KAUA'I COUNTY HOUSING AGENCY
ADAM ROVERSI, DIRECTOR

DEREK S.K. KAWAKAMI, MAYOR
REIKO MATSUYAMA, MANAGING DIRECTOR

October 24, 2023

Mary Alice Evans, OPSD Director

State of Hawai'i Office of Planning and Sustainable Development

Environmental Review Program

235 S. Beretania Street, Room 702

Honolulu, Hawai'i 96813

Subject: Publication of the Draft Environmental Assessment (DEA-FONSI) for the Proposed

Kahua Ho'oulu Affordable Housing Development

Līhu'e District, Island of Kaua'i, Hawai'i

TMK (4) 3-3-04: 020

Dear Ms. Evans,

With this letter, the Kaua'i County, Housing Agency hereby transmits the Draft Environmental Assessment and Anticipated Finding of No Significant Impact (DEA-AFONSI) for the proposed Kahua Ho'oulu Affordable Housing Development project situated at TMK No. (4) 3-3-04: 020, in the Līhu'e District, Island of Kaua'i for publication in next available edition of the Environmental Notice.

Enclosed is a completed OEQC Publication Form by completing the online Submittal Form, an electronic Adobe Acrobat PDF file of the DEA-AFONSI, and an electronic file containing a shapefile for the action location boundary. Simultaneous with this letter, we have submitted the summary of the action in a text file by electronic mail to your office.

If there are any questions, please contact me at (808) 241-4444.

Sincerely,

Adam P. Roversi

Director, Kaua'i County Housing Agency

From: webmaster@hawaii.gov
To: DBEDT OPSD Environmental Review Program
Subject: New online submission for The Environmental Notice
Date: Tuesday, December 26, 2023 1:06:37 PM

Action Name

County of Kauaʻi Housing Agency Kahua Hoʻoulu Housing Development

Type of Document/Determination

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

HRS §343-5(a) Trigger(s)

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

Judicial district

Līhuʻe, Kauaʻi

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

(4) 3-3-004:020

Action type

Agency

Other required permits and approvals

HRS 343 Compliance, HRS 6E Compliance, County Grubbing and Grading Permit, County Building Permit, NPDES Coverage, NEPA / HUD Compliance

Proposing/determining agency

County of Kauaʻi Housing Agency

Agency contact name

Adam Roversi

Agency contact email (for info about the action)

aroversi@kauai.gov

Email address or URL for receiving comments

info@kaimanaenv.com

Agency contact phone

(808) 241-4444

Agency address

4444 Rice Street, Suite 330
Līhuʻe, HI 96766
United States
Map It

Was this submittal prepared by a consultant?

Yes

Consultant

Kaimana Environmental Solutions LLC

Consultant contact name

Max Solmssen

Consultant contact email

max@kaimanaenv.com

Consultant contact phone

(808) 341-3546

Consultant address

PO Box 11890
Honolulu, HI 96828
United States
Map It

Action summary

The County of Kauaʻi Housing Agency proposes to build an affordable housing and educational and health facility on County-owned land in Puhi, Kauaʻi that would include five 3-story buildings consisting of up to 60 apartment units in total, and associated parking area.

Reasons supporting determination

Based on the environmental assessment conducted, the proposed project would not result in any significant impacts to the natural or human environment. Please see Section 3 of the environmental assessment for a detailed environmental significance criteria assessment.

Attached documents (signed agency letter & EA/EIS)

- Kahua-Hooulu-DEA.pdf
- DEA-Publication-Letter-Signed.pdf

Action location map

- Hale_Hooulu.kml.zip

Authorized individual

Max Solmssen

Authorization

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

Draft Environmental Assessment

for the

County of Kauaʻi Housing Agency

Kahua Hoʻoulu Housing Development

Līhuʻe, Kauaʻi, Hawaiʻi

Tax Map Key Parcel (4) 3-3-004: 020

***Prepared for**:*

The County of Kauai Housing Agency

December 2023

Prepared by:

KAIMANA

environmental solutions

www.kaimanaenv.com

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Table of Contents

List of Tables

List of Figures

Appendices

List of Acronyms

AMP	archaeological monitoring plan
BMPs	best management practices
CDP	Census Designated Place
dBA	decibels
DEA	Draft Environmental Assessment
DOH	State of Hawaiʻi Department of Health
DOT-H	State of Hawaiʻi Department of Transportation-Highways Division
DLNR	State of Hawaiʻi Department of Land and Natural Resources
DOFAW	State of Hawaiʻi DLNR Division of Forestry and Wildlife
DPW	County of Kauai Department of Public Works
FEMA	Federal Emergency Management Agency
FONSI	finding of no significant impact
GHG	greenhouse gases
HAR	Hawaiʻi Administrative Rules
HRS	Hawaiʻi Revised Statutes
IPCC	Intergovernmental Panel on Climate Change
L_{eq}	Equivalent Continuous Sound Level
LOS	Level of Service
NAAQS	National Ambient Air Quality Standards
NOAA	National Oceanic and Atmospheric Administration
SAAQS	State Ambient Air Quality Standards
SHPD	State of Hawaiʻi DLNR State Historic Preservation Division
SMA	Special Management Area
TIAR	Traffic Impact Analysis Report
TMK	Tax Map Key
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service

1 Introduction

This draft Environmental Assessment (DEA) was prepared in accordance with Hawaiʻi Revised Statutes (HRS) 343, and its implementing regulations; Hawaiʻi Administrative Rules (HAR) 11-200.1. This DEA also complies with the National Environmental Policy Act (NEPA) of 1969 (42 United States Code (USC) §4321 et seq.) as implemented by the Council on Environmental Quality regulations (40 Code of Federal Regulations (CFR) Parts 1500- 1508). NEPA compliance is required for this project due to potential federal funding by the United States Department of Housing and Urban Development (HUD). This DEA also complies with Code of Federal Regulations (CFR) Title 24, Part 58: Environmental Review Procedures for Entities Assuming HUD Environmental Responsibilities. An Environmental Assessment Determinations and Compliance Findings for HUD-assisted Projects report is included as Appendix F of this DEA.

1.1 Project Information Summary

Project Name:	Kahua Hoʻoulu Housing Project
Address:	None
Tax Map Key (TMK):	(4) 3-3-04: 020
Project Area Size	Approximately 2.91 Acres
Document Type	Draft Environmental Assessment
Proposing / ApprovingAgency	County of Kauaʻi Housing Agency Contact: Adam Roversi, Director 4444 Rice Street, Suite 330 Līhuʻe HI 96766 aroversi@kauai.gov (808) 241-444**4**
Consultant:	Kaimana Environmental Solutions LLC Contact: Max Solmssen, Environmental Planner PO Box 11890 Honolulu, HI 96828 max@kaimanaenv.com (808) 341-3546
HRS 343 Trigger:	Use of County Lands or Funds
State Land Use Zoning:	Urban
County Zoning:	OP: Open Public
Flood Zone Designation:	Zone X – Determined to be outside the 500-year flood plain

Special Management Area (SMA): Outside SMA

Anticipated Determination: Finding of No Significant Impact (FONSI)

Permits/Approvals:	HRS 343 Compliance HRS 6E Compliance County Grubbing and Grading Permit County Building Permit NPDES Coverage NEPA / HUD Compliance
Estimated Project Cost	$24,000,000
Estimated Project Construction Duration Schedule	1.5 Years

1.2 Location and Project Description

The project site is located on the east side of the Island of Kauaʻi, within the Puhi region of Līhuʻe town (Figure 1), and includes one approximately 2.91 acre parcel of undeveloped County-owned parkland Tax Map Key (TMK) parcel (4) 3-3-04: 020 (project site). The project site includes landscaped grass, trees, and play structures. The project site is bordered to the north by the Kaumualiʻi Highway, across which is Kauaʻi Community College, to the east by Nani Street, accross which is open land, to the south by Welau Street, accross which are existing single family residences, and to the west by commercial development (Figure 2).

The proposed project includes the design and construction of the Kahua Hoʻoulu Affordable Housing Development, which also includes a planned educational and health center. Figure 3 shows the proposed project site plan. The proposed project would include five 3-story buildings consisting of up to 60 apartment units in total, and associated parking area.

1.3 Purpose and Need for the Proposed Action

The purpose of the proposed project is to provide much needed affordable housing and community education and health services within the Līhuʻe community. The proposed housing and educational and health facility would provide greatly needed housing and community health and educational services to Kauaʻi's residents.

Figure 1: Project General Location Map

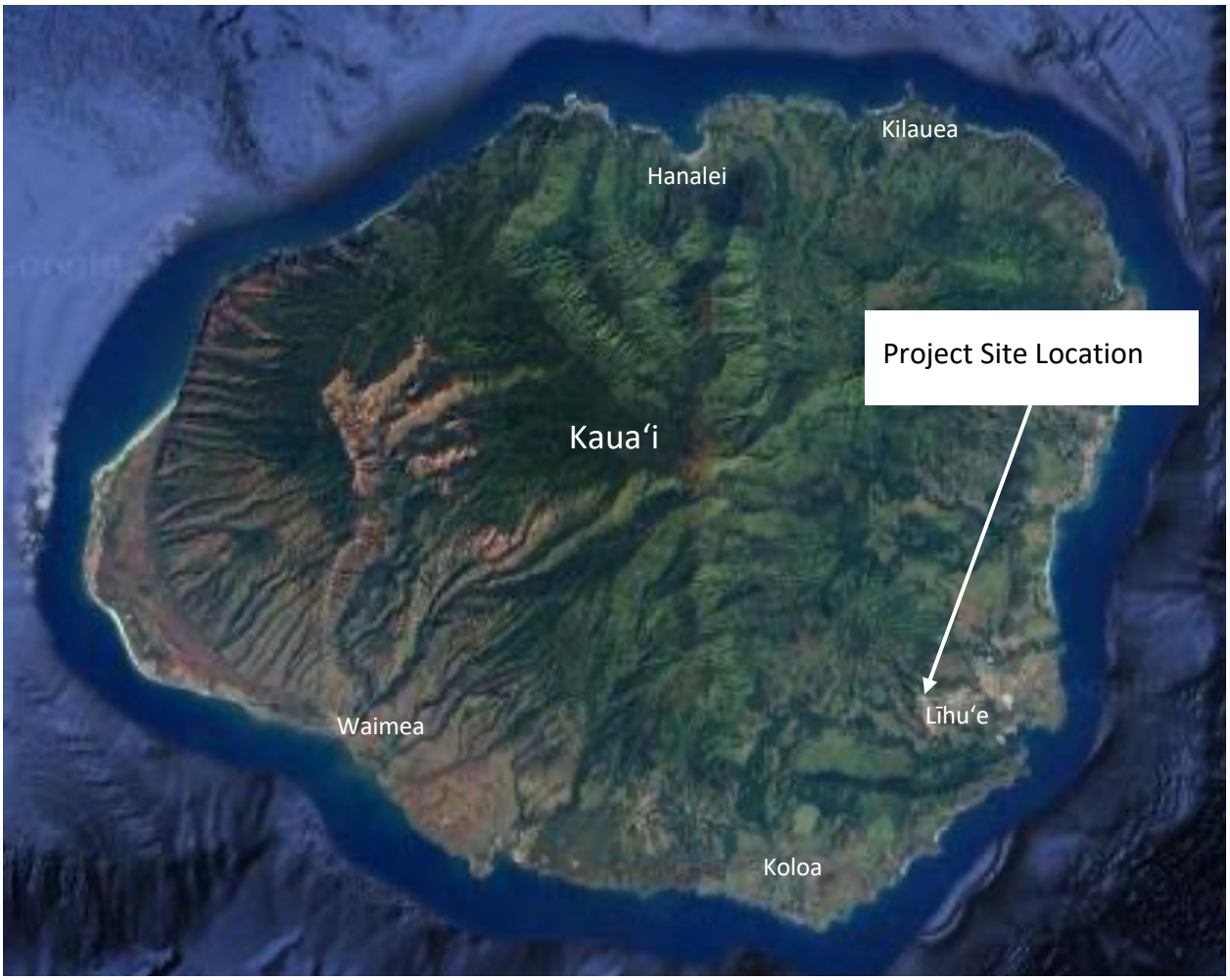

Figure 2: Project Location Detail Map

1.4 Environmental Assessment Distribution and Early Consultation

Table 1 shows the Kauaʻi County, State and Federal agencies, community groups and businesses that were engaged for early consultation as part of the environmental review process. Table 1 also includes a distribution list of those that received the DEA publication notice, and will receive notice of subsequent decision document publications for this project. All early consultation correspondence is included in Appendix E of this DEA.

Table 1: Environmental Assessment Distribution and Early Consultation

Agency/Group Affiliation	Agency/Group	Early Consultation Notice Sent	Early Consultation Response Received	DEA Publication Notice Sent
Federal Agencies	Department of the Interior United States Fish and Wildlife Service	**X**	**X**	**X**
State of Hawaiʻi Agencies	Office of Planning	**X**		**X**
	DOH Clean Water Branch	**X**		**X**
	DLNR Division of Forestry and Wildlife	**X**	**X**	**X**
	DLNR Land Division	**X**	**X**	**X**
	DLNR Engineering Division	**X**	**X**	**X**
	DLNR State Historic Preservation Division	**X**		**X**
	Office of Hawaiian Affairs	**X**		**X**
	Department of Transportation-Highways Division	**X**		**X**
	Department of Education	**X**	**X**	**X**

Agency/Group Affiliation	Agency/Group	Early Consultation Notice Sent	Early Consultation Response Received	DEA Publication Notice Sent
County of Kauaʻi Agencies	Department of Water	**X**	**X**	**X**
	Transportation Agency	**X**	**X**	**X**
	Department of Public Works	**X**		**X**
	County Council	**X**		**X**
	Department of Parks and Recreation	**X**	**X**	**X**
	Planning Department	**X**	**X**	**X**
	Highways Division	**X**		**X**
	Fire Department	**X**	**X**	**X**
	Police Department	**X**	**X**	**X**
	Kauaʻi Community College			
Utility Companies	Hawaiian Electric Company	**X**		**X**
	Hawaiian Telcom	**X**	**X**	**X**
	Spectrum	**X**		**X**

Agency/Group Affiliation	Agency/Group	Early Consultation Notice Sent	Early Consultation Response Received	DEA Publication Notice Sent
	Hawaii Gas	**X**		**X**
Utility Companies (cont.)	Kauaʻi Island Utility Cooperative	**X**		**X**
	Puhi Sewer and Water Company / Aqua Engineers	**X**		**X**
Libraries/Repositories	Līhuʻe Public Library			**X**
Other	Island School	**X**		**X**

1.5 Overview of Alternatives Considered and Description of the Proposed Action

Alternative 1: No Action – Under Alternative 1, the proposed affordable housing, educational and health center facility would not be constructed, and the project site would remain as undeveloped landscaped land. Although the no action alternative does not address the project purpose and need, it was carried forward for analysis in this EA in compliance with the provisions of NEPA.

Alternative 2: Alternate Project Location – Under Alternative 2 the proposed affordable housing, educational and health center facility would be built in a different location within Kauaʻi County. This alternative was eliminated from further consideration since the proposed project site is already located on County-owned land in a central area of Kauaʻi County, within Līhuʻe town; a primary job center of Kauaʻi County, where new building sites are scarce and costly to procure.

Alternative 3 (Proposed Action): Kahua Hoʻoulu Housing and Educational and Health Center– Under Alternative 3, the Proposed Action, the proposed affordable housing, educational and health center facility would be built on available County-owned land located in a central location (Figure 2 & Figure 3). Alternative 3 was carried forward for analysis in this EA since it best fulfills the project purpose and need to provide much needed health services in a central location accessible to the local community.

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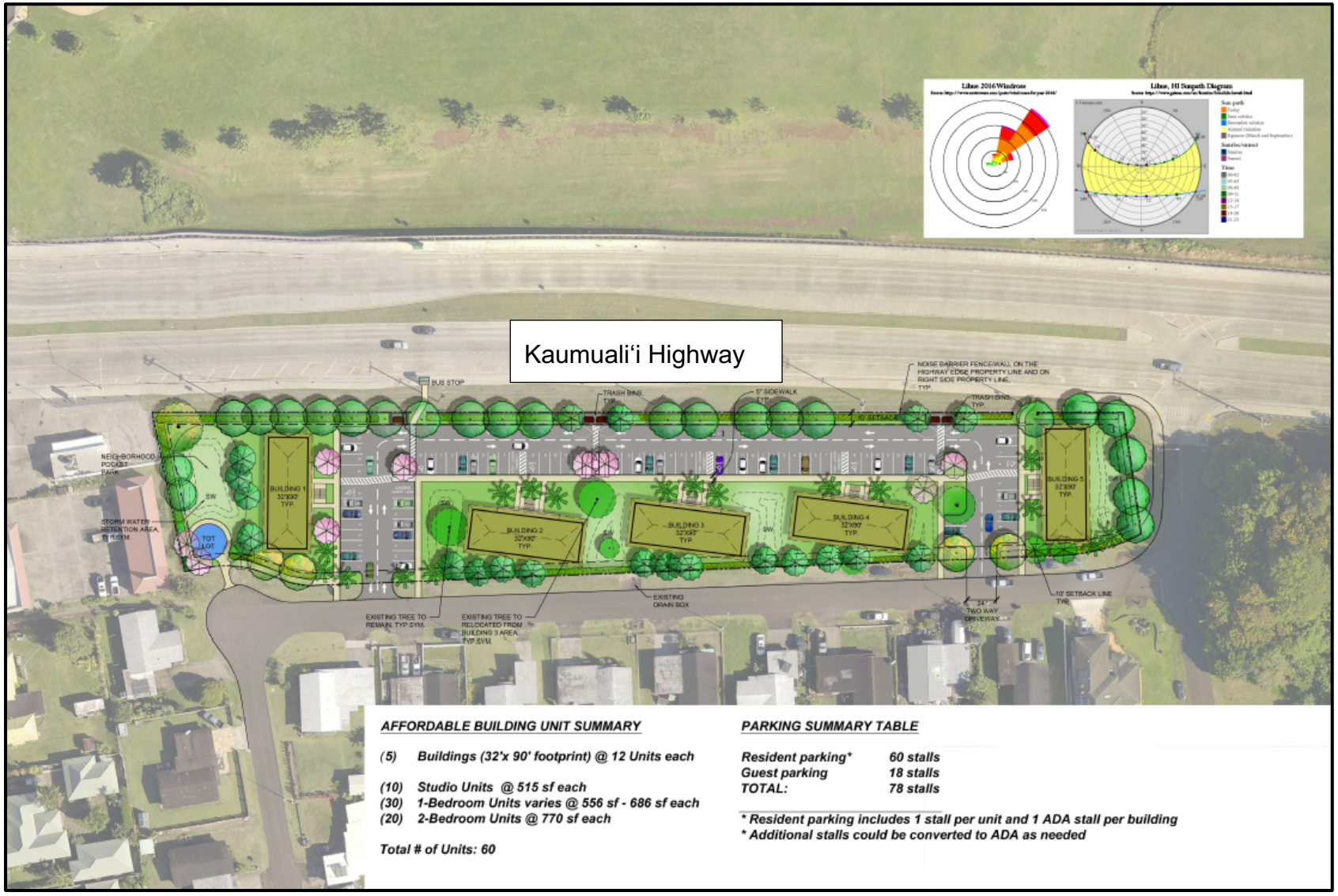
Figure 3: Site Plan



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2 Environmental Setting, Potential Impacts, and Mitigation Measures

The environmental, social, and economic setting of the existing environment and the probable impacts of the Proposed Action, and mitigation measures are described in this section of the EA. Impacts are evaluated as to whether they constitute a "significant effect" on a particular environmental setting. Impacts are described as having No Impact, Significant Adverse Impact, or Beneficial Impact to the environment. The terms "impact" and "effect" are used synonymously in this EA. Impacts may apply to the full range of natural, aesthetic, historic, cultural, and economic resources.

Following the environmental impact analysis for all resource areas in this section, an overall summary evaluation of the environmental impact significance criteria included in HAR 11-200.1-13, including discussion of cumulative impacts, is provided at the end of this section of the EA.

2.1 Climate and Air Quality

Existing Conditions

The project site is located in a tropical zone along the southeastern inland portion of Līhuʻe, Kauaʻi. The predominate wind pattern within the vicinity of the project area is northeast trade winds generated from the North Pacific high pressure system northeast of the Hawaiian Islands. Trade winds persist for most of the year, while winds from the south and southwest known as Kona Winds also occur (Fletcher et. al, 2002). Average annual rainfall within the vicinity of the project site is 55 inches (Giambelluca et. al, 2013). The average annual temperature within the vicinity of the project site is 72.92 degrees Fahrenheit (Giambelluca et. al, 2014).

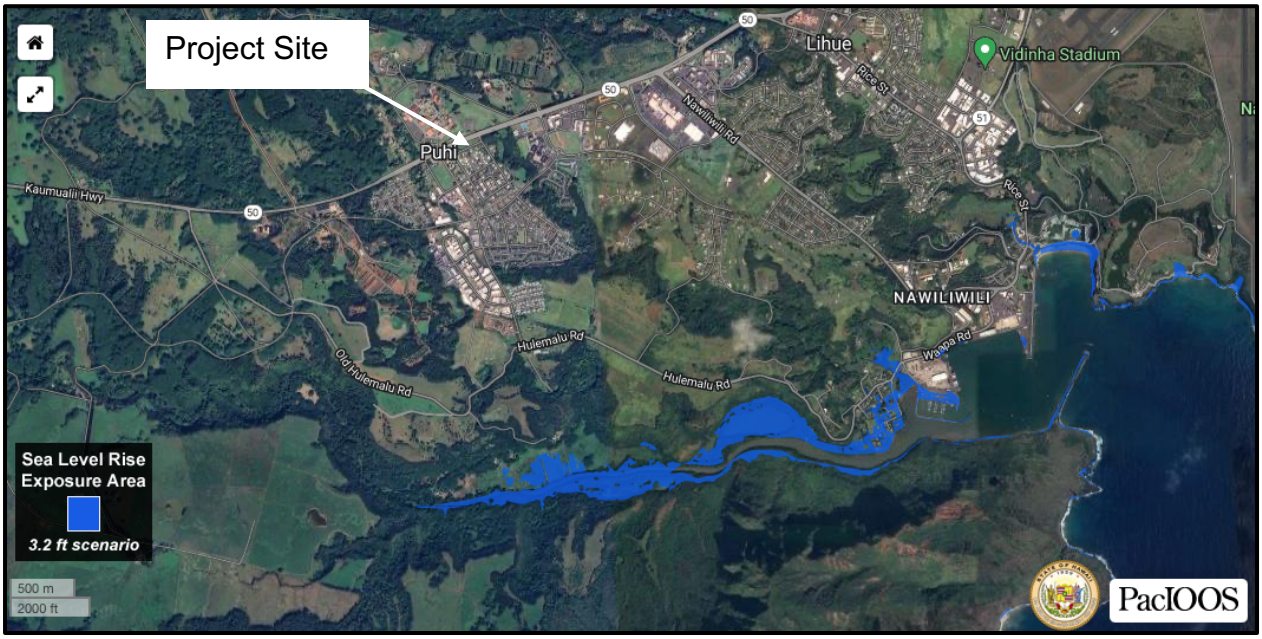
Ambient air quality in an area is evaluated based on its compliance with National Ambient Air Quality Standards (NAAQS), as well as State Ambient Air Quality Standards (SAAQS). The criteria pollutants that are measured by federal and state standards include carbon monoxide, nitrogen dioxide, sulfur dioxide, lead, ozone, and particulate matter. Based on data gathered by the State of Hawaiʻi DOH Clean Air Branch, the entire State of Hawaiʻi is in compliance (attainment) for all the above criteria pollutants, except on the Big Island during times of naturally occurring impacts from volcanic activity. There is a DOH air quality measurement station in Niumalu, within the vicinity of the project area near Nawiliwili Harbor (DOH, 2021).

2.1.1 Sea Level Rise and Climate Change

The Intergovernmental Panel on Climate Change (IPCC) is the United Nations body for assessing the science related to climate change. The IPCC predicts an approximately 2 meter global sea level rise by the year 2100, as well as increased extreme whether events related to climate change (IPCC, 2022). The Pacific Islands Ocean Observing System is a tool created and managed by the University of Hawaiʻi, and funded in part by the National Oceanic and Atmospheric Administration (NOAA) that provides updated coastal and ocean information, tools and services. One of the tools provided by the Pacific Islands

Ocean Observing System is the State of Hawai'i Sea Level Rise Viewer, which provides an interactive mapping tool that models coastal inundation based on different sea level rise scenarios. Figure 4 shows the project site during the 3.2 foot (highest) sea level rise scenario. The project site would not be directly affected by the modeled sea level rise scenario (PacIOOS, 2023).

Figure 4: Sea Level Rise Exposure Scenario



Potential Impacts and Mitigation Measures

Alternative 1: No Action

Under the no action alternative no construction or land disturbance would occur, and there would be no additional impact to air quality.

Alternative 3: Proposed Action

Dust would be generated on a short-term basis during construction site work. In order to mitigate airborne dust (particulate matter) impacts to the surrounding environment, all construction activities would need to adhere to County of Kaua'i DPW Interim Construction Best Management Practices (BMPs) for Sediment and Erosion Control. BMPs include watering active work areas and unpaved work roads; use of dust fences; establishment of a routine road cleaning and tire washing program; establishment of landscaping or hardened surface early in the construction schedule; and monitoring dust at the project boundary during construction (COK, 2004). With these mitigation measures in place there would be no significant impact to air quality from the proposed action during construction. Once completed, it is not anticipated that there would be any significant long-term air quality impacts from the operation of the proposed development since there would be no significant source of dust or other air emissions during operation of the development.

2.2 Geological Resources

Existing Conditions

The project site is located in the Līhuʻe basin which dominates the eastern part of the island of Kauaʻi. the Līhuʻe basin is a large (~110 km^2) semicircular depression bounded by steep cliffs and partly filled by late rejuvenated-stage (or post- erosional stage) volcanic material (Stearns, 1985). The project site is mostly level at an elevation of approximately 325 feet above mean sea level. Soil within the project area includes Puhi silty clam loam. This soil type is classified as Class B well drained soil with moderate infiltration rates and moderately coarse textures (NRCS, 2023).

Potential Impacts and Mitigation Measures

Alternative 1: No Action

Under the no action alternative no construction or land disturbance would occur, and there would be no additional impact to site soils or other geological resources.

Alternative 3: Proposed Action

The proposed action would result in short-term less than significant impacts to soils during construction from grading, site work, utility, and infrastructure development. Soils would be temporarily excavated and stockpiled onsite during the construction period. Exposed soils are susceptible to erosion, especially if it rains heavily during site work periods.

Adverse impacts from soil erosion and runoff would be minimized as a result of erosion and sedimentation control measures that would be implemented during construction. Proposed construction would need to comply with Kauaʻi County BMP standards addressing soil and erosion control (e.g., silt fencing, covering and protecting soil stockpiles with tarps and filter socks, surface revegetation as soon as possible) (COK, 2004). These mitigation measures would minimize soil migration from the proposed construction area. The topography of the project site would remain similar to existing conditions following construction.

Once completed, the proposed development would include hardened surfaces for driveway area, walkways and parking. All hardened surfaces would need appropriate drainage features in compliance with County code (i.e., drywells, swales and drainage culverts). Landscaped areas are also proposed that would hold soil in place naturally similar to existing conditions (Figure 3). As a result, soil and topography impacts are anticipated to be short-term and insignificant.

2.3 Noise

Existing Conditions

An environmental noise assessment was conducted by D.L. Adams Associates from May through July 2021 in order to determine existing noise sources and receptors at and surrounding the project site that may affect the proposed project users, as well as to determine any potential noise impacts to the affected environment from the proposed project. The noise assessment report is included as Appendix B. Ambient noise level measurements were conducted at key street intersections bordering the project site from

June 24th through June 27th, 2021 to assess the existing acoustical environment at the project site. Continuous, hourly equivalent sound levels were recorded at each location. The noise assessment determined that traffic noise from Kaumuali'i Highway was the primary noise source, as well as noise from the gas station and carwash to the west of the project site (DL Adams, 2021).

Potential Impacts and Mitigation Measures

Alternative 1: No Action

Under the no action alternative no construction or noise-generating activity would occur, and there would be no additional impact to noise receptors at or surrounding the project area.

Alternative 3: Proposed Action

Under the proposed action, short-term noise impacts from construction activities would occur. Development of the project site would involve excavation, grading, and use of other typical mechanized construction equipment/tools. Table 2 below shows typical construction noise levels by phase.

Based on the maximum generalized outdoor noise levels at the nearest residences across the street from the project site, HDOH Community Noise Rule criteria will be exceeded during construction of the project, and the project will require a Noise Permit to proceed with construction. HDOH may also require the contractor to conduct noise monitoring or community meetings inviting the neighboring residents and business owners to discuss construction noise. The contractor should use reasonable and standard practices to mitigate noise, such as using mufflers on diesel and gasoline engines, using properly tuned and balanced machines, etc.

HDOH may require additional noise mitigation, such as temporary noise barriers, or time of day usage limits for certain kinds of construction activities. However, maximum noise levels at any one receptor will be short-term and vary with the phase of construction and equipment actually used on site. Therefore, while noise permits will be required to comply with the HDOH Community Noise Rule, and noise mitigation measures should be incorporated into any construction alternative to reduce maximum noise levels, significant construction noise impacts are not expected at any receptor during the construction of the proposed development.

Long-term vehicular traffic noise impacts to users of the new facility, as well as the surrounding community noise receptors from additional trips and vehicle idling generated from the proposed facility are projected to be minimal compared to existing conditions. Once in operation, all stationary noise sources (i.e. air handler units) will be required to comply with the HDOH Community Noise Rule. All equipment located exterior to the building and which duct to the building exterior must be evaluated and designed for compliance with the HDOH Criteria for Category A receptors at all neighboring property lines. Therefore, no significant impact is expected due to stationary sources associated with the operation of the proposed development (DL Adams, 2021).

Table 2: Typical Construction Phase Noise Levels

Construction Phase	Noise Level at 50 Feet (L_{eq} dBA)
Ground Clearing	84
Excavation	89
Foundation	78
Structure Erection	87
Finishing	89

L_{eq} dBA = equivalent continuous sound level in decibels

The noise study also analyzed potential long-term impacts to onsite future residents from existing noise, as well as project-generated noise in accordance with HUD Site Acceptability Standards (24 CFR Part 51B).

Based on the assumed exterior wall assemblies and minimum STC 30-rated windows, the project achieves the HUD maximum interior noise level of 45 dBA and is considered "Acceptable". It is recommend selecting window assemblies with minimum STC 30 ratings and selecting exterior wall and door construction acoustically equivalent or superior to those assumed herein. If windows with higher STC ratings are selected, expect interior noise levels to decrease.

2.4 Biological Resources

Existing Conditions

A biological resources survey of the project site was completed for the project site by TetraTech that included a review of relevant publicly available literature and data relevant to the biological resources in and near the project site. Evaluated resources included previous survey reports, environmental assessments and environmental impact statements, public datasets, scientific journals and reports, as well as available, unpublished data that are relevant to the natural history and ecology of the area. In addition, available geospatial data, aerial photographs, and topographic maps of the area were reviewed to identify occurrences of federally or state listed or otherwise rare species, or habitats that could harbor these species.

A field survey of the project area was conducted by a trained biologist on April 27, 2021. The field survey methodology included inspection of the project site and recordation of the existing plant and animal species and/or species habitats observed. The project area is comprised of a fenced manicured lawn with several planted ornamental tree and shrub species. The species composition is dominated by non-native plant and wildlife species. Of the native species observed, all are common across Kaua'i and other Hawaiian Islands. No federally or state listed species were observed in the project area during the survey. Although not observed in the project area during the survey, several federally or state listed animal species may occasionally occur in or traverse the project area. No

designated critical habitat occurs in the project area. The closest designated critical habitat is nearly 2.3 miles to the southeast of the project area.

Potential Impacts and Mitigation Measures

Alternative 1: No Action

Under the no action alternative no construction or land disturbance would occur, and there would be no additional impact to biological species within or surrounding the project area.

Alternative 3: Proposed Action

Plants

The vegetation types and plant species recorded in the project area are not considered unique. No federal or state listed plant species were observed. Over 97 percent of the plant species observed are not native to the Hawaiian Islands. Milo, the one native plant species observed, commonly occurs throughout Hawaiʻi. Regardless, the following measures are recomended to avoid and minimize potential impacts of the Project:

If landscaping is installed as part of the Project, use non-invasive plants and incorporate native plant species to the maximum extent practicable.

Although non-native weedy species are common in the project area, implement invasive species minimization measures to avoid the unintentional introduction or transport of new invasive species to the area. This includes utilizing on-site gravel, rock, and soil (or purchasing from a local supplier) when practicable; utilizing certified, weed-free seed mixes; and washing construction equipment and/or visually inspecting for excessive dirt, debris, plant materials, and invasive or harmful non-native species as appropriate. Consult with Kauaʻi Invasive Species Committee if needed.

To minimize spread of the fungal pathogen responsible for Rapid ʻŌhiʻa Death, follow the most recent Rapid Ōhiʻa Death decontamination protocols recommended by USFWS and DOFAW.

Wildlife

All the animal species recorded in the project area are not native to the Hawaiian Islands. However, as described above, several listed wildlife species have the potential to occur in or transit through the project area. The following general measures are recommended to avoid and minimize potential impacts to listed wildlife species:

Establish a wildlife education and observation program for all construction and operational personnel. Staff should be trained to identify listed wildlife that may be found on-site (including listed waterbirds and seabirds, and the Hawaiian goose) and to take appropriate steps if listed wildlife species are found.

If downed listed species are observed at the project area, notify USFWS and DOFAW.

Implement speed limits on site to reduce the risk of collision to listed wildlife

Listed Water Birds

The project area does not provide suitable nesting or foraging habitat for listed Hawaiian waterbirds because there is no standing water; however, listed waterbirds may fly through the Study Area in transit to and from other areas or forage in the project area in the event of temporary flooding. If these species land within the project area, they could be impacted by construction and operation activities. The following avoidance measures adapted from USFWS are recommended:

Avoid creating areas with temporary or permanent standing water to avoid attracting listed waterbirds.

If listed waterbirds are found in the project area during active construction, cease all activities within 100 feet of the bird(s), and do not approach the bird(s). If appropriate nesting habitat is present, a biological monitor that is familiar with the species biology should conduct Hawaiian waterbird nest surveys. Repeat nest surveys again within 3 days of project initiation and after any subsequent delay of work of 3 or more days (during which birds may attempt nesting). If a nest of a listed waterbird is not discovered, work may continue after the listed waterbird leaves the area of its own accord.

If a nest of a listed waterbird is discovered, contact USFWS and DOFAW within 24 hours, and establish a 100-foot buffer around all active nests and/or broods until the chicks/ducklings have fledged. Do not conduct potentially disruptive activities or habitat alteration within this buffer

is possible that Hawaiian geese may fly through the Study Area when in transit to and from areas with known populations. Should this species occur within the Study Area, it could be impacted by construction and operation activities. Tetra Tech recommends the following avoidance measures adapted from USFWS (USFWS 2023):

If Hawaiian geese are observed in the project area during active construction, all activities within 100 feet of the bird should cease. Do not feed, approach, or disturb the bird(s). Work may continue after the bird leaves the area of its own accord.

If Hawaiian geese are observed loafing or foraging within the project area during the breeding season (September through April), halt work and have a biologist familiar with nesting behavior survey for nests in the area prior to the resumption of work. If a nest is discovered, contact USFWS and DOFAW and cease all work within 150 feet. If a nest is not discovered, work may continue after the bird leaves the area of its own accord.

In areas where Hawaiian geese are known to be present, post and implement reduced speed limits.

Listed Seabirds

The project area does not provide suitable nesting or foraging habitat for the listed Hawaiian seabirds. However, listed seabirds may fly over the project area in transit between the ocean and upland breeding sites during the breeding, nesting, and fledging seasons (March 1–December 15) and may be attracted to nighttime lighting. It is recommended that the following measures be implemented to avoid and minimize potential impacts to listed seabirds:

Avoid nighttime construction during the seabird fledgling period (September 15–December 15).

If nighttime construction is required outside the seabird fledging period, construction lighting should be shielded and directed downward and fit with non-white lights to minimize the attractiveness of construction lights to seabirds.

Operational on-site lighting should be fully shielded and directed downward to prevent upward radiation, triggered by a motion detector and/or timer controls when human activity is not occurring, and fitted with non-white light bulbs to the extent possible. Other possible lighting recommendations may include: placing lights under eaves; shifting lighting according to moon phase; decreasing visibility of interior lights; planting vegetation around lights to reduce light visibility; and using longer light wavelengths (DOFAW 2020).

Minimize construction of ovehead lines to reduce collision risk.

For powerlines, guywires, and other cables, minimize exposure above vegetation height and vertical profile.

If a grounded seabird is found, contact the Save Our Shearwaters (SOS) program at (808) 635-5117.

Hawaiian Hoary Bat

The USFWS (2019) provides the following avoidance and minimization measures for the Hawaiian hoary bat:

Avoid trimming or removing woody vegetation (trees or shrubs) taller than 15 feet between June 1 and September 15, when juvenile bats are not yet capable of flying and may be roosting in the trees, resulting in the potential to be impacted.

To prevent entanglement, do not use barbed wire for fencing.

It is recommended that if some trimming or removal of woody vegetation taller than 15 feet (4.5 m) is necessary between June 1 and September 15, consult with USFWS and DOFAW to ensure impacts to the Hawaiian hoary bat are avoided.

With the implementation of the biological mitigation measures listed above, there would be no significant impacts to biologcal resources at the project area, or within the directly surrounding area.

2.5 Water Resources

Existing Conditions

Surface Water

The project area is located within the southern Līhu'e Basin, which includes numerous perennial streams that flow down Kilohana Volcano Crater to lower elevations. Halehaka Stream is located directly northeast of the project area, across Nani Street. Puali Stream is located approximately 1,000 feet west of the project site. Halehaka and Puali Streams converge at an elevation below the project site, and then flow into Nawilili Bay.

Halehaka and Puali streams are identified as Class 2 inland waters by the DOH. "The objectives of Class 2 waters are to protect uses for recreational purposes, the support and propagation of fish and other aquatic life, and agricultural and industrial water supplies" (DOH, 2014).

Groundwater

The project area is associated with two underlying aquifers (upper and lower aquifer). The aquifers are part of the Līhu'e aquifer sector, within the Hanamaulu system. The upper aquifer is classified as high level (fresh water not in contact with seawater), unconfined, and is a flank aquifer type. This aquifer is currently used for drinking water, is fresh, irreplaceable, and has a high vulnerability to contamination. The lower aquifer is part of the same aquifer sector and system, and is classified as high level, confined, dike type. This lower aquifer has potential use for drinking water, is fresh, irreplaceable and has a low vulnerability to contamination (Mink and Lau, 1990).

The estimated depth to groundwater at the TP is approximately 200 feet below ground surface. Based on the TP topography, the groundwater flow may be towards the southeast. Mean annual rainfall at the TP is approximately 55 inches (Giambelluca *et al.*, 2016).

Flood Plains

The project site is located in Federal Emergency Management Agency (FEMA) Flood Zone X: area of minimal flood hazard (FEMA, 2023).

Tsunami Hazards

The project site is located in the Safe Zone, at an elevation well above (outside) the Extreme Tsunami Evacuation Zone, and the Tsunami Evacuation Zone (Figure 5, NOAA, 2023).

Potential Impacts and Mitigation Measures

Surface Water

Construction activities have the potential to result in short-term impacts to surface water quality since soils will be disturbed and may be stockpiled temporarily onsite during construction, which could lead to sediment stormwater runoff on and offsite. Other construction site pollutants may include solid and sanitary wastes, fertilizers, pesticides, oil and grease, concrete truck washout, construction chemicals, and construction debris.

In order to mitigate sediment and other pollutant runoff from construction activities, the contractor will be required to install and maintain construction BMPs in compliance with Kaua'i County BMP standards. Stormwater BMPs include, but are not limited to; sediment basins/ traps; filter fabric silt fences; straw bale, sandbag, or gravel bag barriers; stormwater drain inlet protection, and stabilized construction entrances (COK, 2004). The project will also comply with State water quality regulations HAR Chapters 11-54 and 11-55. National Pollution Discharge Elimination System (NPDES) General Permits for discharges of construction dewatering and hydrotesting waters may also be obtained from the DOH Clean Water Branch.

Figure 5: Tsunami Evacuation Zone Map

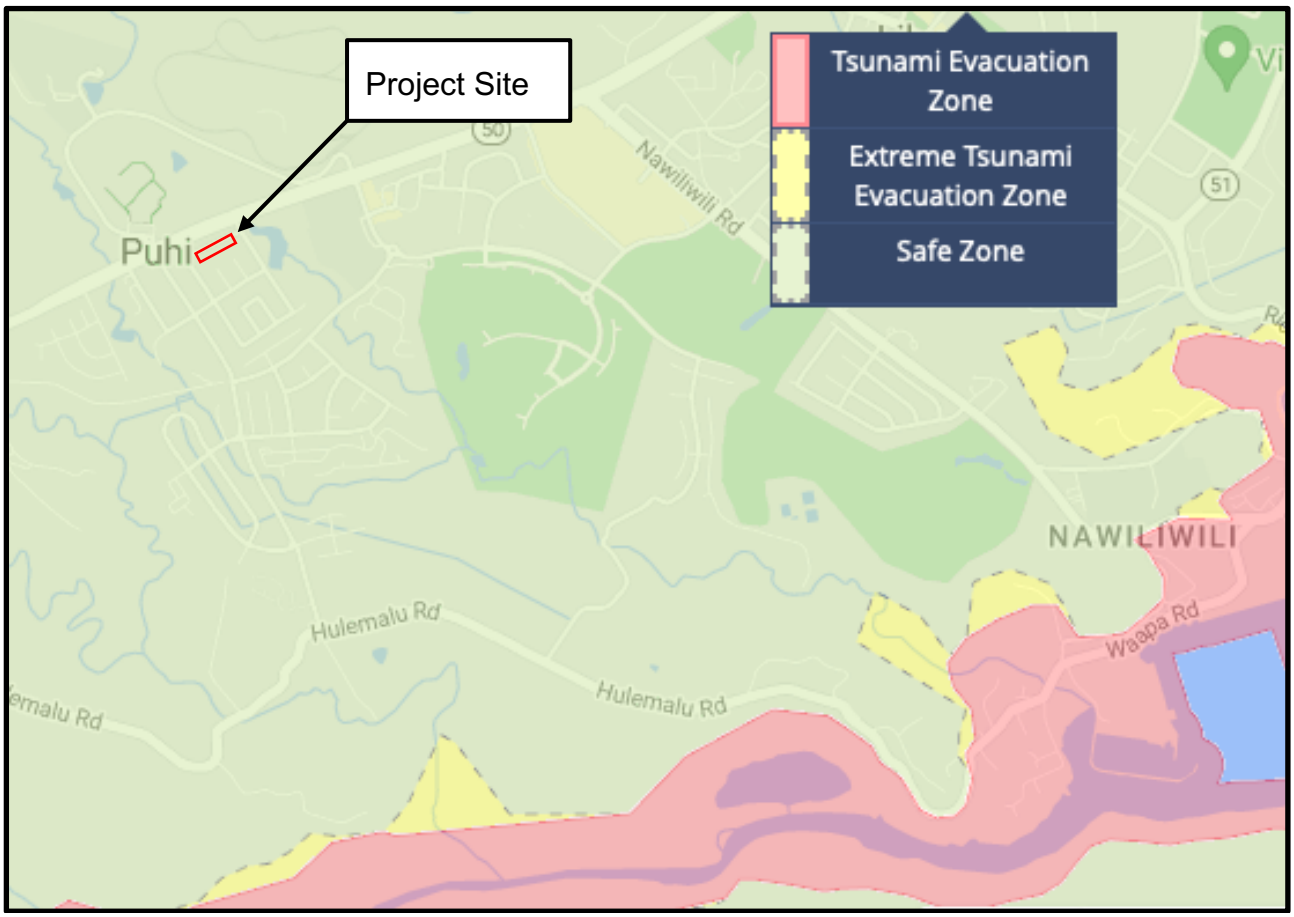


Figure Reference: NOAA, 2023

A permanent stormwater management system would be implemented at the proposed development that would adequately manage stormwater in accordance with County rules.

The proposed project would not result in increased risk of tsunami danger to the affected human environment since it would be constructed outside the Tsunami Evacuation Area in accordance with the Kauaʻi County Building Code.

Groundwater

It is not anticipated that groundwater will be encountered or affected by the proposed project given the depth to groundwater at the project site (approximately 200 feet below ground surface). Site grading for the proposed deveopment would occur well above groundwater level.

Potable water use at the proposed deveopment would need to comply with the Department of Water, County of Kauaʻi Rules and Regulations. The requested water demand shall be verified by the County Department of Water upon receipt of the building permit application.

During construction the contractor would need to supply sanitary portable toilets that would be serviced regularly. In order to operate, the proposed housing and educational

and health facility would need to apply for sewer service with the Puhi Sewer and Water Company / Aqua Engineers.

2.6 Solid and Hazardous Waste

Existing Conditions

Solid waste generated in Puhi/Līhuʻe is collected by municipal trucks and transfered for disposal at the Kekaha Landfill which is located on the west side of Kauaʻi. There is no solid waste currently generated at the project site. There are no known sources of hazardous materials/wastes at the project site.

Potential Impacts and Mitigation Measures

Alternative 1: No Action

Under the no action alternative no construction or land disturbance would occur, and there would be no additional solid or hazardous waste generated at the project site.

Alternative 3: Proposed Action

During construction of the proposed development, non-hazardous green waste and native soil will be generated from grading activities. Construction materials, such as concrete, asphalt, gypsum board, paints and coatings will also be used onsite during construction. Construction vehicles and earth moving equipment fueled by petroleum products will be used onsite. The contractor would need to conduct regular inspections and maintenance of vehicles and equipment to assure that no petroleum spills or leaks occur. Any excess green waste, soil and construction materials generated onsite will be recycled or properly disposed at the Kekaha Landfill or another approved facility in accordance with County rules.

Once in operation, the housing facility would not generate or store any significant quantities of hazardous materials. Small quantities of petroleum, paints and coatings may be utilized by maintenance staff. All potentially hazardous materials would need to be properly stored out of the sun/elements in flammable lockers within secure designated maintenance areas. The facility would generate non-hazardous household solid waste from the residents. All solid waste would be properly collected by municipal solid waste service and disposed at the Kekaha Landfill. There would be no significant short-term or long-term impacts to the affected environment from solid or hazardous waste.

A Phase I Environmental Site Assessment was conducted by KES in October 2021. While the project site was redeveloped along with the surrounding area, the area was formerly used as commercial sugar croplands from at least 1950 through 1998. Former commercial croplands in Hawaii have been known to contain elevated levels of lead, arsenic and organochlorine pesticides. It is recommended that site soils be tested for these target constituents prior to land disturbance, if not completed previously, in order to determine if any residual chemical contamination is present in soil. If soil is shown to contain elevated levels of these target chemicals, worker and environmental protection measures must be implemente in accordance with DOH and OSHA rules.

2.7 Traffic, Access and Parking

Existing Conditions

A traffic impact analysis was conducted for the proposed project by Community Planning & Engineering in May 2021. The traffic analysis was conducted to determine existing and future vehicular traffic patterns at key roadway intersections around the project site using both with and without project scenarios to determine traffic impacts from the proposed rehabilitation facility. The traffic impact analysis report (TIAR) is included as Appendix D.

The intersection analysis within the project area was performed on the following intersections due to their proximity to the Project:

(1) Kaumuali'i Highway/Puhi Road (signalized)

(2) Puhi Road/Leleiona Street (unsignalized)

(3) Leleiona Street/Mua Street (unsignalized)

(4) Kaumuali'i Highway/Nani Street (unsignalized)

(5) Nani Street/Welau Street (unsignalized)

The Level of Service (LOS) methodolgy was employed for the traffic study, which is a qualitative measurement methd used to describe the conditions of traffic flow at intersections, with values ranging from free-flow conditions at LOS A to congested conditions at LOS F. Volume-to-Capacity ratio data was also collected as part of the study.

Existing Traffic Volumes

Turning movement counts were collected on Wednesday, May 5, 2021 from 6:00-9:00 AM and 2:30-5:30 PM. The County of Kaua'i was under an emergency order for the COVID-19 pandemic during this time. This meant travel restrictions were still in place decreasing the number of tourists arriving in the islands, as well as school and work restrictions permitting distance learning and working from home. The 2019 historical roadway volume along Kaumuali'i Highway and Puhi Road were compared to the existing traffic data collected for this project to determine if the traffic volumes collected were significantly different due to the COVID-19 pandemic. However, the traffic volumes collected were similar to the historical traffic volumes along Kaumuali'i Highway and Puhi Road and traffic.

A few turning movements at the signalized intersection of Kaumuali'i Highway and Puhi Road operated at LOS D or LOS E. The movements are the eastbound left turn movement, the westbound left turn movement and the northbound left and through movement. All other turning movements operated at LOS C or better and no movements had a volume-to-capacity ratio greater than 1. Refer to Table 3 for the analysis results of the existing traffic conditions. Detailed intersection data reports for the existing conditions are included in the Traffic Report (Appendix D).

Table 3: Existing Traffic Conditions LOS Summary

Road Name	Approach	Movement	AM Peak Hour			PM Peak Hour		
			Delay (s/veh)	LOS	V/C	Delay (s/veh)	LOS	V/C
Kaumualii Highway at Puhi Road/Kauai Community College driveway (Signalized)								
Kaumualii Hwy	Eastbound	Left	55.8	E	0.43	47.9	D	0.13
		Thru	30.5	C	0.68	25.1	C	0.56
	Westbound	Left	53.4	D	0.49	55.0	D	0.44
		Thru	22.2	C	0.39	26.5	C	0.63
Puhi Rd	Northbound	Left-Thru	38.1	D	0.44	39.8	D	0.45
KCC dwy	Southbound	Left	31.1	C	0.12	33.0	C	0.20
		Thru	29.8	C	0.03	30.9	C	0.07
Intersection			31.2	C	-	28.8	C	-
Puhi Road and Leleiona Street (TWSC)								
Leleiona St	Eastbound	Left-Thru-Right	13.0	B	0.05	12.7	B	0.06
	Westbound	Left-Thru-Right	14.3	B	0.12	13.4	B	0.11
Puhi Rd	Northbound	Left	8.1	A	0.01	7.8	A	0.02
	Southbound	Left	7.9	A	0.01	8.1	A	0.01
Intersection			1.7	A	-	1.9	A	-
Leleiona Street and Mua Street (TWSC)								
Leleiona St	Eastbound	Left	7.3	A	0.01	7.3	A	0.01
	Westbound	Left	7.3	A	0.01	7.3	A	0.01
Mua St	Northbound	Left-Thru-Right	9.1	A	0.05	8.9	A	0.02
	Southbound	Left-Thru-Right	8.7	A	0.01	8.7	A	0.01
Intersection			3.9	A	-	2.5	A	-
Kaumualii Highway and Nani Street (TWSC)								
Kaumualii Hwy	Westbound	Left	11.8	B	0.06	12.1	B	0.12
Nani St	Northbound	Left-Right	17.1	C	0.23	17.3	C	0.16
Intersection			0.9	A	-	0.7	A	-
Nani Street and Welau Street (TWSC)								
Welau St	Eastbound	Left-Right	9.2	A	0.02	9.3	A	0.01
Nani St	Northbound	Left	0.0	A	0.00	7.4	A	0.01
Intersection			1.1	A	-	0.3	A	-

Potential Impacts and Mitigation Measures

Alternative 1: No Action

Under the no action alternative no addtional vehicular trips would occur to or from the project site, and there would be no additional impact to traffic volume from activities at the project site.

Alternative 3: Proposed Action

There are an estimated 78 parking stalls planned at the proposed development. Vehicle access to the proposed development will be from two driveways off Welau Street. One driveway is 125-feet west of Nani Street and the other driveway is 100-feet east of Mua Street. Both driveways will be two-way access. Pedestrian access from the development to the bus stop along Kaumualiʻi Highway will be provided via an opening on the north side of the development. There will be sidewalks throughout the proposed development.

The trip generation land uses for the proposed development includes Multifamily Housing (Mid-Rise) and Educational Center. For the proposed development, 22 (AM) and 32 (PM) vehicles are estimated to enter the proposed development while 30 (AM) and 28 (PM) vehicles are estimated to exit. All trips are assumed to be vehicle trips. Table 4 shows the project generated trips.

Table 4: Project Generated Trips

Land Use (Code)	Weekday AM Peak hour of adjacent street traffic		Weekday PM Peak hour of adjacent street traffic	
	Enter	Exit	Enter	Exit
Mid-Rise Multi-Family Housing (221) 60 units[1]	5	15	17	11
Day Care Center (565) 2,880 sq. ft.[2]	17	15	15	17
Total	**22**	**30**	**32**	**28**
[1]- AM Equation: Ln(T)=0.96Ln(X)-0.63; PM Equation: Ln(T)=0.98Ln(X)-0.98; X=Dwelling Units [2]-AM Equation: T=11.00(X); PM Equation: T=11.12(X); X=1,000 Sq. Ft. Gross				

The LOS for each intersection at the five intersections will remain the same when comparing the existing traffic conditions to the proposed with project traffic conditions. The LOS for the intersections will remain to operate at LOS C or better for the AM and PM peak hours. Therefore, the proposed project-generated traffic is not anticipated to create significant impacts to traffic patterns at or surrounding the project site (CPE, 2021).

2.8 Historic and Cultural Resources

Existing Conditions

An Archaeological Literature Review and Field Inspection was conducted by Honua Consulting from June through September 2021. This consisted of a pedestrian field inspection of the project site and a review of State Historic Preservation Division (SHPD) and other published archaeological records within a half-mile radius of the project site.

The archaeological literature review revealed that the project area is located in the uplands of Haʻikū and Niumalu on the flat, lightly sloping lands beneath the southeastern flank of Kilohana Crater. Little is known of traditional land use in the surrounding area due to modifications to the land and waterways for commercial sugarcane cultivation as early as the mid- 19th century.

The ahupuaʻa of Haʻikū and Niumalu, both of which include the project site, were awarded as Land Commission Award (LCA) 7713 ʻāpana 2, Royal Patent (RP) 4479 , to Victoria Kamāmalu during the Māhele. The only exception was several kuleana (commoner) lands awarded as various LCA's along Puali Stream and on the Niumalu Flats in Niumalu Ahupuaʻa and along the Hulēʻia River in Haʻikū Ahupuaʻa. Eventually the land was purchased and consolidated under the Grove Farm sugar plantation in the latter half of the 1800s. Historic maps and aerial photographs show that the project site was under sugarcane cultivation beginning in the late 1800's with continued use through the 1960's.

A residential neighborhood was constructed just south of the project area in the late 1960's and the project area was designated a community park in its current configuration in the early 1970's. The only changes to the project area since that time have been the installation of an emergency warning siren along the western boundary and the installation of electrical utility boxes on the eastern-most side of the project area along Nani Street.

Numerous archaeological studies have been conducted in the vicinity of the project site, including surveys for the Kauaʻi Community College, the Philippine Cultural Center, the Island School, highway improvements, and several former and current Grove Farm properties in support of commercial and residential developments. These studies documented plantation-era sites associated with the Grove Farm and Līhuʻe Plantations and included historic houses, two historic cemeteries, a historic bridge, Grove Farm locomotives, plantation water control features, a Territory of Hawaii survey datum, and a subsurface trash pit associated with former Puhi housing (Honua, 2021).

The pedestrian field inspection of the project site was completed on July 1, 2021, which consisted of a walk through the area to assess the current site conditions and understand the potential for encountering historically significant and/or culturally sensitive sites.

Historic playground equipment was observed and photographed. However, it did not possess integrity or significance and is not a historic property. Nothing else of archaeological note was documented or collected at the project site. The lack of surface sites is attributed to use of the project area for commercial sugarcane cultivation and subsequent development and use as a community park (Honua, 2021).

Since the project site is currently County-owned parkland, it is possible that Native Hawaiian cultural practices may occur at the project site. These practices would need to relocate to other parklands available in the area.

One native plant species; the Milo Tree (*Thespesia populnea*) was observed at the project site, and is native to the Hawaiian Islands. This indigenous species is not considered rare and is commonly planted throughout the islands (TetraTech, 2021).

Potential Impacts and Mitigation Measures

Alternative 1: No Action

Under the no action alternative no construction or land disturbance would occur, and there would be no additional impact to any potential historical or cultural resources at or surrounding the project site.

Alternative 3: Proposed Action

Although the literature review and field inspection did not find evidence of significant historical or cultural resources at the project site, the close proximity of multiple historic properties associated with Grove Farm, plantation village, and Puhi Camp warrants archaeological monitoring guided by an archaeological monitoring plan (AMP) during construction of the proposed development. The AMP must be approved by SHPD prior to the start of ground disturbance.

Further, since U.S. federal funds are being sought for the proposed project, compliance with the U.S. National Historical Preservation Act (NHPA) is also required. The County Housing Agency will need to consult with the State SHPD in accordance with Section 106 of the NHPA prior to project approval.

If the above recommendations are implemented, there are no significant adverse impacts anticipated to historical or cultural resources/practices due to the proposed project.

2.9 Socioeconomic Resources

Existing Conditions

The project site is located within the Census Designated Place (CDP) of Puhi. The population of the Puhi CDP as of the April 1, 2020 Census was 3,380. Persons under 5 years old represented 8.8% of the CDP population, persons under 18 years old represented 22.6% of the CDP population, and persons 60 or older represented 20.3% of the CDP population. The median household income in Puhi was $103,181 (US Census Bureau, 2020).

Potential Impacts and Mitigation Measures

Alternative 1: No Action

Under the no action alternative no construction or land disturbance would occur, and there would be adverse socioeconomic impacts since no additional short-term construction jobs, or long-term affordable housing units would be created.

Alternative 3: Proposed Action

The proposed project would result in the creation of short and long-term jobs for the local community. Construction jobs would be created during the construction of the proposed development, and there would likely be long-term property management and maintenance jobs created also. Once in operation, the facility would create much needed affordable housing, as well as health and educational services.

The proposed project is not anticipated to result in any short or long-term adverse impacts to socioeconomic conditions since it would not cause loss of any jobs or housing, and

would not result in tax revenue loss. The project would have beneficial economic and social impacts since it would result in job creation and much needed affordable housing, as well as health and educational services for the local community.

2.10 Recreational Resources

Existing Conditions

The project site is currently used as Kauaʻi County parkland. The park is owned and managed by the County of Kauaʻi, Department of Parks and Recreation.

Potential Impacts and Mitigation Measures

Alternative 1: No Action

Under the no action alternative no construction or land disturbance would occur, and there would be no additional impact to recreational resources.

Alternative 3: Proposed Action

The existing recreational users of the project site will be impacted by the proposed action since the project site will no longer be available to the public for recreational activities. However, there are two other parks in close proximity to the project site; Kauaʻi Community Market Park is located approximately 320 feet southwest of the project site, and Puhi Park is located approximately 915 feet southeast of the project site. Since there are other existing parklands / open areas available within the direct vicinity of the project site, it is not anticipated that the proposed action would result in a significant impact to existing recreational resources.

2.11 Visual and Scenic Resources

Existing Conditions

The project site is located in flat area along Kaumualiʻi Highway. Kauaʻi Community College and Island School are visible directly north of the proejct site, accross the highway, and the project site is flanked in all other directions by residential and commercially developed areas. Significant visual features viewed from the project site and surrounding area include Hāʻupu Mountain to the southwest, Kapalaʻoa and Kahili Mountains to the northwest and tall trees to the northeast.

Potential Impacts and Mitigation Measures

Alternative 1: No Action

Under the no action alternative no construction or land disturbance would occur, and there would be no additional buildings or development that would impact view plains in the area.

Alternative 3: Proposed Action

During construction, dust fences, construction materials and equipment would be visible. However, these impacts would be short-term, and dust fences around the work site would reduce visual distractions caused by construction. Once complete, the proposed development would include five 3-story buildings, parking areas north of the buildings,

and landscaping/trees between the buildings. Figure 6 depicts a rendering of the proposed facility.

The proposed facility would be visible from surrounding houses, especially those homes located across Welau Street, south of the project site. However, landscaping buffers are planned around the proposed facility buildings that would soften the visual presence of the new building, and perserve distant view corridors to the mountains. Therefore, there are no significant impacts anticipated to visual and scenic resources from the proposed project.

2.12 Utilities and Infrastructure

A preliminary engineering report was completed for the proposed project by Community Planning and Engineering, Inc. The report is attached as Appendix G. There are no utilities present at the project site currently. Overhead electric poles are present directly north of the project site, along Kaumualiʻi Highway, and underground electric and cable service is provided to the residences directly south of the project site along Welau Street. Potable water lines are also present at the project site border, along Welau Street.

2.12.1 Wastewater

Wastewater service at the project site would need to be coordinated with Puhi Sewer and Water Company / Aqua Engineers in order to construct a private wastewater system for the proposed facility that will connect to the Puhi Sewer and Water Company system in accordance with County and State DOH wastewater rules.

2.12.2 Potable Water

Municipal potable water service is available at the project site along Welau Street. Potable water use at the proposed facility would need to comply with the Kauaʻi County Department of Water Rules and Regulations for Water Service Connections.

2.12.3 Electrical and Telephone/Cable Service

Electrical service to the area is available and provided by Kauaʻi Island Utility Cooperative. Telephone and internet service is provided by Hawaiian Telcom and Spectrum. The County developer would be responsible for applicable utility component installations in order to accomodate the proposed facility (i.e., transformers, electric and cable lines).

Developent and use of municipal and private utilities would require coordination and permits from Kauaʻi County regulatory agencies in order to assure adequate source and proper management of utility resource use. Since all utility use would comply with applicable Kauaʻi County codes and rules, there would be no significant adverse impact to existing utility use or infrastructure.

2.13 Cumulative and Secondary Impacts

HAR 11-200.1 defines cumulative impact as "[*t]he impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes*

such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (HAR 11-200.1-2).

The proposed affordable housing, educational and health facility is planned as a stand alone project being initiated by the Kauaʻi County Housing Agency based on the needs of the community. The proposed action would represent an incremental increase in long-term resource use. However, the proposed development would not represent a significant source of GHG emissions since it would be a modern facility with updated and efficient systems. There are no significant adverse cumulative impacts anticipated from the proposed action.

2.14 Relationship to Plans and Policies

This section of the EA analyzes the proposed project in relation to local and State plans and policies. These land use plans and policies include the Hawaiʻi State Plan, Hawaiʻi State Land Use Districts Zoning, Kauaʻi County Zoning Code, and the General Plan for the County of Kauaʻi. The project site is within the State Urban land use district (Figure 6). The project site parcel is currently within the County Open Zoning District (Figure 7). The Housing Agency would need to apply for a Project Development Use Permit, which allows for increases in residential density for affordable housing projects. Table 4 provides an analysis of the proposed action in relation to the policies and objectives of the Hawaiʻi State Plan.

