT OF LAND AND NATURAL RESOURCES

ATTN: HERBERT POEPOE
HAWAII ISLAND BURIAL COUNCIL
C/O STATE HISTORIC PRESERVATION DIVISION

FROM: ROSS M. HIGASHI 
INTERIM DIRECTOR OF TRANSPORTATION

SUBJECT: NATIONAL HISTORIC PRESERVATION ACT SECTION 106 CONSULTATION
ALII DRIVE CULVERT REPLACEMENT
KAHULUI AHUPUAA, NORTH KONA DISTRICT, HAWAII ISLAND
FEDERAL-AID PROJECT NO. STP-0186(1)
TAX MAP KEYS: (3) 7-5-019:007, 008, 009, and 016

On behalf of the Federal Highway Administration (FHWA) and the County of Hawaii Department of Public Works (DPW), the State of Hawaii Department of Transportation (HDOT) would like to invite you to participate in consultation for this proposed culvert replacement project.

The project addresses issues with a double-cell culvert on Alii Drive at Kahului Bay in Kailua-Kona, Island of Hawaii, known as Kahului Bridge (see enclosed maps in Figure 1 and photographs in Figure 2). The work is intended to repair deterioration and to resize the culvert openings to meet current design guidelines. The roadway deck will also be widened to improve conditions for vehicular, pedestrian, and bicycle access across the Kahului drainage channel.

The proposed project would utilize federal funding and would be considered a federal action and undertaking, as defined by the Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (2006). Therefore, the FHWA requires compliance with the National Environmental Policy Act, NHPA, and other federal requirements. The FHWA has authorized HDOT and the DPW to act on behalf of the FHWA regarding the NHPA Section 106 notification and consultation. We would like to invite you to participate in the Section 106 consultation for the proposed project in accordance with Title 36 of the *Code of Federal Regulations*, Section 800.3.

THE HONORABLE WILLIAM J. AILA, JR.
November 28, 2014
Page 2

HWY-DD 2.8019

Overview of the Undertaking

The existing concrete and stone, double-cell structure culvert dates from 1937 and on top is a concrete deck supporting two ten-foot lanes for vehicles and a narrow shoulder. The culvert structure has a number of issues, including spalls exposing corroded steel on the underside of the concrete deck. The culvert openings will be enlarged to pass the 100-year design flood from the gulch that it spans, which has promoted recurrent floods that have damaged adjacent properties. The stream embankments are often overtopped during heavy storms, flooding adjacent private property. In heavier storms, the flooding can overtop Alii Drive itself. In addition, the bridge is considered to be functionally obsolete because of the non-conforming travel lanes and shoulders. The existing shoulders above the culvert will be widened for improved pedestrian/bicycle passage. The purpose of the project is to construct a properly sized structure that meets the needs of motorists, pedestrians, and bicycles, and reduces flood hazard in the area. In order to accomplish this, it is necessary to replace the culvert with a larger structure, expand the flood channel, and widens the roadway above to accommodate a bike lane and raised sidewalk. Construction would be phased in order to maintain two lanes of traffic at all times, and is expected to last approximately one year. Construction would take place during daytime hours.

The existing culvert structure and portions of Parcels 007, 008, 009, and 016 extending *mauka* as well as to the north and south of the culvert would be disturbed as part of the construction activities. These activities include the demolition of the culvert, the reconfiguration of the drainage channel and adjacent floodplain to better accommodate a 100-year storm scenario, and the redesign and relocation of the new travel lanes. The boundary of this proposed work activity can be seen on Figure 3, and after consultation with the State Historic Preservation Division (SHPD), it is this area that we believe constitutes an appropriate Area of Potential Effect (APE) for this undertaking. Excavation for the two new abutments would extend approximately three feet into the basalt. The remainder of the stream channel would remain at approximately the existing elevation, including the widened portion of the stream channel. No effects, direct or indirect, are expected beyond the limits of the APE.

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The project area is located along the coast within the greater Kailua-Kona village area. During Precontact times this area was used extensively for habitation and burial by the *makaainana* as well as the *alii*. Several habitation and burial sites as well as a substantial *heiau* have been documented in the area just *mauka* of the current proposed APE. As a result of the *Mahele*, Kahului 1st was retained as government land and Kahului 2nd was awarded to Grace Kamaikui, daughter of John Young. Kahului 1st was later granted to Kaupena. Within and adjacent to the current proposed APE there were three *kuleana* land commission awards made to Kalawa, Kuapuu, and Niniha. All three of these awards were for house lots. While two of these lots were abandoned by the early twentieth century, the third (Kalawa-Makuakane) had seen continuous family occupation until the 1990s. The area *mauka* of the proposed APE was incorporated into the Gomes Ranch in 1927 as cattle grazing lands. This area was later sold and converted to resort use, now operated by Wyndham Hotels and Resorts.

THE HONORABLE WILLIAM J. AILA, JR.
November 28, 2014
Page 3

HWY-DD 2.8019

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THE HONORABLE WILLIAM J. AILA, JR.
November 28, 2014
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Enclosures

c: Kai Hawaii, Inc., FHWA (Meesa Otani); DPW (Casey Yanagihara)

NEIL ABERCROMBIE
GOVERNOR



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

ROSS M. HIGASHI
INTERIM DIRECTOR

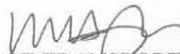
Deputy Directors
JEFFREY CHANG
RANDY GRUNE
AUDREY HIDANO
JADINE URASAKI

IN REPLY REFER TO:

HWY-DD 2.8019

November 28, 2014

TO: KAMANA'OPONO M. CRABBE, CHIEF EXECUTIVE OFFICER
OFFICE OF HAWAIIAN AFFAIRS

FROM: ROSS M. HIGASHI 
INTERIM DIRECTOR OF TRANSPORTATION

SUBJECT: NATIONAL HISTORIC PRESERVATION ACT SECTION 106 CONSULTATION
ALII DRIVE CULVERT REPLACEMENT
KAHULUI AHUPUAA, NORTH KONA DISTRICT, HAWAII ISLAND
FEDERAL-AID PROJECT NO. STP-0186(1)
TAX MAP KEYS: (3) 7-5-019:007, 008, 009, and 016

On behalf of the Federal Highway Administration (FHWA) and the County of Hawaii Department of Public Works (DPW), the State of Hawaii Department of Transportation (HDOT) would like to invite you to participate in consultation for this proposed culvert replacement project.

The project addresses issues with a double-cell culvert on Alii Drive at Kahului Bay in Kailua-Kona, Island of Hawaii, known as Kahului Bridge (see enclosed maps in Figure 1 and photographs in Figure 2). The work is intended to repair deterioration and to resize the culvert openings to meet current design guidelines. The roadway deck will also be widened to improve conditions for vehicular, pedestrian, and bicycle access across the Kahului drainage channel.

The proposed project would utilize federal funding and would be considered a federal action and undertaking, as defined by the Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (2006). Therefore, the FHWA requires compliance with the National Environmental Policy Act, NHPA, and other federal requirements. The FHWA has authorized HDOT and the DPW to act on behalf of the FHWA regarding the NHPA Section 106 notification and consultation. We would like to invite you to participate in the Section 106 consultation for the proposed project in accordance with Title 36 of the *Code of Federal Regulations*, Section 800.3.

Kamana'opono M. Crabbe
November 28, 2014
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HWY-DD 2.8019

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November 28, 2014
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

ROSS M. HIGASHI
INTERIM DIRECTOR

Deputy Directors
JEFFREY CHANG
RANDY GRUNE
AUDREY HIDANO
JADINE URASAKI

IN REPLY REFER TO:

HWY-DD 2.8019

November 28, 2014

Association of Hawaiian Civic Clubs
P.O. Box 1135
Honolulu, Hawaii 96807

Dear Sir/Madame:

Subject: National Historic Preservation Act Section 106 Consultation
Alii Drive Culvert Replacement
Kahului Ahupuaa, North Kona District, Hawaii Island
Federal-Aid Project No. STP-0186(1)
Tax Map Keys: (3) 7-5-019:007, 008, 009, and 016

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Association of Hawaiian Civic Clubs
November 28, 2014
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Sincerely,



ROSS M. HIGASHI
Interim Director of Transportation

Enclosures

c: Kai Hawaii, Inc., FHWA (Meesa Otani); DPW (Casey Yanagihara)

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Deputy Directors
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IN REPLY REFER TO:

HWY-DD 2.8019

November 28, 2014

Mr. Edward Halealoha Ayau
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622 Wainaku Avenue
Hilo, Hawaii 96720

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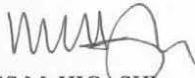
Mr. Edward Halealoha Ayau
November 28, 2014
Page 4

HWY-DD 2.8019

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Sincerely,



ROSS M. HIGASHI
Interim Director of Transportation

Enclosures

c: Kai Hawaii, Inc., FHWA (Meesa Otani); DPW (Casey Yanagihara)

NEIL ABERCROMBIE
GOVERNOR



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

ROSS M. HIGASHI
INTERIM DIRECTOR

Deputy Directors
JEFFREY CHANG
RANDY GRUNE
AUDREY HIDANO
JADINE URASAKI

IN REPLY REFER TO:

HWY-DD 2.8019

November 28, 2014

Kona Hawaiian Civic Club
P.O. Box 4098
Kailua-Kona, Hawaii 96745

Dear Sir/Madame:

Subject: National Historic Preservation Act Section 106 Consultation
Alii Drive Culvert Replacement
Kahului Ahupuaa, North Kona District, Hawaii Island
Federal-Aid Project No. STP-0186(1)
Tax Map Keys: (3) 7-5-019:007, 008, 009, and 016

On behalf of the Federal Highway Administration (FHWA) and the County of Hawaii Department of Public Works (DPW), the State of Hawaii Department of Transportation (HDOT) would like to invite you to participate in consultation for this proposed culvert replacement project.

The project addresses issues with a double-cell culvert on Alii Drive at Kahului Bay in Kailua-Kona, Island of Hawaii, known as Kahului Bridge (see enclosed maps in Figure 1 and photographs in Figure 2). The work is intended to repair deterioration and to resize the culvert openings to meet current design guidelines. The roadway deck will also be widened to improve conditions for vehicular, pedestrian, and bicycle access across the Kahului drainage channel.

The proposed project would utilize federal funding and would be considered a federal action and undertaking, as defined by the Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (2006). Therefore, the FHWA requires compliance with the National Environmental Policy Act, NHPA, and other federal requirements. The FHWA has authorized HDOT and the DPW to act on behalf of the FHWA regarding the NHPA Section 106 notification and consultation. We would like to invite you to participate in the Section 106 consultation for the proposed project in accordance with Title 36 of the *Code of Federal Regulations*, Section 800.3.

Kona Hawaiian Civic Club
November 28, 2014
Page 2

HWY-DD 2.8019

Overview of the Undertaking

The existing concrete and stone, double-cell structure culvert dates from 1937 and on top is a concrete deck supporting two ten-foot lanes for vehicles and a narrow shoulder. The culvert structure has a number of issues, including spalls exposing corroded steel on the underside of the concrete deck. The culvert openings will be enlarged to pass the 100-year design flood from the gulch that it spans, which has promoted recurrent floods that have damaged adjacent properties. The stream embankments are often overtopped during heavy storms, flooding adjacent private property. In heavier storms, the flooding can overtop Alii Drive itself. In addition, the bridge is considered to be functionally obsolete because of the non-conforming travel lanes and shoulders. The existing shoulders above the culvert will be widened for improved pedestrian/bicycle passage. The purpose of the project is to construct a properly sized structure that meets the needs of motorists, pedestrians, and bicycles, and reduces flood hazard in the area. In order to accomplish this, it is necessary to replace the culvert with a larger structure, expand the flood channel, and widens the roadway above to accommodate a bike lane and raised sidewalk. Construction would be phased in order to maintain two lanes of traffic at all times, and is expected to last approximately one year. Construction would take place during daytime hours.

The existing culvert structure and portions of Parcels 007, 008, 009, and 016 extending *mauka* as well as to the north and south of the culvert would be disturbed as part of the construction activities. These activities include the demolition of the culvert, the reconfiguration of the drainage channel and adjacent floodplain to better accommodate a 100-year storm scenario, and the redesign and relocation of the new travel lanes. The boundary of this proposed work activity can be seen on Figure 3, and after consultation with the State Historic Preservation Division (SHPD), it is this area that we believe constitutes an appropriate Area of Potential Effect (APE) for this undertaking. Excavation for the two new abutments would extend approximately three feet into the basalt. The remainder of the stream channel would remain at approximately the existing elevation, including the widened portion of the stream channel. No effects, direct or indirect, are expected beyond the limits of the APE.

Culture-Historical Background

The project area is located along the coast within the greater Kailua-Kona village area. During Precontact times this area was used extensively for habitation and burial by the *makaainana* as well as the *alii*. Several habitation and burial sites as well as a substantial *heiau* have been documented in the area just *mauka* of the current proposed APE. As a result of the *Mahele*, Kahului 1st was retained as government land and Kahului 2nd was awarded to Grace Kamaikui, daughter of John Young. Kahului 1st was later granted to Kaupena. Within and adjacent to the current proposed APE there were three *kuleana* land commission awards made to Kalawa, Kuapuu, and Niniha. All three of these awards were for house lots. While two of these lots were abandoned by the early twentieth century, the third (Kalawa-Makuakane) had seen continuous family occupation until the 1990s. The area *mauka* of the proposed APE was incorporated into the Gomes Ranch in 1927 as cattle grazing lands. This area was later sold and converted to resort use, now operated by Wyndham Hotels and Resorts.

Kona Hawaiian Civic Club
November 28, 2014
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HWY-DD 2.8019

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Kona Hawaiian Civic Club
November 28, 2014
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HWY-DD 2.8019

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Sincerely,



ROSS M. HIGASHI
Interim Director of Transportation

Enclosures

c: Kai Hawaii, Inc., FHWA (Meesa Otani); DPW (Casey Yanagihara)

NEIL ABERCROMBIE
GOVERNOR



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

ROSS M. HIGASHI
INTERIM DIRECTOR

Deputy Directors
JEFFREY CHANG
RANDY GRUNE
AUDREY HIDANO
JADINE URASAKI

IN REPLY REFER TO:

HWY-DD 2.8019

November 28, 2014

Mr. Craig V. Kahui
Lai Opua 2020
74-5599 Luhia Street, E5
Kailua-Kona, Hawaii 96740

Dear Mr. Kahui:

Subject: National Historic Preservation Act Section 106 Consultation
Alii Drive Culvert Replacement
Kahului Ahupuaa, North Kona District, Hawaii Island
Federal-Aid Project No. STP-0186(1)
Tax Map Keys: (3) 7-5-019:007, 008, 009, and 016

On behalf of the Federal Highway Administration (FHWA) and the County of Hawaii Department of Public Works (DPW), the State of Hawaii Department of Transportation (HDOT) would like to invite you to participate in consultation for this proposed culvert replacement project.

The project addresses issues with a double-cell culvert on Alii Drive at Kahului Bay in Kailua-Kona, Island of Hawaii, known as Kahului Bridge (see enclosed maps in Figure 1 and photographs in Figure 2). The work is intended to repair deterioration and to resize the culvert openings to meet current design guidelines. The roadway deck will also be widened to improve conditions for vehicular, pedestrian, and bicycle access across the Kahului drainage channel.

The proposed project would utilize federal funding and would be considered a federal action and undertaking, as defined by the Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (2006). Therefore, the FHWA requires compliance with the National Environmental Policy Act, NHPA, and other federal requirements. The FHWA has authorized HDOT and the DPW to act on behalf of the FHWA regarding the NHPA Section 106 notification and consultation. We would like to invite you to participate in the Section 106 consultation for the proposed project in accordance with Title 36 of the *Code of Federal Regulations*, Section 800.3.

Mr. Craig V. Kahui
November 28, 2014
Page 2

HWY-DD 2.8019

Overview of the Undertaking

The existing concrete and stone, double-cell structure culvert dates from 1937 and on top is a concrete deck supporting two ten-foot lanes for vehicles and a narrow shoulder. The culvert structure has a number of issues, including spalls exposing corroded steel on the underside of the concrete deck. The culvert openings will be enlarged to pass the 100-year design flood from the gulch that it spans, which has promoted recurrent floods that have damaged adjacent properties. The stream embankments are often overtopped during heavy storms, flooding adjacent private property. In heavier storms, the flooding can overtop Alii Drive itself. In addition, the bridge is considered to be functionally obsolete because of the non-conforming travel lanes and shoulders. The existing shoulders above the culvert will be widened for improved pedestrian/bicycle passage. The purpose of the project is to construct a properly sized structure that meets the needs of motorists, pedestrians, and bicycles, and reduces flood hazard in the area. In order to accomplish this, it is necessary to replace the culvert with a larger structure, expand the flood channel, and widens the roadway above to accommodate a bike lane and raised sidewalk. Construction would be phased in order to maintain two lanes of traffic at all times, and is expected to last approximately one year. Construction would take place during daytime hours.

The existing culvert structure and portions of Parcels 007, 008, 009, and 016 extending *mauka* as well as to the north and south of the culvert would be disturbed as part of the construction activities. These activities include the demolition of the culvert, the reconfiguration of the drainage channel and adjacent floodplain to better accommodate a 100-year storm scenario, and the redesign and relocation of the new travel lanes. The boundary of this proposed work activity can be seen on Figure 3, and after consultation with the State Historic Preservation Division (SHPD), it is this area that we believe constitutes an appropriate Area of Potential Effect (APE) for this undertaking. Excavation for the two new abutments would extend approximately three feet into the basalt. The remainder of the stream channel would remain at approximately the existing elevation, including the widened portion of the stream channel. No effects, direct or indirect, are expected beyond the limits of the APE.

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The project area is located along the coast within the greater Kailua-Kona village area. During Precontact times this area was used extensively for habitation and burial by the *makaainana* as well as the *alii*. Several habitation and burial sites as well as a substantial *heiau* have been documented in the area just *mauka* of the current proposed APE. As a result of the *Mahele*, Kahului 1st was retained as government land and Kahului 2nd was awarded to Grace Kamaikui, daughter of John Young. Kahului 1st was later granted to Kaupena. Within and adjacent to the current proposed APE there were three *kuleana* land commission awards made to Kalawa, Kuapuu, and Niniha. All three of these awards were for house lots. While two of these lots were abandoned by the early twentieth century, the third (Kalawa-Makuakane) had seen continuous family occupation until the 1990s. The area *mauka* of the proposed APE was incorporated into the Gomes Ranch in 1927 as cattle grazing lands. This area was later sold and converted to resort use, now operated by Wyndham Hotels and Resorts.

Mr. Craig V. Kahui
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HWY-DD 2.8019

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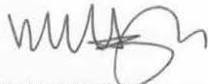
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ROSS M. HIGASHI
Interim Director of Transportation

Enclosures

c: Kai Hawaii, Inc., FHWA (Meesa Otani); DPW (Casey Yanagihara)

NEIL ABERCROMBIE
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869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

ROSS M. HIGASHI
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JEFFREY CHANG
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JADINE URASAKI

IN REPLY REFER TO:

HWY-DD 2.8019

November 28, 2014

Ms. Nicole Lui
76-6217 Lehua Road
Kailua-Kona, Hawaii 96740

Dear Ms. Lui:

Subject: National Historic Preservation Act Section 106 Consultation
Alii Drive Culvert Replacement
Kahului Ahupuaa, North Kona District, Hawaii Island
Federal-Aid Project No. STP-0186(1)
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Ms. Nicole Lui
November 28, 2014
Page 2

HWY-DD 2.8019

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Ms. Nicole Lui
November 28, 2014
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HWY-DD 2.8019

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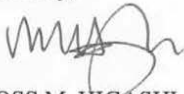
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ROSS M. HIGASHI
Interim Director of Transportation

Enclosures

c: Kai Hawaii, Inc., FHWA (Meesa Otani); DPW (Casey Yanagihara)

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GOVERNOR



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

ROSS M. HIGASHI
INTERIM DIRECTOR

Deputy Directors
JEFFREY CHANG
RANDY GRUNE
AUDREY HIDANO
JADINE URASAKI

IN REPLY REFER TO:

HWY-DD 2.8019

November 28, 2014

Mr. Curtis Tyler
73-1366 Kaiminani Drive
Kailua-Kona, Hawaii 96740

Dear Mr. Tyler:

Subject: National Historic Preservation Act Section 106 Consultation
Alii Drive Culvert Replacement
Kahului Ahupuaa, North Kona District, Hawaii Island
Federal-Aid Project No. STP-0186(1)
Tax Map Keys: (3) 7-5-019:007, 008, 009, and 016

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The proposed project would utilize federal funding and would be considered a federal action and undertaking, as defined by the Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (2006). Therefore, the FHWA requires compliance with the National Environmental Policy Act, NHPA, and other federal requirements. The FHWA has authorized HDOT and the DPW to act on behalf of the FHWA regarding the NHPA Section 106 notification and consultation. We would like to invite you to participate in the Section 106 consultation for the proposed project in accordance with Title 36 of the *Code of Federal Regulations*, Section 800.3.