Figure 6: State Land Use Map

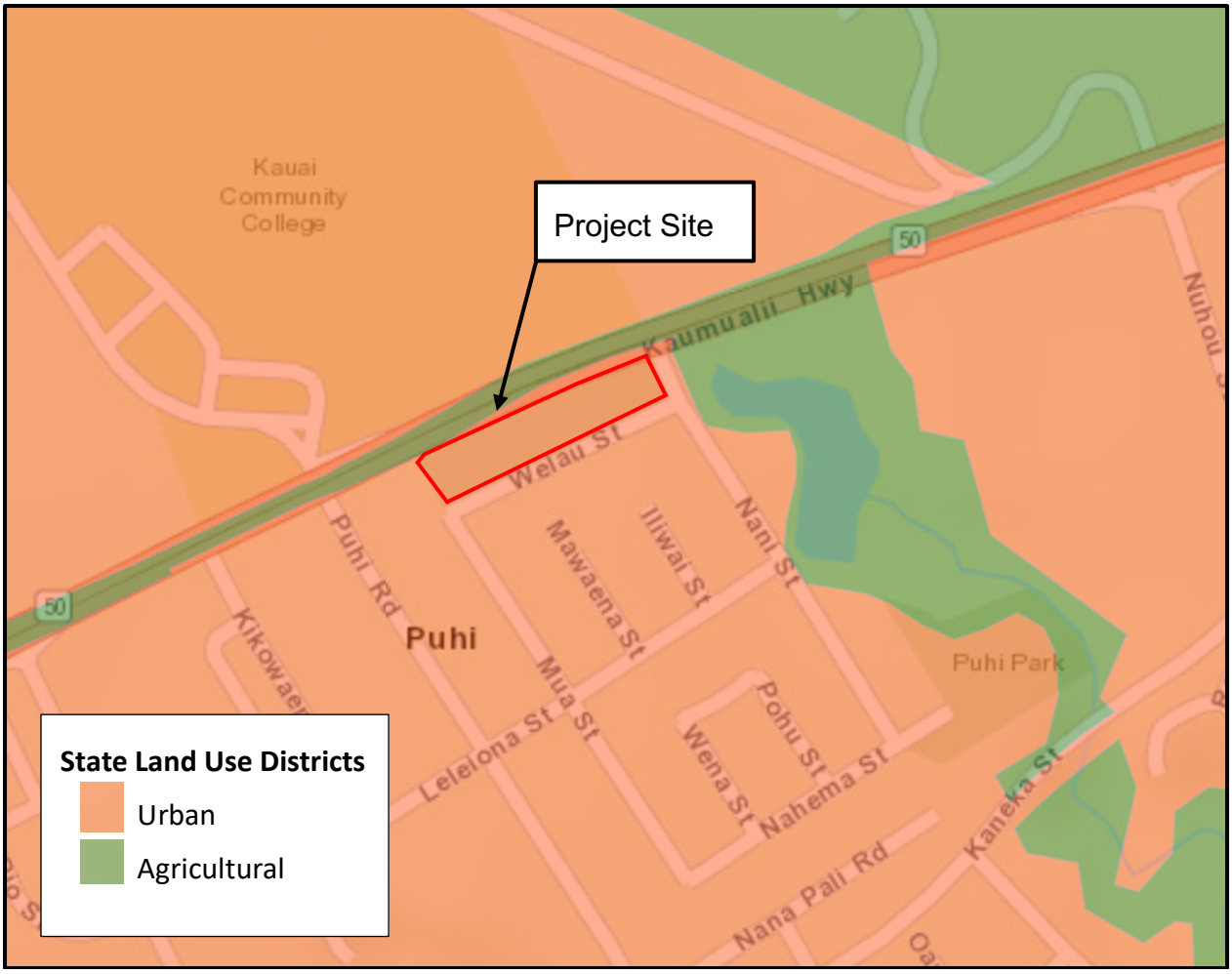
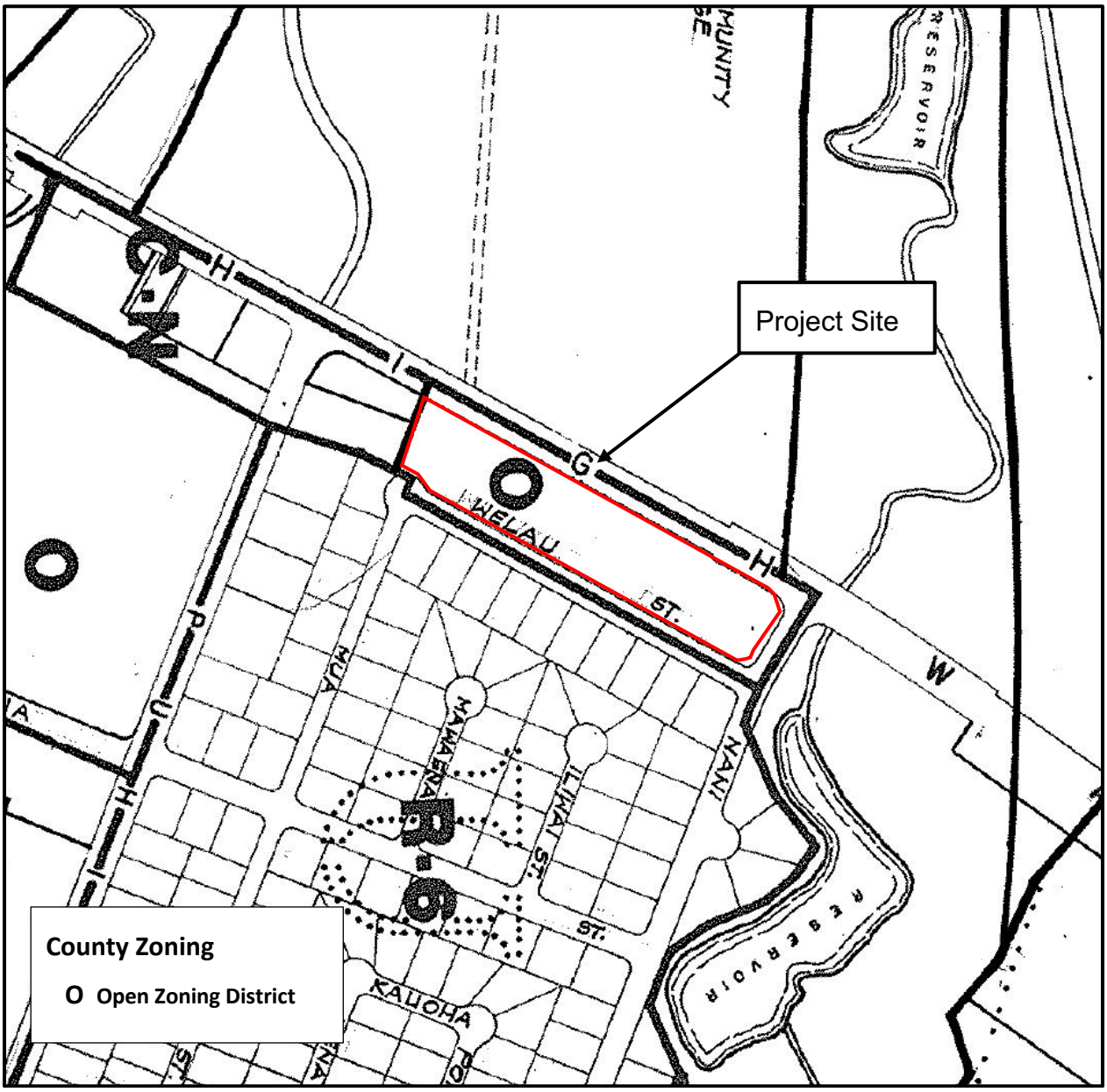


Figure 7: County Zoning Map



2.14.1 Hawaiʻi State Plan

Table 5: Hawaiʻi State Plan Analysis

Hawaiʻi Revised Statutes Chapter 226- Hawaiʻi State Plan Analysis Part I: Overall Themes, Goals, Objectives and Policies S = Supportive, N/S = Not Supportive, N/A = Not Applicable	**S**	**N/S**	**N/A**
HRS 226-1: Findings and Purpose			
HRS 226-2: Definitions			
HRS 226-3: Overall Theme			
HRS 226-4: State Goals In order to guarantee, for the present and future generations, those elements of choice and mobility that ensure that individuals and groups may approach their desired levels of self-reliance and self determination, it shall be the goal of the State to achieve: A strong, viable economy, characterized by stability, diversity, and growth, that enables the fulfillment of the needs and expectations of Hawaiʻi's present and future generations. A desired physical environment, characterized by beauty, cleanliness, quiet, stable natural systems, and uniqueness, that enhances the mental and physical well-being of the people. Physical, social, and economic well-being, for individuals and families in Hawaiʻi, that nourishes a sense of community responsibility, of caring, and of participation in community life.	**X**		
Discussion: The proposed development would increase self reliance and self determination for local community members by providing essential needed housing, health and educational services. The addition of affordable housing units would help to increase economic well-being, and would nurish a sense of community, and participation of community life.			
HRS 226-5: Objectives and Policies for Population It shall be the objective in planning for the State's population to guide population growth to be consistent with the achievement of physical, economic and social objectives contained in this chapter.	**X**		
Manage population growth statewide in a manner that provides increased opportunities for Hawaiʻi's people to pursue their physical, social and economic aspirations while recognizing the unique needs of each county.	**X**		
Encourage an increase in economic activities and employment opportunities on the neighbor islands consistent with community needs-and desires.	**X**		
Promote increased opportunities for Hawaiʻi's people to pursue their socioeconomic aspirations throughout the islands	**X**		

Hawaiʻi Revised Statutes Chapter 226- Hawaiʻi State Plan Analysis Part I: Overall Themes, Goals, Objectives and Policies S = Supportive, N/S = Not Supportive, N/A = Not Applicable	**S**	**N/S**	**N/A**
Encourage research activities and public awareness programs to foster and understanding of Hawaiʻi's limited capacity to accommodate population needs and to address concerns resulting from an increase in Hawaiʻi's population.			**X**
Encourage federal actions and coordination among major governmental agencies to promote a more balanced distribution of immigrants among states, provided that such actions do not prevent the reunion of immediate family members.			**X**
Pursue an increase in federal assistance for states with a greater proportion of foreign immigrants relative to their state's population.			**X**
Plan the development and availability of land and water resources in a coordinated manner so as to provide for the desired levels of growth in each geographic area.	**X**		
Discussion: The proposed project is planned to be developed in a central urban location where existing utilites, job centers and other services are readily available in close proximity. The proposed project would promote an increase in economic activities and employment opportunities by allowing County citizens to live close to jobs and other essential services.			
Chapter 226-6 Objectives and policies for the economy in general			
Planning for the State's economy in general shall be directed toward achievement of the following objectives:			
Increased and diversified employment opportunities to achieve full employment, increased income and job choice, and improved living standards for Hawaiʻi's people.	**X**		
A steadily growing and diversified economic base that is not overly dependent on a few industries and includes the development and expansion of industries on the neighbor islands			**X**
These objectives shall be achieved through implementation of the following Policies:			
Promote and encourage entrepreneurship within Hawaiʻi by residents and nonresidents of the State.	**X**		
Expand Hawaiʻi's national and international marketing, communication, and organizational ties, to increase the State's capacity to adjust to and capitalize upon economic changes and opportunities occurring outside the State.			**X**

Hawaiʻi Revised Statutes Chapter 226- Hawaiʻi State Plan Analysis Part I: Overall Themes, Goals, Objectives and Policies S = Supportive, N/S = Not Supportive, N/A = Not Applicable	**S**	**N/S**	**N/A**
Promote Hawaiʻi as an attractive market for environmentally and socially sound investment activities that benefit Hawaiʻi's people			**X**
Transform and maintain Hawaiʻi as a place that welcomes and facilitates innovative activity that may lead to commercial opportunities.			**X**
Promote innovative activity that may pose initial risks, but ultimately contribute to the economy of Hawaiʻi			**X**
Seek broader outlets for new or expanded Hawaiʻi business investments.			**X**
Expand existing markets and penetrate new markets for Hawaiʻi's products and services.			**X**
Assure that the basic economic needs of Hawaiʻi's people are maintained in the event of disruptions in overseas transportation.			**X**
Strive to achieve a level of construction activity responsive to, and consistent with, state growth objectives.	**X**		
Encourage the formation of cooperatives and other favorable marketing arrangements at the local or regional level to assist Hawaiʻi's small-scale producers, manufacturers, and distributors.			**X**
Encourage labor-intensive activities that are economically satisfying, and which offer opportunities for upward mobility.			**X**
Encourage innovative activities that may not be labor-intensive, but may otherwise contribute to the economy of Hawaiʻi.	**X**		
Foster greater cooperation and coordination between the government and private sectors in developing Hawaiʻi's employment and economic growth opportunities.			**X**
Stimulate the development and expansion of economic activities which will benefit areas with substantial or expected employment problems.			**X**
Maintain acceptable working conditions and standards for Hawaiʻi's workers.	**X**		
Provide equal employment opportunities for all segments of Hawaiʻi's population through affirmative action and nondiscrimination measures.			**X**
Stimulate the development and expansion of economic activities capitalizing on defense, dual-use, and science and technology assets, particularly on the neighbor islands where employment opportunities may be limited.			**X**

Hawaiʻi Revised Statutes Chapter 226- Hawaiʻi State Plan Analysis Part I: Overall Themes, Goals, Objectives and Policies S = Supportive, N/S = Not Supportive, N/A = Not Applicable	**S**	**N/S**	**N/A**
Encourage businesses that have favorable financial multiplier effects within Hawaiʻi's economy.	**X**		
Promote and protect intangible resources in Hawaiʻi, such as scenic beauty and the aloha spirit, which are vital to a healthy economy.			**X**
Increase effective communication between the educational community and the private sector to develop relevant curricula and training programs to meet future employment needs in general, and requirements of new, potential growth industries in particular.			**X**
Foster a business climate in Hawaiʻi, including attitudes, tax and regulatory policies, and financial and technical assistance programs that is conducive to the expansion of existing enterprises and the creation and attraction of new business and industry.			**X**
Discussion: The proposed development would result in stimulating new and upwardly mobile jobs that would have a financial multiplier effect through expanded opportunities for health and educational workers, as well as construction jobs to build the facility.			
HAR 226-7: Objectives and policies for the economy - Agriculture			
Planning for the State's economy with regard to agriculture shall be directed towards achievement of the following objectives:			
Viability of Hawaiʻi's sugar and pineapple industries.			**X**
Growth and development of diversified agriculture throughout the State.			**X**
An agriculture industry that continues to constitute a dynamic and essential component of Hawaiʻi's strategic, economic, and social well-being.			**X**
To achieve the agriculture objectives, the following policies shall be implemented:			
Establish a clear direction for Hawaiʻi's agriculture through stakeholder commitment and advocacy.			**X**
Encourage agriculture by making best use of natural resources.			**X**
Provide the governor and the legislature with information and options needed for prudent decision making for the development of agriculture.			**X**
Establish strong relationships between the agricultural and visitor industries for mutual marketing benefits.			**X**

Hawaiʻi Revised Statutes Chapter 226- Hawaiʻi State Plan Analysis Part I: Overall Themes, Goals, Objectives and Policies S = Supportive, N/S = Not Supportive, N/A = Not Applicable	**S**	**N/S**	**N/A**
Foster increased public awareness and understanding of the contributions and benefits of agriculture as a major sector of Hawaiʻi's economy.			**X**
Seek the enactment and retention of federal and state legislation that benefits Hawaiʻi's agricultural industries			**X**
Strengthen diversified agriculture by developing an effective promotion, marketing, and distribution system between Hawaiʻi's producers and consumer markets locally, on the continental United States, and internationally.			**X**
Support research and development activities that provide greater efficiency and economic productivity in agriculture.			**X**
Enhance agricultural growth by providing public incentives and encouraging private initiatives.			**X**
Assure the availability of agriculturally suitable lands with adequate water to accommodate present and future needs.			**X**
Increase the attractiveness and opportunities for an agricultural education and livelihood.			**X**
Expand Hawaiʻi's agricultural base by promoting growth and development of flowers, tropical fruits and plants, livestock, feed grains, forestry, food crops, aquaculture, and other potential enterprises.			**X**
Promote economically competitive activities that increase Hawaiʻi's agricultural self-sufficiency, including the increased purchase and use of Hawaiʻi-grown food and food products by residents, businesses, and governmental bodies as defined under section 103D-104.			**X**
Promote and assist in the establishment of sound financial programs for diversified agriculture.			**X**
Institute and support programs and activities to assist the entry of displaced agricultural workers into alternative agricultural or other employment.			**X**
Facilitate the transition of agricultural lands in economically nonfeasible agricultural production to economically viable agricultural uses.			**X**
Perpetuate, promote, and increase use of traditional Hawaiian farming systems, such as the use of loko iʻa, māla, and irrigated loʻi, and growth of traditional Hawaiian crops, such as kalo, ʻuala, and ʻulu.			**X**

Hawaiʻi Revised Statutes Chapter 226- Hawaiʻi State Plan Analysis Part I: Overall Themes, Goals, Objectives and Policies S = Supportive, N/S = Not Supportive, N/A = Not Applicable	**S**	**N/S**	**N/A**
Increase and develop small-scale farms.			**X**
Discussion: Not applicable to the proposed project.			
HAR 226-8: Objectives and policies for the economy- visitor industry			
Objective: Planning for the State's economy with regard to the visitor industry shall be directed towards the achievement of the objective of a visitor industry that constitutes a major component of steady growth for Hawaiʻi's economy.			X
Policies			
Support and assist in the promotion of Hawaiʻi's visitor attractions and facilities			**X**
Ensure that visitor industry activities are in keeping with the social, economic, and physical needs and aspirations of Hawaiʻi's people.			**X**
Improve the quality of existing visitor destination areas by utilizing Hawaiʻi's strengths in science and technology.			**X**
Encourage cooperation and coordination between the government and private sectors in developing and maintaining well-designed, adequately serviced visitor industry and related developments which are sensitive to neighboring communities and activities.			**X**
Develop the industry in a manner that will continue to provide new job opportunities and steady employment for Hawaiʻi's people.			**X**
Provide opportunities for Hawaiʻi's people to obtain job training and education that will allow for upward mobility within the visitor industry.			**X**
Foster a recognition of the contribution of the visitor industry to Hawaiʻi's economy and the need to perpetuate the aloha spirit.			**X**
Foster an understanding by visitors of the aloha spirit and of the unique and sensitive character of Hawaiʻi's cultures and values.			**X**
Discussion: Not applicable to the proposed project.			
Chapter 226-9 Objective and policies for the economy – federal expenditures			
Objective: Planning for the State's economy with regard to federal expenditures shall be directed towards achievement of the objective of a stable federal investment base as an integral component of Hawaiʻi's economy	**X**		
Policies			
Encourage the sustained flow of federal expenditures in Hawaiʻi that generates long-term government civilian employment;	**X**		

Hawaiʻi Revised Statutes Chapter 226- Hawaiʻi State Plan Analysis Part I: Overall Themes, Goals, Objectives and Policies S = Supportive, N/S = Not Supportive, N/A = Not Applicable	**S**	**N/S**	**N/A**
Promote Hawaiʻi's supportive role in national defense, in a manner consistent with Hawaiʻi's social, environmental, and cultural goals by building upon dual-use and defense applications to develop thriving ocean engineering, aerospace research and development, and related dual-use technology sectors in Hawaiʻi's economy;			**X**
Promote the development of federally supported activities in Hawaiʻi that respect statewide economic concerns, are sensitive to community needs, and minimize adverse impacts on Hawaiʻi's environment;	**X**		
Increase opportunities for entry and advancement of Hawaiʻi's people into federal government service;			**X**
Promote federal use of local commodities, services, and facilities available in Hawaiʻi:			**X**
Strengthen federal-state-county communication and coordination in all federal activities that affect Hawaiʻi;	**X**		
Pursue the return of federally controlled lands in Hawaiʻi that are not required for either the defense of the nation or for other purposes of national importance, and promote the mutually beneficial exchanges of land between federal agencies, the State, and the counties			**X**
Discussion: The development of the proposed project is likely to funded by federal HUD funds. Therefore, federal investment will result in increased housing and health and educational services to the local community.			
Chapter 226-10 Objective and policies for the economy – potential growth and innovative activities.			
Objective: Planning for the State's economy with regard to potential growth and innovative activities shall be directed towards achievement of the objective of development and expansion of potential growth and innovative activities that serve to increase and diversify Hawaiʻi's economic base.			**X**
Policies			
Facilitate investment and employment growth in economic activities that have the potential to expand and diversify Hawaiʻi's economy, including but not limited to diversified agriculture, aquaculture, renewable energy development, creative media, health care, and science and technology-based sectors;			**X**
Facilitate investment in innovative activity that may pose risks or be less labor-intensive than other traditional business activity, but if successful, will generate revenue in Hawaiʻi through the export of services or products or substitution of imported services or products;			**X**

Hawaiʻi Revised Statutes Chapter 226- Hawaiʻi State Plan Analysis Part I: Overall Themes, Goals, Objectives and Policies S = Supportive, N/S = Not Supportive, N/A = Not Applicable	**S**	**N/S**	**N/A**
Encourage entrepreneurship in innovative activity by academic researchers and instructors who may not have the background, skill, or initial inclination to commercially exploit their discoveries or achievements;			**X**
Recognize that innovative activity is not exclusively dependent upon individuals with advanced formal education, but that many self-taught, motivated individuals are able, willing, sufficiently knowledgeable, and equipped with the attitude necessary to undertake innovative activity;			**X**
Increase the opportunities for investors in innovative activity and talent engaged in innovative activity to personally meet and interact at cultural, art, entertainment, culinary, athletic, or visitor-oriented events without a business focus;			**X**
Expand Hawaiʻi's capacity to attract and service international programs and activities that generate employment for Hawaiʻi's people;			**X**
Enhance and promote Hawaiʻi's role as a center for international relations, trade, finance, services, technology, education, culture, and the arts;			**X**
Accelerate research and development of new energy-related industries based on wind, solar, ocean, underground resources, and solid waste;			**X**
Promote Hawaiʻi's geographic, environmental, social, and technological advantages to attract new or innovative economic activities into the State;			**X**
Provide public incentives and encourage private initiative to attract new or innovative industries that best support Hawaiʻi's social, economic, physical, and environmental objectives;			**X**
Increase research and the development of ocean-related economic activities such as mining, food production, and scientific research;			**X**
Develop, promote, and support research and educational and training programs that will enhance Hawaiʻi's ability to attract and develop economic activities of benefit to Hawaiʻi;			**X**
Foster a broader public recognition and understanding of the potential benefits of new or innovative growth-oriented industry in Hawaiʻi;			**X**
Encourage the development and implementation of joint federal and state initiatives to attract federal programs and projects that will support Hawaiʻi's social, economic, physical, and environmental objectives;			**X**
Increase research and development of businesses and services in the telecommunications and information industries;			**X**
Foster the research and development of nonfossil fuel and energy efficient modes of transportation;			**X**
Recognize and promote health care and health care information technology as growth industries			**X**
Discussion: Not applicable to the proposed project			
Chapter 226-10.5 Objectives and policies for the economy – information industry			
Objective: Planning for the State's economy with regard to telecommunications and information technology shall be directed toward recognizing that broadband and wireless communication capability and infrastructure are foundations for an innovative economy and positioning			**X**

Hawaiʻi Revised Statutes Chapter 226- Hawaiʻi State Plan Analysis Part I: Overall Themes, Goals, Objectives and Policies S = Supportive, N/S = Not Supportive, N/A = Not Applicable	**S**	**N/S**	**N/A**
Hawaiʻi as a leader in broadband and wireless communications and applications in the Pacific Region.			**X**
Policies			
Promote efforts to attain the highest speeds of electronic and wireless communication within Hawaiʻi and between Hawaiʻi and the world, and make high speed communication available to all residents and businesses in Hawaiʻi;			**X**
Encourage the continued development and expansion of the telecommunications infrastructure serving Hawaiʻi to accommodate future growth and innovation in Hawaiʻi's economy;			**X**
Facilitate the development of new or innovative business and service ventures in the information industry which will provide employment opportunities for the people of Hawaiʻi;			**X**
Encourage mainland- and foreign-based companies of all sizes, whether information technology-focused or not, to allow their principals, employees, or contractors to live in and work from Hawaiʻi, using technology to communicate with their headquarters, offices, or customers located out-of state;			**X**
Encourage greater cooperation between the public and private sectors in developing and maintaining a well-designed information industry;			**X**
Ensure that the development of new businesses and services in the industry are in keeping with the social, economic, and physical needs and aspirations of Hawaiʻi's people;			**X**
Provide opportunities for Hawaiʻi's people to obtain job training and education that will allow for upward mobility within the information industry;			**X**
Foster a recognition of the contribution of the information industry to Hawaiʻi's economy;			**X**
Assist in the promotion of Hawaiʻi as a broker, creator, and processor of information in the Pacific.			**X**
Discussion: Not applicable to the proposed project.			
Chapter 226-11 Objectives and policies for the physical environment – land based, shoreline, and marine resources			
Objectives: Planning for the State's physical environment with regard to land-based, shoreline, and marine resources shall be directed towards achievement of the following objectives:			**X**
Prudent use of Hawaiʻi's land-based, shoreline, and marine resources.			**X**
Effective protection of Hawaiʻi's unique and fragile environmental resources			**X**
Policies			
Exercise an overall conservation ethic in the use of Hawaiʻi's natural resources.			**X**

Hawai'i Revised Statutes Chapter 226- Hawai'i State Plan Analysis Part I: Overall Themes, Goals, Objectives and Policies S = Supportive, N/S = Not Supportive, N/A = Not Applicable	**S**	**N/S**	**N/A**
Ensure compatibility between land-based and water-based activities and natural resources and ecological systems.			**X**
Take into account the physical attributes of areas when planning and designing activities and facilities.	**X**		
Manage natural resources and environs to encourage their beneficial and multiple use without generating costly or irreparable environmental damage.	**X**		
Consider multiple uses in watershed areas, provided such uses do not detrimentally affect water quality and recharge functions.	**X**		
Encourage the protection of rare or endangered plant and animal species and habitats native to Hawai'i.	**X**		
Provide public incentives that encourage private actions to protect significant natural resources from degradation or unnecessary depletion.			**X**
Pursue compatible relationships among activities, facilities, and natural resources.	**X**		
Promote increased accessibility and prudent use of inland and shoreline areas for public recreational, educational, and scientific purposes.			**X**
Discussion: The proposed project would be located in a central developed area outside the SMA, and would be congruent with sustainable planning principles, and in compliance with County and State zoning policies. Existing utility and transportation networks are established at and surrounding the project site. No endangered or protected species habitats or wetlands have been identified at the project site.			
Chapter 226-12 Objective and policies for the physical environment – scenic, natural beauty, and historic resources.			
Objective: Planning for the State's physical environment shall be directed towards achievement of the objective of enhancement of Hawai'i's scenic assets, natural beauty, and multi-cultural/historical resources			**X**
Policies			
Promote the preservation and restoration of significant natural and historic Resources.			**X**
Provide incentives to maintain and enhance historic, cultural, and scenic amenities.			**X**
Promote the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.			**X**
Protect those special areas, structures, and elements that are an integral and functional part of Hawai'i's ethnic and cultural heritage.			**X**
Encourage the design of developments and activities that complement the natural beauty of the islands.			**X**
Discussion: Not applicable to the proposed project.			

Hawai'i Revised Statutes Chapter 226- Hawai'i State Plan Analysis Part I: Overall Themes, Goals, Objectives and Policies S = Supportive, N/S = Not Supportive, N/A = Not Applicable	**S**	**N/S**	**N/A**
Chapter 226-13 Objectives and policies for the physical environment – land, air, and water quality.			
Objectives: Planning for the State's physical environment with regard to land, air, and water quality shall be directed towards achievement of the following objectives:			
Maintenance and pursuit of improved quality in Hawai'i's land, air, and water resources.	**X**		
Greater public awareness and appreciation of Hawai'i's environmental resources.			**X**
Policies			
Foster educational activities that promote a better understanding of Hawai'i's limited environmental resources.			**X**
Promote the proper management of Hawai'i's land and water resources.	**X**		
Promote effective measures to achieve desired quality in Hawai'i's surface, ground, and coastal waters.	**X**		
Encourage actions to maintain or improve aural and air quality levels to enhance the health and well-being of Hawai'i's people.	**X**		
Reduce the threat to life and property from erosion, flooding, tsunamis, hurricanes, earthquakes, volcanic eruptions, and other natural or man-induced hazards and disasters.	**X**		
Encourage design and construction practices that enhance the physical qualities of Hawai'i's communities.	**X**		
Encourage urban developments in close proximity to existing services and facilities.	**X**		
Foster recognition of the importance and value of the land, air, and water resources to Hawai'i's people, their cultures and visitors.	**X**		
Discussion: Development of the proposed project would be completed to carefully manage land, air and water resources in accordance with County and State regulations. Proper drainage and erosion control measures would be implemented during construction and operations of the proposed facility in order to reduce impacts to natural resources. The project site is located outside the Extreme Tsunami Evacuation Zone, and no natural waterways pass throught the project site.			
Chapter 226-14 Objective and policies for facility systems – in general			
Objective: Planning for the State's facility systems in general shall be directed towards achievement of the objective of water, transportation, waste disposal, and energy and telecommunication systems that support statewide social, economic, and physical objectives			**X**

Hawaiʻi Revised Statutes Chapter 226- Hawaiʻi State Plan Analysis Part I: Overall Themes, Goals, Objectives and Policies S = Supportive, N/S = Not Supportive, N/A = Not Applicable	**S**	**N/S**	**N/A**
Policies			
Accommodate the needs of Hawaiʻi's people through coordination of facility systems and capital improvement priorities in consonance with state and county plans.			**X**
Encourage flexibility in the design and development of facility systems to promote prudent use of resources and accommodate changing public demands and priorities.			**X**
Ensure that required facility systems can be supported within resource capacities and at reasonable cost to the user.			**X**
Pursue alternative methods of financing programs and projects and cost saving techniques in the planning, construction, and maintenance of facility systems.			**X**
Analysis: Not applicable for the proposed project			
Chapter 226-15 Objectives and policies for facility systems – solid and liquid waste			
Objectives: Planning for the State's facility systems with regard to solid and liquid wastes shall be directed towards the achievement of the following objectives			**X**
Maintenance of basic public health and sanitation standards relating to treatment and disposal of solid and liquid wastes.			**X**
Provision of adequate sewerage facilities for physical and economic activities that alleviate problems in housing, employment, mobility, and other areas.			**X**
Policies			
Encourage the adequate development of sewerage facilities that complement planned growth.			**X**
Promote re-use and recycling to reduce solid and liquid wastes and employ a conservation ethic.			**X**
Promote research to develop more efficient and economical treatment and disposal of solid and liquid wastes			**X**
Discussion: Not applicable to the proposed project.			
Chapter 226-16 Objective and policies for facility systems – water			
Objective: Planning for the State's facility systems with regard to water shall be directed towards achievement of the objective of the provision of water to adequately accommodate domestic, agricultural, commercial, industrial, recreational, and other needs within resource capacities	**X**		
Policies			
Coordinate development of land use activities with existing and potential water supply.	**X**		

Hawai'i Revised Statutes Chapter 226- Hawai'i State Plan Analysis Part I: Overall Themes, Goals, Objectives and Policies S = Supportive, N/S = Not Supportive, N/A = Not Applicable	**S**	**N/S**	**N/A**
Support research and development of alternative methods to meet future water requirements well in advance of anticipated needs.			**X**
Reclaim and encourage the productive use of runoff water and wastewater discharges.	**X**		
Assist in improving the quality, efficiency, service, and storage capabilities of water systems for domestic and agricultural use.			**X**
Support water supply services to areas experiencing critical water problems.			**X**
Promote water conservation programs and practices in government, private industry, and the general public to help ensure adequate water to meet long-term needs.	**X**		
Discussion: The existing County potable water system is anticipated to be adequate to accommodate the proposed project. However, the availability of potable water, and management of stormwater will be confirmed with the County when the building permit application is submitted. The proposed project will implement water conservation measures such as incorporating water efficient fixtures and appropriate landscaping to reduce irrigation water demands, to the extent practicable.			
Chapter 226-17 Objectives and policies for facility systems – transportation			
Objectives: Planning for the State's facility systems with regard to transportation shall be directed towards the achievement of the following objectives:			
An integrated multi-modal transportation system that services statewide needs and promotes the efficient, economical, safe, and convenient movement of people and goods.			**X**
A statewide transportation system that is consistent with and will accommodate planned growth objectives throughout the State			**X**
Policies			
Design, program, and develop a multi-modal system in conformance with desired growth and physical development as stated in this chapter;			**X**
Coordinate state, county, federal, and private transportation activities and programs toward the achievement of statewide objectives;			**X**
Encourage a reasonable distribution of financial responsibilities for transportation among participating governmental and private parties;			**X**
Provide for improved accessibility to shipping, docking, and storage Facilities;			**X**
Promote a reasonable level and variety of mass transportation services that adequately meet statewide and community needs;			**X**
Encourage transportation systems that serve to accommodate present and future development needs of communities;			**X**
Encourage a variety of carriers to offer increased opportunities and advantages to interisland movement of people and goods			**X**
Increase the capacities of airport and harbor systems and support facilities to effectively accommodate transshipment and storage needs;			**X**

Hawai'i Revised Statutes Chapter 226- Hawai'i State Plan Analysis Part I: Overall Themes, Goals, Objectives and Policies S = Supportive, N/S = Not Supportive, N/A = Not Applicable	**S**	**N/S**	**N/A**
Encourage the development of transportation systems and programs which would assist statewide economic growth and diversification;			**X**
Encourage the design and development of transportation systems sensitive to the needs of affected communities and the quality of Hawai'i's natural environment;			**X**
Encourage safe and convenient use of low-cost, energy-efficient, nonpolluting means of transportation;			**X**
Coordinate intergovernmental land use and transportation planning activities to ensure the timely delivery of supporting transportation infrastructure in order to accommodate planned growth objectives;			**X**
Encourage diversification of transportation modes and infrastructure to promote alternate fuels and energy efficiency.			**X**
Discussion: Not applicable to the proposed project.			
Chapter 226-18 Objectives and policies for facility systems – energy.			
Objectives: Planning for the State's facility systems with regard to energy shall be directed toward the achievement of the following objectives, giving due consideration to all:			
Dependable, efficient, and economical statewide energy systems capable of supporting the needs of the people;			**X**
To achieve the energy objectives, it shall be the policy of this State to ensure the short- and long-term provision of adequate, reasonably prices, and dependable energy services to accommodate demand.			**X**
Increased energy security and self-sufficiency through the reduction and ultimate elimination of Hawai'i's dependence on imported fuels for electrical generation and ground transportation.			**X**
Greater diversification of energy generation in the face of threats to Hawai'i's energy supplies and systems;			**X**
Reduction, avoidance, or sequestration of greenhouse gas emissions from energy supply and use;			**X**
Utility models that make the social and financial interests of Hawai'i's utility customers a priority.			**X**
To achieve the energy objectives, it shall be the policy of this State to ensure the short- and long-term provision of adequate, reasonably prices, and dependable energy services to accommodate demand.			**X**
Policies			
Support research and development as well as promote the use of renewable energy sources;			**X**
Ensure that the combination of energy supplies and energy-saving systems is sufficient to support the demands of growth;			**X**
Base decisions of least-cost supply-side and demand-side energy resource options on a comparison of their total costs and benefits when a least-cost is determined by a reasonably comprehensive, quantitative, and			**X**

Hawai'i Revised Statutes Chapter 226- Hawai'i State Plan Analysis **Part I: Overall Themes, Goals, Objectives and Policies** **S = Supportive, N/S = Not Supportive, N/A = Not Applicable**	**S**	**N/S**	**N/A**
qualitative accounting of their long-term, direct and indirect economic, environmental, social, cultural, and public health costs and benefits;			
Promote all cost-effective conservation of power and fuel supplies through measures, including: • Development of cost-effective demand-side management programs; □ • Education; • Adoption of energy-efficient practices and technologies; and □ • Increasing energy efficiency and decreasing energy use in public infrastructure			**X**
Ensure, to the extent that new supply-side resources are needed, that the development or expansion of energy systems uses the least-cost energy supply option and maximizes efficient technologies;			**X**
Support research, development, demonstration, and use of energy efficiency, load management, and other demand-side management programs, practices, and technologies;			**X**
Promote alternate fuels and transportation energy efficiency;			**X**
Support actions that reduce, avoid, or sequester greenhouse gases in utility, transportation, and industrial sector applications;			**X**
Support actions that reduce, avoid, or sequester Hawai'i's greenhouse gas emissions through agriculture and forestry initiatives;			**X**
Provide priority handling and processing for all state and county permits required for renewable energy projects;			**X**
Ensure that liquefied natural gas is used only as a cost-effective transitional, limited-term replacement of petroleum for electricity generation and does not impede the development and use of other cost-effective renewable energy sources; and are located on public trust land as an affordable and reliable source of firm power for Hawai'i.			**X**
Promote the development of indigenous geothermal energy resources that are located on public trust land as an affordable and reliable source of firm power for Hawai'i.			**X**
Discussion: Not applicable to the proposed project.			
Chapter 226-18.5 Objectives and policies for facility systems – telecommunications			
Objectives			
Planning for the State's telecommunications facility systems shall be directed towards the achievement of dependable, efficient, and economical statewide telecommunications systems capable of supporting the needs of the people.			**X**
To achieve the telecommunications objective, it shall be the policy of this State to ensure the provision of adequate, reasonably priced, and dependable telecommunications services to accommodate demand.			**X**
Policies			

Hawai'i Revised Statutes Chapter 226- Hawai'i State Plan Analysis Part I: Overall Themes, Goals, Objectives and Policies S = Supportive, N/S = Not Supportive, N/A = Not Applicable	**S**	**N/S**	**N/A**
Facilitate research and development of telecommunications systems and resources;			**X**
Encourage public and private sector efforts to develop means for adequate, ongoing telecommunications planning;			**X**
Promote efficient management and use of existing telecommunications systems and services;			**X**
Facilitate the development of education and training of telecommunications personnel.			**X**
Discussion: Not applicable to the proposed project.			
Chapter 226-19 Objectives and policies for socio-cultural advancement – housing.			
Objectives: Planning for the State's socio-cultural advancement with regard to housing shall be directed toward the achievement of the following objectives:			
Greater opportunities for Hawai'i's people to secure reasonably priced, safe, sanitary, and livable homes, located in suitable environments that satisfactorily accommodate the needs and desires of families and individuals, through collaboration and cooperation between government and nonprofit and for-profit developers to ensure that more affordable housing is made available to very low-, low- and moderate-income segments of Hawai'i's population.	**X**		
The orderly development of residential areas sensitive to community needs and other land uses.	**X**		
The development and provision of affordable rental housing by the State to meet the housing needs of Hawai'i's people.	**X**		
Policies			
Effectively accommodate the housing needs of Hawai'i's people.	**X**		
Stimulate and promote feasible approaches that increase housing choices for low-income, moderate-income, and gap-group households.	**X**		
Increase homeownership and rental opportunities and choices in terms of quality, location, cost, densities, style, and size of housing.	**X**		
Promote appropriate improvement, rehabilitation, and maintenance of existing housing units and residential areas.	**X**		
Promote design and location of housing developments taking into account the physical setting, accessibility to public facilities and services, and other concerns of existing communities and surrounding areas.	**X**		
Facilitate the use of available vacant, developable, and underutilized urban lands for housing.	**X**		
Foster a variety of lifestyles traditional to Hawai'i through the design and maintenance of neighborhoods that reflect the culture and values of the community.	**X**		

Hawai'i Revised Statutes Chapter 226- Hawai'i State Plan Analysis Part I: Overall Themes, Goals, Objectives and Policies S = Supportive, N/S = Not Supportive, N/A = Not Applicable	**S**	**N/S**	**N/A**
Promote research and development of methods to reduce the cost of housing construction in Hawai'i.	**X**		
Discussion: the proposed project would be an affordable housing project that would offer much needed housing units located in a central location close to jobs, public transportation, schools and other essential services, such as health care, grocery stores and restaurants.			
Chapter 226-20 Objectives and policies for socio-cultural advancement – health			
Objectives: Planning for the State's socio-cultural advancement with regard to health shall be directed towards achievement of the following objectives:			
Fulfillment of basic individual health needs of the general public.	**X**		
Maintenance of sanitary and environmentally healthful conditions in Hawai'i's communities.			**X**
Elimination of health disparities by identifying and addressing social determinants of health.			**X**
Policies			
Provide adequate and accessible services and facilities for prevention and treatment of physical and mental health problems, including substance abuse.	**X**		
Encourage improved cooperation among public and private sectors in the provision of health care to accommodate the total health needs of individuals throughout the State.			**X**
Encourage public and private efforts to develop and promote statewide and local strategies to reduce health care and related insurance costs.			**X**
Foster an awareness of the need for personal health maintenance and preventive health care through education and other measures.	**X**		
Provide programs, services, and activities that ensure environmentally healthful and sanitary conditions.			**X**
Improve the State's capabilities in preventing contamination by pesticides and other potentially hazardous substances through increased coordination, education, monitoring, and enforcement.			**X**
Prioritize programs, services, interventions, and activities that address identified social determinants of health to improve native Hawaiian health and well-being consistent with the United States Congress' declaration of policy as codified in title 42 United States Code section 11702, and to reduce health disparities of disproportionately affected demographics, including native Hawaiians, other Pacific Islanders, and Filipinos. The prioritization of affected demographic groups other than native Hawaiians may be reviewed every ten years and revised based on the best available epidemiological and public health data.	**X**		

Hawai'i Revised Statutes Chapter 226- Hawai'i State Plan Analysis **Part I: Overall Themes, Goals, Objectives and Policies** **S = Supportive, N/S = Not Supportive, N/A = Not Applicable**	**S**	**N/S**	**N/A**
Discussion: The proposed project includes health and educational services that would promote public awareness of personal and family health.			
Chapter 226-21 Objectives and policies for Socio-cultural advancement – education.			
Objective: Planning for the State's socio-cultural advancement with regard to education shall be directed towards achievement of the objective of the provision of a variety of educational opportunities to enable individuals to fulfill their needs, responsibilities, and aspirations			
Policies			
Support educational programs and activities that enhance personal development, physical fitness, recreation, and cultural pursuits of all groups.	**X**		**X**
Ensure the provision of adequate and accessible educational services and facilities that are designed to meet individual and community needs.	**X**		**X**
Provide appropriate educational opportunities for groups with special needs.	**X**		
Promote educational programs which enhance understanding of Hawai'i's cultural heritage.	**X**		
Provide higher educational opportunities that enable Hawai'i's people to adapt to changing employment demands.	**X**		
Assist individuals, especially those experiencing critical employment problems or barriers, or undergoing employment transitions, by providing appropriate employment training programs and other related educational opportunities.			**X**
Promote programs and activities that facilitate the acquisition of basic skills, such as reading, writing, computing, listening, speaking, and reasoning.	**X**		
Emphasize quality educational programs in Hawai'i's institutions to promote academic excellence.			**X**
Support research programs and activities that enhance the education programs of the State.			**X**
Discussion: The proposed project includes plans for providing educational services to the local community.			
Chapter 226-22 Objective and policies for socio-cultural advancement – social services			
Objective: Planning for the State's socio-cultural advancement with regard to social services shall be directed towards the achievement of the objective of improved public and private social services and activities that enable individuals, families, and groups to become more self-reliant and confident to improve their well-being.	**X**		
Policies			
Assist individuals, especially those in need of attaining a minimally adequate standard of living and those confronted by social and economic			**X**

Hawai'i Revised Statutes Chapter 226- Hawai'i State Plan Analysis Part I: Overall Themes, Goals, Objectives and Policies S = Supportive, N/S = Not Supportive, N/A = Not Applicable	**S**	**N/S**	**N/A**
hardship conditions, through social services and activities within the State's fiscal capacities.			
Promote coordination and integrative approaches among public and private agencies and programs to jointly address social problems that will enable individuals, families, and groups to deal effectively with social problems and to enhance their participation in society.	**X**		
Facilitate the adjustment of new residents, especially recently arrived immigrants, into Hawai'i's communities.			**X**
Promote alternatives to institutional care in the provision of long-term care for elder and disabled populations.			**X**
Support public and private efforts to prevent domestic abuse and child molestation, and assist victims of abuse and neglect.			**X**
Promote programs which assist people in need of family planning services to enable them to meet their needs			**X**
Discussion: the proposed project would include much needed affordable housing, as well as health and educational services that would enable individual and families to become more self-reliant and confident, which could lead to improved socio-cultural advancement.			
Chapter 226-23 Objective and policies for socio-cultural advancement – leisure			
Policies			
Objective: Planning for the State's socio-cultural advancement with regard to leisure shall be directed towards the achievement of the objective of the adequate provision of resources to accommodate diverse cultural, artistic, and recreational needs for present and future generations.			**X**
Foster and preserve Hawai'i's multi-cultural heritage through supportive cultural, artistic, recreational, and humanities-oriented programs and activities.			**X**
Provide a wide range of activities and facilities to fulfill the cultural, artistic, and recreational needs of all diverse and special groups effectively and efficiently.			**X**
Enhance the enjoyment of recreational experiences through safety and security measures, educational opportunities, and improved facility design and maintenance.			**X**
Promote the recreational and educational potential of natural resources having scenic, open space, cultural, historical, geological, or biological values while ensuring that their inherent values are preserved.			**X**
Ensure opportunities for everyone to use and enjoy Hawai'i's recreational resources.			**X**
Assure the availability of sufficient resources to provide for future cultural, artistic, and recreational needs.			**X**
Provide adequate and accessible physical fitness programs to promote the physical and mental well-being of Hawai'i's people.			**X**

Hawai'i Revised Statutes Chapter 226- Hawai'i State Plan Analysis Part I: Overall Themes, Goals, Objectives and Policies S = Supportive, N/S = Not Supportive, N/A = Not Applicable	**S**	**N/S**	**N/A**
Increase opportunities for appreciation and participation in the creative arts, including the literary, theatrical, visual, musical, folk, and traditional art forms.			**X**
Encourage the development of creative expression in the artistic disciplines to enable all segments of Hawai'i's population to participate in the creative arts.			**X**
Assure adequate access to significant natural and cultural resources in public ownership.			**X**
Discussion: Not applicable to the proposed project.			
Chapter 226-24 Objective and policies for socio-cultural advancement – individual rights and personal well-being			
Objective: Planning for the State's socio-cultural advancement with regard to individual rights and personal well-being shall be directed towards achievement of the objective of increased opportunities and protection of individual rights to enable individuals to fulfill their socio-economic needs and aspirations.	**X**		
Policies			
Provide effective services and activities that protect individuals from criminal acts and unfair practices and that alleviate the consequences of criminal acts in order to foster a safe and secure environment.			**X**
Uphold and protect the national and state constitutional rights of every individual.			**X**
Assure access to, and availability of, legal assistance, consumer protection, and other public services which strive to attain social justice.			**X**
Ensure equal opportunities for individual participation in society.	**X**		
Discussion: The proposed project would enable citizens to live closer to the primary County job center, which could make it easier to secure and commute to and from jobs.			
Chapter 226-25 Objective and policies for socio-cultural advancement – culture.			
Objective: Planning for the State's socio-cultural advancement with regard to culture shall be directed toward the achievement of the objective of enhancement of cultural identities, traditions, values, customs, and arts of Hawai'i's people.			**X**
Policies			
Foster increased knowledge and understanding of Hawai'i's ethnic and cultural heritages and the history of Hawai'i.			**X**
Support activities and conditions that promote cultural values, customs, and arts that enrich the lifestyles of Hawai'i's people and which are sensitive and responsive to family and community needs.			**X**

Hawai'i Revised Statutes Chapter 226- Hawai'i State Plan Analysis Part I: Overall Themes, Goals, Objectives and Policies S = Supportive, N/S = Not Supportive, N/A = Not Applicable	**S**	**N/S**	**N/A**
Encourage increased awareness of the effects of proposed public and private actions on the integrity and quality of cultural and community lifestyles in Hawai'i.			**X**
Encourage the essence of the aloha spirit in people's daily activities to promote harmonious relationships among Hawai'i's people and visitors.			**X**
Discussion: Not applicable to the proposed project.			
Chapter 226-26 Objectives and policies for socio-cultural advancement – public safety			
Objective: Planning for the State's socio-cultural advancement with regard to public safety shall be directed towards the achievement of the following objectives:			
Assurance of public safety and adequate protection of life and property for all people.			**X**
Optimum organizational readiness and capability in all phases of emergency management to maintain the strength, resources, and social and economic well-being of the community in the event of civil disruptions, wars, natural disasters, and other major disturbances.			**X**
Promotion of a sense of community responsibility for the welfare and safety of Hawai'i's people.			**X**
Policies (Public Safety)			
Ensure that public safety programs are effective and responsive to community needs.			**X**
Encourage increased community awareness and participation in public safety programs.			**X**
Policies (Public Safety-Criminal Justice)			
Support criminal justice programs aimed at preventing and curtailing criminal activities.			**X**
Develop a coordinated, systematic approach to criminal justice administration among all criminal justice agencies.			**X**
Provide a range of correctional resources which may include facilities and alternatives to traditional incarceration in order to address the varied security needs of the community and successfully reintegrate offenders into the community.			**X**
Policies (Public Safety-Emergency Management)			
Ensure that responsible organizations are in a proper state of readiness to respond to major war-related, natural, or technological disasters and civil disturbances at all times.			**X**
Enhance the coordination between emergency management programs throughout the State.			**X**
Discussion: Not applicable to the proposed project.			

Hawaiʻi Revised Statutes Chapter 226- Hawaiʻi State Plan Analysis Part I: Overall Themes, Goals, Objectives and Policies S = Supportive, N/S = Not Supportive, N/A = Not Applicable	**S**	**N/S**	**N/A**
Chapter 226-27 Objectives and policies for socio-cultural advancement – government			
Objectives: Planning the State's socio-cultural advancement with regard to government shall be directed towards the achievement of the following objectives:			
Efficient, effective, and responsive government services at all levels in the State.			**X**
Fiscal integrity, responsibility, and efficiency in the state government and county governments.			**X**
Policies			
Provide for necessary public goods and services not assumed by the private sector.			**X**
Pursue an openness and responsiveness in government that permits the flow of public information, interaction, and response			**X**
Minimize the size of government to that necessary to be effective.			**X**
Stimulate the responsibility in citizens to productively participate in government for a better Hawaiʻi.			**X**
Assure that government attitudes, actions, and services are sensitive to community needs and concerns.			**X**
Provide for a balanced fiscal budget.			**X**
Improve the fiscal budgeting and management system of the State.			**X**
Promote the consolidation of state and county governmental functions to increase the effective and efficient delivery of government programs and services and to eliminate duplicative services wherever feasible.			**X**
Discussion: Not applicable to the proposed project.			

Hawaiʻi State Plan, HRS Chapter 226 – Part III. Priority Guidelines **S = Supportive, N/S = Not Supportive, N/A = Not Applicable**	**S**	**N/S**	**N/A**
Chapter 226-101: Purpose. The purpose of this part is to establish overall priority guidelines to address areas of statewide concern			
Chapter 226-103: Economic priority guidelines			
Priority guidelines to stimulate economic growth and encourage business expansion and development to provide needed jobs for Hawaiʻi's people and achieve a stable and diversified economy:			
(1) Seek a variety of means to increase the availability of investment capital for new and expanding enterprises.			X
(A) Encourage investments which:			
(i) Reflect long term commitments to the State;	X		
(ii) Rely on economic linkages within the local economy;	X		
(iii) Diversify the economy;			X
(iv) Reinvest in the local economy;	X		
(v) Are sensitive to community needs and priorities;	X		
(vi) Demonstrate a commitment to provide management opportunities to Hawaiʻi residents; and			X
(B) Encourage investments in innovative activities that have a nexus to the State, such as:			
(i) Present or former residents acting as entrepreneurs or principals;			X
(ii) Academic support from an institution of higher education in Hawaiʻi;			X
(iii) Investment interest from Hawaiʻi residents;			X
(iv) Resources unique to Hawaiʻi that are required for innovative activity; and			X
(v) Complementary or supportive industries or government programs or projects.			X
(2) Encourage the expansion of technological research to assist industry development and support the development and commercialization of technological advancements.			X
(3) Improve the quality, accessibility, and range of services provided by government to business, including data and reference services and assistance in complying with governmental regulations.			X
(4) Seek to ensure that state business tax and labor laws and administrative policies are equitable, rational, and predictable.			X

Hawaiʻi State Plan, HRS Chapter 226 – Part III. Priority Guidelines **S = Supportive, N/S = Not Supportive, N/A = Not Applicable**	**S**	**N/S**	**N/A**
(5) Streamline the processes for building and development permit and review, and telecommunication infrastructure installation approval and eliminate or consolidate other burdensome or duplicative governmental requirements imposed on business, where scientific evidence indicates that public health, safety and welfare would not be adversely affected.			X
(6) Encourage the formation of cooperatives and other favorable marketing or distribution arrangements at the regional or local level to assist Hawaiʻi's small-scale producers, manufacturers, and distributors.			X
(7) Continue to seek legislation to protect Hawaiʻi from transportation interruptions between Hawaiʻi and the continental United States.			X
(8) Provide public incentives and encourage private initiative to develop and attract industries which promise long-term growth potentials and which have the following characteristics:			
(A) An industry that can take advantage of Hawaiʻi's unique location and available physical and human resources			X
(B) A clean industry that would have minimal adverse effects on Hawaiʻi's environment.			X
(C) An industry that is willing to hire and train Hawaiʻi's people to meet the industry's labor needs at all levels of employment.			X
(D) An industry that would provide reasonable income and steady employment			X
(9) Support and encourage, through educational and technical assistance programs and other means, expanded opportunities for employee ownership and participation in Hawaiʻi business.			X
(10) Enhance the quality of Hawaiʻi's labor force and develop and maintain career opportunities for Hawaiʻi's people through the following actions:			
(A) Expand vocational training in diversified agriculture, aquaculture, information industry, and other areas where growth is desired and feasible.			X
(B) Encourage more effective career counseling and guidance in high schools and post-secondary institutions to inform students of present and future career opportunities.			X
(C) Allocate educational resources to career areas where high employment is expected and where growth of new industries is desired.			X
(D) Promote career opportunities in all industries for Hawaiʻi's people by encouraging firms doing business in the State to hire residents.			X

Hawaiʻi State Plan, HRS Chapter 226 – Part III. Priority Guidelines **S = Supportive, N/S = Not Supportive, N/A = Not Applicable**	**S**	**N/S**	**N/A**
(E) Promote greater public and private sector cooperation in determining industrial training needs and in developing relevant curricula and on the-job training opportunities.			X
(F) Provide retraining programs and other support services to assist entry of displaced workers into alternative employment.			X
(b) Priority guidelines to promote the economic health and quality of the visitor industry:			
(1) Promote visitor satisfaction by fostering an environment which enhances the Aloha Spirit and minimizes inconveniences to Hawaiʻi's residents and visitors.			X
(2) Encourage the development and maintenance of well-designed, adequately serviced hotels and resort destination areas which are sensitive to neighboring communities and activities and which provide for adequate shoreline setbacks and beach access.			X
(3) Support appropriate capital improvements to enhance the quality of existing resort destination areas and provide incentives to encourage investment in upgrading, repair, and maintenance of visitor facilities.			X
(4) Encourage visitor industry practices and activities which respect, preserve, and enhance Hawaiʻi's significant natural, scenic, historic, and cultural resources.			X
(5) Develop and maintain career opportunities in the visitor industry for Hawaiʻi's people, with emphasis on managerial positions.			X
(6) Support and coordinate tourism promotion abroad to enhance Hawaiʻi's share of existing and potential visitor markets.			X
(7) Maintain and encourage a more favorable resort investment climate consistent with the objectives of this chapter.			X
(8) Support law enforcement activities that provide a safer environment for both visitors and residents alike.			X
(9) Coordinate visitor industry activities and promotions to business visitors through the state network of advanced data communication techniques.			X
(c) Priority guidelines to promote the continued viability of the sugar and pineapple industries:			
(1) Provide adequate agricultural lands to support the economic viability of the sugar and pineapple industries.			X
(2) Continue efforts to maintain federal support to provide stable sugar prices high enough to allow profitable operations in Hawaiʻi.			X

Hawaiʻi State Plan, HRS Chapter 226 – Part III. Priority Guidelines **S = Supportive, N/S = Not Supportive, N/A = Not Applicable**	**S**	**N/S**	**N/A**
(3) Support research and development, as appropriate, to improve the quality and production of sugar and pineapple crops.			X
(d) Priority guidelines to promote the growth and development of diversified agriculture and aquaculture:			
(1) Identify, conserve, and protect agricultural and aquacultural lands of importance and initiate affirmative and comprehensive programs to promote economically productive agricultural and aquacultural uses of such lands.			X
(2) Assist in providing adequate, reasonably priced water for agricultural activities.			X
(3) Encourage public and private investment to increase water supply and to improve transmission, storage, and irrigation facilities in support of diversified agriculture and aquaculture.			X
(4) Assist in the formation and operation of production and marketing associations and cooperatives to reduce production and marketing costs.			X
(5) Encourage and assist with the development of a waterborne and airborne freight and cargo system capable of meeting the needs of Hawaiʻi's agricultural community.			X
(6) Seek favorable freight rates for Hawaiʻi's agricultural products from interisland and overseas transportation operators.			X
(7) Encourage the development and expansion of agricultural and aquacultural activities which offer long-term economic growth potential and employment opportunities.			X
(8) Continue the development of agricultural parks and other programs to assist small independent farmers in securing agricultural lands and loans.			X
(9) Require agricultural uses in agricultural subdivisions and closely monitor the uses in these subdivisions.			X
(10) Support the continuation of land currently in use for diversified agriculture.			X
(11) Encourage residents and visitors to support Hawaiʻi's farmers by purchasing locally grown food and food products.			X
(e) Priority guidelines for water use and development:			
(1) Maintain and improve water conservation programs to reduce the overall water consumption rate.			X

Hawaiʻi State Plan, HRS Chapter 226 – Part III. Priority Guidelines **S = Supportive, N/S = Not Supportive, N/A = Not Applicable**	**S**	**N/S**	**N/A**
(2) Encourage the improvement of irrigation technology and promote the use of nonpotable water for agricultural and landscaping purposes.			X
(3) Increase the support for research and development of economically feasible alternative water sources.			X
(4) Explore alternative funding sources and approaches to support future water development programs and water system improvements.			X
(f) Priority guidelines for energy use and development:			
(1) Encourage the development, demonstration, and commercialization of renewable energy sources.			X
(2) Initiate, maintain, and improve energy conservation programs aimed at reducing energy waste and increasing public awareness of the need to conserve energy.			X
(3) Provide incentives to encourage the use of energy conserving technology in residential, industrial, and other buildings.			X
(4) Encourage the development and use of energy conserving and cost-efficient transportation systems.			X
(g) Priority guidelines to promote the development of the information industry:			
(1) Establish an information network, with an emphasis on broadband and wireless infrastructure and capability that will serve as the foundation of and catalyst for overall economic growth and diversification in Hawaiʻi.			X
(2) Encourage the development of services such as financial data processing, a products and services exchange, foreign language translations, telemarketing, teleconferencing, a twenty-four-hour international stock exchange, international banking, and a Pacific Rim management center.			X
(3) Encourage the development of small businesses in the information field such as software development; the development of new information systems, peripherals, and applications; data conversion and data entry services; and home or cottage services such as computer programming, secretarial, and accounting services.			X
(4) Encourage the development or expansion of educational and training opportunities for residents in the information and telecommunications fields.			X

Hawai'i State Plan, HRS Chapter 226 – Part III. Priority Guidelines **S = Supportive, N/S = Not Supportive, N/A = Not Applicable**	**S**	**N/S**	**N/A**
(5) Encourage research activities, including legal research in the information and telecommunications fields.			X
(6) Support promotional activities to market Hawai'i's information industry services.			X
(7) Encourage the location or co-location of telecommunication or wireless information relay facilities in the community, including public areas, where scientific evidence indicates that the public health, safety, and welfare would not be adversely affected.			X
Discussion: Not applicable for the proposed project.			
Chapter 226-104: Population growth and land resources priority guidelines			
(a) Priority guidelines to effect desired statewide growth and distribution:			
(1) Encourage planning and resource management to ensure that population growth rates throughout the State are consistent with available and planned resource capacities and reflect the needs and desires of Hawai'i's people.			**X**
2) Manage a growth rate for Hawai'i's economy that will parallel future employment needs for Hawai'i's people.			**X**
(3) Ensure that adequate support services and facilities are provided to accommodate the desired distribution of future growth throughout the State.	**X**		
(4) Encourage major state and federal investments and services to promote economic development and private investment to the neighbor islands, as appropriate.	**X**		
(5) Explore the possibility of making available urban land, low-interest loans, and housing subsidies to encourage the provision of housing to support selective economic and population growth on the neighbor islands.	**X**		
(6) Seek federal funds and other funding sources outside the State for research, program development, and training to provide future employment opportunities on the neighbor islands.	**X**		
(7) Support the development of high technology parks on the neighbor islands.			**X**

Hawai'i State Plan, HRS Chapter 226 – Part III. Priority Guidelines **S = Supportive, N/S = Not Supportive, N/A = Not Applicable**	**S**	**N/S**	**N/A**
(b) Priority guidelines for regional growth distribution and land resource utilization:			
(1) Encourage urban growth primarily to existing urban areas where adequate public facilities are already available or can be provided with reasonable public expenditures, and away from areas where other important benefits are present, such as protection of important agricultural land or preservation of lifestyles.	**X**		
2) Make available marginal or nonessential agricultural lands for appropriate urban uses while maintaining agricultural lands of importance in the agricultural district.			**X**
(3) Restrict development when drafting of water would result in exceeding the sustainable yield or in significantly diminishing the recharge capacity of any groundwater area.	X		
(4) Encourage restriction of new urban development in areas where water is insufficient from any source for both agricultural and domestic use.			**X**
(5) In order to preserve green belts, give priority to state capital-improvement funds which encourage location of urban development within existing urban areas except where compelling public interest dictates development of a noncontiguous new urban core.			**X**
(6) Seek participation from the private sector for the cost of building infrastructure and utilities, and maintaining open spaces.			**X**
(7) Pursue rehabilitation of appropriate urban areas.			**X**
(8) Support the redevelopment of Kaka'ako into a viable residential, industrial, and commercial community.			**X**
(9) Direct future urban development away from critical environmental areas or impose mitigating measures so that negative impacts on the environment would be minimized.	X		
(10) Identify critical environmental areas in Hawai'i to include but not be limited to the following: watershed and recharge areas; wildlife habitats (on land and in the ocean); areas with endangered species of plants and wildlife; natural streams and water bodies; scenic and recreational shoreline resources; open space and natural areas; historic and cultural sites; areas particularly sensitive to reduction in water and air quality; and scenic resources.			**X**
(11) Identify all areas where priority should be given to preserving rural character and lifestyle.			**X**

Hawai'i State Plan, HRS Chapter 226 – Part III. Priority Guidelines **S = Supportive, N/S = Not Supportive, N/A = Not Applicable**	**S**	**N/S**	**N/A**
(12) Utilize Hawai'i's limited land resources wisely, providing adequate land to accommodate projected population and economic growth needs while ensuring the protection of the environment and the availability of the shoreline, conservation lands, and other limited resources for future generations.	X		
(13) Protect and enhance Hawai'i's shoreline, open spaces, and scenic resources.			**X**
Discussion: The proposed project would include development within a central developed urban area within close proximity to jobs, and other critical urban service centers. All resource development use (i.e., water, wastewater, electricity) will be conducted in accordance with County and State sustainability regulatory guidelines.			
Chapter 226-105: Crime and criminal justice.			
Priority guidelines in the area of crime and criminal justice:			
(1) Support law enforcement activities and other criminal justice efforts that are directed to provide a safer environment.			**X**
(2) Target state and local resources on efforts to reduce the incidence of violent crime and on programs relating to the apprehension and prosecution of repeat offenders.			**X**
(3) Support community and neighborhood program initiatives that enable residents to assist law enforcement agencies in preventing criminal activities.			**X**
(4) Reduce overcrowding or substandard conditions in correctional facilities through a comprehensive approach among all criminal justice agencies which may include sentencing law revisions and use of alternative sanctions other than incarceration for persons who pose no danger to their community.			**X**
(5) Provide a range of appropriate sanctions for juvenile offenders, including community-based programs and other alternative sanctions.			**X**
(6) Increase public and private efforts to assist witnesses and victims of crimes and to minimize the costs of victimization.			**X**
Discussion: Not applicable to the proposed project.			
Chapter 226-106: Affordable housing			
Priority guidelines for the provision of affordable housing			
(1) Seek to use marginal or nonessential agricultural land and public land to meet housing needs of low- and moderate-income and gap-group households.	X		

Hawaiʻi State Plan, HRS Chapter 226 – Part III. Priority Guidelines **S = Supportive, N/S = Not Supportive, N/A = Not Applicable**	**S**	**N/S**	**N/A**
(2) Encourage the use of alternative construction and development methods as a means of reducing production costs.			**X**
(3) Improve information and analysis relative to land availability and suitability for housing.			**X**
(4) Create incentives for development which would increase home ownership and rental opportunities for Hawai'i's low- and moderate income households, gap-group households, and residents with special needs.			**X**
(5) Encourage continued support for government or private housing programs that provide low interest mortgages to Hawai'i's people for the purchase of initial owner-occupied housing.	**X**		
(6) Encourage public and private sector cooperation in the development of rental housing alternatives.			**X**
(7) Encourage improved coordination between various agencies and levels of government to deal with housing policies and regulations.	**X**		
(8) Give higher priority to the provision of quality housing that is affordable for Hawai'i's residents and less priority to development of housing intended primarily for individuals outside of Hawai'i.	**X**		
Discussion: The proposed project would include a government-funded low income housing development that would provide low and moderate income families and individuals with much needed affordable housing.			
Chapter 226-107: Quality education			
Priority guidelines to promote quality education:			
(1) Pursue effective programs which reflect the varied district, school, and student needs to strengthen basic skills achievement;			**X**
(2) Continue emphasis on general education "core" requirements to provide common background to students and essential support to other university programs;			**X**
(3) Initiate efforts to improve the quality of education by improving the capabilities of the education work force;			**X**
(4) Promote increased opportunities for greater autonomy and flexibility of educational institutions in their decision making responsibilities;	**X**		
(5) Increase and improve the use of information technology in education by the availability of telecommunications equipment for:			**X**
(A) The electronic exchange of information			**X**

Hawai'i State Plan, HRS Chapter 226 – Part III. Priority Guidelines **S = Supportive, N/S = Not Supportive, N/A = Not Applicable**	**S**	**N/S**	**N/A**
(B) Statewide electronic mail; and			**X**
(C) Access to the Internet.			**X**
(6) Encourage programs that increase the public's awareness and understanding of the impact of information technologies on our lives;			**X**
(7) Pursue the establishment of Hawai'i's public and private universities and colleges as research and training centers of the Pacific;			**X**
(8) Develop resources and programs for early childhood education;			**X**
(9) Explore alternatives for funding and delivery of educational services to improve the overall quality of education; and			**X**
(10) Strengthen and expand educational programs and services for students with special needs.			**X**
Discussion: The proposed project is planned to include space for educational programs offered to the local community.			
Chapter 226-108: Sustainability			
Priority guidelines and principles to promote sustainability shall include:			
(1) Encouraging balanced economic, social, community, and environmental priorities;			**X**
(2) Encouraging planning that respects and promotes living within the natural resources and limits of the State;	X		
(3) Promoting a diversified and dynamic economy;			**X**
(4) Encouraging respect for the host culture;			**X**
(5) Promoting decisions based on meeting the needs of the present without compromising the needs of future generations;	X		
(6) Considering the principles of the ahupua'a system; and			**X**
(7) Emphasizing that everyone, including individuals, families, communities, businesses, and government, has the responsibility for achieving a sustainable Hawai'i.	X		
Discussion: The proposed project would practice sustainable practices by adhering to current Kaua'i County building codes with regards to building size, zoning, water and electricity consumption.			

Hawai'i State Plan, HRS Chapter 226 – Part III. Priority Guidelines **S = Supportive, N/S = Not Supportive, N/A = Not Applicable**	**S**	**N/S**	**N/A**
CHAPTER 226-109: Climate change adaptation			
Priority guidelines and principles to promote climate change adaptation shall include:			
(1) Ensure that Hawai'i's people are educated, informed, and aware of the impacts climate change may have on their communities;			**X**
(2) Encourage community stewardship groups and local stakeholders to participate in planning and implementation of climate change policies;			**X**
(3) Invest in continued monitoring and research of Hawai'i's climate and the impacts of climate change on the State;			**X**
(4) Consider native Hawaiian traditional knowledge and practices in planning for the impacts of climate change;			**X**
(5) Encourage the preservation and restoration of natural landscape features, such as coral reefs, beaches and dunes, forests, streams, floodplains, and wetlands, that have the inherent capacity to avoid, minimize, or mitigate the impacts of climate change;			**X**
(6) Explore adaptation strategies that moderate harm or exploit beneficial opportunities in response to actual or expected climate change impacts to the natural and built environments;			**X**
(7) Promote sector resilience in areas such as water, roads, airports, and public health, by encouraging the identification of climate change threats, assessment of potential consequences, and evaluation of adaptation options;			**X**
(8) Foster cross-jurisdictional collaboration between county, state, and federal agencies and partnerships between government and private entities and other nongovernmental entities, including nonprofit entities;			**X**
(9) Use management and implementation approaches that encourage the continual collection, evaluation, and integration of new information and strategies into new and existing practices, policies, and plans; and			**X**
(10) Encourage planning and management of the natural and built environments that effectively integrate climate change policy.			**X**
Discussion: Not applicable to the proposed project.			

2.14.2 State of Hawai'i Land Use Law Chapter 205, HRS

Chapter 205, HRS promulgates the State Land Use Law. This law is intended to preserve, protect, and encourage the development of lands in the State of Hawai'i for

uses that are best suited to the public health and welfare of its people. The LUC classifies all land into four districts: Urban, Conservation, Agriculture, and Rural.

Discussion: The project site is designated within the State LUC Urban District. The proposed project proposes urban use as a residential and educational/health facility; therefore, the Proposed Action would be in accordance with the State LUC designation.

2.14.3 Hawai'i 2050 Sustainability Plan

The long-term strategy of the Hawai'i 2050 Sustainability Plan (Sustainability 2050 Plan) is supported by its main goals and objectives of respect for culture, character, beauty, and history of the State's island communities; balance among economic, community, and environmental priorities; and an effort to meet the needs of the present without compromising the ability of future generations to meet their own needs. The 2050 Plan includes goals toward a sustainable Hawai'i as well as strategic actions for implementation and indicators to measure success or failure:

Goal One: Living sustainably is part of our daily practice in Hawai'i. Strategic Actions: Develop a sustainability ethic.

Goal Two: Our diversified and globally competitive economy enables us to meaningfully live, work, and play in Hawai'i. Strategic Actions: Develop a more diverse and resilient economy; support the building blocks for economic stability and sustainability.

Goal Three: Our natural resources are responsibly and respectfully used, replenished, and preserved for future generations. Strategic Actions: Provide greater protection for air, and land-, fresh water and ocean-based habitats; conserve agricultural, open space and conservation lands and resources.

Goal Four: Our community is strong, healthy, vibrant and nurturing, providing safety nets for those in need. Strategic Actions: Provide access to diverse recreational facilities and opportunities.

Goal Five: Our Kanaka Maoli and island cultures and values are thriving and perpetuated. Strategic.

Discussion : The proposed facility would be designed and constructed in compliance with Kaua'i County Code, which requires the responsible and sustainable development, use and management of natural resources; such as water, electricity and visual and scenic resources.

2.14.4 Hawai'i Coastal Zone Management Program

The Coastal Zone Management Act of 1972 (16 USC §1451), as amended through Public Law 104-150, created the coastal management program and the National Estuarine Research Reserve system. The coastal states are authorized to develop and implement a state coastal zone management (CZM) program. Hawai'i CZM Program received federal approval in the late 1970's. The objectives of the Hawai'i CZM Program, HRS §205A-2, are to protect valuable and vulnerable coastal resources such as coastal

ecosystems, special scenic and cultural values and recreational opportunities. The objectives of the program are also to reduce coastal hazards and to improve the review process for activities proposed within the coastal zone.

The Hawai'i CZM law requires each County to designate and administer the SMA within the State's coastal areas that extends inland from the shoreline. Development within the SMA is subject to County approval to ensure the proposal is consistent with the policies and objectives of the Hawai'i CZM Program. The following are objectives of the Hawai'i CZM Program and the Project's impacts relative to the State CZM objectives and policies:

Objectives

(1) Recreational resources;

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

Discussion: Not applicable since the project site is located outside the shoreline and SMA Area.

(2) Historic resources;

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

Discussion: An archaeolgical survey and background research was completed for the proposed project as part of the EA process. Consultation with SHPD and local Native Hawaiian groups and individuals is in progress, and will continue throughout the planning and development process to comply with HRS 6E, as well as Section 106 of the U.S. NHPA.

(3) Scenic and open space resources;

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

Discussion: The proposed project will incorporate landscaping buffers between and around the proposed buildings onsite, and will include relatively low-lying buildings in order to fit into the existing environment.

(4) Coastal ecosystems;

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

Discussion: Not applicable since the proposed project is not proposed at or near the coastal shoreline area/SMA.

(5) Economic uses;

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

Discussion: The proposed project is planned in a suitable central location readily accessible to the local community.

(6) Coastal hazards;

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

Discussion: The proposed project site is located outside the tsunami evacuation zone and the State SMA. The project site is located within FEMA Flood Zone X: Area of minimal flood hazard. During construction, BMPs will be implemented to reduce/eliminate on and off-site runoff/pollution.

(7) Managing development;

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

Discussion: The proposed project is going through the environmental review process in compliance with the State Hawaiʻi Environmental Policy Act. A public review/comment period will be conducted during the environmental review process, which will allow for public participation/agency communication.

(8) Public participation;

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

Discussion: As stated above, the proposed project is going through the environmental review process and will include a public review/comment period, which will allow for public participation/agency communication. Additional public awareness and education in matters of coastal management are not applicable to the proposed project.

9) Beach protection;

(A) Protect beaches for public use and recreation.

Discussion: Not applicable for the proposed project which is located outside the shoreline/SMA.

10) Marine resources;

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

Discussion: Not applicable for the proposed project which is located outside the shoreline/SMA.

Policies

(1) Recreational resources;

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

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

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

(ii) Requiring replacement of coastal resources having significant recreational value including, but not limited to, surfing sites, fishponds, and sand beaches, when such resources will be unavoidably damaged by development; or requiring reasonable monetary compensation to the State for recreation when replacement is not feasible or desirable;

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

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

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

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

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

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

Discussion: None of the policies are applicable to the proposed project since it would not include the creation or conversion of recreational shoreline areas. While the proposed project would use existing land managed by the County of Kaua'i Department of Parks and Recreation, there are adequate alternate County recreational park areas in close proximity to the project site.

(2) Historic resources;

(A) Identify and analyze significant archaeological resources;

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

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

Discussion: An archaeolgical survey and background reaseach was completed as part of the environmental review process to ensure proper analysis, information retention and

protection of any historic or cultural resources. An AMP is recommended for construction, and acceptance of the proposed project by SHPD is required prior to issuance of County building permit.

(3) Scenic and open space resources;

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

(B) Ensure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural landforms and existing public views to and along the shoreline;

(C) Preserve, maintain, and, where desirable, improve and restore shoreline open space and scenic resources; and

(D) Encourage those developments that are not coastal dependent to locate in inland areas.

Discussion: The proposed project would be compatible with the existing visual environment since it would be sited in a developed area, and would include a relatively low height, and would include landscaping buffering in its design to soften the visual presence of the proposed facilty. View corridors of Hā‘upu Mountain to the southwest, and Kapala‘oa and Kahili Mountains to the north/northwest would not be significantly impacted.

(4) Coastal ecosystems;

(A) Exercise an overall conservation ethic, and practice stewardship in the protection, use, and development of marine and coastal resources;

(B) Improve the technical basis for natural resource management;

(C) Preserve valuable coastal ecosystems, including reefs, of significant biological or economic importance;

(D) Minimize disruption or degradation of coastal water ecosystems by effective regulation of stream diversions, channelization, and similar land and water uses, recognizing competing water needs; and

(E) Promote water quantity and quality planning and management practices that reflect the tolerance of fresh water and marine ecosystems and maintain and enhance water quality through the development and implementation of point and nonpoint source water pollution control measures.

Discussion: Utility and natural systems resource development and use under the proposed project would be completed in compliance with Kaua’i County Code, which manages the proper allocation and sustainable use of natrual resources and utilities.

5) Economic uses;

(A) Concentrate coastal dependent development in appropriate areas;

(B) Ensure that coastal dependent development such as harbors and ports, and coastal related development such as visitor industry facilities and energy

generating facilities, are located, designed, and constructed to minimize adverse social, visual, and environmental impacts in the coastal zone management area; and

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

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

(ii) Adverse environmental effects are minimized; and

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

Discussion: Not applicable since the proposed development is not proposed in the shoreline area/SMA.

(6) Coastal hazards;

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

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

(C) Ensure that developments comply with requirements of the Federal Flood Insurance Program; and

(D) Prevent coastal flooding from inland projects.

Discussion: The proposed project site is located outside the tsunami evacuation zone and the SMA. The project site is located within FEMA Flood Zone X: Area of minimal flooding.

(7) Managing development;

(A) Use, implement, and enforce existing law effectively to the maximum extent possible in managing present and future coastal zone development;

(B) Facilitate timely processing of applications for development permits and resolve overlapping or conflicting permit requirements; and

(C) Communicate the potential short and long-term impacts of proposed significant coastal developments early in their life cycle and in terms understandable to the public to facilitate public participation in the planning and review process.

Discussion: Not applicable since the proposed development is not proposed in the shoreline area/SMA

(8) Public participation;

(A) Promote public involvement in coastal zone management processes;

(B) Disseminate information on coastal management issues by means of educational materials, published reports, staff contact, and public workshops for

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

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

Discussion: A public review/comment period will be conducted during the environmental review process, which will allow for public participation/agency communication.

(9) Beach protection;

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

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

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

Discussion: Not applicable since the proposed project is not planned in the shoreline/SMA.

(10) Marine resources;

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

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

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

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

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

Discussion: Not applicable since the proposed project is not planned in the shoreline/SMA.

2.14.5 The General Plan for The County of Kaua'i

The General Plan for the County of Kaua'i was updated in 2018 and provides broad goals, objectives, policies, and implementing actions that outline the direction of the County's

future. The General Plan provides the policy framework for future development within Kauaʻi County.