Mr. Curtis Tyler
November 28, 2014
Page 2

HWY-DD 2.8019

Overview of the Undertaking

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The existing culvert structure and portions of Parcels 007, 008, 009, and 016 extending *mauka* as well as to the north and south of the culvert would be disturbed as part of the construction activities. These activities include the demolition of the culvert, the reconfiguration of the drainage channel and adjacent floodplain to better accommodate a 100-year storm scenario, and the redesign and relocation of the new travel lanes. The boundary of this proposed work activity can be seen on Figure 3, and after consultation with the State Historic Preservation Division (SHPD), it is this area that we believe constitutes an appropriate Area of Potential Effect (APE) for this undertaking. Excavation for the two new abutments would extend approximately three feet into the basalt. The remainder of the stream channel would remain at approximately the existing elevation, including the widened portion of the stream channel. No effects, direct or indirect, are expected beyond the limits of the APE.

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The project area is located along the coast within the greater Kailua-Kona village area. During Precontact times this area was used extensively for habitation and burial by the *makaainana* as well as the *alii*. Several habitation and burial sites as well as a substantial *heiau* have been documented in the area just *mauka* of the current proposed APE. As a result of the *Mahele*, Kahului 1st was retained as government land and Kahului 2nd was awarded to Grace Kamaikui, daughter of John Young. Kahului 1st was later granted to Kaupena. Within and adjacent to the current proposed APE there were three *kuleana* land commission awards made to Kalawa, Kuapuu, and Niniha. All three of these awards were for house lots. While two of these lots were abandoned by the early twentieth century, the third (Kalawa-Makuakane) had seen continuous family occupation until the 1990s. The area *mauka* of the proposed APE was incorporated into the Gomes Ranch in 1927 as cattle grazing lands. This area was later sold and converted to resort use, now operated by Wyndham Hotels and Resorts.

Mr. Curtis Tyler
November 28, 2014
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HWY-DD 2.8019

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Mr. Curtis Tyler
November 28, 2014
Page 4

HWY-DD 2.8019

We would appreciate a written response within 30 days from date of receipt, to Mr. Casey Yanagihara of the County of Hawaii, via email at cyanagihara@co.hawaii.hi.us, or by U.S. Postal Service to the Department of Public Works, 101 Pauahi Street, Suite 7, Hilo, Hawaii 96720.

Please feel free to contact Mr. Casey Yanagihara at (808) 961-8004 if you have any questions. Mr. Robert Sun, HDOT project manager, is also available to contact upon request at (808) 692-7578. We look forward to working with you on this much needed project.

Sincerely,



ROSS M. HIGASHI
Interim Director of Transportation

Enclosures

c: Kai Hawaii, Inc., FHWA (Meesa Otani); DPW (Casey Yanagihara)

NEIL ABERCROMBIE
GOVERNOR



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

ROSS M. HIGASHI
INTERIM DIRECTOR

Deputy Directors
JEFFREY CHANG
RANDY GRUNE
AUDREY HIDANO
JADINE URASAKI

IN REPLY REFER TO:

HWY-DD 2.8019

November 28, 2014

Ms. Cynthia Nazzaro
P.O. Box 5684
Kailua-Kona, Hawaii 96745

Dear Ms. Nazzaro:

Subject: National Historic Preservation Act Section 106 Consultation
Alii Drive Culvert Replacement
Kahului Ahupuaa, North Kona District, Hawaii Island
Federal-Aid Project No. STP-0186(1)
Tax Map Keys: (3) 7-5-019:007, 008, 009, and 016

On behalf of the Federal Highway Administration (FHWA) and the County of Hawaii Department of Public Works (DPW), the State of Hawaii Department of Transportation (HDOT) would like to invite you to participate in consultation for this proposed culvert replacement project.

The project addresses issues with a double-cell culvert on Alii Drive at Kahului Bay in Kailua-Kona, Island of Hawaii, known as Kahului Bridge (see enclosed maps in Figure 1 and photographs in Figure 2). The work is intended to repair deterioration and to resize the culvert openings to meet current design guidelines. The roadway deck will also be widened to improve conditions for vehicular, pedestrian, and bicycle access across the Kahului drainage channel.

The proposed project would utilize federal funding and would be considered a federal action and undertaking, as defined by the Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (2006). Therefore, the FHWA requires compliance with the National Environmental Policy Act, NHPA, and other federal requirements. The FHWA has authorized HDOT and the DPW to act on behalf of the FHWA regarding the NHPA Section 106 notification and consultation. We would like to invite you to participate in the Section 106 consultation for the proposed project in accordance with Title 36 of the *Code of Federal Regulations*, Section 800.3.

Ms. Cynthia Nazzaro
November 28, 2014
Page 2

HWY-DD 2.8019

Overview of the Undertaking

The existing concrete and stone, double-cell structure culvert dates from 1937 and on top is a concrete deck supporting two ten-foot lanes for vehicles and a narrow shoulder. The culvert structure has a number of issues, including spalls exposing corroded steel on the underside of the concrete deck. The culvert openings will be enlarged to pass the 100-year design flood from the gulch that it spans, which has promoted recurrent floods that have damaged adjacent properties. The stream embankments are often overtopped during heavy storms, flooding adjacent private property. In heavier storms, the flooding can overtop Alii Drive itself. In addition, the bridge is considered to be functionally obsolete because of the non-conforming travel lanes and shoulders. The existing shoulders above the culvert will be widened for improved pedestrian/bicycle passage. The purpose of the project is to construct a properly sized structure that meets the needs of motorists, pedestrians, and bicycles, and reduces flood hazard in the area. In order to accomplish this, it is necessary to replace the culvert with a larger structure, expand the flood channel, and widens the roadway above to accommodate a bike lane and raised sidewalk. Construction would be phased in order to maintain two lanes of traffic at all times, and is expected to last approximately one year. Construction would take place during daytime hours.

The existing culvert structure and portions of Parcels 007, 008, 009, and 016 extending *mauka* as well as to the north and south of the culvert would be disturbed as part of the construction activities. These activities include the demolition of the culvert, the reconfiguration of the drainage channel and adjacent floodplain to better accommodate a 100-year storm scenario, and the redesign and relocation of the new travel lanes. The boundary of this proposed work activity can be seen on Figure 3, and after consultation with the State Historic Preservation Division (SHPD), it is this area that we believe constitutes an appropriate Area of Potential Effect (APE) for this undertaking. Excavation for the two new abutments would extend approximately three feet into the basalt. The remainder of the stream channel would remain at approximately the existing elevation, including the widened portion of the stream channel. No effects, direct or indirect, are expected beyond the limits of the APE.

Culture-Historical Background

The project area is located along the coast within the greater Kailua-Kona village area. During Precontact times this area was used extensively for habitation and burial by the *makaainana* as well as the *alii*. Several habitation and burial sites as well as a substantial *heiau* have been documented in the area just *mauka* of the current proposed APE. As a result of the *Mahele*, Kahului 1st was retained as government land and Kahului 2nd was awarded to Grace Kamaikui, daughter of John Young. Kahului 1st was later granted to Kaupena. Within and adjacent to the current proposed APE there were three *kuleana* land commission awards made to Kalawa, Kuapuu, and Niniha. All three of these awards were for house lots. While two of these lots were abandoned by the early twentieth century, the third (Kalawa-Makuakane) had seen continuous family occupation until the 1990s. The area *mauka* of the proposed APE was incorporated into the Gomes Ranch in 1927 as cattle grazing lands. This area was later sold and converted to resort use, now operated by Wyndham Hotels and Resorts.

Ms. Cynthia Nazzaro
November 28, 2014
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HWY-DD 2.8019

Summary of Potential Historic Properties within the APE

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Ms. Cynthia Nazzaro
November 28, 2014
Page 4

HWY-DD 2.8019

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Sincerely,



ROSS M. HIGASHI
Interim Director of Transportation

Enclosures

c: Kai Hawaii, Inc., FHWA (Meesa Otani); DPW (Casey Yanagihara)

NEIL ABERCROMBIE
GOVERNOR



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

ROSS M. HIGASHI
INTERIM DIRECTOR

Deputy Directors
JEFFREY CHANG
RANDY GRUNE
AUDREY HIDANO
JADINE URASAKI

IN REPLY REFER TO:

HWY-DD 2.8019

November 28, 2014

Mr. Hiram Rivera
73-4354 Mamalahoa Highway, #204
Kailua-Kona, Hawaii 96740

Dear Mr. Rivera:

Subject: National Historic Preservation Act Section 106 Consultation
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Mr. Hiram Rivera
November 28, 2014
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HWY-DD 2.8019

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Mr. Hiram Rivera
November 28, 2014
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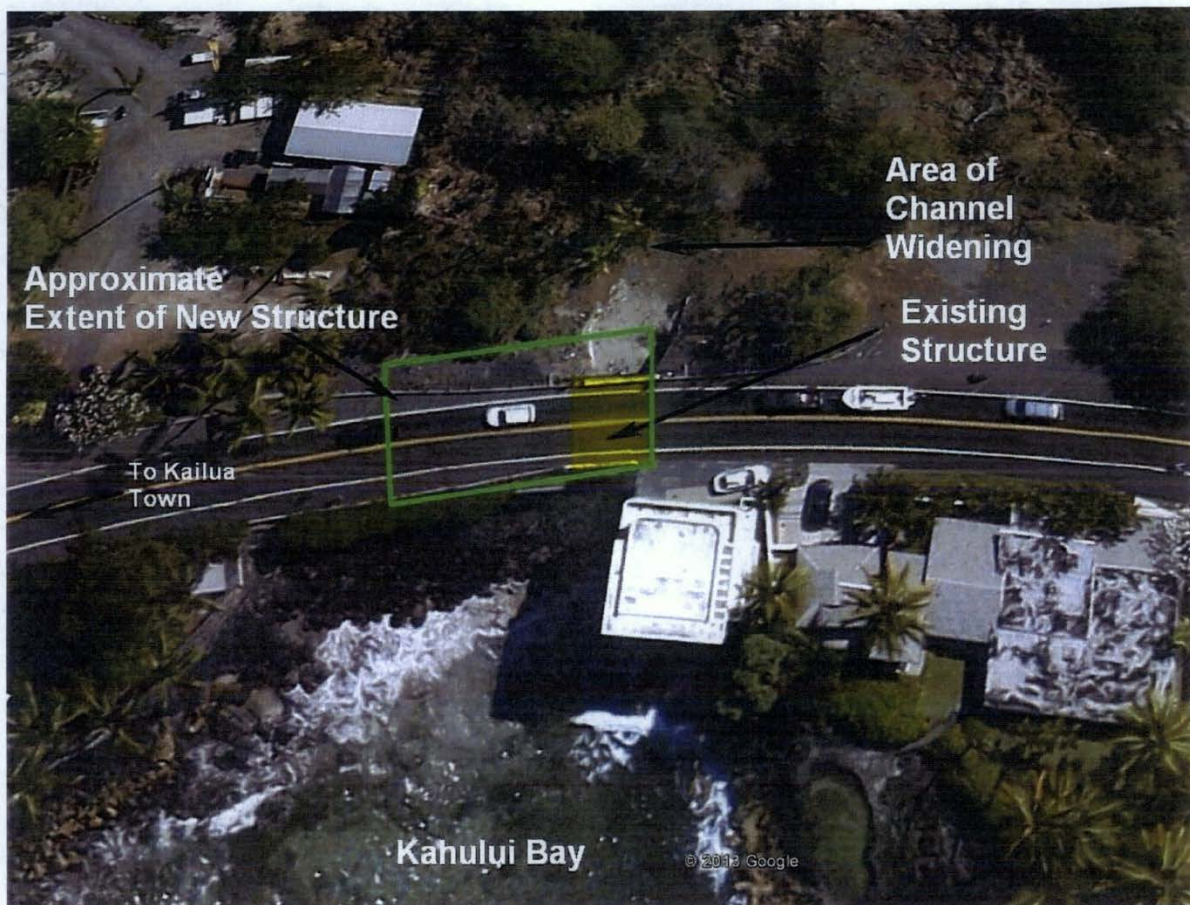
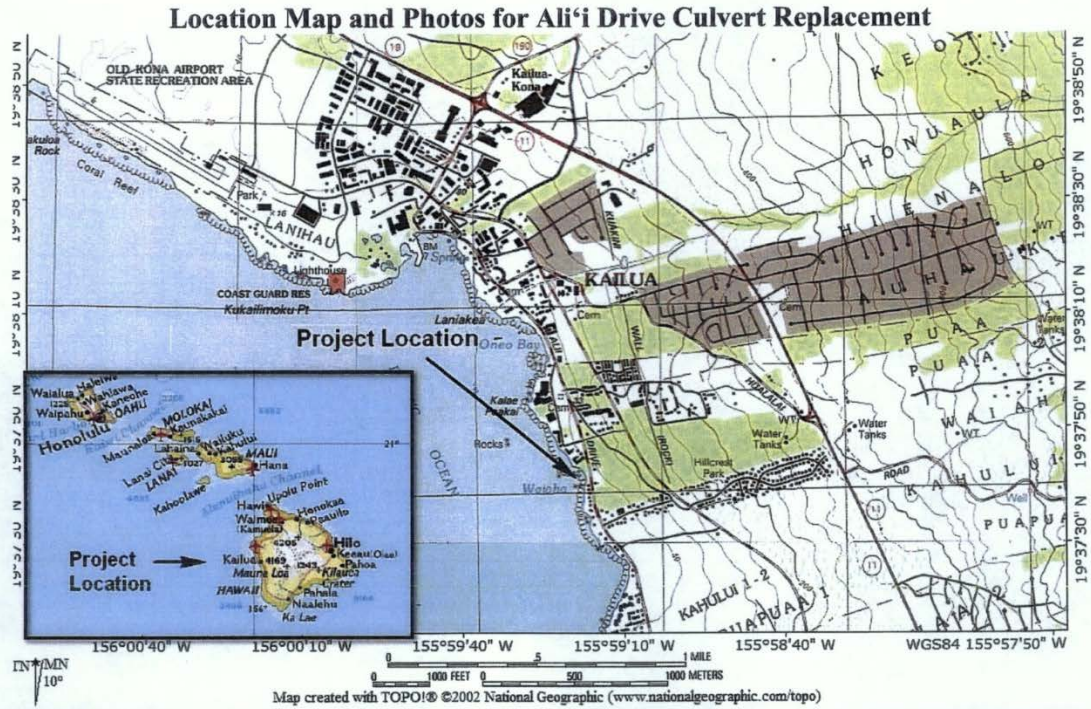
Sincerely,



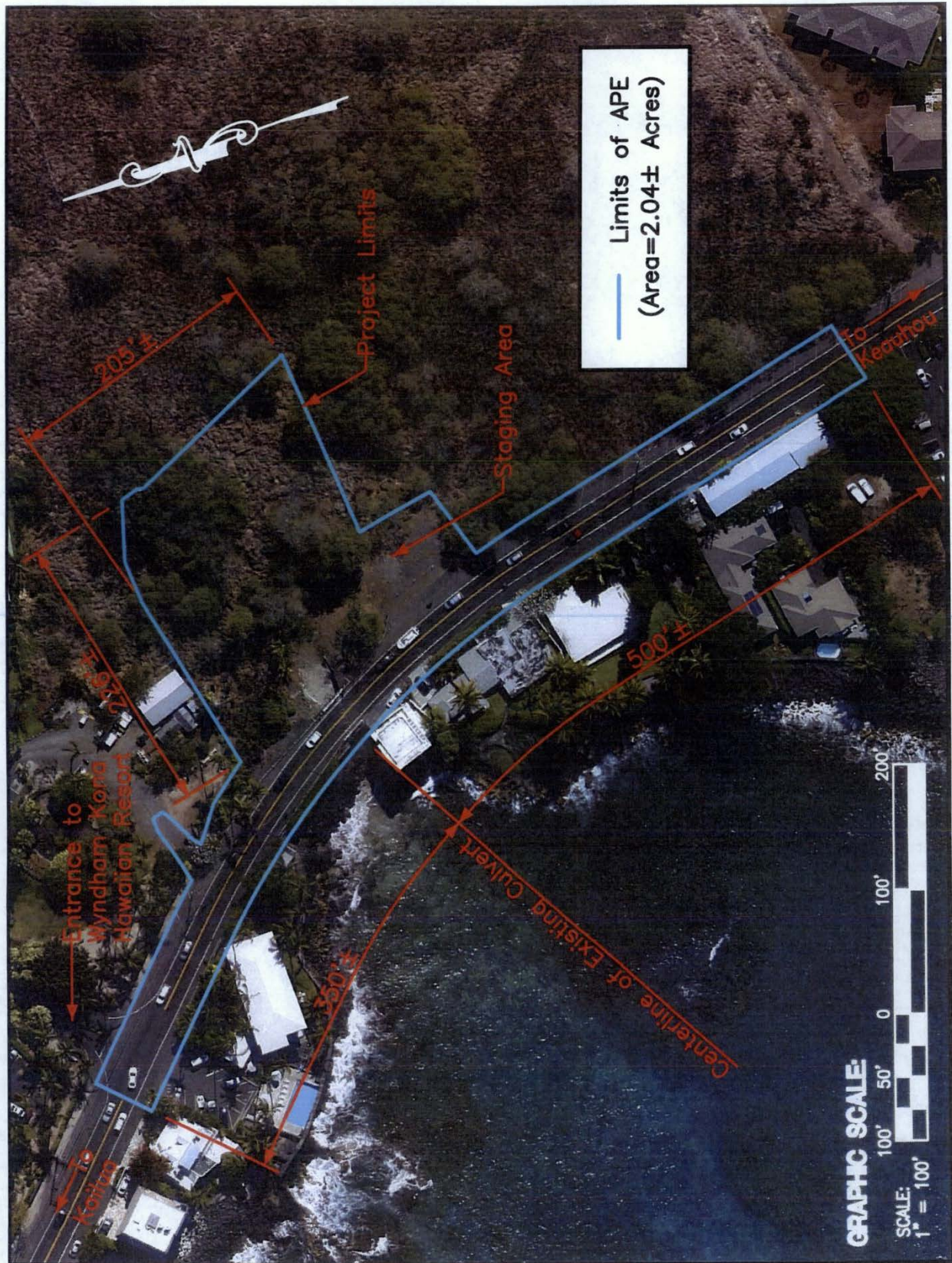
ROSS M. HIGASHI
Interim Director of Transportation

Enclosures

c: Kai Hawaii, Inc., FHWA (Meesa Otani); DPW (Casey Yanagihara)







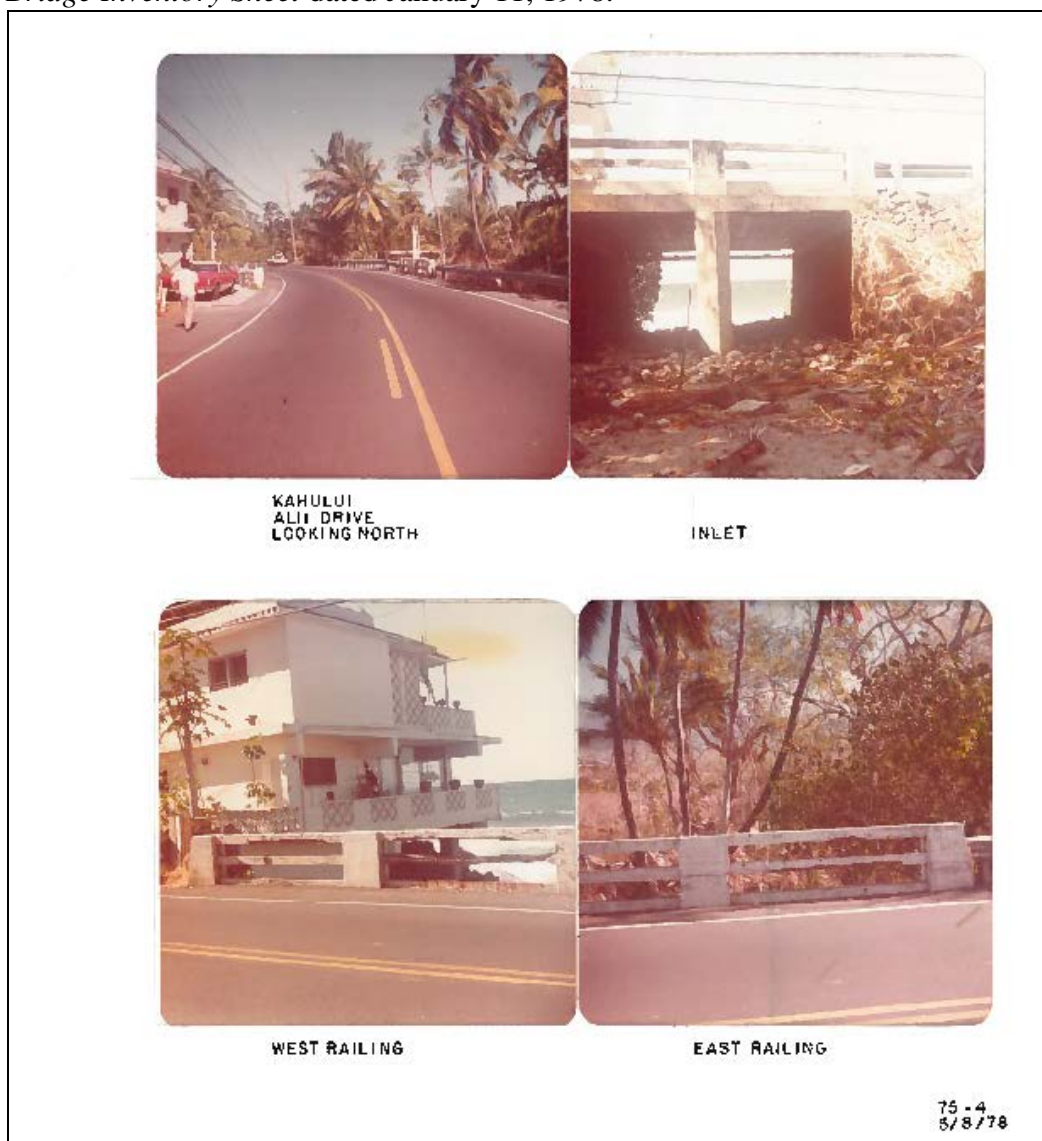
APPENDIX C – Integrity Assessment for the Kahului Bridge on Ali‘i Drive

Prepared June 2016 by: Tonia S. Moy, AIA

Tonia Moy meets the Secretary of Interior Professional Standards for Architectural Historian.

The Kahului Bridge (Inventory #0017500001100004) was identified as eligible in the *2013 State Historic Bridge Inventory and Evaluation* (MKE and Fung 2013) under Criterion C. However, further research indicates that multiple changes to the bridge have affected its historic and structural integrity to a point where the bridge no longer retains enough of its character-defining features to be considered eligible for the NRHP.

Below is a page from the *State of Hawaii, Department of Transportation Highways Division Bridge Inventory Sheet* dated January 11, 1978.



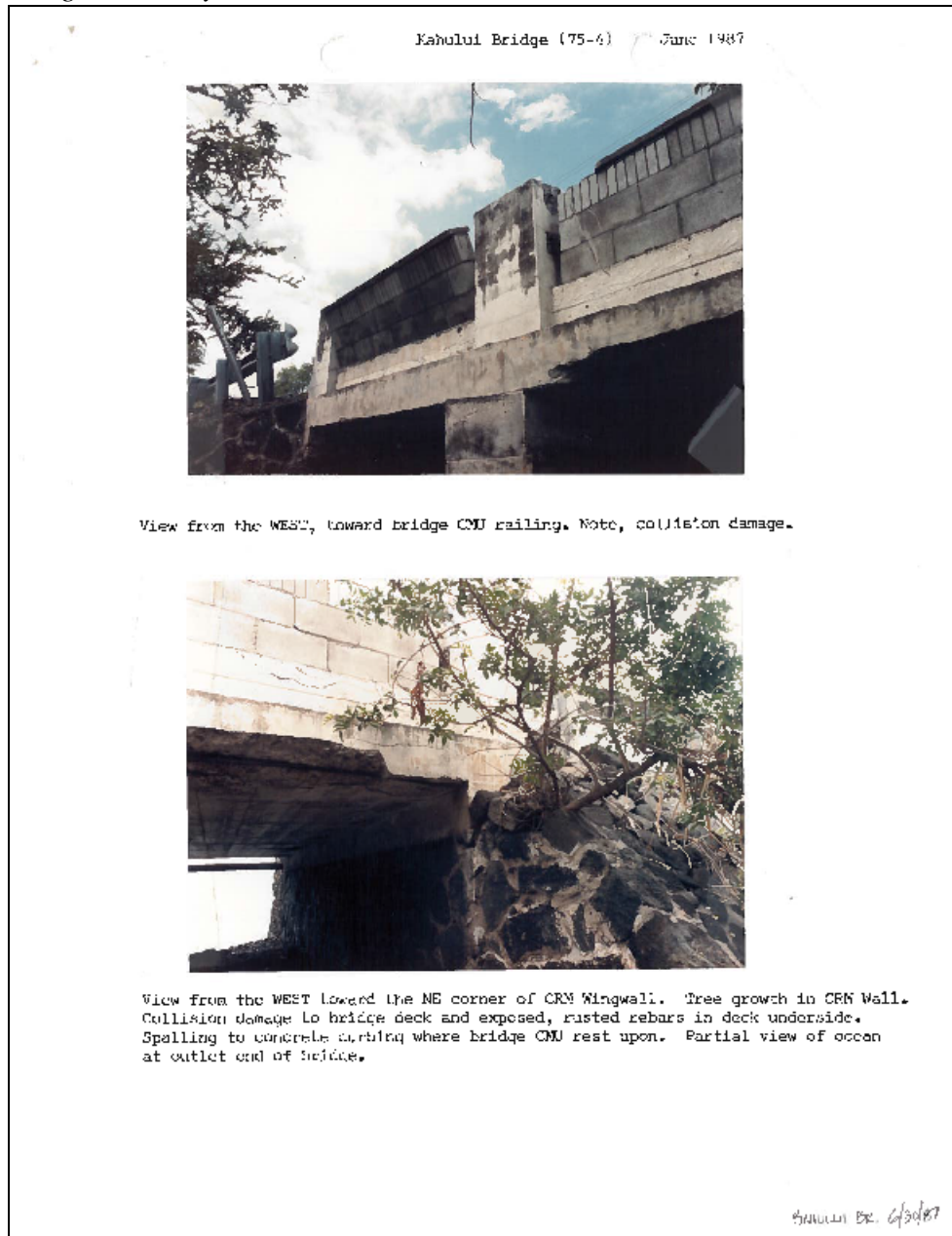
As evidenced by this photo, there was clear deterioration of both rails, but especially the *makai* or ocean side rails labeled “WEST RAILING.” The design of the railing appears to be open horizontal rails evenly spaced with a center pilaster and two end posts of approximately the same size.

Below is a page from the *Structure Inventory and Appraisal Sheet Abridged (Short Form)* dated October 6, 1982.



By the October 6, 1982 inspection, the *makai* side railing has completely spalled such that only the rebars remain in the center rail.

Below is a page from the *State of Hawaii Department of Transportation Highways Division Bridge Inventory Sheet* dated June 30, 1987.



Photos indicate that somewhere between 1982 and 1987, the top and middle rails were removed and the parapet infilled with CMU.

Attached is the Inventory Sheets for the Kahului Bridge when the statewide inventory report was done. Note that the Statewide Inventory was based on photographs and past reports due to the financial constraints of HDOT at the time and relied heavily on local HDOT sources. Also attached are additional photos of what the bridge looks like today indicating that the top rail has

also been changed sometime between 1987 and 2013, most likely after the 1987 collision damage.

Photos also indicate spalling so severe that approximately two-thirds of any original railing is no longer extant. As indicated by photos, the bridge has lost six of the seven aspects of historic integrity. The only aspect of integrity that remains is Location. The following aspects of integrity have been severely compromised:

- Design: Historic parapet was three horizontal rails with three posts, the current appearance is a solid parapet.
- Setting: New buildings surrounding the area would not have been there in 1937, though that is not as severe a compromise as the other aspects.
- Materials: The parapets are essentially all new material.
- Workmanship: The workmanship of the abutments and center pier below the deck remain, however, the parapets have been completely altered.
- Feeling and Association: The bridge was thought to be eligible for its overall appearance as a bridge representing the era, however, that association is no longer there now that the design and materials have been compromised.

Therefore, we believe the bridge has lost both historic and structural integrity to the point it is not eligible for listing on the Hawaii or National Registers of Historic Places. While the rock abutments, with the cutwater on the upstream side of the center pier are somewhat noteworthy, they are not unique and do not constitute enough of the bridge to be worthy of eligibility. It is recommended that a minimum of 1200 X 1600 pixel digital photos be taken of the bridge and its abutments prior to demolition.

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Ali‘i Drive Culvert Replacement at Kahului Bay

Environmental Assessment

APPENDIX 4

Selected Section 404 Clean Water Act Correspondence and Materials

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

April 9, 2014

Regulatory Office

Ron Terry, Ph.D.
Project Environmental Consultant
Geometrician Associates, LLC
P.O. Box 396
Hilo, Hawaii 96721

Dear Dr. Terry:

This letter is in response to your February 14, 2014 request for early consultation with the U.S. Army Corps of Engineers (Corps) and input on the County of Hawaii's Environmental Assessment (EA) and Federal Highway Administration's EA that are being prepared pursuant to Chapter 343, Hawaii Revised Statutes and National Environmental Policy Act, respectively, for the proposed Ali'i Drive Culvert Replacement Project located in Kailua-Kona, Island of Hawaii, Hawaii (TMKs 7-5-019:007, 008, 009 and 016). We have assigned Corps file number POH-2014-00045 to this action, which you should refer to in any future communications with our office on this project.

According to your letter, the County of Hawaii, Department of Public Works (DPW) proposes to replace an existing double-cell culvert on Ali'i Drive at Kahului Bay with a larger structure, expand the flood control channel, and widen the roadway to accommodate a bike lane and raised sidewalk. Kahului Bay (Pacific Ocean) is a navigable water of the United States (U.S.) and therefore, certain work or construction activities in, over, under or affecting this waterway requires Department of the Army (DA) authorization.

As you prepare the draft EA and alternatives to the proposed action, I recommend you identify and characterize all aquatic resources that occur within the study area, including but not limited to, streams (perennial, intermittent, ephemeral), gulches, and wetlands. Under Section 404 of the Clean Water Act ("Section 404"; 33 U.S.C. 1344) a DA permit is required for activities that result in the discharge of dredged or fill material into jurisdictional waters of the U.S., including wetlands. Examples of such activities include, but are not limited to: placing rock for bank protection, temporary or permanent stockpiling of excavated material, bridge abutments for road crossings, replacing or enlarging culverts, backfilling for utility line crossings, constructing outfall structures, allowing runoff or overflow from a contained land or water disposal area to re-enter a water of the U.S., and placing pilings when such placement has or would have the effect of a discharge of fill material. For tidally influenced waters, in the absence of adjacent wetlands, the shoreward limit of the Corps' Section 404 jurisdiction extends to the high tide line, which in Hawai'i may be approximated by reference to the mean higher high water mark. For non-tidal waters, the lateral limits of the Corps' Section 404 jurisdiction

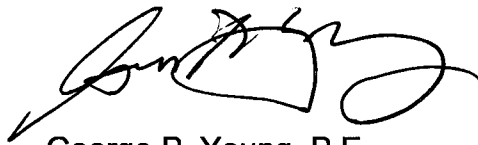
extend to the ordinary high water mark and/or the approved delineated boundary of any adjacent wetlands.

In addition, pursuant to Section 10 of the Rivers and Harbors Act of 1899 ("Section 10"; 33 U.S.C. 403) DA authorization is required for any work or structure in, over, under or affecting navigable waters of the United States. Navigable waters are those waters of the U.S. subject to the ebb and flow of the tide (tidally influenced) shoreward to the mean high water mark and/or are presently used, or have been used in the past, or may be susceptible to use to transport interstate or foreign commerce. Section 10 "work" includes any dredging or disposal of dredged material, excavation, filling, or other modification of a navigable water of the U.S. The term "structure" includes any pier, boat dock, boat ramp, wharf, dolphin, weir, boom, breakwater, bulkhead, revetment, riprap, jetty, artificial island, artificial reef, permanent mooring structure, power transmission line, permanently moored floating vessel, piling, aid to navigation, or any other obstacle or obstruction.

The County of Hawaii, DPW should ensure all practicable steps are taken to avoid and minimize adverse effects to the aquatic environment. Based on our review of the information you have provided, the County of Hawaii, DPW should request a jurisdictional determination to establish the Corps' geographic extent, if any, and determine whether the proposed activities would require DA authorization. For additional permit application information, please visit our website at <http://www.poh.usace.army.mil/EC-R/EC-R.htm>.

If you have any questions or need further assistance, please contact Susan A. Meyer at (808) 835-4599 or susan.a.meyer@usace.army.mil. I encourage you to comment on your experience with Regulatory Division by accessing the Corps web-based customer survey form at http://corpsmapu.usace.army.mil/cm_apex/f?p=regulatory_survey.

Sincerely,

A handwritten signature in black ink, appearing to read "George P. Young", with a stylized flourish at the end.

George P. Young, P.E.
Chief, Regulatory Office



U.S. Department
of Transportation
**Federal Highway
Administration**

Hawaii Federal-Aid Division

August 24, 2015

300 Ala Moana Blvd, Rm 3-306
Box 50206
Honolulu, Hawaii 96850
Phone: (808) 541-2700
Fax: (808) 541-2704

In Reply Refer To:
HDA-HI

Michael Tosatto
Regional Administrator, Pacific Islands Regional Office
National Oceanic and Atmospheric Administration, National Marine Fisheries Service
1845 Wasp Boulevard, Building 176
Honolulu, HI 96818

Subject: National Environmental Policy Act/Clean Water Act Section 404 Integration Process
Ali'i Drive Culvert Replacement
Federal-aid Project No. STP-0186(001)

Dear Mr. Tosatto:

The County of Hawai'i Department of Public Works (DPW), in coordination with the Federal Highway Administration (FHWA) and the Hawai'i Department of Transportation (HDOT), proposes to replace a culvert structure that bridges the Waiaha Drainageway on Ali'i Drive near the shoreline at Kahului Bay, in the North Kona District on the island of Hawai'i.

As the project proposes to use Federal-aid highway funds and requires an Individual Section 404 permit, compliance with the *Memorandum of Understanding (MOU), National Environmental Policy Act (NEPA) and Clean Water Act (CWA) Section 404 Integration Process for Surface Transportation Projects in the State of Hawaii* is required. Commonly called the NEPA-404 MOU, this document was developed and signed by officials of the FHWA, HDOT, U.S. Army Corps of Engineers (USACE), the U.S. Environmental Protection Agency (EPA), the U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS) in 1994-1995. The NEPA-404 MOU provides official guidance on integrating NEPA and Section 404 of the Clean Water Act in the transportation planning and project development stages. This allows the earliest possible consideration of environmental concerns pertaining to waters of the U.S., including wetlands, in order to avoid or minimize adverse impacts to waters of the U.S. and associated sensitive species, including threatened and endangered species.

According to the MOU, for an Environmental Assessment (EA) that is likely to require an individual Department of Army permit, HDOT and FHWA may initiate a pre-scoping process. HDOT and FHWA will invite the USACE, EPA, FWS, and NMFS (when marine resources are involved) to actively participate in the project development process. The USACE, EPA, FWS, and NMFS will each choose to participate in the project development process at an appropriate level of involvement depending on the quality and quantity of resource involved (e.g., choose not to participate in some or all of the project meetings).

The agreement points for the process are below:

- Purpose and Need of the project,
- Criteria for alternative selection,
- Project alternatives to be evaluated in EA,
- Preliminary preferred alternative (if known), and
- Level of agency involvement.

Enclosed is a document that describes the purpose and need of the project and the preliminary alternatives. Each of these alternatives have been explored to some depth in order to understand their advantages and disadvantages, which are listed and discussed. Based on the ability of each alternative to meet purpose and need, as well as environmental factors and cost considerations, only Alternative 1 and Alternative 6 are proposed for further study in the EA.

FHWA and HDOT invite you to participate in the NEPA-404 MOU Process for the Ali'i Drive Culvert Replacement project. At this time, we seek your concurrence on the first three points: Purpose and Need, Criteria for alternative selection, and project alternatives to be evaluated in the EA. We also invite any comments you may have on this document. If you have any questions, please feel free to contact me at (808) 541-2316 or by email at meesa.otani@dot.gov.

Sincerely yours,



Meesa Otani
Environmental Engineer

Enclosure

cc: Patrick Opay (NMFS, w/enclosure), Danielle Jayewardene (NMFS, w/enclosure), Robert Sun (HDOT), Casey Yanagihara (DPW)



U.S. Department
of Transportation
**Federal Highway
Administration**

Hawaii Federal-Aid Division

August 24, 2015

300 Ala Moana Blvd, Rm 3-306
Box 50206
Honolulu, Hawaii 96850
Phone: (808) 541-2700
Fax: (808) 541-2704

In Reply Refer To:
HDA-HI

Michelle Lynch
Chief, Regulatory Branch
U.S. Army Corps of Engineers, Honolulu District Regulatory Office
Building 230, CEPOH-RO
Ft. Shafter, HI 96858-5440

Subject: National Environmental Policy Act/Clean Water Act Section 404 Integration Process
Ali'i Drive Culvert Replacement
Federal-aid Project No. STP-0186(001)

Dear Ms. Lynch:

The County of Hawai'i Department of Public Works (DPW), in coordination with the Federal Highway Administration (FHWA) and the Hawai'i Department of Transportation (HDOT), proposes to replace a culvert structure that bridges the Waiaha Drainageway on Ali'i Drive near the shoreline at Kahului Bay, in the North Kona District on the island of Hawai'i.

As the project proposes to use Federal-aid highway funds and requires an Individual Section 404 permit, compliance with the *Memorandum of Understanding (MOU), National Environmental Policy Act (NEPA) and Clean Water Act (CWA) Section 404 Integration Process for Surface Transportation Projects in the State of Hawaii* is required. Commonly called the NEPA-404 MOU, this document was developed and signed by officials of the FHWA, HDOT, U.S. Army Corps of Engineers (USACE), the U.S. Environmental Protection Agency (EPA), the U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS) in 1994-1995. The NEPA-404 MOU provides official guidance on integrating NEPA and Section 404 of the Clean Water Act in the transportation planning and project development stages. This allows the earliest possible consideration of environmental concerns pertaining to waters of the U.S., including wetlands, in order to avoid or minimize adverse impacts to waters of the U.S. and associated sensitive species, including threatened and endangered species.

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FHWA and HDOT invite you to participate in the NEPA-404 MOU Process for the Ali'i Drive Culvert Replacement project. At this time, we seek your concurrence on the first three points: Purpose and Need, Criteria for alternative selection, and project alternatives to be evaluated in the EA. We also invite any comments you may have on this document. If you have any questions, please feel free to contact me at (808) 541-2316 or by email at meesa.otani@dot.gov.

Sincerely yours,



Meesa Otani
Environmental Engineer

Enclosure

cc: Susan Meyer (USACE, w/enclosure), Jessie Paahana (USACE, w/enclosure), Robert Sun (HDOT), Casey Yanagihara (DPW)



U.S. Department
of Transportation
**Federal Highway
Administration**

Hawaii Federal-Aid Division

August 24, 2015

300 Ala Moana Blvd, Rm 3-306
Box 50206
Honolulu, Hawaii 96850
Phone: (808) 541-2700
Fax: (808) 541-2704

In Reply Refer To:
HDA-HI

Kristi Young
Acting Field Supervisor, Pacific Islands Fish and Wildlife Office
U.S. Fish and Wildlife Service
300 Ala Moana Boulevard, Room 3-122
Honolulu, HI 96850

Subject: National Environmental Policy Act/Clean Water Act Section 404 Integration Process
Ali'i Drive Culvert Replacement
Federal-aid Project No. STP-0186(001)

Dear Ms. Young:

The County of Hawai'i Department of Public Works (DPW), in coordination with the Federal Highway Administration (FHWA) and the Hawai'i Department of Transportation (HDOT), proposes to replace a culvert structure that bridges the Waiaha Drainageway on Ali'i Drive near the shoreline at Kahului Bay, in the North Kona District on the island of Hawai'i.

As the project proposes to use Federal-aid highway funds and requires an Individual Section 404 permit, compliance with the *Memorandum of Understanding (MOU), National Environmental Policy Act (NEPA) and Clean Water Act (CWA) Section 404 Integration Process for Surface Transportation Projects in the State of Hawaii* is required. Commonly called the NEPA-404 MOU, this document was developed and signed by officials of the FHWA, HDOT, U.S. Army Corps of Engineers (USACE), the U.S. Environmental Protection Agency (EPA), the U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS) in 1994-1995. The NEPA-404 MOU provides official guidance on integrating NEPA and Section 404 of the Clean Water Act in the transportation planning and project development stages. This allows the earliest possible consideration of environmental concerns pertaining to waters of the U.S., including wetlands, in order to avoid or minimize adverse impacts to waters of the U.S. and associated sensitive species, including threatened and endangered species.

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Sincerely yours,



Meesa Otani
Environmental Engineer

Enclosure

cc: Michelle Bogardus (FWS, w/enclosure), Robert Sun (HDOT), Casey Yanagihara (DPW)



U.S. Department
of Transportation
**Federal Highway
Administration**

Hawaii Federal-Aid Division

August 24, 2015

300 Ala Moana Blvd, Rm 3-306
Box 50206
Honolulu, Hawaii 96850
Phone: (808) 541-2700
Fax: (808) 541-2704

In Reply Refer To:
HDA-HI

Jared Blumenfeld
Regional Administrator
U.S. Environmental Protection Agency, Region 9
75 Hawthorne Street
San Francisco, CA 94105

Subject: National Environmental Policy Act/Clean Water Act Section 404 Integration Process
Ali'i Drive Culvert Replacement
Federal-aid Project No. STP-0186(001)

Dear Mr. Blumenfeld:

The County of Hawai'i Department of Public Works (DPW), in coordination with the Federal Highway Administration (FHWA) and the Hawai'i Department of Transportation (HDOT), proposes to replace a culvert structure that bridges the Waiaha Drainageway on Ali'i Drive near the shoreline at Kahului Bay, in the North Kona District on the island of Hawai'i.

As the project proposes to use Federal-aid highway funds and requires an Individual Section 404 permit, compliance with the *Memorandum of Understanding (MOU), National Environmental Policy Act (NEPA) and Clean Water Act (CWA) Section 404 Integration Process for Surface Transportation Projects in the State of Hawaii* is required. Commonly called the NEPA-404 MOU, this document was developed and signed by officials of the FHWA, HDOT, U.S. Army Corps of Engineers (USACE), the U.S. Environmental Protection Agency (EPA), the U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS) in 1994-1995. The NEPA-404 MOU provides official guidance on integrating NEPA and Section 404 of the Clean Water Act in the transportation planning and project development stages. This allows the earliest possible consideration of environmental concerns pertaining to waters of the U.S., including wetlands, in order to avoid or minimize adverse impacts to waters of the U.S. and associated sensitive species, including threatened and endangered species.