Section 1.4 of the Kaua'i County General Plan includes the following policies to guide future growth that are relevant to the proposed project:

Policy #1: Manage Growth to Preserve Rural Character

Policy #2: Provide Affordable Housing While Facilitating a Diversity of Privately-Developed Housing for Local Families

Policy #4: Design Healthy and Complete Neighborhoods

Policy #6: Reduce the Cost of Living

Policy #10: Help Business Thrive

Policy: 14: Prepare for Climate Change

Discussion: The proposed project would be an urban infill project that would represent sustainable development within the urban core, adjacent to existing housing and public transportation, rather than in outlying rural areas. The proposed action is an affordable housing project that will reduce the cost of living for low-income Kaua'i residents by reducing housing cost. The proposed action would result in new construction jobs/business, and is sited in a location away from the shoreline, and outside flood zones where climate change impacts are generally less severe.

Section 2.1 of the General Plan includes the following Future Land Use Objectives:

1. *To accommodate Kauaʻi's projected population growth and housing needs.*
2. *To meet future housing needs through "missing middle" housing types that are affordable by design and located near job centers.*
3. *To protect rural character by ensuring new growth is designed to be compact and focused around existing town centers.*
4. *To manage land use and development in a manner that respects the unique character of a place.*
5. *To locate residential growth in and near major jobs centers.*
6. *To increase overall commuity health through design that supports safe and accessible parks, streets, and other shared spaces.*
7. *To encourage the development of Līhuʻe as Kauaʻi's primary urban center with an urban edge boundary.*
8. *To increase resiliency by limiting development in areas impacted by future sea level rise.*

Discussion: The proposed project represents a compact development within the primary urban center on Kauaʻi: Līhuʻe. The project site is located well above the shoreline area, increasing its future resiliency to sea level rise impacts.

2.14.6 Līhuʻe Community Plan

The Līhuʻe Community Plan, dated June 2015, provides direction for future land use and growth within Līhuʻe town. The areas of Puhi, Pūʻali and Nūhou, where the project area

is located, are descibed in the plan as a commercial destination and employment center for the island. An increase in density and mixed use around Puhi Park and Kukui Grove Shopping were recommended in the plan. The plan also states that Līhu'e is expected to experience the largest population growth of any planning district on Kaua'i. As such, Līhu'e is also expected to accomodate nearly half of all new needed housing units between 2010 and 2035.

Discussion: The proposed project is congruent with the goals of the Līhu'e Community Plan since the proposed development represents much needed new housing stock within Līhu'e's urban core. The proposed mixed use aspect of the proposed development also is consistent with the Līhu'e Community Plan.

3 Environmental Impact Significance Criteria Analysis

HAR 11-200.1-13 includes an environmental significance criteria assessment that requires the agency or applicant conducting an EA or EIS to screen a proposed project against 13 environmental significance criteria. The 11-200.1-13 environmental significance criteria assessment for this project is presented below:

(1) Irrevocably commit a natural, cultural, or historic resource

> **Discussion**: Based on the environmental studies completed, there are no known significant natural, historic or cultural resources present at the project site that would be committed. An AMP is recommended during construction. If any potential subsurface historic/cultural resources are encountered during the construction process, all work shall halt and SHPD, the Burial Council and other appropriate groups will be notified in order to assess and protect the resources encountered in accordance with State law.

(2) Curtail the range of beneficial uses of the environment

> **Discussion***:* It is not anticipated that the proposed project would curtail beneficial uses of the affected environment. While the the project site would no longer be used as County parkland, there are similar County parks closeby in the surrounding area.

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

Discussion: The proposed project would not conflict with any State environmental policies or long-term goals. The proposed development would be planned and constructed in accordance with State laws and procedures. This EA represents compliance with State environmental regulation HRS 343. And the proposed project would comply with HRS 344: State Environmental Policy since there would be no misuse or overuse of natural resources, or pollution to the environment, which would help to safeguard the State's unique natural environmental characteristics.

(4) Have a substantial adverse effect on the economic welfare, social welfare, or cultural practices of the community and State

Discussion: The proposed project would have a beneficial effect on the economic welfare of the community and State since it would result in construction jobs, as well as as provide much needed affordable housing that would lower economic costs for Kauaʻi residents. There are no known significant cultural practices that occur at the project site that would be impacted.

(5) Have a substantial adverse effect on public health

Discussion: The proposed project would have a beneficial effect on public health since it would result in providing educational and health services to the local community.

(6) Involve adverse secondary impacts, such as population changes or effects on public facilities

Discussion: The proposed project would result in a slight population increase as new residents move to the proposed housing development. However, this population shift to Līhuʻe, the County's urban core, is in line with The County General Plan, as well as the Līhuʻe Community Plan goals, as discussed earlier in this EA.

(*7) Involve a substantial degradation of environmental quality*

Discussion: The proposed project is not anticipated to involve a substantial degradation of environmental quality. During construction, BMPs will be implemented to reduce/eliminate sediment and construction material runoff. The operation of the housing and educational/health facility would not result in any significant emissions or use /generate hazardous materials, and would incorporate stormwater management elements to reduce/eliminate runoff to the affected environment.

(8) Be individually limited but cumulatively have substantial adverse effect upon the environment or involves a commitment for larger actions

Discussion: The proposed project is a stand alone project initiated by the County Housing Agency, and would not result in adverse effects on the environment, or commitment for larger actions.

(9) Have a substantial adverse effect on a rare, threatened or endangered species, or its habitat

Discussion: The proposed project is not anticipated to have an effect on any sensitive biological resources or habitat. A biological resources survey of the project area, including background research into the surrounding area was conducted for the proposed project (Appendix A). The mitigation measures discussed earlier in this EA would reduce any potential impacts to sensitive biological resources to a level of insignificance.

(10) Have a substantial adverse effect on air or water quality or ambient noise levels

Discussion: The proposed project is not anticipated to have a substantial adverse effect on air or water quality or ambient noise levels. During construction, there is the potential for temporary, short-term impacts on existing air quality, noise conditions in the immediate vicinity of the project site. Construction work would comply with County regulations during construction and would implement BMPs to minimize temporary impacts. Once in operation, there would be no significant air emissions, water runoff or noise pollution from the proposed facility.

(11) Have a substantial adverse effect on or be likely to suffer damage by being located in an environmentally sensitive area such as flood plain, tsunami zone, sea level rise exposure area, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters.

Discussion: The proposed project site is not located in a sensitive area such as the SMA or shoreline area. It is located outside the Tsunami Evacuation Zone, and is located in FEMA Flood Zone X: Area of Minimal Flood Hazard. There are no geologic hazards, or waterways located at the project site.

(*12) Have a substantial adverse effect on scenic vistas and view planes, during day or night, identified in county or state plans or studies*

Discussion: During construction, dust fences, construction materials and equipment would be visible. However, these impacts would be short-term, and dust fences around the work site would reduce visual distractions caused by construction. Once complete, the proposed facility would include separate free standing buildings that would be spaced with view corridors.

The proposed facility would be visible from surrounding houses, especially those homes located across Welau Street south of the project site. However, landscaping buffers are planned around the proposed facility that would soften the visual presence of the new building. The views of Hāʻupu Mountain to the southwest, Kapalaʻoa and Kahili Mountains to the northwest would still be visible from the project site and surrounding area. Therefore, there are no significant impacts anticipated to visual and scenic resources from the proposed project.

(13) Require substantial energy consumption or emit substantial greenhouse gases

Discussion: The proposed facility would be designed with modern efficient electrical and water use systems in accordance with Kauaʻi County Code, and would be a compact multi-family develpment, which is more energy efficient than single family residences. There would be no significant GHG emissions generated from the proposed development.

3.1 Project Environmental Determination

Based on the research, studies and outreach conducted as part of this DEA, it is determined that the proposed project would not result in a significant environmental impact. Therefore, a finding of no significant impact (FONSI) is anticipated for this project.

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Appendix A:
Biological Resources Survey Report

Puhi Housing Project

Biological Resources Survey Report

Prepared for:

Kaimana Environmental Solutions, LLC

May 2021

TETRA TECH

complex world | CLEAR SOLUTIONS™

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Table of Contents

List of Tables

List of Figures

List of Appendices

1.0 Introduction

The County of Kauaʻi is proposing the Puhi Housing Project (Project) in the Lihue District of Puhi on the Island of Kauaʻi. The proposed Project involves construction of approximately 60 multi-family apartments within a 2.9 acre parcel (Tax Map Key (TMK) (4) 3-3-004:020) along Kaumualii Highway between Puhi Road and Nani Street. The Project is federally funded by the U.S. Department of Housing and Urban Development.

Tetra Tech, Inc. (Tetra Tech) was contracted by Kaimana Environmental Solutions LLC (Kaimana) to conduct a biological survey for the Project to support an Environmental Assessment. The purpose of the biological survey was to characterize the existing plant and animal habitat and determine whether species that are federally or state listed as threatened or endangered (pursuant to the federal Endangered Species Act or Hawaiʻi Revised Statutes [HRS] § 195D), or are otherwise considered rare, have the potential to occur and could be impacted by construction or operation of the Project. This report summarizes the results of the biological survey conducted by Tetra Tech on April 27, 2021.

2.0 Description of Study Area

The Study Area is an approximately 2.9-acre park located in Puhi on the southeast side of the Island of Kauaʻi (Figure 1). It encompasses a single TMK ((4) 3-3-004:020) that is owned by the County of Kauaʻi. The Study Area is bordered by Kaumualii Highway to the north, Nani Street to the east, Welau Street to the south, and commercial buildings to the west. Residential houses are present immediately south of the Study Area. The Study Area is approximately two miles west of Lihue. Notable land uses in the immediate vicinity include Kauaʻi Community College, Puhi Park, Kauaʻi Plantation, and Kauaʻi YMCA. The Hulēʻia National Wildlife Refuge is located roughly 1.3 miles to the southeast.

2.1 Climate

The climate in the Study Area is characterized as seasonally mesic (Price et al. 2012). According to the Online Rainfall Atlas of Hawaiʻi (Giambelluca et al. 2013), the area receives a mean annual rainfall of approximately 56 inches. Rainfall is typically highest from October-March and lowest from June-September (Giambelluca et al. 2013). The closest functioning National Weather Service rainfall gage to the Study Area (Lihue Airport) recorded above average rainfall in February, above average rainfall in March, below average rainfall in April (NWS 2021). The year-to-date total for this gage through the end of April 2021 was approximately 139 percent of average. The National Weather Service rainfall data suggest conditions were within normal range, but slightly wetter than normal when the biological survey was conducted.


Puhi Housing Project
Figure 1
Study Area and Vicinity
KAUAI COUNTY, HI
Legend
Study Area
TMK Boundary
Road
Puhi Road
Kaumualii Highway
Welau Street
Nani Street
Reference Map
Kauai
Data Sources: State of Hawaii (TMK Boundary, Roads); ESRI (Aerial Imagery)
1:3,500
NAD 1983 UTM Zone 4N
0
500
1,000
Feet
NOT FOR CONSTRUCTION

2.2 Topography and Soils

The Study Area is located at approximately 320 feet elevation, and the topography is relatively flat. The Natural Resources Conservation Service (NRCS) identifies the following three soil types in the Study Area: Puhi silty clay loam, 0 to 3 percent slopes; Puhi silty clay loam, 3 to 8 percent slopes; Puhi silty clay loam, 8 to 15 percent slopes (NRCS 2020).

2.3 Hydrology

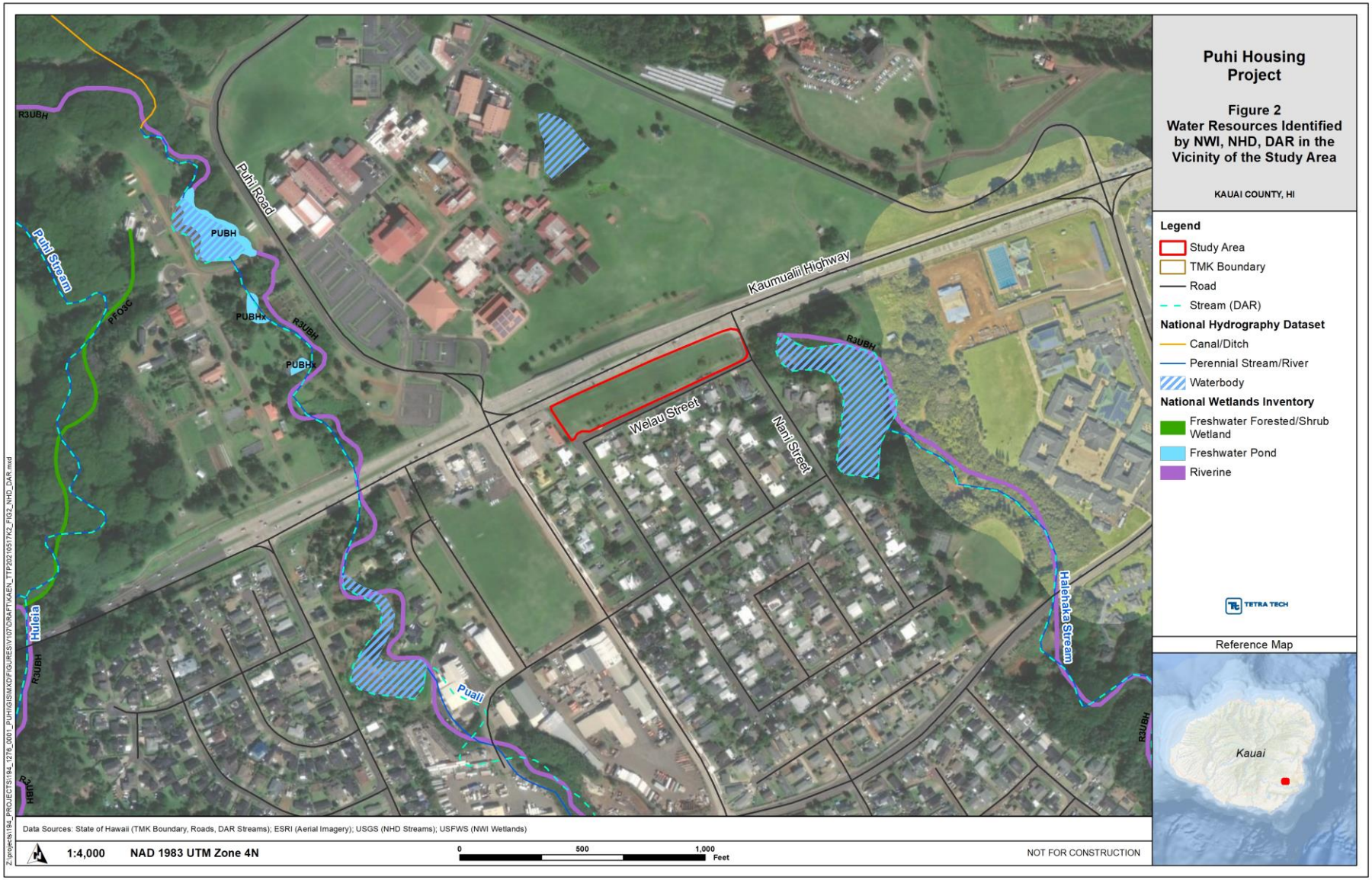
The Study Area is within the Puali watershed which encompasses roughly 2.1 square miles (Parham et al. 2008). Wetlands, streams, ditches, and other features identified in the vicinity by the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) data (NWI 2020), the U.S. Geological Survey (USGS) topographic and National Hydrography Dataset (NHD 2020), and the State of Hawai'i Division of Aquatic Resources (DAR) dataset (DAR 2008) are shown in Figure 2. Halehaka Stream is to the east of the Study Area and Puali Stream is to the west. These streams join further south of the Study Area and eventually drain into Nāwiliwili Bay. Several reservoirs also occur in the vicinity of the Study Area (see Figure 2).

3.0 Methods

Prior to the field survey, Tetra Tech conducted a review of relevant publicly available literature and data relevant to the biological resources in and near the Study Area. Evaluated resources included previous survey reports, environmental assessments and environmental impact statements, public datasets (including NWI, NHD, and DAR), scientific journals and reports, as well as available, unpublished data that are relevant to the natural history and ecology of the area. In addition, Tetra Tech reviewed available geospatial data, aerial photographs, and topographic maps of the Study Area to identify occurrences of federally or state listed or otherwise rare species, or habitats that could harbor these species. A field survey of the Study Area was conducted on April 27, 2021; the survey was conducted from approximately 9:00 am until 11:00 am in ideal survey conditions with clear skies, light winds, and warm temperatures. Details regarding the field survey methodologies are provided below.

3.1 Plants

Tetra Tech conducted a pedestrian survey to record common plant species and dominant vegetation types, as well as any listed or rare plant species within the Study Area. Plant identifications were made in the field; plants that could not be positively identified were photo-documented for comparison with the recent taxonomic literature.


Puhi Housing Project
Figure 2
Water Resources Identified by NWI, NHD, DAR in the Vicinity of the Study Area
KAUAI COUNTY, HI
Legend
Study Area
TMK Boundary
Road
Stream (DAR)
National Hydrography Dataset
Canal/Ditch
Perennial Stream/River
Waterbody
National Wetlands Inventory
Freshwater Forested/Shrub Wetland
Freshwater Pond
Riverine
TETRA TECH
Reference Map
Kauai
Puhi Road
Puhi Stream
Kaumualii Highway
Welau Street
Nani Street
Halehaka Stream
Huleia
Puali
PUBH
PUBHx
PFOSC
R3UBH
Data Sources: State of Hawaii (TMK Boundary, Roads, DAR Streams); ESRI (Aerial Imagery); USGS (NHD Streams); USFWS (NWI Wetlands)
1:4,000
NAD 1983 UTM Zone 4N
0
500
1,000
Feet
NOT FOR CONSTRUCTION

Plants recorded during the survey are indicative of the season and environmental conditions at the time of the survey. The presence and location of plants can be influenced by seasonal and temporal changes; therefore, it is possible additional species may occur within the Study Area but were not present during this survey.

The taxonomy and nomenclature of the flowering plants are in accordance with Wagner et al. (1999, 2012), Wagner and Herbst (2003), and Imada (2012, 2019) for native and naturalized flowering plants, and Staples and Herbst (2005) for ornamental plants. Common/Hawaiian names are provided first, followed by scientific names in parentheses. If no common or Hawaiian name is known, only the scientific name is provided.

3.2 Wildlife

Wildlife surveys consisted of observations and identification of birds, mammals, and large invertebrates species encountered while searching the Study Area. Observations of invertebrates encountered were recorded incidentally to wildlife surveys. Invertebrates were identified through visual observations and were not collected in the field. Tetra Tech recorded all wildlife seen or heard while walking within the Study Area coupled with visual observation of scat, tracks, and other animal sign. Habitats or plants that could support listed wildlife species were also identified if present (e.g., water features as potential habitat for listed Hawaiian waterbirds).

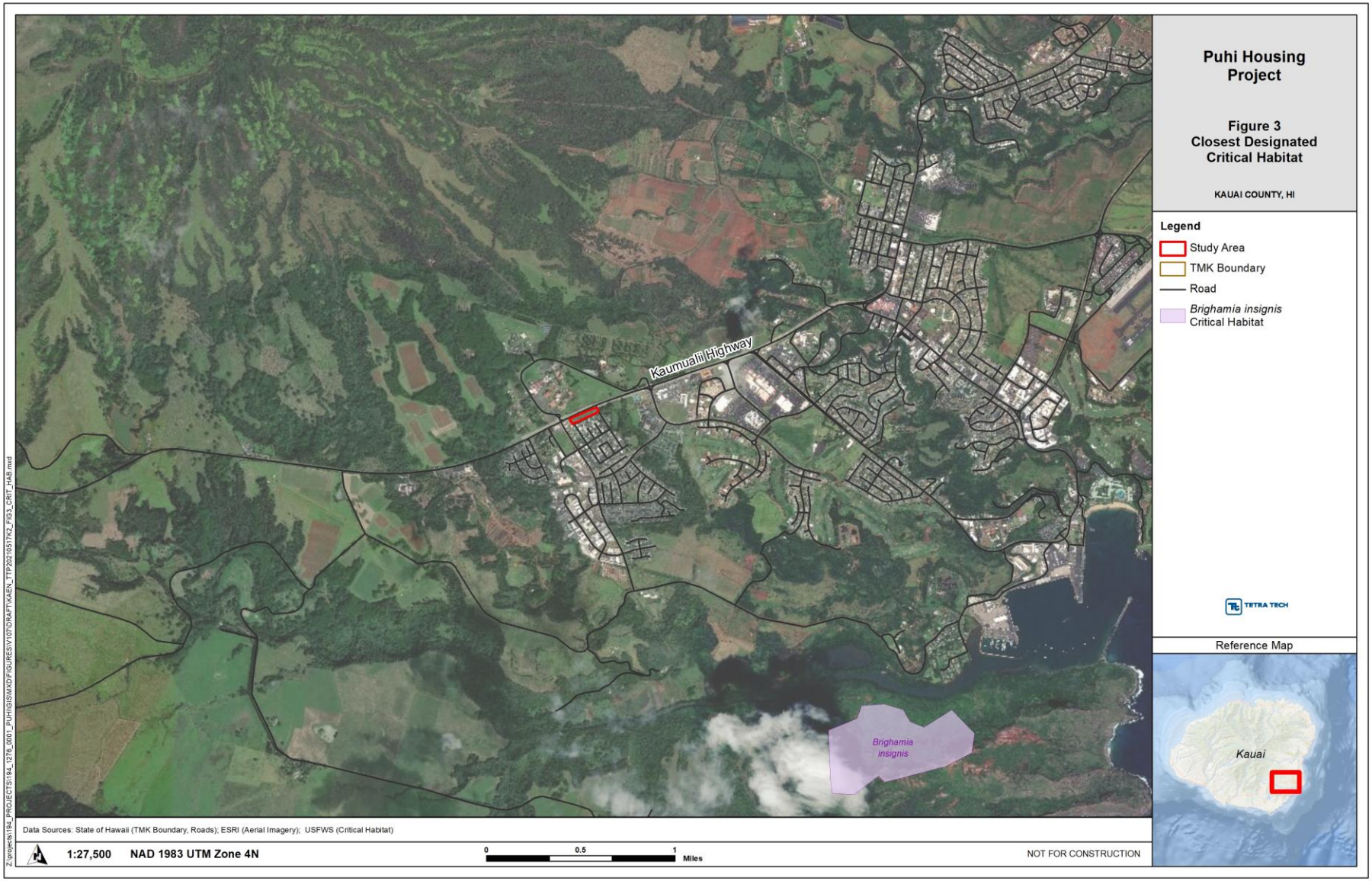
Specific surveys for the endangered Hawaiian hoary bat or ʻōpeʻapeʻa (*Lasiurus cinereus semotus*) with acoustic bat detectors or nighttime observation were not conducted. Rather, as the USFWS and State of Hawaiʻi Division of Forestry and Wildlife (DOFAW) recognize all woody vegetation greater than 15 feet tall as potential bat roosting habitat (DOFAW 2015, USFWS 2019), Tetra Tech noted the presence/absence of any such vegetation within the Study Area.

Scientific nomenclature for birds follows Birds of the World (Billerman et al. 2020). Scientific names for mammals follow Tomich (1986). Scientific nomenclature follows Nishida (2002) for invertebrates.

4.0 Results and Discussion

The Study Area is comprised of a fenced manicured lawn with several planted ornamental tree and shrub species. Several picnic tables and play/exercise equipment are present in the park. The species composition is dominated by non-native plant and wildlife species. Of the native species observed, all are common across Kauaʻi and other Hawaiian Islands. No federally or state listed species were observed in the Study Area during the survey. Although not observed in the Study Area during the survey, several federally or state listed animal species may occasionally occur in or traverse the Study Area. These listed species are discussed in further detail below. No designated critical habitat occurs in the Study Area. The closest designated critical habitat is nearly 2.3 miles to the southeast (see Figure 3).

Representative photographs of the Study Area are presented in Appendix A.


Puhi Housing Project
Figure 3
Closest Designated Critical Habitat
KAUAI COUNTY, HI
Legend
Study Area
TMK Boundary
Road
Brighamia insignis Critical Habitat
Kaumualii Highway
Brighamia insignis
TETRA TECH
Reference Map
Kauai
Data Sources: State of Hawaii (TMK Boundary, Roads); ESRI (Aerial Imagery); USFWS (Critical Habitat)
1:27,500
NAD 1983 UTM Zone 4N
0
0.5
1
Miles
NOT FOR CONSTRUCTION
Z:\projects\194_PROJECTS\194_1276_0001_PUHI\GIS\MXD\FIGURES\V1\07\DRAFT\KAEN_TTP20210517K2_Fig3_CRIT_HAB.mxd

4.1 Plants

No federally or state listed plant species or rare plant species were observed in the Study Area during the survey. A total of 34 plant species were documented within the Study Area. Of these, only one species—milo (*Thespesia populnea*)—is considered native to the Hawaiian Islands. This indigenous species is not considered rare and is commonly planted throughout the islands. A list of plants observed during the survey is presented in Appendix B.

The vegetation within the Study Area is characterized by a manicured lawn interspersed with low-growing weeds and several ornamental trees. The lawn appears to be regularly cut and consists primarily of zoysia grass (*Zoysia* sp.), fimbriate paspalum (*Paspalum fimbriatum*), St. Augustine grass (*Stenotaphrum secundatum*), and Bermuda grass (*Cynodon dactylon*). Common weed species growing along the edges of the lawn include yellow wood sorrel (*Oxalis corniculata*), maile hohono (*Ageratum conyzoides*), and graceful spurge (*Euphorbia hypericifolia*). Royal poinciana (*Delonix regia*) trees, kukui nut (*Aleurites moluccana*) trees, and milo trees are planted along the southern boundary of the Study Area. Ornamental crotons (*Codiaeum variegatum*) circle each royal poinciana tree in the Study Area.

4.2 Wildlife

4.2.1 Birds

Twelve bird species were recorded within the Study Area (Table 1). Warbling white-eye (*Zosterops japonicus*), house finch (*Haemorhous mexicanus*) and zebra dove (*Geopelia striata*) were the most common bird species recorded during the survey. All of the bird species detected are non-native to the Hawaiian Islands and are commonly found in residential areas. Although not seen during the survey, one native migratory bird species—the Pacific golden-plover or kōlea (*Pluvialis fulva*)—was seen near the Study Area and could likely occur in the Study Area. Two non-native bird species seen or heard during the survey are protected by Migratory Bird Treaty Act, as listed in Table 1.

Although not observed in the Study Area during the survey, several federally and state listed bird species are known to occur in the vicinity and may fly over or use habitat in the Study Area. These listed bird species are discussed in further detail below.

Listed Waterbirds:

Listed waterbird species that occur on Kaua‘i include the Hawaiian stilt or ae‘o (*Himantopus mexicanus knudseni*), Hawaiian coot or ‘alea kea (*Fulica alai*), Hawaiian gallinule or ‘alae ‘ula (*Gallinula galeata sandvicensis*), and the Hawaiian duck or koloa (*Anas wyvilliana*); these species are collectively referred to as listed waterbirds. No listed waterbirds or their habitat were observed in the Study Area during the survey; however, all of these bird species can be found at Hulē‘ia National Wildlife Refuge approximately 1.3 miles to the south of the Study Area (USFWS 2015). Listed waterbirds have also been recorded immediately north of the Study Area at Island School and Kaua‘i Community College (David and Guinther 2010a, David and Guinther 2010b). Suitable nesting and foraging habitat is present at these campuses.

Table 1. Birds Recorded in the Study Area During the Survey

Common Name	Scientific Name	Status	MBTA
Cattle egret	*Bubulcus ibis*	NN	X
Common myna	*Acridotheres tristis*	NN	
Chestnut munia	*Lonchura atricapilla*	NN	
House finch	*Haemorhous mexicanus*	NN	X
House sparrow	*Passer domesticus*	NN	
Red-crested cardinal	*Paroaria coronata*	NN	
Red junglefowl	*Gallus*	NN	
Rose-ringed parakeet	*Psittacula krameria*	NN	
Spotted dove	*Streptopelia chinensis*	NN	
Warbling white-eye	*Zosterops japonicus*	NN	
White-rumped shama	*Copsychus malabaricus*	NN	
Zebra dove	*Geopelia striata*	NN	
Status: NN = non-native established species, MBTA = Migratory Bird Treaty Act			

Hawaiian Goose:

Although not observed within the Study Area during the survey, suitable habitat for the threatened Hawaiian goose or nēnē (*Branta sandvicensis*) occurs within the Study Area and in the immediate vicinity. Hawaiian geese use various habitat types, including beach strand, shrubland, grasslands to lava rock (Banko et al. 2020). They are also known to use landscaped/maintained areas, such as golf courses, grazed pastures, playing fields, and lawns. Hawaiian geese have been observed in the vicinity including at Island School (David and Guinther 2010a), Kauaʻi Community College (David and Guinther 2010b), and the Hulēʻia National Wildlife Refuge (USFWS 2015). It is possible that Hawaiian geese may fly through the Study Area when in transit to and from areas with known populations. Hawaiian geese also have the potential to be attracted to the Study Area during or after construction if foraging habitat is created (i.e., mowed lawns).

Listed Seabirds:

Federally and state listed seabird species that occur on Kauaʻi include the endangered Hawaiian petrel or ʻuaʻu (*Pterodroma sandwichensis*), threatened Newell's shearwater or aʻo (*Puffinus newelli*), and the endangered band-rumped storm-petrel or ʻakēʻakē (*Oceanodroma castro*); these species are collectively referred to as listed seabirds. These birds spend most of their life far offshore, but return to land to breed. Nests are typically located in high elevation mountainous areas.

Suitable nesting and foraging habitat for listed seabirds does not occur in the Study Area. However, suitable nesting habitat for listed seabirds exists at upper elevations in many areas of Kauaʻi. Listed seabirds have been observed flying over this area during the nesting season (David and Guinther 2010b).

Therefore, it is possible these seabirds could fly over the Study Area at night between April and December while transiting between nest sites and the ocean.

Listed seabirds may be attracted to construction or operational lights at night. Juvenile birds are particularly vulnerable to light attraction, especially during their post-fledging departure. Disorientation and fallout as a result of light attraction could occur for individuals attracted to nighttime construction lighting and unshielded nighttime facility lighting. Grounded seabirds can become injured or suffer from predation or vehicle strikes (Rodríguez et al. 2017, DOFAW 2020).

4.2.2 Mammals

Non-native cats (*Felis catus*) and dogs (*Canis lupus familiaris*) were detected within the Study Area. Although not observed, other introduced mammals, such as house mouse (*Mus musculus*) and rats (*Rattus* spp.), are likely to occur within the Study Area.

Hawai'i's only native, extant terrestrial mammal—the endangered Hawaiian hoary bat—may transit, roost, or forage in portions of the Study Area. Royal poinciana trees, kukui trees, and milo trees within the Study Area are over 15 feet tall and have the potential to function as bat roost trees, per USFWS and DOFAW. Foraging and roosting habitat for the Hawaiian hoary bat also occurs immediately outside of the Study Area, east of Nani Street.

4.2.3 Invertebrates

Invertebrates incidentally observed during the wildlife surveys include: the Western honey bee (*Apis mellifera*), Oriental flower beetle (*Proteatia orientalis*), and the monarch butterfly (*Danaus plexippus*). These three insect species are non-native to the Hawaiian Islands.

5.0 Conclusions and Recommendations

As described in Section 4, the majority of the plants and animals observed in the Study Area are introduced, non-native species. No federally or state listed wildlife species were observed during the biological surveys. However, several listed wildlife species have the potential to occur in or transit through the Study Area. Recommended measures to avoid and minimize impacts to these federally and state listed species, as well as other native species, are outlined below.

5.1 Plants

The vegetation types and plant species recorded in the Study Area are not considered unique. No federal or state listed plant species were observed. Over 97 percent of the plant species observed are not native to the Hawaiian Islands. Milo, the one native plant species observed, commonly occurs throughout Hawai'i. Regardless, Tetra Tech recommends the following measures to avoid and minimize potential impacts of the Project:

- If landscaping is installed as part of the Project, use non-invasive plants and incorporate native plant species to the maximum extent practicable.
- Although non-native weedy species are common in the Study Area, implement invasive species minimization measures to avoid the unintentional introduction or transport of new invasive species to the area. This includes utilizing on-site gravel, rock, and soil (or purchasing from a local supplier) when practicable; utilizing certified, weed-free seed mixes; and washing construction equipment and/or visually inspecting for excessive dirt, debris, plant materials, and invasive or harmful non-native species as appropriate. Consult with Kaua‘i Invasive Species Committee if needed.
- To minimize spread of the fungal pathogen responsible for Rapid ‘Ōhi‘a Death, follow the most recent Rapid ‘Ōhi‘a Death decontamination protocols recommended by USFWS and DOFAW.

5.2 Wildlife

All the animal species recorded in the Study Area are not native to the Hawaiian Islands. However, as described above, several listed wildlife species have the potential to occur in or transit through the Study Area. Tetra Tech recommends the following general measures to avoid and minimize potential impacts to listed wildlife species:

- Establish a wildlife education and observation program for all construction and operational personnel. Staff should be trained to identify listed wildlife that may be found on-site (including listed waterbirds and seabirds, and the Hawaiian goose) and to take appropriate steps if listed wildlife species are found.
- If downed listed species are observed at the Project, notify USFWS and DOFAW.
- Implement speed limits on site to reduce the risk of collision to listed wildlife.

5.2.1 Listed Waterbirds

The Study Area does not provide suitable nesting or foraging habitat for listed Hawaiian waterbirds because there is no standing water; however, listed waterbirds may fly through the Study Area in transit to and from other areas or forage in the Study Area in the event of temporary flooding. If these species land within the Study Area, they could be impacted by construction and operation activities. Tetra Tech recommends the following avoidance measures adapted from USFWS (2019):

- Avoid creating areas with temporary or permanent standing water to avoid attracting listed waterbirds.
- If listed waterbirds are found in the Study Area during active construction, cease all activities within 100 feet of the bird(s), and do not approach the bird(s). If appropriate nesting habitat is present, a biological monitor that is familiar with the species’ biology should conduct Hawaiian waterbird nest surveys. Repeat nest surveys again within 3 days of project initiation and after

any subsequent delay of work of 3 or more days (during which birds may attempt nesting). If a nest of a listed waterbird is not discovered, work may continue after the listed waterbird leaves the area of its own accord.

- If a nest of a listed waterbird is discovered, contact USFWS and DOFAW within 24 hours, and establish a 100-foot buffer around all active nests and/or broods until the chicks/ducklings have fledged. Do not conduct potentially disruptive activities or habitat alteration within this buffer.

5.2.2 Hawaiian Goose

It is possible that Hawaiian geese may fly through the Study Area when in transit to and from areas with known populations. Should this species occur within the Study Area, it could be impacted by construction and operation activities. Tetra Tech recommends the following avoidance measures adapted from USFWS (USFWS 2019):

- If Hawaiian geese are observed in the Study Area during active construction, all activities within 100 feet of the bird should cease. Do not feed, approach, or disturb the bird(s). Work may continue after the bird leaves the area of its own accord.
- If Hawaiian geese are observed loafing or foraging within the Study Area during the breeding season (September through April), halt work and have a biologist familiar with nesting behavior survey for nests in the area prior to the resumption of work. If a nest is discovered, contact USFWS and DOFAW and cease all work within 150 feet. If a nest is not discovered, work may continue after the bird leaves the area of its own accord.
- In areas where Hawaiian geese are known to be present, post and implement reduced speed limits.

5.2.3 Listed Seabirds

The Study Area does not provide suitable nesting or foraging habitat for the listed Hawaiian seabirds. However, listed seabirds may fly over the Study Area in transit between the ocean and upland breeding sites during the breeding, nesting, and fledging seasons (March 1–December 15) and may be attracted to nighttime lighting. Tetra Tech recommends the following measures to avoid and minimize potential impacts to listed seabirds:

- Avoid nighttime construction during the seabird fledgling period (September 15–December 15).
- If nighttime construction is required outside the seabird fledging period, construction lighting should be shielded and directed downward and fit with non-white lights to minimize the attractiveness of construction lights to seabirds.
- Operational on-site lighting should be fully shielded and directed downward to prevent upward radiation, triggered by a motion detector and/or timer controls when human activity is not occurring, and fitted with non-white light bulbs to the extent possible. Other possible lighting recommendations may include: placing lights under eaves; shifting lighting according to moon

phase; decreasing visibility of interior lights; planting vegetation around lights to reduce light visibility; and using longer light wavelengths (DOFAW 2020).

- Minimize construction of overhead lines to reduce collision risk.
- For powerlines, guywires, and other cables, minimize exposure above vegetation height and vertical profile.
- If a grounded seabird is found, contact the Save Our Shearwaters (SOS) program at (808) 635-5117.

5.2.4 Hawaiian Hoary Bat

The USFWS (2019) provides the following avoidance and minimization measures for the Hawaiian hoary bat:

- Avoid trimming or removing woody vegetation (trees or shrubs) taller than 15 feet between June 1 and September 15, when juvenile bats are not yet capable of flying and may be roosting in the trees, resulting in the potential to be impacted.
- To prevent entanglement, do not use barbed wire for fencing.

Tetra Tech recommends that if some trimming or removal of woody vegetation taller than 15 feet (4.5 m) is necessary between June 1 and September 15, consult with USFWS and DOFAW to ensure impacts to the Hawaiian hoary bat are avoided.

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APPENDIX A

REPRESENTATIVE PHOTOGRAPHS OF THE PUHI HOUSING STUDY AREA

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Photo 1. Recently mowed lawn with ornamental trees and shrubs looking west across the Study Area. Location: 21.967705, -159.392772.

Photo 2. Looking east across the Study Area with Kaumualii Highway to the north (left) and Welau Street to the south (right). Location: 21.967087, -159.394781.

Photo 3. Looking northeast across the Study Area showing exercise/play equipment and planted milo trees. Location: 21.967136, -159.394040.

Photo 4. Looking east down Welau Street showing royal poinciana tree and croton planted inside the fenced park. Location: 21.967139, -159.393735.

APPENDIX B

LIST OF PLANT SPECIES OBSERVED DURING SURVEYS OF THE PUHI HOUSING STUDY AREA

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Table B-1 provides a list of plant species observed in the Study Area by Tetra Tech on April 27, 2021. The plant names are arranged alphabetically by family and then by species into two groups: Monocots and Dicots. The taxonomy and nomenclature of the flowering plants are in accordance with Wagner et al. (1999, 2012), Wagner and Herbst (2003), and Imada (2012, 2019) for native and naturalized flowering plants, and Staples and Herbst (2005) for ornamental plants. If no common or Hawaiian name is known, only the scientific name is provided.

Status:

- I = indigenous = native to the Hawaiian Islands and elsewhere
- P = Polynesian = introduced by Polynesians
- X = introduced/ non-native = all those plants brought to the Hawaiian Islands by humans, intentionally or accidentally, after Western contact (Cook's arrival in the islands in 1778)

Table B-1. List of Plant Species Observed During Surveys for the Puhi Housing Project

Scientific Name and Authorship	Hawaiian/Common Name(s)	Status
MONOCOTS		
Agavaceae		
Cordyline fruticosa (L.) A.Chev.	ki, ti	P
Cyperaceae		
Cyperus mindorensis (Steud.) Huygh	white kyllinga	X
Cyperus rotundus L.	nut grass	X
Poaceae		
Bothriochloa sp.	--	X
Cynodon dactylon (L.) Pers.	Bermuda grass	X
Paspalum fimbriatum Kunth	fimbriate paspalum	X
Stenotaphrum secundatum (Walter) Kuntze	St. Augustine grass	X
Zoysia sp.	zoysia grass	X
DICOTS		
Amaranthaceae		
Amaranthus sp.	amaranth	X
Apiaceae		
Ciclospermum leptophyllum (Pers.) Sprague ex Britton & P.Wilson	fir-leaved celery	X
Asteraceae		
Ageratum conyzoides L.	ageratum, maile hohono	X
Galinsoga sp.	--	X
Emilia sonchifolia (L.) DC.	Flora's paintbrush	X
Parthenium hysterophorus L.	false ragweed	X
Sonchus oleraceus L.	sow thistle	X

Scientific Name and Authorship	Hawaiian/Common Name(s)	Status
Sphagneticola trilobata (L.) Pruski	wedelia	X
Synedrella nodiflora (L.) Gaertn.	nodeweed	X
Brassicaceae		
Lepidium virginicum L.	Virginia pepperwort	X
Convolvulaceae		
Ipomoea obscura (L.) Ker-Gawl.	obscure morning glory	X
Euphorbiaceae		
Aleurites moluccana (L.) Willd	kukui	P
Codiaeum variegatum (L.) Blume	croton	X
Euphorbia hirta L.	hairy spurge	X
Euphorbia hypericifolia L.	graceful spurge	X
Euphorbia prostrata Aiton	prostrate spurge	X
Fabaceae		
Chamaecrista nictitans (L.) Moench	partridge pea	X
Delonix regia (Bojer ex Hook.) Raf.	royal poinciana	X
Indigofera spicata Forssk.	creeping indigo	X
Malvaceae		
Thespesia populnea (L.) Sol. ex Corrêa	milo	I
Oxalidaceae		
Oxalis corniculata L.	wood sorrel	X
Plantaginaceae		
Plantago lanceolata L.	narrow-leaved plantain	X
Phyllanthaceae		
Phyllanthus debilis Klein ex Willd.	niruri	X
Primulaceae		
Lysimachia arvensis (L.) U.Manns & Anderb.	scarlet pimpernel	X
Rubiaceae		
Spermacoce remota Lam.	buttonweed	X
Verbenaceae		
Stachytarpheta sp.	--	X

Appendix B:
Environmental Noise Assessment Report

D. L. ADAMS ASSOCIATES
acoustics | performing arts | technology

970 N. Kalaheo Ave.
Suite A311
Kailua, HI 96734
www.dlaa.com
808.254.3318

October 19, 2021

Kaimana Environmental Solutions LLC
PO Box 11890
Honolulu, HI 96828

Attention: Max R. Solmssen

RE: Puhi Affordable Housing Environmental Noise Assessment and HUD Study (DLAA #20-030)

Dear Mr. Solmssen,

DLAA conducted noise measurements to assess the existing exterior noise environment at the location of the Puhi Affordable Housing development project in Puhi, Kauai, HI. The following report includes the project's exterior noise criteria, a summary of the results of the noise measurements and analysis, and sound isolation calculations for the exterior glazing to verify compliance with the interior noise design criteria. Analysis and assumptions are based on meeting the Department of Housing and Urban Development's requirements for exterior sound transmission to residential units.

Please note DLAA's recommendations are based on meeting acoustical objectives only and should be reviewed for code compliance and non-acoustical design objectives by qualified personnel prior to implementation.

HUD STUDY

Design Criteria

The noise assessment evaluates the site based on the Site Acceptability Standards of the U.S. Department of House and Urban Development (HUD). The Site Acceptability Standards are given in the Code of Federal Regulations 24 CFR Part 51B. The standards regulate the acceptability of sites for residential buildings with HUD funding. The noise levels are expressed in terms of the Day-Night Average Sound Level (DNL). The DNL is the average sound level over a 24-hour period to which a 10-decibel penalty has been applied to sound levels occurring during the nighttime hours (10:00 PM to 7:00 AM). DNL level in decibels are A-weighted. The HUD Site Acceptability Standards for exterior sound levels are summarized in **Table 1** below.

Table 1. HUD Site Acceptability Standards

Category	DNL	Comments
Acceptable	Less than or equal to 65 dBA	No special acoustical design consideration necessary
Normally Unacceptable	Greater than 65 dBA, but less than or equal to 70 dBA	5 dB additional attenuation required through the use of barriers or in design to ensure interior noise levels are acceptable
	Greater than 70 dBA, but less or equal to 75 dBA	10 dB additional attenuation required through the use of barriers or in design to ensure interior noise levels are acceptable
Unacceptable	Greater than 75 dBA	Attenuation measures must be submitted and approved on a case-by-case basis

The intent of the 65 DNL outside criteria is to achieve DNL 45 dBA indoors. HUD typically allows upgrades to the building shell to meet an interior DNL of 45 dBA in Normally Unacceptable or Unacceptable areas. This can be accomplished by specifying building facades, windows, and doors with higher sound transmission class (STC) ratings than normal construction. Addressing windows is particularly important, as they are often the weak link in the building facade with respect to noise intrusion.

HUD Measurements and Calculations

Traffic data was used to forecast increases in ambient noise levels due to the project's impact on Kaumualii Highway and Nani St. This data was obtained from the "Draft Traffic Impact Analysis Report (TIAR) Kahua Hooulu Affordable Housing" prepared by Community Planning and Engineering, Inc. Peak AM and PM hour traffic counts were provided in the TIAR for current (2021) conditions. This report included estimated traffic increases due to the new housing project. TIAR traffic volume counts were compared with Average Daily Trip (ADT) counts reported by HDOT "Highways Program Status" website.

The project site is exposed to non-traffic noise sources, specifically commercial activity on neighboring properties. Consequently, on-site noise measurements were conducted in lieu of traffic noise calculations to establish the ambient noise levels on site. DLAA measured noise levels at two (2) different locations at the project parcel near Kaumualii Highway, Nani Street, and Welau Road. Sound level meters were secured on site to collect noise levels for 96 consecutive hours, from June 24th to June 27th, 2021. Traffic noise from Kaumualii Highway was the primary noise source, as well as noise from the gas station and carwash to the west of the project site. Traffic noise was significantly lower from Welau Road and Nani Street. Weather reports show no rainfall or high wind speeds during the measurement period.

DNLs were calculated from 4-day averages at each location. Results from these measurements were used to estimate DNLs at six (6) different noise assessment locations (NALs) on the project site. NALs were chosen based on site plans provided to DLAA on 4/12/2021. These consist of representative "worst-case" units on the second floor of each building with direct line-of-sight to major roadways adjacent to the project site. Site plan markups in **Figure 1** illustrate the two long-term measurement locations as well as the six NALs selected for the HUD study. **Table 2** below summarizes the calculated DNLs at each NAL.

Table 2: Calculated DNL at Each NAL

NAL	Measured Existing DNL (2021)	DNL with Project (2026)	DNL with Project, 10-Years (2036)
NAL #1	70 L_{DN}	70 L_{DN}	70 L_{DN}
NAL #2	62 L_{DN}	62 L_{DN}	62 L_{DN}
NAL #3	63 L_{DN}	63 L_{DN}	64 L_{DN}
NAL #4	63 L_{DN}	63 L_{DN}	63 L_{DN}
NAL #5	73 L_{DN}	73 L_{DN}	74 L_{DN}
NAL #6	58 L_{DN}	58 L_{DN}	58 L_{DN}

Based on the worst-case results of 70 L_{DN} for NAL#1 and 74 L_{DN} for NAL#5, the site is considered "Normally Unacceptable". Further calculations are required to examine interior noise levels due to the exterior wall assemblies at these locations.

Exterior Shell Review

DLAA has reviewed the necessary composite STC (STC_C) rating for the building shell to achieve the HUD required interior 45 L_{DN} criteria. The STC_C rating differs slightly from a normal STC rating it examines an area composed of multiple façade elements (i.e. windows, exterior walls, or doors) and calculates a weighted average of the assemblies' STC ratings. The STC_C rating of the exterior assemblies were assessed at second floor units representing different window and wall combinations for each NAL of the complex exposed to DNL greater than 65 L_{DN}. Only NAL #1 and #5 were assessed for STC_C ratings, corresponding to Buildings 1 and 5. Units represented by NAL #2, 3, 4, and 6, corresponding to Buildings 2, 3, 4 and 5, are not predicted to have exposure greater than 65 L_{DN}, therefore STC_C analysis is not necessary for these units. **Figure 2** shows elevations of the exterior partitions considered in the analysis of NALs #1 and #5. STC_C rating HUD worksheets are provided in **Attachment 1**.

The modeled exterior partition assembly is assumed to be constructed as follows. The assumed partition assembly has been approved by the Kauai County reviewer.

- 1 layer of 5/8" Type X Gypsum board
- 6" metal studs @ 16" O.C. with R-13 fiberglass insulation
- 1 layer of 5/8" exterior sheathing board
- 1 layer of painted EIFS or metal panel exterior system

All STC_C calculations assume minimum STC 30-rated windows, which is typical for windows with a 1" insulating glazing assembly comprised of 1/4" Lite - 1/2" air space – 1/4" Lite. Exterior doors are assumed to be 3'x7' typical wood doors with wood frames, or comparable standard construction hollow metal door. DLAA assumes there are no through-wall secondary means of ventilation i.e., PTACs or thru-wall AC. The only façade elements are windows, doors, and exterior wall.

This partition is used as a worst-case scenario. DLAA recommends implementing an assembly with equal or greater sound isolation performance. Refer to **Attachment 2** for sound isolation performance predictions for each element. **Table 3** below summarizes the calculated STC_C ratings at each location.

Table 3: Calculated Composite STC For "Normally Unacceptable" NALs

NAL	Worst-Case DNL (L_{DN})	Required STC_C	Calculated STC_C	Further Action Required?
NAL #1	70	28	29.47	No
NAL #5	74	32	37.35	No

Based on the assumed exterior wall assemblies and minimum STC 30-rated windows, each NAL achieves the HUD maximum interior noise level of 45 dBA and is considered "Acceptable". We recommend selecting window assemblies with minimum STC 30 ratings and selecting exterior wall and door construction acoustically equivalent or superior to those assumed herein. If windows with higher STC ratings are selected, expect interior noise levels to decrease.

This concludes or comments at this time. Please let us know if you have any questions.

Sincerely,

Zane Wright
Staff Consultant

Encl.:
Figure 1: Noise Assessment Locations (NALs)
Figure 2: NAL Building Elevations for STCc Calculations
Attachment 1: STC_C Results Compiled – NAL #1 & #5
Attachment 2: Partition Elements Sound Isolation

FIGURE 1: NOISE ASSESSMENT LOCATIONS (NALs)

KUHIO HIGHWAY
Kaumualii Highway

Measurement Location - L1

NAL #1

NAL #2

NAL #3

NAL #4

NAL #5

NAL #6

Measurement Location - L2

Welau Road

Nani Street

BUS STOP

TRASH BINS, TYP.

5" SIDEWALK TYP.

10' SETBACK

NOISE BARRIER FENCE/WALL ON THE HIGHWAY EDGE PROPERTY LINE AND ON RIGHT SIDE PROPERTY LINE, TYP.

BUILDING 1 32'X90' TYP.

BUILDING 2 32'X90' TYP.

BUILDING 3 32'X90' TYP.

BUILDING 4 32'X90' TYP.

BUILDING 5 32'X90' TYP.

SW

LOADING GUEST / ADA

STORM WATER RETENTION AREA, TYP.SYM.

TOT LOT

EXISTING TREE TO REMAIN, TYP.SYM.

EXISTING TREE TO RELOCATED FROM BUILDING 3 AREA, TYP.SYM.

45 ' OPENING

EXISTING DRAIN BOX

25 ' OPENING

AFFORDABLE BUILDING UNIT SUMMARY

(5) Buildings (32'x 90' footprint) @ 12 Units each

(10) Studio Units @ 515 sf each
(30) 1-Bedroom Units varies @ 556 sf - 686 sf each
(20) 2-Bedroom Units @ 770 sf each

Total # of Units: 60

PARKING SUMMARY TABLE

Resident parking*	***60 stalls***
Guest parking	***18 stalls***
TOTAL:	***78 stalls***

**** Resident parking includes 1 stall per unit and 1 ADA stall per building***
**** Additional stalls could be converted to ADA as needed***

Concept Site Plan 11/20/2020

KAHUA HO`OULU

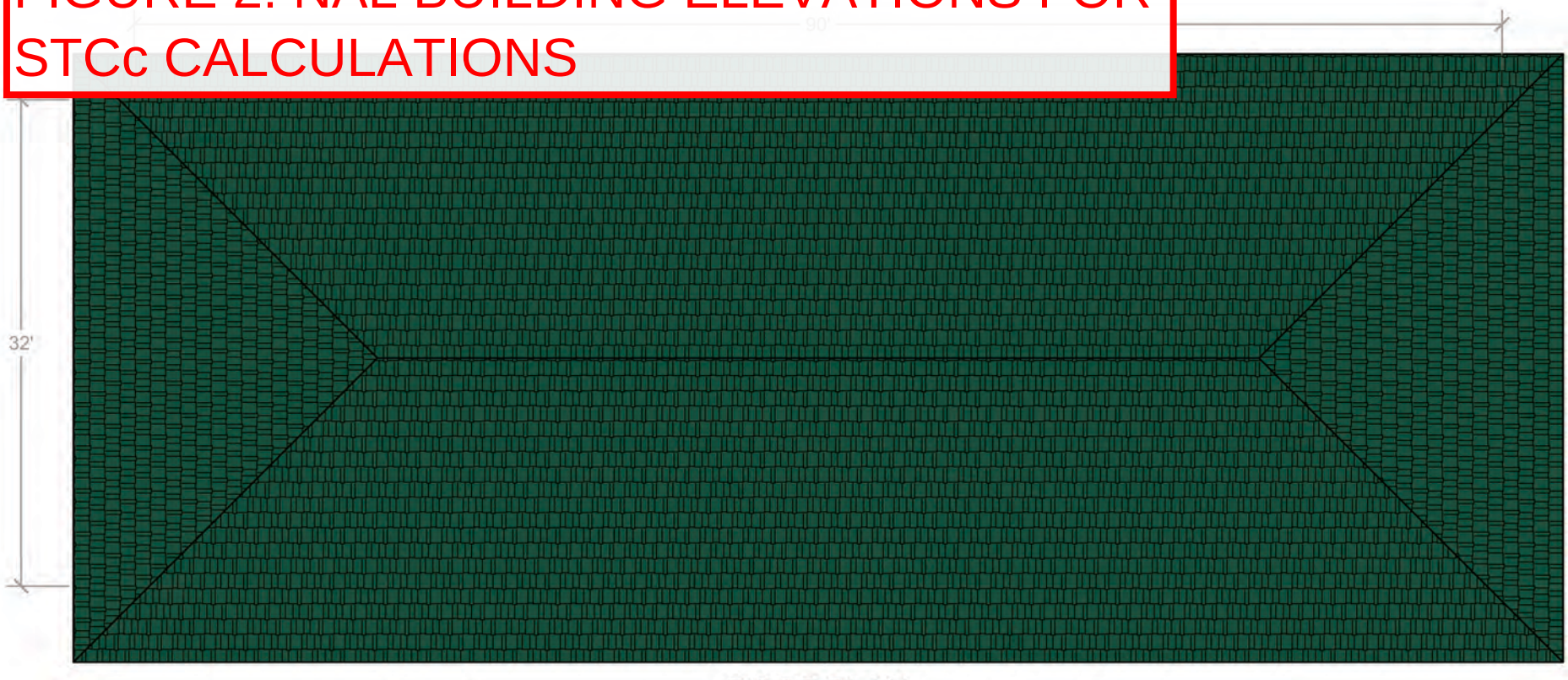
Island of Kauai

North

Linear Scale 0 15 30

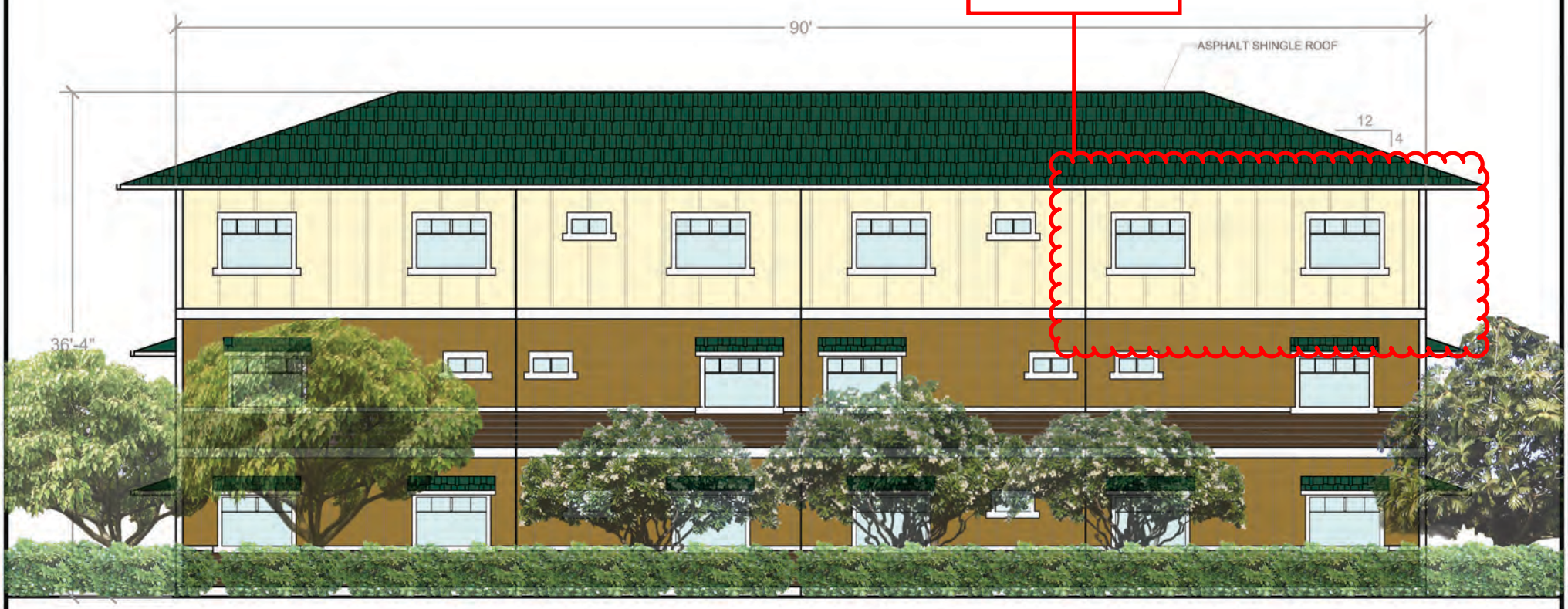
PBR HAWAII & ASSOCIATES, INC.

FIGURE 2: NAL BUILDING ELEVATIONS FOR STCc CALCULATIONS



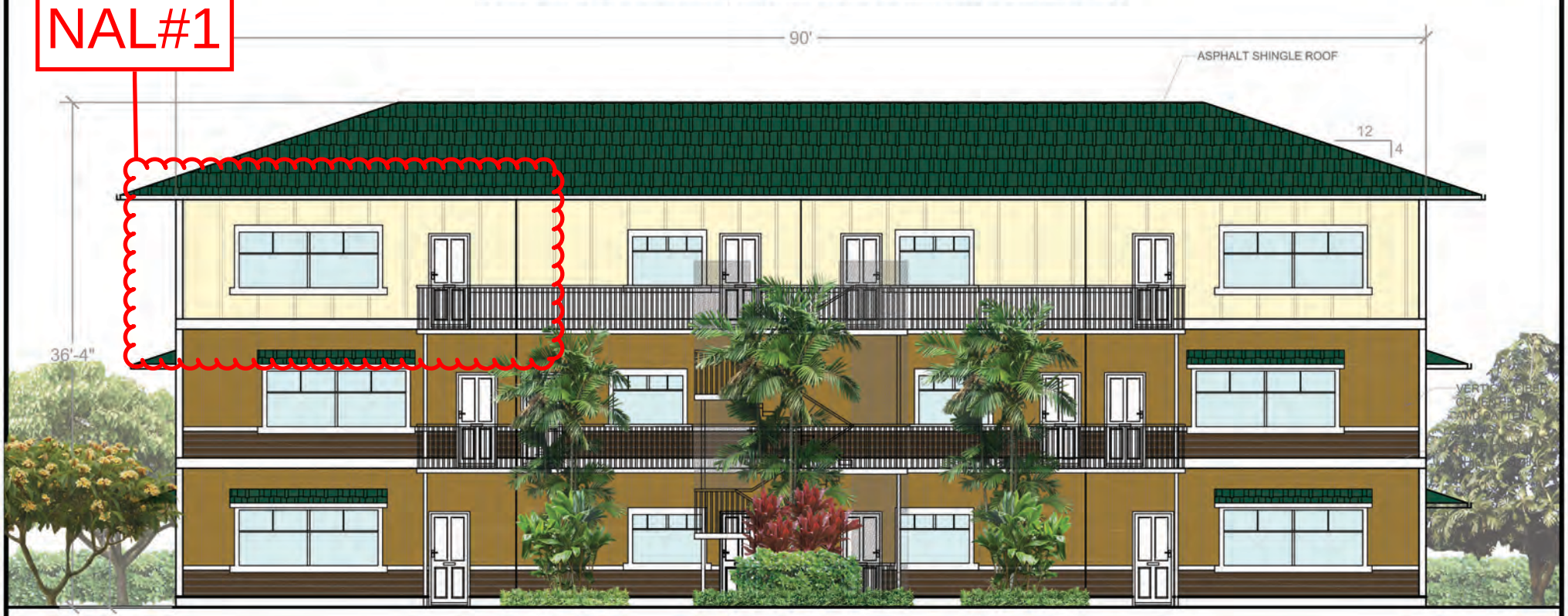
ROOF PLAN

NAL #5



SOUTH ELEVATION (FACING WELAU STREET)

NAL#1



NORTH ELEVATION (FACING KAUA'I COMMUNITY COLLEGE)

PBR HAWAII & ASSOCIATES, INC.
1001 BISHOP ST.
ASB TOWER, SUITE 650
HONOLULU, HI 96813

Date:	Project No.	File:
11/20/2020		

Revisions

No./Date	Description

Project Title: COUNTY OF KAUA'I AFFORDABLE HOUSING PROJECT

Dwg. Title: CONCEPTUAL BUILDING ELEVATIONS WITH PLANTING

SK#

SC: 3/32" = 1'-0"

Dwg. Ref. No.

ATTACHMENT 1
STCc Results Compiled – NAL #1 & #5

Sound Transmission Classification Assessment Tool (STraCAT)

Overview

The Sound Transmission Classification Assessment Tool (STraCAT) is an electronic version of Figures 17 and 19 in The HUD Noise Guidebook. The purpose of this tool is to document sound attenuation performance of wall systems. Based on wall, window, and door Sound Transmission Classification (STC) values, the STraCAT generates a composite STC value for the wall assembly as a whole. Users can enter the calculated noise level related to a specific Noise Assessment Location in front of a building façade and STraCAT will generate a target required attenuation value for the wall assembly in STC. Based on wall materials, the tool will state whether the composite wall assembly STC meets the required attenuation value.

How to Use This Tool

Location, Noise Level and Wall Configuration to Be Analyzed
STraCAT is designed to calculate the attenuation provided by the wall assembly for one wall of one unit. If unit exterior square footage and window/door configuration is identical around the structure, a single STraCAT may be sufficient. If units vary, at least one STraCAT should be completed for each different exterior unit wall configuration to document that all will achieve the required attenuation. Additionally, if attenuation is not based on a single worst-case NAL, but there are multiple NALs which require different levels of attenuation around the structure, a STraCAT should be completed for each differing exterior wall configuration associated with each NAL.

Exterior wall configurations associated with an NAL include those with parallel (facing) or near-parallel exposure as well as those with perpendicular exposure. When a façade has parallel or perpendicular exposure to two or more NALs, you should base the required attenuation on the NAL with the highest calculated noise level. For corner units where the unit interior receives exterior noise through two facades, the STraCAT calculation should incorporate the area of wall, window and door materials pertaining to the corner unit's total exterior wall area (i.e., from both walls).

Information to Be Entered
Users first enter basic project information and the NAL noise level that will be used as the basis for required attenuation. This noise level must be entered in whole numbers. STraCAT users then enter information on wall, window and door component type and area. Again, as noted above, the wall, window and door entries are based on one unit, and one wall (except for corner units as discussed above). The tool sums total wall square footage based on the combined area of walls, doors and windows for the façade being evaluated.

Users may input STC values for materials in one of two ways. The tool includes a dropdown menu of common construction materials with STC values prefilled. If selected construction materials are not included in this dropdown menu, the user may also enter the STC for a given component manually. Verification of the component STC must be included in the ERR. Documentation includes the architect or construction manager's project plans showing wall material specifications. For new construction or for components that will be newly installed in an existing wall, documentation also includes the manufacturer's product specification sheet (cut sheet) documenting the STC rating of selected doors and windows.

Required STC Rating and Determination of Compliance
Finally, based on project information entered the tool will indicate the required STC rating for the wall assembly being evaluated and whether or not the materials specified will produce a combined rating that meets this requirement. Note that for noise levels above 75 dB DNL, either HUD (for 24 CFR Part 50 reviews) or the Responsible Entity (for 24 CFR Part 58 reviews) must approve the level and type of attenuation, among other processing requirements. Required attenuation values generated by STraCAT for NALs above 75 dB DNL should therefore be considered tentative pending approval by HUD or the RE.

Part I - Description

Part I - Description

Project

Puhi Housing - NAL#1

Sponsor/Developer

PBR Hawaii and Associates

Location

Puhi, Kauai, HI

Prepared by

DLAA

Noise Level

70

Date

10/15/2021

Primary Source(s)

Kaumualii Hwy

Part II - Wall Components

Wall Construction Detail	Area	STC
EXTERIOR WALL - 5/8" Type X Gypsum, 6" Steel studs (25ga) @ 16" O.C. w/ berglass insulation, 5"/8" exterior sheathing board, EIFS	223	40
	223 Sq. Feet	**40**

Add new wall

Window Construction Detail	Quantity	Sq Ft/Unit	STC
WINDOW - 1" overall - 1/4" glass, 1/2" airspace, 1/4" glass	1	41	32

Add new window

Door Construction Detail	Quantity	Sq Ft/Unit	STC
3'x7' hollow-core wood door 1 3/4" thick	1	**21**	**20**

Add new door

Part III - Results

Part III - Results

Wall Statistics

Stat	Value
Area:	223 ft²
Wall STC:	40

Aperture Statistics

Aperture	Count	Area	% of wall
Windows:	1	**41 ft²**	**18.39%**
Doors:	1	**21 ft²**	**9.42%**

Evaluation Criteria

Criteria	Value
Noise source sound level (dB):	**70**
Combined STC for wall assembly:	**29.47**
Required STC rating:	**28**
Does wall assembly meet requirements?	**Yes**

Print

Part 4 - Tips

What do you do if the preferred wall design is not sufficient to achieve the required attenuation? Another wall design with more substantial materials will work, but may not be the most cost-effective solution. Try adding some other elements for just a little more attenuation.

For example:

- Staggering the studs in a wall offers approximately 4dB of additional protection.
- Increasing the stud spacing from 16” on center to 24” can increase the STC from 2-5dB.
- Adding a 2” air space can provide 3dB more attenuation.
- Increasing a wall’s air space from 3” to 6”can reduce noise levels by an additional 5dB.
- Adding a layer of ½” gypsum board on “Z” furring channels adds 2dB of attenuation.
- Using resilient channels and clips between wall panels and studs can improve the STC from 2-5dB.
- Adding a layer of ½” gypsum board on resilient channels adds 5dB of attenuation.
- Adding acoustical or isolation blankets to a wall’s airspace can add 4-10dB of attenuation.
- A 1” rockwool acoustical blanket adds 3dB to the wall’s STC.
- Filling the cells of lightweight concrete masonry units with expanded mineral loose-fill insulation adds 2dB to the STC.

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Users may input STC values for materials in one of two ways. The tool includes a dropdown menu of common construction materials with STC values prefilled. If selected construction materials are not included in this dropdown menu, the user may also enter the STC for a given component manually. Verification of the component STC must be included in the ERR. Documentation includes the architect or construction manager's project plans showing wall material specifications. For new construction or for components that will be newly installed in an existing wall, documentation also includes the manufacturer's product specification sheet (cut sheet) documenting the STC rating of selected doors and windows.

Required STC Rating and Determination of Compliance
Finally, based on project information entered the tool will indicate the required STC rating for the wall assembly being evaluated and whether or not the materials specified will produce a combined rating that meets this requirement. Note that for noise levels above 75 dB DNL, either HUD (for 24 CFR Part 50 reviews) or the Responsible Entity (for 24 CFR Part 58 reviews) must approve the level and type of attenuation, among other processing requirements. Required attenuation values generated by STraCAT for NALs above 75 dB DNL should therefore be considered tentative pending approval by HUD or the RE.

Part I - Description

Part I - Description

Project

Puhi Housing - NAL#5

Sponsor/Developer

PBR Hawaii and Associates

Location

Puhi, Kauai, HI

Prepared by

DLAA

Noise Level

74

Date

10/15/2021

Primary Source(s)

Kaumualii Hwy

Part II - Wall Components

Wall Construction Detail	Area	STC
EXTERIOR WALL - 5/8" Type X Gypsum, 6" Steel studs (25ga) @ 16" O.C. w/ berglass insulation, 5"/8" exterior sheathing board, EIFS	227	40

Add new wall

	227 Sq. Feet	40

Window Construction Detail	Quantity	Sq Ft/Unit	STC
WINDOW - 1" overall - 1/4" glass, 1/2" airspace, 1/4" glass	2	18	32

Add new window

Door Construction Detail	Quantity	Sq Ft/Unit	STC

Add new door

Part III - Results

Part III - Results

Wall Statistics

Stat	Value
Area:	227 ft²
Wall STC:	40

Aperture Statistics

Aperture	Count	Area	% of wall
Windows:	2	**36 ft²**	**15.86%**
Doors:	0	**0 ft²**	**0%**

Evaluation Criteria

Criteria	Value
Noise source sound level (dB):	**74**
Combined STC for wall assembly:	**37.35**
Required STC rating:	**32**
Does wall assembly meet requirements?	**Yes**

Print

Part 4 - Tips

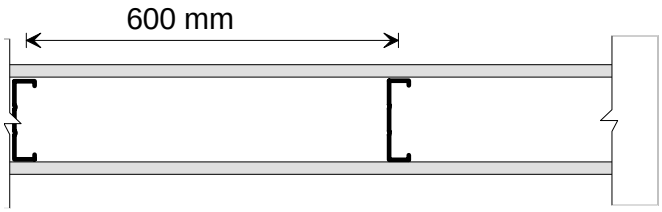
What do you do if the preferred wall design is not sufficient to achieve the required attenuation? Another wall design with more substantial materials will work, but may not be the most cost-effective solution. Try adding some other elements for just a little more attenuation.

For example:

- Staggering the studs in a wall offers approximately 4dB of additional protection.
- Increasing the stud spacing from 16” on center to 24” can increase the STC from 2-5dB.
- Adding a 2” air space can provide 3dB more attenuation.
- Increasing a wall’s air space from 3” to 6”can reduce noise levels by an additional 5dB.
- Adding a layer of ½” gypsum board on “Z” furring channels adds 2dB of attenuation.
- Using resilient channels and clips between wall panels and studs can improve the STC from 2-5dB.
- Adding a layer of ½” gypsum board on resilient channels adds 5dB of attenuation.
- Adding acoustical or isolation blankets to a wall’s airspace can add 4-10dB of attenuation.
- A 1” rockwool acoustical blanket adds 3dB to the wall’s STC.
- Filling the cells of lightweight concrete masonry units with expanded mineral loose-fill insulation adds 2dB to the STC.