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Sincerely yours,



Meesa Otani
Environmental Engineer

Enclosure

cc: Connell Dunning (EPA, w/enclosure), Jason Brush (EPA, w/enclosure), Zac Appleton (EPA, w/enclosure), Robert Sun (HDOT), Casey Yanagihara (DPW)



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

October 28, 2015

Meesa Otani
Environmental Engineer
Federal Highway Administration
Hawaii Federal-Aid Division
300 Ala Moana Boulevard, Room 3-306
Honolulu, Hawaii 96850

Dear Ms. Otani:

This letter is in response to your August 24, 2015 invitation for the U.S. Army Corps of Engineers (Corps) to participate in the interagency coordination process prescribed in the *Memorandum of Understanding (MOU), National Environmental Policy Act (NEPA) and Clean Water Act (CWA) Section 404 Integration Process for Surface Transportation Projects in the State of Hawaii* (herein "NEPA/404 MOU") for the proposed Ali'i Drive Culvert Replacement Project located in Kailua-Kona, Island of Hawaii, Hawaii (TMKs (3) 7-5-019:007, 008, 009 and 016). We have assigned Corps file number POH-2014-00045 to this action, which you should refer to in any future communications with our office on this project.

According to the project description enclosed with your letter of invitation, the County of Hawaii, Department of Public Works (DPW) proposes to replace an existing double-cell culvert on Ali'i Drive at Kahului Bay with a larger structure, expand the capacity of the Kahului Drainageway (also known as the Waiaha Drainageway) to provide capacity for the 100-year flood, and widen the roadway to accommodate a bike lane and raised sidewalk.

Based on our cursory review of the project information you provided, we recommend that the State of Hawaii, Department of Transportation (HDOT) and the County of Hawaii DPW first determine the geographic extent of waters of the United States (U.S.) occurring within the project limits to help gauge the level, or range, of impacts to jurisdictional waters of the U.S. In doing so, this information will help to inform the applicant of the potential Department of the Army (DA) permitting strategy and then based upon the type of DA permit that would be processed (i.e., Nationwide Permit versus standard individual permit) we can collectively determine whether there is a need to formally engage in the NEPA/404 MOU process. However, until such basic jurisdictional information is known, we have conservatively assumed a standard individual permit will be required, thereby requiring that the project progress under the NEPA/404 MOU procedures. Should it later be determined that the subject project is not required to follow the NEPA/404 MOU integration process, we nonetheless would anticipate that any early feedback provided by the Corps to Federal Highway Administration (FHWA), HDOT, and County of Hawaii, DPW would remain useful and relevant.

Regarding the proposed Purpose and Need (P&N) statement, page 3 of your enclosed documentation indicates:

“The Purpose of the project has several elements:

- Enlarge the culvert openings and channel upstream to pass the 100-year flood;
- Provide a structure that is structurally sound for the required motor vehicle loads;
- Maximize safety for motor vehicles, pedestrians and bicycles;
- Accommodate the water and sewer utilities that traverse the drainageway; and
- Properly assess and protect the greatest practical degree the scenic, historic and water resources present.”

We recommend HDOT and County of Hawaii, DPW consider the following revisions to the P&N statement as follows:

“The purpose of the proposed project is to improve the safety and structural integrity of the existing road along Ali'i Drive where it crosses the Kahului Drainageway. More specifically, the objectives of the project are to: provide engineering and structural improvements between station [xx+xx] and station [yy+yy] to support current and projected future vehicular loads and traffic volumes; attenuate localized flooding at Ali'i Drive caused by the existing undersized culverts; accommodate existing utilities; and integrate current American Association of State Highway Transportation Officials design standards and American with Disabilities Act standards for improved public safety.”

In our August 9, 2014 letter addressed to Ron Terry of Geometrician Associates, LLC (the designated agent for the applicant) we emphasized the importance of HDOT and the County of Hawaii, DPW taking all practicable steps to avoid and minimize adverse impacts on the aquatic environment. The most straightforward way to accomplish this would be to avoid extensive hardening of the stream channel and/or stream banks, as well as avoid unnecessary increases in stream velocities that could in turn, increase soil erosion, siltation, and facilitate the transport of pollutants to the Pacific Ocean (e.g., petroleum-based pollutants, sediments). The proposed alternatives described in your documentation involve alternatives that would alone or in combination harden the channel, construct levees along the Kahului Drainageway, create a 10-acre (+/-) detention basin, and/or substantially deepen the existing channel. However, in all cases, the proposed alternatives fail to include one or more options that would evaluate a complete span of the Kahului Drainageway and other design variations that would involve bio-engineering techniques in lieu of channel hardening to achieve the overall

project purposes. Water quality and habitat degradation, increased soil erosion and sedimentation, loss of pervious area, and channel hardening (i.e., concrete, grouted riprap, etc.) are all areas of heightened environmental concern because of the proximity of the project to Kahului Bay. Therefore, in the absence of with- and without-project hydraulic data and analysis, baseline environmental conditions, and documentation to justify why certain avoidance and minimization alternatives are not *practicable*¹, the Corps cannot agree to the range of alternatives presented in your August 24th letter. We continue to recommend HDOT and County of Hawaii, DPW explore alternatives that incorporate bio-engineering techniques and involve less hardening of the channel substrate and streambanks.

In moving forward, the Corps suggests FHWA and HDOT convene an interagency coordination meeting to update the NEPA/404 MOU signatory agencies on the status of the project, review agency comments received in response to FHWA's August 24, 2015 letter of invitation and request for agreement on the P&N statement, alternative selection criteria, and range of alternatives. We also suggest the NEPA/404 MOU signatory agencies discuss and agree to next steps, identify required data and technical analyses, and understand the proposed schedule related to the NEPA/404 MOU process and preparation of the draft environmental assessment.

Related to overall interagency coordination and public transparency, we would appreciate an understanding from FHWA, as the lead Federal agency, as to whether this project could result in significant environmental impacts that would necessitate the preparation of an environmental impact statement, especially if the proposed project were to involve the construction of a detention basin and/or levees. If so, it may require tracking on the Office of Management and Budget (OMB) "Dashboard" for Federal Infrastructure projects per Presidential Memorandum, dated May 17, 2013, Executive Order 13604, and the joint OMB/Council on Environmental Quality Memorandum (OMB M-15-20), dated September 22, 2015, regarding Guidance Establishing Metrics for the Permitting and Environmental Review of Infrastructure Projects.

We look forward to working with you on this transportation infrastructure project. If you have any questions or need further assistance, please contact Susan A. Meyer Gayagas at (808) 835-4599 or susan.a.meyer@usace.army.mil. I encourage you to

¹ "Practicable" is defined in Federal regulation as an alternative that is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes [40 C.F.R. 230.10(a)(2)].

comment on your experience with our Regulatory Office by accessing the Corps web-based customer survey form at
http://corpsmapu.usace.army.mil/cm_apex/f?p=regulatory_survey.

Sincerely,

A handwritten signature in dark ink, appearing to read "Michelle Lynch". The signature is fluid and cursive, with the first name "Michelle" written in a larger, more prominent script than the last name "Lynch".

Michelle R. Lynch
Chief, Regulatory Office

cc:

Wendy Wiltse, U.S. Environmental Protection Agency, Region IX
Zac Appleton, U.S. Environmental Protection Agency, Region IX
Danielle Jayewardene NOAA, Fisheries, Habitat and Conservation Division
Jayne LeFors, NOAA, Fisheries, Protected Resources Division
Nadiera McCarthy, U.S. Fish and Wildlife Service

ALI'I DRIVE CULVERT REPLACEMENT
Federal-Aid Project No. STP-0186(1)
NEPA/Section 404

Meeting Agenda

Federal Highway Administration (FHWA)
Federal Building, Room 3-306
300 Ala Moana Blvd.
Honolulu, Hawai'i

May 24, 2016, 1:00pm to 3:00pm
Call-in No.: #: 1-888-278-0296, Passcode: 6086595

- **PARTICIPANTS:**
 - USACE:
 - Susan Meyer Gayagas, Senior Project Manager;
Susan.A.Meyer@usace.army.mil
 - EPA:
 - Wendy Wiltse, Regional Administrator; Wiltse.Wendy@epa.gov
 - Zac Appleton; Appleton.Zac@epa.gov (by phone)
 - NOAA/NMFS:
 - Stuart Goldberg - NOAA Affiliate; Stuart.Goldberg@noaa.gov
 - Jayne LeFors, NEPA Project Manager; Jayne.LeFors@noaa.gov (by phone)
 - USFWS
 - Chelsie Javar-Salas; Chelsie_Javar@fws.gov
 - Highway Agencies and Consultant Team:
 - Meesa Otani, FHWA; Meesa.Otani@dot.gov
 - Clifford Chew, FHWA; Clifford.Chew@dot.gov
 - Robert Sun, HDOT; Robert.Sun@hawaii.gov
 - Todd Nishioka, HDOT; Todd.Nishioka@hawaii.gov
 - Misako Mimura, HDOT; Misako.K.Mimura@hawaii.gov
 - Warren Lee, COH-DPW; wlee@hawaiiicounty.gov
 - Casey Yanagihara, COH-DPW; cyanagihara@hawaiiicounty.gov
 - Mike Hunnemann, KAI Hawaii; mike@kaihawaii.com
 - Lennie Okano-Kendrick, Okahara and Associates; lokano@okahara.com
 - Ron Terry, Geometrician Associates; rterry@hawaii.rr.com
- **WELCOME AND INTRODUCTIONS** (Meesa and Casey; All)
- **ALI'I DRIVE CULVERT** (Mike and Ron)
- **NEPA-404 PROCESS** (Ron)

- **BRIEF RECAP OF NEPA-404 COORDINATION TO DATE** (Ron)
 - Early consultation letter of February 14, 2014 to various parties including USACE and letters of March 18, 2014 to USFWS and NMFS requesting species lists; responses
 - Studies of the vegetation and habitat of Waiaha gulch and marine environment offshore
 - Invitation for multi-agency field visit
 - Field visit of April 23, 2015 by USACE.
 - Work on Purpose and Need and Alternatives and letter of August 24, 2015 to NEPA 404 Participants
 - Feedback from this process (conference call of October 8, 2015 and October 28, 2015 letter from USACE)
 - Restart: work on OHWM and April 22, 2016 submittal to USACE of OHWM report and additional Alternatives
- **QUESTIONS AND FUTURE COORDINATION** (Casey; All)

**DEPARTMENT OF PUBLIC WORKS
COUNTY OF HAWAII
HILO, HAWAII**

Date: June 9, 2016

Meeting Minutes

Meeting Date: March 24, 2016

Location: Federal Highways Division Office, 300 Ala Moana Boulevard, Room 3-306

**Ali'i Drive Culvert Replacement
Kahului Bay, Kailua-Kona, Hawai'i
Federal Aid Project No. STP-0186(001)
USACE File No. POH-2014-00045**

Participants:

Susan Meyer Gayagas – *United States Army Corps of Engineers (USACE)*
Wendy Wiltse; Zac Appleton (via telecon) – *Environmental Protection Agency (EPA)*
Jayne LeFors (via telecon); **Stuart Goldberg** (via telecon) – *National Marine Fisheries Service (NMFS)*
Chelsie Javar-Salas – *United States Fish and Wildlife Service (USFWS)*
Kaha'a Rezantes; Meesa Otani; Clifford Chew – *Federal Highway Administration (FHWA)*
Robert Sun; Todd Nishioka; Misako Mimura – *Hawai'i Department of Transportation (HDOT)*
Warren Lee; Casey Yanagihara – *County of Hawai'i (COH)*
Mike Hunnemann – *KAI Hawai'i, Inc.*
Ron Terry – *Geometrician Associates, LLC*
Lennie Okano-Kendrick – *Okahara and Associates, Inc.*

Purpose of Meeting:

The purpose of this meeting was to discuss the National Environmental Policy Act/Clean Water Act, Section 404 Integration (NEPA-404) process.

Project Background:

- Existing culvert is deteriorating and needs to be replaced.
- Existing culvert was built in 1937 and the existing gulch was partially filled for construction of the road and culvert.
- Lots of pedestrian and bicycle activities along Ali'i Drive; speed limit is 25mph, with nonconforming narrow shoulders.

- Beach on outlet side of culvert changes with seasons (white sand to pāhoehoe to ‘ili‘ili rocks) and seawall reflection of waves hampers collection of white sand on the beach.
- Upstream channel vegetation is both native and non-native; further upstream is all non-native. Milo and Kou grow closer to the culvert.
- No threatened or endangered plants or animals in project area.
- Runoff in channel drains quickly after storm event(s); no sitting water.

Existing Culvert:

- 10-foot, double cell culvert is structurally deficient and functionally obsolete.
- Temporary shoring constructed to provide needed structural stability due to deterioration of the culvert.
- Prone to flooding during heavy storm events (overtopping on Ali‘i Drive and flooding of adjacent properties).
- Debris builds up at inlet due to shoring and culvert walls, interfering the flow path.
- 100-year storm flood zone (FIRM) shows inundation along Ali‘i Drive and of adjacent properties.

NEPA-404 MOU Process:

- Cooperating Agencies responded that they are in possession of the NEPA-404 MOU.
- Multi-agency participation to include FHWA, HDOT, EPA, USFWS, USACE, NMFS as appropriate. Agencies can choose level and timing of participation within the process.
- Get agencies agreement on project Purpose and Need, alternative selection criteria, alternatives evaluated in draft Environmental Assessment (DEA), and preferred alternative.
- Obtain Jurisdictional Determination/delineation by USACE on Waters of the U.S.
- Environmental inventory/impact evaluation by HDOT and FHWA.
- Informal endangered species consultation with USFWS and NMFS.
- Develop any necessary mitigation options, if needed.
- Agency participation in DEA via meetings; given chance to review.
- FHWA and HDOT give DEA approval; HDOT submits 404 permit application.
- DEA circulation and Section 404 public notice – may have joint public hearing.
- Final EA development after comments received on DEA – FHWA decide to do Environmental Impact Statement (EIS) or Findings of No Significant Impact (FONSI).
- If FONSI, proceed to either; 1) obtain FHWA approval on preferred alternative meeting Purpose and Need, and blessing to move forward with final design process and permitting, or 2) provide written agreements with USFWS, NMFS, EPA for their approval on project impacts before obtaining FHWA approval and proceeding with final design.

Possible Project Alternatives for Upstream Channel:

1. Bridge replacement with widened channel with hardened bottom and sides.
2. No action.
3. Bridge replacement with 10-acre detention basin.
4. Bridge replacement with deepened channel (no widening); would have to be 25 feet deep with invert elevation of minus 10 feet below sea level.
5. Bridge replacement with levees at channel sides (no widening); levees would need to be higher than bridge deck and runoff would flood road.
6. Bridge replacement with widened channel with natural bottom and hardened sides - per recommendation from USACE to minimize adverse impacts to aquatic environment. ***Question from Susan regarding channel velocity and roughness coefficient used in modeling 100-year storm: 11 feet per second (ft/s) immediately upstream of bridge; 24 ft/s immediately downstream of bridge; $n = 0.025$ for natural channel bottom; $n = 0.035$ for hardened channel sides***

Discussion and Comments:

- USACE, Susan Meyer Gayagas
 - (Along with Wendy Wiltse) suggested utilizing the *2015 Red Book – Synchronizing Environmental Reviews for Transportation and Other Infrastructure Project*, which is a joint publication from USACE, United States Department of Transportation (USDOT), EPA, USFWS, NOAA, and United State Coast Guard (USCG); which lays out the integration process and is a good resource for the NEPA-404 Integration (has templates, examples, etc.). ***A copy of the 2015 Red Book can be found online at: https://www.environment.fhwa.dot.gov/strmlng/Redbook_2015.pdf***
 - In order to determine the USACE geographic limits within this project, they want to verify the Ordinary High Water Mark delineation presented in AECOS's November 24, 2015 report to determine how much Waters of the U.S. are within the project area.
 - USACE would also like to determine the Mean Higher High Water Mark (MHHWM) on the existing sea wall.
 - USACE would like the design team to explore the use of bioengineered devices for use in constructing the channel sides and to incorporate as much as possible into the design.
 - Suggested COH/HDOT/FHWA to ask USACE for a Jurisdictional Determination to determine if the project will need to obtain a General or Individual 404 Permit from USACE.
 - Suggested the Purpose and Need statement specify 100-year flood protection.
- COH-DPW, Warren Lee
 - Flooding occurred prior to 2008 north and south of the existing channel.

- Goal is for bridge design to meet requirements of all current agency standards/requirements (FHWA, HDOT, COH, Environmental)
- Goal is for Plans/Specifications/Estimate (PS&E) to be completed by May 2017, so a Ready-To-Advertise and funds can be obligated by October 2017.
- The County of Hawai‘i receives approximately \$10 million every year from the State to use for various projects. If that money is not used (obligated) within that year, it is lost and goes back to the State.
- For these projects, the Federal funds will be used to cover 80% of the cost, and the County will cover 20% of the cost.
- NMFS, Jayne LeFors
 - The latest alternative showing a natural channel bottom is important for the habitat. It should give the sediment some time to drop out prior to reaching the ocean.
 - Would also like the design team to explore the use of bioengineered devices for the channel sides and to incorporate as much as possible.
- NMFS, Stuart Goldberg
 - Biggest concerns for the fish habitat are turbidity and sedimentation.
 - Installation of project Best Management Practices (BMPs) and requirements from the National Pollutant Discharge Elimination System (NPDES) permit(s) will aid in preventing an increase in turbidity and sedimentation; which the design team is working on.
- EPA, Zac Appleton
 - Favors the natural channel bottom design alternative.
 - Inquired about whether there would be wetland impacts, and if so, the size of impact area. Pursuant to the Terrestrial Biology Report, no wetlands are present, as the stream flows less than yearly, and the water table is far below the surface.
 - Suggested the Purpose and Need statement include reference to the 100-year storm design, bicyclists, and widening of the channel.
- USFWS, Chelsie Javar-Salas
 - On the terrestrial side; noted that it appeared from the report that there would be no endangered plants and wetlands impact, which would be the area of USFWS concern.
 - Noted that Nadiera would be interested in aquatic species and habitat.
 - Consider protection of any ‘ōpe‘ape‘a (Hawaiian Hoary Bat) and ‘io (Hawaiian hawk) habitat, and possible construction impacts to their habitat, when putting together project specifications for construction. Noted that the area did not appear to be habitat for Hawaiian hawks.
- Cultural Resources
 - Bridge eligible for historical register.
 - Archaeology – data recovery will need to be done prior to construction.
 - Section 106 consultation done and there are no issues thus far.

- Establish Points of Contact; Kaha‘a Rezantes
 - FHWA is okay with COH and HDOT contacting the participating agencies on their behalf.
 - All present at the meeting agreed to be their respective agency’s point-of-contact for this project.
- Purpose and Need Statement
 - COH sent out a draft in August 2014 and Susan provided a revised statement adding a little more detail to the statement.
 - Ron will revise the Purpose and Need statement, incorporating discussions from this meeting. This statement will be shared with all agencies for review and comment before finalizing.
 - The estimated area of impact will depend on the design alternative selected.
 - Ensure design alternative selected meets Purpose and Need statement.
 - Try to keep Purpose and Need and design alternative separate.

These meeting minutes are finalized and constitute our understanding of the items discussed, and has been accepted by all participants. Should there be any further questions, please contact Casey Yanagihara at 808-961-8004 or cyanagihara@hawaiiicounty.gov.

*Respectfully submitted,
Casey K. Yanagihara, P.E.
County of Hawai‘i
Department of Public Works*

William P. Kenoi
Mayor

Randall Kurohara
Managing Director



Warren H. W. Lee
Director

Brandon A. K. Gonzalez
Deputy Director

County of Hawai'i
DEPARTMENT OF PUBLIC WORKS

Aupuni Center
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(808) 961-8321 · Fax (808) 961-8630
www.co.hawaii.hi.us

June 14, 2016



Mr. Shane McCoy, Chief, Regulatory Branch
U.S. Army Corps of Engineers, Honolulu District Regulatory Office
Building 230, CEPOH-RO
Ft. Shafter, HI 96858-5440


Attn: Susan Meyer Gayagas

Subject: National Environmental Policy Act/Clean Water Act Section 404 Integration Process
Ali'i Drive Culvert Replacement
Federal-aid Project No. STP-0186(001), USACE file number POH-2014-00045

This letter is to request a Preliminary Jurisdictional Determination for the mouth of the Waiaha Drainageway. The County of Hawai'i expects to be the applicant for a Section 404 Permit that will be filed with your office concerning a proposed culvert replacement, on which we have been coordinating with your office as part of the NEPA-404 MOU process. In the letter of the April 22, 2016 from our Federal partner agency, FHWA-Hawaii Division, we provided a report from our consultant AECOS, Inc., describing a proposed Ordinary High Water Mark (OHWM) for the feature. Please refer to that document for maps, photographs and descriptions of this intermittent stream. In response to your comments about the topographic map in that report showing the OHWM, we are attaching a revised map and cross sections that more clearly labels the features.

Pursuant to discussions with our consultant Ron Terry, we understand that he will be providing information on the PJD Word form that your office provided. When he has completed, we will review and forward it to you as a Word document for your review and completion.

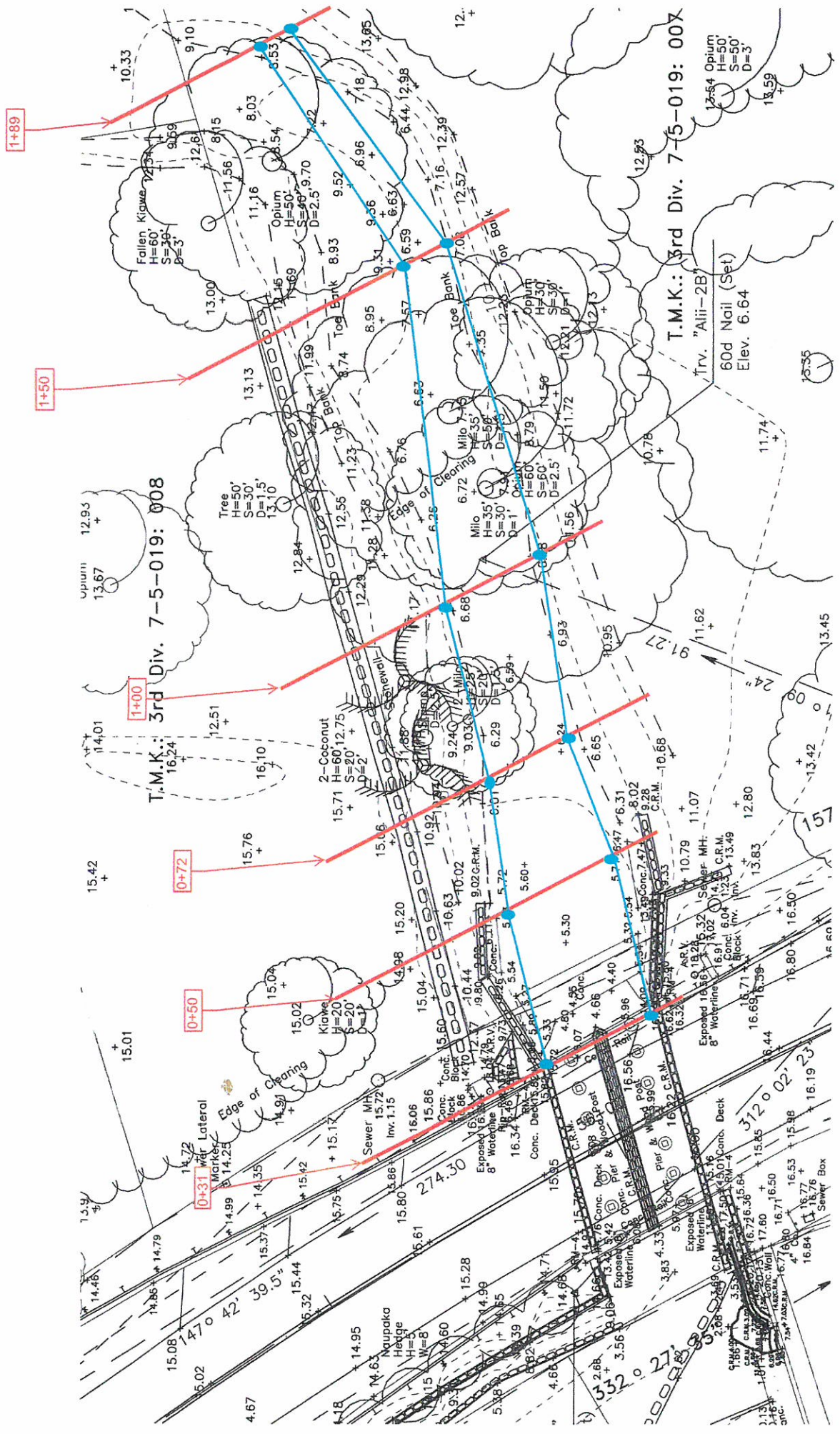
Should there be any questions, please feel free to contact our project engineer Casey Yanagihara at (808) 961-8004, or by email at cyanagihara@hawaiicounty.gov.


Warren H. W. Lee, P.E.
Director of Public Works

CKY

Enclosures

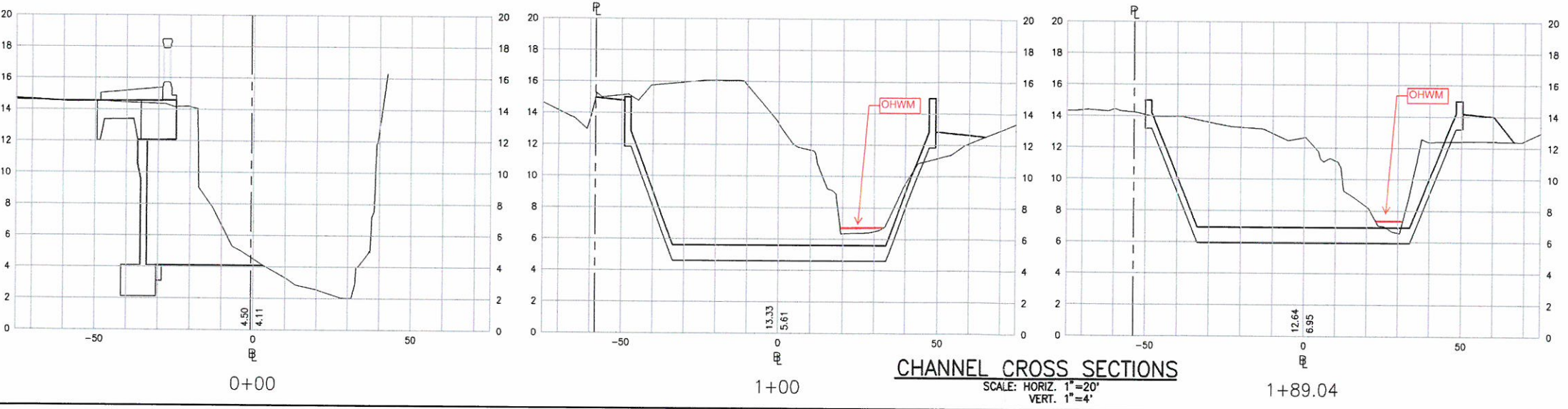
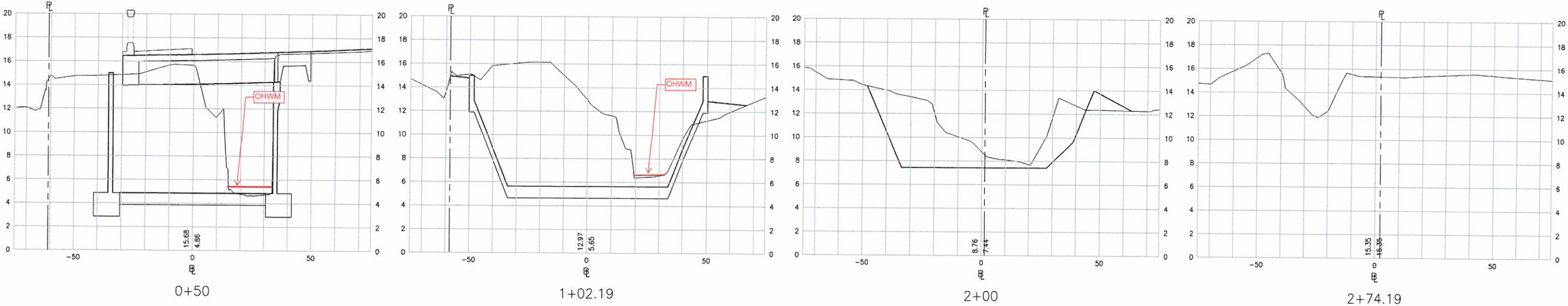
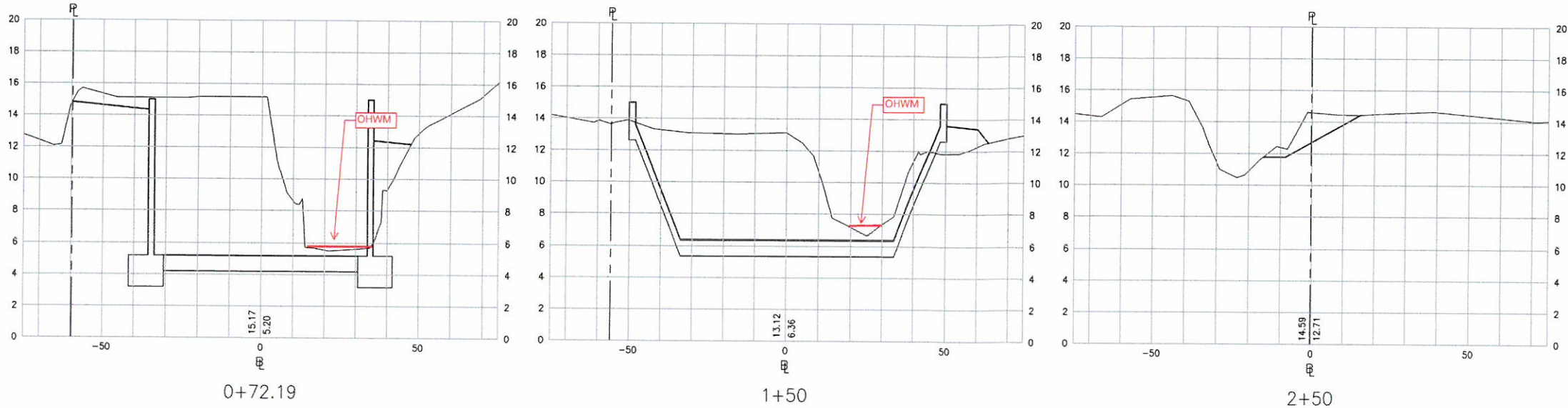
cc: Meesa Otani (FHWA); Clifford Chew (FHWA); Robert Sun (HDOT); Mike Hunnemann (KAI Hawaii);
Ron Terry (Geometrician Associates)



T.M.K.: 3rd Div. 7-5-019: 008

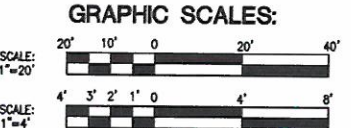
T.M.K.: 3rd Div. 7-5-019: 007

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	STP-0186(1)	1999		53



CHANNEL CROSS SECTIONS
SCALE: HORIZ. 1"=20'
VERT. 1"=4'

IF THIS SHEET IS LESS THAN 22"x34", IT IS A REDUCED PRINT. SCALE REDUCED ACCORDINGLY.



REVISION	DATE	BRIEF	MADE BY	APPROVED
DEPT. OF PUBLIC WORKS, ENGINEERING DIVISION COUNTY OF HAWAII HILO, HAWAII				
ALI DRIVE CULVERT REPLACEMENT ALI DRIVE - KAILUA, KONA FEDERAL-AID PROJECT NO. STP-0186(1) JOB NO. P-6389				
CHANNEL CROSS SECTIONS				
KAILUA-KONA, HAWAII				
APPROVED				Survey Design CH Drawn SS Checked CH
Division Chief				Sheet C-22 of XX



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

August 22, 2016

SUBJECT: Preliminary Jurisdictional Determination for Ali'i Drive Culvert Replacement Project, Kailua-Kona, Island of Hawaii, Hawaii (Department of the Army File No. POH-2014-00045)

Mr. Warren Lee
Director
County of Hawaii, Department of Public Works
Engineering Division
101 Pauahi Street, Suite 7
Hilo, Hawaii 96720

Dear Mr. Lee:

The Honolulu District, U.S. Army Corps of Engineers (Corps) is in receipt of your letter dated July 8, 2016 requesting a preliminary jurisdictional determination (PJD) for the Ali'i Drive Culvert Replacement project located in Kailua-Kona on the Island of Hawaii, Hawaii (Latitude: 19.623974° N, Longitude: -155.985693° W). Your project has been assigned Department of the Army (DA) file number POH-2014-00045. Please reference this number in all future correspondence concerning this action.

We have completed our review of your submittal pursuant to Section 404 of the Clean Water Act (33 U.S.C. 1344; "Section 404") and Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403; "Section 10"). Section 404 requires DA authorization for the discharge (placement) of dredged and/or fill material into waters of the United States (U.S.), including wetlands. Section 10 requires DA authorization for the placement of structures in navigable waters of the U.S. and/or work in, over, under or affecting navigable waters of the U.S. The Corps' evaluation process for determining whether a DA permit is needed involves two tests. If both tests are met, then a permit would likely be required. The first test determines whether the proposed project is located within the Corps' geographic jurisdiction (i.e., whether it is within a water of the U.S.). The second test determines whether the proposed project is a regulated activity under Section 10 and/or Section 404. This evaluation pertains only to geographic jurisdiction.

The review area for this PJD encompasses approximately 0.4-acre that surrounds the Wai'aha Stream (Enclosure 1). According to the information you submitted, Wai'aha Stream is an intermittent tributary in its lower reaches and flows in a westerly direction under the Ali'i Drive Bridge just before entering the Pacific Ocean. Based on our review of available information, including data presented in the report prepared by AECOS, Inc. entitled "*Ordinary High Water Mark Delineation on Wai'aha Gulch, South Kona District, Hawaii*" (herein "JD report"; dated November 24, 2015), it appears waters of the U.S.

may be present within the review area in the approximate locations noted on the maps and drawings contained in the subject report.

This PJD, however, does not provide final concurrence on the Corps' geographic jurisdictional limits of the Wai'aha Stream within the review area. The surveyed ordinary high water mark (OHWM) of the non-tidal portions of Wai'aha Stream and the high tide line (HTL) along the coastal shoreline where portions of the seawall are to be demolished must be included on your project plans and may be subject to field verification by the Corps. The OHWM should be delineated based on physical indicators present in the field, such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, or the presence of litter and debris.

Similarly, the HTL should be delineated based on physical indicators present in the field, such as an oil or scum line, debris line, vegetation line, or other physical markings that delineate the general height reached by a rising tide. The line encompasses spring high tides and other high tides that occur with periodic frequency but does not include storm surges. If there are circumstances that prevent the use of physical indicators to determine the HTL, then the HTL elevation can be established by survey with reference to available tidal datum (i.e., NOAA tidal station datum. You may obtain such data from the web link at: <http://tidesandcurrents.noaa.gov/datums.html?id=>). Mean higher high water (MHHW) datum may be substituted for the HTL datum; however, if using the MHHW datum at this project location, the datum must be adjusted and in reference to mean lower low water (MLLW) where MLLW equals 0.

The enclosed PJD is a non-binding written indication that there may be waters of the U.S. within your project area (Enclosure 2). Preliminary JDs are advisory in nature and may not be appealed. For purposes of computation of impacts, compensatory mitigation requirements, and other resource protection measures, a permit decision made on the basis of a PJD will treat all waters and wetlands that would be affected in any way by the permitted activity on the site as if they are jurisdictional waters of the U.S. If you accept this PJD, please sign and date the enclosed PJD Form and return it to our office within 15 days from the date of this letter. However, if you do not concur with this PJD, you may request an approved jurisdictional determination, which is an official determination regarding the presence or absence of waters of the U.S. An approved JD may be appealed through the Corps' administrative appeal process prescribed at 33 C.F.R. § 331 (Enclosure 3).

Thank you for your cooperation with the Honolulu District Regulatory Program. If you have any questions, please contact Susan A. Meyer Gayagas at (808) 835-4599 or via e-mail at susan.a.meyer@usace.army.mil. Please also complete the customer survey form at http://corpsmapu.usace.army.mil/cm_apex/f?p=regulatory_survey, which would help me to evaluate and improve the regulatory experience for others.

Sincerely,

Tunis W. McElwain
Acting Chief, Regulatory Office

Enclosures

cc (via email w/out enclosures):

Clifford Chew, Federal Highway Administration

Robert Sun, State of Hawaii, Department of Transportation

Casey Yanagihara, County of Hawaii, DPW

Ron Terry, Geometrician Associates

From: Yanagihara, Casey [mailto:Casey.Yanagihara@hawaiicounty.gov]

Sent: Thursday, August 25, 2016 11:31 AM

To: Chelsie Javar-Salas <Chelsie_Javar@fws.gov>; Jayne LeFors <Jayne.LeFors@noaa.gov>; Kaha'a Rezantes <Kahaa.Rezantes@dot.gov>; Lee, Warren <Warren.Lee@hawaiicounty.gov>; Lennie Okano-Kendrick <lokano@okahara.com>; Meesa Otani <Meesa.Otani@dot.gov>; Mike Hunnemann <mike@kaihawaii.com>; Misako Mimura <Misako.K.Mimura@hawaii.gov>; Nadiera Sukhraj <Nadiera_McCarthy@fws.gov>; Robert Sun <Robert.Sun@hawaii.gov>; Ron Terry <rterry@hawaii.rr.com>; Stuart Goldberg <Stuart.Goldberg@noaa.gov>; Susan Meyer Gayaga <Susan.A.Meyer@usace.army.mil>; Todd Nishioka <Todd.Nishioka@hawaii.gov>; Wendy Wiltse <Wiltse.Wendy@epa.gov>; Zac Appleton <Appleton.Zac@epa.gov>; Lisa.Powell@dot.gov; Michelle_Bogardus@fws.gov; Charrier, Jodi <jodi_charrier@fws.gov>

Cc: Gonzalez, Brandon <Brandon.Gonzalez@hawaiicounty.gov>; Ishii, Ben <Ben.Ishii@hawaiicounty.gov>; Yanabu, Robert <Robert.Yanabu@hawaiicounty.gov>; Clifford Chew <Clifford.Chew@dot.gov>

Subject: Ali'i Drive Culvert Replacement Federal-Aid Project No. STP-0186(001) -- Corps File No. POH-2014-00045

**Subject: National Environmental Policy Act/Clean Water Act
Section 404 Integration Process**

Ali'i Drive Culvert Replacement

Kailua-Kona, Hawai'i

Federal-Aid Project No. STP-0186(001)

USACE File No. POH-2014-00045

Aloha all Cooperating Agencies:

Mahalo Nui Loa for your contributions that you have made working with the County of Hawai'i (COH), the Hawai'i Department of Transportation (HDOT) and the Federal Highways Administration (FHWA); in the NEPA-404 MOU process for the Ali'i Drive Culvert Replacement Project.

On 24 May 2016, we had a very successful project meeting and jointly developed a Purpose and Need Statement, and a set of criteria by which alternatives could be evaluated. Most importantly, the highway agencies gained a sense of the issues that the resource agencies felt were critical for minimizing impacts on the marine environment during those unusual occasions after very heavy rains when the Waiaha Drainage briefly flows. The preferred project alternative has evolved from one with a wide, concrete-lined channel to a channel that will use the natural surface of rock and accumulated sediment. Bioengineering features are also planned to help stabilize the stream banks and reduce flow velocity. The overall footprint of the artificial surface for the project has thus shrunk substantially. Combined with the potential to widen the outlet from its current (artificial constricted) state, to a cross-section approaching the natural width that will help promote more natural shoreline processes, this project will be beneficial for the environment. The rebuilt culvert will also decrease flooding, provide

safe passage for motor vehicles, and will for the first time feature adequate sidewalks and bicycle lanes needed and desired by the people of Hawai'i.

The COH applied to the USACE for a Preliminary Jurisdictional Determination (PJD), and given the findings of the extent of the jurisdictional waters, and the reduction in the hardened surface area of the proposed culvert and channel, it now appears that the project will qualify for a Nationwide rather than Individual Section 404 Permit, for fill in the Waters of the United States. As such, the NEPA-404 MOU process has been suspended, and will not resume unless it is later determined that an Individual Permit is required.

We appreciate all of your cooperative spirits in which the NEPA-404 MOU partner agencies have helped us to critically examine the project design, the environment, and the impacts, which has resulted in an improved project. We will continue to work with the USACE through the Nationwide Permit process, along with the USFWS and the NMFS, through consultation related to Section 7 ESA and Essential Fish Habitat; we will keep the EPA informed of the project by providing them a copy of the Draft EA and all critical correspondence.

Again, thank you for your previous, ongoing and future participation in this project; we look forward to working with all of you. Should you have any questions, please feel free to call me at 808-961-8004 or email me at cyanagihara@hawaiiicounty.gov. Our FHWA lead for this project has been transferred over to Lisa Powell, who can be contacted at 808-541-2305 or by email at Lisa.Powell@dot.gov.