ATTACHMENT 2
Partition Elements Sound Isolation

Table SS-7: 31x152 mm, 25 gauge (0.50 mm) non-loadbearing steel studs at 600 mm o.c. with one layer gypsum board each side



one layer of gypsum board
31x152 mm, 25 gauge (0.50 mm) non-loadbearing steel studs at 600 mm o.c., with absorptive material (as noted) in stud cavity
one layer of gypsum board

Gypsum Board		Absorptive Material	Test Number	STC	R_w
15.9 mm Type X (C)	glass fibre (G1)	150 mm batt	TL-93-298	51	51
12.7 mm Type X (A)	glass fibre (G1)	150 mm batt	TL-93-299	52	52

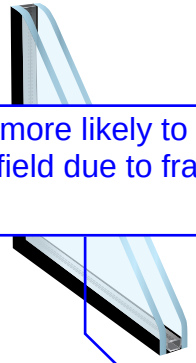
With worst-case scenario of 16-gauge studs, DLAA predicts field sound isolation performance of exterior partition to be approximately STC 40.

Window - Sound Isolation

VIRACON®

ACOUSTIC PERFORMANCE DATA TABLES

INSULATING ACOUSTICAL DATA



Window is more likely to provide STC 32 in field due to framing loss.

Viracon Acoustical Glass is made from combinations of various glass types along with acoustical window frames to help you effectively reduce sound transmission from airplanes, trains, vehicles and other unwanted noises. The performance data below applies to an insulating unit constructed with two plies of glass and an air or argon filled space. Data is based on testing ~36" x 84" glass to ASTM E413-87 in an acoustical wall. *OITC is estimated based on this test. Glass size and glazing system will affect STC rating.

The **STC (Sound Transmission Class)** rating is a single-number rating system for interior building partitions and viewing windows used to categorize acoustic performance. Its original intent was to quantify interior building partitions not exterior wall components. As a result it is not recommended for glass selection of exterior wall applications since the single-number rating was achieved under a specific set of laboratory conditions.

The **OITC (Outside-Inside Transmission Class)** rating is used to classify acoustic performance of glazing in exterior applications.

Insulating Glass Construction	STC	OITC*	Frequency (Hz)																	
			100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000
			Sound Transmission Loss (dB)																	
1/2" overall - 1/8" glass, 1/4" airspace, 1/8" glass	**28**	**26**	26	21	23	23	26	21	19	24	27	30	33	36	40	44	46	39	34	45
5/8" overall - 1/8" glass, 3/8" airspace, 1/8" glass	**31**	**26**	26	23	23	20	23	19	23	27	29	32	35	39	44	47	48	41	36	43
1" overall - 1/4" glass, 1/2" airspace, 1/4" glass	**35**	**30**	27	24	29	22	22	25	30	33	35	38	40	42	42	37	37	43	46	49
1" overall - 1/4" glass, 1/2" **argon** space, 1/4" glass	**35**	**29**	32	29	28	22	20	25	30	33	37	40	43	45	44	39	40	45	49	52
1" overall - 1/4" glass, 9/16" airspace, 3/16" glass	**37**	**30**	32	26	25	20	24	29	33	34	38	41	43	46	46	42	36	43	48	53
1-1/8" overall - 5/16" glass, 1/2" airspace, 5/16" glass	**37**	**32**	26	24	25	31	24	32	32	35	37	39	39	38	36	38	42	44	46	49
1-1/4" overall - 3/8" glass, 1/2" airspace, 3/8" glass	**37**	**32**	29	23	23	29	31	34	34	35	36	36	35	35	36	40	43	47	49	48
1-1/2" overall - 1/4" glass, 1" airspace, 1/4" glass	**37**	**30**	22	19	27	23	31	30	35	35	36	39	41	42	41	36	37	46	51	56
1-1/16" overall - 1/4" glass, 1/2" airspace, 5/16" glass	**38**	**33**	30	24	29	26	29	33	34	36	39	41	41	40	38	37	39	43	46	48
1-1/4" overall - 1/4" glass, 3/4" airspace, 1/4" glass	**38**	**31**	27	23	28	21	27	29	34	35	37	41	43	45	44	39	39	46	49	52
1-1/8" overall - 1/4" glass, 1/2" airspace, 3/8" glass	**39**	**34**	28	26	32	29	29	31	35	37	38	39	41	43	41	40	41	44	47	49
1-3/16" overall - 5/16" glass, 1/2" airspace, 3/8" glass	**39**	**34**	29	26	26	31	30	37	36	37	39	39	40	37	35	39	43	46	48	49
1-3/8" overall - 1/4" glass, 3/4" airspace, 3/8" glass	**40**	**33**	30	23	31	28	33	37	39	40	41	39	38	38	39	39	40	47	51	53

Appendix C: Archaeological Report

Archaeological Literature Review and Field Inspection for the Puhi Development Project, Haʻikū and Niumalu Ahupuaʻa, Puna District, Kauaʻi Island, TMK: [4] 3-3-004:020

Prepared for

County of Kauaʻi

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HONUA CONSULTING

Honolulu, Hawaiʻi

September 2021

Management Summary

At the request of the County of Kauaʻi, this archaeological literature review and field inspection was completed by Honua Consulting, LLC for the Puhi Development Project located within Haʻikū and Niumalu Ahupuaʻa in the Puna District of Kauaʻi Island, TMK: [4] 3-3-004:020. The project area is situated in the southeastern portion of Kauaʻi along Kaʻumualiʻi Highway in the town of Puhi, just west of Līhuʻe, and measures approximately 2.911 acres (126,801 square feet [sq. ft.] or 11,780 square meters [sq. m.]). The project area currently functions as a community park owned and maintained by the County of Kauaʻi.

The project proposes to build a new affordable housing and educational health center. The proposed project will construct five 2-story buildings consisting of 60 units total, and an associated parking area. Ground disturbance will require mass grading, excavation for building footings and foundations, installation of associated utilities, and landscaping. Depths of ground disturbance can be expected to reach up to 12 ft. (3.6 m.) in depth.

Traditionally, the area surrounding Nāwiliwili Bay and the Hulēʻia River would have had a substantial traditional Hawaiian population based on the proximity of ʻAlekoko (Menehune) Fishpond, a large fishpond along the Hulēʻia River, and numerous heiau (traditional place of worship) formerly present in commanding locations around the bay. The project area is located in the uplands of Haʻikū and Niumalu on the flat, lightly sloping lands beneath the southeastern flank of Kilohana Crater. Little is known of traditional land use in the surrounding area due to modifications to the land and waterways for commercial sugarcane cultivation as early as the mid-19th century.

The ahupuaʻa of Haʻikū and Niumalu, both of which include the project area, were awarded as Land Commission Award (LCA) 7713 ʻāpana 2, Royal Patent (RP) 4479 , to Victoria Kamāmalu during the Māhele. The only exception was several kuleana (commoner) lands awarded as various LCA's along Puali Stream and on the Niumalu Flats in Niumalu Ahupuaʻa and along the Hulēʻia River in Haʻikū Ahupuaʻa. Eventually the land was purchased and consolidated under the Grove Farm sugar plantation in the latter half of the 1800s. Historic maps and aerial photographs show that the project area was under sugarcane cultivation beginning in the late 1800's with continued use through the 1960's. A residential neighborhood was constructed just south of the project area in the late 1960's and the project area was designated a community park in its current configuration in the early 1970's. The only changes to the project area since that time have been the installation of an emergency warning siren along the western boundary and the installation of electrical utility boxes on the eastern-most side of the project area along Nani Street.

No previous archaeological studies have been conducted and no sites are known to be present within the project area. Numerous archaeological studies have been conducted in the vicinity, including surveys for the Kauaʻi Community College, the Philippine Cultural Center, the Island School, highway improvements, and several former and current Grove Farm properties in support of commercial and residential developments. These studies documented plantation-era sites associated with the Grove Farm and Lihue Plantations and included historic houses, two historic cemeteries, a historic bridge, Grove Farm locomotives, plantation water control features, a Territory of Hawaii survey datum, and a subsurface trash pit associated with former Puhi housing.

The purpose of this literature review and field inspection was to determine the land-use history of the project area and to identify any potential artifacts, surface architecture, or cultural deposits present on the ground surface of the property and to provide historic preservation recommendations for the project. The field investigation included a 100% pedestrian survey of the project area. Historic playground equipment was observed and photographed, however, this study recommends it does not possess integrity or significance and is not a historic property. Nothing else of archaeological note was documented or collected within the project area. The lack of surface sites is attributed to use of the project area for commercial sugarcane cultivation and subsequent development and use as a community park.

Fieldwork for the current project was performed under the archaeological permit number 21-24 issued to Honua Consulting by the SHPD, in accordance with Hawai‘i Administrative Rules (HAR) Chapter 13-282. This study is not an AIS, however, it was written using standards outlined within HAR 13-276 for archaeological inventory surveys and is intended to assist with historic preservation efforts associated with the project.

Background research and the results of this investigation support a project determination of “no historic properties affected”. However, due to the proximity of multiple historic properties associated with Grove Farm and the proximity of the plantation village, Puhi Camp, archaeological monitoring guided by an archaeological monitoring plan (AMP) is recommended for the proposed project.

Table of Contents

List of Figures

List of Tables

Introduction

1.1 Project Background

This literature review and field inspection was prepared by Honua Consulting, LLC at the request of the County of Kauaʻi for the Puhi Development Project located in Haʻikū and Niumalu Ahupuaʻa, Puna District, Kauaʻi Island, TMK: [4] 3-3-004:020. The project area is situated on the southeastern portion of Kauaʻi along Kaʻumualiʻi Highway in the town of Puhi and measures approximately 2.911 acres (126,801 square feet [sq. ft.] or 11,780 square meters [sq. m.]). It consists of a community park owned and maintained by the County of Kauaʻi. The project area is shown on an USGS (Figure 1), an Aerial Orthophoto (Figure 2), and a Tax Map Key (TMK) (Figure 3). A site plan of the proposed Puhi Development project is included as Figure 4.

The project proposes to build a new affordable housing and educational health center. The proposed project will construct five 2-story buildings consisting of 60 units total, and an associated parking area. Ground disturbance will require mass grading, excavation for building footings and foundations, installation of associated utilities, and landscaping. Depths of ground disturbance can be expected to reach up to 12 ft. (3.6 m.) in depth.

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1.2 Environmental Setting

Kauaʻi is the second oldest and fourth largest of the main Hawaiian islands and was initially formed by a single large shield volcano (MacDonald 1960). The remainder of the island was formed through many complex eruptions and weathering which created Waimea Canyon and its many stream-cut valleys. The project area is located in the southeastern portion of Kauaʻi and is situated on the gently sloping uplands below the southeast flank of Kilohana Crater. It is just west of Līhuʻe, the county seat of Kauaʻi, within the town of Puhi.

Kauaʻi generally receives abundant rain with major stream activity. The project area receives a mean annual rainfall of approximately 1,435 millimeters (mm) (56.5 inches), with wetter months November through March (Giambelluca et al. 2013). The closest water resources include Halehaka Stream and a plantation-era reservoir created from the stream, approximately 250 ft. (76 m.) to the east of the project area. Nāwiliwili Bay and the ocean are located approximately 2.4 miles to the southeast.

The project area is at an elevation of 315 to 330 feet above mean sea level and the topography is relatively flat. The soil underlying the project area is characterized as Puhi silty clay loam on slopes ranging from 0 to 3 percent (PnA) in the western half of the project area and 3 to 8 percent (PnB) in the eastern half of the project area (Foote et al. 1972) (Figure 5). Puhi silty clay loam

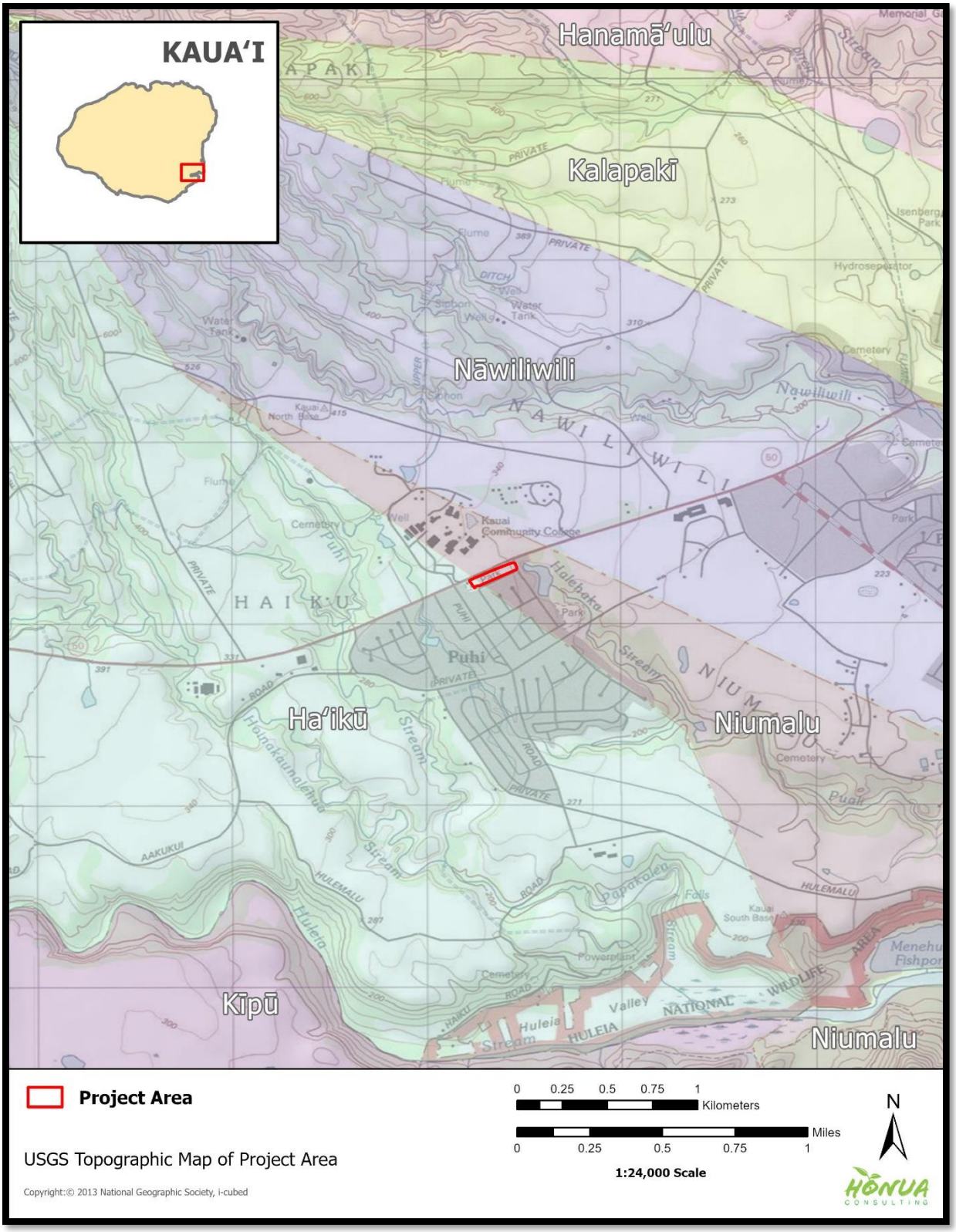

Figure 1. Portion of a 2013 U.S. Geological Survey (USGS) showing the location of the project area

Figure 2. Aerial photo showing the location of the project area

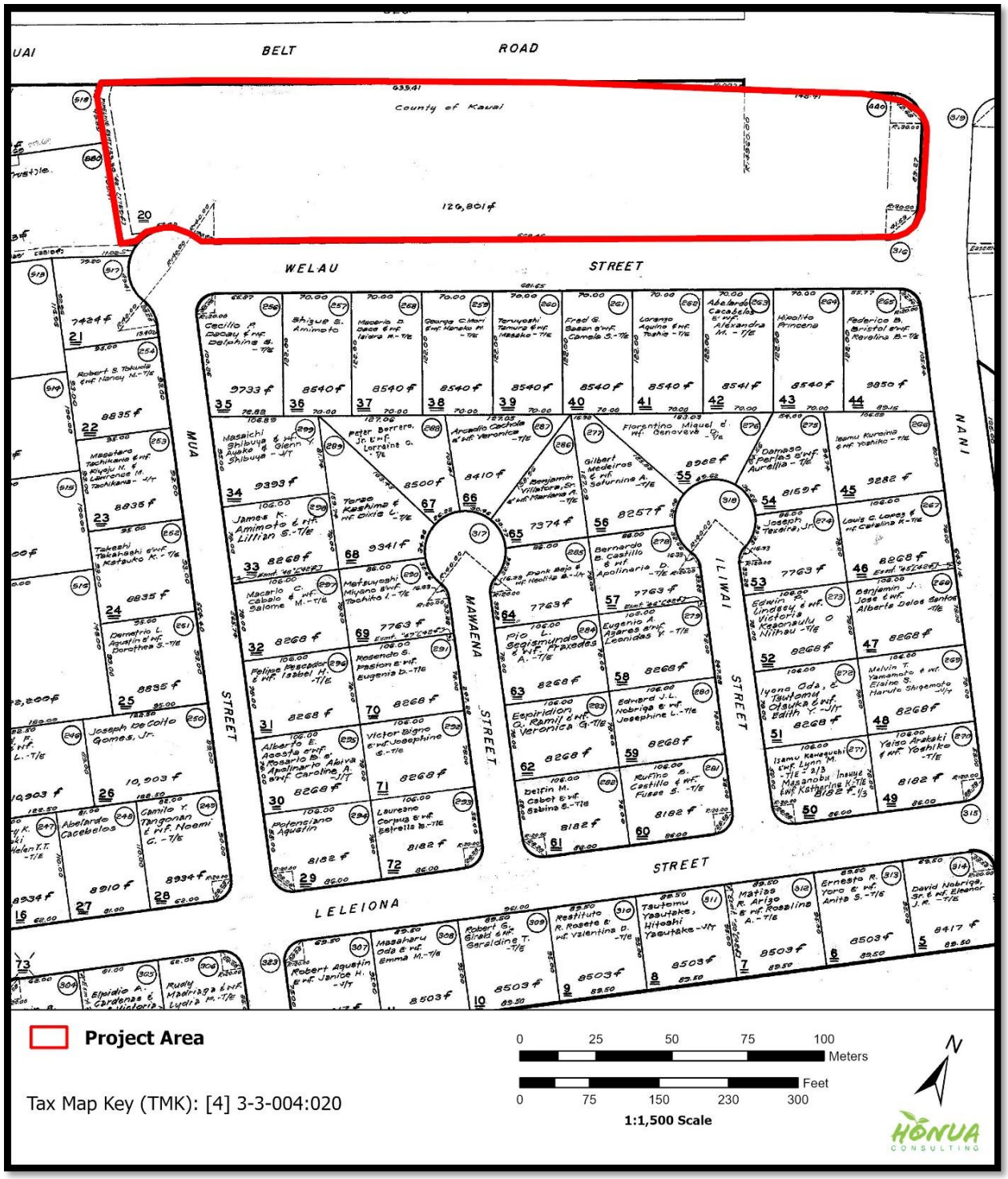

Figure 3. Portion of Tax Map Key (TMK): [4] 3-3-004 showing the location of the project area

Figure 4. Site Plan showing the proposed Puhi Development Project

consists of well-drained soils on the uplands of Kauaʻi which developed in material derived from basic igneous rock. Pna soil has moderately rapid permeability, slow runoff, and no erosion hazard, whereas PnB soil has slow runoff and a slight erosion hazard (Foote et al. 1972:115). These soil types are typically used for sugarcane, pineapple, truck crops, orchards, pasture, and homesites. Natural vegetation on Puhi silty clay loam consists of guava (*Psidium guajava*), Java plum (*Syzygium cumini*), pangola grass (*Digitaria eriantha*), kikuyu grass (*Pennisetum clandestinum*), *Elephantopus* species, joee (*Eutrochium purpureum*), yellow foxtail (*Setaria pumila*) and rhodomyrtus (*Rhodomyrtus tomentosa*).

The built environment of the project area is entirely developed with manicured lawn grass and landscaped vegetation. Commercial properties exist to the west and residential homes are built to the south. The project area is bordered by Kaʻumualiʻi Highway on the north, Nani Street on the east, Welau Street on the south, and on the west by the Puhi Paint and Gammie Homecare commercial space and a Shell gas station with car wash. The project area currently functions as a community park and is surrounded by a metal chain-link fence with two entrances along Welau Street. Two metal play structures are located in the middle of the park and the Puhi emergency warning siren is located along the western boundary. Utilities in the area are subsurface and run along the western boundary of the project area and along Nani and Welau Streets.

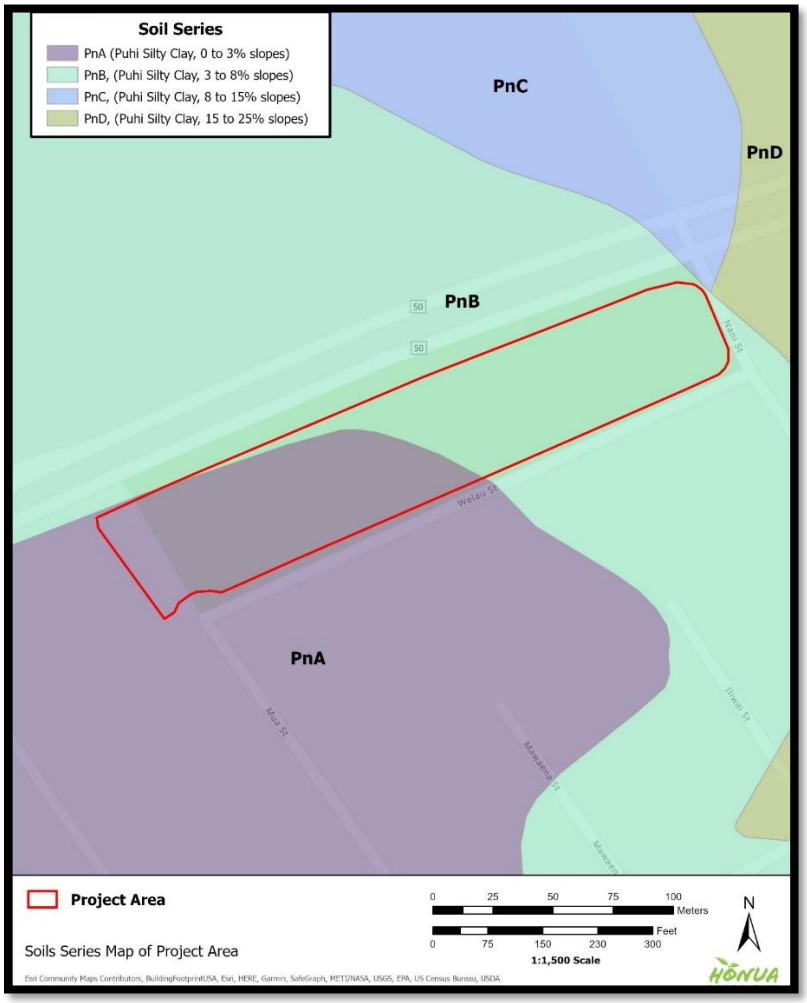

Figure 5. Portion of a ESRI Kauaʻi USGS with soil series overlay showing anticipated soils

Traditional and Historical Background

Background research for the literature review was conducted using materials obtained from the State Historic Preservation Division (SHPD) library in Kapolei and the Honua Consulting LLC. report library. On-line materials consulted included the Ulukau Electronic Hawaiian Database (www.ulukau.com), Papakilo Database (www.papakilodatabase.com), the State Library on-line (http://www.librarieshawaii.org/ Serials/databases.html), and Waihona ʻAina Māhele database (http://www.waihona.com). Hawaiian terms and place names were translated using the on-line Hawaiian Dictionary (Nā Puke Wehewehe ʻŌlelo Hawaiʻi, www.wehewehe.com) and Place Names of Hawaii (Pukui et al. 1974). Historic maps were obtained from the State Archives, State of Hawaiʻi Land Survey Division website (http://ags.hawaii.gov/survey/map-search/), and UH-Mānoa Maps, Aerial Photographs, and GIS (MAGIS) website (http://guides.library.manoa.hawaii.edu/magis). Maps were geo-referenced using ArcGIS Pro desktop. GIS is not 100% precise and historic maps were created with inherent flaws; therefore, geo-referenced maps should be understood to have some built-in inaccuracy.

2.1 Traditional Background

The project area is situated within the traditional moku (district) of Puna, one of five districts that once divided the island of Kauaʻi. These districts were further divided into 54 various ahupuaʻa, (land divisions). The project area is located in the southeastern portion of Kauaʻi on the uplands within the ahupuaʻa of Haʻikū and Niumalu.

2.1.1 Niumalu Ahupuaʻa

Niumalu literally translates “shaded coconut tree” and is named for a legend associated with its creation (Wichman 1998). The legend is described as follows:

> After many adventures on other islands, Kapūnohu traveled to Waimea to begin a tour of Kauaʻi. When he reached Kōloa, he was asked to turn back as there was a man named Kemamo that lived on the border of Kona and Puna. He challenged all travelers to a contest. Kemamo was very skillful in the use of the sling. It was said that he never missed a shot and that rocks flung from his sling could go as far as five miles. Kapūnohu continued his journey and was met by Kemamo. The two settled the terms of their bet, Kemamo’s sling against Kapūnohu’s spear thrown toward Kalalea peak, which was visible from where they were. Kemamo took up his sling and threw his stone. It flew across the uplands of Puna and dropped down near Anahola. Kapūnohu threw his spear. As it flew, it shaded the coconut trees, thus the name Niumalu, dipped into the Wailua River, hence the name Waiehu, and finally pierced the mountain at Kalalea leaving a large hole that visible until just a few years ago (Wichman 1998:57).

Niumalu Ahupuaʻa was known for its rich fishing grounds, a large fishpond along the Hulēʻia River, and cultivated terraces along Puali Stream. Due to these factors, and the former heiau present along the coast in nearby Nāwiliwili ahupuaʻa, it is likely that a substantial traditional Hawaiian population was present in the area around Nāwiliwili Bay. Niumalu Ahupuaʻa is briefly described by Handy (1940:67) as follows:

> Niumalu is a tiny ahupuaʻa, a mere wedge between Nawiliwili and Haʻikū, but it was, and is, one of the most important fishing localities on Kauai, and contained a fairly large area of terraces along the lower mile of Puali Stream. There were a few terraces at the lower end of Halehaka Stream where it joins Puali about 1.5 miles inland.

The Hulēʻia (Hulaia) River is a defining natural feature of Niumalu Ahupuaʻa and literally translates "a kind of soft pumice stone" (Pukui and Elbert 1986:89). It is briefly mentioned in Abraham Fornanders' *An Account of the Polynesian Race, Volume II* in association with Kahekili's conquest of Oʻahu in the early 1780's:

> A number of chiefesses of the highest rank – "Kapumoe" – were killed, mutilated, or otherwise severely afflicted. Kekelao-kalani, the cousin of Kahahana's mother and of Kahekili, made her escape to Kauai. As an instance of deep affection, of bitterness of feeling, and of supreme hope of return and revenge at some future day, it is said that she took with her when she fled some of the Oahu soil from Apua-kehau, Kahaloa, Waiaula, and Kupalaha at Waikiki, and deposited it at Hulaia, Kaulana, and Kane on Kauai. (Fornander 1880:227)

Aside from the early historic accounts and moʻolelo, much of the traditional history of the ahupuaʻa has been obscured or destroyed by clearing and modification for commercial sugar cane cultivation, and numerous construction and development projects conducted before historic preservation became commonplace.

ʻAlekoko (Menehune Fishpond)

ʻAlekoko Fishpond (Menehune) is the largest and best preserved inland fishpond on the island of Kauaʻi and is the most prominent traditional Hawaiian feature of Niumalu Ahupuaʻa. It measures approximately 5 acres in size and is located approximately one-half mile inland along a bend in the Hulēʻia River and three-fourth mile south west away from the project area. The major defining feature that creates the pond is an approximately 825 meter long wall that cuts off the bend of the river. It has been constructed of earth and carefully fitted stacked stones with a height of up to 5 feet above the water surface.

Several moʻolelo have been recorded regarding the origins of ʻAlekoko Fishpond, all of which center around the mythical menehune. The earliest account was recorded by William Hyde Rice in his book *Hawaiian Legends* and is explained as follows:

> After their return the Menehune built the wall of the Alakoko fish pond at Niumalu. Standing in two rows they passed the stones from hand to hand all the way from Makaweli to Niumalu. Daylight came before they had finished the work, and two gaps were left in the wall. These were filled in by Chinamen in late years, and the pond is still in use. (Rice 1923:36-37)

An unattributed account is provided in a Ching et al. (1973) that included ʻAlekoko Fishpond and the surrounding area. It provides the following explanation for the fishpond:

> Living in the valley between the Kipu River (Hulēʻia) and Niumalu resided Alekoko, the brother, and Ka-lala-lehua, the sister, young chiefs of handsome countenance, who agreed together to construct a fishpond each for themselves. The work on these fishponds was done by the menehunes, it was done in one night

> (during the night of akua, on which there was a full moon). Stones for the walls were gathered from as far away as the sea beach of Makalii.
>
> (The pond of the brother was built on one side of the river, while the pond of the sister was built in the opposite bend in the river below Kalaekapapa Point. The menehune women built the sister's pond, and the menehune men built the brother's pond.) As dawn approached the menehunes fled to the mountains. (The sister's pond was never completed.)
>
> The sister seeing her fishpond was incomplete, was grieved and wept at its unfinished state, while the brother rejoiced at the completion of his. The stones gathered for the sister's pond still remain to this day. (Ching et al. 1973:28)

Lastly, another account of the creation of the fishpond is included in Frederick Wichman's book on place names and legends of Kauaʻi and is described as follows:

> In Niumalu there is a large fishpond now called Menehune Fishpond. The dam for this pond was built across a large bend in the Hulēʻia River and is a nine-hundred-yard dirt levee faced with stone. The rocks used for the facing, the story goes, came from the plains of Wahiawa and were passed hand to hand down a double row of men and women. The pond was built at the request of Chief ʻAlekoko and Chiefess Ka-lālā-lehua, who were brother and sister. The Menehune insisted that these two must remain inside their house and must not peek out at the work in progress. Through the long night and most of the day, the two listened to the voices of the Menehune and heard the sounds of stone falling on stone. At last curiosity won out, and the brother poked his fingers through the grass thatch of the house and peered out. Immediately the Menehune chief ordered his people to drop the stones they were holding and wash their hands in the almost completed fishpond. The rocks were not water polished and there was not a hand that wasn't bleeding from several cuts. The Menehune left the dam unfinished as a reminder to Chief ʻAlekoko of his broken promise. The fishpond still bears his name: ʻAle-koko "rippling blood" (Wichman 1998:57-58).

Although attributed to the pre-contact time period, the age and origin of ʻAlekoko Fishpond are as of yet undetermined. The fishpond, SIHP #50-30-11-098, is preserved and was added to the National Register of Historic Places (NRHP #73000677) in 1973 (Martin 1973).

2.1.2 Haʻikū Ahupuaʻa

Haʻikū has multiple translations that mean "haughty", "conceited", "to speak abruptly", and "a sharp break" (Pukui and Elbert 1986:47). The ahupuaʻa of Haʻikū is unique in that it is cut off from the ocean with its only access through the Hulēʻia River. The Hulēʻia River is a defining feature of the ahupuaʻa and delineates the southern boundary with Kipu ahupuaʻa. Based on the location of Land Commission Awards in Haʻikū it is likely that the traditional Hawaiian population of the ahupuaʻa was focused along the Hulēʻia River and its various tributaries. The uplands of the ahupuaʻa include the lands on the southern and southwestern flank of Kilohana Crater. Little is known of traditional land use in the uplands of Haʻikū due to extensive modifications to the land and water resources during made during plantation-era commercial sugarcane cultivation.

The remnants of traditional Hawaiian agricultural activities along the Hulēʻia River in Haʻikū are briefly described by Handy and Handy (1972) in *Native planters in old Hawaii: their life, lore and environment* as follows:

> The broad delta of the Huleʻia River is 1.5 miles long and a half mile wide and is in the ahupuaʻa named Haʻikū, the next to last of the southeasterly valleys of Puna. This area was ideal for wet taro. Terraces continue upriver, and there were terraces up the streams that empty into the river. Old breadfruit and mango trees indicate that there were many Hawaiian kuleana up to 6 miles inland from the delta. (Handy and Handy 1972:427)

The general vicinity of the uplands of Haʻikū are briefly mentioned in the Legend of Uweuwelekehau in Abraham Fornanders' *Hawaiian Antiquities and Folklore Volume. 5* as included below:

Legend of Uweuwelekehau

> Ku was the father and Hina was the mother of Uweuwelekehau, and Wailua, Kauai was the land [of their birth]. Olopana was the first-born, then Ku came next, and the last of the family was Hina, a girl. They lived in Wailua as chiefs and rulers of Kauai. After a while Olopana became displeased with Ku, so Ku set out and journeyed to Piihonua, Hilo, Hawaii, where he made his home. In this journey Hina, the sister, followed Ku, as she was much attached to him, and thus left Olopana in Kauai by himself.
>
> After they arrived at Hilo, Ku in accordance with the old custom took Hina to be his wife, as he was of too high a rank to take any other woman to wife; and they became king and queen of Hilo. Their bathing place was at the pool called Waianuenue. In course of time Hina conceived and gave birth to a male child, who was called Uweuwelekehau. At the birth of the child a great storm swept over the land; the thunder roared, the earth was shaken by a great earthquake, the lightning flashed, the rivers and streams overflowed, the wind blew and the rain came down in torrents.
>
> After Uweuwelekehau was grown up into manhood it was seen that he was very handsome and pleasant to look upon. He was always accompanied by his two gods, Kane and Kanaloa. His bringing up was surrounded by many restrictions; his house was sacred, people not being allowed to pass near it upon pain of certain death.
>
> In the meantime Olopana lived on Kauai, and he too in course of time was blessed with a child, a girl, who was called Luukia. Upon hearing that Hina had given birth to a male child, Olopana made oath that his daughter should marry no one except Uweuwelekehau. Olopana then commanded the people of Kauai that Uweuwelekehau when he comes shall come in a red canoe, having red sails, red paddles, accompanied by large and small men in large and small canoes. When they see such a man come with these different things, then it is the sign of a great chief.
>
> One day near the month of October while Ku and Hina were living in their home, they were possessed with the desire to go up the Wailuku river for oopu and shrimps. In this expedition they took all their servants along with them leaving Uweuwelekehau alone with his attendants. After his parents had departed on their

way up the stream Uweuwelekehau set out for the Kalopulepule river to sail his canoe. As he was in the river a small cloud appeared from the sea and came on up till it stood directly above the Wailuku stream when it came down in the form of rain, flooding the whole country and causing the stream to flow in a rush to the ocean, carrying Uweuwelekehau along in its flood. This carrying away of Uweuwelekehau by the flood was cause by Kane and Kanaloa. After he was thus carried out to sea some one went up and informed Ku of the matter and he and his company returned home and a search was made, but the boy could not be found. The parents then mourned for the boy.

While in the sea Uweuwelekehau was changed into a fish through the power of Kane and Kanaloa, and by them taken to Kauai and left in a crevice in the rocks near the shore where the fish of Luukia was generally caught by her attendant, Papioholoholokahakai. The fish into which Uweuwelekehau was changed was of the kind called moa, a short stubby fish.

Early the next morning when Luukia awoke from her sleep she told her attendant, Papioholoholokahakai, to go down and catch her some fish for breakfast, as there was none ready for her morning meal. Papioholoholokahakai took up his net and proceeded to the beach. After three casts of his net he found that he had caught nothing. Thinking that his charge would get with him he again made another attempt, when to his delight he caught a small stubby fish, and upon closer inspection he saw that it was a good fish. He then took the fish and placed it into a calabash with some water and proceeded home. When he arrived in the presence of Luukia, he handed her the calabash which contained the fish. Luukia looked at the fish and was made glad by the shape of the fish and took and gave it to her servants with the order that it be given good care.

After the lapse of one day, one the second day, while Luukia and her attendants were asleep, the fish transformed itself into a human being, through the power of Kane and Kanaloa. When Luukia and her attendants woke up they saw a handsome young man coming to them and immediately Luukia fell in love with him, for he was indeed very comely and pleasant to look upon. Luukia called Uweuwelekehau to come closer, whereupon they came together, though they did not know each other, Kane and Kanaloa disapproved of their living together at this time.

While they were living this way, Olopana heard that Luukia was living with a husband; so he became very angry because of the promise he had made, that Luukia should have no one else but Uweuwelekehau for her husband [not knowing that this very person was the man of his choice]. Olopana then gathered all the people of Kauai and ordered them to come before him to hear what he had to say about Luukia and her lover, and to see for themselves who he was. As soon as the people came together in his presence, he asked Luukia: “Which would you rather have, the husband or your father?” “I will take my husband,” said Luukia. Olopana then ordered his chief officer “Take off everything from Luukia and leave her naked; also take off everything from her husband except his malo.” Olopana thought they were deserving of this ill treatment because his daughter had disobeyed him. Olopana then told the people of the whole of Kauai not to take these two into their

homes nor give them food or clothing. He also commanded that they go to Mana and live, a place of spirits; no human beings lived there.

Luukia and Uweuwelekehau therefore left Wialua and journeyed to the land to which they were commanded to go live. When they reached the plains of Lihue, Luukia began to weep and show signs of complaint against her father for forcing her to go naked. When Uweuwelekehau saw this he said: “Don’t weep; have patience until we reach that hill, where you will find a pa-u.” When they arrived at the hill, they found several pa-u and all manner of kapas, which furnished them with all their wants and thus covered their nakedness. After they left the place Luukia again began weeping because she was hungry. Her husband then said to her: “Have a little patience until we reach that hill, Kohoaea, where we will find food and meat.” Upon arriving at the hill they found food and meat which they ate until they were satisfied. From this place they continued on their way until they came to Mana, where they made their home.

Mana, as has been said, was the land where the spirits lived; no human beings lived there; no food or any description grew in the place; the only things that grew in the place were wild shrubs and weeds. It was also a place avoided by people, lest they be destroyed by the spirits, and it was for these reasons that Luukia and her husband were sent there.

During the night, as they slept, a house was built over them, food was provided, animals were brought to the place and all their need were supplied them. When they woke up the next morning Luukia was surprised to see these different things. The two lived on in peace in the place from this time on.

When the fishermen who were out in their canoes saw the light burning they came ashore and were entertained by Uweuwelekehau, food and meat were given them as well as kapas and other things. Through his great kindness he stole the heart of these people who came to Mana, causing many of them to come and live there, and through their labor turned the waste land into a rich and comfortable place. By this time these doings were reported to Olopana who was still at Wailua. In order therefore to see these things for himself and also to make up with his daughter an son-in-law, for news had also come to him that this person was Uweuwelekehau himself, because the latter had informed his wife and the people in Mana as to his identity. Olopana set out for Mana, with the purpose not only to make up, but to make his son-in-law and daughter the king and queen of Kauai.

The news of Uweuwelekehau being alive an in Kauai was not by any means confined to that island alone, but it was also carried to Hawaii and to Ku and Hina. They therefore came to Kauai with their servants, in large and small canoes, having red sails, red cords, red paddles, red seats, red bailing cups and red men, and with everything needed for the voyage.

When the people from Hawaii arrived they were met by a great host of people at Mana and great festivities were had. That night for the first time the tow covered by the same kapa, for Kane and Kanaloa were pleased to remove the kapu placed over their charge.

> Uweuwelekehau and Luukia were at this time declared the king and queen of Kauai. Among their first acts to commemorate their great fortune were the planting of the grove of coconut trees at Kaunalewa and the building of the temple of Lolomauna. This is the end of this legend. (Fornander 1918:192-198)

It is believed that the trail westward from Wailua mentioned in the legend above is the approximate location of the Kauai Belt Road, located adjacent to the project area to the north and now known as Kaʻumualiʻi Highway.

2.2 Historical Background

Following the landing of Captain Cook at Waimea in 1778, Hawaiian life on Kauaʻi began to change at a rapid pace. In the late 18th century Waimea became a port-of-call for merchants and explorers and is described in several early historic accounts (Portlock 1789, Dixon 1789 and Vancouver 1798). Starting in 1810 the sandalwood trade became the driving force of the Kauaʻi economy and by the 1830's the sandalwood forests of Waimea Canyon and Kōkeʻe were mostly exhausted (Joesting 1984).

Missionaries came to the island in the 1820's and documented a widespread influenza epidemic that killed much of the native population. The native population census records over the next few decades documented the systematic decline of the native population due in part to introduced diseases. The village of Nāwiliwili, which eventually developed into Līhuʻe, was established in the 1830's by Kaikioewa, the Governor of Kauaʻi. This coincided with the beginning of the whaling industry and the introduction of commercial agriculture on Kauaʻi.

The earliest account of Līhuʻe is given by the United States Exploring Expedition in 1840 and it is described as:

> A settlement lately undertaken by the Rev. Mr. Lafon, for the purpose of inducing the natives to remove from the sea-coast thus abandoning their poor lands to cultivate the rich plains above… Mr. and Mrs. Lafon are very industrious with their large school, to which some of the children come five miles.
>
> The principal village is Nawiliwili, ten miles east of Koloa. The district contains about forty square miles, being 'twenty miles long by two broad. The soil is rich: it produces sugar-cane, taro, sweet potatoes, beans, etc. The only market is that of Koloa. The cane suffers somewhat from the high winds on the plains.
>
> The temperature of Lihui has much the same range as that of Koloa, and the climate is pleasant: the trade-winds sweep over uninterruptedly, and sufficient rain falls to keep the vegetation green throughout the year. No cattle are to be seen, although the pasturage is good.
>
> As yet there is little appearance of increase in industry, or improvement in the dwellings of the natives. There are no more than about seventy pupils in this district, who are taught by natives. There are two houses of worship, and about forty communicants. (Damon 1931:405-406)

No description of Niumalu or Haʻikū is included in the account but the general area is broadly described as fertile with a native population along the coastline.

2.2.1 Early Historic Land Tenure in Haʻikū and Niumalu Ahupuaʻa

In the 1840s, private property was introduced into Hawaiian society through formation of the Board of Commissioners to Quiet Land Titles and the adoption of the Great Māhele (the division of Hawaiian lands). In 1845 King Kamehameha III waived his right to full authority over the land, portioning out land for his personal use (crown lands) and then dividing the rest of his territory into land for the government, land for the aliʻi (chiefs) and konohiki (land overseers), and land for tenants or commoners (kuleana land) (Alexander 1891, Board of Commissioners 1929, Moffat and Fitzpatrick 1995). Following thereafter Land Commission Awards (LCAs) were awarded to commoners as kuleana parcels for fee ownership. Kuleana land claims required proof of residency on the land and continued land improvements. LCAs therefore record who resided on the land and how the land was used. Royal Patents were often granted on LCAs awarded from 1847-1853, which finalized the sale and legal title of the lands. Royal Patents (R.P.) were used until the overthrow of the Hawaiian government in 1892 and thereafter are referred to as Land Patents.

The majority of the ahupuaʻa of Haʻikū and Niumalu, including the project area, were awarded to Princess Victoria Kamāmalu as R.P. 4479, LCA 7713 ʻāpana 2. The remaining lands included kuleana claims by native tenants on the Niumalu Flats (Niumalu Village), along Puali Stream in Niumalu, and along several portions of the Hulēʻia River in Niumalu and Haʻikū. These included 35 LCAs in Haʻikū ahupuaʻa and 24 LCAs in Niumalu ahupuaʻa No LCAs were awarded within the project area or vicinity.

2.2.2 Development of Nāwiliwili Harbor

Before the arrival of Europeans, Nāwiliwili Bay was a preferred canoe landing and known for its bountiful fishing grounds, especially in the area where Huleʻia Stream empties into the bay (Figure 6). Nāwiliwili Bay was identified as one of three natural harbors for sailing ships on the island, the other two being Waimea Bay and Hanakaʻape Bay (Kōloa).

In the 1830's, the Governor of Kauaʻi established a village at Nāwiliwili that eventually became Līhuʻe. The catalyst for the development of Nāwiliwili Harbor was the founding of the Lihue Plantation Company in 1849 and the establishment of a sugar mill along Nāwiliwili Stream.[1] In 1851 the plantation sold four acres of land along Nāwiliwili Bay for construction of the harbor. During the latter half of the 19th century, the naturally protected harbor became a key shipping point for the Lihue and Grove Farm plantations (Figure 6).

After being selected as the Federal harbor for the island of Kauaʻi, the government authorized the construction of a breakwater, dredging of the bay to a depth of 35 feet, and the construction of several wharfs at Nāwiliwili Harbor under the River and Harbor Act of March 2, 1919. The breakwater was completed in 1926 and dredging of the bay was conducted between 1929 and 1930. The wharf facilities were constructed on imported fill and dredge material.

The approximately 25 acre Nāwiliwili Small Boat Harbor was authorized under Section 107 of the River and Harbor Act of 1960 and was completed in 1974.[2] Since that time, numerous projects

[1] Hawaiian Sugar Planters' Association Archives - https://www2.hawaii.edu/~speccoll/p_lihue.html#:~:text=The%20original%203%2C000%20acres%20of,included%20an%20excellent%20water%20source.&text=A%20mill%20was%20built%20at,north%20side%20of%20Hanamaulu%20Gulch.

[2] U.S. Army Corps of Engineers Website-

have been conducted for facility upgrades and additions. Currently, Nāwiliwili Harbor serves as a center for recreational boating, a port of call for visiting cruise ships, and a major shipping lifeline to the island.

Figure 6. 1900 photo of Nāwiliwili Bay and the vicinity of the project area (Ching et al. 1973:10-12, Plate 2, Courtesy of the Kaua‘i Historical Society)

2.2.3 Grove Farm Plantation

The land that would become Grove Farm Plantation was acquired by Warren Goodall in 1850 and gets its name from the kukui grove that surrounded the original property. It was sold to B. Marshall later that same year and was acquired by Judge H.A. Widemann in 1856. In 1863 George N. Wilcox was hired to construct the irrigation system of the property. This resulted in the excavation of two irrigation ditches, known as the 1st ditch and 2nd ditch, and various other irrigation infrastructure improvements between 1864 and 1865.

The story of the first sugar cane cultivated on the plantation refers to the village of Niumalu, located on the flats to the west of the project area. In their book *Grove Farm Plantation: The Biography of a Sugar Plantation*, Krauss and Alexander (1984) write that George N. Wilcox:

> …drove an ox cart to the beach and around the bay to a Hawaiian settlement called Niumalu where the natives grew sugar cane, as a supplementary food crop, on the earthen dams that separated their taro patches, George carefully chose stands of healthy cane, making sure that they were the original plantings and not rations. (Krauss and Alexander 1984:133)

https://www.poh.usace.army.mil/Missions/Civil-Works/Civil-Works -Projects/Nawilili-Small-Boat-Harbor/

Based on the description, it is likely that Wilcox visited the former village of Niumalu, comprised of a cluster of LCA's located on the flats adjacent to Nāwiliwili Bay and the Hulēʻia River. It is also likely that he picked his stock from the sugar cane cultivated in the cluster of LCA's comprising the large loʻi (irrigated terraces) complex along Puali Stream in the coastal inlands of Niumalu.

Grove Farm was purchased from H.A. Widemann by George Wilcox in 1870. During this time, the sugar cane was milled at the Lihue Mill and exported via Nāwiliwili Bay. Growth continued, and Wilcox increased his land holdings through a series of deals with Princess Ruth Keʻelikōlani between 1874 and 1881. An 1878 W.D. Alexander Government Survey map of Kauaʻi shows the extent of the Grove Farm plantation at that time (Figure 7). A 1910 United States Geological Survey (USGS) map shows a road that would become the Kauai Belt Road to the north of the project area (Figure 8).

Additional water rights were obtained in the early 1900's and allowed for the construction of the upper ditch between 1914 and 1917 and the expansion and improvement of the irrigation system through the end of the 1920's (Wilcox 1998).

To accommodate the growth of the plantation and the influx of new workers Grove Farm built Puhi Camp between 1917 and 1920. Puhi camp was built as a village-style planned community and originally consisted of 120 new homes and expanded to over 600 homes during the height of sugar cultivation in the late 1930's (Riznik 1999) (Figure 9). A 1934 map of Land Court Application (LCApp) 1087 shows the project area in relation to the Kauai Belt Road (now known as Kaʻumualiʻi Highway) and Puhi Camp to the northwest (Figure 10).

In 1948 Grove Farm purchased Koloa Plantation which gave them access to their own sugar mill. This doubled the land holdings of Grove Farm and eliminated the use of the mill at the Lihue Plantation. The growth of the farm facilitated further improvements which included the construction of the Wilcox Tunnel between 1948 and 1949, the development of an airfield at Haʻikū in 1954, and the construction of the Kuia-Waita Tunnel in the early 1960's. Aerial photographs from 1950 and 1965 show the project area under sugarcane cultivation and little change in the vicinity of the project or Puhi town during that time (Figure 11 and Figure 12).

In the mid 1960's Grove Farm donated 200 acres of land that would later become the Kauaʻi Community College. The majority of Puhi Camp was destroyed in the 1970's during construction of the Kauaʻi Community College and housing in the area was constructed on the makai side of Kaʻumualiʻi Highway. In 1974, Grove Farm ceased its sugar operations and began leasing lands to the Lihue and McBryde plantations. A 1978 aerial photograph shows the project area, a residential neighborhood to the south, and the development of the Kauaʻi Community College to the north (Figure 13). In the 1980's the remainder of the Puhi housing was destroyed. Aside from additions and upgrades to the Kauaʻi Community College little development has occurred in the Puhi since that time.

Figure 7. 1878 Government Survey map of Kaua‘i showing the extent of the cultivated lands of Grove Farm and the approximate location of the project area (Alexander 1878)

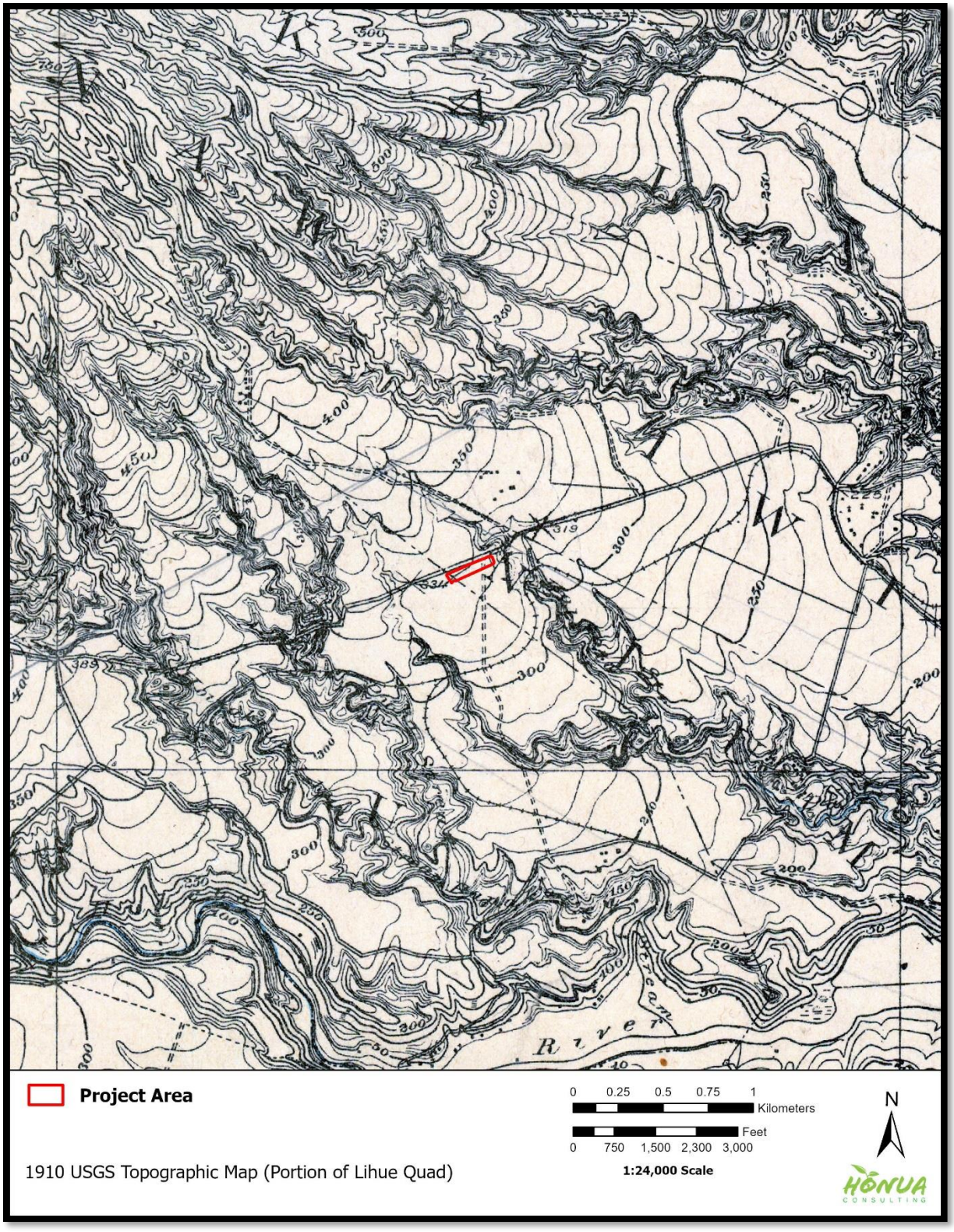

Figure 8. Portion of a 1910 USGS survey map showing the location of the project area and the Niumalu Road Bridge crossing

Figure 9. 1930 W.M. Moragne Map showing the layout of Puhi Camp (Kamai et al. 2016:24)

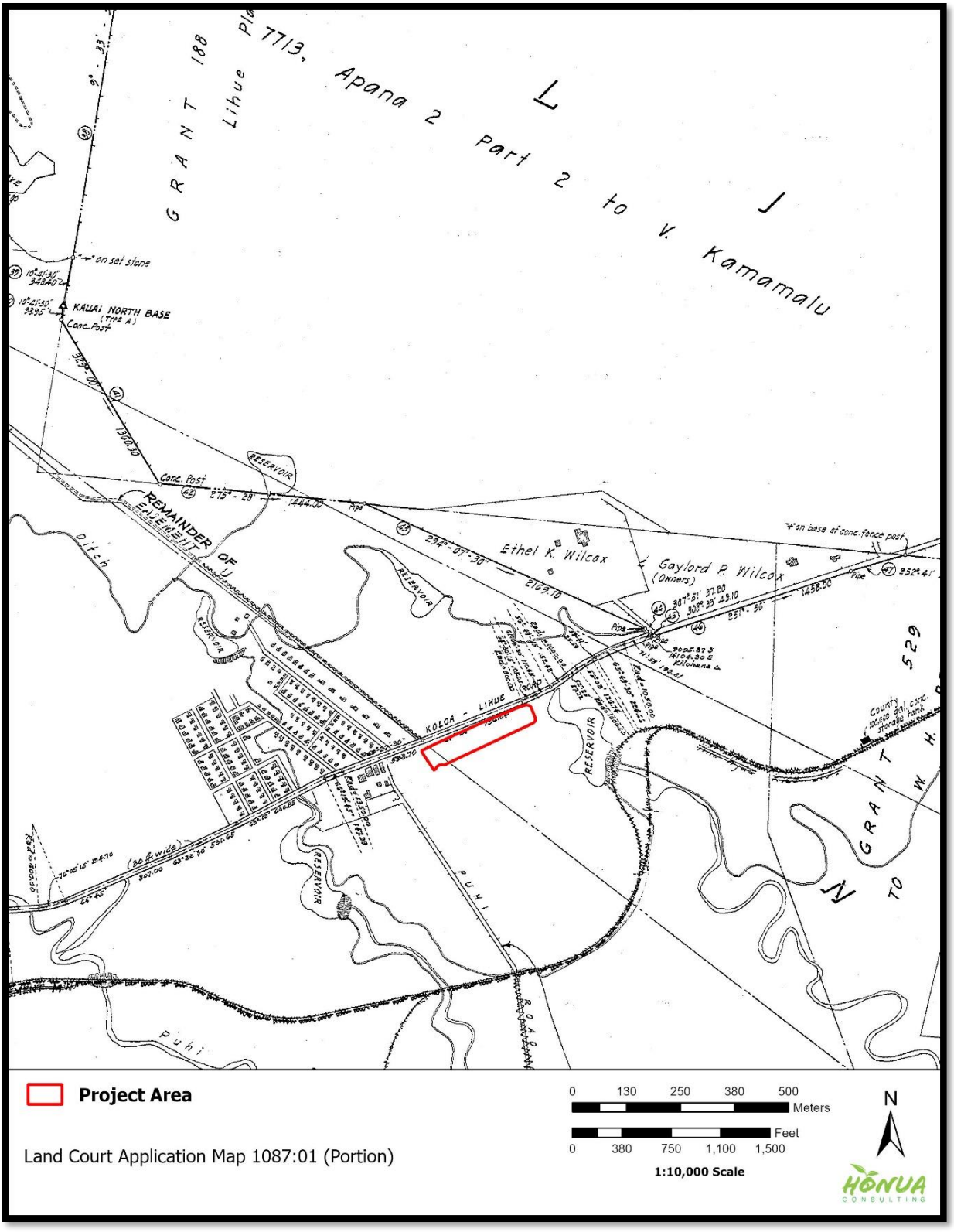

Figure 10. Portion of LCApp 1087 Map 001 showing the project area in relation to the Kauai Belt Road and Puhi Camp (Towill 1933)

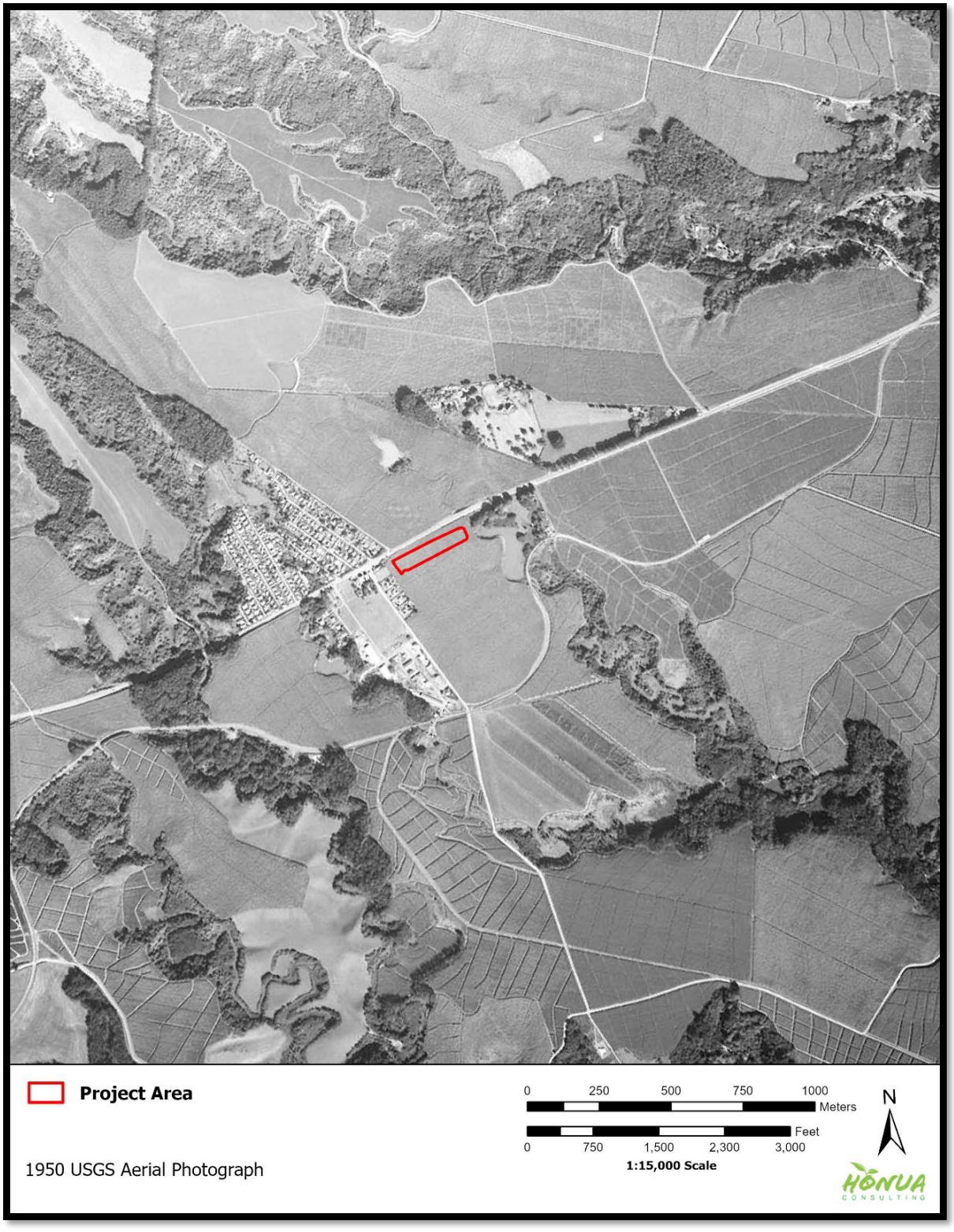

Figure 11. Portion of a 1950 USGS aerial photograph showing the project area under commercial sugarcane cultivation

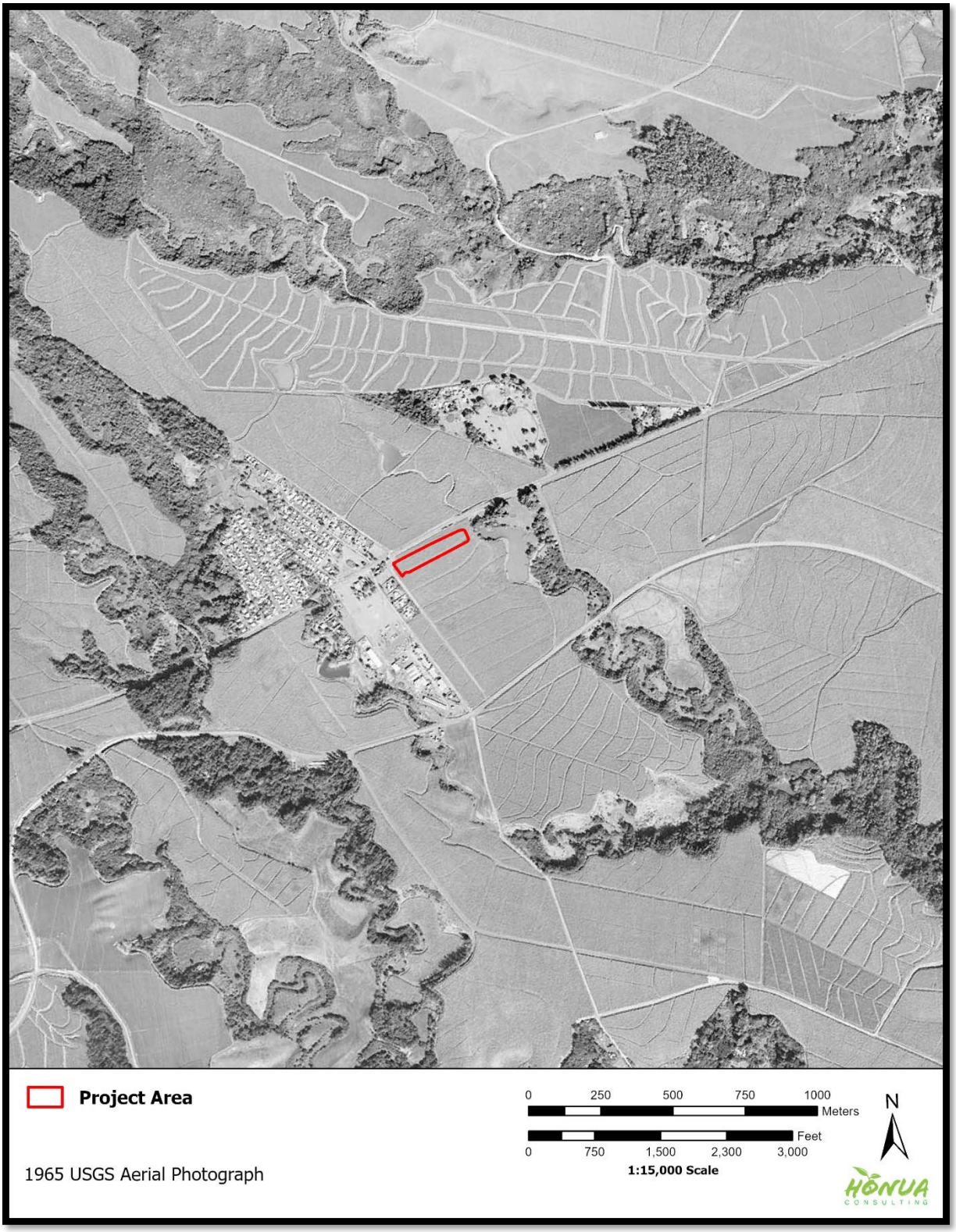

Figure 12. Portion of a 1965 USGS aerial photograph showing the project area under sugar cane cultivation

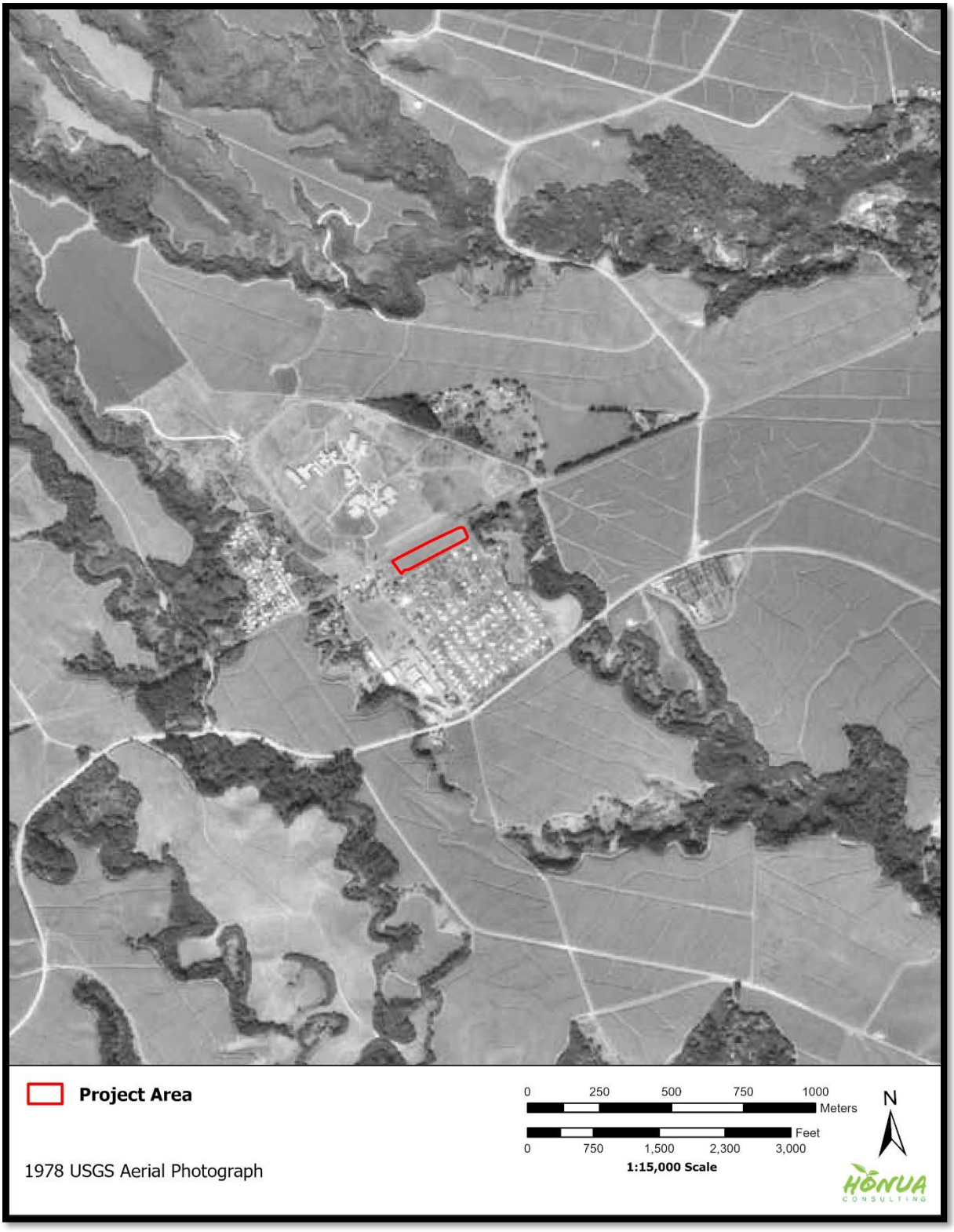

Figure 13. Portion of a 1978 USGS aerial photograph showing the current layout of the project area, residential housing to the south, and the development of Kauai Community College to the north

Today, Grove Farm has land holdings of approximately 38,000 acres and has diversified into agricultural land licensing and residential, industrial, and commercial land development. Additionally, the Wilcox plantation homestead now functions as the Grove Farm Sugar Plantation Museum and operates tours and host events. The Grove Farm Locomotives are part of the museum and consist of 4 locomotives donated to Ethel Wilcox when the plantation museum opened in 1976 (Schleck and Napoka 1979). The focal point of the property is the Wilcox plantation homestead, the one-story portion of which was constructed sometime in the 1850's. The two story colonial revival addition to the home was added by Wilcox in 1915 and was designed by Honolulu architect Clinton B. Ripley (Baer et al. 1982). The Wilcox 1930's home at Puhi, located to the northwest of the project area, now operates as the Kilohana Plantation Estate and offers a plantation setting for shops, restaurants, train rides, events and other tourist activities.

2.2.4 Land Division and Development of the Project Area

In 1933, Land Court Application (LCApp) 1087 subdivided the Grove Farm owned lands of Haʻikū, Hanamāʻulu, Nāwiliwili, Kalapakī and Niumalu into Lots 1 through 10, with the project area being located within Lot 1 containing 14,323.368 acres. Between 1937 and 1971 the land containing the project area was divided, consolidated, and re-subdivided into numerous lots. The LCApp maps indicate the project area was included within Lot 1-B (5,198.260 acres) in 1937, Lot 21 (906.016 acres) in 1949 and Lot 132 (905.074 acres) in 1952. The LCApp maps showing the early divisions of the land containing the project area have been included as Appendix B.