Agencies:

1. USACE
 - a. Susan A. Meyer Gayagas; Susan.A.Meyer@usace.army.mil
2. EPA
 - a. Wendy Wiltse; Wiltse.Wendy@epa.gov
 - b. Zac Appleton, Appleton.Zac@epa.gov
3. NOAA/IRC/NMFS
 - a. Jayne M. LeFors; Jayne.LeFors@noaa.gov
 - b. Stuart Goldberg; Stuart.Goldberg@noaa.gov
4. USFWS
 - a. Michelle Bogardus; Michelle_Bogardus@fws.gov
 - b. Nadiera Sukhraj, Ph.D.; Nadiera_McCarthy@fws.gov
 - c. Chelsie Javar-Salas; Chelsie_Javar@fws.gov
 - d. Jodi Charrier; Jodi_Charrier@fws.gov
5. FHWA
 - a. Kaha'a Rezantes; Kahaa.Rezantes@dot.gov
 - b. Meesa Otani, FHWA; Meesa.Otani@dot.gov
 - c. Clifford Chew, FHWA; Clifford.Chew@dot.gov
 - d. Lisa Powell, FHWA; Lisa.Powell@dot.gov

6. HDOT

- a. Robert Sun; Robert.Sun@hawaii.gov
- b. Todd Nishioka; Todd.Nishioka@hawaii.gov
- c. Misako K. Mimura; Misako.K.Mimura@hawaii.gov

7. COH and Design Team

- a. Warren Lee, DPW; wlee@hawaiiicounty.gov
- b. Casey Yanagihara, DPW-ENG; cyanagihara@hawaiiicounty.gov
- c. Mike Hunnemann, KAI Hawai'i; mike@kaihawaii.com
- d. Lennie Okano-Kendrick, Okahara and Associates; lokano@okahara.com
- e. Ron Terry, Geometrician Associate; rterry@hawaii.rr.com

Respectfully submitted,
Casey K. Yanagihara, P.E.
County of Hawai'i
Department of Public Works
Engineering Division
808.961.8004

From: Jayne LeFors - NOAA Federal [mailto:jayne.lefors@noaa.gov]

Sent: Thursday, August 25, 2016 11:44 AM

To: Yanagihara, Casey <Casey.Yanagihara@hawaiicounty.gov>

Cc: Chelsie Javar-Salas <Chelsie_Javar@fws.gov>; Kaha'a Rezantes <Kahaa.Rezantes@dot.gov>; Lee, Warren <Warren.Lee@hawaiicounty.gov>; Lennie Okano-Kendrick <lokano@okahara.com>; Meesa Otani <Meesa.Otani@dot.gov>; Mike Hunnemann <mike@kaihawaii.com>; Misako Mimura <Misako.K.Mimura@hawaii.gov>; Nadiera Sukhraj <Nadiera_McCarthy@fws.gov>; Robert Sun <Robert.Sun@hawaii.gov>; Ron Terry <rterry@hawaii.rr.com>; Stuart Goldberg <Stuart.Goldberg@noaa.gov>; Susan Meyer Gayaga <Susan.A.Meyer@usace.army.mil>; Todd Nishioka <Todd.Nishioka@hawaii.gov>; Wendy Wiltse <Wiltse.Wendy@epa.gov>; Zac Appleton <Appleton.Zac@epa.gov>; Lisa.Powell@dot.gov; Michelle_Bogardus@fws.gov; Charrier, Jodi <jodi_charrier@fws.gov>; Gonzalez, Brandon <Brandon.Gonzalez@hawaiicounty.gov>; Ishii, Ben <Ben.Ishii@hawaiicounty.gov>; Yanabu, Robert <Robert.Yanabu@hawaiicounty.gov>; Clifford Chew <Clifford.Chew@dot.gov>

Subject: Re: Ali'i Drive Culvert Replacement Federal-Aid Project No. STP-0186(001) -- Corps File No. POH-2014-00045

That is good news! Thanks for letting NMFS provide our input to the project.

Aloha,
Jayne LeFors

From: McCarthy, Nadiera [mailto:nadiera_mccarthy@fws.gov]

Sent: Thursday, August 25, 2016 11:46 AM

To: Yanagihara, Casey <Casey.Yanagihara@hawaiicounty.gov>

Subject: Re: Ali'i Drive Culvert Replacement Federal-Aid Project No. STP-0186(001) -- Corps File No. POH-2014-00045

Casey-

Thanks for the update. Hope the Nationwide process goes smoothly.

-Nadiera

>< >< >< >< ><

Nadiera Sukhraj, Ph.D
Aquatic Ecosystems Conservation
U.S. Fish and Wildlife Service
300 Ala Moana Blvd, Rm 3-122
Honolulu, HI 96850
E-mail: Nadiera_McCarthy@fws.gov
Phone: 808-792-9410
<http://www.fws.gov/pacificislands/>

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Ali'i Drive Culvert Replacement at Kahului Bay

Environmental Assessment

APPENDIX 5

Drainage Report

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PRELIMINARY

ALI'I DRIVE CULVERT REPLACEMENT

DRAINAGE REPORT

KAILUA-KONA, ISLAND OF HAWAI'I

Prepared For: **The Department of Public Works
County of Hawai'i**

Prepared By: **Okahara and Associates, Inc.
200 Kohola Street
Hilo, HI 96720**

November 2015

TABLE OF CONTENTS

INTRODUCTION	4
I. PURPOSE & SCOPE.....	4
II. REFERENCES	4
A. County of Hawai'i Storm Drainage Standard.....	4
B. Flood Insurance Study (FIS).....	4
C. AECOM Report.....	4
D. FlowMaster®.....	4
E. Hydraflow Express Extension for Autodesk®	4
F. HEC-RAS	4
III. ROADWAY DRAINAGE.....	5
A. Existing Roadway Conditions	5
B. Proposed Roadway Conditions.....	5
C. Roadway Drainage Conclusion	5
IV. WAIAHA DRAINAGEWAY	6
A. Description.....	6
B. 100-Year Peak Runoff Values.....	6
V. ALI'I DRIVE CULVERT / BRIDGE.....	6
A. Existing Ali'i Drive Culvert	6
B. Proposed Ali'i Drive Bridge and Channel.....	7
C. CLOMR	8
VI. SUMMARY	9

ATTACHMENTS

Appendix A: Location Maps (4 pgs.)

- *Figure A1 - Island Map (1 pg.)*
- *Figure A2 - Site Plan - USGS (1 pg.)*
- *Figure A3 - Site Plan - TMK (1 pg.)*
- *Figure A4 - Site Plan - Aerial (1 pg.)*

Appendix B: Roadway Drainage Calculations (4 pgs.)

- *Storm Drainage Standard Reference Pages (2 pgs.)*
- *Figure B1 - Runoff Calculation - Existing (1 pg.)*
- *Figure B2 - Runoff Calculation - Post Construction (1 pg.)*

Appendix C: Floodzone Maps (2 pgs.)

- *Figure C1 - Existing FEMA Floodzone (1 pg.)*
- *Figure C2 - Proposed AECOM Floodzone (1 pg.)*

Appendix D: Existing Ali'i Drive Culvert (5 pgs.)

- *Figure D1 - Photo Index (1 pg.)*
- *Photos of Existing Culvert (3 pgs.)*
- *Existing Ali'i Drive Culvert Capacity Worksheet (1 pg.)*

Appendix E: Bridge and Channel Plans (5 pgs.)

- *Figure E1 - Bridge Layout Plan (1 pg.)*
- *Figure E2 - Longitudinal Section at the Centerline of Bridge (1 pg.)*
- *Figure E3 - Typical Bridge Cross-Section (1 pg.)*
- *Figure E4 - Channel Plan and Profile (1 pg.)*
- *Figure E5 - Typical Channel Section (1 pg.)*

Appendix F: Channel/Bridge Worksheets (23 pgs.)

- *Channel Flow Depth (Natural and GRP) Worksheets (2 pgs.)*
- *Bridge Flow Depth (Natural and GRP) Worksheets (2 pgs.)*
- *HEC-RAS Calculations and Cross Sections (15 pgs.)*
- *Channel Capacity ((Natural and GRP) Worksheets (2 pgs.)*
- *Bridge Capacity ((Natural and GRP) Worksheets (2 pgs.)*

Appendix G: CLOMR (20 pgs.)

- *Figure H1 - Post-Construction Floodzone (1 pg.)*
- *HEC-RAS Calculations (19 pgs.)*

INTRODUCTION

This drainage report is for the proposed Ali'i Drive Culvert Replacement Project. The project site is located within Kailua-Kona along Ali'i Drive just south of the Ali'i Drive - Lunapule Road intersection (See Appendix A). The project encompasses approximately 1.8 acres which includes a new bridge, a slight re-alignment of Ali'i Drive, rerouting of existing utilities, and a new drainage channel. This new bridge and channel will convey the flow of the Waiaha Drainageway, which is designated by the Federal Emergency Management Agency (FEMA) as a floodzone, to Kahului Bay.

I. PURPOSE & SCOPE

The purpose of this project is to replace the existing culvert in this area which was deemed to be structurally and hydraulically inadequate. This report will examine the impacts this project will have for the surrounding areas by determining the existing and future roadway runoff quantities; providing necessary mitigative measures to address any deficiencies pertaining to roadway drainage; and providing hydraulic support for the design of the bridge and channel structures.

II. REFERENCES

A. County of Hawai'i Storm Drainage Standard

Roadway runoff calculations for this project followed the procedures outlined in the Department of Public Works (DPW), County of Hawai'i "Storm Drainage Standard" dated October 1970. Based on these standards, the Rational Method ($Q=CIA$) and a 10-year 1-hour storm recurrence interval were utilized for runoff calculations.

B. Flood Insurance Study (FIS)

The "Flood Insurance Study, Hawai'i County, Hawai'i. Volume 1 of 4," by FEMA, revised April 2, 2004, was used for general information of the Waiaha Drainageway.

C. AECOM Report

The "Draft Hydraulic Analysis Report for North Kona Flood Insurance Restudy, Hawai'i County, Hawai'i," dated December 2011 by AECOM was used general information on the proposed runoff quantity for Waiaha Drainageway. The results of this study is in the process of being accepted by FEMA.

D. FlowMaster®

FlowMaster® v6.0 by Haestad Methods, Inc. was used to perform simple open channel flow calculations.

E. Hydraflow Express Extension for Autodesk®

Hydraflow Express® by Autodesk, Inc. was used to perform simple open channel flow calculations.

F. HEC-RAS

The Hydrologic Engineering Center River Analysis System, Version 4.1 by the US Army Corps of Engineers is the program used to model the Waiaha Drainageway.

III. ROADWAY DRAINAGE

A. Existing Roadway Conditions

The existing Ali'i Drive is a two lane asphalt concrete pavement (AC) roadway with paved shoulders. Lane widths range from 10 to 11 feet wide, while the shoulders range from 3 feet at the culvert crossing, to 18 feet at other locations. Runoff generated by the roadway is generally allowed to sheet flow off the sides, and runoff near the existing culvert exits the roadway on the makai side near both ends of the rails.

The total existing peak 10-year runoff was calculated to be approximately 4.47 cubic feet per second (cfs). See Appendix B for pre-construction drainage calculations.

B. Proposed Roadway Conditions

Ali'i Drive will remain a two-lane roadway with paved shoulders, and the limits of paving will remain virtually the same as in the existing condition. Pavement area will increase however on the makai side of the Kailua-Kona approach to the new bridge, and on the bridge itself. On the bridge, the roadway will contain two 11-foot traffic lanes, two 5-foot bike lanes, and two 7-foot concrete sidewalks. As in the existing condition, runoff will be allowed to flow off of the roadway near either ends of the bridge.

The total post-construction peak 10-year runoff was calculated to be approximately 4.68 cfs. See Appendix B for the post-construction calculations.

C. Roadway Drainage Conclusion

The difference between existing and post-construction roadway drainage was calculated to be 0.21 cfs, with most, if not all, of this increase occurring near the proposed bridge. Therefore, it is concluded that this relatively small increase will not adversely affect the surrounding parcels, and the runoff will be allowed to exit the roadway at the bridge ends as it currently does.

IV. WAIAHA DRAINAGEWAY

A. Description

The Waiaha Drainageway is an existing intermittent drainageway that originates along the slopes of the Hualalai Mountain, and empties into the Pacific Ocean at Kahului Bay. It is a FEMA studied floodzone from an approximate elevation of 2,000 feet down to its termination at the ocean. Along the way, this drainageway crosses several major thoroughfares including, Māmalahoa Highway, Queen Ka'ahumanu Highway, Kuakini Highway, and Ali'i Drive. The existing FEMA model of this drainageway shows that this drainageway diverges at three separate locations, creating Waiaha Drainageway Splitflows 1, 2, and 3. Splitflows 1 and 3 eventually converge back to the main Waiaha Drainageway, while Splitflow 2 flows down its own path down to the Ocean. The entirety of the Waiaha Drainageway can be seen on the FEMA Flood Insurance Rate Map (FIRM) Community-Panel Numbers 155166 0713 D, 155166 0714 C and 155166 0926 E. See Figure C1 in Appendix C for the exiting limits of the Waiaha Drainageway in relation to the proposed project.

B. 100-Year Peak Runoff Values

The 100-year peak runoff value (Q_{100}) at the mouth of the Waiaha Drainageway is listed in the Hawai'i County FIS (dated 4/2004) as 7,110 cfs. AECOM utilized LiDAR surveys to map the drainageway more accurately, and recalculated the hydrology resulting in a new peak flow value of 7,752 cfs at the mouth. See Figure C2 in Appendix C for the proposed limits of the Waiaha Drainageway. A Technical Support Data Notebook (TSDN) pertaining to the Waiaha Drainageway was submitted by AECOM on behalf of the County of Hawai'i, and was approved by FEMA. Since this increase in flow affects four FIRM panels, it cannot be incorporated as a Letter Of Map Revision (LOMR). The change will need to be done as a Physical Map Revision (PMR). Until the PMR becomes effective, FEMA recommends using the current effective FIS and FIRM Q_{100} runoff value of 7,110 cfs for the culvert replacement project. It is unknown at this time what flow will be accepted when the PMR is done.

V. ALI'I DRIVE CULVERT / BRIDGE

A. Existing Ali'i Drive Culvert

The existing Ali'i Drive Culvert is a two-cell culvert constructed out of cement rubble masonry (CRM) and reinforced concrete. For additional structural support, the County of Hawai'i has installed wooden posts in the middle of each cell. Each cell is approximately 8 feet wide, 9 feet high, and 30 feet long. At an existing longitudinal slope of 1%, this culvert has a theoretical maximum capacity of 2,240 cfs (calculated using FlowMaster®), which is clearly inadequate for the 100-year peak flow of 7,110 cfs mentioned earlier. This theoretical capacity does

not account for the reduced flow area caused by the wooden posts. See Appendix D.

B. Proposed Ali'i Drive Bridge and Channel

The proposed Ali'i Drive Bridge will be a single span concrete bridge with a width of 67.35 feet, minimum heights of 8.23 feet at the downstream end, 10.17 feet at the upstream end, and a centerline length of 51 feet. The proposed channel will be trapezoidal-shaped with a bottom width of 67.35 feet, top width of 96.35 feet, height of 8.50 feet, 2:1 (horizontal:vertical) side slopes, and a centerline length of 130 feet. Upstream of the bridge, the trapezoidal section will transition to a rectangular section to tie into the bridge. Both the bridge and the channel will have a longitudinal slope of 1.5% (See Appendix E). The abutments of the bridge will be constructed out of concrete and embedded into the subsurface basalt rock. The floor of the bridge and the channel bottom will be natural, and the sides of the channel will be constructed of grouted rip-rap (GRP).

According to County of Hawai'i Standards, (unlined) natural channel bottom (rock, smooth and uniform) has a Manning's n value of 0.035 with maximum permissible velocity of 15 fps, and grouted rip-rap has a Manning's n value of 0.025, with maximum permissible velocity of 20 fps. Hydraflow Express Extension for Autodesk® was utilized to perform an initial check on the characteristics of the flow, with the following results (See Appendix F):

Average Channel Velocity	17.06 fps (feet per second)
Average Channel Freeboard	8.14 feet
Average Bridge Velocity	18.07 fps
Average Bridge Freeboard	8.72 feet

The above numbers show that the average freeboard height in the channel is below the minimum height of the channel (8.50 feet) and the freeboard height of the bridge is above the minimum height of the bridge (8.23 feet). However, Hydraflow® assumes a consistent flow has been reached, which only happens in a straight, consistent cross section. Because of the relatively short length of this channel and bridge, HEC-RAS was used to actually model the flow. The HEC-RAS model shows a hydraulic jump just before the transition from trapezoidal section to rectangular section which exceeds the height of the channel. Therefore, a vertical wall was placed at the top of the channel, and the model was run again with the following results:

Section	Velocity (fps)	Depth (ft)	Freeboard (DPW/HDOT) (ft)	Required Channel Depth (DPW/HDOT) (ft)	Channel Depth (ft)
177	20.29	4.90	2.86/2.00	7.76/6.90	10.23
105	9.52	9.46	2.50/2.00	11.96/11.46	12.50
73	15.05	7.02	2.72/2.00	9.74/9.02	11.79
48	16.34	6.36	2.76/2.00	9.12/8.36	9.15
34	16.87	6.13	2.77/2.00	8.90/8.13	8.85
6	23.11	4.25	2.94/2.00	7.19/6.25	8.32

The HEC-RAS model shows that the flow velocity stays between 9.52 and 23.11 fps, and the depth plus freeboard height remains below the top of the channel (with the vertical wall) except in one instance using DPW freeboard on the downstream end of the bridge crossing. At this location, we do not meet the freeboard by less than one inch. Hawai'i Department of Transportation (HDOT) minimum freeboard is two feet, which remains below the top of the channel at all locations. The theoretical maximum capacity of the bridge and channel are from 9,973 cfs to 14,190 cfs, respectively, with a maximum velocity of 25.50 fps. See Appendix F.

C. **CLOMR**

A Conditional Letter of Map Revision (CLOMR) will be submitted to FEMA describing the proposed changes to the floodzone resulting from this project. The only question at this point is which version of the Waiaha Floodplain to use. As mentioned earlier, AECOM will submit a PMR to revise the Waiaha Floodplain. The floodplain shown on FIRM Community-Panel 155166 0713 D and the peak flow value in the FIS are still official. In anticipation of the AECOM PMR and new flow value being accepted, a HEC-RAS simulation of the proposed bridge and channel was done using AECOM data outside the limits of the project topographic survey, and modifying the data within the survey limits (See Appendix H). Should approval of the pending PMR be delayed, then another simulation will need to be performed using the FIRM and FIS data

RS 73 and RS 48 of the HEC-RAS simulation shows the flood zone extending beyond the limits of the channel improvements (also depicted as the red area in Figure G1). The model shows runoff in these areas due to the fact that the ground elevation is lower than the water surface elevation. Water from the channel should not overflow into this area, but it does not mean that water from upstream will not flow into this low area.

VI. SUMMARY

Construction of this project will add approximately 3,113 square feet of additional pavement to Ali'i Drive, which will result in a 0.21 cfs increase of the 10-year peak flow. This increase is considered to be negligible, and will be allowed to flow off the roadway at the ends of the bridge as it does currently.

The proposed channel and bridge floor will be left un-lined, and the design will allow these structures to pass the expected 100-year runoff value of 7,110 cfs within HDOT freeboard criteria. The existing Ali'i Drive Culvert has a capacity of only 2,240 cfs, which is 32% of the capacity needed to convey the flow (not including freeboard). Therefore, it is concluded that the construction of the Ali'i Drive Culvert project will improve the drainage in the area, and will be beneficial to the surrounding parcels.