A 1968 LCApp map shows the development of the residential development to the south, the project area within Lot 244 (3.186 acres), and a Kauai Board of Water Supply easement (Easement 42) running within and along the western boundary of the current project area (Figure 14). In 1971, Lot 244 was consolidated and subdivided into Lot 440 (2.911 acres) which is the current configuration of the project area (Figure 15). It is likely the project area was developed as a community park around that time. Since then, there has been little change within the project area except for the installation of an emergency alert and warning siren along the western boundary and the installation of electrical utilities along Nani Road on the eastern-most side.

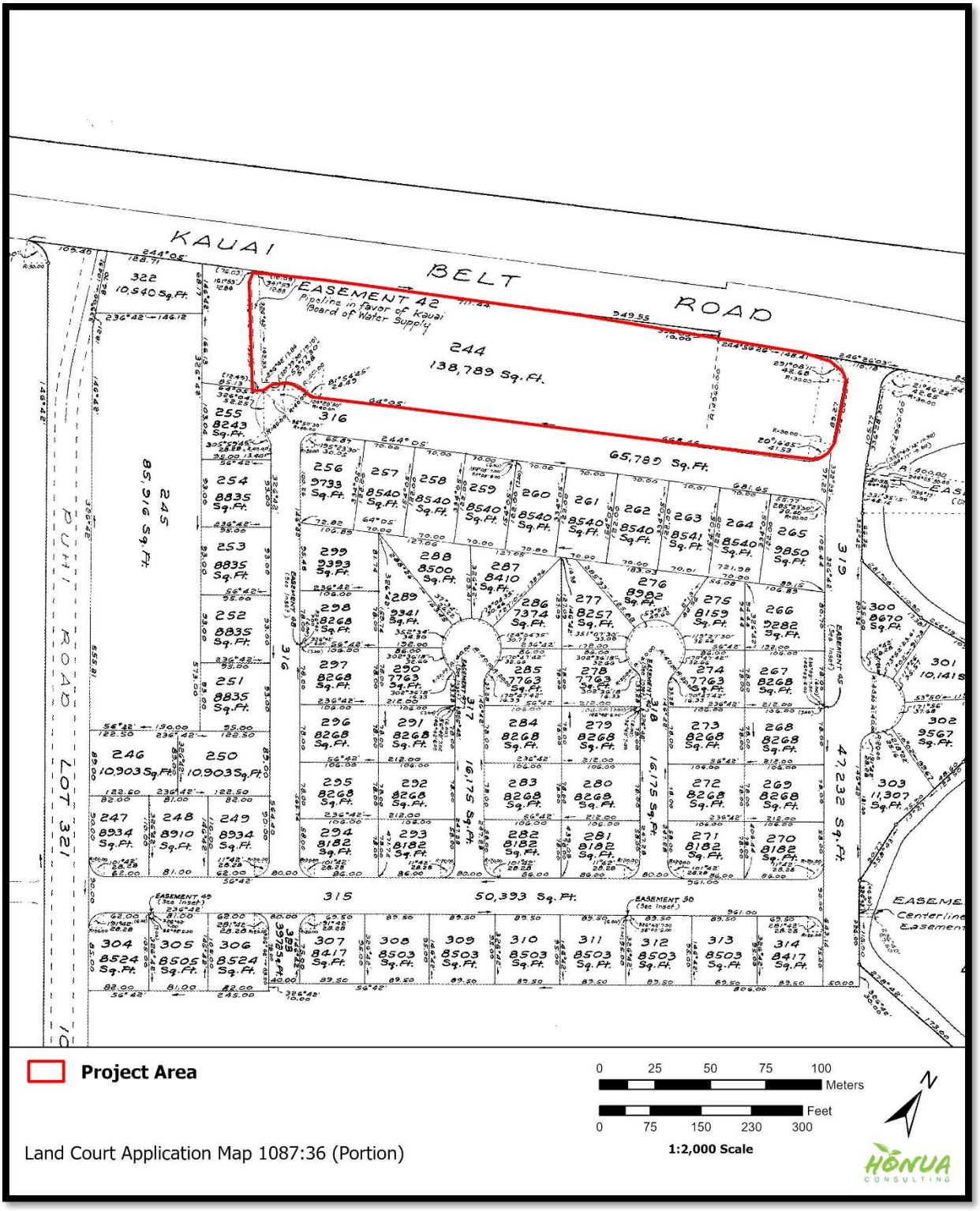

Figure 14. Portion of LCApp 1087 Map 036 showing the residential development to the south and the project area within Lot 244 (Fujishige 1968)

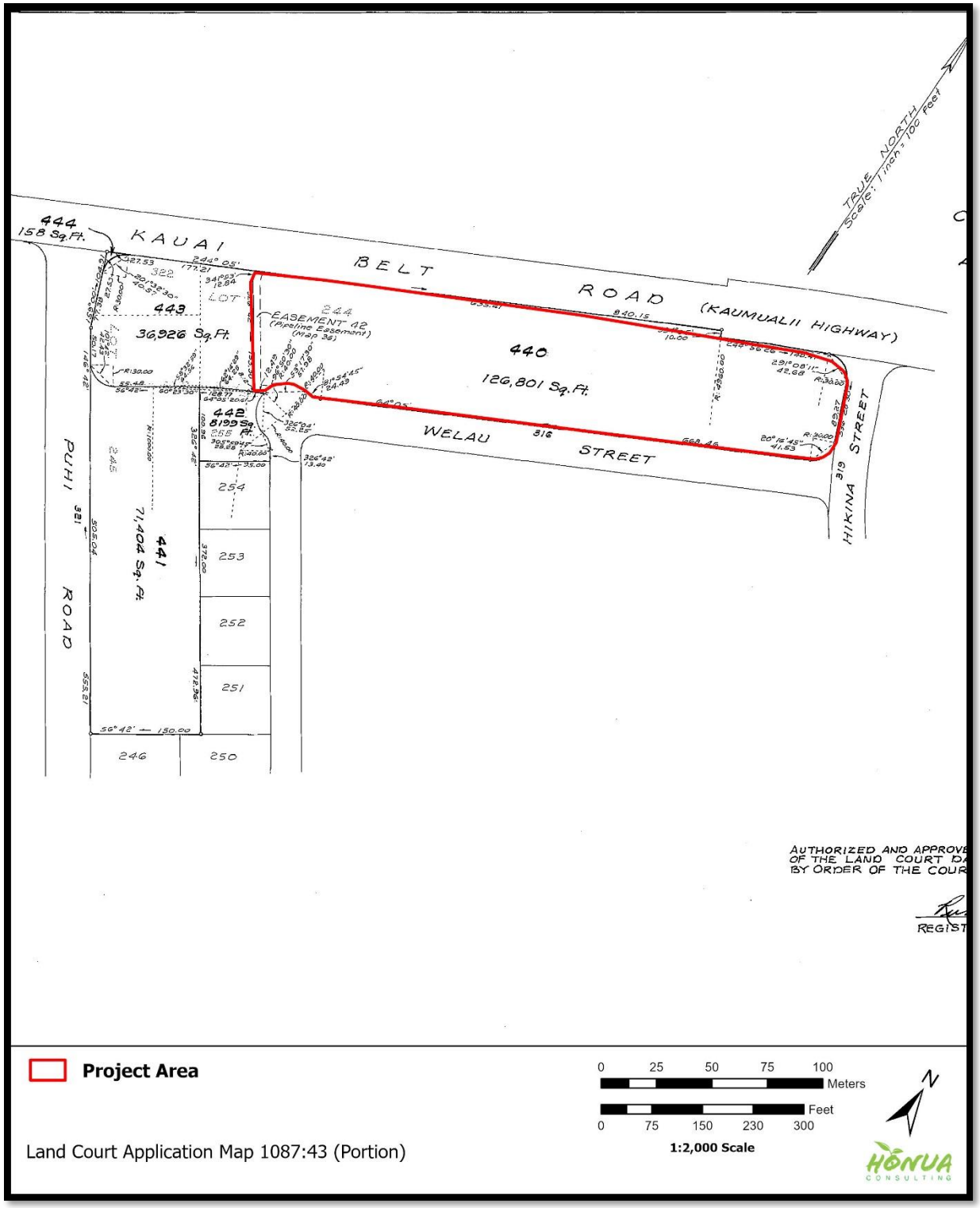

Figure 15. Portion of LCApp 1087 Map 043 showing the current project area as Lot 440 (Fujishige 1971)

Previous Studies

No previous archaeological studies have been conducted within the project area previously and no archaeological sites are known to be present. The numerous studies that have been conducted in the vicinity include surveys for the Kaua‘i Community College, the Philippine Cultural Center, the Island School, highway improvements, and several former and current Grove Farm properties in support of residential and commercial developments. These studies primarily documented plantation-era sites associated with the Grove Farm and Lihue Plantations. The sites documented in the vicinity include historic houses, two historic cemeteries, a historic bridge, the Grove Farm locomotives, plantation water control features, a Territory of Hawaii survey datum, and a subsurface trash pit associated with the former Puhi housing. All archaeological studies and sites in a 1.5 mile radius are shown in Figure 16 and Figure 17 and all studies are listed in Table 1.

3.1 Nearby Archaeological Studies

3.1.1 Bennett 1931

Between 1928 and 1929 Wendell Clark Bennett of the Bernice Pauahi Bishop Museum conducted an island-wide survey of the archaeological resources of Kaua‘i (Bennett 1931). A total of 202 sites were recorded during the survey. A single site of note was documented in Niumalu Ahupua‘a, Menehune Fishpond, which later became SIHP # 50-30-11-098. The site was described by Bennett as follows:

> Site 98. Fish pond, near the mouth of the Huleia River, Lihue district.
>
> The Niamalu [sic] fish pond consists principally of a stone-faced, dirt wall that runs for over 900 yards and cuts off a large bend in the river for use as a fish pond. It is to-day used both for fish and ducks. Cement walls and iron gates have obscured any old method of controlling the water or the fish. Between the west end of the wall and the shore there is 50 yards of shallow and reedy swamp land. The dirt wall runs, unfaced with stones, for 145 yards, whereupon the stone facing starts on the outside. The dirt wall is 5 feet above the water level, 4 feet wide on top, and the dirt slants up on the sides. The facing wall starts with a single row of stones but soon becomes double thickness as it gets farther out into the river and the current starts to be effective. The stones also become larger until the double layer is 2 feet thick. The stone facing only on the outside, is 5 feet high in most places, and quite perpendicular. The stones are not uniform in size but are fitted together quite well. The stone facing runs only for 588 yards through the dirt wall and continues beyond.

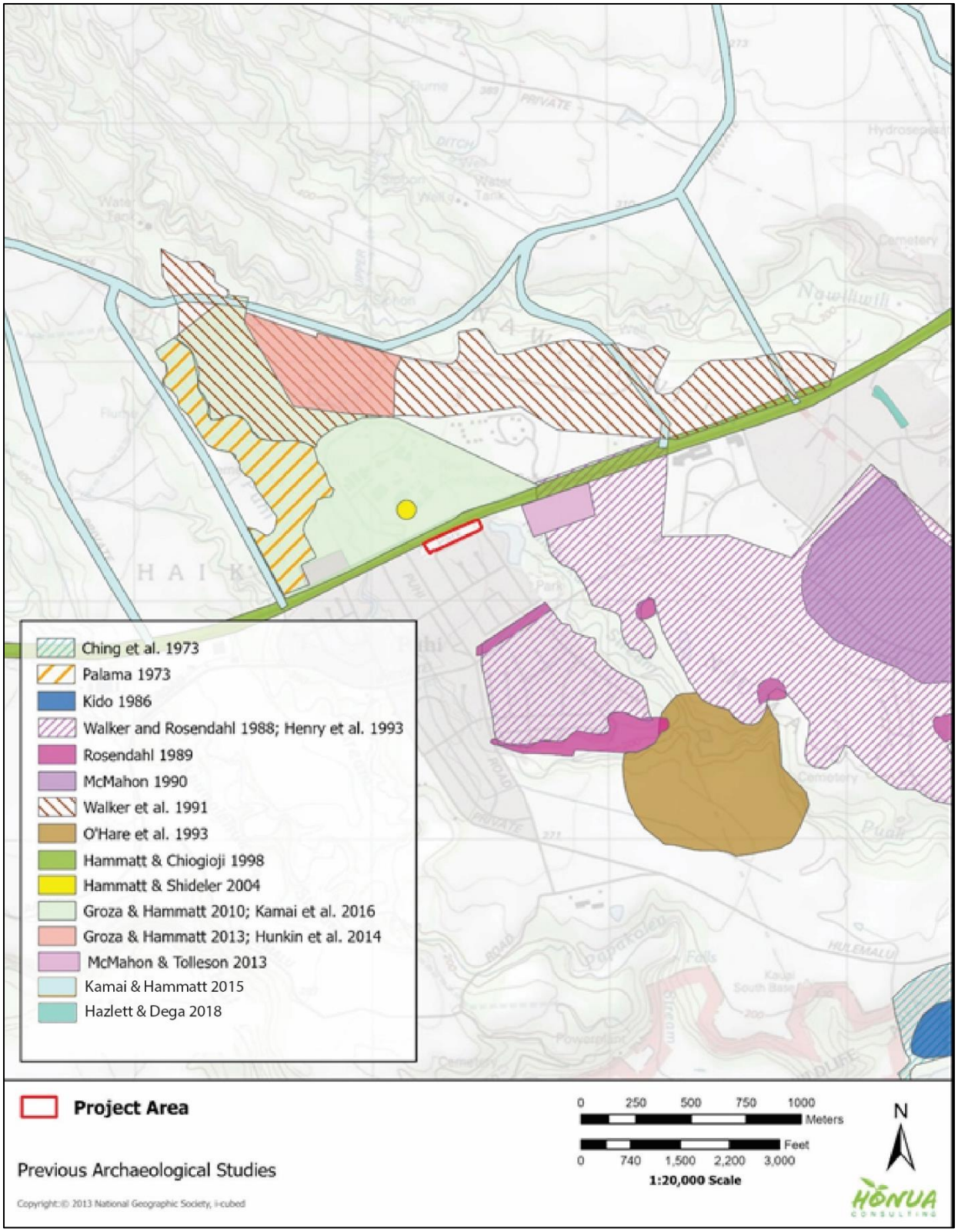

Figure 16. Portion of a 2013 Kaua‘i USGS showing locations of previous archaeological studies within a 1.5 mile radius of the project area

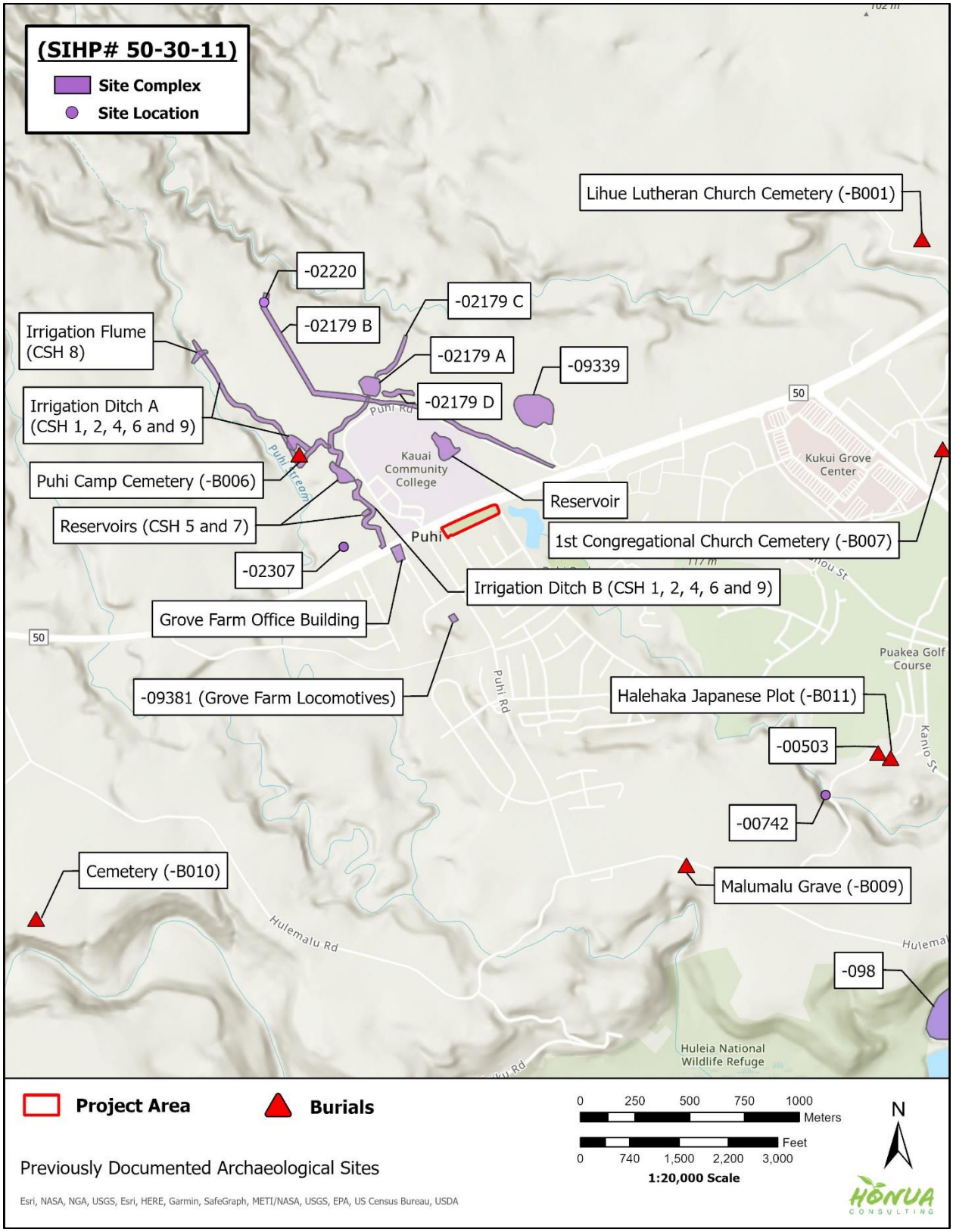

Figure 17. Portion of a 2013 Kaua‘i USGS showing locations of archaeological sites within a 1.5 mile radius of the project area

Table 1. Archaeological Studies Within 1.5 Miles of the Project Area

Author(s)	Type of Study	Location	Findings (SIHP #50-30-11)
Bennett 1931 (not shown in Figure 16)	Archaeological Investigation	Island-Wide	Recorded SIHP #'s -098 (Menehune Fishpond)
Ching et al. 1973	Archaeological Report	Niumalu Ahupuaʻa, Loko Kuapa o Alekoko (Menehune Fishpond)	Relocated and documented SIHP # -098 (Menehune Fishpond) and recorded SIHP #'s -3027 (fishpond), -3028 (fishpond), -3029 (ʻauwai), -3030 (ʻauwai), -3031 (loʻi), -3032 (loʻi), -3033 (loʻi), -3034 (loʻi) (outside the 1.5 mile research radius, not on Figure 17)
Neller and Palama 1973 (not shown in Figure 16)	Archaeological Reconnaissance	Niumalu Ahupuaʻa to Kipu Ahupuaʻa	Documented over 30 archaeological sites, all of which were located near the coast (outside the 1.5 mile research radius, not on Figure 17)
Palama 1973	Archaeological Reconnaissance	Kauaʻi Community College	Documented a Japanese cemetery (later designated SIHP # -B006), two plantation camps, a military complex, possible loʻi, and a historic ditch known as the Grove Farm "Mauka Ditch", no SIHP numbers assigned (not on Figure 17)
Kido 1986	Preliminary Survey	ʻAlekoko (Menehune) Fishpond, Hulēʻia Estuary	Provided documentation and recommendations for SIHP # -098 (Menehune Fishpond)
Walker and Rosendahl 1988	Archaeological Inventory Survey (AIS)	Grove Farm, Nāwiliwili, Niumalu, and Haʻikū Ahupuaʻa	Documented SIHP # -503, (Grove Farm Cemetery) and SIHP # -9390 (Grove Farm manager's residence) (outside the 1.5 mile research radius, not on Figure 17), no subsurface deposits were documented in any of the backhoe trenches excavated

Author(s)	Type of Study	Location	Findings (SIHP #50-30-11)
Rosendahl 1989	AIS Addendum	Grove Farm, Nāwiliwili, Niumalu, and Haʻiku Ahupuaʻa; TMK: [4] 3-3-003: Por. 1	No new sites recorded
McMahon 1990	Archaeological Field Check`	Nāwiliwili, Kalapakī, and Hanamāʻulu	Recorded three historic house sites documented as SIHP #'s -9390, -9401, and -9402 (outside the 1.5 mile research radius, not on Figure 17)
Walker et al. 1991	AIS	Līhuʻe, Puhi, Hanamāʻulu Master Plan	No sites recorded in the vicinity
Kikuchi and Remoaldo 1992 (not shown in Figure 16)	Archaeological Investigation on Cemeteries of Kauaʻi	Island-wide	Recorded 6 historic cemeteries: Lihue Lutheran Cemetery (SIHP # -B001), the Puhi Camp Cemetery (-B006), the 1st Congregational Church Cemetery (-B007), Malumalu Grave (-B009), a historic cemetery (-B010), and the Halehaka Japanese Burial Plot (-B011)
Henry et al. 1993	AIS	Grove Farm, Nāwiliwili, Niumalu, and Haʻikū Ahupuaʻa; TMK: [4] 3-3-003: Por. 1	Recorded two sites, SIHP # -503 (Historic Cemetery at Grove Farm) and SIHP # -9390 (historic house site) (outside the 1.5 mile research radius, not on Figure 17)
O'Hare et al. 1993	AIS	Puakea Golf and Country Club, Niumalu and Haʻikū	Recorded SIHP # -742, a historic bridge crossing Puali Stream
Hammatt and Chiogioji 1998	Archaeological Inventory Survey (Archaeological Assessment, AA Report)	Kaʻumaliʻi Highway Through Nāwiliwili, Haʻikū and Kōloa Ahupuaʻa	No sites recorded; noted the presence of the Grove Farm Office Building near the current project area and two bridges and a cemetery outside the 1.5 mile research radius
Hammatt and Shideler 2004	Archaeological and Cultural Impact Evaluation	One-Stop Center, Kauaʻi Community College Campus	No sites recorded

Author(s)	Type of Study	Location	Findings (SIHP #50-30-11)
Groza and Hammatt 2010	Archaeological Literature Review and Field Inspection (LRFI)	Kauaʻi Community College Campus, TMK: [4] 3-4-007:001, 002, 003 & 006	Recorded 10 plantation era sites, included five irrigation ditches (CSH-1, CSH-2, CSH-4, CSH-6, CSH-9), three reservoirs (CSH-3, CSH-5, and CSH-7), a flume (CSH-8), and the Puhi Camp Cemetery (CSH-10) (exact locations of all sites is not known)
Groza and Hammatt 2013	LRFI	Island School State Land Use District Boundary Amendment, TMK: [4] 3-8-002:016	Recorded SIHP # -2179, Features A-D, includes plantation-era water control features consisting of a reservoir recorded as Feature A, and three irrigation ditches recorded as Features B, C, and D
McMahon and Tolleson 2013	Archaeological Inventory Survey (AA Report)	Kauai Philippine Cultural Center, TMK: [4] 3-3-003:043	No sites recorded
Hunkin et al. 2014	AIS	Island School, TMK: [4] 3-8-002:016	Relocated previously recorded SIHP -2179, Feature B and recorded SIHP # -2220, a Territory of Hawaii survey marker and transit station
Kamai and Hammatt 2015	LRFI	Līhuʻe, Hanamāʻulu Mauka Road, TMKs [4] 3-4-005 & 007 and 3-8-002, 003, 005 por.	Relocated an irrigation ditch previously recorded as SIHP # -2179, Feature B, and a Territory of Hawaii survey marker and transit station previously recorded as SIHP # -2220

Author(s)	Type of Study	Location	Findings (SIHP #50-30-11)
Kamai et al. 2016	AIS	Kauaʻi Community College Campus, TMKs [4] 3-4-007:001, 002, 003, and 006	Recorded four sites, three of which were previously recorded, previously recorded sites include the Puhi Camp Cemetery (SIHP # -B006), plantation era water distribution features recorded as SIHP # -2179, and a Territory of Hawaii survey marker and transit station (SIHP # -2220), and a single newly documented site, SIHP #50-30-11-2307, consisted of a subsurface trash pit associated with the former Puhi Camp
Hazlett and Dega 2018	Archaeological Inventory Survey (Archaeological Assessment (AA Report)	Pua Loke Multi-Family Affordable Housing, TMK: [4] 3-8-005:028 & 029	No sites recorded

3.1.2 Ching et al. 1973

In 1973, Archaeological Research Center of Hawaii (ARCH) conducted a pedestrian survey of Kanoa Estate lands which included ʻAlekoko (Menehune) Fishpond and a portion of Niumalu ahupuaʻa (Ching et al. 1973). The study documented a total of nine archaeological sites, including ʻAlekoko (Menehune) Fishpond, SIHP #50-30-11-098, previously documented by Bennett (1931). The remaining eight sites were newly identified and consisted of two loko wai fishponds (inland fishponds) recorded as SIHP #'s 50-30-11-3027 and 50-30-11-3028, two ʻauwai recorded as SIHP #'s 50-30-11-3029 and 50-30-11-3030, and four loʻi complexes recorded as SIHP #'s 50-30-11-3031 through 50-30-11-3034. The study also relocated and surveyed the former Governor of Kauaʻi Paul P. Kanoa's house. The report provides significance assessments for the sites based on three levels of priority. The ʻAlekoko (Menehune) Fishpond, SIHP # -098 was assessed as the "highest" priority site, and preservation, restoration, and maintenance were recommended for the site. Governor Kanoa's house (no SIHP # assigned) was assessed as "high" priority, and preservation and restoration was recommended. However, due to remodeling of the house it was stated that the house could be removed to the conservation district after all ground structures were surveyed and mapped. The remaining sites, SIHP #'s -3027 through -3034, were assessed as "low priority" and could be destroyed with reservations.

3.1.3 Neller and Palama 1973

In 1973, ARCH conducted an archaeological reconnaissance survey of the lower portion of the Hulēʻia River and portions of Niumalu (Neller and Palama 1973). The survey documented over

30 archaeological sites and included previously documented SIHP #'s 50-30-11-093, a house site, 50-30-11-094, several house sites, and 50-30-11-098, ʻAlekoko (Menehune) Fishpond previously documented by Bennett (1931). The study also relocated previously documented SIHP #'s -3027 and -3028, two inland fishponds, SIHP #'s -3029 and -3030, two ʻauwai, and SIHP #'s -3031, -3032, -3033, -3034, four loʻi, all originally documented by Ching et al. (1973).

The remaining newly documented sites were primarily traditional Hawaiian and included SIHP # 50-30-11-3000, a habitation enclosure, 50-30-11-3001, a cave and terraces, 50-30-11-3002, a habitation enclosure, 50-30-11-3003 a habitation complex, 50-30-11-3004, the Kipu Kai Trail, 50-30-11-3005, a wall, 50-30-11-3006, a house platform, 50-30-11-3007, an alaea pit, 50-30-11-3008, several agricultural terraces and house sites, 50-30-11-3009, an agricultural complex, 50-30-11-3010, a habitation complex, 50-30-11-3011, a habitation complex and platforms, 50-30-11-3012, several enclosures, 50-30-11-3013, Pepeawa Fishpond, 50-30-11-3022, a wall, 50-30-11-3023, an enclosure, 50-30-11-3024, an enclosure 50-30-11-3025, several walls, and 50-30-11-3026, a house platform. The newly documented sites, SIHP #'s -3000 to -3013 and SIHP #'s -3022 to -3026 were located across the Hlēʻia River.

3.1.4 Palama 1973

In 1973, ARCH conducted an archaeological reconnaissance survey for the western portion of the Kauaʻi Community College (Palama 1973). The survey consisted of pedestrian reconnaissance of the approximately 57 acre gulch portion of the Kauaʻi Community College property. The study documented a Japanese cemetery (later designated as SIHP # -B006), two plantation camps, a military complex, possible loʻi, and a historic ditch known as the Grove Farm "Mauka Ditch". Following the survey, no further work was recommended and no SIHP's numbers were assigned to any of the sites documented. The obtained copy of the Palama (1973) report did not include a map showing site locations.

3.1.5 Kido 1986

In 1986, Michael H. Kido conducted a survey of the ʻAlekoko (Menehune) Fishpond and the Hulēʻia Estuary (Kido 1986). The survey documented the current condition of the pond and vicinity and recommends a more comprehensive survey of the area.

3.1.6 Walker and Rosendahl 1988

In 1988, Paul H. Rosendahl PhD. Inc. (PHRI) conducted an archaeological inventory survey for a 450-acre portion of Grove Farm south of Kaʻumualiʻi Highway in Līhuʻe and Puhi (Walker and Rosendahl 1988). The study consisted of a pedestrian survey that documented two historic properties, the historic Grove Farm Cemetery recorded as SIHP #50-30-11-0503 and the Grove Farm managers house recorded as SIHP #50-30-11-9390.

3.1.7 Rosendahl 1989

In 1989, PHRI conducted an addendum archaeological survey to the previous survey by Walker and Rosendahl (1988) for a 450-acre portion of Grove Farm (Rosendahl 1989). The addendum survey consisted of pedestrian reconnaissance of 8 additional areas which documented no additional historic properties.

3.1.8 McMahon 1990

In 1990, state archaeologist Nancy McMahon conducted a field check at three separate locations for the proposed Kauaʻi Judiciary Building (McMahon 1990). The study documented three previously identified historic plantation era house sites in the Nāwiliwili project area and included SIHP # -9390, the Grove Farm manager's house, and two other historic house sites recorded as SIHP #'s 50-30-11-9401 and 50-30-11-9402.

3.1.9 Walker et al. 1991

In 1991, PHRI conducted an archaeological inventory survey for the Līhue/Puhi/Hanamāʻulu master plan (Walker et al. 1991). The survey included approximately 1,550 acres and was surveyed in sections. An approximately 220 acre parcel designated Section 1 was the only part of the survey within the vicinity of the current project area. The study noted that the entirety of Section 1 had been modified and was under sugarcane cultivation. Due to this, only a limited survey of the area was conducted, and no subsurface excavations were carried out.

A total of ten archaeological sites were recorded well outside the current project area in the other parcels of the project. They include a pre-contact habitation deposit recorded as SIHP #'s 50-30-11-1838, a pre-contact agricultural wall and terrace recorded as 50-30-11-1839, a historic retaining wall recorded as 50-30-11-1840, a historic road recorded as 50-30-11-1841, a boundary/agricultural wall recorded as 50-30-11-1842, historic concrete foundation, road, and concrete wall recorded as 50-30-11-1843, a historic cemetery recorded as 50-30-11-1844, a historic railroad bridge recorded as 50-30-11-1845, two concrete bridges recorded as 50-30-11-1846, and Hanamāʻulu Valley as 50-30-11-1847.

3.1.10 Kikuchi and Remoaldo 1992

Cemeteries throughout Kauaʻi were documented in 1992 by the Kauaʻi Community College committee for the preservation of Hawaiian language, art and culture (Kikuchi and Remoaldo 1992). The study documented 6 historic cemeteries in the vicinity of the project area which include the Lihue Lutheran Cemetery (SIHP # -B001), the Puhi Camp Cemetery (SIHP # -B006), the 1st Congregational Church Cemetery (SIHP # -B007), Malumalu Grave (SIHP # -B009), a separate historic cemetery (SIHP # -B010), and the Halehaka Japanese Burial Plot (SIHP # -B011).

3.1.11 Henry et al. 1993

Between 1988 and 1991, PHRI conducted an archaeological inventory survey for a 590-acre portion of the former Grove Farm sugar plantation (Henry et al. 1993). The survey area included two areas that had been surveyed previously by Walker and Rosendahl (1988) and Rosendahl (1989). No new sites were identified during the survey but two previously recorded sites, SIHP # -0503, the Grove Farm Cemetery, and SIHP # -9390, the Grove Farm manager's house, were relocated. The study indicates that the manager's house, SIHP # -9390, once the home of Charles Henry Wilcox, was built in 1913. It was documented in poor condition in 1991 and sustained major damage during Hurricane ʻIniki in 1992.

3.1.12 O'Hare et al. 1993

In 1993, CSH conducted an archaeological inventory survey of approximately 100-acres for the Puakea Golf and Country Club (O'Hare et al. 1993). The study documented a single site, SIHP

#50-30-11-0742, a historic bridge crossing Puali Stream. The lack of other sites in the project area was attributed to clearing of the area for sugar cane cultivation by the Grove Farm sugar plantation.

3.1.13 Hammatt and Chiogioji 1998

In 1998, CSH conducted an archaeological assessment for an approximately 11.5 kilometer long portion of Kaʻumaualiʻi Highway from Nāwiliwili to Kōloa (Hammatt and Chiogioji 1998). The assessment consisted of pedestrian reconnaissance of the road corridor. A total of four historic properties were noted during the project, including two bridges, a cemetery, and the Grove Farm Office Building, none of which were assigned SIHP numbers. The Grove Farm Office Building is located approximately 2 blocks west of the project area.

3.1.14 Hammatt and Shideler 2004

In 2003, CSH conducted a brief field inspection of the One-Stop Center at the Kauaʻi Community College (Hammatt and Shideler 2004). The area was observed to be a graded, established lawn and background research found it to have been under sugar cane cultivation for many decades. No cultural materials were observed. In consultation with the SHPD, it was decided no further work was needed for the project.

3.1.15 Groza and Hammatt 2010

In 2010, CSH conducted an archaeological literature review and field inspection for Kauaʻi Community College rezone campus project located across Kaʻumaualiʻi Highway from the current project area (Groza and Hammatt 2010). A total of 10 plantation era sites, recorded as temporary site numbers CSH-1 through CSH-10, were documented during the pedestrian survey of the property. They included five irrigation ditches recorded as CSH-1, CSH-2, CSH-4, CSH-6, CSH-9, three reservoirs recorded as CSH-3, CSH-5, and CSH-7, a flume recorded as CSH-8, and the Puhi Camp Cemetery recorded as CSH-10. Following the field inspection, an archaeological inventory survey of the area was recommended. The full report was not found during our research, therefore, the exact locations of many of the sites is not known.

3.1.16 Groza and Hammatt 2013

In 2010, CSH conducted an archaeological literature review and field inspection for the Island School land use district boundary amendment project (Groza and Hammatt 2013). The pedestrian survey of the project area documented a single historic property, SIHP #50-30-11-2179. The site consisted of four water control features associated with the Lihue Plantation which were designated Features A-D. They include a reservoir recorded as Feature A, and three irrigation ditches recorded as Features B, C, and D. SIHP # -2179 was assessed as significant for its information content under criterion d and an archaeological inventory survey of the area was recommended prior to development.

3.1.17 McMahon and Tolleson 2013

In 2013, Exploration Associates, Ltd. conducted an archaeological inventory survey for the Kauai Philippine Cultural Center (McMahon and Tolleson 2013). Due to the negative results of the survey, it was termed an archaeological assessment. The survey consisted of a pedestrian survey of the area and the excavation of 4 backhoe trenches. No artifacts or deposits were

encountered during the surface survey or in any of the backhoe trenches excavated. The study concluded that the parcel had been under sugarcane cultivation and was subsequently graded, leveled, and covered with topsoil during development of the YMCA of Kauaʻi and the Chiefess Kamakahelei Middle School.

3.1.18 Hunkin et al. 2014

In 2014, CSH conducted an archaeological inventory survey and cultural impact assessment for the Island School (Hunkin et al. 2014 and Magat et al. 2014)). The survey relocated an irrigation ditch that had been previously recorded as SIHP # -2179, Feature B during a literature review and field inspection for the Island School land use district boundary amendment project (Groza and Hammatt 2013). A single newly documented site was encountered during the survey and consisted of a Territory of Hawaii survey marker and transit station recorded as SIHP #50-30-11-2220.

3.1.19 Kamai et al. 2015

In 2014, CSH conducted an archaeological literature review and field inspection for the proposed Līhuʻe Hanamāʻulu mauka road and several potential future mauka roads (Kamai et al. 2015). The literature review identified several previously recorded sites within and along the proposed Līhuʻe Hanamāʻulu mauka road and the several potential future mauka roads. A total of 36 feature components of a previously recorded plantation era agricultural complex recorded as SIHP # -2218. They were identified in the Līhuʻe Hanamāʻulu mauka road section far outside the vicinity of the project to the east. Two sites were identified in the potential future mauka road section of the project in the vicinity of the project area. They included a plantation era irrigation ditch previously recorded as Feature B of SIHP # -2179 and of a Territory of Hawaii survey marker and transit station recorded as SIHP #50-30-11-2220.

The field inspection was mostly conducted within and adjacent to existing cane haul roads and documented temporary sites CSH-1 through CSH-4 and SIHP #2218, Feature 47, all of which were plantation era ditch features located outside the vicinity of the project area to the west. All of the features were assessed as significant under criterion d, for their information content. The study determined that the project may have an adverse effect on the plantation era infrastructure associated with SIHP #'s -2218 and -2719 as well as SIHP # -2220, the Territory of Hawaii survey marker and transit station and further documentation was recommended prior to development.

3.1.20 Kamai et al. 2016

In 2015, CSH conducted an archaeological inventory survey for the Kauaʻi Community College rezone campus project located across Kaʻumauliʻi Highway from the current project area (Kamai et al. 2016). The survey consisted of pedestrian reconnaissance and the excavation of 17 backhoe trenches throughout the project area. A total of four sites were documented, three of which were previously recorded. The three previously recorded sites included the Puhi Camp Cemetery, SIHP #50-30-11-B006, plantation era water distribution features recorded as SIHP # -2179, and a Territory of Hawaii survey marker and transit station recorded as SIHP # -2220. The single newly documented site, SIHP #50-30-11-2307, consisted of a subsurface trash pit associated with the former Puhi Camp. Following the survey, no further work was recommended for SIHP #'s -2179, -2220, and -2307. It was recommended that portions of SIHP # -2179 be incorporated into the new campus design if possible and that SIHP # -B006, although outside the project area, be preserved through avoidance and protection.

3.1.21 Hazlett and Dega 2018

In 2017, Scientific Consulting Services conducted an archaeological inventory survey for the Pua Loke multi-family affordable housing development (Hazlett and Dega 2018). Due to the negative results of the survey, it was termed an archaeological assessment. The field effort consisted of a pedestrian survey of the project area and the excavation of 11 backhoe trenches within the project area. Fill materials overlying natural truncated soils were observed in all of the trenches excavated and no cultural materials or deposits of any kind were encountered. Additionally, no historic properties were documented during the pedestrian survey of the area.

3.2 Nearby Historic Properties

A total of 11 historic properties are present within a 1.5 mile radius of the project area (see Figure 17). All of the sites in the vicinity are from the plantation era and associated with the Grove Farm and Lihue plantations. The types of sites documented in the vicinity include historic houses, two historic cemeteries, a historic bridge, the Grove Farm locomotives, plantation water control features, a Territory of Hawaii survey datum, and a subsurface trash pit associated with the former Puhi housing. A listing of sites with information including site type, site significance and recommendations is included as Table 2.

Bishop Museum archaeologist Wendell Clark Bennett identified a single archaeological site in the area, SIHP #50-30-11-098, the ʻAlekoko (Menehune) Fishpond, during his island-wide survey of Kauaʻi between 1928 and 1929. Several additional surveys of SIHP # -098, ʻAlekoko (Menehune) Fishpond have been conducted since that time as part of a cursory survey and condition assessment and two large archaeological inventory surveys of the area (Kido 1986, Ching et al. 1973, Neller and Palama 1973). SIHP # -098 was added to the NRHP as #73000677 in 1973 (Martin 1973).

The Grove Farm plantation cemetery, SIHP #50-30-11-0503, is located to southwest of the project area and was first documented during an archaeological inventory survey of 450-acres of the Grove Farm plantation (Walker and Rosendahl 1988). The site was relocated during an additional archaeological inventory survey of 590-acres of Grove Farm plantation which included the previous 450-acre project area (Henry et al. 1993). Background research indicated that the cemetery was used for Japanese and Hawaiian plantation workers at Grove Farm up until the early 1960's. Other historic-era sites associated with the Grove Farm plantation include SIHP # -0742, a historic bridge crossing Puali Stream documented during an archaeological inventory survey for the Puakea Golf and Country Club and SIHP # -9381, the Grove Farm Locomotives which include four preserved locomotives on the grounds of the Grove Farm Sugar Plantation Museum at the site of the original Wilcox plantation homestead. (O'Hare et al. 1993).

The Walker and Rosendahl (1988) study also documented a plantation-era house, SIHP #50-30-11-9390, later identified as the Grove Farm manager's house. SIHP # -9390 was documented again in 1990 by state archaeologist Nancy McMahon during a survey of three proposed location for the Kauaʻi Judiciary Building (McMahon 1990). Two additional plantation era houses, SIHP #'s 50-30-11-9401 and 50-30-11-9402, were also documented during the survey. The Grove Farm manager's house, SIHP # -9390, was documented a third time during the Henry et al. (1993) archaeological survey. Background research indicated the house was belonged to Charles Henry Wilcox, the manager of Grove Farm, and was constructed in 1913. The survey documented SIHP # -9390 in poor to fair condition in 1991 and it was severely damaged during Hurricane ʻIniki in

1992. The current condition of SIHP #'s -9390, -9401, and -9402 is unknown but is possible that they have been destroyed. Additionally, the location of SIHP # -9402 is unknown.

The Gaylord P. Wilcox house, also known as Kilohana, is located to the northwest of the project area and recorded as SIHP #50-30-11-9339 (Baer et al. 1982). In 1993 the house was assessed as eligible for listing on the National Register of Historic Places (NRHP) under Criterion c but was never added to the national register. The house currently functions as Kilohana and operates tours and hosts events.

The remaining sites in the area were documented during several field inspections and surveys for the Kauaʻi Community College and Island School. The initial archaeological literature review and field inspection for the Island School documented a single historic property, SIHP # -2179 (Groza et al. 2013). The site consisted of four water control features associated with the Lihue Plantation which were designated Features A-D. They include a reservoir recorded as Feature A, and three irrigation ditches recorded as Features B, C, and D. A subsequent archaeological inventory survey of the property relocated Feature B of SIHP # -2179 and recorded SIHP # -2220, a Territory of Hawaii survey marker and transit station (Hunkin et al. 2014). The sites were assessed as eligible under criterion d and no further work was recommended for SIHP # -2220.

The initial archaeological literature review and field inspection for Kauaʻi Community College documented 10 temporary sites recorded as CSH-1 through CSH-10 (Groza et al. 2010). A subsequent archaeological inventory survey of the property documented four sites, three of which were previously recorded (Kamai et al. 2016). The three previously recorded sites included the Puhi Camp Cemetery, SIHP #50-30-11-B006, plantation era water distribution features recorded as SIHP # -2179, and a Territory of Hawaii survey marker and transit station recorded as SIHP # -2220. The single newly documented site, SIHP #50-30-11-2307, consisted of a subsurface trash pit associated with the former Puhi Camp. Following the survey, no further work was recommended for SIHP #'s -2179, -2220, and -2307. It was recommended that portions of SIHP # -2179 be incorporated into the new campus design if possible and that SIHP # -B006, although outside the project area, be preserved through avoidance and protection.

The cemeteries of the area including SIHP # -B006 were documented in 1992 during an inventory of the cemeteries of Kauaʻi by the Kauaʻi Community College committee for the preservation of Hawaiian language, art and culture (Kikuchi and Remoaldo 1992). The study documented 6 historic cemeteries in the vicinity of the project area which included the Lihue Lutheran Cemetery recorded as SIHP # -B001, the Puhi Camp Cemetery recorded as SIHP # -B006, the 1st Congregational Church Cemetery recorded as SIHP # -B007, Malumalu Grave recorded as SIHP # -B009, a historic cemetery recorded as SIHP # -B010, and the Halehaka Japanese Burial Plot as SIHP # -B011.

Table 2. Archaeological Sites Documented Within a 1.5-mile Radius of the Project Area

Reference	SIHP #50-30-11	Site Type	Site Significance	Recommendation	Notes
Kikuchi and Remaoldo 1992	-B001	Lihue Lutheran Cemetery	Criteria d and e	Preservation	--
Palama 1973, Kikuchi and Remaoldo 1992, Kamai et al. 2016	-B006	Puhi Camp Cemetery	Criteria d, and e	Preservation	--
Kikuchi and Remaoldo 1992	-B007	1st Congregational Church Cemetery	Criteria d and e	Preservation	--
Kikuchi and Remaoldo 1992	-B009	Malumalu Grave	Criteria d and e	Preservation	--
Kikuchi and Remaoldo 1992	-B010	Historic Cemetery	Criteria d and e	Preservation	--
Kikuchi and Remaoldo	-B011	Halehaka Japanese Plot	Criteria d and e	Preservation	--
Walker and Rosendahl 1988, Henry et al. 1993	-0503	Grove Farm Cemetery	Criteria c, d, and e	Preservation	--
O'Hare et al. 1993	-742	Historic Bridge	--	Preservation	--
Groza and Hammatt 2013, Hunkin et al. 2014, Kamai et al. 2016	-2179	Plantation Era Water Control Features	Criterion d	Incorporation into KCC development plan, possible interpretive development	Three irrigation ditches and a reservoir
Hunkin et al. 2014	-2220	Territory of Hawaii Survey Marker and Transit Station	Criterion d	No further work	--

Reference	SIHP #50-30-11	Site Type	Site Significance	Recommendation	Notes
Kamai et al. 2016	-2307	Subsurface Trash Pit	Criterion d	No further work	--
Morrison 1973	-9339	Gaylord P. Wilcox House (Kilohana)	Criteria c and d	Preservation	--
Statewide Inventory of Historic Places 1974, Schleck and Napoka 1979	-9381	Grove Farm Company Locomotives	Unknown	Preservation	NRHP # 79000761
Walker and Rosendahl 1988, McMahon 1990, Henry et al. 1993	-9390	Historic Grove Farm Manager's House	Unknown	Preservation	Possibly destroyed
McMahon 1990	-9401	Plantation-era House	Unknown	Preservation	Possibly destroyed
McMahon 1990 (not shown on Figure 17)	-9402	Plantation-era House	Unknown	Location Unknown	Possibly destroyed

Archaeological Field Inspection

Fieldwork for this project was conducted on July 7th, 2021 by Nathan DiVito, B.A. Fieldwork was conducted under the general supervision of Rosanna Thurman, M.A., (principal investigator), who has a Master's Degree in Applied Archaeology and over 14 years of experience in archaeological field inventories, historic property assessments, and site evaluations in Hawai'i. Archaeological monitoring was performed under the archaeological permit number 21-24, issued to Honua Consulting by the SHPD/DLNR in accordance with HAR Chapter 13-282.

4.1 Methodology

The archaeological field inspection consisted of a 100% pedestrian survey of the project area. It included a visual inspection for any constructed surface architecture and observation of the ground surface and soil exposures for artifacts and/or exposed cultural deposits. The pedestrian survey transects were spaced at 2 meter intervals throughout the project area for maximum coverage (Figure 18).

Digital photographs were taken throughout the project to record the vegetation, topography, and condition of the project area. An associated photo log was maintained, which recorded the subject of the photograph, the direction the camera was pointing, and other information as appropriate. A hand-held Trimble GeoXT (6000 series) device was used to record transect paths and the location of points of interest on the property. The Trimble maintained an accuracy ranging between 1-3 m (3-10 ft.) and recorded data was post-processed for accuracy.

Figure 18. Aerial photo showing survey transects throughout the project area

4.2 Survey Results

The project area is located in the southeastern portion of Kaua‘i and is situated on the gently sloping uplands below the southeastern flank of Kilohana Crater along Ka‘umuali‘i Highway in the town of Puhi. The project area is bordered by Ka‘umuali‘i Highway on the north, Nani Street on the east, Welau Street on the south, and on the west by the Puhi Paint and Gammie Homecare commercial space and a Shell gas station with car wash facility (Figure 19 and Figure 20). A sidewalk and bus stop border the project area along Ka‘umuali‘i Highway. The property currently functions as a community park and is surrounded by a metal chain link fence with two entrances along Welau Street. The topography of the property is flat. The project area is at least 60 cm higher than Welau Road to the south. Ka‘umuali‘i Highway, to the north, is higher in elevation than the project area. It is likely that the property has been previously graded and/or filled to construct the park space.

The interior of the property consisted of manicured lawn grass, a line of alternating milo (*Thespesia populnea*) and kukui (*Aleurites moluccanus*) trees along the southern fence line, and three evenly spaced areas with a Poinciana (*Delonix regia*) tree and picnic table encircled by crotons (*Codiaeum variegatum*) (Figure 21). Landscaping fabric was exposed on the perimeter of the property along the sloping shoulder greenspace for the highway and around electrical boxes along Nani Road.

Two 10 foot high tetherball poles and two metal play structures are located in the middle of the park. The play structures are identical and measured approximately 4.5 meters long, 3.5 meters wide, and 2.4 meters high and have been constructed of cast metal pipe fittings (Figure 22). One play structure has been painted green and the other has been painted yellow. They each have two ladders on both sides with an upright sliding pole at the end, although the ladders on the green structure are bent and damaged. The play structures have a snake motif and a cast metal snake head with plantation-style lauhala hat at the front end of each (Figure 23). A makers mark reading “GAME TIME INC. / LITCHFIELD . MICHIGAN / 1015” is embossed on the cast metal pipe fittings of the structure and indicates they were produced by Game Time Incorporated, a maker of playground equipment since 1929 (Figure 24). The Game Time Inc. manufacturing facility was located in Litchfield, Michigan until 1979 when it moved to Fort Payne, Alabama. Game Time Inc. still manufactures playground equipment and operates today as a division of PlayCore, Inc. The community park was presumably developed shortly after construction of the neighborhood to the south in the late 1960’s. This makes it likely that the two play structures were produced and set within the project area sometime between the late 1960’s and 1979. It is recommended that the playground set does not possess integrity or significance and is not a historic property.

A small 80 x 80 cm square concrete slab was present between the two play structures (Figure 25). It was raised 10 cm above the ground surface and had no other defining characteristics. It is likely related to the nearby playground equipment.

The emergency alert and warning siren for Puhi Town is located just within the western boundary of the project area and is connected via a subsurface electrical utility (Figure 26). Electrical utility boxes are present in the small grassy shoulder portion of the project area outside the fence and adjacent to Nani Street and a drain and water line run along Welau Street adjacent to south side of the project area.

Figure 19. Overview photo of the project area from the northwest corner looking east

Figure 20. Overview photo of the project area from the northeast corner looking west

Figure 21. Overview photo of landscaped vegetation within the project area from the western side of the parcel looking east

Figure 22. Overview photo of play structures and small concrete slab located in the middle of the project area looking south

Figure 23. Close-up view of play structures with snake motif present within the project area

Figure 24. Close-up photo of Game Time Inc. makers mark present on both play structures

Figure 25. Close-up photo showing small concrete slab present between the two play structures

Figure 26. Overview photo of the Puhi town emergency alert and warning siren looking west

Summary and Recommendations

At the request of the County of Kauaʻi, Honua Consulting, LLC conducted an archaeological literature review and field inspection for the Puhi Development Project located in Haʻikū and Niumalu Ahupuaʻa, Puna District, Kauaʻi Island, TMK: [4] 3-3-004:020. The project area is situated in the southeastern portion of Kauaʻi along Kaʻumualiʻi Highway in the town of Puhi and measures approximately 2.911 acres. The project area currently functions as a community park owned and maintained by the County of Kauaʻi.

Traditionally, the area surrounding Nāwiliwili Bay and the Hulēʻia River would have had a substantial traditional Hawaiian population based on the proximity of ʻAlekoko (Menehune) Fishpond, a large fishpond along the Hulēʻia River, and numerous heiau formerly present in commanding locations around the bay. The project area is located in the uplands of Haʻikū and Niumalu on the lightly sloping lands beneath the southeastern flank of Kilohana Crater. Little is known of traditional land use in the surrounding area due to modifications to the land and waterways for commercial sugarcane cultivation as early as the mid- 19th century.

The ahupuaʻa of Haʻikū and Niumalu, both of which include the project area, were awarded as Land Commission Award(LCA) 7713 ʻāpana 2, Royal Patent (RP) 4479 , to Victoria Kamāmalu during the Māhele. The only exception was several kuleana lands awarded as various LCA's along Puali Stream and on the Niumalu Flats in Niumalu Ahupuaʻa and along the Hulēʻia River in Haʻikū Ahupuaʻa. Eventually the land was purchased and consolidated under the Grove Farm sugar plantation in the latter half of the 1800s. Historic maps along with aerial photographs show that the project area was under sugarcane cultivation as early as the late 1800's with continued use through the 1960's. Just northwest of the project area, Puhi Camp was built between 1917 and 1920 as a village-style community for plantation laborers and their families. A residential neighborhood was constructed to the south in the late 1960's and the project area was designated a community park in its current configuration by the early 1970's. A 1971 LCApp shows the property in its current size and configuration (refer to Figure 15). The only changes to the project area since that time have been the installation of an emergency warning siren along the western boundary and the installation of electrical utility boxes on the eastern-most side of the project area along Nani Street.

No previous archaeological studies have been conducted within the project area and no sites are known to be present. The numerous studies that have been conducted in the vicinity include surveys for the Kauaʻi Community College, the Philippine Cultural Center, the Island School, highway improvements, and several former and current Grove Farm properties in support of commercial and residential developments. These studies documented plantation era sites associated with the Grove Farm and Lihue Plantations and included historic houses, two historic cemeteries, a historic bridge, the Grove Farm locomotives, plantation water control features, a Territory of Hawaii survey datum, and a subsurface trash pit associated with the former Puhi housing.

The purpose of this literature review and field inspection was to determine the land-use history of the project area and to identify any potential artifacts, surface architecture, or cultural deposits present on the ground surface of the property and to provide historic preservation recommendations for the project. The field investigation included a 100% pedestrian survey of the project area. Historic playground equipment was observed and photographed, however, this study

recommends it does not possess integrity or significance and is not a historic property. Nothing else of archaeological note was documented or collected within the project area. The lack of significant surface sites is attributed to use of the project area for commercial sugarcane cultivation and subsequent development and use as a community park.

Fieldwork for the current project was performed under the archaeological permit number 21-24 issued to Honua Consulting by the SHPD, in accordance with HAR 13-282. This study is not an AIS, however, it was written using standards outlined within HAR 13-276 for archaeological inventory surveys and is intended to assist with historic preservation efforts associated with the project.

Background research and the results of this investigation support a project determination of "no historic properties affected". However, due to the proximity of multiple historic properties associated with Grove Farm and the proximity of the plantation village, Puhi Camp, archaeological monitoring guided by an archaeological monitoring plan is recommended for the proposed project.

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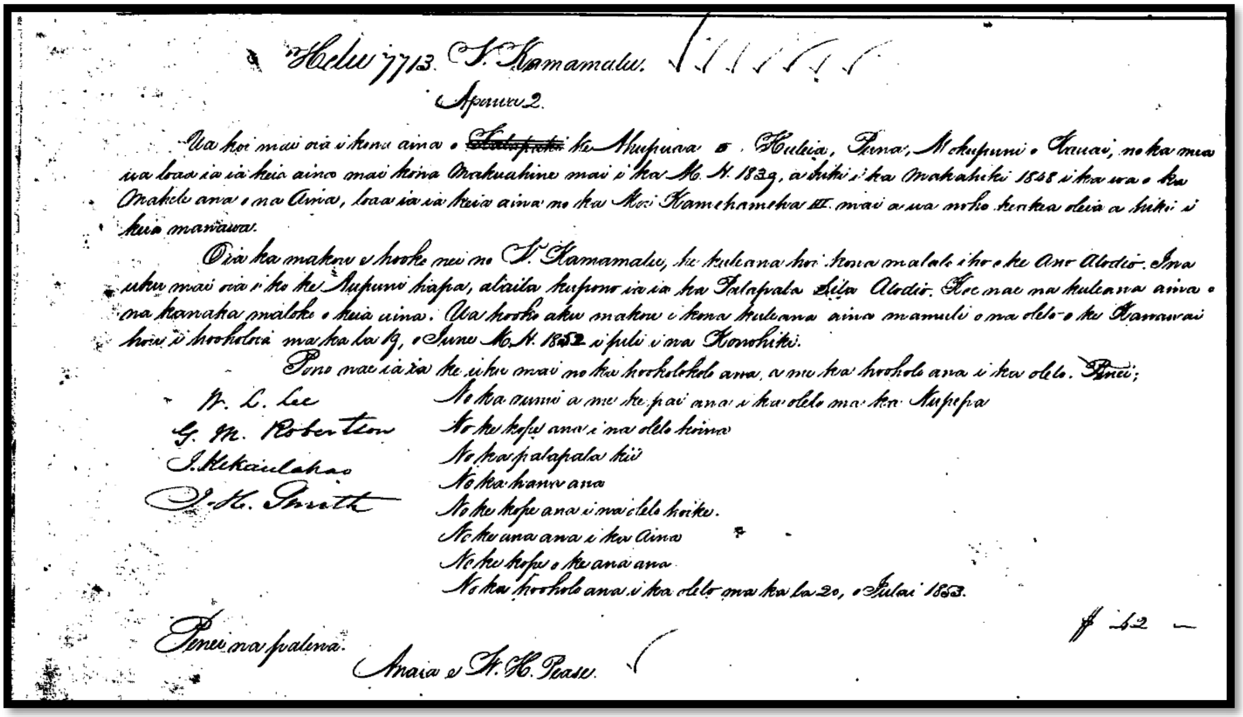
Appendix A: Māhele Documentation



Helu 7713. V. Kamamalu.

Apana 2.

Ua hoi mai oia i kona aina o ~~[illegible]~~ ke Ahupuaa o Huleia, Puna, Mokupuni o Kauai, no ka mea ua loaa ia ia keia aina mai kona Makuahine mai i ka M. H. 1839, a hiki i ka makahiki 1848 i ka wa o ka Mahele ana o na Aina, loaa ia ia keia aina no ka Moi Kamehameha III mai a ua noho kuikahi oleia a hiki i keia manawa.

Oia ka makou e hooko nei no V. Kamamalu, ke kuleana hoi kona malalo iho o ke Ano Alodio. Ina uku mai oia i ko ke Aupuni hapa, alaila kupono ia ia ka Palapala Sila Alodio. Koe nae na kuleana aina o na kanaka maloko o keia aina. Ua hooko aku makou i keia kuleana aina mamuli o na olelo o ke Kanawai hou i hooholoia ma ka la 19, o June M. H. 1852 i pili i na Konohiki.

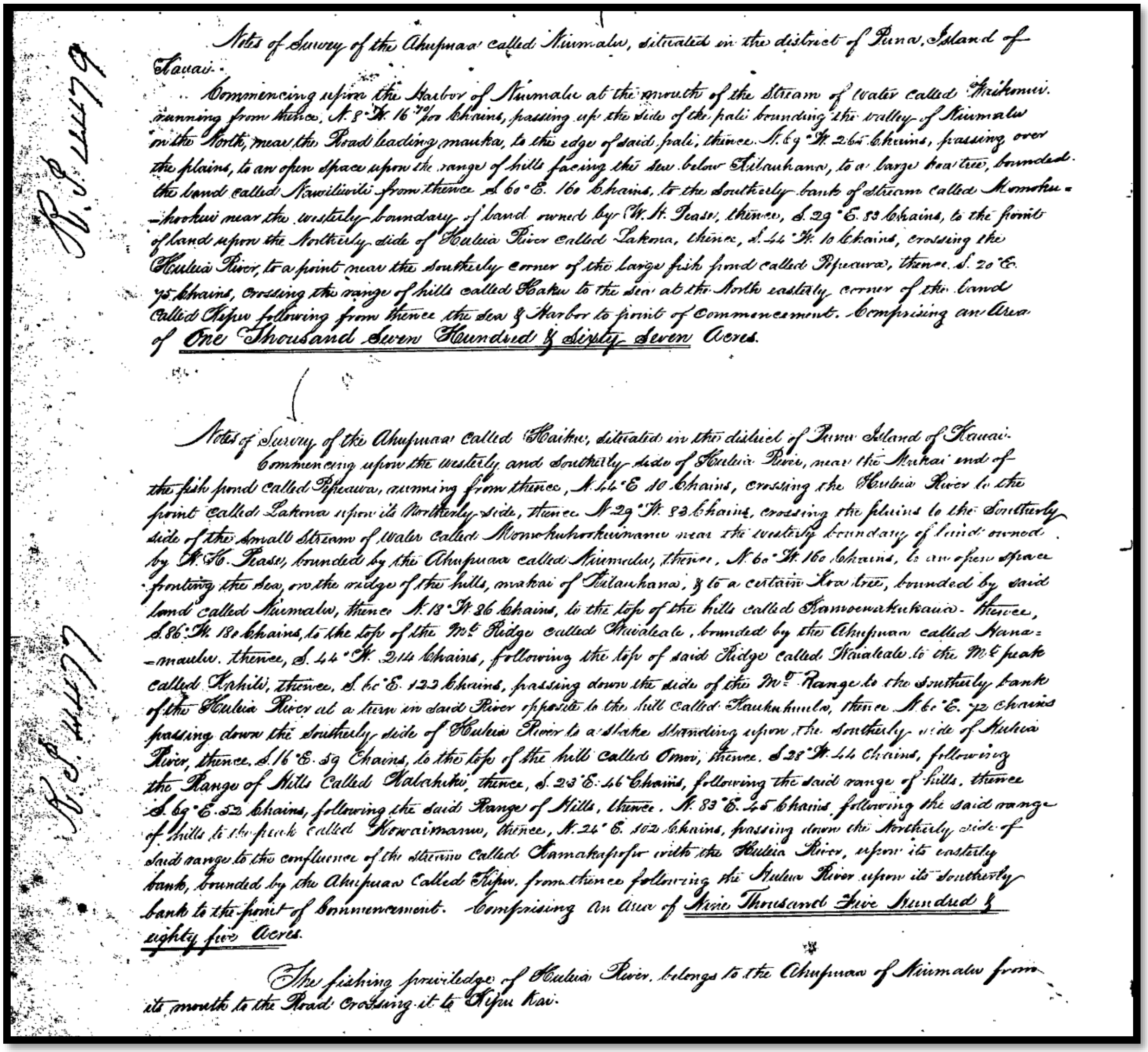
Pono nae ia ia ke uku mai no ka hookolokolo ana, a me ka hoohole ana i ka olelo. Penei;

W. L. Lee — No ka [illegible] a me ke pai ana i ka olelo ma ka Nupepa
G. M. Robertson — No ke kope ana i na olelo koina
I. Kekaulahao — No ka palapala kii
J. H. Smith — No ka hana ana
No ke kope ana i na olelo hoike.
No ke ana ana i ka Aina
No ke kope o ke ana ana
No ka hoohole ana i ka olelo ma ka la 20, o Iulai 1853.

$ 62 —

Penei na palena. Anaia e W. H. Pease.

LCA 7713 ‘āpana 2 to Victoria Kamāmalu (Māhele Award Book Reel 11, Vol. 9 pg. 263)



R.P. 4479

Notes of Survey of the Ahupuaa called Niumalu, situated in the district of Puna, Island of Kauai.

Commencing upon the Harbor of Niumalu at the mouth of the Stream of water called Waikomo, running from thence, N. 8° W. 16 70/100 Chains, passing up the side of the pali bounding the valley of Niumalu on the North, near the Road leading mauka, to the edge of said pali; thence N. 69° W. 265 Chains, passing over the plains, to an open space upon the range of hills facing the sea below Kilauhana, to a large koa tree, bounded the land called Nawiliwili from thence S. 60° E. 160 Chains, to the Southerly bank of Stream called Momohu-hookui near the westerly boundary of land owned by W. H. Pease, thence, S. 29° E. 83 Chains, to the point of land upon the Northerly side of Huleia River called Lakona, thence, S. 44° W. 10 Chains, crossing the Huleia River, to a point near the Southerly corner of the large fish pond called Pepeawa, thence S. 20° E. 75 Chains, crossing the range of hills called Haku to the sea at the North easterly corner of the land called Kipu following from thence the sea & Harbor to point of Commencement. Comprising an Area of One Thousand Seven Hundred & Sixty Seven Acres.

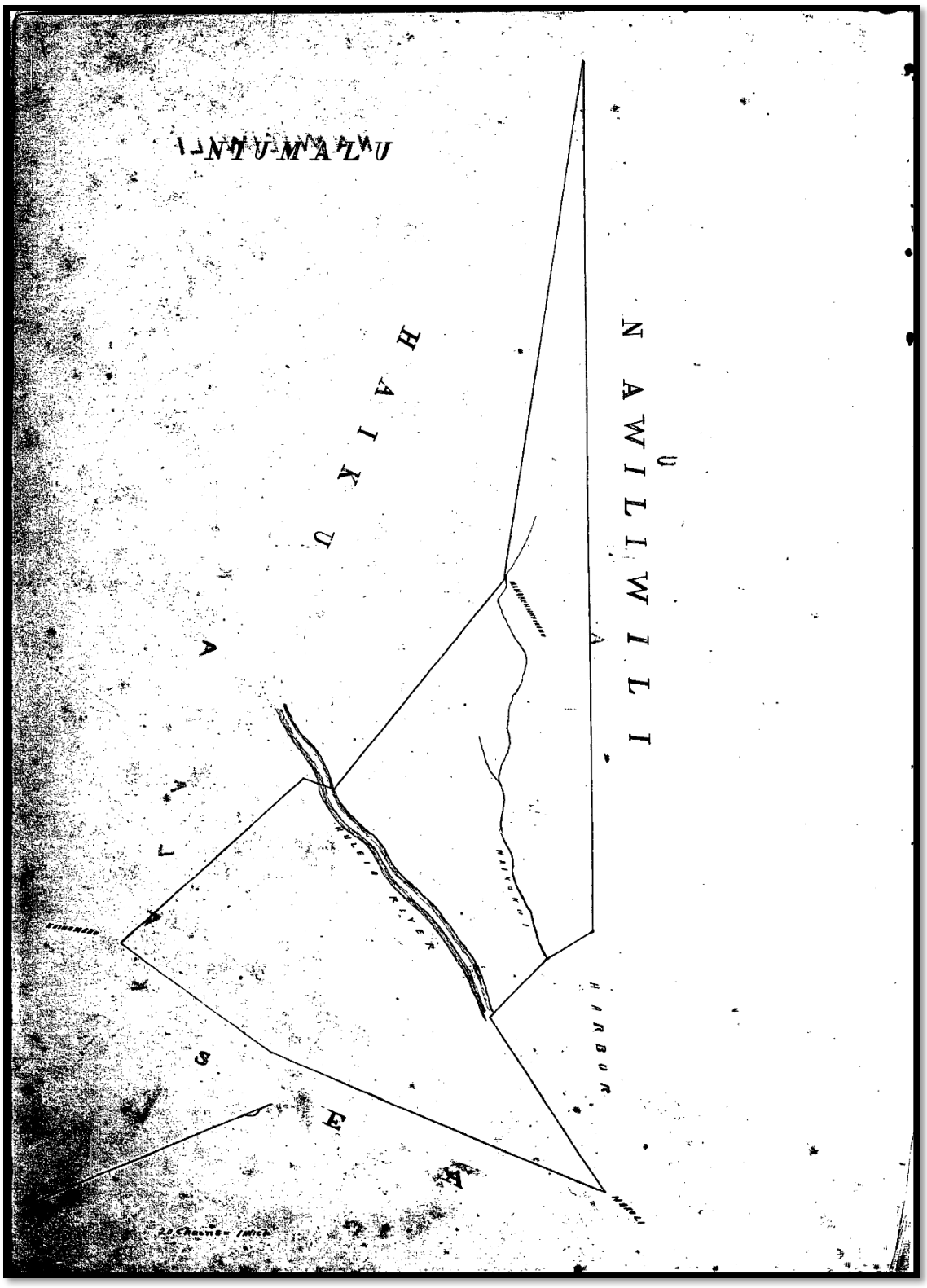
R.P. 4477

Notes of Survey of the Ahupuaa called Haiku, situated in the district of Puna Island of Kauai.

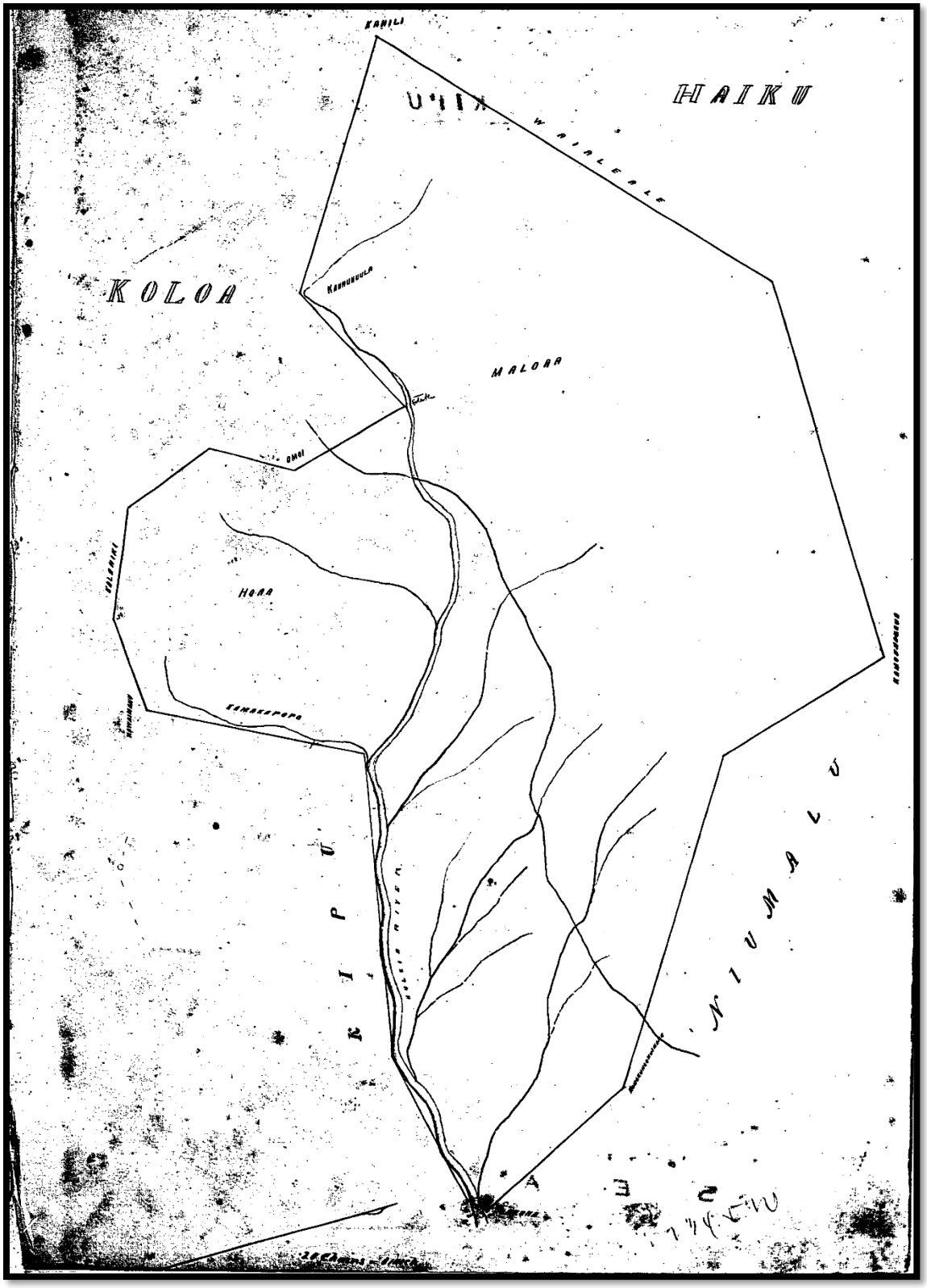
Commencing upon the westerly and Southerly side of Huleia River, near the Makai end of the fish pond called Pepeawa, running from thence, N. 44° E 10 Chains, crossing the Huleia River to the point called Lakona upon its Northerly side, thence N 29° W. 83 Chains, crossing the plains to the Southerly side of the Small Stream of Water called Momohuhookuimanu near the westerly boundary of land owned by W. H. Pease, bounded by the Ahupuaa called Niumalu, thence, N. 60° W. 160 Chains, to an open space fronting the sea, on the ridge of the hills, makai of Kilauhana, & to a certain Koa tree, bounded by said land called Niumalu, thence N. 18° W. 26 Chains, to the top of the hills called Kamoenakukaua. thence, S. 86° W. 180 Chains, to the top of the Mt. Ridge called Waialeale, bounded by the Ahupuaa called Hana-maulu. thence, S. 44° W. 214 Chains, following the top of said Ridge called Waialeale to the Mt. peak called Kahili, thence, S. 60° E. 122 Chains, passing down the side of the Mt. Range to the southerly bank of the Huleia River at a turn in said River opposite to the hill called Kaukahuula, thence N. 60° E. 72 Chains passing down the southerly side of Huleia River to a stake standing upon the southerly side of Huleia River, thence S. 16° E. 59 Chains, to the top of the hill called Omoi, thence. S 28° W. 44 Chains, following the Range of Hills called Kalahiki, thence, S. 23° E. 46 Chains, following the said range of hills. thence S. 69° E. 52 Chains, following the said Range of Hills, thence. N. 83° E. 45 Chains, following the said range of hills to the peak called Kowaimanu, thence, N. 24° E. 102 Chains, passing down the Northerly side of said range to the confluence of the stream called Kamakapopo with the Huleia River, upon its easterly bank, bounded by the Ahupuaa called Kipu, from thence following the Huleia River upon its southerly bank to the point of Commencement. Comprising an Area of Nine Thousand Five Hundred & eighty five Acres.

The fishing priviledge of Huleia River, belongs to the Ahupuaa of Niumalu from its mouth to the Road crossing it to Kipu Kai.

LCA 7713 ʻāpana 2 to Victoria Kamāmalu, Niumalu and Haʻikū survey notes (Māhele Award Book Reel 11, Vol. 9 pg. 264)

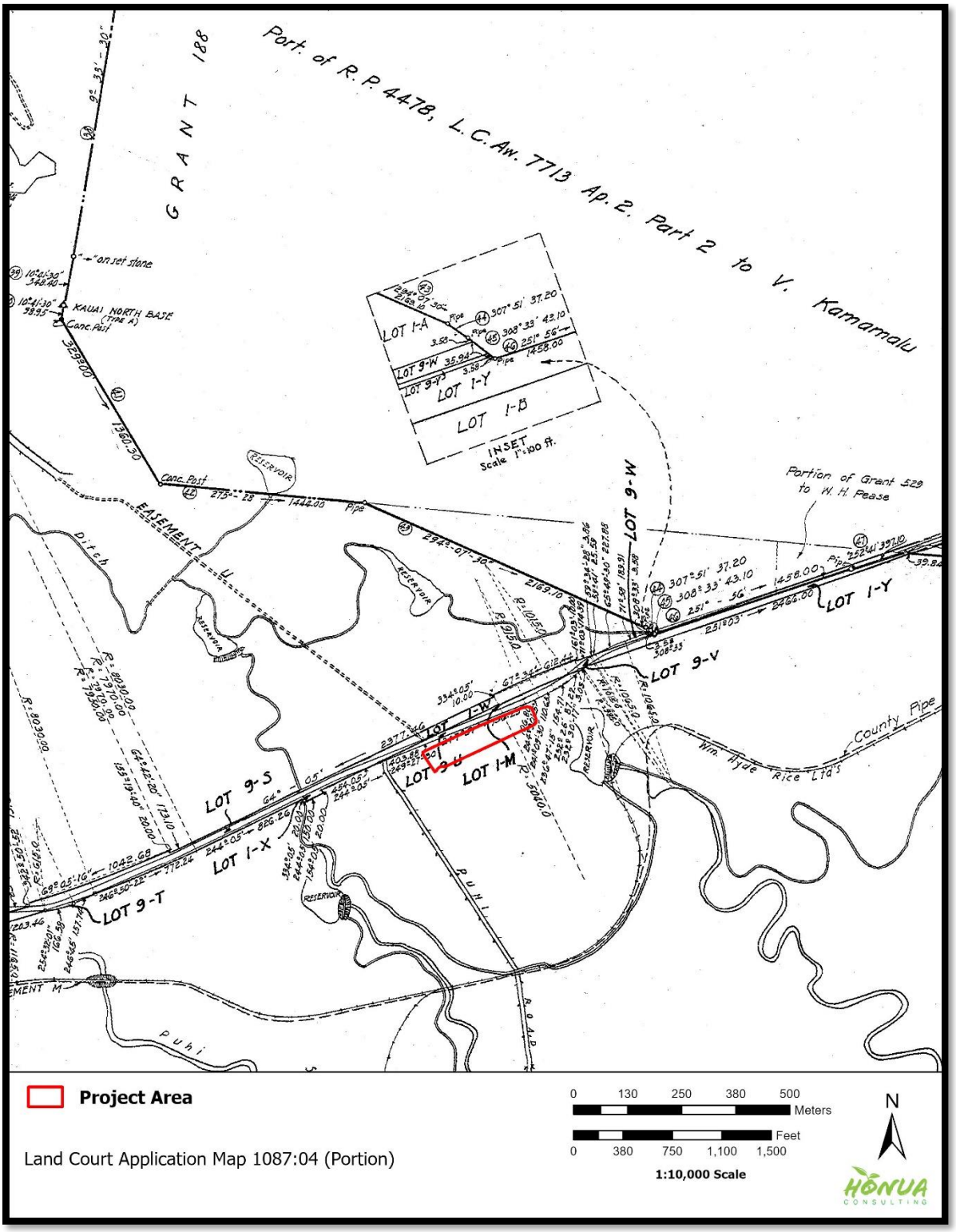


LCA 7713ʻāpana 2 to Victoria Kamāmalu, map of Niumalu Ahupuaʻa (Māhele Award Book Reel 11, Vol. 9)

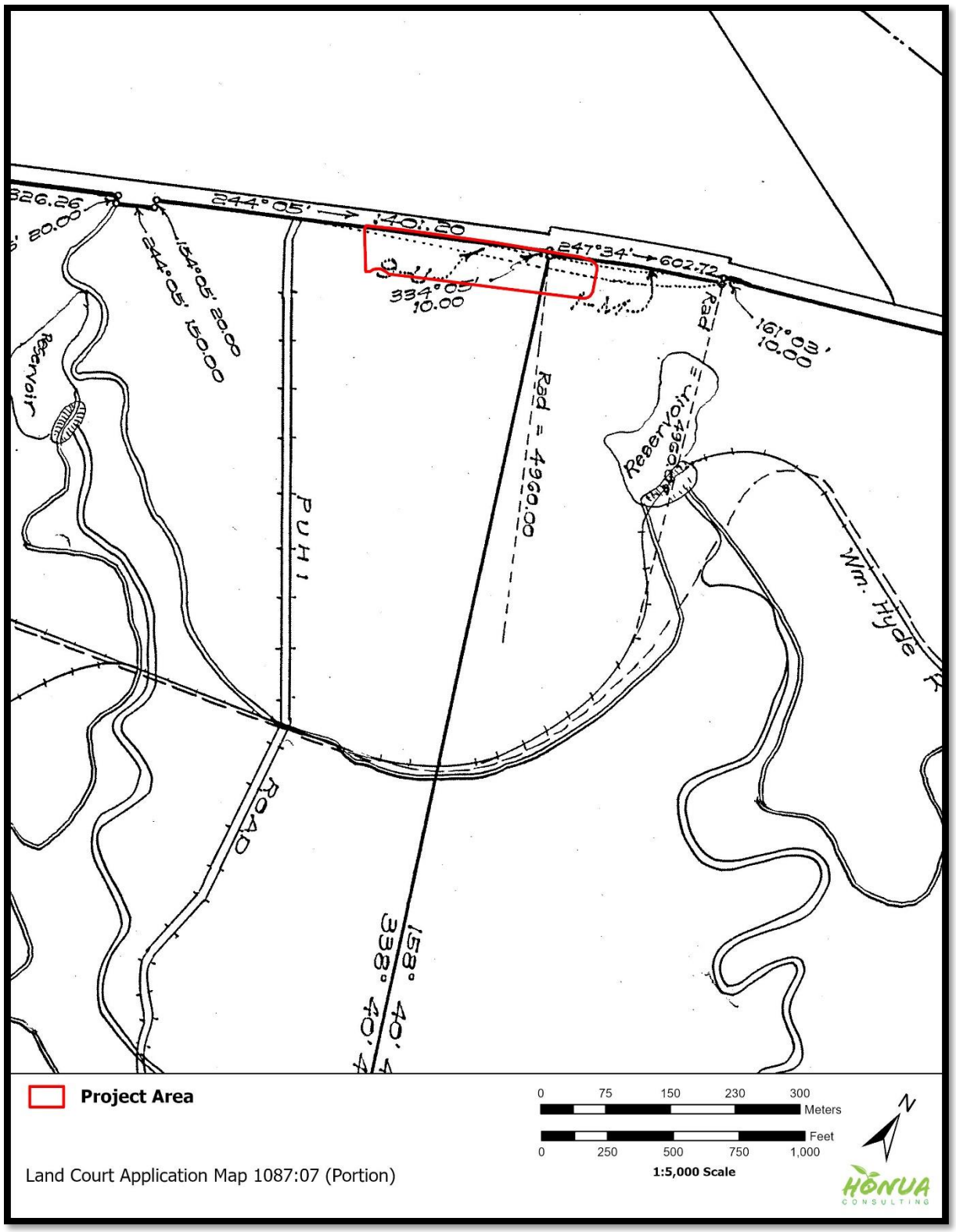


LCA 7713‘āpana 2 to Victoria Kamāmalu, map of Ha‘ikū Ahupua‘a (Māhele Award Book Reel 11, Vol. 9)

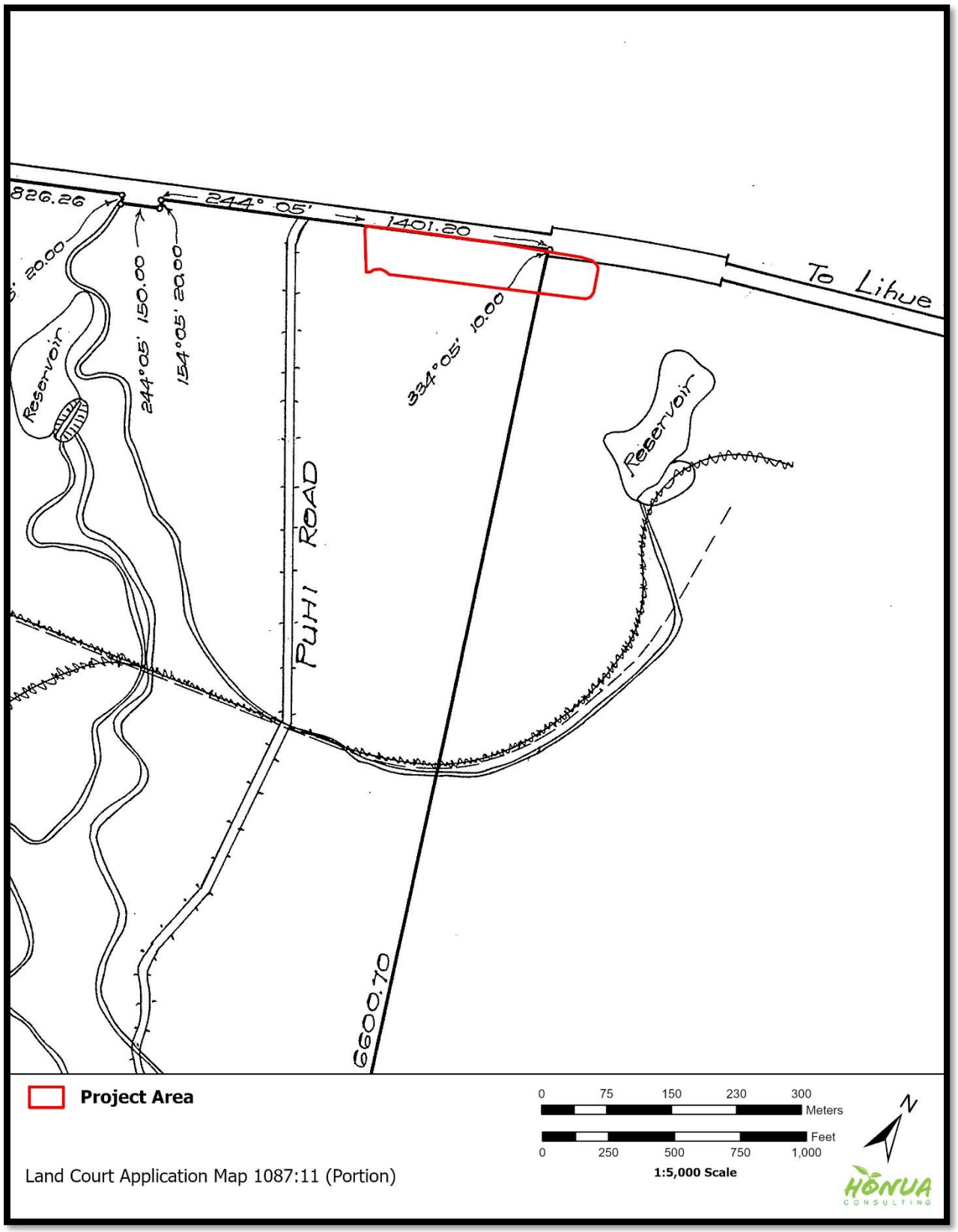
Appendix B: LCApp Map Documentation



Portion of LCApp 1087 Map 004 showing the location of the project area (Whitehouse 1937)



Portion of LCApp 1087 Map 007 showing the location of the project area (Towill 1949)



Portion of LCApp 1087 Map 011 showing the location of the project area (Towill 1952)

Appendix D:
Traffic Impact Analysis Report

DRAFT

TRAFFIC IMPACT ANALYSIS REPORT
KAHUA HOOULU AFFORDABLE HOUSING
LIHUE, KAUAI, HAWAII

August 2021

Prepared for:
County of Kauai Housing Agency
Piʻikoi Building
4444 Rice Street, Suite 330
Līhuʻe, HI 96766

Prepared by:
Community Planning and Engineering, Inc.
1286 Queen Emma Street
Honolulu, HI 96813

Table of Contents

List of Figures and Tables

1 Introduction

1.1 Purpose

The purpose of this traffic impact analysis report is to evaluate the existing conditions and determine the impact of the traffic generated by the proposed affordable housing development, Kahua Hooulu.

1.2 Project Location

The project site is located in the Puhi area on the island of Kauai. The vacant lot is identified as Tax Map Key (TMK) (4) 3-3-004: 020. The location of this project is shown in Figure 1. The parcel is approximately 2.91-acre and is bordered by Kaumualii Highway on the north, Nani Street on the east and Welau Street on the south. A commercial building and car wash station is located west of the parcel.

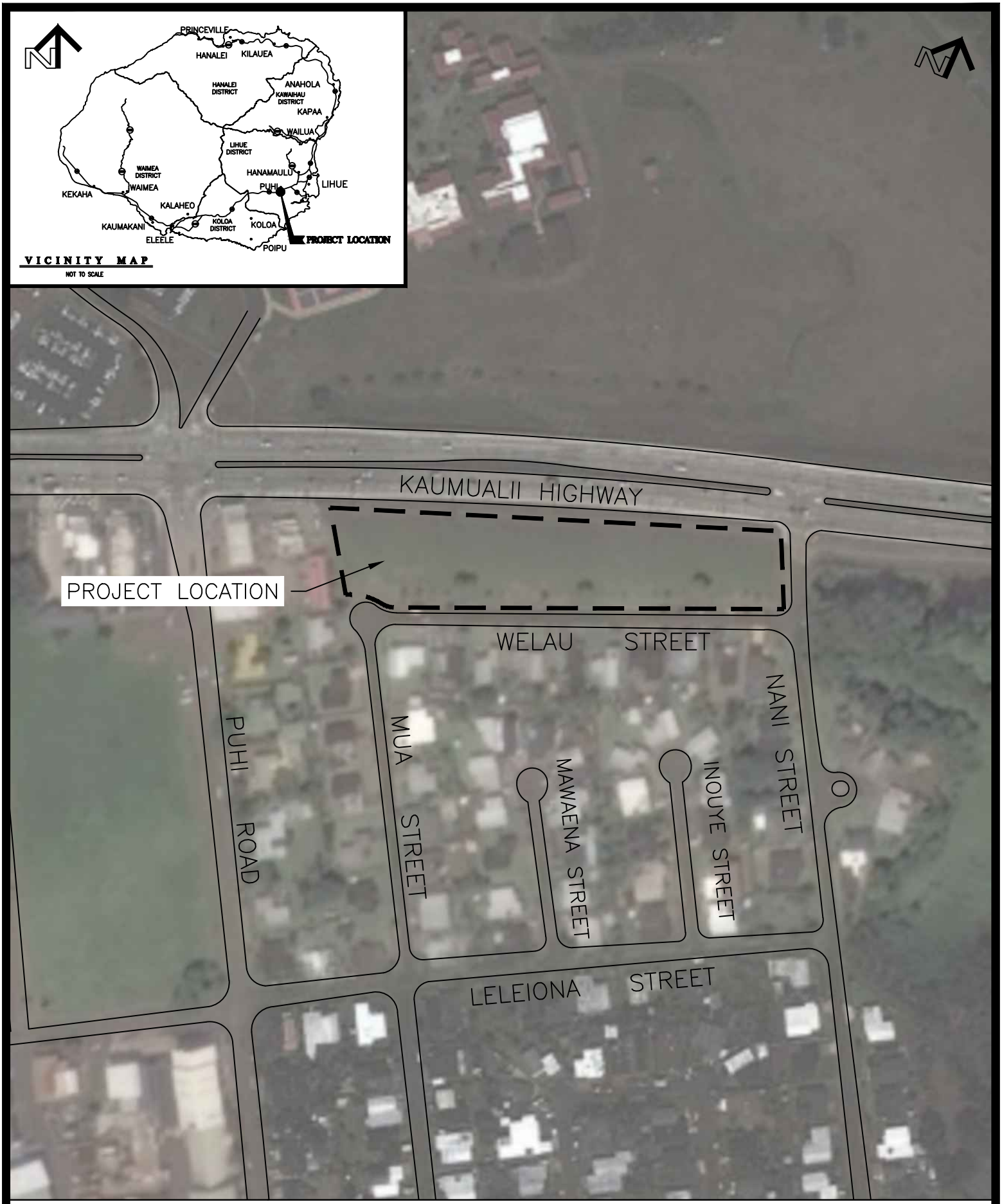
For the proposed development, a traffic analysis was performed for the nearby intersections. Traffic data and field observations were collected at five intersections:

1. Kaumualii Highway and Puhi Road
2. Kaumualii Highway and Nani Street
3. Puhi Road and Leleiona Street
4. Leleiona Street and Mua Street
5. Nani Street and Welau Street

1.3 Project Description

The County of Kauai Housing Agency (CKHA) is planning to develop a vacant parcel into a 60-unit affordable housing which will consist of studio, 1-bedroom and 2-bedroom units. There will be five 3-story buildings, each with a building footprint area of 2,880 square feet (sq. ft.). An early education facility will potentially be included with the affordable housing development. A conceptual plan of the affordable housing is shown in Figure 2. The project is anticipated to be completed and fully occupied by 2026.

Vehicular access to the development will be from two driveways off of Welau Street; one driveway is 125-feet west of Nani Street and the other driveway is 100-feet east of Mua Street. The anticipated traffic flow to access the parcel for vehicles traveling from the north, east, or west of the project site will be via Kaumualii Highway to Nani Street to Welau Street. For vehicles coming from the south, the traffic flow will be from Puhi Road to Leliona Street to Mua Street to Welau Street. Pedestrian access to the development from Kaumualii Highway will be provided thru an opening on the north side of the development. This will provide access to the existing bus stops along Kaumualii Highway and a shorter walking path towards Kauai Community College.

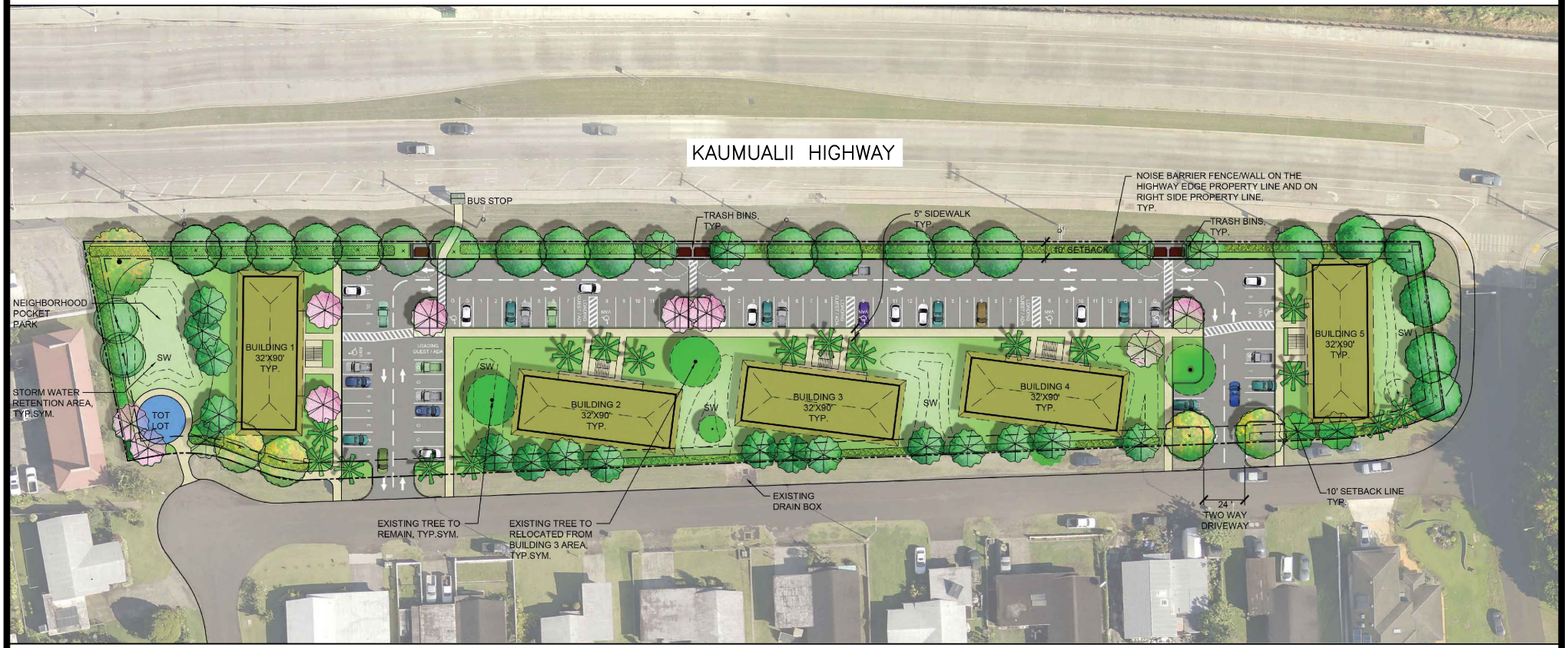


KAHUA HOOULU AFFORDABLE HOUSING

Community Planning and Engineering, Inc.
Engineering Design | Construction Management | Infrastructure Planning
1286 Queen Emma St Honolulu, Hawaii

LOCATION MAP

FIGURE 1



KAHUA HOOULU AFFORDABLE HOUSING

cp&e **Community Planning and Engineering, Inc.**
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CONCEPTUAL PLAN

FIGURE 2

1.4 Analysis Methodology

Level of Service (LOS) of an intersection was used to determine traffic impacts based on projected traffic conditions generated from the alternatives by comparing them to an existing condition baseline control. The Highway Capacity Manual (HCM) was used to determine the LOS of the intersection. Refer to Table 1 and 2 below for the LOS criteria for an unsignalized and signalized intersection, respectively.

Table 1: Level of Service Criteria for Unsignalized Intersections

Control Delay (s/veh)	**LOS by Volume-to-Capacity Ratio**	
	v/c < 1.0	v/c ≥ 1.0
0-10	A	F
>10-15	B	F
>15-25	C	F
>25-35	D	F
>35-50	E	F
>50	F	F
Source : Highway Capacity Manual 6th Edition, Transportation Research Board		

Table 2: Level of Service Criteria for Signalized Intersections

Control Delay (s/veh)	**LOS by Volume-to-Capacity Ratio**	
	v/c < 1.0	v/c ≥ 1.0
≤10	A	F
>10-20	B	F
>20-35	C	F
>25-35	D	F
>35-55	E	F
>80	F	F
Source : Highway Capacity Manual 6th Edition, Transportation Research Board		

Traffic analysis of the study intersection was performed using Synchro, an analysis software that develops reports based on methods described in the HCM. The results of the reports generated by Synchro for AM and PM peak were used along with field observations to provide a more thorough analysis for this report.

2 Existing Conditions

2.1 Existing Site Conditions

Kaumualii Highway (State Route 50) is a four-lane, two-way, divided arterial. The roadway is under the jurisdiction of the State of Hawaii. There are 8-foot wide concrete sidewalks and 5-foot wide bike lanes on both sides of the roadway near the project site. There is a bus stop with bus bay located on either side of the highway. The speed limit is 25 miles per hour (mph).

Puhi Road is a two-way, two-lane collector roadway that servers as a connection to residential and industrial areas. The roadway is under the jurisdiction of the County of Kauai. There is a 5-foot wide sidewalk, a 6-foot wide planter strip, a 7-foot wide parallel parking area and a 6-foot wide bike lane on the Lihue side of Puhi Road. The speed limit is 25 mph.

Welau Street, Nani Street, Mua Street and Leleiona Street are all two-way, two-lane roadways. These roadways are under the County of Kauai jurisdiction. The shoulder area is grassed and there are no improved sidewalks or marked bike lanes along these roadways. The speed limit is 25 mph.

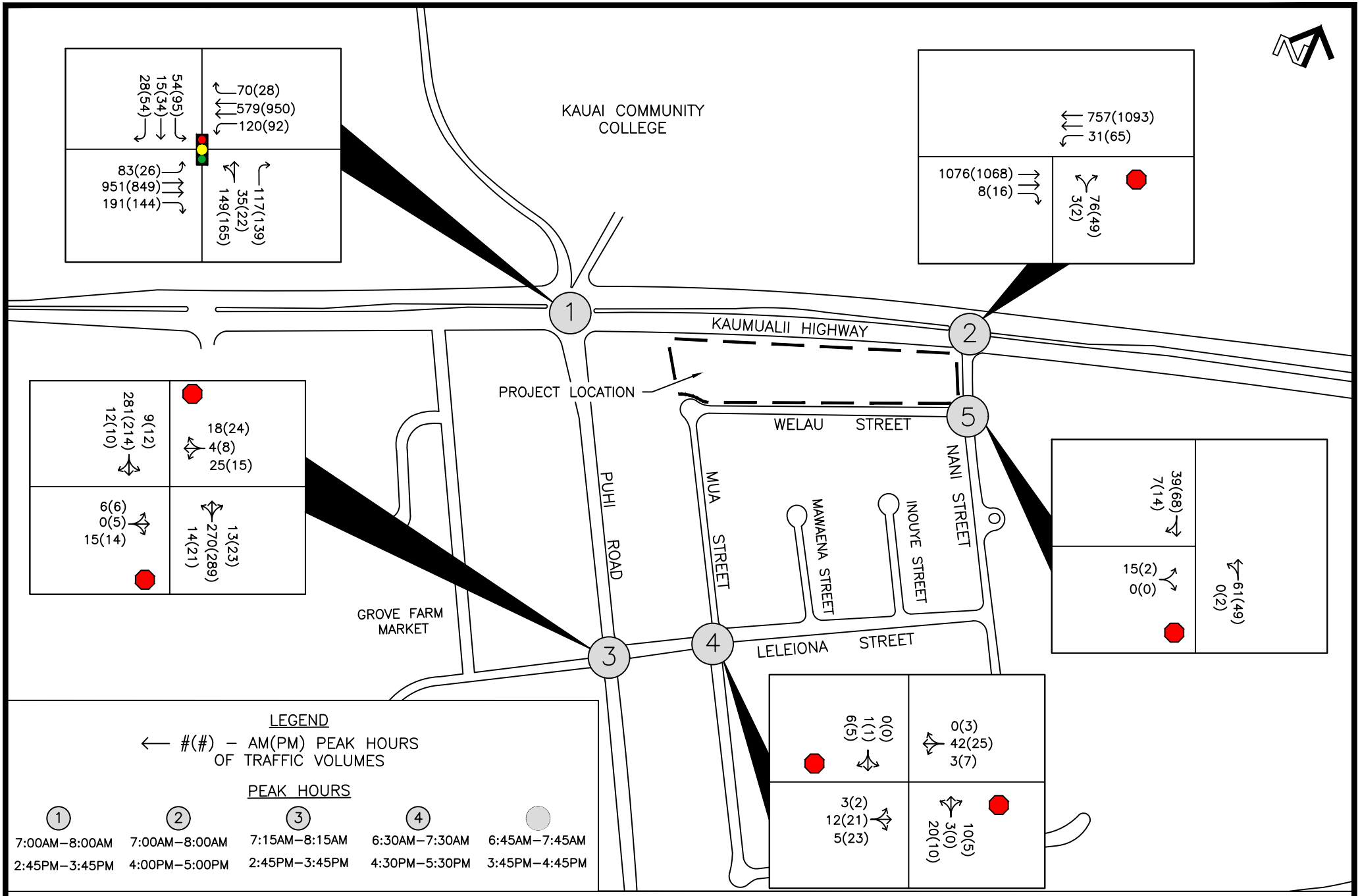
2.2 Traffic Data for Existing Conditions

The traffic volumes for this report were collected on Wednesday, May 5, 2021 from 6:00-9:00 AM and 2:30-5:30 PM. The following intersections were studied:

(1) Kaumualii Highway/Puhi Road (signalized)
(2) Puhi Road/Leleiona Street (unsignalized)
(3) Leleiona Street/Mua Street (unsignalized)
(4) Kaumualii Highway/Nani Street (unsignalized)
(5) Nani Street/Welau Street (unsignalized)

The turning movement volumes of each intersection and the corresponding lane configurations are shown in Figure 3 for the AM and PM peak hours. The AM and PM peak hours varied at each intersection and are listed in Figure 3. The traffic volumes used at each intersection were based on the individual intersection AM and PM peak hours to analyze a conservative scenario of vehicular traffic at each intersection. Traffic volume data for all intersections are included in Appendix A.

The County of Kauai was under an emergency order for the COVID-19 pandemic. This meant travel restrictions were still in place decreasing the number of tourists arriving in the islands, as well as school and work restrictions permitting distance learning and working from home. The 2019 historical roadway volume along Kaumualii Highway and Puhi Road were compared to the existing traffic data collected for this project to determine if the traffic volumes collected were significantly different due to the COVID-19 pandemic. However, the traffic volumes collected were similar to the historical traffic volumes along Kaumualii Highway and Puhi Road and traffic data seem to represent the existing roadway network.



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EXISTING TRAFFIC VOLUMES

FIGURE 3

2.3 Traffic Analysis for Existing Conditions

To analyze the existing traffic conditions at the study intersection, the vehicle delay, LOS and Volume-to-Capacity ratio (V/C) was determined. For the purposes of this traffic analysis, the volume of traffic during the AM and PM peak hour was used to model the existing traffic conditions in the Synchro program. The traffic volumes for the AM peak and PM peak hour was modeled in the program. All intersections operated at LOS C or better.

A few turning movements at the signalized intersection of Kaumualii Highway and Puhi Road operated at LOS D or LOS E. The movements are the eastbound left turn movement, the westbound left turn movement and the northbound left and through movement. All other turning movements operated at LOS C or better and no movements had a V/C ratio greater than 1.

Refer to Table 3 for the analysis results of the existing traffic conditions. Detailed intersection data reports for the existing conditions are included in Appendix B.

Table 3: Existing Intersection Operations

Road Name	Approach	Movement	AM Peak Hour			PM Peak Hour		
			Delay (s/veh)	LOS	V/C	Delay (s/veh)	LOS	V/C
Kaumualii Highway at Puhi Road/Kauai Community College driveway (Signalized)								
Kaumualii Hwy	Eastbound	Left	55.8	E	0.43	47.9	D	0.13
		Thru	30.5	C	0.68	25.1	C	0.56
	Westbound	Left	53.4	D	0.49	55.0	D	0.44
		Thru	22.2	C	0.39	26.5	C	0.63
Puhi Rd	Northbound	Left-Thru	38.1	D	0.44	39.8	D	0.45
KCC dwy	Southbound	Left	31.1	C	0.12	33.0	C	0.20
		Thru	29.8	C	0.03	30.9	C	0.07
Intersection			31.2	C	-	28.8	C	-
Puhi Road and Leleiona Street (TWSC)								
Leleiona St	Eastbound	Left-Thru-Right	13.0	B	0.05	12.7	B	0.06
	Westbound	Left-Thru-Right	14.3	B	0.12	13.4	B	0.11
Puhi Rd	Northbound	Left	8.1	A	0.01	7.8	A	0.02
	Southbound	Left	7.9	A	0.01	8.1	A	0.01
Intersection			1.7	A	-	1.9	A	-
Leleiona Street and Mua Street (TWSC)								
Leleiona St	Eastbound	Left	7.3	A	0.01	7.3	A	0.01
	Westbound	Left	7.3	A	0.01	7.3	A	0.01
Mua St	Northbound	Left-Thru-Right	9.1	A	0.05	8.9	A	0.02
	Southbound	Left-Thru-Right	8.7	A	0.01	8.7	A	0.01
Intersection			3.9	A	-	2.5	A	-
Kaumualii Highway and Nani Street (TWSC)								
Kaumualii Hwy	Westbound	Left	11.8	B	0.06	12.1	B	0.12
Nani St	Northbound	Left-Right	17.1	C	0.23	17.3	C	0.16
Intersection			0.9	A	-	0.7	A	-
Nani Street and Welau Street (TWSC)								
Welau St	Eastbound	Left-Right	9.2	A	0.02	9.3	A	0.01
Nani St	Northbound	Left	0.0	A	0.00	7.4	A	0.01
Intersection			1.1	A	-	0.3	A	-

3 Proposed Traffic Conditions

3.1 *Proposed Project Conditions*

The proposed Kahua Hooulu affordable housing development will occupy a vacant parcel located between Kaumualii Highway on the north, Nani Street on the east and Welau Street on the south. There will be 60 residential dwelling units. In addition to the residential units, there will be a potential of an early educational facility. There are 78 parking stall proposed on the site. Vehicle access to the proposed development will be from two driveways off Welau Street. One driveway is 125-feet west of Nani Street and the other driveway is 100-feet east of Mua Street. Both driveways will be two-way access. Pedestrian access from the development to the bus stop along Kaumualii Highway will be provided via an opening on the north side of the development. There will be sidewalks throughout the proposed development.

3.2 *Project Trip Generation*

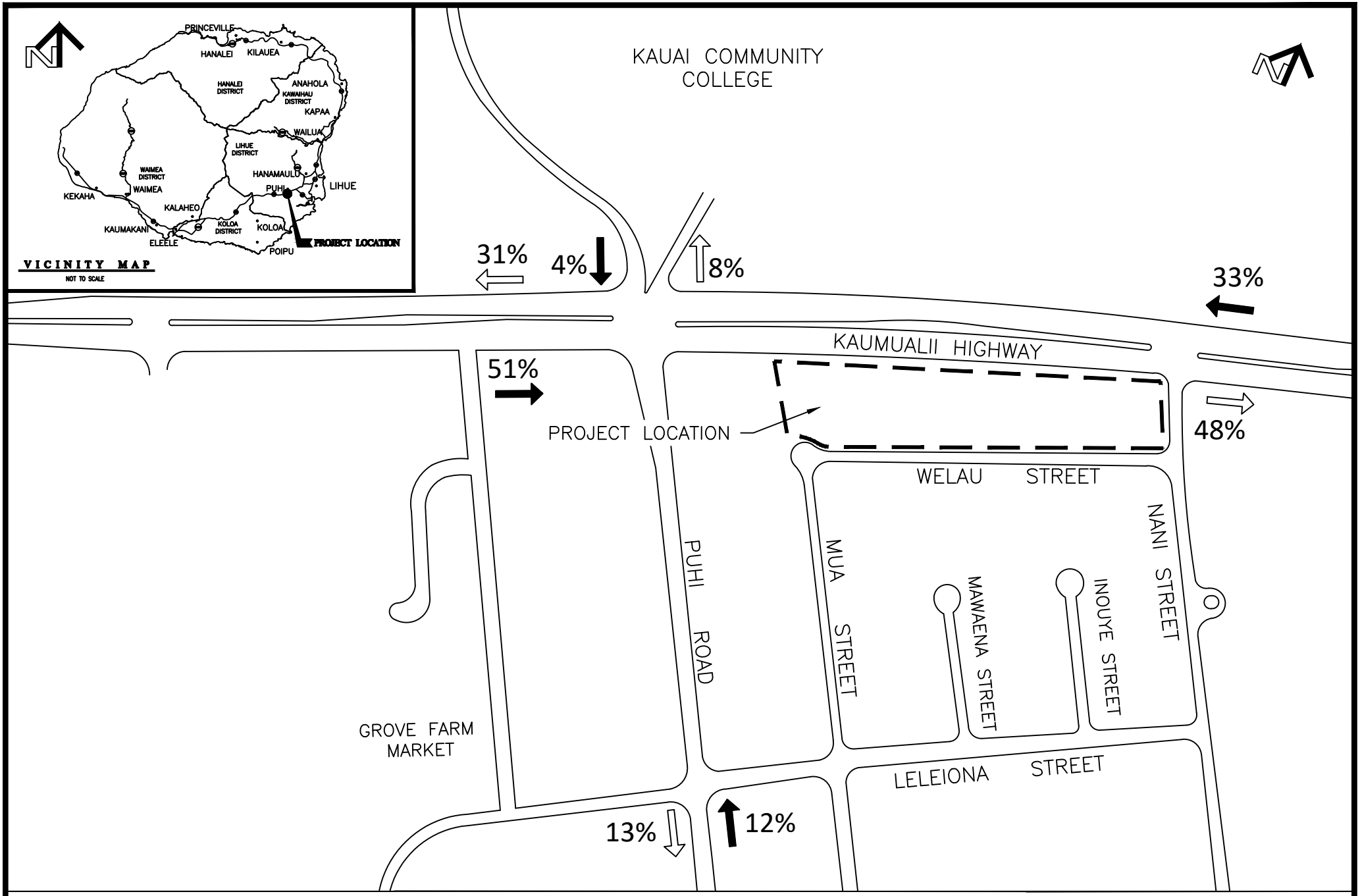
The ITE Trip Generation Manual, 10th Edition was referenced to forecast the estimated number of trips that will be generated by the proposed affordable housing and day care center. The trip generation land uses for the proposed development includes Multifamily Housing (Mid-Rise) and Day Care Center. For the proposed development, 22 (AM) and 32 (PM) vehicles are estimated to enter the proposed development while 30 (AM) and 28 (PM) vehicles are estimated to exit. All trips are assumed to be vehicle trips. Table 4 shows the project generated trips.

Trip distribution rates were based off of the existing traffic volumes. Vehicles traveling east, west, or north are anticipated to use Kaumualii Highway while vehicles traveling south would use Puhi Road. Figures 4 and 5 provide the incoming and outgoing trip distribution during the AM and PM peak hours. Project related trips were assigned based on the trip distribution and are shown in Figure 6. The future traffic volumes include the existing traffic volumes with the project related trips. The future traffic volumes are shown in Figure 7.

Table 4: Project Generated Trips

Land Use (Code)	Weekday AM Peak hour of adjacent street traffic		Weekday PM Peak hour of adjacent street traffic	
	Enter	Exit	Enter	Exit
Mid-Rise Multi-Family Housing (221) 60 units[1]	5	15	17	11
Day Care Center (565) 2,880 sq. ft.[2]	17	15	15	17
Total	**22**	**30**	**32**	**28**

[1]- AM Equation: Ln(T)=0.96Ln(X)-0.63; PM Equation: Ln(T)=0.98Ln(X)-0.98; X=Dwelling Units
[2]-AM Equation: T=11.00(X); PM Equation: T=11.12(X); X=1,000 Sq. Ft. Gross



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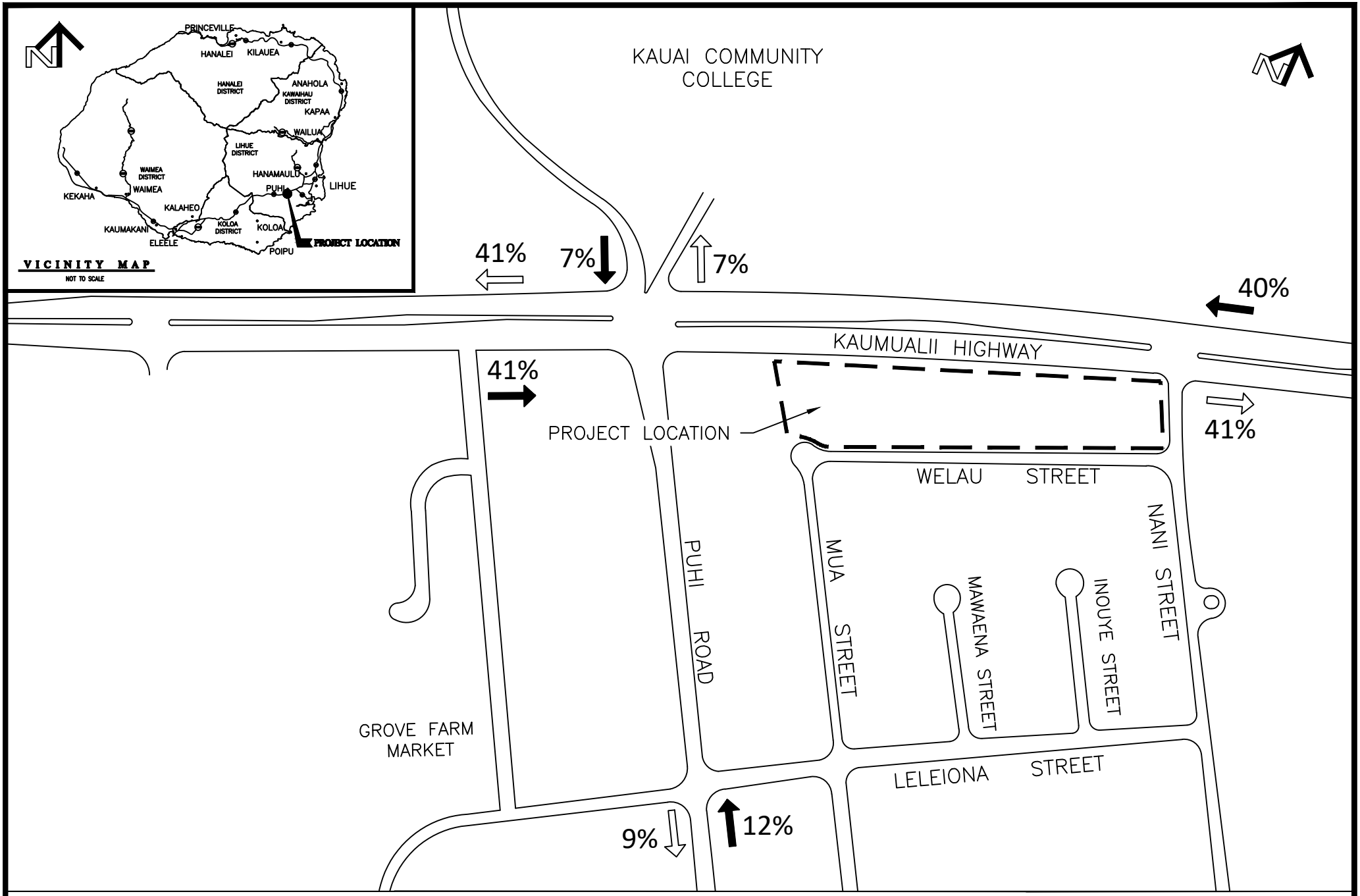
PROJECT TRIP DISTRIBUTION
AM PEAK HOUR

FIGURE 4



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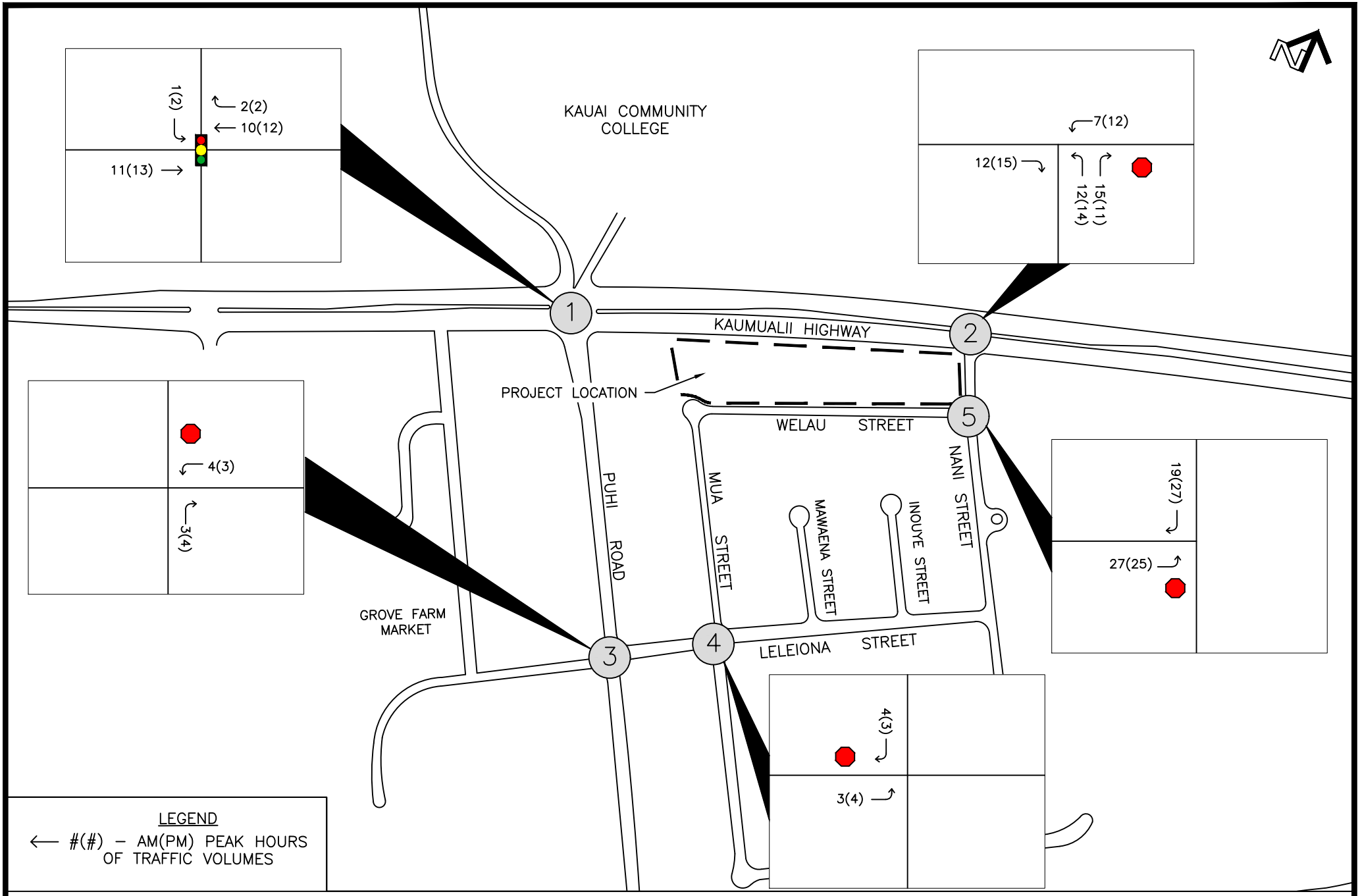
PROJECT TRIP DISTRIBUTION
PM PEAK HOUR

FIGURE
5



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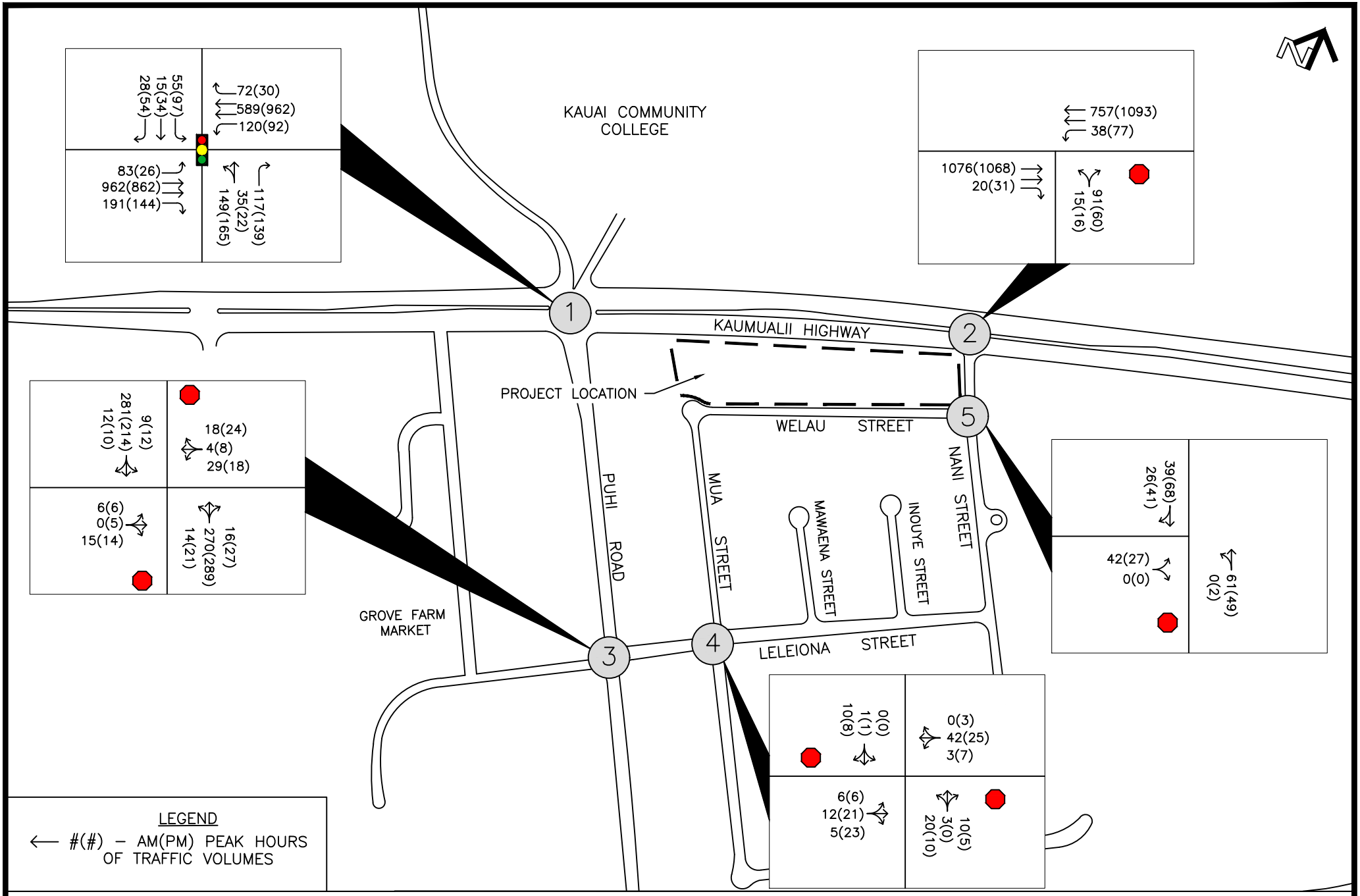
PROJECT TRIP ASSIGNMENT

FIGURE 6



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TRAFFIC VOLUMES WITH PROJECT

FIGURE 7

3.3 *Traffic Analysis with Project Conditions*

The estimated number of generated trips for the proposed project was incorporated into the existing traffic volumes to model the forecasted conditions. Based on the analysis performed for the proposed project conditions, all intersections will still operate at LOS C or better during the AM and PM peak hours. Refer to Table 5 for the analysis results of the proposed traffic conditions. Detailed intersection data reports for the projected conditions are included in Appendix C.

Table 5: Proposed Conditions Traffic Analysis

Road Name	Approach	Movement	AM Peak Hour			PM Peak Hour		
			Delay (s/veh)	LOS	V/C	Delay (s/veh)	LOS	V/C
Kaumualii Highway at Puhi Road/Kauai Community College driveway (Signalized)								
Kaumualii Hwy	Eastbound	Left	55.8	E	0.43	57.8	D	0.13
		Thru	30.5	C	0.68	28.7	C	0.56
	Westbound	Left	53.4	D	0.49	58.0	D	0.44
		Thru	22.2	C	0.39	23.3	C	0.63
Puhi Rd	Northbound	Left-Thru	38.1	D	0.44	36.6	D	0.45
KCC dwy	Southbound	Left	31.2	C	0.12	30.7	C	0.20
		Thru	29.8	C	0.03	28.8	C	0.07
		Right	0.0	-	-	0.0	-	-
Intersection			31.2	C	-	28.5	C	-
Puhi Road and Leleiona Street (TWSC)								
Leleiona St	Eastbound	Left-Thru-Right	13.0	B	0.05	12.7	B	0.06
	Westbound	Left-Thru-Right	14.7	B	0.13	13.7	B	0.12
Puhi Rd	Northbound	Left	8.1	A	0.01	7.8	A	0.02
	Southbound	Left	7.9	A	0.01	8.1	A	0.01
Intersection			1.8	A	-	2.0	A	-
Leleiona Street and Mua Street (TWSC)								
Leleiona St	Eastbound	Left	7.3	A	0.01	7.3	A	0.01
	Westbound	Left	7.3	A	0.01	7.3	A	0.01
Mua St	Northbound	Left-Thru-Right	9.2	A	0.05	9.0	A	0.02
	Southbound	Left-Thru-Right	8.7	A	0.02	8.6	A	0.01
Intersection			4.2	A	-	2.8	A	-
Kaumualii Highway and Nani Street (TWSC)								
Kaumualii Hwy	Westbound	Left	12.0	B	0.08	12.4	B	0.15
Nani St	Northbound	Left-Right	28.1	D	0.43	46.8	E	0.50
Intersection			1.7	A	-	1.9	A	-
Nani Street and Welau Street (TWSC)								
Welau St	Eastbound	Left-Right	9.5	A	0.06	9.6	A	0.04
Nani St	Northbound	Left	0.0	A	0.00	7.5	A	0.01
Intersection			2.4	A	-	1.5	A	-

3.4 *Traffic Impact Discussion*

The LOS for each intersection at the five intersections will remain the same when comparing the existing traffic conditions to the proposed traffic conditions. The LOS for the intersections will remain to operate at LOS C or better for the AM and PM peak hours.

At the intersection of Kaumualii Highway and Nani Street, there will have an increase in the northbound approach delay time from 17.1 seconds to 28.1 seconds during the AM peak hour and an intersection delay time from 17.3 seconds to 46.8 seconds during the PM peak hour. Although the northbound approach operates at LOS D and LOS E during the AM and PM peak hours with the additional 27(AM) and 25(PM) vehicles, the entire intersection continue to operate at LOS A.

The northbound left turn movement has a refuge lane for the vehicles traveling in the westbound direction. This means that vehicles making the northbound left turn movement can wait for a gap from the eastbound through movement to make the left turn movement and then wait in the refuge lane for another gap from the westbound through movement. The northbound right turn movement has an acceleration lane for the eastbound direction. Both the refuge lane and the acceleration lane will help with the flow of traffic at this intersection.

4 Summary

A traffic analysis was performed for the proposed affordable housing Kahua Hooulu to be located along Welau Street in Puhi, Kauai. The traffic flow at the nearby intersections was evaluated.

Data collection and field observations were performed at the five study intersections to analyze the existing traffic and pedestrian movements. Under the existing traffic conditions, the five intersections were determined to operate at LOS C or better during the AM and PM peak hours.

For the proposed traffic conditions, an estimated number of generated trips was determined to forecast the proposed affordable housing and early educational development. Based on the traffic analysis done for the proposed traffic conditions, the five intersections will continue to operate at LOS C or better during both peak hours.

Appendix A: Traffic Volume Data

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Count Name: Kaumualii Hwy and Puhi St
Site Code:
Start Date: 05/04/2021

Turning Movement Data

Start Time	Puhi Rd Southbound						Kaumualii Hwy Westbound						Puhi Rd Northbound						Kaumualii Hwy Eastbound						Int. Total
	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	
5:31 AM	0	1	1	0	1	2	2	44	8	0	2	54	9	0	8	0	2	17	12	92	0	0	0	104	177
5:46 AM	1	0	0	0	0	1	1	76	11	0	0	88	5	0	11	0	0	16	30	119	3	0	0	152	257
Hourly Total	1	1	1	0	1	3	3	120	19	0	2	142	14	0	19	0	2	33	42	211	3	0	0	256	434
6:01 AM	1	0	0	0	0	1	2	88	11	0	1	101	12	1	14	0	2	27	29	127	3	0	0	159	288
6:16 AM	2	0	2	0	0	4	7	175	22	0	0	204	8	0	13	0	0	21	26	196	1	0	0	223	452
6:31 AM	0	0	0	0	0	0	3	159	23	0	0	185	18	2	25	0	0	45	43	203	1	0	0	247	477
6:46 AM	3	2	1	0	1	6	7	128	41	0	1	176	16	3	22	0	2	41	51	210	5	0	0	266	489
Hourly Total	6	2	3	0	1	11	19	550	97	0	2	666	54	6	74	0	4	134	149	736	10	0	0	895	1706
7:01 AM	2	1	4	0	1	7	13	164	21	0	1	198	16	5	36	0	0	57	48	214	9	0	0	271	533
7:16 AM	5	2	8	0	0	15	19	153	38	0	0	210	29	7	31	0	1	67	60	240	13	0	0	313	605
7:31 AM	7	5	22	0	0	34	23	135	23	0	0	181	30	16	51	0	0	97	51	252	25	0	0	328	640
7:46 AM	14	7	20	0	0	41	15	127	38	0	1	180	42	7	31	0	0	80	32	245	36	0	0	313	614
Hourly Total	28	15	54	0	1	97	70	579	120	0	2	769	117	35	149	0	1	301	191	951	83	0	0	1225	2392
8:01 AM	7	5	3	0	0	15	11	163	30	0	1	204	28	4	31	0	1	63	36	191	7	0	0	234	516
8:16 AM	2	4	4	0	0	10	15	141	30	0	0	186	27	3	27	0	0	57	16	177	5	0	0	198	451
8:31 AM	3	0	6	0	0	9	12	142	21	0	1	175	17	5	17	0	1	39	31	234	3	0	0	268	491
8:46 AM	3	4	3	0	0	10	7	146	41	0	0	194	30	2	28	0	0	60	35	212	4	0	0	251	515
Hourly Total	15	13	16	0	0	44	45	592	122	0	2	759	102	14	103	0	2	219	118	814	19	0	0	951	1973
9:01 AM	0	1	0	0	0	1	5	137	18	0	0	160	20	0	22	0	0	42	28	187	3	0	0	218	421
9:16 AM	4	0	3	0	0	7	3	155	25	0	0	183	27	0	34	0	0	61	22	185	5	0	0	212	463
9:31 AM	2	0	7	0	0	9	4	158	27	0	4	189	30	1	23	0	2	54	33	193	2	0	0	228	480
9:46 AM	5	3	5	0	0	13	6	172	26	0	0	204	25	4	17	0	0	46	33	194	2	0	0	229	492
Hourly Total	11	4	15	0	0	30	18	622	96	0	4	736	102	5	96	0	2	203	116	759	12	0	0	887	1856
10:01 AM	0	1	3	0	0	4	3	178	11	0	0	192	16	1	29	0	0	46	20	158	1	0	0	179	421
10:16 AM	0	3	3	0	0	6	2	177	33	0	0	212	27	1	15	0	1	43	26	174	2	0	0	202	463
10:31 AM	4	0	6	0	0	10	8	139	20	0	0	167	32	1	17	0	0	50	27	164	3	0	0	194	421
10:46 AM	3	2	4	0	0	9	6	168	29	0	0	203	29	1	21	0	0	51	27	197	0	1	0	225	488
Hourly Total	7	6	16	0	0	29	19	662	93	0	0	774	104	4	82	0	1	190	100	693	6	1	0	800	1793
11:01 AM	3	1	7	0	0	11	5	181	29	0	0	215	23	3	30	0	0	56	27	181	2	1	0	211	493
11:16 AM	1	6	3	0	0	10	7	186	27	0	1	220	25	2	15	0	0	42	31	161	1	0	0	193	465
11:31 AM	1	4	3	0	0	8	4	187	23	0	0	214	22	2	22	0	0	46	24	170	2	0	0	196	464
11:46 AM	5	4	8	0	0	17	5	180	29	0	0	214	30	2	27	0	0	59	20	209	3	0	0	232	522
Hourly Total	10	15	21	0	0	46	21	734	108	0	1	863	100	9	94	0	0	203	102	721	8	1	0	832	1944
12:01 PM	4	6	7	0	0	17	15	190	28	0	0	233	28	2	33	0	0	63	23	161	3	0	0	187	500
12:16 PM	0	1	4	0	0	5	5	207	21	0	0	233	31	1	23	0	1	55	23	184	4	0	0	211	504
12:31 PM	3	0	6	0	0	9	7	196	21	0	0	224	29	4	32	0	0	65	26	164	2	0	0	192	490
12:46 PM	1	0	5	0	0	6	10	210	26	0	0	246	24	3	27	0	0	54	30	148	2	0	0	180	486
Hourly Total	8	7	22	0	0	37	37	803	96	0	0	936	112	10	115	0	1	237	102	657	11	0	0	770	1980

1:01 PM	2	3	8	0	0	13	3	195	18	0	0	216	24	5	35	0	0	64	35	189	2	0	0	226	519
1:16 PM	2	0	5	0	1	7	8	219	26	0	1	253	23	3	26	0	0	52	36	180	1	0	0	217	529
1:31 PM	6	5	11	0	0	22	13	181	22	0	0	216	35	1	26	0	0	62	29	162	2	0	0	193	493
1:46 PM	3	4	17	0	0	24	12	204	28	0	1	244	29	4	27	0	2	60	34	210	7	1	0	252	580
Hourly Total	13	12	41	0	1	66	36	799	94	0	2	929	111	13	114	0	2	238	134	741	12	1	0	888	2121
2:01 PM	6	4	32	0	0	42	10	174	24	0	2	208	18	3	26	0	1	47	35	172	4	0	0	211	508
2:16 PM	2	2	12	0	0	16	9	253	26	0	0	288	25	3	32	0	1	60	32	218	3	0	0	253	617
2:31 PM	3	1	8	0	0	12	7	224	26	0	1	257	26	1	32	0	0	59	32	181	3	2	0	218	546
2:46 PM	10	3	8	0	0	21	9	244	24	0	0	277	34	6	35	0	0	75	36	205	10	0	0	251	624
Hourly Total	21	10	60	0	0	91	35	895	100	0	3	1030	103	13	125	0	2	241	135	776	20	2	0	933	2295
3:01 PM	25	20	47	0	0	92	9	237	26	0	1	272	28	8	43	0	0	79	34	210	8	0	0	252	695
3:16 PM	12	7	27	0	0	46	6	214	24	0	2	244	40	1	50	0	0	91	40	203	5	0	0	248	629
3:31 PM	7	4	13	0	0	24	4	255	18	0	0	277	37	7	37	0	0	81	34	231	3	0	0	268	650
3:46 PM	4	4	8	0	0	16	2	242	15	0	1	259	35	0	39	0	1	74	47	218	2	0	0	267	616
Hourly Total	48	35	95	0	0	178	21	948	83	0	4	1052	140	16	169	0	1	325	155	862	18	0	0	1035	2590
4:01 PM	4	1	6	0	0	11	3	277	15	0	0	295	26	1	49	0	0	76	49	211	7	0	0	267	649
4:16 PM	10	7	17	0	0	34	3	232	5	0	0	240	34	1	38	0	1	73	50	216	3	0	0	269	616
4:31 PM	14	4	8	0	0	26	2	281	19	0	0	302	26	1	58	0	0	85	23	226	2	0	0	251	664
4:46 PM	0	3	7	1	0	11	6	240	19	0	2	265	27	2	40	0	0	69	27	177	1	0	0	205	550
Hourly Total	28	15	38	1	0	82	14	1030	58	0	2	1102	113	5	185	0	1	303	149	830	13	0	0	992	2479
5:01 PM	6	2	3	0	0	11	10	244	15	0	0	269	16	2	34	0	0	52	16	153	3	0	0	172	504
5:16 PM	6	3	8	0	0	17	3	207	13	0	0	223	16	3	22	0	0	41	25	171	3	0	0	199	480
Grand Total	208	140	393	1	4	742	351	8785	1114	0	24	10250	1204	135	1381	0	19	2720	1534	9075	221	5	0	10835	24547
Approach %	28.0	18.9	53.0	0.1	-	-	3.4	85.7	10.9	0.0	-	-	44.3	5.0	50.8	0.0	-	-	14.2	83.8	2.0	0.0	-	-	-
Total %	0.8	0.6	1.6	0.0	-	3.0	1.4	35.8	4.5	0.0	-	41.8	4.9	0.5	5.6	0.0	-	11.1	6.2	37.0	0.9	0.0	-	44.1	-
Lights	190	132	365	1	-	688	315	8485	1038	0	-	9838	1127	131	1299	0	-	2557	1413	8792	216	5	-	10426	23509
% Lights	91.3	94.3	92.9	100.0	-	92.7	89.7	96.6	93.2	-	-	96.0	93.6	97.0	94.1	-	-	94.0	92.1	96.9	97.7	100.0	-	96.2	95.8
Mediums	18	6	28	0	-	52	36	222	65	0	-	323	72	3	66	0	-	141	97	204	5	0	-	306	822
% Mediums	8.7	4.3	7.1	0.0	-	7.0	10.3	2.5	5.8	-	-	3.2	6.0	2.2	4.8	-	-	5.2	6.3	2.2	2.3	0.0	-	2.8	3.3
Articulated Trucks	0	0	0	0	-	0	0	76	11	0	-	87	3	0	16	0	-	19	20	76	0	0	-	96	202
% Articulated Trucks	0.0	0.0	0.0	0.0	-	0.0	0.0	0.9	1.0	-	-	0.8	0.2	0.0	1.2	-	-	0.7	1.3	0.8	0.0	0.0	-	0.9	0.8
Bicycles on Road	0	2	0	0	-	2	0	2	0	0	-	2	2	1	0	0	-	3	4	3	0	0	-	7	14
% Bicycles on Road	0.0	1.4	0.0	0.0	-	0.3	0.0	0.0	0.0	-	-	0.0	0.2	0.7	0.0	-	-	0.1	0.3	0.0	0.0	0.0	-	0.1	0.1
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	3	-	-	-	-	-	1	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	12.5	-	-	-	-	-	5.3	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	4	-	-	-	-	-	21	-	-	-	-	-	18	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	87.5	-	-	-	-	-	94.7	-	-	-	-	-	-	-	-

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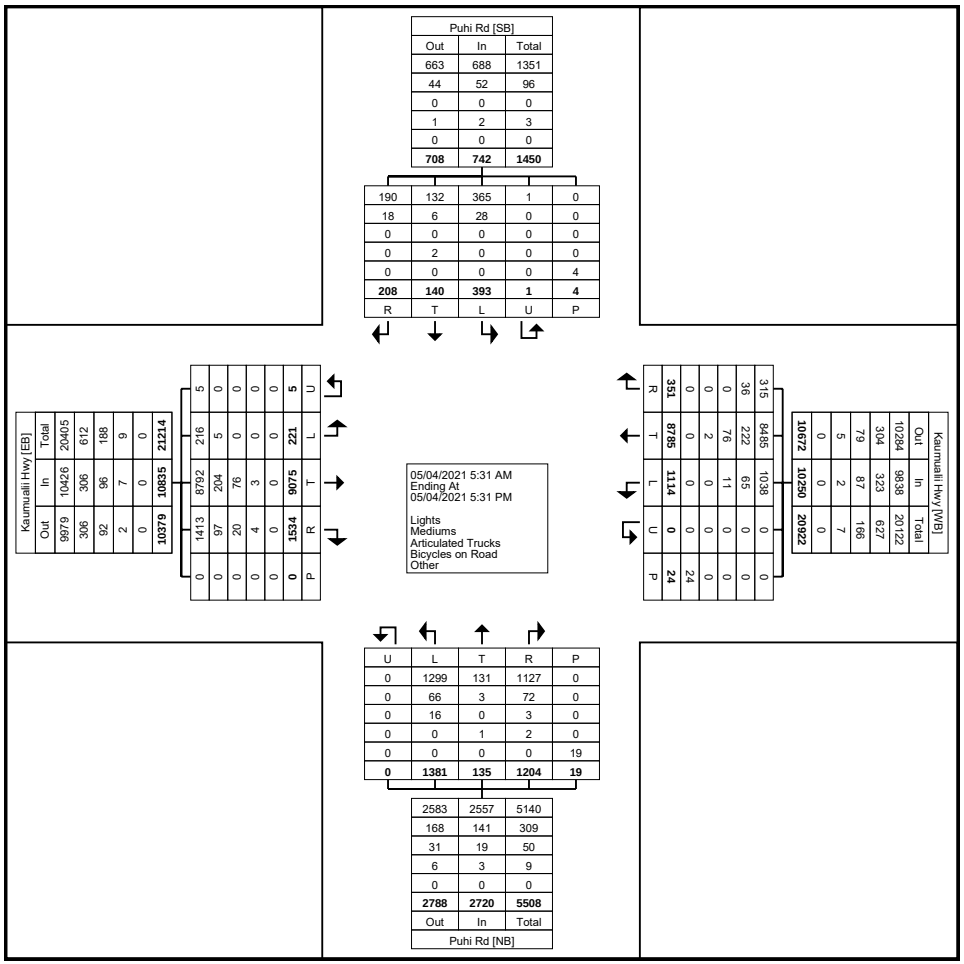
Count Name: Kaumualii Hwy and Puhi St
Site Code:
Start Date: 05/04/2021