NOTE:

**ATTACHMENTS TO DRAINAGE REPORT NOT INCLUDED
IN ENVIRONMENTAL ASSESSMENT BUT ARE AVAILABLE
UPON REQUEST OF HAWAI'I COUNTY
DEPARTMENT OF PUBLIC WORKS**

Ali‘i Drive Culvert Replacement at Kahului Bay

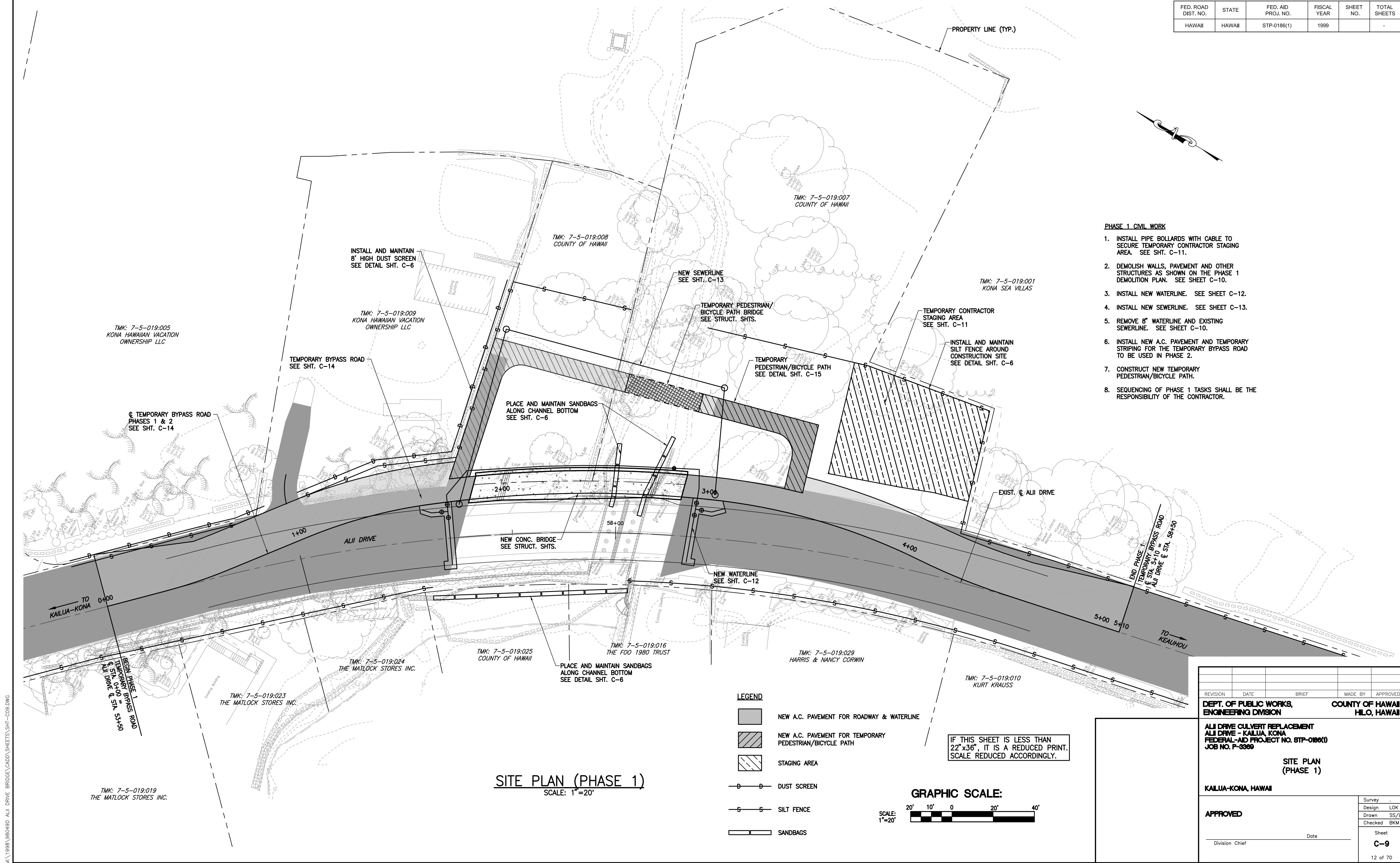
Environmental Assessment

APPENDIX 6

Phasing Site Plans

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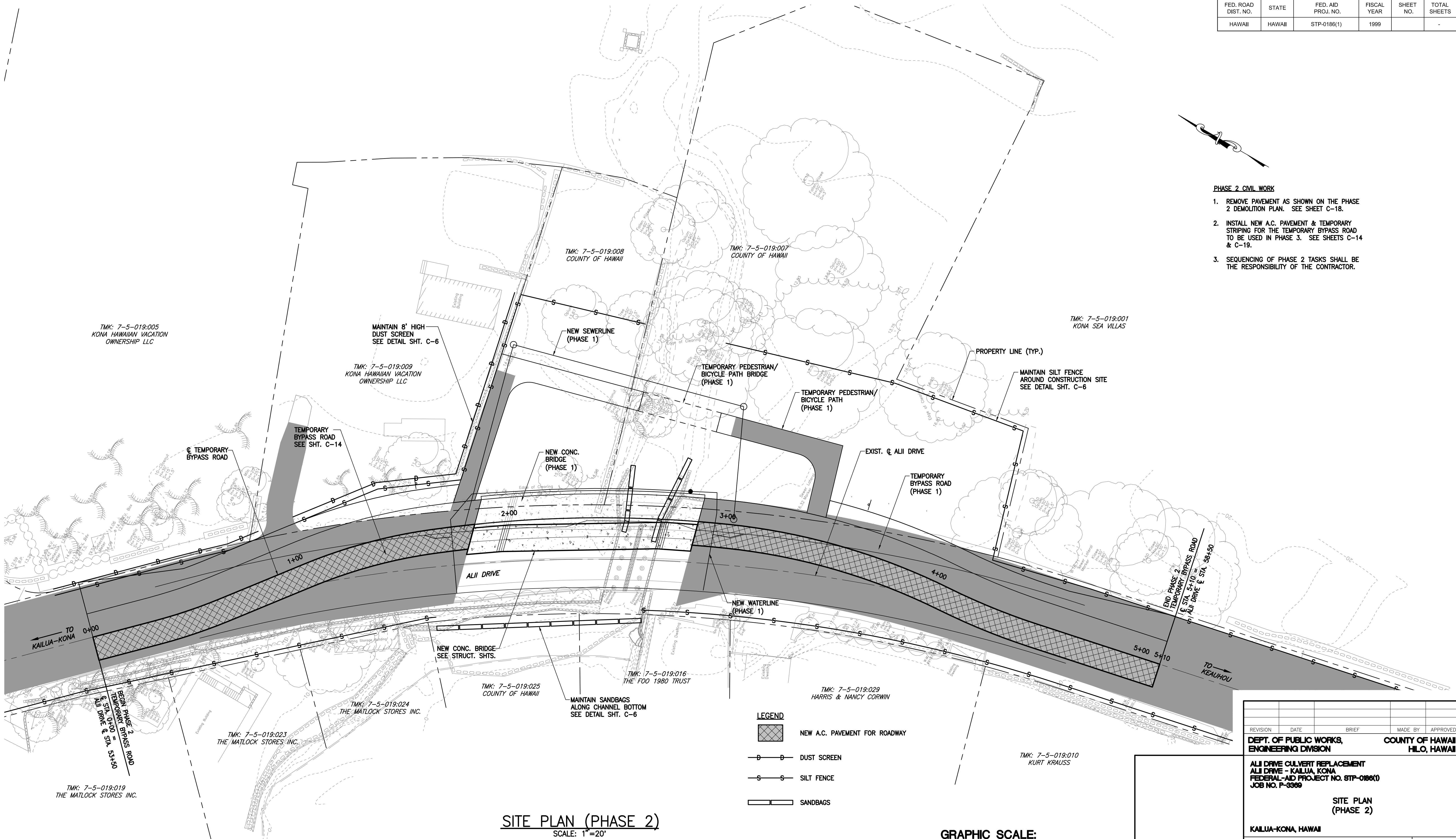
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HAWAII	HAWAII	STP-0186(1)	1999		-



FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	STP-0186(1)	1999		-

PHASE 2 CIVIL WORK

1. REMOVE PAVEMENT AS SHOWN ON THE PHASE 2 DEMOLITION PLAN. SEE SHEET C-18.
2. INSTALL NEW A.C. PAVEMENT & TEMPORARY STRIPING FOR THE TEMPORARY BYPASS ROAD TO BE USED IN PHASE 3. SEE SHEETS C-14 & C-19.
3. SEQUENCING OF PHASE 2 TASKS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.



SITE PLAN (PHASE 2)
SCALE: 1"=20'

IF THIS SHEET IS LESS THAN
22"x36", IT IS A REDUCED PRINT.
SCALE REDUCED ACCORDINGLY.

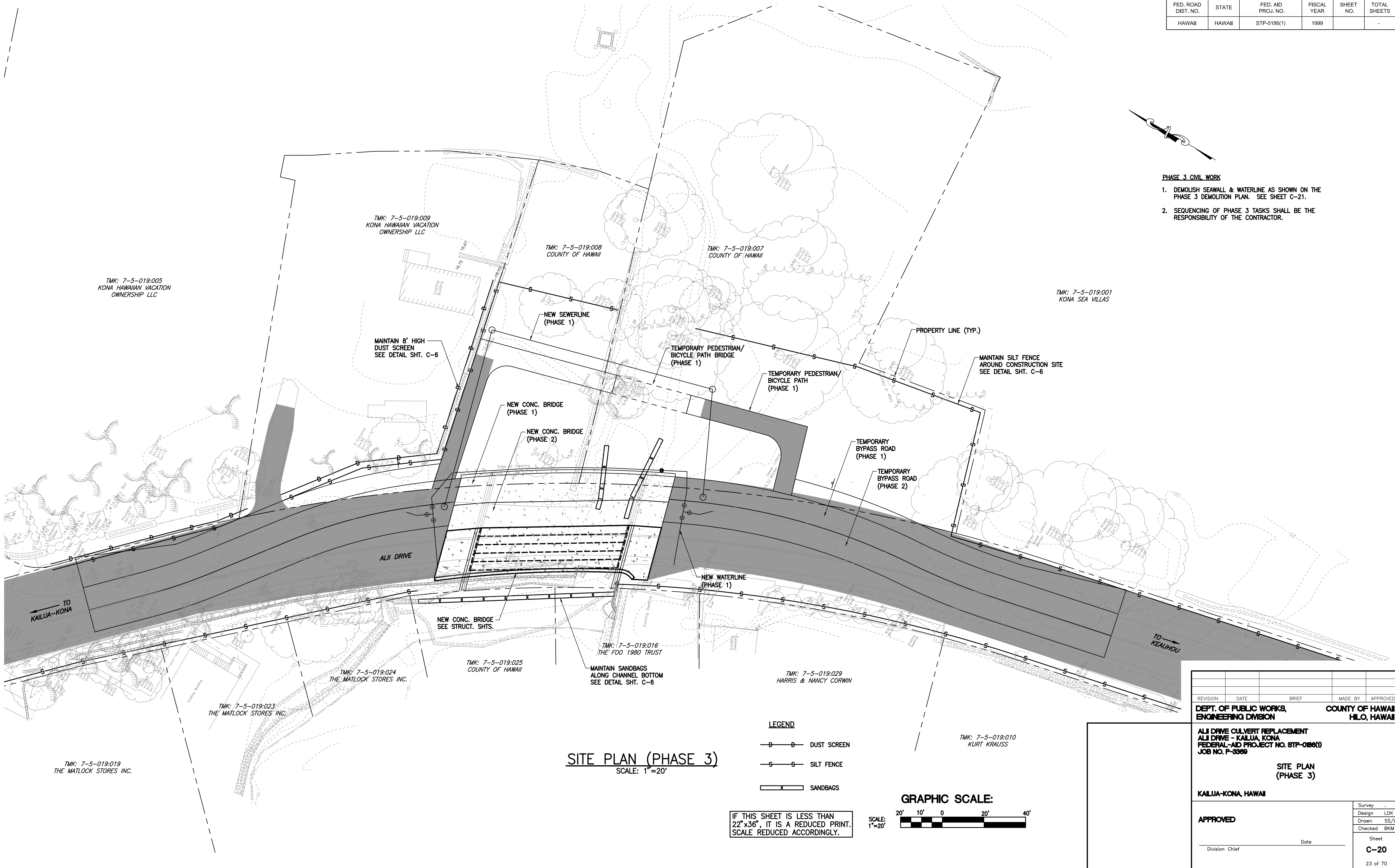


REVISION	DATE	BRIEF	MADE BY	APPROVED
DEPT. OF PUBLIC WORKS, ENGINEERING DIVISION				COUNTY OF HAWAII HILO, HAWAII
ALI DRIVE CULVERT REPLACEMENT ALI DRIVE - KAILUA, KONA FEDERAL-AID PROJECT NO. STP-0186(1) JOB NO. P-3369				
SITE PLAN (PHASE 2)				
KAILUA-KONA, HAWAII				
APPROVED				Survey Design LOK Drawn SS/LS Checked BKM Sheet C-17 20 of 70
Division Chief				Date

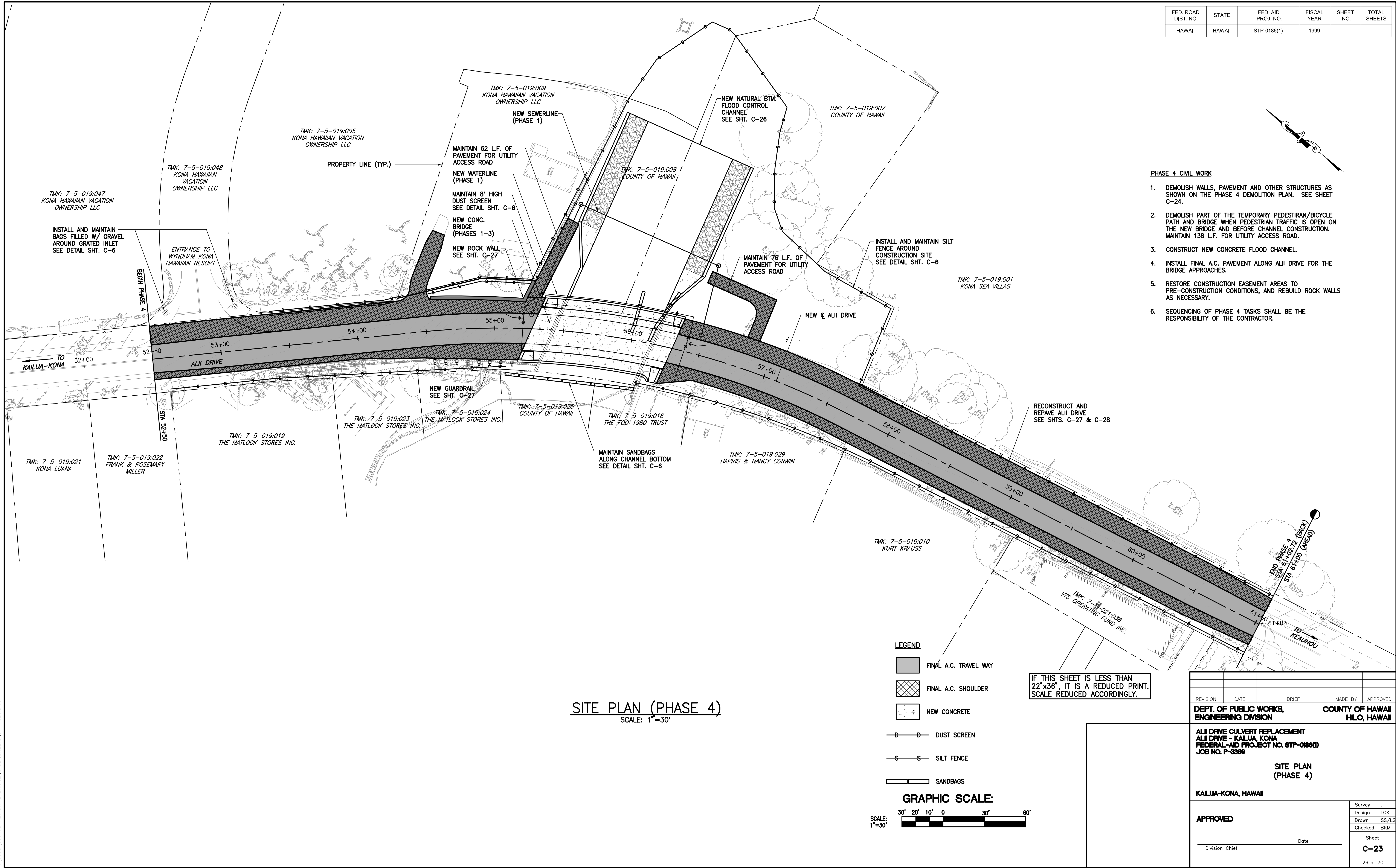
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	STP-0186(1)	1999		-

PHASE 3 CIVIL WORK

- DEMOLISH SEAWALL & WATERLINE AS SHOWN ON THE PHASE 3 DEMOLITION PLAN. SEE SHEET C-21.
- SEQUENCING OF PHASE 3 TASKS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.



FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	STP-0186(1)	1999		-



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Ali‘i Drive Culvert Replacement at Kahului Bay

Environmental Assessment

APPENDIX 7

Section 7 Endangered Species Act and Related Correspondence

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United States Department of the Interior

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



In Reply Refer To:
2014-SL-0226

MAR 24 2014

Mr. Alvin A. Takeshita
State of Hawaii Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813

Subject: Species List for Alii Drive Drainage Project, Kailua-Kona, Hawaii

Dear Mr. Takeshita:

We are in receipt of your letter dated March 18, 2014, requesting a species list for drainage improvements and culvert replacement on Alii Drive over an ephemeral stream near the shoreline at Kahului Bay in Kailua-Kona, Hawaii. The project is funded by the Federal Highway Administration (FHWA).

We reviewed the proposed project pursuant to the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Our databases, including data compiled by the Hawaii Biodiversity and Mapping Program, indicate the following listed species may be present in the vicinity of the proposed project: (1) endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*) (2) Hawaiian stilt (*Himantopus mexicanus knudseni*), and (2) threatened Hawaiian hawk (*Buteo solitaries*). To avoid and minimize impacts to these listed species, we recommend that you incorporate the following conservation measures into your project:

Hawaiian hoary bat

The Hawaiian hoary bat roosts in both exotic and native woody vegetation and, while foraging, will leave young unattended in "nursery" trees and shrubs. If trees or shrubs suitable for bat roosting are cleared during the breeding season, there is a risk that young bats could inadvertently be harmed or killed. As a result, the Service recommends that woody plants greater than 15 feet tall should not be removed or trimmed from June 1 to September 15.

Hawaiian hawk

To avoid impacts to Hawaiian hawks, we recommend against clearing any brush or trees during their breeding season (March through September). If you are unable to avoid clearing vegetation during these months, we recommend you conduct surveys for nests prior to any clearing activity



and contact our office for survey methodology and further recommendations to avoid impacting Hawaiian hawk nests.

Hawaiian stilt

To avoid potential adverse impacts to listed Hawaiian waterbirds, we recommend the project occur outside of the Hawaiian stilt breeding season (February through August). If the Hawaiian stilt breeding season cannot be avoided, we recommend you work with our office during project planning so that we may assist you in developing specific measures to avoid impacts to listed species.

General Comments

Terrestrial, aquatic, and marine fish and wildlife resources occur immediately adjacent to the proposed terrestrial and submerged project areas. Particular attention should be given to potential construction impacts to sea turtles, water quality, seabirds and migratory birds, coral reefs, macroalgae beds, and rare and native species and their habitats. The direct, indirect, and cumulative effects of potential impacts over time should be discussed in the Environmental Assessment. Measures to avoid unnecessary impacts and minimize unavoidable impacts should also be addressed including the use of silt curtains to contain suspended sediments. Impacts that cannot be avoided or minimized should be mitigated.

Enclosed is our Best Management Practices (BMP) for construction work in aquatic environments. These BMPs will help to reduce erosion, sedimentation, and other adverse impacts to aquatic resources. As project plans are developed, the Service's Aquatics Ecosystem Conservation Program should be included in planning conversations in order to assure that the applicant is in compliance with regulatory requirements for their U.S. Army Corps of Engineers permit.

If you have questions regarding the species list, please contact Jodi Charrier, Fish and Wildlife Biologist (phone: 808-792-9400, email: Jodi_Charrier@fws.gov). If you have questions regarding our comments for marine resources please contact Nadiera Sukhraj (phone: 808-792-9400; email: Nadiera_Sukhraj@fws.gov).

Sincerely,

Tim Langer (Acting)

for Loyal Mehrhoff
Field Supervisor

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

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.

1. 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.
2. Dredging/filling in the marine environment shall be scheduled to avoid coral spawning and recruitment periods and sea turtle nesting and hatching periods.
3. 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.
4. All project-related materials and equipment (dredges, barges, backhoes, etc.) to be placed in the water shall be cleaned of pollutants prior to use.
5. 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.
6. All debris removed from the marine/aquatic environment shall be disposed of at an approved upland or ocean dumping site.
7. No contamination (trash or debris disposal, non-native species introduction, 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.haccp-nrm.org/Wizard/default.asp>) to prevent attraction and introduction of non-native species.
8. 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 on-site, if appropriate, to facilitate the clean-up of accidental petroleum releases.
9. 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.
10. 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.).

William P. Kenoi
Mayor

Randall Kurohara
Managing Director



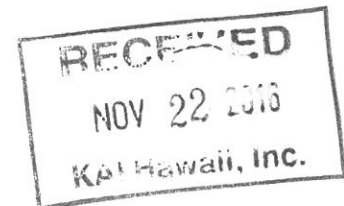
Warren H. W. Lee
Director

Brandon A. K. Gonzalez
Deputy Director

County of Hawai'i
DEPARTMENT OF PUBLIC WORKS
Aupuni Center
101 Pauahi Street, Suite 7 · Hilo, Hawai'i 96720-4224
(808) 961-8321 · Fax (808) 961-8630
www.co.hawaii.hi.us

November 15, 2016

Jodi Charrier, USFWS Field Supervisor
Maui Nui and Hawai'i Islands
U.S. Fish and Wildlife Service
300 Ala Moana Boulevard, Room 3-122
Honolulu, HI 96850



Attn: Michelle Bogardus, Island Team Manager

SUBJECT: Consultation for Endangered Species Act Section 7 and Fish and Wildlife Coordination Act, Ali'i Drive Culvert Replacement Project
Waiaha Drainageway, North Kona District, Hawaii Island
TMK (3rd.): 7-5-019:007, 008, 009, & 016
Federal-Aid Project No. STP-1086(0001)
"Not Likely to Adversely Affect" Determination in Accordance with Section 7, Endangered Species Act
"No Effect on Fish or Wildlife Habitat" in Accordance with Fish and Wildlife Coordination Act

As stated in the previous correspondence from the Federal Highway Administration (FHWA) to the U.S. Fish and Wildlife Service (USFWS) of March 18, 2014, and in various emails and meetings in 2015 and 2016; as part of the NEPA-404 Memorandum of Understanding process, the County of Hawai'i, Department of Public Works (DPW), in cooperation with the Hawai'i Department of Transportation (HDOT) and FHWA, is planning to undertake the Ali'i Drive Culvert Replacement Project.