Turning Movement Data Plot

Community Planning and Engineering, Inc.
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(808) 531-4252 x1040 jwolfgramm@cpe-hawaii.com

Count Name: Kaumualii Hwy and Puhi St
Site Code:
Start Date: 05/04/2021

Turning Movement Peak Hour Data (7:01 AM)

Start Time	Puhi Rd Southbound						Kaumualii Hwy Westbound						Puhi Rd Northbound						Kaumualii Hwy Eastbound						Int. Total
	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	
7:01 AM	2	1	4	0	1	7	13	164	21	0	1	198	16	5	36	0	0	57	48	214	9	0	0	271	533
7:16 AM	5	2	8	0	0	15	19	153	38	0	0	210	29	7	31	0	1	67	60	240	13	0	0	313	605
7:31 AM	7	5	22	0	0	34	23	135	23	0	0	181	30	16	51	0	0	97	51	252	25	0	0	328	640
7:46 AM	14	7	20	0	0	41	15	127	38	0	1	180	42	7	31	0	0	80	32	245	36	0	0	313	614
Total	28	15	54	0	1	97	70	579	120	0	2	769	117	35	149	0	1	301	191	951	83	0	0	1225	2392
Approach %	28.9	15.5	55.7	0.0	-	-	9.1	75.3	15.6	0.0	-	-	38.9	11.6	49.5	0.0	-	-	15.6	77.6	6.8	0.0	-	-	-
Total %	1.2	0.6	2.3	0.0	-	4.1	2.9	24.2	5.0	0.0	-	32.1	4.9	1.5	6.2	0.0	-	12.6	8.0	39.8	3.5	0.0	-	51.2	-
PHF	0.500	0.536	0.614	0.000	-	0.591	0.761	0.883	0.789	0.000	-	0.915	0.696	0.547	0.730	0.000	-	0.776	0.796	0.943	0.576	0.000	-	0.934	0.934
Lights	27	15	49	0	-	91	67	543	118	0	-	728	102	34	129	0	-	265	177	925	81	0	-	1183	2267
% Lights	96.4	100.0	90.7	-	-	93.8	95.7	93.8	98.3	-	-	94.7	87.2	97.1	86.6	-	-	88.0	92.7	97.3	97.6	-	-	96.6	94.8
Mediums	1	0	5	0	-	6	3	25	1	0	-	29	15	1	16	0	-	32	12	22	2	0	-	36	103
% Mediums	3.6	0.0	9.3	-	-	6.2	4.3	4.3	0.8	-	-	3.8	12.8	2.9	10.7	-	-	10.6	6.3	2.3	2.4	-	-	2.9	4.3
Articulated Trucks	0	0	0	0	-	0	0	10	1	0	-	11	0	0	4	0	-	4	2	4	0	0	-	6	21
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	1.7	0.8	-	-	1.4	0.0	0.0	2.7	-	-	1.3	1.0	0.4	0.0	-	-	0.5	0.9
Bicycles on Road	0	0	0	0	-	0	0	1	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	1
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.2	0.0	-	-	0.1	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	50.0	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	50.0	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-

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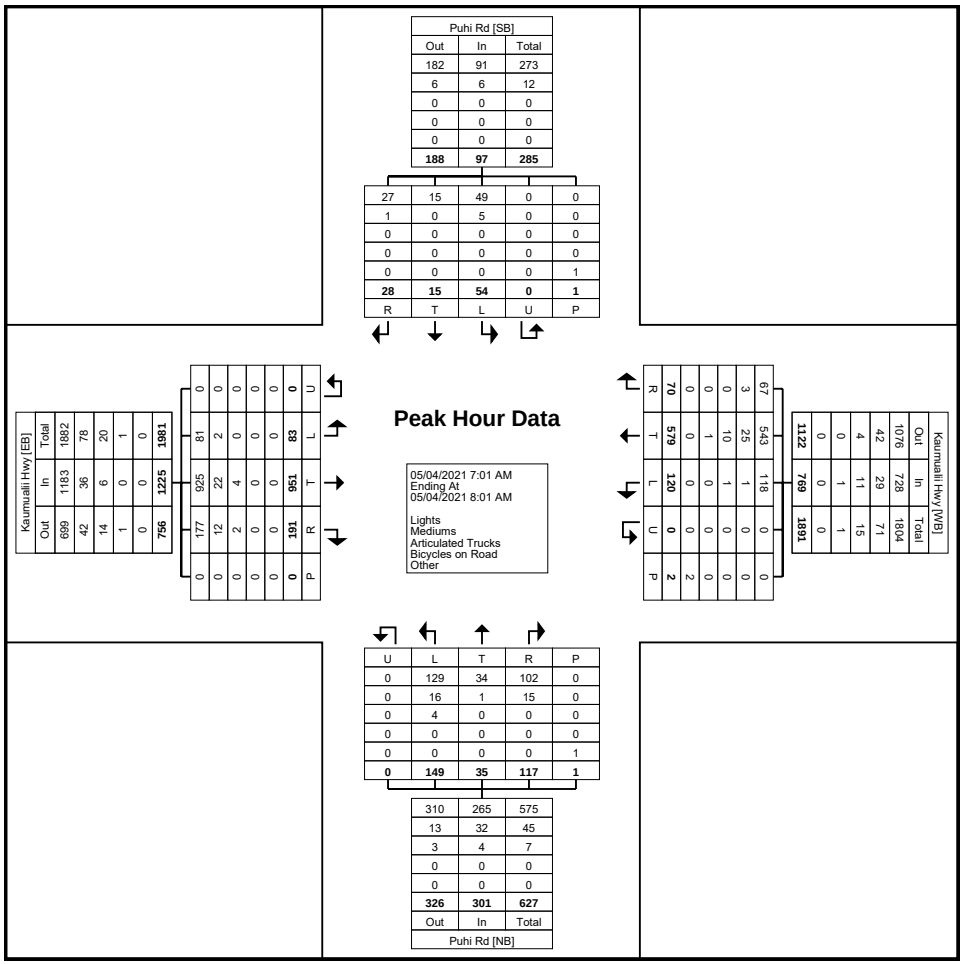
Site Code:
Start Date: 05/04/2021



Turning Movement Peak Hour Data Plot (7:01 AM)

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(808) 531-4252 x1040 jwolfgramm@cpe-hawaii.com

Count Name: Kaumualii Hwy and Puhi St
Site Code:
Start Date: 05/04/2021

Turning Movement Peak Hour Data (2:46 PM)

Start Time	Puhi Rd Southbound						Kaumualii Hwy Westbound						Puhi Rd Northbound						Kaumualii Hwy Eastbound						Int. Total
	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	
2:46 PM	10	3	8	0	0	21	9	244	24	0	0	277	34	6	35	0	0	75	36	205	10	0	0	251	624
3:01 PM	25	20	47	0	0	92	9	237	26	0	1	272	28	8	43	0	0	79	34	210	8	0	0	252	695
3:16 PM	12	7	27	0	0	46	6	214	24	0	2	244	40	1	50	0	0	91	40	203	5	0	0	248	629
3:31 PM	7	4	13	0	0	24	4	255	18	0	0	277	37	7	37	0	0	81	34	231	3	0	0	268	650
Total	54	34	95	0	0	183	28	950	92	0	3	1070	139	22	165	0	0	326	144	849	26	0	0	1019	2598
Approach %	29.5	18.6	51.9	0.0	-	-	2.6	88.8	8.6	0.0	-	-	42.6	6.7	50.6	0.0	-	-	14.1	83.3	2.6	0.0	-	-	-
Total %	2.1	1.3	3.7	0.0	-	7.0	1.1	36.6	3.5	0.0	-	41.2	5.4	0.8	6.4	0.0	-	12.5	5.5	32.7	1.0	0.0	-	39.2	-
PHF	0.540	0.425	0.505	0.000	-	0.497	0.778	0.931	0.885	0.000	-	0.966	0.869	0.688	0.825	0.000	-	0.896	0.900	0.919	0.650	0.000	-	0.951	0.935
Lights	52	32	91	0	-	175	26	929	80	0	-	1035	132	22	158	0	-	312	134	824	26	0	-	984	2506
% Lights	96.3	94.1	95.8	-	-	95.6	92.9	97.8	87.0	-	-	96.7	95.0	100.0	95.8	-	-	95.7	93.1	97.1	100.0	-	-	96.6	96.5
Mediums	2	0	4	0	-	6	2	14	9	0	-	25	7	0	7	0	-	14	9	20	0	0	-	29	74
% Mediums	3.7	0.0	4.2	-	-	3.3	7.1	1.5	9.8	-	-	2.3	5.0	0.0	4.2	-	-	4.3	6.3	2.4	0.0	-	-	2.8	2.8
Articulated Trucks	0	0	0	0	-	0	0	7	3	0	-	10	0	0	0	0	-	0	1	4	0	0	-	5	15
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.7	3.3	-	-	0.9	0.0	0.0	0.0	-	-	0.0	0.7	0.5	0.0	-	-	0.5	0.6
Bicycles on Road	0	2	0	0	-	2	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	1	3
% Bicycles on Road	0.0	5.9	0.0	-	-	1.1	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.1	0.0	-	-	0.1	0.1
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	3	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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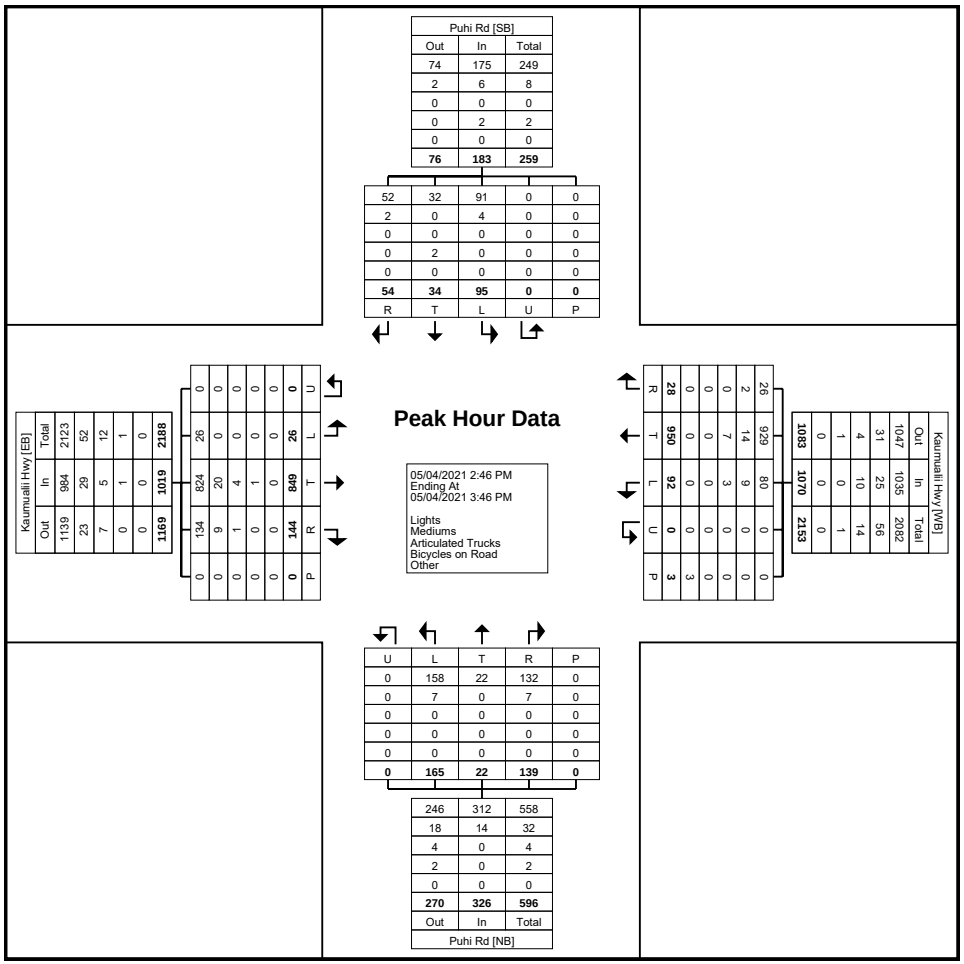
Site Code:
Start Date: 05/04/2021



Turning Movement Peak Hour Data Plot (2:46 PM)

Community Planning and Engineering, Inc.
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Honolulu, Hawaii, United States 96813
(808) 531-4252 x1040 jwolfgramm@cpe-hawaii.com

Count Name: Kaumualii Hwy and Nani St
Site Code:
Start Date: 05/05/2021

Turning Movement Data

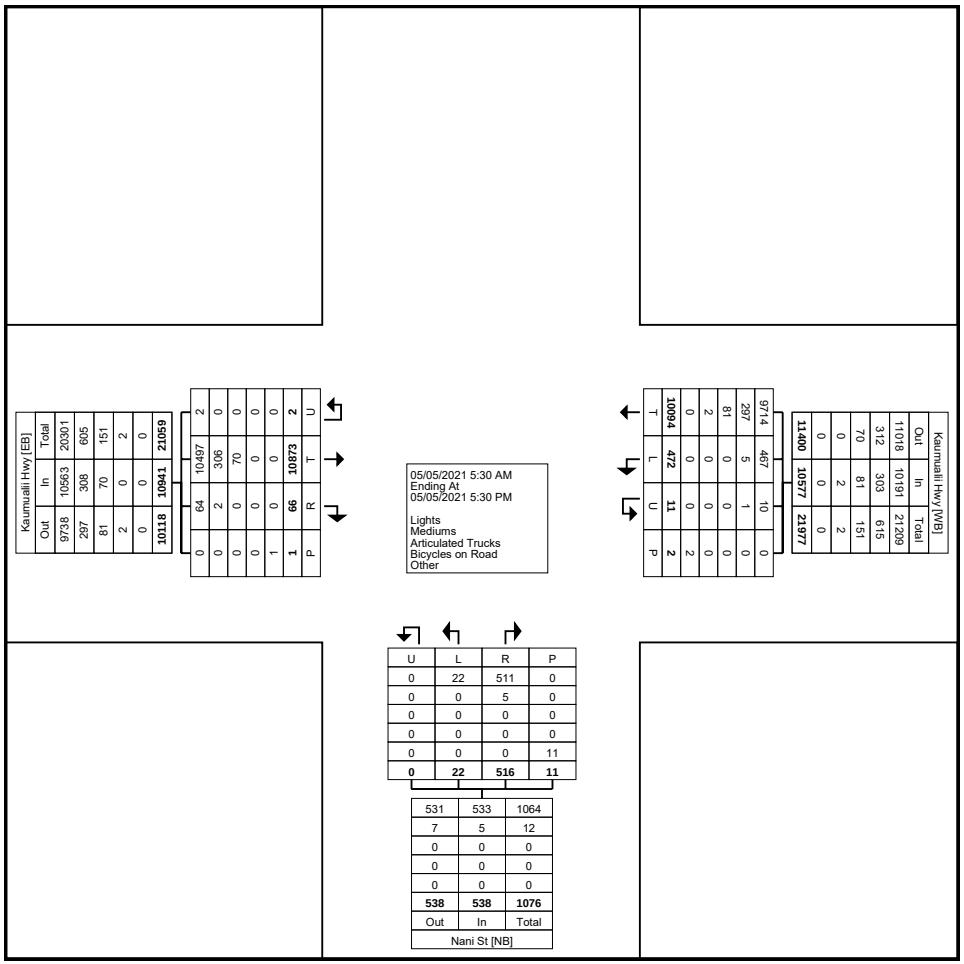
Start Time	Kaumualii Hwy Westbound					Nani St Northbound					Kaumualii Hwy Eastbound					Int. Total
	Thru	Left	U-Turn	Peds	App. Total	Right	Left	U-Turn	Peds	App. Total	Right	Thru	U-Turn	Peds	App. Total	
5:30 AM	43	3	0	0	46	1	1	0	0	2	0	89	0	1	89	137
5:45 AM	79	3	0	1	82	12	2	0	0	14	0	123	0	0	123	219
Hourly Total	122	6	0	1	128	13	3	0	0	16	0	212	0	1	212	356
6:00 AM	116	2	0	1	118	6	1	0	0	7	2	136	0	0	138	263
6:15 AM	183	3	0	0	186	16	0	0	1	16	1	180	0	0	181	383
6:30 AM	163	10	0	0	173	15	2	0	0	17	2	205	1	0	208	398
6:45 AM	191	16	0	0	207	15	1	0	1	16	1	239	0	0	240	463
Hourly Total	653	31	0	1	684	52	4	0	2	56	6	760	1	0	767	1507
7:00 AM	177	7	0	0	184	11	0	0	2	11	2	234	0	0	236	431
7:15 AM	192	8	0	0	200	24	2	0	0	26	2	311	0	0	313	539
7:30 AM	211	9	0	0	220	25	0	0	0	25	0	263	0	0	263	508
7:45 AM	177	7	0	0	184	16	1	0	1	17	4	268	0	0	272	473
Hourly Total	757	31	0	0	788	76	3	0	3	79	8	1076	0	0	1084	1951
8:00 AM	144	10	0	0	154	6	0	0	0	6	1	253	0	0	254	414
8:15 AM	163	7	1	0	171	6	0	0	0	6	1	235	0	0	236	413
8:30 AM	162	7	2	0	171	5	0	0	0	5	1	243	0	0	244	420
8:45 AM	184	2	0	0	186	13	0	0	0	13	0	223	0	0	223	422
Hourly Total	653	26	3	0	682	30	0	0	0	30	3	954	0	0	957	1669
9:00 AM	173	11	1	0	185	6	0	0	0	6	0	163	0	0	163	354
9:15 AM	157	5	0	0	162	9	0	0	0	9	0	193	0	0	193	364
9:30 AM	180	13	0	0	193	10	1	0	0	11	1	214	0	0	215	419
9:45 AM	210	3	0	0	213	15	0	0	1	15	0	234	0	0	234	462
Hourly Total	720	32	1	0	753	40	1	0	1	41	1	804	0	0	805	1599
10:00 AM	185	5	0	0	190	12	0	0	1	12	1	202	0	0	203	405
10:15 AM	185	3	0	0	188	11	0	0	0	11	1	254	0	0	255	454
10:30 AM	198	9	0	0	207	6	0	0	0	6	1	231	0	0	232	445
10:45 AM	197	7	0	0	204	11	0	0	0	11	1	231	0	0	232	447
Hourly Total	765	24	0	0	789	40	0	0	1	40	4	918	0	0	922	1751
11:00 AM	209	10	0	0	219	6	0	0	0	6	1	225	0	0	226	451
11:15 AM	196	16	1	0	213	10	1	0	0	11	1	235	0	0	236	460
11:30 AM	224	5	0	0	229	8	0	0	0	8	0	217	0	0	217	454
11:45 AM	192	11	0	0	203	10	0	0	0	10	0	239	0	0	239	452
Hourly Total	821	42	1	0	864	34	1	0	0	35	2	916	0	0	918	1817
12:00 PM	261	13	1	0	275	11	1	0	1	12	4	216	0	0	220	507
12:15 PM	266	10	1	0	277	11	0	0	0	11	2	259	0	0	261	549
12:30 PM	239	8	0	0	247	15	0	0	0	15	0	229	0	0	229	491
12:45 PM	244	8	0	0	252	14	0	0	0	14	0	210	0	0	210	476
Hourly Total	1010	39	2	0	1051	51	1	0	1	52	6	914	0	0	920	2023
1:00 PM	218	10	0	0	228	8	0	0	0	8	2	195	0	0	197	433

1:15 PM	240	8	0	0	248	15	0	0	0	15	0	226	0	0	226	489
1:30 PM	232	13	0	0	245	3	0	0	0	3	4	233	0	0	237	485
1:45 PM	233	18	0	0	251	9	0	0	1	9	0	227	0	0	227	487
Hourly Total	923	49	0	0	972	35	0	0	1	35	6	881	0	0	887	1894
2:00 PM	263	16	0	0	279	11	0	0	0	11	0	206	0	0	206	496
2:15 PM	221	12	0	0	233	8	1	0	0	9	1	246	0	0	247	489
2:30 PM	258	11	1	0	270	9	1	0	1	10	2	246	0	0	248	528
2:45 PM	242	17	0	0	259	6	1	0	0	7	1	248	0	0	249	515
Hourly Total	984	56	1	0	1041	34	3	0	1	37	4	946	0	0	950	2028
3:00 PM	253	12	1	0	266	15	0	0	0	15	1	273	0	0	274	555
3:15 PM	275	9	0	0	284	6	0	0	0	6	0	244	0	0	244	534
3:30 PM	262	11	1	0	274	6	1	0	0	7	2	248	0	0	250	531
3:45 PM	261	14	0	0	275	9	0	0	0	9	3	233	0	0	236	520
Hourly Total	1051	46	2	0	1099	36	1	0	0	37	6	998	0	0	1004	2140
4:00 PM	283	17	0	0	300	12	1	0	0	13	11	307	0	0	318	631
4:15 PM	259	20	0	0	279	10	0	0	0	10	2	273	0	0	275	564
4:30 PM	288	9	0	0	297	18	0	0	0	18	2	258	1	0	261	576
4:45 PM	263	19	0	0	282	9	1	0	1	10	1	230	0	0	231	523
Hourly Total	1093	65	0	0	1158	49	2	0	1	51	16	1068	1	0	1085	2294
5:00 PM	283	9	1	0	293	13	1	0	0	14	2	228	0	0	230	537
5:15 PM	259	16	0	0	275	13	2	0	0	15	2	198	0	0	200	490
Grand Total	10094	472	11	2	10577	516	22	0	11	538	66	10873	2	1	10941	22056
Approach %	95.4	4.5	0.1	-	-	95.9	4.1	0.0	-	-	0.6	99.4	0.0	-	-	-
Total %	45.8	2.1	0.0	-	48.0	2.3	0.1	0.0	-	2.4	0.3	49.3	0.0	-	49.6	-
Lights	9714	467	10	-	10191	511	22	0	-	533	64	10497	2	-	10563	21287
% Lights	96.2	98.9	90.9	-	96.4	99.0	100.0	-	-	99.1	97.0	96.5	100.0	-	96.5	96.5
Mediums	297	5	1	-	303	5	0	0	-	5	2	306	0	-	308	616
% Mediums	2.9	1.1	9.1	-	2.9	1.0	0.0	-	-	0.9	3.0	2.8	0.0	-	2.8	2.8
Articulated Trucks	81	0	0	-	81	0	0	0	-	0	0	70	0	-	70	151
% Articulated Trucks	0.8	0.0	0.0	-	0.8	0.0	0.0	-	-	0.0	0.0	0.6	0.0	-	0.6	0.7
Bicycles on Road	2	0	0	-	2	0	0	0	-	0	0	0	0	-	0	2
% Bicycles on Road	0.0	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	2	-	-	-	-	3	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	100.0	-	-	-	-	27.3	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	0	-	-	-	-	8	-	-	-	-	1	-	-
% Pedestrians	-	-	-	0.0	-	-	-	-	72.7	-	-	-	-	100.0	-	-

Community Planning and Engineering, Inc.
1286 Queen Emma St.

Honolulu, Hawaii, United States 96813
(808) 531-4252 x1040 jwolfgramm@cpe-hawaii.com

Count Name: Kaumualii Hwy and Nani St
Site Code:
Start Date: 05/05/2021



Turning Movement Data Plot

Community Planning and Engineering, Inc.
1286 Queen Emma St.

Honolulu, Hawaii, United States 96813
(808) 531-4252 x1040 jwolfgramm@cpe-hawaii.com

Count Name: Kaumualii Hwy and Nani St
Site Code:
Start Date: 05/05/2021

Turning Movement Peak Hour Data (7:00 AM)

Start Time	Kaumualii Hwy Westbound					Nani St Northbound					Kaumualii Hwy Eastbound					
	Thru	Left	U-Turn	Peds	App. Total	Right	Left	U-Turn	Peds	App. Total	Right	Thru	U-Turn	Peds	App. Total	Int. Total
7:00 AM	177	7	0	0	184	11	0	0	2	11	2	234	0	0	236	431
7:15 AM	192	8	0	0	200	24	2	0	0	26	2	311	0	0	313	539
7:30 AM	211	9	0	0	220	25	0	0	0	25	0	263	0	0	263	508
7:45 AM	177	7	0	0	184	16	1	0	1	17	4	268	0	0	272	473
Total	757	31	0	0	788	76	3	0	3	79	8	1076	0	0	1084	1951
Approach %	96.1	3.9	0.0	-	-	96.2	3.8	0.0	-	-	0.7	99.3	0.0	-	-	-
Total %	38.8	1.6	0.0	-	40.4	3.9	0.2	0.0	-	4.0	0.4	55.2	0.0	-	55.6	-
PHF	0.897	0.861	0.000	-	0.895	0.760	0.375	0.000	-	0.760	0.500	0.865	0.000	-	0.866	0.905
Lights	723	29	0	-	752	75	3	0	-	78	8	1041	0	-	1049	1879
% Lights	95.5	93.5	-	-	95.4	98.7	100.0	-	-	98.7	100.0	96.7	-	-	96.8	96.3
Mediums	28	2	0	-	30	1	0	0	-	1	0	34	0	-	34	65
% Mediums	3.7	6.5	-	-	3.8	1.3	0.0	-	-	1.3	0.0	3.2	-	-	3.1	3.3
Articulated Trucks	6	0	0	-	6	0	0	0	-	0	0	1	0	-	1	7
% Articulated Trucks	0.8	0.0	-	-	0.8	0.0	0.0	-	-	0.0	0.0	0.1	-	-	0.1	0.4
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	3	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-

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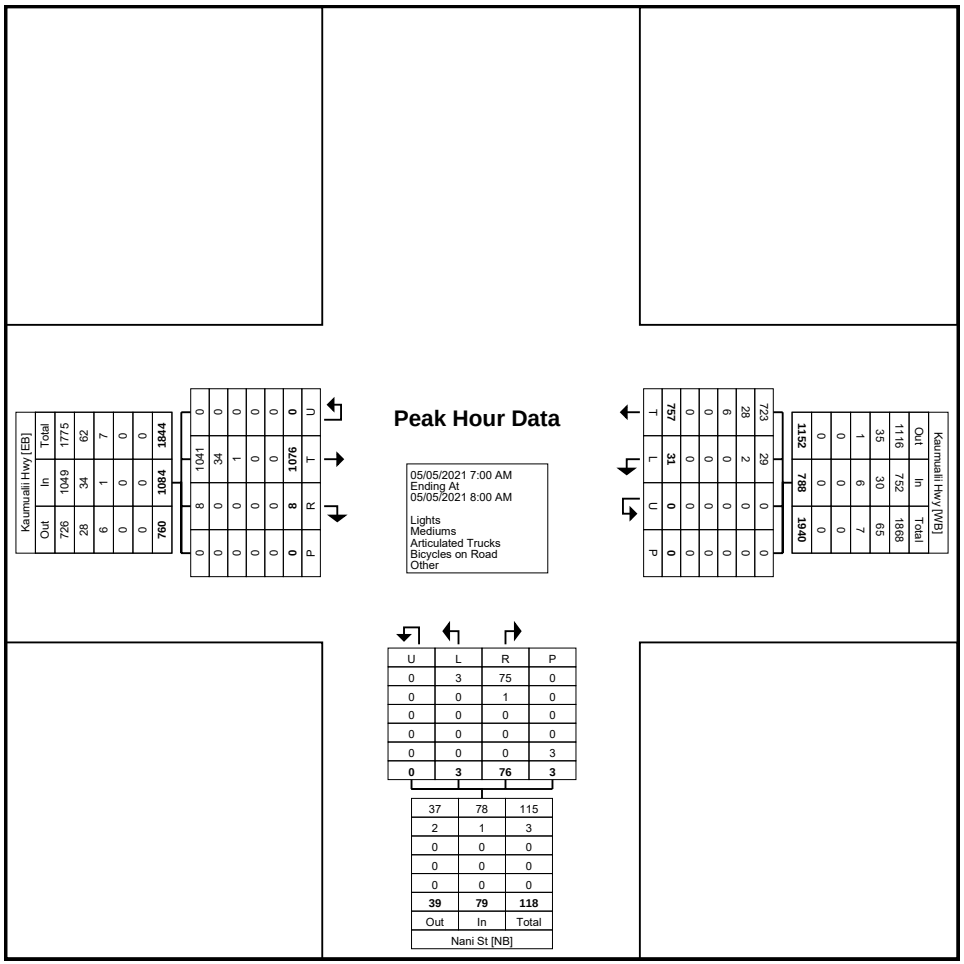
Count Name: Kaumualii Hwy and Nani St
Site Code:
Start Date: 05/05/2021



Turning Movement Peak Hour Data Plot (7:00 AM)

Community Planning and Engineering, Inc.
1286 Queen Emma St.

Honolulu, Hawaii, United States 96813
(808) 531-4252 x1040 jwolfgramm@cpe-hawaii.com

Count Name: Kaumualii Hwy and Nani St
Site Code:
Start Date: 05/05/2021

Turning Movement Peak Hour Data (4:00 PM)

Start Time	Kaumualii Hwy Westbound					Nani St Northbound					Kaumualii Hwy Eastbound					
	Thru	Left	U-Turn	Peds	App. Total	Right	Left	U-Turn	Peds	App. Total	Right	Thru	U-Turn	Peds	App. Total	Int. Total
4:00 PM	283	17	0	0	300	12	1	0	0	13	11	307	0	0	318	631
4:15 PM	259	20	0	0	279	10	0	0	0	10	2	273	0	0	275	564
4:30 PM	288	9	0	0	297	18	0	0	0	18	2	258	1	0	261	576
4:45 PM	263	19	0	0	282	9	1	0	1	10	1	230	0	0	231	523
Total	1093	65	0	0	1158	49	2	0	1	51	16	1068	1	0	1085	2294
Approach %	94.4	5.6	0.0	-	-	96.1	3.9	0.0	-	-	1.5	98.4	0.1	-	-	-
Total %	47.6	2.8	0.0	-	50.5	2.1	0.1	0.0	-	2.2	0.7	46.6	0.0	-	47.3	-
PHF	0.949	0.813	0.000	-	0.965	0.681	0.500	0.000	-	0.708	0.364	0.870	0.250	-	0.853	0.909
Lights	1075	65	0	-	1140	49	2	0	-	51	16	1049	1	-	1066	2257
% Lights	98.4	100.0	-	-	98.4	100.0	100.0	-	-	100.0	100.0	98.2	100.0	-	98.2	98.4
Mediums	15	0	0	-	15	0	0	0	-	0	0	18	0	-	18	33
% Mediums	1.4	0.0	-	-	1.3	0.0	0.0	-	-	0.0	0.0	1.7	0.0	-	1.7	1.4
Articulated Trucks	3	0	0	-	3	0	0	0	-	0	0	1	0	-	1	4
% Articulated Trucks	0.3	0.0	-	-	0.3	0.0	0.0	-	-	0.0	0.0	0.1	0.0	-	0.1	0.2
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	1	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-

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Site Code:
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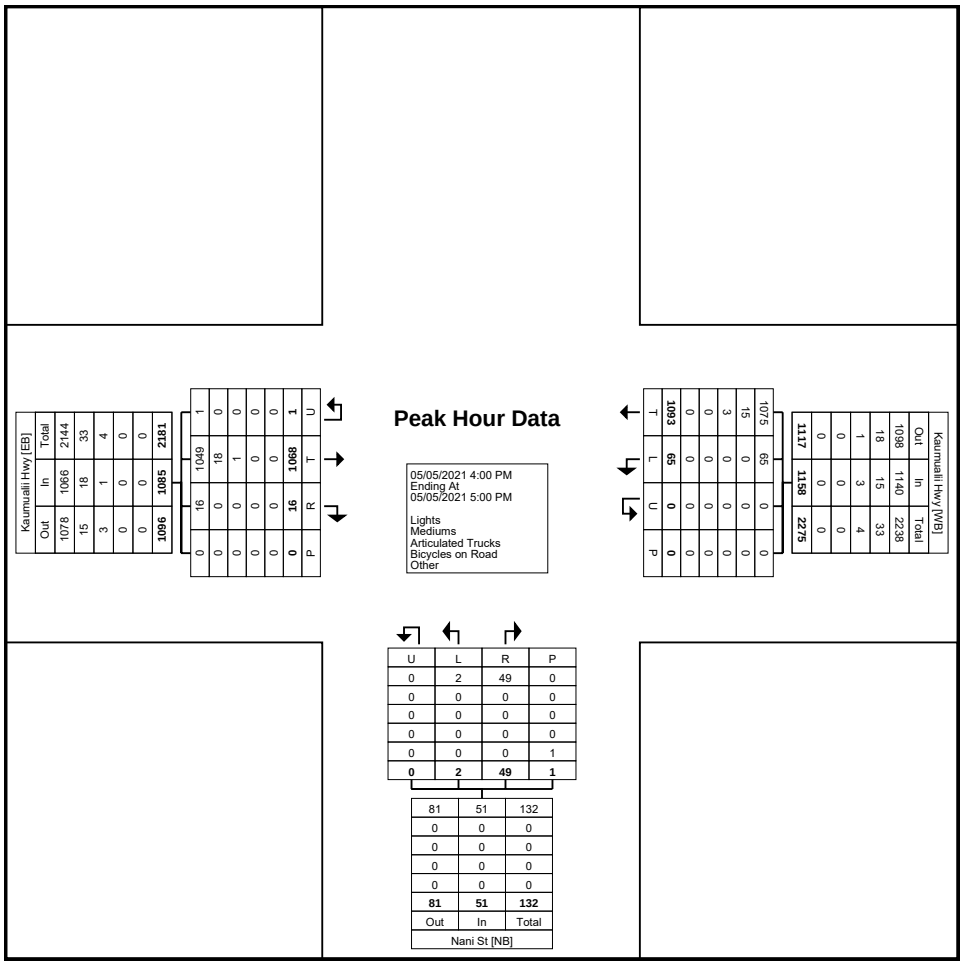

Turning Movement Peak Hour Data Plot (4:00 PM)

Community Planning and Engineering Inc.

1286 Queen Emma Street
Honolulu, HI 96813

File Name : 210504 Puhi_Leleiona AM
Site Code : 00000001
Start Date : 5/4/2021
Page No : 1

Groups Printed- Unshifted - Bank 1 - Bank 2

	Puhi St Southbound					Leleiona St Westbound					Puhi St Northbound					Leleiona St Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:00 AM	0	32	4	0	36	1	1	5	0	7	2	26	0	0	28	1	1	4	0	6	77
06:15 AM	1	31	3	0	35	5	1	3	0	9	0	12	1	0	13	3	1	3	0	7	64
06:30 AM	2	55	7	0	64	2	3	6	0	11	3	34	3	1	41	3	0	5	0	8	124
06:45 AM	1	71	8	0	80	15	4	3	0	22	2	32	1	0	35	4	0	1	0	5	142
Total	4	189	22	0	215	23	9	17	0	49	7	104	5	1	117	11	2	13	0	26	407
07:00 AM	3	58	3	0	64	8	0	6	1	15	1	48	1	1	51	1	0	4	0	5	135
07:15 AM	2	83	3	0	88	13	2	7	0	22	2	61	5	1	69	1	0	2	0	3	182
07:30 AM	2	66	3	0	71	4	1	3	0	8	4	86	3	2	95	5	0	7	0	12	186
07:45 AM	0	69	0	0	69	5	0	5	0	10	5	69	3	1	78	0	0	5	0	5	162
Total	7	276	9	0	292	30	3	21	1	55	12	264	12	5	293	7	0	18	0	25	665
08:00 AM	5	63	6	1	75	3	1	3	1	8	3	54	2	0	59	0	0	1	0	1	143
08:15 AM	1	38	5	0	44	6	2	6	1	15	6	51	5	0	62	3	0	3	0	6	127
08:30 AM	2	50	2	0	54	2	1	3	0	6	2	34	4	0	40	2	0	5	0	7	107
08:45 AM	1	54	5	0	60	6	0	4	0	10	2	49	3	0	54	0	0	6	0	6	130
Total	9	205	18	1	233	17	4	16	2	39	13	188	14	0	215	5	0	15	0	20	507
Grand Total	20	670	49	1	740	70	16	54	3	143	32	556	31	6	625	23	2	46	0	71	1579
Apprch %	2.7	90.5	6.6	0.1		49	11.2	37.8	2.1		5.1	89	5	1		32.4	2.8	64.8	0		
Total %	1.3	42.4	3.1	0.1	46.9	4.4	1	3.4	0.2	9.1	2	35.2	2	0.4	39.6	1.5	0.1	2.9	0	4.5	
Unshifted	19	642	44	1	706	68	15	50	3	136	21	496	30	6	553	14	2	20	0	36	1431
% Unshifted	95	95.8	89.8	100	95.4	97.1	93.8	92.6	100	95.1	65.6	89.2	96.8	100	88.5	60.9	100	43.5	0	50.7	90.6
Bank 1	1	28	4	0	33	2	0	4	0	6	11	60	1	0	72	9	0	25	0	34	145
% Bank 1	5	4.2	8.2	0	4.5	2.9	0	7.4	0	4.2	34.4	10.8	3.2	0	11.5	39.1	0	54.3	0	47.9	9.2
Bank 2	0	0	1	0	1	0	1	0	0	1	0	0	0	0	0	0	0	1	0	1	3
% Bank 2	0	0	2	0	0.1	0	6.2	0	0	0.7	0	0	0	0	0	0	0	2.2	0	1.4	0.2

Community Planning and Engineering Inc.

1286 Queen Emma Street
Honolulu, HI 96813

File Name : 210504 Puhi_Leleiona AM
Site Code : 00000001
Start Date : 5/4/2021
Page No : 2

	Puhi St Southbound					Leleiona St Westbound					Puhi St Northbound					Leleiona St Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	2	**83**	3	0	**88**	**13**	**2**	**7**	0	**22**	2	61	**5**	1	69	1	0	2	0	3	182
07:30 AM	2	66	3	0	71	4	1	3	0	8	4	**86**	3	**2**	**95**	**5**	0	**7**	0	**12**	**186**
07:45 AM	0	69	0	0	69	5	0	5	0	10	**5**	69	3	1	78	0	0	5	0	5	162
08:00 AM	**5**	63	**6**	**1**	75	3	1	3	**1**	8	3	54	2	0	59	0	0	1	0	1	143
Total Volume	9	281	12	1	303	25	4	18	1	48	14	270	13	4	301	6	0	15	0	21	673
% App. Total	3	92.7	4	0.3		52.1	8.3	37.5	2.1		4.7	89.7	4.3	1.3		28.6	0	71.4	0		
PHF	.450	.846	.500	.250	.861	.481	.500	.643	.250	.545	.700	.785	.650	.500	.792	.300	.000	.536	.000	.438	.905
Unshifted	9	273	11	1	294	25	4	16	1	46	9	236	13	4	262	4	0	7	0	11	613
% Unshifted	100	97.2	91.7	100	97.0	100	100	88.9	100	95.8	64.3	87.4	100	100	87.0	66.7	0	46.7	0	52.4	91.1
Bank 1	0	8	1	0	9	0	0	2	0	2	5	34	0	0	39	2	0	8	0	10	60
% Bank 1	0	2.8	8.3	0	3.0	0	0	11.1	0	4.2	35.7	12.6	0	0	13.0	33.3	0	53.3	0	47.6	8.9
Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	06:45 AM					06:30 AM					07:15 AM					06:00 AM				
+0 mins.	1	71	**8**	0	80	2	3	6	0	11	2	61	**5**	1	69	1	**1**	4	0	6
+15 mins.	**3**	58	3	0	64	**15**	**4**	3	0	**22**	4	**86**	3	**2**	**95**	3	1	3	0	7
+30 mins.	2	**83**	3	0	**88**	8	0	6	**1**	15	**5**	69	3	1	78	3	0	**5**	0	**8**
+45 mins.	2	66	3	0	71	13	2	**7**	0	22	3	54	2	0	59	**4**	0	1	0	5
Total Volume	8	278	17	0	303	38	9	22	1	70	14	270	13	4	301	11	2	13	0	26
% App. Total	2.6	91.7	5.6	0		54.3	12.9	31.4	1.4		4.7	89.7	4.3	1.3		42.3	7.7	50	0	
PHF	.667	.837	.531	.000	.861	.633	.563	.786	.250	.795	.700	.785	.650	.500	.792	.688	.500	.650	.000	.813
Unshifted	7	267	15	0	289	36	8	21	1	66	9	236	13	4	262	6	2	4	0	12
% Unshifted	87.5	96	88.2	0	95.4	94.7	88.9	95.5	100	94.3	64.3	87.4	100	100	87	54.5	100	30.8	0	46.2
Bank 1	1	11	2	0	14	2	0	1	0	3	5	34	0	0	39	5	0	8	0	13
% Bank 1	12.5	4	11.8	0	4.6	5.3	0	4.5	0	4.3	35.7	12.6	0	0	13	45.5	0	61.5	0	50
Bank 2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	1
% Bank 2	0	0	0	0	0	0	11.1	0	0	1.4	0	0	0	0	0	0	0	7.7	0	3.8

Community Planning and Engineering Inc.

1286 Queen Emma Street
Honolulu, HI 96813

File Name : 210504 Puhi_Leleiona PM
Site Code : 00000001
Start Date : 5/4/2021
Page No : 1

Groups Printed- Unshifted - Bank 1 - Bank 2

	Puhi St Southbound					Leleiona St Westbound					Puhi St Northbound					Leleiona St Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
02:30 PM	3	44	1	0	48	4	0	5	0	9	6	49	7	0	62	6	0	4	0	10	129
02:45 PM	1	59	2	0	62	5	3	7	1	16	9	62	4	0	75	0	1	2	0	3	156
Total	4	103	3	0	110	9	3	12	1	25	15	111	11	0	137	6	1	6	0	13	285
03:00 PM	3	59	3	0	65	3	2	7	0	12	3	69	4	3	79	2	1	7	0	10	166
03:15 PM	4	60	5	0	69	5	1	3	3	12	2	77	11	0	90	4	3	1	1	9	180
03:30 PM	4	36	0	0	40	2	2	7	0	11	7	81	4	1	93	0	0	4	0	4	148
03:45 PM	5	57	2	0	64	2	1	2	0	5	4	51	10	5	70	4	3	9	0	16	155
Total	16	212	10	0	238	12	6	19	3	40	16	278	29	9	332	10	7	21	1	39	649
04:00 PM	3	49	1	0	53	5	0	4	0	9	5	72	5	0	82	10	1	4	0	15	159
04:15 PM	9	46	1	0	56	4	0	5	1	10	4	62	4	1	71	2	0	4	0	6	143
04:30 PM	3	35	2	0	40	4	1	4	1	10	2	80	7	1	90	2	3	2	0	7	147
04:45 PM	2	44	5	0	51	8	1	2	1	12	2	56	12	1	71	7	0	2	0	9	143
Total	17	174	9	0	200	21	2	15	3	41	13	270	28	3	314	21	4	12	0	37	592
05:00 PM	1	29	2	0	32	8	0	2	0	10	3	53	5	0	61	3	1	4	0	8	111
05:15 PM	3	41	1	0	45	2	0	5	0	7	4	36	12	0	52	3	0	2	0	5	109
Grand Total	41	559	25	0	625	52	11	53	7	123	51	748	85	12	896	43	13	45	1	102	1746
Apprch %	6.6	89.4	4	0		42.3	8.9	43.1	5.7		5.7	83.5	9.5	1.3		42.2	12.7	44.1	1		
Total %	2.3	32	1.4	0	35.8	3	0.6	3	0.4	7	2.9	42.8	4.9	0.7	51.3	2.5	0.7	2.6	0.1	5.8	
Unshifted	41	531	17	0	589	51	11	53	7	122	43	725	83	12	863	40	13	43	1	97	1671
% Unshifted	100	95	68	0	94.2	98.1	100	100	100	99.2	84.3	96.9	97.6	100	96.3	93	100	95.6	100	95.1	95.7
Bank 1	0	26	8	0	34	1	0	0	0	1	8	23	2	0	33	2	0	1	0	3	71
% Bank 1	0	4.7	32	0	5.4	1.9	0	0	0	0.8	15.7	3.1	2.4	0	3.7	4.7	0	2.2	0	2.9	4.1
Bank 2	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2	4
% Bank 2	0	0.4	0	0	0.3	0	0	0	0	0	0	0	0	0	0	2.3	0	2.2	0	2	0.2

Community Planning and Engineering Inc.

1286 Queen Emma Street
Honolulu, HI 96813

File Name : 210504 Puhi_Leleiona PM
Site Code : 00000001
Start Date : 5/4/2021
Page No : 2

	Puhi St Southbound					Leleiona St Westbound					Puhi St Northbound					Leleiona St Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 02:30 PM to 05:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 02:45 PM																					
02:45 PM	1	59	2	0	62	**5**	**3**	**7**	1	**16**	**9**	62	4	0	75	0	1	2	0	3	156
03:00 PM	3	59	3	0	65	3	2	7	0	12	3	69	4	**3**	79	2	1	**7**	0	**10**	166
03:15 PM	**4**	**60**	**5**	0	**69**	5	1	3	**3**	12	2	77	**11**	0	90	**4**	**3**	1	**1**	9	**180**
03:30 PM	4	36	0	0	40	2	2	7	0	11	7	**81**	4	1	**93**	0	0	4	0	4	148
Total Volume	12	214	10	0	236	15	8	24	4	51	21	289	23	4	337	6	5	14	1	26	650
% App. Total	5.1	90.7	4.2	0		29.4	15.7	47.1	7.8		6.2	85.8	6.8	1.2		23.1	19.2	53.8	3.8		
PHF	.750	.892	.500	.000	.855	.750	.667	.857	.333	.797	.583	.892	.523	.333	.906	.375	.417	.500	.250	.650	.903
Unshifted	12	202	4	0	218	14	8	24	4	50	18	276	23	4	321	4	5	12	1	22	611
% Unshifted	100	94.4	40.0	0	92.4	93.3	100	100	100	98.0	85.7	95.5	100	100	95.3	66.7	100	85.7	100	84.6	94.0
Bank 1	0	11	6	0	17	1	0	0	0	1	3	13	0	0	16	2	0	1	0	3	37
% Bank 1	0	5.1	60.0	0	7.2	6.7	0	0	0	2.0	14.3	4.5	0	0	4.7	33.3	0	7.1	0	11.5	5.7
Bank 2	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2
% Bank 2	0	0.5	0	0	0.4	0	0	0	0	0	0	0	0	0	0	0	0	7.1	0	3.8	0.3

Peak Hour Analysis From 02:30 PM to 05:15 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	02:30 PM					02:45 PM					02:45 PM					03:15 PM				
+0 mins.	3	44	1	0	48	**5**	**3**	**7**	1	**16**	**9**	62	4	0	75	4	**3**	1	**1**	9
+15 mins.	1	59	2	0	62	3	2	7	0	12	3	69	4	**3**	79	0	0	4	0	4
+30 mins.	3	59	3	0	65	5	1	3	**3**	12	2	77	**11**	0	90	4	3	**9**	0	**16**
+45 mins.	**4**	**60**	**5**	0	**69**	2	2	7	0	11	7	**81**	4	1	**93**	**10**	1	4	0	15
Total Volume	11	222	11	0	244	15	8	24	4	51	21	289	23	4	337	18	7	18	1	44
% App. Total	4.5	91	4.5	0		29.4	15.7	47.1	7.8		6.2	85.8	6.8	1.2		40.9	15.9	40.9	2.3	
PHF	.688	.925	.550	.000	.884	.750	.667	.857	.333	.797	.583	.892	.523	.333	.906	.450	.583	.500	.250	.688
Unshifted	11	209	4	0	224	14	8	24	4	50	18	276	23	4	321	17	7	17	1	42
% Unshifted	100	94.1	36.4	0	91.8	93.3	100	100	100	98	85.7	95.5	100	100	95.3	94.4	100	94.4	100	95.5
Bank 1	0	12	7	0	19	1	0	0	0	1	3	13	0	0	16	1	0	1	0	2
% Bank 1	0	5.4	63.6	0	7.8	6.7	0	0	0	2	14.3	4.5	0	0	4.7	5.6	0	5.6	0	4.5
Bank 2	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 2	0	0.5	0	0	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Community Planning and Engineering, Inc.

1286 Queen Emma Street
Honolulu, HI 96813

File Name : 210504 mua_leleiona am
Site Code : 00000002
Start Date : 5/4/2021
Page No : 1

Groups Printed- Unshifted - Bank 1 - Bank 2

	Mua Street Southbound					Leleiona Street Westbound					Mua Street Northbound					Leleiona Street Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:00 AM	0	0	0	0	0	0	3	0	0	3	4	1	1	0	6	0	1	0	1	2	11
06:15 AM	0	1	1	0	2	0	7	0	0	7	2	0	1	0	3	1	1	2	0	4	16
06:30 AM	0	1	0	0	1	0	4	0	0	4	5	0	3	0	8	0	3	2	1	6	19
06:45 AM	0	0	2	0	2	1	16	0	0	17	4	2	1	0	7	0	1	1	0	2	28
Total	0	2	3	0	5	1	30	0	0	31	15	3	6	0	24	1	6	5	2	14	74
07:00 AM	0	0	0	0	0	1	12	0	0	13	5	0	1	0	6	0	5	1	0	6	25
07:15 AM	0	0	4	0	4	1	10	0	0	11	6	1	5	1	13	3	3	1	0	7	35
07:30 AM	1	0	2	0	3	2	5	1	0	8	2	1	0	0	3	1	3	1	0	5	19
07:45 AM	0	0	0	0	0	1	8	0	1	10	1	1	1	1	4	0	2	1	0	3	17
Total	1	0	6	0	7	5	35	1	1	42	14	3	7	2	26	4	13	4	0	21	96
08:00 AM	1	0	1	0	2	0	7	0	0	7	1	0	0	0	1	1	5	1	0	7	17
08:15 AM	0	0	2	0	2	0	6	0	0	6	3	0	1	0	4	0	3	4	0	7	19
08:30 AM	0	0	1	0	1	3	4	0	0	7	2	0	1	0	3	3	1	2	0	6	17
08:45 AM	0	0	4	0	4	0	6	1	0	7	1	0	0	0	1	1	1	1	0	3	15
Total	1	0	8	0	9	3	23	1	0	27	7	0	2	0	9	5	10	8	0	23	68
Grand Total	2	2	17	0	21	9	88	2	1	100	36	6	15	2	59	10	29	17	2	58	238
Apprch %	9.5	9.5	81	0		9	88	2	1		61	10.2	25.4	3.4		17.2	50	29.3	3.4		
Total %	0.8	0.8	7.1	0	8.8	3.8	37	0.8	0.4	42	15.1	2.5	6.3	0.8	24.8	4.2	12.2	7.1	0.8	24.4	
Unshifted	2	2	14	0	18	9	84	2	1	96	34	6	15	2	57	10	25	17	2	54	225
% Unshifted	100	100	82.4	0	85.7	100	95.5	100	100	96	94.4	100	100	100	96.6	100	86.2	100	100	93.1	94.5
Bank 1	0	0	2	0	2	0	4	0	0	4	0	0	0	0	0	0	2	0	0	2	8
% Bank 1	0	0	11.8	0	9.5	0	4.5	0	0	4	0	0	0	0	0	0	6.9	0	0	3.4	3.4
Bank 2	0	0	1	0	1	0	0	0	0	0	2	0	0	0	2	0	2	0	0	2	5
% Bank 2	0	0	5.9	0	4.8	0	0	0	0	0	5.6	0	0	0	3.4	0	6.9	0	0	3.4	2.1

Community Planning and Engineering, Inc.

1286 Queen Emma Street
Honolulu, HI 96813

File Name : 210504 mua_leleiona am
Site Code : 00000002
Start Date : 5/4/2021
Page No : 2

	Mua Street Southbound					Leleiona Street Westbound					Mua Street Northbound					Leleiona Street Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 06:30 AM																					
06:30 AM	0	**1**	0	0	1	0	4	0	0	4	5	0	3	0	8	0	3	**2**	**1**	6	19
06:45 AM	0	0	2	0	2	**1**	**16**	0	0	**17**	4	**2**	1	0	7	0	1	1	0	2	28
07:00 AM	0	0	0	0	0	1	12	0	0	13	5	0	1	0	6	0	**5**	1	0	6	25
07:15 AM	0	0	**4**	0	**4**	1	10	0	0	11	**6**	1	**5**	**1**	**13**	**3**	3	1	0	**7**	**35**
Total Volume	0	1	6	0	7	3	42	0	0	45	20	3	10	1	34	3	12	5	1	21	107
% App. Total	0	14.3	85.7	0		6.7	93.3	0	0		58.8	8.8	29.4	2.9		14.3	57.1	23.8	4.8		
PHF	.000	.250	.375	.000	.438	.750	.656	.000	.000	.662	.833	.375	.500	.250	.654	.250	.600	.625	.250	.750	.764
Unshifted	0	1	5	0	6	3	40	0	0	43	19	3	10	1	33	3	8	5	1	17	99
% Unshifted	0	100	83.3	0	85.7	100	95.2	0	0	95.6	95.0	100	100	100	97.1	100	66.7	100	100	81.0	92.5
Bank 1	0	0	1	0	1	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2	5
% Bank 1	0	0	16.7	0	14.3	0	4.8	0	0	4.4	0	0	0	0	0	0	16.7	0	0	9.5	4.7
Bank 2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2	0	0	2	3
% Bank 2	0	0	0	0	0	0	0	0	0	0	5.0	0	0	0	2.9	0	16.7	0	0	9.5	2.8

Community Planning and Engineering, Inc.

1286 Queen Emma Street
Honolulu, HI 96813

File Name : 210504 mua_leleiona am
Site Code : 00000002
Start Date : 5/4/2021
Page No : 3

	Mua Street Southbound					Leleiona Street Westbound					Mua Street Northbound					Leleiona Street Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	06:45 AM					06:45 AM					06:30 AM					07:45 AM					
+0 mins.	0	0	2	0	2	1	**16**	0	0	**17**	5	0	3	0	8	0	2	1	0	3	
+15 mins.	0	0	0	0	0	1	12	0	0	13	4	**2**	1	0	7	1	**5**	1	0	**7**	
+30 mins.	0	0	**4**	0	**4**	1	10	0	0	11	5	0	1	0	6	0	3	**4**	0	7	
+45 mins.	**1**	0	2	0	3	**2**	5	**1**	0	8	**6**	1	**5**	**1**	**13**	**3**	1	2	0	6	
Total Volume	1	0	8	0	9	5	43	1	0	49	20	3	10	1	34	4	11	8	0	23	
% App. Total	11.1	0	88.9	0		10.2	87.8	2	0		58.8	8.8	29.4	2.9		17.4	47.8	34.8	0		
PHF	.250	.000	.500	.000	.563	.625	.672	.250	.000	.721	.833	.375	.500	.250	.654	.333	.550	.500	.000	.821	
Unshifted	1	0	7	0	8	5	40	1	0	46	19	3	10	1	33	4	11	8	0	23	
% Unshifted	100	0	87.5	0	88.9	100	93	100	0	93.9	95	100	100	100	97.1	100	100	100	0	100	
Bank 1	0	0	1	0	1	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	
% Bank 1	0	0	12.5	0	11.1	0	7	0	0	6.1	0	0	0	0	0	0	0	0	0	0	
Bank 2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	
% Bank 2	0	0	0	0	0	0	0	0	0	0	5	0	0	0	2.9	0	0	0	0	0	

Community Planning and Engineering Inc.

1286 Queen Emma Street
Honolulu, HI 96813

File Name : 210504 Mua_Leleiona PM
Site Code : 00000002
Start Date : 5/4/2021
Page No : 1

Groups Printed- Unshifted - Bank 1 - Bank 2

	Mua St Southbound					Leleiona St Westbound					Mua St Northbound					Leleiona St Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
02:30 PM	0	1	2	0	3	1	3	1	0	5	3	0	1	0	4	1	4	3	0	8	20
02:45 PM	0	1	4	0	5	0	7	0	1	8	5	0	1	0	6	0	4	3	1	8	27
Total	0	2	6	0	8	1	10	1	1	13	8	0	2	0	10	1	8	6	1	16	47
03:00 PM	0	2	0	0	2	0	6	0	0	6	6	0	2	0	8	1	4	2	0	7	23
03:15 PM	0	0	1	0	1	1	4	0	0	5	4	0	1	0	5	2	6	6	0	14	25
03:30 PM	0	0	0	0	0	0	5	0	0	5	4	0	0	0	4	0	4	8	0	12	21
03:45 PM	1	0	1	0	2	2	2	0	0	4	4	0	0	0	4	0	8	9	0	17	27
Total	1	2	2	0	5	3	17	0	0	20	18	0	3	0	21	3	22	25	0	50	96
04:00 PM	0	0	1	0	1	0	7	1	0	8	2	0	0	1	3	0	4	5	0	9	21
04:15 PM	0	1	0	0	1	0	3	0	1	4	6	0	2	0	8	2	4	7	0	13	26
04:30 PM	0	1	3	0	4	4	6	1	0	11	3	0	0	0	3	1	3	8	0	12	30
04:45 PM	0	0	1	0	1	1	6	0	0	7	2	0	3	0	5	1	8	6	0	15	28
Total	0	2	5	0	7	5	22	2	1	30	13	0	5	1	19	4	19	26	0	49	105
05:00 PM	0	0	0	2	2	0	8	1	1	10	3	0	0	0	3	0	2	3	0	5	20
05:15 PM	0	0	1	0	1	2	5	1	1	9	2	0	2	0	4	0	8	6	0	14	28
Grand Total	1	6	14	2	23	11	62	5	4	82	44	0	12	1	57	8	59	66	1	134	296
Apprch %	4.3	26.1	60.9	8.7		13.4	75.6	6.1	4.9		77.2	0	21.1	1.8		6	44	49.3	0.7		
Total %	0.3	2	4.7	0.7	7.8	3.7	20.9	1.7	1.4	27.7	14.9	0	4.1	0.3	19.3	2.7	19.9	22.3	0.3	45.3	
Unshifted	1	6	14	2	23	10	61	4	4	79	44	0	10	1	55	8	56	65	1	130	287
% Unshifted	100	100	100	100	100	90.9	98.4	80	100	96.3	100	0	83.3	100	96.5	100	94.9	98.5	100	97	97
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.4	0	0	1.5	0.7
Bank 2	0	0	0	0	0	1	1	1	0	3	0	0	2	0	2	0	1	1	0	2	7
% Bank 2	0	0	0	0	0	9.1	1.6	20	0	3.7	0	0	16.7	0	3.5	0	1.7	1.5	0	1.5	2.4

Community Planning and Engineering Inc.

1286 Queen Emma Street
Honolulu, HI 96813

File Name : 210504 Mua_Leleiona PM
Site Code : 00000002
Start Date : 5/4/2021
Page No : 2

	Mua St Southbound					Leleiona St Westbound					Mua St Northbound					Leleiona St Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 02:30 PM to 05:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	**1**	**3**	0	**4**	**4**	6	**1**	0	**11**	**3**	0	0	0	3	**1**	3	**8**	0	12	**30**
04:45 PM	0	0	1	0	1	1	6	0	0	7	2	0	**3**	0	**5**	1	**8**	6	0	**15**	28
05:00 PM	0	0	0	**2**	2	0	**8**	1	**1**	10	3	0	0	0	3	0	2	3	0	5	20
05:15 PM	0	0	1	0	1	2	5	1	1	9	2	0	2	0	4	0	8	6	0	14	28
Total Volume	0	1	5	2	8	7	25	3	2	37	10	0	5	0	15	2	21	23	0	46	106
% App. Total	0	12.5	62.5	25		18.9	67.6	8.1	5.4		66.7	0	33.3	0		4.3	45.7	50	0		
PHF	.000	.250	.417	.250	.500	.438	.781	.750	.500	.841	.833	.000	.417	.000	.750	.500	.656	.719	.000	.767	.883
Unshifted	0	1	5	2	8	7	25	2	2	36	10	0	5	0	15	2	21	23	0	46	105
% Unshifted	0	100	100	100	100	100	100	66.7	100	97.3	100	0	100	0	100	100	100	100	0	100	99.1
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bank 2	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1
% Bank 2	0	0	0	0	0	0	0	33.3	0	2.7	0	0	0	0	0	0	0	0	0	0	0.9

Peak Hour Analysis From 02:30 PM to 05:15 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	02:30 PM					04:30 PM					02:30 PM					03:15 PM					
+0 mins.	0	1	2	0	3	**4**	6	**1**	0	**11**	3	0	1	0	4	**2**	6	6	0	14	
+15 mins.	0	1	**4**	0	**5**	1	6	0	0	7	5	0	1	0	6	0	4	8	0	12	
+30 mins.	0	**2**	0	0	2	0	**8**	1	**1**	10	**6**	0	**2**	0	**8**	0	**8**	**9**	0	**17**	
+45 mins.	0	0	1	0	1	2	5	1	1	9	4	0	1	0	5	0	4	5	0	9	
Total Volume	0	4	7	0	11	7	25	3	2	37	18	0	5	0	23	2	22	28	0	52	
% App. Total	0	36.4	63.6	0		18.9	67.6	8.1	5.4		78.3	0	21.7	0		3.8	42.3	53.8	0		
PHF	.000	.500	.438	.000	.550	.438	.781	.750	.500	.841	.750	.000	.625	.000	.719	.250	.688	.778	.000	.765	
Unshifted	0	4	7	0	11	7	25	2	2	36	18	0	3	0	21	2	22	27	0	51	
% Unshifted	0	100	100	0	100	100	100	66.7	100	97.3	100	0	60	0	91.3	100	100	96.4	0	98.1	
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bank 2	0	0	0	0	0	0	0	1	0	1	0	0	2	0	2	0	0	1	0	1	
% Bank 2	0	0	0	0	0	0	0	33.3	0	2.7	0	0	40	0	8.7	0	0	3.6	0	1.9	

Community Planning and Engineering Inc.

1286 Queen Emma Street
Honolulu, HI 96813

File Name : 210505 Nani_Welau AM
Site Code : 00000003
Start Date : 5/5/2021
Page No : 1

Groups Printed- Unshifted - Bank 1 - Bank 2

	Nani St Southbound					Westbound					Nani St Northbound					Welau St Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:00 AM	0	6	0	0	6	0	0	0	0	0	0	8	0	0	8	1	0	0	0	1	15
06:15 AM	0	5	0	1	6	0	0	0	0	0	0	15	0	0	15	1	0	1	1	3	24
06:30 AM	0	10	1	0	11	0	0	0	0	0	0	18	0	0	18	0	0	0	0	0	29
06:45 AM	0	15	4	0	19	0	0	0	0	0	0	12	0	0	12	3	0	0	0	3	34
Total	0	36	5	1	42	0	0	0	0	0	0	53	0	0	53	5	0	1	1	7	102
07:00 AM	0	7	1	1	9	0	0	0	0	0	0	6	0	1	7	4	0	0	0	4	20
07:15 AM	0	10	0	0	10	0	0	0	0	0	0	23	0	0	23	4	0	0	0	4	37
07:30 AM	0	7	2	0	9	0	0	0	0	0	0	20	0	0	20	4	0	0	0	4	33
07:45 AM	0	12	2	0	14	0	0	0	0	0	0	12	0	0	12	4	0	0	0	4	30
Total	0	36	5	1	42	0	0	0	0	0	0	61	0	1	62	16	0	0	0	16	120
08:00 AM	0	8	0	0	8	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	15
08:15 AM	0	7	1	0	8	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	14
08:30 AM	0	8	0	0	8	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	13
08:45 AM	0	3	1	0	4	0	0	0	0	0	1	12	0	0	13	1	0	0	0	1	18
Total	0	26	2	0	28	0	0	0	0	0	1	30	0	0	31	1	0	0	0	1	60
Grand Total	0	98	12	2	112	0	0	0	0	0	1	144	0	1	146	22	0	1	1	24	282
Apprch %	0	87.5	10.7	1.8		0	0	0	0		0.7	98.6	0	0.7		91.7	0	4.2	4.2		
Total %	0	34.8	4.3	0.7	39.7	0	0	0	0	0	0.4	51.1	0	0.4	51.8	7.8	0	0.4	0.4	8.5	
Unshifted	0	96	11	2	109	0	0	0	0	0	1	141	0	1	143	22	0	0	1	23	275
% Unshifted	0	98	91.7	100	97.3	0	0	0	0	0	100	97.9	0	100	97.9	100	0	0	100	95.8	97.5
Bank 1	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	3
% Bank 1	0	1	0	0	0.9	0	0	0	0	0	0	1.4	0	0	1.4	0	0	0	0	0	1.1
Bank 2	0	1	1	0	2	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	4
% Bank 2	0	1	8.3	0	1.8	0	0	0	0	0	0	0.7	0	0	0.7	0	0	100	0	4.2	1.4

Community Planning and Engineering Inc.

1286 Queen Emma Street
Honolulu, HI 96813

File Name : 210505 Nani_Welau AM
Site Code : 00000003
Start Date : 5/5/2021
Page No : 2

	Nani St Southbound					Westbound					Nani St Northbound					Welau St Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 06:45 AM																					
06:45 AM	0	**15**	**4**	0	**19**	0	0	0	0	0	0	12	0	0	12	3	0	0	0	3	34
07:00 AM	0	7	1	**1**	9	0	0	0	0	0	0	6	0	**1**	7	**4**	0	0	0	**4**	20
07:15 AM	0	10	0	0	10	0	0	0	0	0	0	**23**	0	0	**23**	4	0	0	0	4	**37**
07:30 AM	0	7	2	0	9	0	0	0	0	0	0	20	0	0	20	4	0	0	0	4	33
Total Volume	0	39	7	1	47	0	0	0	0	0	0	61	0	1	62	15	0	0	0	15	124
% App. Total	0	83	14.9	2.1		0	0	0	0		0	98.4	0	1.6		100	0	0	0		
PHF	.000	.650	.438	.250	.618	.000	.000	.000	.000	.000	.000	.663	.000	.250	.674	.938	.000	.000	.000	.938	.838
Unshifted	0	38	6	1	45	0	0	0	0	0	0	60	0	1	61	15	0	0	0	15	121
% Unshifted	0	97.4	85.7	100	95.7	0	0	0	0	0	0	98.4	0	100	98.4	100	0	0	0	100	97.6
Bank 1	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
% Bank 1	0	2.6	0	0	2.1	0	0	0	0	0	0	1.6	0	0	1.6	0	0	0	0	0	1.6
Bank 2	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
% Bank 2	0	0	14.3	0	2.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.8

Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	06:30 AM					06:00 AM					06:45 AM					07:00 AM					
+0 mins.	0	10	1	0	11	0	0	0	0	0	0	12	0	0	12	**4**	0	0	0	**4**	
+15 mins.	0	**15**	**4**	0	**19**	0	0	0	0	0	0	6	0	**1**	7	4	0	0	0	4	
+30 mins.	0	7	1	**1**	9	0	0	0	0	0	0	**23**	0	0	**23**	4	0	0	0	4	
+45 mins.	0	10	0	0	10	0	0	0	0	0	0	20	0	0	20	4	0	0	0	4	
Total Volume	0	42	6	1	49	0	0	0	0	0	0	61	0	1	62	16	0	0	0	16	
% App. Total	0	85.7	12.2	2		0	0	0	0		0	98.4	0	1.6		100	0	0	0		
PHF	.000	.700	.375	.250	.645	.000	.000	.000	.000	.000	.000	.663	.000	.250	.674	1.000	.000	.000	.000	1.000	
Unshifted	0	41	5	1	47	0	0	0	0	0	0	60	0	1	61	16	0	0	0	16	
% Unshifted	0	97.6	83.3	100	95.9	0	0	0	0	0	0	98.4	0	100	98.4	100	0	0	0	100	
Bank 1	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	
% Bank 1	0	2.4	0	0	2	0	0	0	0	0	0	1.6	0	0	1.6	0	0	0	0	0	
Bank 2	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
% Bank 2	0	0	16.7	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Community Planning and Engineering Inc.

1286 Queen Emma Street
Honolulu, HI 96813

File Name : 210505 Nani_Welau PM
Site Code : 00000003
Start Date : 5/5/2021
Page No : 1

Groups Printed- Unshifted - Bank 1 - Bank 2

	Nani St Southbound					Westbound					Nani St Northbound					Welau St Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
02:15 PM	0	11	0	0	11	0	0	0	0	0	1	10	0	0	11	0	0	0	0	0	22
02:30 PM	0	18	3	0	21	0	0	0	0	0	0	5	0	0	5	2	0	0	0	2	28
02:45 PM	0	8	5	0	13	0	0	0	0	0	1	13	0	0	14	2	0	0	0	2	29
Total	0	37	8	0	45	0	0	0	0	0	2	28	0	0	30	4	0	0	0	4	79
03:00 PM	0	8	0	1	9	0	0	0	0	0	1	5	0	0	6	1	0	0	0	1	16
03:15 PM	0	10	1	0	11	0	0	0	0	0	0	5	0	0	5	1	0	0	0	1	17
03:30 PM	0	18	0	0	18	0	0	0	0	0	0	8	0	0	8	1	0	0	0	1	27
03:45 PM	0	22	5	0	27	0	0	0	0	0	0	13	0	0	13	0	0	0	0	0	40
Total	0	58	6	1	65	0	0	0	0	0	1	31	0	0	32	3	0	0	0	3	100
04:00 PM	0	18	6	0	24	0	0	0	0	0	0	9	0	0	9	1	0	0	0	1	34
04:15 PM	0	12	0	0	12	0	0	0	0	0	1	19	0	0	20	0	0	0	0	0	32
04:30 PM	0	16	3	0	19	0	0	0	0	0	1	8	0	0	9	1	0	0	0	1	29
04:45 PM	0	10	2	0	12	0	0	0	0	0	0	11	0	0	11	4	0	1	0	5	28
Total	0	56	11	0	67	0	0	0	0	0	2	47	0	0	49	6	0	1	0	7	123
05:00 PM	0	15	2	0	17	0	0	0	0	0	0	13	0	0	13	2	0	1	0	3	33
Grand Total	0	166	27	1	194	0	0	0	0	0	5	119	0	0	124	15	0	2	0	17	335
Apprch %	0	85.6	13.9	0.5		0	0	0	0		4	96	0	0		88.2	0	11.8	0		
Total %	0	49.6	8.1	0.3	57.9	0	0	0	0	0	1.5	35.5	0	0	37	4.5	0	0.6	0	5.1	
Unshifted	0	164	26	1	191	0	0	0	0	0	3	119	0	0	122	15	0	2	0	17	330
% Unshifted	0	98.8	96.3	100	98.5	0	0	0	0	0	60	100	0	0	98.4	100	0	100	0	100	98.5
Bank 1	0	1	0	0	1	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	3
% Bank 1	0	0.6	0	0	0.5	0	0	0	0	0	40	0	0	0	1.6	0	0	0	0	0	0.9
Bank 2	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
% Bank 2	0	0.6	3.7	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6

Community Planning and Engineering Inc.