To summarize the information previously provided, the project area involves the crossing of Ali'i Drive over an ephemeral, rarely-flowing gulch called the Waiaha Drainageway near the shoreline at Kahului Bay in Kailua-Kona, on the Big Island of Hawai'i (see attached map and photo figures). The culvert structure was built in 1937 and now has a number of structural and capacity deficiencies. Periodic bridge inspections have found major spalls exposing corroded

reinforcing steel on the underside of the concrete deck, which may render it unsafe in the near future. The culvert openings are not large enough to pass the 100-year flood from the gulch that it spans, which has promoted recurrent overtopping of the stream embankments and the Ali'i Drive roadway surface, resulting in damage to adjacent properties. The artificially constricted channel that is confined in the middle of a seawall also resulted in excessive wave reflection at the channel outlet, which has reduced the volume of sand and small cobbles in the beach that fronts the structure, particularly during high surf seasons. Finally, the bridge is too narrow for adequate pedestrian/bicycle lanes, in an area with a high volume of such use.

The purpose and need of the proposed project was determined through concurrence among the NEPA-404 MOU partner agencies: the highway agencies named above; the U.S. Army Corps of Engineers (USACE); the USFWS; the National Oceanic and Atmospheric Administration-National Marine Fisheries Service (NOAA-NMFS); and the U.S. Environmental Protection Agency (EPA). The purpose and need is to improve the safety and structural integrity at the crossing of the Waiaha Drainageway on Ali'i Drive. More specifically, the objectives of the Ali'i Drive Culvert Replacement project are to:

- Provide the necessary engineering to replace this functionally obsolete and structurally deficient bridge crossing.
- Support current and projected traffic for vehicles, bicycles, and pedestrians, integrating current American Association of State Highway and Transportation Officials design standards, Federal Highways Administration Complete Streets guidance, and the American with Disabilities Act standards.
- Attenuate flooding on adjacent properties to meet the 100-year flood zone standards.
- Accommodate existing utility crossings; i.e., electric, telephone, cable TV, sewer, and water.

The project would replace the existing double-cell culvert with a wider structure and expand the roadway above to accommodate a wider shoulder for pedestrians and bicyclists. The proposed design would replace the existing culvert/roadway with a new, wider one-span concrete bridge structure with a greater total cross sectional flow area, similar to the natural drainage channel (see Page 19 of Enclosure). The project would also widen the channel upstream of the new bridge to minimize the flooding that periodically occurs there now. As currently conceived, the construction of the new bridge will be conducted in phases in order to allow two lanes of traffic to remain open at all times throughout the construction project. The project is currently scheduled for construction over the course of a year starting in mid-2018. There is currently no night work anticipated.

As discussed in previous correspondence with your agency, the NEPA-404 MOU process has been suspended due to the finding that the project is very likely to require a Nationwide rather than Individual Section 404 Permit for fill in the Waters of the U.S. However, early efforts in the NEPA-404 MOU consultation between the highway partner agencies and the USACE, USFWS, NOAA-NMFS and EPA has resulted in a significant refinement in the design of the widened channel. The channel bottom is now proposed to have a natural surface instead of a concrete bottom. For a distance of 100 feet upstream, the channel sides will be grouted riprap in order to provide the hydraulic flow necessary to pass the 100-year flood safely under the bridge. Beyond

100 feet, the channel will be left in a natural condition and allowed to vegetate. This minimizes hardening of surfaces and maximizes natural surfaces. The cross-sections on Page 18 and 19 of Enclosure.

The project would involve a Nationwide Permit for fill in Waters of the U.S., a Section 401 Water Quality Certification to avoid and minimize impacts to receiving waters during construction, and a County grading permit and National Pollutant Discharge Elimination System Permit to avoid and minimize erosion and sedimentation throughout the project footprint. We would also note that our agencies are consulting with the NOAA-NMFS concerning pursuant to the Endangered Species Act, and the Magnuson-Stevens Fishery Conservation and Management Act 16 USC 1801.

DPW initiated consultation concerning endangered species with your agency through an HRS Chapter 343 Environmental Assessment early consultation letter dated March 18, 2014. Your agency provided a technical assistance letter in response on March 24, 2014.

The technical assistance letter provided the information that the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*), the threatened Hawaiian hawk (*Buteo solitarius*), and the endangered Hawaiian stilt (*Himantopus mexicanus knudseni*) may be present in the subject area. The letter further provided a list of measures to preserve aquatic habitat function to avoid and minimize impacts to federally listed water birds and the marine aquatic environment, recommendations for survey and avoidance measures for Hawaiian hawks, and measures to avoid impacts to Hawaiian hoary bats. Subsequent botanical, ornithological and aquatic biological surveys that have been provided to your office previously, along with discussion with Chelsie Javar-Salas of your staff, determined that the nearly perpetually dry wash does not offer habitat for Hawaiian stilts or any other Hawaiian water birds, and that Hawaiian hawks are rarely if ever seen in this dry, urban area of Kona. The field biological survey also determined that no rare, threatened or endangered plant or bird species was present, that no 'ōhi'a (*Metrosideros polymorpha*) trees are present in or near the area, and that Rapid 'Ōhi'a Death (ROD) is not an issue for the project.

It is recognized that many areas of Kona contain vegetation that may support the endangered Blackburn's sphinx moth (*Manduca blackburnii*). Adult moths are known to be feed on nectar from native plants, including beach morning glory (*Ipomoea pes-caprae*), ilie'e (*Plumbago zeylanica*), and maiapilo (*Capparis sandwichiana*). Among these plants, there is only a very limited amount of beach morning glory at the project site. Moth larvae are known to feed upon certain plants in the Solanaceae family, particularly the non-native tree tobacco (*Nicotiana glauca*) and native aiea (*Nothocestrum latifolium*). No tree tobacco has been found during any of the several botanical surveys conducted to date. The area is not habitat for aiea and none are present, nor are any other native or non-native members of the Solanaceae family.

As the project involves work in the shoreline area just mauka of the "mean high high water" line, there is a potential for several endangered marine animals to be present. The Hawaiian monk seal (*Monachus schauinslandi*) is an endangered earless seal that is endemic to the waters off of the Hawaiian Islands. Monk seals commonly haul out of the water onto sandy beaches to rest. As the shoreline in the subject area consists primarily of boulders, it would not appear to present an

optimal location for seal haul-out. The threatened green sea turtle (*Chelonia mydas*) occurs commonly throughout Hawaiian waters, and turtles are frequently observed in West Hawai'i. The endangered hawksbill turtle (*Eretmochelys imbricata*) is known infrequently from waters of the State. Three green turtles were observed traversing the area during the course of underwater surveys conducted for the project. As discussed above, our agencies are consulting with NOAA-NMFS concerning effects to these species.

Based on the information provided by the USFWS, field surveys undertaken as a part of the project, and the nature of the proposed work, the partner highway agencies have determined that the subject project may affect, but is not likely to adversely affect, threatened or endangered plant or animal species, or critical habitats within the project limits. No critical habitat is present. Specific measures will be taken to ensure the protection of the Hawaiian hoary bat, the Hawaiian hawk, the Blackburn's sphinx moth, the aquatic environment, and listed marine animals that utilize the shoreline.

The following conservation measures to avoid and minimize impacts to the listed species will be implemented:

- For the Hawaiian hoary bat, no trees or shrubs greater than 15 feet will be removed or trimmed during the breeding season of June 1 to September 15. Also, barbed wire fencing will not be used as part of the proposed action. Field cards with pictures of the Hawaiian hoary bat will be distributed to the general contractor prior to the start of construction activities to assist in recognizing this species should it occur within the project area.
- As the area is within a dry, highly urban area, with no native forest and few tall trees (all of them ornamental, within the landscape of multifamily developments), and no record of Hawaiian hawk nesting, there does not appear to be a need to undertake an initial hawk survey. However, the contractor will be supplied with an environmental awareness sheet as part of the construction contract that will include field cards of Hawaiian hawks and instructions concerning protocol if they are observed on the site. The protocol will specify that during the March through September period, if any Hawaiian hawks are seen in the area, and construction activity involving ground disturbance or brush or tree clearing is planned, a Hawaiian hawk survey must be undertaken by a qualified ornithologist. If disturbance at the project site does not occur within 14 days of the survey, another survey will be undertaken. The survey will cover areas within 1,600 feet of the construction activity and will ensure that if any nests are detected within this distance, no construction will occur and the USFWS will be contacted. Construction will not resume during the nesting period unless appropriate avoidance and minimization measures coordinated with the USFWS are agreed upon and adopted.
- The project is occurring in a low-lying site between buildings in an existing urban area with low potential for interaction with listed seabirds, and night construction is not currently anticipated. However, if nighttime construction does occur, construction contracts will specify that all project lighting will be properly shielded and designed to minimize glare and constructed in a manner that fully shields lighting sources and directs light downwards, to reduce the potential for adverse interactions between nocturnally flying listed seabirds and structures or lines.

- All work on the project that occurs near the shoreline will be required to avoid any direct or indirect impacts to Hawaiian monk seals, green sea turtles and hawksbill turtles. If any individuals of these species are utilizing the shoreline area during construction activities on or near the shoreline, construction with any potential to displace or harm them will cease until the animals leave of their own accord. Additional measures may be determined as part of consultation with NOAA-NFMS.
- No tree tobacco plants have been observed in any botanical surveys of the area, and there is no other reason to suspect that Blackburn's sphinx moth is present; however, a tree tobacco plant could sprout and moth(s) could be present; therefore, a qualified botanist will survey the area of proposed construction activities for larval host plants prior to work initiation. To the degree practicable, surveys will be conducted during the wettest portion of the year (which, in Kona, is summer) or several weeks after a significant rain, and immediately prior to construction. If any larval host plants are found, a qualified biologist will search for eggs, larvae, and signs of larval feeding (chewed stems, frass, or leaf damage). Any larval host plants of Blackburn's sphinx moth identified will not be cut or disturbed without further discussions with the USFWS. If moths or their host plants are found during the survey, the USFWS will be contacted for additional guidance.
- If any federally protected bird, insect, reptile or mammal species appears in the project area, work activity will be temporarily suspended until the animal leaves the area of its own accord and/or the USFWS has determined an appropriate action.
- The project will conserve the maximum area of natural drainage channel to reduce impacts to the marine environment. This will be ensured by avoiding placement of fill or structures in the drainage bed for temporary diversion or construction purposes, and by minimizing any stream hardening (including concrete channelization) associated with the bridge replacement.
- Turbidity and siltation from project-related work will 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.
- Any project-related materials and equipment (dredges, barges, backhoes, etc.) to be placed in the water will be cleaned of pollutants prior to use.
- No project-related materials (fill, revetment rock, pipe, etc.) will be stockpiled in the water (intertidal zones, reef flats, stream channels, wetlands, etc.) or on beach habitats.
- Any debris removed from the marine/aquatic environment will be disposed of at an approved upland site.
- No contamination (trash or debris disposal, non-native species introduction, attraction of non-native pests, etc.) of adjacent habitats (reef flats, channels, open ocean, stream channels, wetlands, beaches, forests, etc.) will be allowed to result from project-related activities.
- Fueling of project-related vehicles and equipment will take place away from the water and a contingency plan to control petroleum products accidentally spilled during the project will be developed. Absorbent pads and containment booms will be stored onsite, if appropriate, to facilitate the clean-up of accidental petroleum releases. Any under-layer fills used in the project will be protected from erosion with stones (or core-loc units) as soon after placement as practicable.

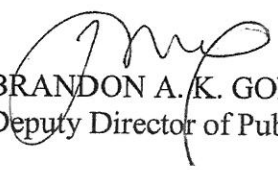
- Any soil exposed near water as part of the project will be protected from erosion (with plastic sheeting, filler fabric, etc.) after exposure and stabilized as soon as practicable (with native or non-invasive vegetation matting, hydroseeding, etc.).

We respectfully request your concurrence with our determination that the subject project, with implementation of the above-listed measures, may affect, but is not likely to adversely affect, threatened or endangered species, or critical habitat.

This letter is also meant to conduct consultation with your office concerning the Fish and Wildlife Coordination Act, 16 USC 661. It is our agencies' determination that the proposed activity will not result in the control or modification of a body of water that provides habitat for fish and that there will be no effect on wildlife. We would also appreciate your concurrence with this finding.

We respectfully request and will deeply appreciate, if you can assist us in responding to this letter within 30 days of receipt of this letter.

If you have any questions, please feel free to contact our project engineer Mr. Casey Yanagihara at (808) 961-8004 or by email at cyanagihara@hawaiiicounty.gov.



BRANDON A. K. GONZALEZ
Deputy Director of Public Works

RT/CKY

Enclosure

cc: Robert Sun, HDOT
Lisa Powell, FHWA
✓ Mike Hunnemann, KAI Hawai'i
Ron Terry, Geometrician Associates



United States Department of the Interior

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



DEC 15 2016

In Reply Refer To:
01EPIF00-2017-1-0049

Mr. Casey Yanagihara
County of Hawaii, Department of Public Works
101 Pauahi Street, Suite 7
Hilo, Hawaii 96720-4224

Subject: Informal Consultation for the Alii Drive Culvert Replacement Project, District of North Kona, Hawaii Island

Dear Mr. Yanagihara:

The U.S. Fish and Wildlife Service (Service) received your correspondence on November 15, 2016, requesting our concurrence with your determination that the proposed County of Hawaii culvert replacement project may affect, but is not likely to adversely affect the federally endangered Hawaiian hawk (*Buteo solitarius*), Hawaiian hoary bat (*Lasiurus cinereus semotus*), Hawaiian petrel (*Pterodroma sandwichensis*), Band-rumped storm-petrel (*Oceanodroma castro*), Hawksbill turtle (*Eretmochelys imbricata*), the threatened green sea turtle (*Chelonia mydas*), the threatened Newell's shearwater (*Puffinus newelli*), and one endangered insect, the Blackburn's sphinx moth (*Manduca blackburni*). No critical habitat is located within the action area and therefore will not be affected. The findings and recommendations in this consultation are based on: (1) your correspondence dated November 15, 2016; (2) emails and phone calls between Chelsie Javar-Salas (Service), you, and Ron Terry (Geometrician Associates); and (3) other information available to us. This response is in accordance with the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531-1544 *et seq.*). A complete administrative record is on file in our office.

Project Description

The proposed project will replace an existing double-cell culvert and roadway on Alii Drive at Kahului Bay with a new wider one-span concrete bridge structure. The project would also widen the Kahului Drainageway (also known as the Waiaha Drainageway) upstream of the new bridge to provide capacity for the 100-year flood. Similarly, widening of the roadway is proposed to accommodate a wider shoulder for pedestrians and bicyclists. No night work is anticipated.

The Service provided a list of all the federally listed and proposed endangered or threatened species and critical habitat that are known to occur on or within the vicinity of the project area in a letter dated March 24, 2014 (Service File No. 2014-SL-0226).

Conservation Measures

The following conservation measures identified in your November 15, 2016 letter will be implemented at the project area to avoid or minimize effects to the species listed in this informal consultation. These conservation measures are considered part of the project description. Any changes to, modifications of, or failure to implement these conservation measures may result in the need to reinstate this consultation.

1. No woody plants over 15 feet tall will be removed, cut, or trimmed during the sensitive bat pup-birthing and rearing season of June 1 to September 15. If a bat is present at the project site, the area will be avoided. If a bat arrives in the construction area after work begins, work will cease until the animal leaves on its own accord.
2. To avoid impacts to the Hawaiian Hoary bat, no barbed wire will not be used for any fencing (temporary or permanent).
3. Field cards with pictures of the Hawaiian hoary bat will be distributed to the general contractor to assist in identifying this species should it occur in the project area.
4. No brush or tree clearing will occur during the hawk nesting season of March through September. If this time period cannot be avoided, a hawk nest search will be conducted by a qualified biologist, within 1,600 feet (500m) of the project site and pre disturbance surveys will be conducted within 14 days prior to construction activity. If surveys determine the presence of Hawaiian hawks nesting in the action area or within 1600 feet of the action area, the Service will be contacted immediately to develop appropriate avoidance and minimization measures dependent upon the site-specific information.
5. An environmental awareness sheet with pictures of the Hawaiian hawk (adults, chicks, and juveniles) and nests will be distributed to the general contractor to assist in identifying this species should it occur in the project area. The awareness sheet will also include instructions concerning protocols to avoid and minimize impacts to Hawaiian hawks if they are observed on the site.
6. In addition to the survey for larval host plants of the Blackburn's sphinx moth that has already been conducted, the project area will again be surveyed for the presence of larval host plant immediately prior to the beginning of construction. If possible, this survey will occur approximately four to eight weeks following significant rainfall and during the wettest portion of the year. If larval host plants are found during this second survey the Service will be contacted.
7. If the project uses imported gravel or dirt fill at the project location, the fill will be from a source that is certified weed free or a plant survey will be conducted around the area where the fill will be extracted.
8. Field cards with pictures of the Blackburn sphinx moth, moth larvae, and tree tobacco will be distributed to the general contractor to assist in identifying this species should it occur in the project area.
9. All outdoor lights will be fully shielded so the bulb can only be seen from below bulb height and only used when necessary. Nighttime construction will be avoided during the seabird fledging period of September 15 to December 15.
10. Field cards with pictures of seabirds will be distributed to the general contractor to assist in identifying this species should it occur in the project area.
11. All work on the project that occurs near the shoreline will avoid any direct or indirect impacts to green sea turtles and hawksbill turtles (collectively known as sea turtles). If any sea turtles are utilizing the shoreline area during construction activities on or near the shoreline, construction with any potential to displace or harm sea turtles will cease until

the animal voluntarily leaves the area. Additional measures may be determined as part of consultation with NOAA-NFMS.

12. The installation of sand bags near the sea wall during construction activities will be positioned so that no sea turtles may become trapped behind the sand bags. This will ensure no sea turtles are restricted from accessing the ocean.
13. All construction debris that may pose an entanglement hazard to listed species will be removed from the proposed project site if such materials are not being actively used. All construction debris will be removed at the conclusion of work.
14. The project will conserve the maximum area of natural drainage channel to reduce impacts to the marine environment. This will be ensured by avoiding placement of fill or structures in the drainage bed for temporary diversion or construction purposes, and by minimizing any stream hardening (including concrete channelization) associated with the bridge replacement.
15. Turbidity and siltation from project-related work will 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.
16. Any project-related materials and equipment (dredges, barges, backhoes, etc.) to be placed in the water will be cleaned of pollutants prior to use.
17. No project-related materials (fill, revetment rock, pipe, etc.) will be stockpiled in the water (intertidal zones, reef flats, stream channels, wetlands, etc.) or on beach habitats.
18. Any debris removed from the marine/aquatic environment will be disposed of at an approved upland site.
19. No contamination (trash or debris disposal, non-native species introduction, attraction of non-native pests, etc.) of adjacent habitats (reef flats, channels, open ocean, stream channels, wetlands, beaches, forests, etc.) will be allowed to result from project-related activities.
20. Fueling of project-related vehicles and equipment will take place away from the water and a contingency plan to control petroleum products accidentally spilled during the project will be developed. Absorbent pads and containment booms will be stored onsite, if appropriate, to facilitate the clean-up of accidental petroleum releases. Any under-layer fills used in the project will be protected from erosion with stones (or core-loc units) as soon after placement is practicable.
21. Any soil exposed near water as part of the project will be protected from erosion (with plastic sheeting, filler fabric, etc.) after exposure and stabilized as soon as practicable (with native or non-invasive vegetation matting, hydroseeding, etc.).

Hawaiian hawk

No Hawaiian hawks and nesting were detected in the area during the biological survey. The habitat present within the project area is not suitable for hawk nesting, and therefore it is unlikely that Hawaiian hawks nest in the project area. Hawks could forage or transit the project area, but could easily avoid any disturbance. By implementing the above conservation measures, the proposed project will avoid potential adverse effects to Hawaiian hawks.

Hawaiian hoary bat

The proposed project site is within the range of the Hawaiian hoary bats. By implementing the above conservation measures, the proposed project will avoid potential adverse effects to Hawaiian hoary bats.

Seabirds

The Hawaiian petrel, Newell's shearwater, and band-rumped storm petrel (collectively known as seabirds) may transit the project area at night while travelling between upland nesting and ocean foraging sites. By implementing the above conservation measures, the proposed project will avoid potential adverse effects to listed seabirds.

Sea turtles

The proposed project site is within the range of the hawksbill turtle and green sea turtle. By implementing the above conservation measures, the proposed project will avoid potential adverse effects to hawksbill turtles and green sea turtles.

Blackburn's sphinx moth

No Blackburn's sphinx moth larval host plants were found during surveys of the project area; a few adult host plants were found including beach morning glory (*Ipomoea pes-caprae*). By implementing the above conservation measures, the proposed project will avoid potential adverse effects to Blackburn's sphinx moth.

Summary

Based on the above conservation measures, we concur with your determination that the proposed project may affect, but is not likely to adversely affect, the Hawaiian hawk, Hawaiian hoary bat, Hawaiian petrel, Newell's shearwater, Band-rumped storm-petrel, Green sea turtle, Hawksbill turtle, and Blackburn's sphinx moth. Unless the project description changes, or new information reveals that the proposed project may affect listed species in a manner or to an extent not considered, or a new species is listed or critical habitat designated that may be affected by the proposed action, no further action pursuant to section 7 of the ESA is necessary.

Thank you for your efforts to conserve listed species and native habitats. If you have any questions or concerns regarding this consultation, please contact Chelsie Javar-Salas, Plant Biologist (phone: 808-792-9400, email: chelsie_javar@fws.gov).

Sincerely,

A handwritten signature in black ink, appearing to read "Michelle Bogardus". The signature is fluid and cursive, with a large initial "M" and a long, sweeping underline.

Michelle Bogardus
Island Team Manager
Maui Nui and Hawaii Islands