1286 Queen Emma Street
Honolulu, HI 96813

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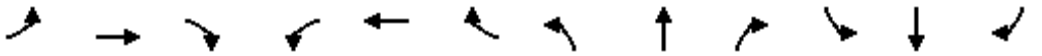
Page No : 2

	Nani St Southbound					Westbound					Nani St Northbound					Welau St Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 02:15 PM to 05:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:45 PM																					
03:45 PM	0	**22**	5	0	**27**	0	0	0	0	0	0	13	0	0	13	0	0	0	0	0	**40**
04:00 PM	0	18	**6**	0	24	0	0	0	0	0	0	9	0	0	9	**1**	0	0	0	**1**	34
04:15 PM	0	12	0	0	12	0	0	0	0	0	**1**	**19**	0	0	**20**	0	0	0	0	0	32
04:30 PM	0	16	3	0	19	0	0	0	0	0	1	8	0	0	9	1	0	0	0	1	29
Total Volume	0	68	14	0	82	0	0	0	0	0	2	49	0	0	51	2	0	0	0	2	135
% App. Total	0	82.9	17.1	0		0	0	0	0		3.9	96.1	0	0		100	0	0	0		
PHF	.000	.773	.583	.000	.759	.000	.000	.000	.000	.000	.500	.645	.000	.000	.638	.500	.000	.000	.000	.500	.844
Unshifted	0	68	13	0	81	0	0	0	0	0	1	49	0	0	50	2	0	0	0	2	133
% Unshifted	0	100	92.9	0	98.8	0	0	0	0	0	50.0	100	0	0	98.0	100	0	0	0	100	98.5
Bank 1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1
% Bank 1	0	0	0	0	0	0	0	0	0	0	50.0	0	0	0	2.0	0	0	0	0	0	0.7
Bank 2	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
% Bank 2	0	0	7.1	0	1.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.7

Peak Hour Analysis From 02:15 PM to 05:00 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	03:45 PM					02:15 PM					04:15 PM					04:15 PM				
+0 mins.	0	**22**	5	0	**27**	0	0	0	0	0	**1**	**19**	0	0	**20**	0	0	0	0	0
+15 mins.	0	18	**6**	0	24	0	0	0	0	0	1	8	0	0	9	1	0	0	0	1
+30 mins.	0	12	0	0	12	0	0	0	0	0	0	11	0	0	11	**4**	0	**1**	0	**5**
+45 mins.	0	16	3	0	19	0	0	0	0	0	0	13	0	0	13	2	0	1	0	3
Total Volume	0	68	14	0	82	0	0	0	0	0	2	51	0	0	53	7	0	2	0	9
% App. Total	0	82.9	17.1	0		0	0	0	0		3.8	96.2	0	0		77.8	0	22.2	0	
PHF	.000	.773	.583	.000	.759	.000	.000	.000	.000	.000	.500	.671	.000	.000	.663	.438	.000	.500	.000	.450
Unshifted	0	68	13	0	81	0	0	0	0	0	1	51	0	0	52	7	0	2	0	9
% Unshifted	0	100	92.9	0	98.8	0	0	0	0	0	50	100	0	0	98.1	100	0	100	0	100
Bank 1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	50	0	0	0	1.9	0	0	0	0	0
Bank 2	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 2	0	0	7.1	0	1.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix B: Existing Analysis Reports



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	83	951	191	120	579	70	149	35	117	54	15	28
Future Volume (veh/h)	83	951	191	120	579	70	149	35	117	54	15	28
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1826	1826	1826	1722	1722	1722	1811	1811	1811
Adj Flow Rate, veh/h	89	1023	0	129	623	0	160	38	0	58	16	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	3	3	3	5	5	5	12	12	12	6	6	6
Cap, veh/h	206	1498		261	1590		375	76		476	543	
Arrive On Green	0.12	0.43	0.00	0.15	0.46	0.00	0.30	0.30	0.00	0.30	0.30	0.00
Sat Flow, veh/h	1767	3526	1572	1739	3469	1547	1070	254	1459	1326	1811	1535
Grp Volume(v), veh/h	89	1023	0	129	623	0	198	0	0	58	16	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1739	1735	1547	1324	0	1459	1326	1811	1535
Q Serve(g_s), s	5.6	28.2	0.0	8.2	14.2	0.0	14.5	0.0	0.0	0.0	0.7	0.0
Cycle Q Clear(g_c), s	5.6	28.2	0.0	8.2	14.2	0.0	15.3	0.0	0.0	3.5	0.7	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.81		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	206	1498		261	1590		451	0		476	543	
V/C Ratio(X)	0.43	0.68		0.49	0.39		0.44	0.00		0.12	0.03	
Avail Cap(c_a), veh/h	206	1498		261	1590		451	0		476	543	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	49.3	27.9	0.0	46.8	21.5	0.0	35.1	0.0	0.0	30.6	29.7	0.0
Incr Delay (d2), s/veh	6.5	2.5	0.0	6.6	0.7	0.0	3.1	0.0	0.0	0.5	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	12.4	0.0	4.1	6.0	0.0	5.2	0.0	0.0	1.3	0.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.8	30.5	0.0	53.4	22.2	0.0	38.1	0.0	0.0	31.1	29.8	0.0
LnGrp LOS	E	C		D	C		D	A		C	C	
Approach Vol, veh/h		1112	A		752	A		198	A		74	A
Approach Delay, s/veh		32.5			27.5			38.1			30.8	
Approach LOS		C			C			D			C	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		41.0	23.0	56.0		41.0	19.0	60.0				
Change Period (Y+Rc), s		5.0	5.0	5.0		5.0	5.0	5.0				
Max Green Setting (Gmax), s		36.0	18.0	51.0		36.0	14.0	55.0				
Max Q Clear Time (g_c+I1), s		17.3	10.2	30.2		5.5	7.6	16.2				
Green Ext Time (p_c), s		1.1	0.2	8.0		0.2	0.1	5.2				

Intersection Summary		
HCM 6th Ctrl Delay		31.2
HCM 6th LOS		C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	0	15	25	4	18	14	270	13	9	281	12
Future Vol, veh/h	6	0	15	25	4	18	14	270	13	9	281	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	48	48	48	4	4	4	13	13	13	3	3	3
Mvmt Flow	7	0	16	27	4	20	15	297	14	10	309	13

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	682	677	316	678	676	304	322	0	0	311	0	0
Stage 1	336	336	-	334	334	-	-	-	-	-	-	-
Stage 2	346	341	-	344	342	-	-	-	-	-	-	-
Critical Hdwy	7.58	6.98	6.68	7.14	6.54	6.24	4.23	-	-	4.13	-	-
Critical Hdwy Stg 1	6.58	5.98	-	6.14	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.58	5.98	-	6.14	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.932	4.432	3.732	3.536	4.036	3.336	2.317	-	-	2.227	-	-
Pot Cap-1 Maneuver	309	322	629	363	373	731	1178	-	-	1244	-	-
Stage 1	592	568	-	676	640	-	-	-	-	-	-	-
Stage 2	584	565	-	667	634	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	292	314	629	347	364	731	1178	-	-	1244	-	-
Mov Cap-2 Maneuver	292	314	-	347	364	-	-	-	-	-	-	-
Stage 1	583	562	-	666	630	-	-	-	-	-	-	-
Stage 2	556	557	-	643	628	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13	14.3	0.4	0.2
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1178	-	-	473	437	1244	-	-
HCM Lane V/C Ratio	0.013	-	-	0.049	0.118	0.008	-	-
HCM Control Delay (s)	8.1	0	-	13	14.3	7.9	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.4	0	-	-

Intersection	
Int Delay, s/veh	3.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	12	5	3	42	0	20	3	10	0	1	6
Future Vol, veh/h	3	12	5	3	42	0	20	3	10	0	1	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	76	76	76	76	76	76	76	76	76	76	76	76
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	16	7	4	55	0	26	4	13	0	1	8

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	55	0	0	23	0	0	96	91	20	99	94	55
Stage 1	-	-	-	-	-	-	28	28	-	63	63	-
Stage 2	-	-	-	-	-	-	68	63	-	36	31	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1550	-	-	1592	-	-	887	799	1058	883	796	1012
Stage 1	-	-	-	-	-	-	989	872	-	948	842	-
Stage 2	-	-	-	-	-	-	942	842	-	980	869	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1550	-	-	1592	-	-	875	794	1058	864	791	1012
Mov Cap-2 Maneuver	-	-	-	-	-	-	875	794	-	864	791	-
Stage 1	-	-	-	-	-	-	986	869	-	945	839	-
Stage 2	-	-	-	-	-	-	930	839	-	961	866	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.1	0.5	9.1	8.7
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	914	1550	-	-	1592	-	-	973
HCM Lane V/C Ratio	0.048	0.003	-	-	0.002	-	-	0.009
HCM Control Delay (s)	9.1	7.3	0	-	7.3	0	-	8.7
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1076	8	31	757	3	76
Future Vol, veh/h	1076	8	31	757	3	76
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	370	275	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	3	3	5	5	2	2
Mvmt Flow	1182	9	34	832	3	84

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1191	0	1666	591
Stage 1	-	-	-	-	1182	-
Stage 2	-	-	-	-	484	-
Critical Hdwy	-	-	4.2	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.25	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	565	-	87	450
Stage 1	-	-	-	-	254	-
Stage 2	-	-	-	-	585	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	565	-	82	450
Mov Cap-2 Maneuver	-	-	-	-	82	-
Stage 1	-	-	-	-	254	-
Stage 2	-	-	-	-	550	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	17.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	384	-	-	565	-
HCM Lane V/C Ratio	0.226	-	-	0.06	-
HCM Control Delay (s)	17.1	-	-	11.8	-
HCM Lane LOS	C	-	-	B	-
HCM 95th %tile Q(veh)	0.9	-	-	0.2	-

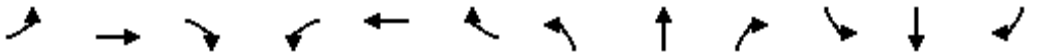
Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	15	0	0	61	39	7
Future Vol, veh/h	15	0	0	61	39	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	18	0	0	73	46	8

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	123	50	54	0	-	0
Stage 1	50	-	-	-	-	-
Stage 2	73	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	872	1018	1551	-	-	-
Stage 1	972	-	-	-	-	-
Stage 2	950	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	872	1018	1551	-	-	-
Mov Cap-2 Maneuver	872	-	-	-	-	-
Stage 1	972	-	-	-	-	-
Stage 2	950	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.2	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1551	-	872	-	-
HCM Lane V/C Ratio	-	-	0.02	-	-
HCM Control Delay (s)	0	-	9.2	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	849	144	92	950	28	165	22	139	95	34	54
Future Volume (veh/h)	26	849	144	92	950	28	165	22	139	95	34	54
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1841	1841	1841	1856	1856	1856
Adj Flow Rate, veh/h	28	903	0	98	1011	0	176	23	0	101	36	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	4	4	4	3	3	3
Cap, veh/h	221	1616		221	1616		399	45		497	541	
Arrive On Green	0.13	0.46	0.00	0.13	0.46	0.00	0.29	0.29	0.00	0.29	0.29	0.00
Sat Flow, veh/h	1767	3526	1572	1767	3526	1572	1173	153	1560	1377	1856	1572
Grp Volume(v), veh/h	28	903	0	98	1011	0	199	0	0	101	36	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1763	1572	1326	0	1560	1377	1856	1572
Q Serve(g_s), s	1.7	22.4	0.0	6.2	26.1	0.0	14.4	0.0	0.0	0.0	1.7	0.0
Cycle Q Clear(g_c), s	1.7	22.4	0.0	6.2	26.1	0.0	16.1	0.0	0.0	5.6	1.7	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.88		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	221	1616		221	1616		443	0		497	541	
V/C Ratio(X)	0.13	0.56		0.44	0.63		0.45	0.00		0.20	0.07	
Avail Cap(c_a), veh/h	221	1616		221	1616		443	0		497	541	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	46.7	23.7	0.0	48.6	24.7	0.0	36.5	0.0	0.0	32.1	30.7	0.0
Incr Delay (d2), s/veh	1.2	1.4	0.0	6.3	1.8	0.0	3.3	0.0	0.0	0.9	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	9.6	0.0	3.1	11.3	0.0	5.4	0.0	0.0	2.4	0.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.9	25.1	0.0	55.0	26.5	0.0	39.8	0.0	0.0	33.0	30.9	0.0
LnGrp LOS	D	C		D	C		D	A		C	C	
Approach Vol, veh/h		931	A		1109	A		199	A		137	A
Approach Delay, s/veh		25.8			29.0			39.8			32.5	
Approach LOS		C			C			D			C	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		40.0	20.0	60.0		40.0	20.0	60.0				
Change Period (Y+Rc), s		5.0	5.0	5.0		5.0	5.0	5.0				
Max Green Setting (Gmax), s		35.0	15.0	55.0		35.0	15.0	55.0				
Max Q Clear Time (g_c+I1), s		18.1	8.2	24.4		7.6	3.7	28.1				
Green Ext Time (p_c), s		1.0	0.1	7.9		0.5	0.0	8.8				

Intersection Summary												
HCM 6th Ctrl Delay			28.8									
HCM 6th LOS			C									

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	5	14	15	8	24	21	289	23	12	214	10
Future Vol, veh/h	6	5	14	15	8	24	21	289	23	12	214	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	12	12	12	2	2	2	5	5	5	7	7	7
Mvmt Flow	7	6	16	17	9	27	23	321	26	13	238	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	668	663	244	661	655	334	249	0	0	347	0	0
Stage 1	270	270	-	380	380	-	-	-	-	-	-	-
Stage 2	398	393	-	281	275	-	-	-	-	-	-	-
Critical Hdwy	7.22	6.62	6.32	7.12	6.52	6.22	4.15	-	-	4.17	-	-
Critical Hdwy Stg 1	6.22	5.62	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.22	5.62	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.608	4.108	3.408	3.518	4.018	3.318	2.245	-	-	2.263	-	-
Pot Cap-1 Maneuver	359	369	771	376	386	708	1299	-	-	1185	-	-
Stage 1	714	668	-	642	614	-	-	-	-	-	-	-
Stage 2	608	589	-	726	683	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	330	356	771	355	372	708	1299	-	-	1185	-	-
Mov Cap-2 Maneuver	330	356	-	355	372	-	-	-	-	-	-	-
Stage 1	698	659	-	628	600	-	-	-	-	-	-	-
Stage 2	564	576	-	696	674	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.7	13.4	0.5	0.4
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1299	-	-	496	481	1185	-	-
HCM Lane V/C Ratio	0.018	-	-	0.056	0.109	0.011	-	-
HCM Control Delay (s)	7.8	0	-	12.7	13.4	8.1	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	0.4	0	-	-

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	21	23	7	25	3	10	0	5	0	1	5
Future Vol, veh/h	2	21	23	7	25	3	10	0	5	0	1	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	24	26	8	28	3	11	0	6	0	1	6

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	31	0	0	50	0	0	90	88	37	90	100	30
Stage 1	-	-	-	-	-	-	41	41	-	46	46	-
Stage 2	-	-	-	-	-	-	49	47	-	44	54	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1582	-	-	1557	-	-	895	802	1035	895	790	1044
Stage 1	-	-	-	-	-	-	974	861	-	968	857	-
Stage 2	-	-	-	-	-	-	964	856	-	970	850	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1582	-	-	1557	-	-	885	797	1035	886	785	1044
Mov Cap-2 Maneuver	-	-	-	-	-	-	885	797	-	886	785	-
Stage 1	-	-	-	-	-	-	973	860	-	967	853	-
Stage 2	-	-	-	-	-	-	953	852	-	964	849	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	1.5	8.9	8.7
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	930	1582	-	-	1557	-	-	990
HCM Lane V/C Ratio	0.018	0.001	-	-	0.005	-	-	0.007
HCM Control Delay (s)	8.9	7.3	0	-	7.3	0	-	8.7
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0

Intersection	
Int Delay, s/veh	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1068	16	65	1093	2	49
Future Vol, veh/h	1068	16	65	1093	2	49
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	370	275	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1174	18	71	1201	2	54

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1192	0	1917	587
Stage 1	-	-	-	-	1174	-
Stage 2	-	-	-	-	743	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	581	-	59	453
Stage 1	-	-	-	-	256	-
Stage 2	-	-	-	-	431	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	581	-	52	453
Mov Cap-2 Maneuver	-	-	-	-	52	-
Stage 1	-	-	-	-	256	-
Stage 2	-	-	-	-	378	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	17.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	348	-	-	581	-
HCM Lane V/C Ratio	0.161	-	-	0.123	-
HCM Control Delay (s)	17.3	-	-	12.1	-
HCM Lane LOS	C	-	-	B	-
HCM 95th %tile Q(veh)	0.6	-	-	0.4	-

Intersection	
Int Delay, s/veh	0.3

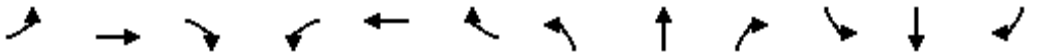
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	0	2	49	68	14
Future Vol, veh/h	2	0	2	49	68	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	0	2	58	81	17

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	152	90	98	0	-	0
Stage 1	90	-	-	-	-	-
Stage 2	62	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	840	968	1495	-	-	-
Stage 1	934	-	-	-	-	-
Stage 2	961	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	839	968	1495	-	-	-
Mov Cap-2 Maneuver	839	-	-	-	-	-
Stage 1	933	-	-	-	-	-
Stage 2	961	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	0.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1495	-	839	-	-
HCM Lane V/C Ratio	0.002	-	0.003	-	-
HCM Control Delay (s)	7.4	0	9.3	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Appendix C: Proposed Analysis Reports



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	83	951	191	120	579	72	149	35	117	55	15	28
Future Volume (veh/h)	83	951	191	120	579	72	149	35	117	55	15	28
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1826	1826	1826	1722	1722	1722	1811	1811	1811
Adj Flow Rate, veh/h	89	1023	0	129	623	0	160	38	0	59	16	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	3	3	3	5	5	5	12	12	12	6	6	6
Cap, veh/h	206	1498		261	1590		375	76		476	543	
Arrive On Green	0.12	0.43	0.00	0.15	0.46	0.00	0.30	0.30	0.00	0.30	0.30	0.00
Sat Flow, veh/h	1767	3526	1572	1739	3469	1547	1070	254	1459	1326	1811	1535
Grp Volume(v), veh/h	89	1023	0	129	623	0	198	0	0	59	16	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1739	1735	1547	1324	0	1459	1326	1811	1535
Q Serve(g_s), s	5.6	28.2	0.0	8.2	14.2	0.0	14.5	0.0	0.0	0.0	0.7	0.0
Cycle Q Clear(g_c), s	5.6	28.2	0.0	8.2	14.2	0.0	15.3	0.0	0.0	3.5	0.7	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.81		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	206	1498		261	1590		451	0		476	543	
V/C Ratio(X)	0.43	0.68		0.49	0.39		0.44	0.00		0.12	0.03	
Avail Cap(c_a), veh/h	206	1498		261	1590		451	0		476	543	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	49.3	27.9	0.0	46.8	21.5	0.0	35.1	0.0	0.0	30.6	29.7	0.0
Incr Delay (d2), s/veh	6.5	2.5	0.0	6.6	0.7	0.0	3.1	0.0	0.0	0.5	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	12.4	0.0	4.1	6.0	0.0	5.2	0.0	0.0	1.3	0.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.8	30.5	0.0	53.4	22.2	0.0	38.1	0.0	0.0	31.2	29.8	0.0
LnGrp LOS	E	C		D	C		D	A		C	C	
Approach Vol, veh/h		1112	A		752	A		198	A		75	A
Approach Delay, s/veh		32.5			27.5			38.1			30.9	
Approach LOS		C			C			D			C	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		41.0	23.0	56.0		41.0	19.0	60.0				
Change Period (Y+Rc), s		5.0	5.0	5.0		5.0	5.0	5.0				
Max Green Setting (Gmax), s		36.0	18.0	51.0		36.0	14.0	55.0				
Max Q Clear Time (g_c+I1), s		17.3	10.2	30.2		5.5	7.6	16.2				
Green Ext Time (p_c), s		1.1	0.2	8.0		0.2	0.1	5.2				

Intersection Summary		
HCM 6th Ctrl Delay		31.2
HCM 6th LOS		C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	0	15	29	4	18	14	270	16	9	281	12
Future Vol, veh/h	6	0	15	29	4	18	14	270	16	9	281	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	48	48	48	4	4	4	13	13	13	3	3	3
Mvmt Flow	7	0	16	32	4	20	15	297	18	10	309	13

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	684	681	316	680	678	306	322	0	0	315	0	0
Stage 1	336	336	-	336	336	-	-	-	-	-	-	-
Stage 2	348	345	-	344	342	-	-	-	-	-	-	-
Critical Hdwy	7.58	6.98	6.68	7.14	6.54	6.24	4.23	-	-	4.13	-	-
Critical Hdwy Stg 1	6.58	5.98	-	6.14	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.58	5.98	-	6.14	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.932	4.432	3.732	3.536	4.036	3.336	2.317	-	-	2.227	-	-
Pot Cap-1 Maneuver	308	320	629	362	372	729	1178	-	-	1240	-	-
Stage 1	592	568	-	674	638	-	-	-	-	-	-	-
Stage 2	583	562	-	667	634	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	291	312	629	346	363	729	1178	-	-	1240	-	-
Mov Cap-2 Maneuver	291	312	-	346	363	-	-	-	-	-	-	-
Stage 1	583	562	-	664	628	-	-	-	-	-	-	-
Stage 2	555	554	-	643	628	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13	14.7	0.4	0.2
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1178	-	-	472	427	1240	-	-
HCM Lane V/C Ratio	0.013	-	-	0.049	0.131	0.008	-	-
HCM Control Delay (s)	8.1	0	-	13	14.7	7.9	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.4	0	-	-

Intersection	
Int Delay, s/veh	4.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	12	5	3	42	0	20	3	10	0	1	10
Future Vol, veh/h	6	12	5	3	42	0	20	3	10	0	1	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	76	76	76	76	76	76	76	76	76	76	76	76
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	16	7	4	55	0	26	4	13	0	1	13

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	55	0	0	23	0	0	106	99	20	107	102	55
Stage 1	-	-	-	-	-	-	36	36	-	63	63	-
Stage 2	-	-	-	-	-	-	70	63	-	44	39	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1550	-	-	1592	-	-	873	791	1058	872	788	1012
Stage 1	-	-	-	-	-	-	980	865	-	948	842	-
Stage 2	-	-	-	-	-	-	940	842	-	970	862	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1550	-	-	1592	-	-	856	785	1058	853	782	1012
Mov Cap-2 Maneuver	-	-	-	-	-	-	856	785	-	853	782	-
Stage 1	-	-	-	-	-	-	975	861	-	943	839	-
Stage 2	-	-	-	-	-	-	924	839	-	949	858	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.9	0.5	9.2	8.7
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	901	1550	-	-	1592	-	-	986
HCM Lane V/C Ratio	0.048	0.005	-	-	0.002	-	-	0.015
HCM Control Delay (s)	9.2	7.3	0	-	7.3	0	-	8.7
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0

Intersection	
Int Delay, s/veh	1.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1076	20	38	757	15	91
Future Vol, veh/h	1076	20	38	757	15	91
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	370	275	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	3	3	5	5	2	2
Mvmt Flow	1182	22	42	832	16	100

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1204	0	1682	591
Stage 1	-	-	-	-	1182	-
Stage 2	-	-	-	-	500	-
Critical Hdwy	-	-	4.2	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.25	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	559	-	85	450
Stage 1	-	-	-	-	254	-
Stage 2	-	-	-	-	575	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	559	-	79	450
Mov Cap-2 Maneuver	-	-	-	-	79	-
Stage 1	-	-	-	-	254	-
Stage 2	-	-	-	-	532	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	28.1
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	270	-	-	559	-
HCM Lane V/C Ratio	0.431	-	-	0.075	-
HCM Control Delay (s)	28.1	-	-	12	-
HCM Lane LOS	D	-	-	B	-
HCM 95th %tile Q(veh)	2.1	-	-	0.2	-

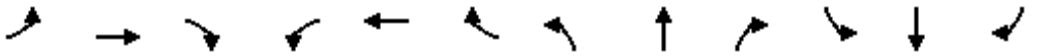
Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	42	0	0	61	39	26
Future Vol, veh/h	42	0	0	61	39	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	50	0	0	73	46	31

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	135	62	77	0	-	0
Stage 1	62	-	-	-	-	-
Stage 2	73	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	859	1003	1522	-	-	-
Stage 1	961	-	-	-	-	-
Stage 2	950	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	859	1003	1522	-	-	-
Mov Cap-2 Maneuver	859	-	-	-	-	-
Stage 1	961	-	-	-	-	-
Stage 2	950	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.5	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1522	-	859	-	-
HCM Lane V/C Ratio	-	-	0.058	-	-
HCM Control Delay (s)	0	-	9.5	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	862	144	92	962	30	165	22	139	95	34	54
Future Volume (veh/h)	26	862	144	92	962	30	165	22	139	95	34	54
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1841	1841	1841	1856	1856	1856
Adj Flow Rate, veh/h	28	917	0	98	1023	0	176	23	0	101	36	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	4	4	4	3	3	3
Cap, veh/h	118	1498		236	1733		430	49		530	588	
Arrive On Green	0.07	0.43	0.00	0.13	0.49	0.00	0.32	0.32	0.00	0.32	0.32	0.00
Sat Flow, veh/h	1767	3526	1572	1767	3526	1572	1180	154	1560	1377	1856	1572
Grp Volume(v), veh/h	28	917	0	98	1023	0	199	0	0	101	36	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1763	1572	1334	0	1560	1377	1856	1572
Q Serve(g_s), s	1.8	24.3	0.0	6.1	24.9	0.0	13.9	0.0	0.0	0.0	1.6	0.0
Cycle Q Clear(g_c), s	1.8	24.3	0.0	6.1	24.9	0.0	15.6	0.0	0.0	5.4	1.6	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.88		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	118	1498		236	1733		479	0		530	588	
V/C Ratio(X)	0.24	0.61		0.42	0.59		0.42	0.00		0.19	0.06	
Avail Cap(c_a), veh/h	118	1498		236	1733		479	0		530	588	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	53.1	26.8	0.0	47.7	21.8	0.0	34.0	0.0	0.0	29.9	28.6	0.0
Incr Delay (d2), s/veh	4.7	1.9	0.0	5.3	1.5	0.0	2.6	0.0	0.0	0.8	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	10.6	0.0	3.1	10.6	0.0	5.1	0.0	0.0	2.3	0.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.8	28.7	0.0	53.0	23.3	0.0	36.6	0.0	0.0	30.7	28.8	0.0
LnGrp LOS	E	C		D	C		D	A		C	C	
Approach Vol, veh/h		945	A		1121	A		199	A		137	A
Approach Delay, s/veh		29.5			25.9			36.6			30.2	
Approach LOS		C			C			D			C	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		43.0	21.0	56.0		43.0	13.0	64.0				
Change Period (Y+Rc), s		5.0	5.0	5.0		5.0	5.0	5.0				
Max Green Setting (Gmax), s		38.0	16.0	51.0		38.0	8.0	59.0				
Max Q Clear Time (g_c+I1), s		17.6	8.1	26.3		7.4	3.8	26.9				
Green Ext Time (p_c), s		1.1	0.1	7.5		0.5	0.0	9.4				

Intersection Summary	
HCM 6th Ctrl Delay	28.5
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	5	14	18	8	24	21	289	27	12	214	10
Future Vol, veh/h	6	5	14	18	8	24	21	289	27	12	214	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	12	12	12	2	2	2	5	5	5	7	7	7
Mvmt Flow	7	6	16	20	9	27	23	321	30	13	238	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	670	667	244	663	657	336	249	0	0	351	0	0
Stage 1	270	270	-	382	382	-	-	-	-	-	-	-
Stage 2	400	397	-	281	275	-	-	-	-	-	-	-
Critical Hdwy	7.22	6.62	6.32	7.12	6.52	6.22	4.15	-	-	4.17	-	-
Critical Hdwy Stg 1	6.22	5.62	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.22	5.62	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.608	4.108	3.408	3.518	4.018	3.318	2.245	-	-	2.263	-	-
Pot Cap-1 Maneuver	357	367	771	375	385	706	1299	-	-	1181	-	-
Stage 1	714	668	-	640	613	-	-	-	-	-	-	-
Stage 2	607	586	-	726	683	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	328	354	771	353	372	706	1299	-	-	1181	-	-
Mov Cap-2 Maneuver	328	354	-	353	372	-	-	-	-	-	-	-
Stage 1	698	659	-	626	600	-	-	-	-	-	-	-
Stage 2	563	573	-	696	674	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.7	13.7	0.5	0.4
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1299	-	-	494	470	1181	-	-
HCM Lane V/C Ratio	0.018	-	-	0.056	0.118	0.011	-	-
HCM Control Delay (s)	7.8	0	-	12.7	13.7	8.1	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	0.4	0	-	-

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	6	21	23	7	25	3	10	0	5	0	1	8
Future Vol, veh/h	6	21	23	7	25	3	10	0	5	0	1	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	24	26	8	28	3	11	0	6	0	1	9

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	31	0	0	50	0	0	102	98	37	100	110	30
Stage 1	-	-	-	-	-	-	51	51	-	46	46	-
Stage 2	-	-	-	-	-	-	51	47	-	54	64	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1582	-	-	1557	-	-	879	792	1035	881	780	1044
Stage 1	-	-	-	-	-	-	962	852	-	968	857	-
Stage 2	-	-	-	-	-	-	962	856	-	958	842	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1582	-	-	1557	-	-	864	784	1035	870	772	1044
Mov Cap-2 Maneuver	-	-	-	-	-	-	864	784	-	870	772	-
Stage 1	-	-	-	-	-	-	957	848	-	963	853	-
Stage 2	-	-	-	-	-	-	948	852	-	948	838	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.9	1.5	9	8.6
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	914	1582	-	-	1557	-	-	1005
HCM Lane V/C Ratio	0.019	0.004	-	-	0.005	-	-	0.01
HCM Control Delay (s)	9	7.3	0	-	7.3	0	-	8.6
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0

Intersection	
Int Delay, s/veh	1.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1068	31	77	1093	16	60
Future Vol, veh/h	1068	31	77	1093	16	60
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	370	275	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1174	34	85	1201	18	66

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1208	0	1945	587
Stage 1	-	-	-	-	1174	-
Stage 2	-	-	-	-	771	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	573	-	57	453
Stage 1	-	-	-	-	256	-
Stage 2	-	-	-	-	417	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	573	-	49	453
Mov Cap-2 Maneuver	-	-	-	-	49	-
Stage 1	-	-	-	-	256	-
Stage 2	-	-	-	-	355	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	46.8
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	166	-	-	573	-
HCM Lane V/C Ratio	0.503	-	-	0.148	-
HCM Control Delay (s)	46.8	-	-	12.4	-
HCM Lane LOS	E	-	-	B	-
HCM 95th %tile Q(veh)	2.5	-	-	0.5	-

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	27	0	2	49	68	41
Future Vol, veh/h	27	0	2	49	68	41
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	32	0	2	58	81	49

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	168	106	130	0	-	0
Stage 1	106	-	-	-	-	-
Stage 2	62	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	822	948	1455	-	-	-
Stage 1	918	-	-	-	-	-
Stage 2	961	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	821	948	1455	-	-	-
Mov Cap-2 Maneuver	821	-	-	-	-	-
Stage 1	917	-	-	-	-	-
Stage 2	961	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.6	0.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1455	-	821	-	-
HCM Lane V/C Ratio	0.002	-	0.039	-	-
HCM Control Delay (s)	7.5	0	9.6	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Appendix E:
Early Consultation Letters and Responses

TRANSPORTATION AGENCY
CELIA M. MAHIKOA, EXECUTIVE
LEONARD T. PETERS, ASSISTANT EXECUTIVE

DEREK S.K. KAWAKAMI, MAYOR
MICHAEL A. DAHILIG, MANAGING DIRECTOR

August 25, 2021

Kaimana Environmental Solutions LLC
PO Box 11890
Honolulu, HI 96828
Attn: Max R. Solmssen

Re: Early Consultation Request for a Hawai'i Revised Statutes, Chapter 343 (HRS 343) Environmental Assessment (EA) for the Kaua'i County Housing Agency Kahua Ho'oulu Affordable Housing Project, Tax Map Key (TMK) Parcel (4) 3-3-004: 020, Līhu'e, Kaua'i

Dear Mr. Solmssen,

In response to your correspondence dated August 20, 2021, the County of Kaua'i Transportation Agency offers the following comments for your attention:

- Considering that this is an affordable housing project, it is reasonable not to ask for an exaction for transit on the condition that ensuring access to the existing surrounding stops is a priority.
- For the sake of the residents and riders, it's best if an ADA-compliant access to the bus stops is included, as well as an ADA-compliant transit pick up point on Welau St.

Another consideration we would recommend is that the surrounding residents should be able to access the bus stop via the shortest route, as well.

We appreciate the opportunity to voice comments and requests for consideration with this project.

Sincerely,

Celia Mahikoa
Executive

Subject: Re: Kahua Ho'oulu: Request for comment
Date: Wednesday, August 25, 2021 at 4:03:33 PM Hawaii-Aleutian Standard Time
From: Max Solmssen
To: Leonard Peters
CC: Celia Mahikoa
Attachments: image001.jpg, image002.png, image003.png

Aloha Leonard,

Thanks so much for your response to early consultation letter. Your letter will be included in the Draft Environmental Assessment (DEA), and your comments will be considered in the DEA.

Thanks,

Max R. Solmssen
Principal
Kaimana Environmental Solutions LLC
808.341.3546
max@kaimanaenv.com
www.kaimanaenv.com

PO Box 11890
Honolulu, HI 96828

From: Leonard Peters <lpeters@kauai.gov>
Date: Wednesday, August 25, 2021 at 1:49 PM
To: Max Solmssen <max@kaimanaenv.com>
Cc: Celia Mahikoa <cmahikoa@kauai.gov>
Subject: Kahua Ho'oulu: Request for comment

Aloha!
Please find attached. A hard copy is also being routed to you. Thank you for the opportunity to comment on this project. Best wishes in your efforts. Please let me know if anything further is needed.

Kind regards,

Leonard T Peters
Assistant Executive
County of Kaua`i
Transportation Agency
3220 Hoolako Street | Lihue, HI 96766
PH: 808.246.8112 | FAX: 808.241.6417
lpeters@kauai.gov

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

September 24, 2021

LD 0965

Max R. Solmssen
Kaimana Environmental Solutions LLC
PO Box 11890
Honolulu, HI 96828

Via email: Max@kaimanaenv.com

Dear Mr. Solmssen:

SUBJECT: **Early Consultation for Draft Environmental Assessment**
Kahua Ho'oulu Affordable Housing Development
Lihue, County and Island of Kauai, Hawaii
TMK: (4) 3-3-004:020

Thank you for the opportunity to review and comment on the subject project. The Land Division of the Department of Land and Natural Resources (DLNR) distributed copies of your request to various DLNR divisions, as indicated on the attached, for their review and comment.

Attached are comments received from our (a) Engineering Division, (b) Division of Forestry and Wildlife, and (c) Land Division, Kauai District. Should you have any questions, please feel free to contact Barbara Lee via email at barbara.j.lee@hawaii.gov. Thank you.

Sincerely,

Russell Tsuji

Russell Y. Tsuji
Land Administrator

Attachments

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

August 27, 2021

LD 0965

MEMORANDUM

FROM:

~~TO:~~ **DLNR Agencies:**
___Div. of Aquatic Resources *(via email: kendall.l.tucker@hawaii.gov)*
___Div. of Boating & Ocean Recreation
_X_ Engineering Division *(via email: DLNR.Engr@hawaii.gov)*
_X_ Div. of Forestry & Wildlife *(via email: Rubyrosa.T.Terrago@hawaii.gov)*
___Div. of State Parks
_X_ Commission on Water Resource Management *(via email: DLNR.CWRM@hawaii.gov)*
___Office of Conservation & Coastal Lands
_X_ Land Division – Kauai District *(via email: DLNR.Land@hawaii.gov)*

TO:

~~FROM:~~ Russell Y. Tsuji, Land Administrator *Russell Tsuji*
SUBJECT: **Early Consultation for Draft Environmental Assessment**
Kahua Ho'oulu Affordable Housing Development
LOCATION: Lihue, County and Island of Kauai, Hawaii; TMK: (4) 3-3-004:020
APPLICANT: **Kaimana Environmental Solutions LLC on behalf of the Kauai County Housing Agency**

Transmitted for your review and comment is information on the above-referenced subject. Please submit any comments by **September 22, 2021** to DLNR.Land@hawaii.gov, and copied to barbara.j.lee@hawaii.gov.

If no response is received by this date, we will assume your agency has no comments. If you have any questions, please contact Barbara Lee directly via email at barbara.j.lee@hawaii.gov. Thank you.

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

Signed: *GSC*
Print Name: Carty S. Chang, Chief Engineer
Division: Engineering Division
Date: Sep 16, 2021

Attachments
Cc: Central Files

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/Russell Y. Tsuji
Ref: Early Consultation for Draft Environmental Assessment
Kahua Ho'oulu Affordable Housing Development
Location: Lihue, County and Island of Kauai, Hawaii
TMK(s): (4) 3-3-004:020
Applicant: Kaimana Environmental Solutions LLC on behalf of the Kauai County Housing Agency

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 Special Flood Hazard Area (high-risk areas). Be advised that 44CFR, Chapter 1, Subchapter B, Part 60 reflects the minimum standards as set forth by the NFIP. Local community flood ordinances may stipulate higher standards that can be more restrictive and would take precedence over the minimum NFIP standards.

The owner of the project property and/or their representative is responsible to research the Flood Hazard Zone designation for the project. Flood zones subject to NFIP requirements are identified on FEMA's Flood Insurance Rate Maps (FIRM). The official FIRMs can be accessed through FEMA's Map Service Center (msc.fema.gov). Our Flood Hazard Assessment Tool (FHAT) (http://gis.hawaiinfip.org/FHAT) could also be used to research flood hazard information.

If there are questions regarding the local flood ordinances, please contact the applicable County NFIP coordinating agency 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) 270-7139.
- Kauai: County of Kauai, Department of Public Works (808) 241-4849.

Signed: _____
CARTY S. CHANG, CHIEF ENGINEER

Date: Sep 16, 2021

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

August 27, 2021

LD 0965

MEMORANDUM

TO: **DLNR Agencies:**
___Div. of Aquatic Resources *(via email: kendall.l.tucker@hawaii.gov)*
___Div. of Boating & Ocean Recreation
_X_ Engineering Division *(via email: DLNR.Engr@hawaii.gov)*
_X_ Div. of Forestry & Wildlife *(via email: Rubyrosa.T.Terrago@hawaii.gov)*
___Div. of State Parks
_X_ Commission on Water Resource Management *(via email: DLNR.CWRM@hawaii.gov)*
___Office of Conservation & Coastal Lands
_X_ Land Division – Kauai District *(via email: DLNR.Land@hawaii.gov)*

FROM: Russell Y. Tsuji, Land Administrator *Russell Tsuji*
SUBJECT: **Early Consultation for Draft Environmental Assessment**
Kahua Ho'oulu Affordable Housing Development
LOCATION: Lihue, County and Island of Kauai, Hawaii; TMK: (4) 3-3-004:020
APPLICANT: **Kaimana Environmental Solutions LLC on behalf of the Kauai County Housing Agency**

Transmitted for your review and comment is information on the above-referenced subject. Please submit any comments by **September 22, 2021** to DLNR.Land@hawaii.gov, and copied to barbara.j.lee@hawaii.gov.

If no response is received by this date, we will assume your agency has no comments. If you have any questions, please contact Barbara Lee directly via email at barbara.j.lee@hawaii.gov. Thank you.

( ) We have no objections.
( ) We have no comments.
( ) We have no additional comments.
(☑) Comments are attached.

Signed: DGS
Print Name: DAVID G. SMITH, Administrator
Division: Division of Forestry and Wildlife
Date: Sep 15, 2021

Attachments
Cc: Central Files

DAVID Y. IGE
GOVERNOR OF HAWAII

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

ROBERT K. MASUDA
FIRST DEPUTY

M. KALEO MANUEL
DEPUTY DIRECTOR - WATER

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF FORESTRY AND WILDLIFE
1151 PUNCHBOWL STREET, ROOM 325
HONOLULU, HAWAII 96813

September 14, 2021

MEMORANDUM *Log no. 3310*

TO: RUSSELL Y. TSUJI, Administrator
Land Division

FROM: DAVID G. SMITH, Administrator
Division of Forestry and Wildlife

SUBJECT: **Division of Forestry and Wildlife Comments on the Early Consultation Request for an Environmental Assessment (EA) for the Kahua Hoʻoulu Affordable Housing Development, Līhuʻe, Kauaʻi**

The Department of Lands and Natural Resources, Division of Forestry and Wildlife (DOFAW) has received your request regarding comment on the early consultation for an EA for the proposed Kahua Hoʻoulu Affordable Housing Development project in Līhuʻe, Kauaʻi; TMK: (4) 3-3-004:020. The proposed project would include the construction of five 3-story buildings consisting of up to 60 housing units total and an associated parking area.

The State listed Hawaiian Hoary Bat or ʻŌpeʻapeʻa (*Lasiurus cinereus semotus*) could potentially occur in the vicinity of the project area and may roost in nearby trees. Any site clearing that is required should be timed to avoid disturbance during the bat birthing and pup rearing season (June 1 through September 15). During this period, no woody plants greater than 15 feet (4.6 meters) tall should be disturbed, removed, or trimmed.

The State listed Hawaiian Goose or Nēnē (*Branta sandvicensis*) may also potentially occur in the vicinity of the proposed project site. It is against State law to harm or harass this species. If this species is present during construction activities, all activities within 100 feet (30 meters) should cease, and the bird should not be approached. Work may continue after the bird leaves the area of its own accord. If a nest is discovered at any point, please contact the Kauaʻi DOFAW Office at (808) 274-3433.

Artificial lighting can adversely impact seabirds that may pass through the area at night by causing them to become disoriented. This disorientation can result in collision with manmade structures or grounding of birds. For nighttime lighting that might be required, DOFAW recommends that all lights be fully shielded to minimize impacts. Nighttime work that requires outdoor lighting should additionally be avoided during the seabird fledging season from September 15 through December 15. This is the period when young, newly fledged seabirds take their initial flight to the open ocean. For illustrations and guidance related to seabird-friendly

lighting styles that also protect the starry night skies of Hawai‘i please visit: https://dlnr.hawaii.gov/wildlife/files/2016/03/ DOC439.pdf.
DOFAW recommends minimizing the movement of plant or soil material between worksites, such as in fill. Soil and plant material may contain invasive fungal pathogens (e.g., Rapid ‘Ōhi‘a Death), vertebrate and invertebrate pests (e.g., Little Fire Ants), or invasive plant parts that could harm our native species and ecosystems. We recommend consulting the Big Island Invasive Species Committee at (808) 933-3340 in planning, design, and construction of the project to learn of any high-risk invasive species in the area and ways to mitigate spread. All equipment, materials, and personnel should be cleaned of excess soil and debris to minimize the risk of spreading invasive species. Gear that may contain soil, such as work boots and vehicles, should be thoroughly cleaned with water and sprayed with 70% alcohol solution to prevent the spread of Rapid ‘Ōhi‘a Death and other harmful fungal pathogens.

DOFAW recommends using native plant species for landscaping that are appropriate for the area (i.e., climate conditions are suitable for the plants to thrive, historically occurred there, etc.). Please do not plant invasive species. DOFAW recommends consulting the Hawai‘i-Pacific Weed Risk Assessment website to determine the potential invasiveness of plants proposed for use in the project (https://sites.google.com/site/weedriskassessment/home). We recommend that you refer to www.plantpono.org for guidance on selection and evaluation for landscaping plants.

We appreciate your efforts to work with our office for the conservation of our native species. Should the scope of the project change significantly, or should it become apparent that threatened or endangered species may be impacted, please contact our staff as soon as possible. If you have any questions, please contact Paul Radley, Protected Species Habitat Conservation Planning Coordinator at (808) 295-1123 or paul.m.radley@hawaii.gov.

Sincerely,

DAVID G. SMITH
Administrator

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

August 27, 2021

LD 0965

MEMORANDUM

TO: **DLNR Agencies:**
___Div. of Aquatic Resources *(via email: kendall.l.tucker@hawaii.gov)*
___Div. of Boating & Ocean Recreation
_X_Engineering Division *(via email: DLNR.Engr@hawaii.gov)*
_X_Div. of Forestry & Wildlife *(via email: Rubyrosa.T.Terrago@hawaii.gov)*
___Div. of State Parks
_X_Commission on Water Resource Management *(via email: DLNR.CWRM@hawaii.gov)*
___Office of Conservation & Coastal Lands
_X_Land Division – Kauai District *(via email: DLNR.Land@hawaii.gov)*

FROM: Russell Y. Tsuji, Land Administrator *Russell Tsuji*
SUBJECT: **Early Consultation for Draft Environmental Assessment**
Kahua Ho'oulu Affordable Housing Development
LOCATION: Lihue, County and Island of Kauai, Hawaii; TMK: (4) 3-3-004:020
APPLICANT: **Kaimana Environmental Solutions LLC on behalf of the Kauai County Housing Agency**

Transmitted for your review and comment is information on the above-referenced subject. Please submit any comments by **September 22, 2021** to DLNR.Land@hawaii.gov, and copied to barbara.j.lee@hawaii.gov.

If no response is received by this date, we will assume your agency has no comments. If you have any questions, please contact Barbara Lee directly via email at barbara.j.lee@hawaii.gov. Thank you.

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

Signed: *Alison Neustein*
Print Name: ALISON NEUSTEIN
Division: LAND DIVISION - KAUAI
Date: 9/7/21

Attachments
Cc: Central Files

LD 0965

RECEIVED
LAND DIVISION

2021 AUG 26 AM 11:30

DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

KAIMANA
environmental solutions

KaimanaEnv.com
808.341.3546
PO Box 11890
Honolulu, HI 96828
max@kaimanaenv.com

August 20, 2021

To: : Russell Tsuji
Land Administrator
Department of Land and Natural Resources- Land Division
P.O. Box 621
Honolulu, HI 96809

Email: dlnr.land@hawaii.gov

Subject: Early Consultation Request for a Hawaii Revised Statutes, Chapter 343 (HRS 343) Environmental Assessment (EA) for the Kauai County Housing Agency Kahua Ho'oulu Affordable Housing Project, Tax Map Key (TMK) Parcel (4) 3-3-004: 020, Lihue, Kauai

Dear Participant:

On behalf of the County of Kauai Housing Agency, Kaimana Environmental Solutions LLC (KES) is in the process of preparing an Environmental Assessment (EA) in compliance with HRS 343 and its implementing regulations, Hawaii Administrative Rules (HAR) 11-200.1 for a proposed affordable housing and educational health center located in Lihue, Kauai. The proposed project is also subject to the provisions of the United States National Environmental Policy Act (NEPA) since federal funds may be utilized.

In compliance with HAR 11-200.1-18 and NEPA, the Proposing Agency; the County of Kauai Housing Agency, is conducting early consultation with county, state and federal government agencies, community groups and individuals who may have an interest in the proposed project. HRS 343 applies since the proposed project site includes development of county owned land. Below is a description of the proposed project. Please send any written comments via email or U.S. mail to the following contact by September 23, 2021.

Email: Max@kaimanaenv.com

Mailing Address:
Kaimana Environmental Solutions LLC
PO Box 11890
Honolulu, HI 96828

Project Description

The Kauai County Housing Agency is proposing to build a new affordable housing and educational health center located in Lihue, Kauai on county owned parcel (4) 3-3-004: 020 located in Lihue, Kauai. Figure 1 shows the proposed project site location map. The proposed project would include five 3-story buildings consisting of up to 60 units total, and associated parking area. Figure 2 includes the proposed site plan.

KAIMANA
environmental solutions

KaimanaEnv.com
808.341.3546
PO Box 11890
Honolulu, HI 96828
max@kaimanaenv.com

Thank you for your participation in consultation process for the proposed project.

Sincerely,

Max R. Solmssen
Environmental Planner
Kaimana Environmental Solutions LLC

Attachments: Figure 1: Project Location Map
Figure 2: Site Plan

Figure 1: Project Location Map

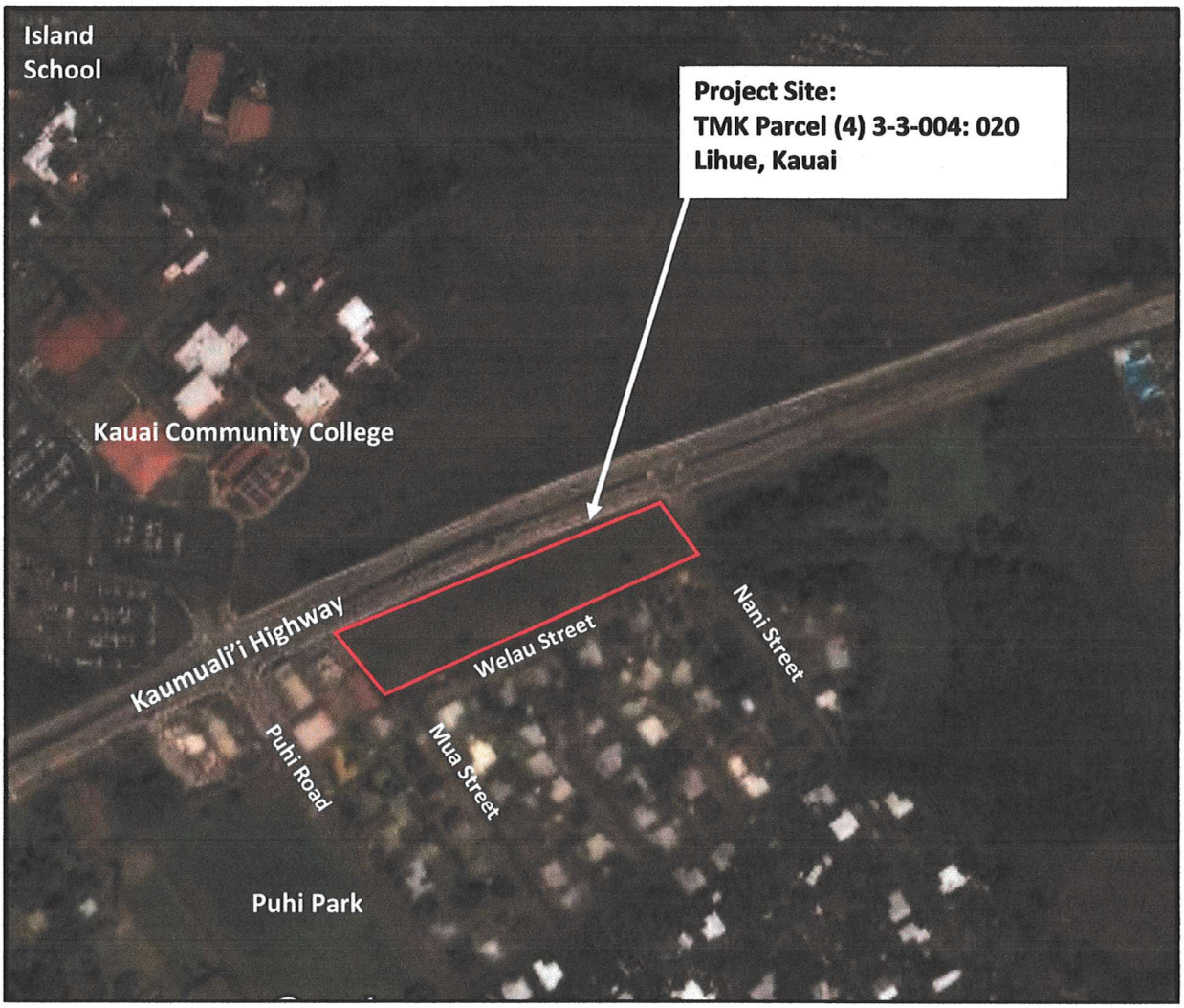


Figure 2: Site Plan

DAVID Y. IGE
GOVERNOR

KEITH T. HAYASHI
INTERIM SUPERINTENDENT

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

OFFICE OF FACILITIES AND OPERATIONS

September 15, 2021

Max R. Solmssen, Environmental Planner
Kaimana Environmental Solutions LLC
PO Box 11890
Honolulu, Hawaii 96828

Re: Early Consultation Request for the Environmental Assessment for the proposed Kauai County Housing Agency Kahua Hooulu Affordable Housing Project, Lihue, Kauai, Hawaii TMK: (4)3-3-004:020

Dear Mr. Solmssen:

Thank you for your letter dated August 20, 2021. The Hawaii State Department of Education (Department) has the following early consultation comments in preparation of a Draft Environmental Assessment (DEA) for the proposed Kahua Hooulu Affordable Housing Project (Project). The Kauai County Housing Agency is proposing to build five three-story buildings consisting of up to 60 units and an educational health center located in Lihue, Island of Kauai, TMK (4)3-3-004:020.

Children living in this Project will be attending Wilcox Elementary, Kamakahelei Middle, and Kauai High schools. Additional comments will be provided once the Department has had an opportunity to review the DEA.

Thank you for the opportunity to comment. Should you have questions please contact Robyn Loudermilk, School Lands and Facilities Specialist of the Facilities Development Branch, Planning Section, at (808) 784-5093 or by email at robyn.loudermilk@k12.hi.us.

Sincerely,

Roy Ikeda
Interim Public Works Manager
Planning section

RI:ct

c: Paul Zina, Complex Area Superintendent, Kauai Complex Area
Facilities Development Branch

KAIMANA
environmental solutions

KaimanaEnv.com
808.341.3546
PO Box 11890
Honolulu, HI 96828
max@kaimanaenv.com

October 4, 2021

To: : Roy Ikeda
Interim Publix Works Manager
State of Hawaii Department of Education
P.O. Box 2360
Honolulu, HI 96804

Subject: Receipt of Environmental Assessment Early Consultation Letter for the Kauai County Housing Agency Kahua Ho'oulu Affordable Housing Project, Tax Map Key (TMK) Parcel (4) 3-3-004: 020, Lihue, Kauai

Dear Mr. Ikeda:

Thank you for your early consultation letter for the subject project dated September 15, 2021. Your letter was received and will be included in the Draft Environmental Assessment (DEA).

Thank you for your participation in consultation process for the proposed project.

Sincerely,

Max R. Solmssen
Environmental Planner
Kaimana Environmental Solutions LLC

Email: Max@kaimanaenv.com

Mailing Address:
Kaimana Environmental Solutions LLC
PO Box 11890
Honolulu, HI 96828

August 30, 2021

Mr. Max R. Solmssen
Environmental Planner
Kaimana Environmental Solutions LLC
P.O. Box 11890
Honolulu, HI 96828
Via email: max@kaimanaenv.com

Subject: **Early Consultation Request for a Hawaii Revised Statues, Chapter 343 (HRS 343) Environmental Assessment (EA) for the Kauai County Housing Agency Kahua Ho`oulu Affordable Housing Project, Tax Map Key (TMK) Parcel (4) 3-3-004:020, Lihue, Kauai**

Dear Mr. Solmssen:

Thank you for your letter of August 20, 2021 seeking comments to the subject project.

Hawaiian Telcom is committed to serving new housing projects such as Kahua Ho`oulu using fiber optic technology. Please keep Hawaiian Telcom apprised as the project progresses.

Should you have any question, call me at (808) 241-5052 or email jimmy.sone@hawaiiantel.com

Sincerely,

Jimmy Sone

Jimmy Sone P.E.
Contract Engineer
OSP Engineering – Kauai

Subject: Re: Kahua Ho`oulu Affordable Housing Project, Puhi, Tax Map Key (TMK) Parcel (4) 3-3-004:020, Lihue, Kauai
Date: Monday, August 30, 2021 at 12:01:47 PM Hawaii-Aleutian Standard Time
From: Max Solmssen
To: Jimmy Sone

Hi Jimmy,

Thank you for your response to early consultation letter. It was received and will be included in the Draft Environmental Assessment (DEA).

Thanks,

Max R. Solmssen
Principal
Kaimana Environmental Solutions LLC
808.341.3546
max@kaimanaenv.com
www.kaimanaenv.com

PO Box 11890
Honolulu, HI 96828

From: Jimmy Sone <James.Sone@hawaiiantel.com>
Date: Monday, August 30, 2021 at 11:51 AM
To: Max Solmssen <max@kaimanaenv.com>
Subject: Kahua Ho`oulu Affordable Housing Project, Puhi, Tax Map Key (TMK) Parcel (4) 3-3-004:020, Lihue, Kauai

Hi Max,

Subject: Early Consultation Request for a Hawaii Revised Statues, Chapter 343 (HRS 343) Environmental Assessment (EA) for the Kauai County Housing Agency Kahua Ho`oulu Affordable Housing Project, Tax Map Key (TMK) Parcel (4) 3-3-004:020, Lihue, Kauai

Letter attached.

Thanks,
Jimmy Sone
OSP Engineering – Kauai
Hawaiian Telcom
808-241-5052
808-651-2281C
Jimmy.sone@hawaiiantel.com

United States Department of the Interior

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

In Reply Refer To:
01EPIF00-2021-SL-0465

October 1, 2021

Mr. Max Solmssen
Kaimana Environmental Solutions LLC
P.O. Box 11890
Honolulu, Hawai‘i 96828

Subject: Species List Request for Kauai County Housing Agency, Kahua Ho‘oulu Affordable Housing Project

Dear Mr. Solmssen:

The U.S. Fish and Wildlife Service (Service) received your letter and enclosures on August 20, 2021, requesting a species list for the Kaua‘i County Housing Agency, Kahua Ho‘oulu Affordable Housing Project. The Kaua‘i County is propsing to build a new affordable housing and educational health center located in Līhue on TMK parcel (4) 3-3-004: 020. The proposed project will include five three-story buildings consisting of up to six-units total and an associated parking area. The Pacific Islands Fish and Wildlife Office (PIFWO) of the U.S. Fish and Wildlife Service (Service) appreciates your efforts to avoid or minimize effects to protected species associated with your proposed actions. The Service offers the following comments to assist you in your planning process so that impacts to trust resources can be avoided through site preparation, construction, and operation. Our comments are provided under the authorities of Endangered Species Act of 1973 (ESA), as amended (16 U.S.C 1531 et seq.).

Our databases, including data compiled by the Hawai‘i Biodiversity and Mapping Program, indicate the following species are known to occur or transit through the vicinity of the proposed project area: the endangered Hawaiian hoary bat or 'Ōpe'ape'a (*Lasiurus cinereus semotus*), the endangered Hawaiian petrel or 'Ua'u (*Pterodroma sandwichensis*), endangered Hawai‘i distinct population segment (DPS) of band-rumped storm-petrel or 'Ake'ake (*Oceanodroma castro*), and threatened Newell’s shearwater or ‘A‘o (*Puffinus auricularis newelli*) (hereafter collectively referred to as Hawaiian seabirds). There is no designated critical habitat within the vicinity of the project area. The Service recommends the following measures to avoid and minimize project impacts to the above listed species.

Hawaiian hoary bat

The Hawaiian hoary bat roosts in both exotic and native woody vegetation across all islands and will leave young unattended in trees and shrubs when they forage.
If trees or shrubs 15 feet or taller are cleared during the pupping season, there is a risk that young bats could inadvertently be harmed or killed since they are too young to fly or may not move away.

To avoid and minimize impacts to the endangered Hawaiian hoary bat we recommend you incorporate the following applicable measures into your project description:

- Do not disturb, remove, or trim woody plants greater than 15 feet tall during the bat birthing and pup rearing season (June 1 through September 15).

Hawaiian seabirds

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

To avoid and minimize potential project impacts to Hawaiian seabirds we recommend you consider incorporating the following applicable measures into your project description:

- Fully shield all outdoor lights so the bulb can only be seen from below bulb height and only use when necessary.
- Install automatic motion sensor switches and controls on all outdoor lights or turn off lights when human activity is not occurring in the lighted area.
- No nighttime construction during the seabird fledging period, September 15 through December 15.

If it is determined that your proposed project may affect federally listed species, we recommend you contact our office early in the planning process so that we may assist you with ESA compliance. If the proposed project is funded, authorized, or permitted, or implemented by a Federal agency, then that agency should consult with us pursuant to section 7(a)(2) of the ESA. If no federal action agency is involved but take of listed species cannot be fully avoided, the project should begin development of a Habitat Conservation Plan in order to obtain an Incidental Take Permit under section 10(a)(1)(B) of the ESA.

We thank you for your efforts to conserve listed species and native habitats. Should you have any questions pertaining to this response or require further guidance please contact Michelle

Clark, Fish and Wildlife Biologist (phone: 808-457-7276, email: michelle_clark@fws.gov). When referring to this project, please include this reference number: 01EPIF00-2021-SL-0465.

Sincerely,

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

From: **Max Solmssen** max@kaimanaenv.com
Subject: Early Consultation Response for the Kahua Hooulu Affordable Housing Project Lihue, Kauai
Date: October 4, 2021 at 11:56 AM
To: michelle_clark@fws.gov
Cc: aaron_nadig@fws.gov

Aloha Michelle,

I received the attached response to consultation letter from your agency in regards to the subject project. The letter, along with the measures you included in the letter will be included in the Draft EA, along with the findings of the biological assessment that was completed at the project site as part of the environmental review process.

Thanks,

Max R. Solmssen
Principal
Kaimana Environmental Solutions LLC
808.341.3546
max@kaimanaenv.com
www.kaimanaenv.com

PO Box 11890
Honolulu, HI 96828

USFWS Response.pdf

Appendix F:
HUD Environmental Assessment

U.S. Department of Housing and Urban Development
451 Seventh Street, SW
Washington, DC 20410
www.hud.gov

espanol.hud.gov

Environmental Assessment
Determinations and Compliance Findings for HUD-assisted Projects
24 CFR Part 58

This is a suggested format that may be used by Responsible Entities to document completion of an Environmental Assessment.

Project Information

Project Name: Kahua Hoʻoulu Housing Development

Responsible Entity: Kauaʻi County Housing Agency

Grant Recipient (if different than Responsible Entity): Same

State/Local Identifier: State of Hawaiʻi / Puhi, County of Kauaʻi

Preparer: Kaimana Environmental Solutions LLC

Certifying Officer Name and Title: **Adam Roversi – Housing Director**

Grant Recipient (if different than Responsible Entity): Same

Consultant (if applicable): **Kaimana Environmental Solutions LLC**
PO Box 11890
Honolulu, HI 96828

Direct Comments to: Max Solmssen / Email: max@kaimanaenv.com

Project Location:

The project site is located on the east side of the Island of Kauaʻi, within the Puhi region of Līhuʻe town, and includes one approximately 2.91 acre parcel of undeveloped County-owned parkland Tax Map Key (TMK) parcel (4) 3-3-04: 020 (project site).

Description of the Proposed Project [24 CFR 50.12 & 58.32; 40 CFR 1508.25]**:**

The proposed project includes the design and construction of the Kahua Hoʻoulu Affordable Housing Development, which also includes a planned educational and health center. The proposed project would include five 3-story buildings consisting of up to 60 apartment units in total, and associated parking area.

Statement of Purpose and Need for the Proposal [40 CFR 1508.9(b)]:

The purpose of the proposed project is to provide much needed affordable housing and community education and health services within the Līhuʻe community. The proposed housing and educational and health facility would provide greatly needed housing and community health and educational services to Kauaʻi's residents.

Existing Conditions and Trends [24 CFR 58.40(a)]:

The project site is located in a mixed use area within the urban core of Puhi/Līhuʻe. The project site is located in close proximity to transportation cooridors, jobs, shopping and other vital community services. The trend in the area includes infill density development within the urban core.

Funding Information

Grant Number	HUD Program	Funding Amount
To be determined	To be determined	To be determined

Estimated Total HUD Funded Amount: To be determined

Estimated Total Project Cost (HUD and non-HUD funds) [24 CFR 58.32(d)]**:**

$24,000,000

Compliance with 24 CFR 50.4, 58.5, and 58.6 Laws and Authorities

Record below the compliance or conformance determinations for each statute, executive order, or regulation. Provide credible, traceable, and supportive source documentation for each authority. Where applicable, complete the necessary reviews or consultations and obtain or note applicable permits of approvals. Clearly note citations, dates/names/titles of contacts, and page references. Attach additional documentation as appropriate.

Compliance Factors: Statutes, Executive Orders, and Regulations listed at 24 CFR §58.5 and §58.6	Are formal compliance steps or mitigation required?	Compliance determinations
STATUTES, EXECUTIVE ORDERS, AND REGULATIONS LISTED AT 24 CFR 50.4 and 58.6		
Airport Hazards 24 CFR Part 51 Subpart D	Yes ☐ No ☒	The project site is located approximately 2.6 miles from the nearest aiport (Līhu‘e Airport), and no military aiports are located within the vicinity of the project site.
Coastal Barrier Resources Coastal Barrier Resources Act, as amended by the Coastal Barrier Improvement Act of 1990 [16 USC 3501]	Yes ☐ No ☒	The project site is located approximately 2.2 miles from the nearest shoreline, and is outside the Tsunami Evacuation Area. No coastal resources are anticipated to be impacted by the proposed project.
Flood Insurance Flood Disaster Protection Act of 1973 and National Flood Insurance Reform Act of 1994 [42 USC 4001-4128 and 42 USC 5154a]	Yes ☐ No ☒	The project site is located in Federal Emergency Management Agency (FEMA) Flood Zone X: area of minimal flood hazard, and is therefore not anticipated to be impacted by flooding.
STATUTES, EXECUTIVE ORDERS, AND REGULATIONS LISTED AT 24 CFR 50.4 & 58.5		
Clean Air Clean Air Act, as amended, particularly section 176(c) & (d); 40 CFR Parts 6, 51, 93	Yes ☒ No ☐	Based on data gathered by the State of Hawai‘i DOH Clean Air Branch, the entire State of Hawai‘i is in compliance (attainment) for all the above criteria pollutants, except on the Big Island during times of naturally occurring impacts from volcanic activity. There is a DOH air quality measurement station in Niumalu, within the vicinity of the project area near Nawiliwili Harbor. Dust would be generated on a short-term basis during construction site work. In order to mitigate airborne dust (particulate matter) impacts to the surrounding environment, all construction activities would need to

		adhere to County of Kaua'i DPW Interim Construction Best Management Practices (BMPs) for Sediment and Erosion Control. BMPs include watering active work areas and unpaved work roads; use of dust fences; establishment of a routine road cleaning and tire washing program; establishment of landscaping or hardened surface early in the construction schedule; and monitoring dust at the project boundary during construction (COK, 2004). With these mitigation measures in place there would be no significant impact to air quality from the proposed action during construction. Once completed, it is not anticipated that there would be any significant long-term air quality impacts from the operation of the proposed development since there would be no significant source of dust or other air emissions during operation of the development.
Coastal Zone Management Coastal Zone Management Act, sections 307(c) & (d)	Yes ☐ No ☒	While the entire State of Hawai'i is located within the designated coastal zone, the project site is not located in the coastal area/Special Management Area (SMA), and is well outside the Tsunami Evacuation Zone.
Contamination and Toxic Substances 24 CFR Part 50.3(i) & 58.5(i)(2)	Yes ☐ No ☒	During construction of the proposed development, non-hazardous green waste and native soil will be generated from grading activities. Construction materials, such as concrete, asphalt, gypsum board, paints and coatings will also be used onsite during construction. Construction vehicles and earth moving equipment fueled by petroleum products will be used onsite. The contractor would need to conduct regular inspections and maintenance of vehicles and equipment to assure that no petroleum spills or leaks occur. Any excess green waste, soil and construction materials generated onsite will be recycled or

		properly disposed at the Kekaha Landfill or another approved facility in accordance with County rules. Once in operation, the housing facility would not generate or store any significant quantities of hazardous materials. Small quantities of petroleum, paints and coatings may be utilized by maintenance staff. All potentially hazardous materials would need to be properly stored out of the sun/elements in flammable lockers within secure designated maintenance areas. The facility would generate non-hazardous household solid waste from the residents. All solid waste would be properly collected by municipal solid waste service and disposed at the Kekaha Landfill. There would be no significant short-term or long-term impacts to the affected environment from solid or hazardous waste. A Phase I Environmental Site Assessment was conducted by KES in October 2021. While the project site was redeveloped along with the surrounding area, the area was formerly used as commercial sugar croplands from at least 1950 through 1998. Former commercial croplands in Hawaii have been known to contain elevated levels of lead, arsenic and organochlorine pesticides. It is recommended that site soils be tested for these target constituents prior to land disturbance, if not completed previously, in order to determine if any residual chemical contamination is present in soil. If soil is shown to contain elevated levels of these target chemicals, worker and environmental protection measures must be implemente in accordance with DOH and OSHA rules.

Endangered Species Endangered Species Act of 1973, particularly section 7; 50 CFR Part 402	Yes ☐ No ☒	A field survey of the project area was conducted by a trained biologist. The field survey methodology included inspection of the project site and recordation of the existing plant and animal species and/or species habitats observed. The project area is comprised of a fenced manicured lawn with several planted ornamental tree and shrub species. The species composition is dominated by non-native plant and wildlife species. Of the native species observed, all are common across Kaua‘i and other Hawaiian Islands. No federally or state listed species were observed in the project area during the survey. Although not observed in the project area during the survey, several federally or state listed animal species may occasionally occur in or traverse the project area. No designated critical habitat occurs in the project area. The closest designated critical habitat is nearly 2.3 miles to the southeast of the project area. Mitigation measures to avoid impacts to protected species that may traverse the project site are included in section 2.7 of the EA.
Explosive and Flammable Hazards 24 CFR Part 51 Subpart C	Yes ☐ No ☒	Construction vehicles and equipment would utilize machinery fueled by flammable fuel (i.e., gasoline). Off-site fueling and safe fueling practices would mitigate any hazards from these flammable materials. Once in operation the main source of flammable materials would be resident vehicles, which does not represent a significant source of explosive or flammable hazards since vehicles would be fueled off-site.
Farmlands Protection Farmland Protection Policy Act of 1981, particularly	Yes ☐ No ☒	There is no farmland located at or surrounding the project site. Therefore,

sections 1504(b) and 1541; 7 CFR Part 658		the proposed development would not result in any impact to famlands.
Floodplain Management Executive Order 11988, particularly section 2(a); 24 CFR Part 55	Yes ☐ No ☒	The project site is not located within a floodplain. Intermittent streams are located close to the project site, but are buffered by roads and other properties. Therefore, there would be no impact to floodplains, and the proposed development would have little to no risk of inundation. Further, the proposed facility would be designed in accordance with County code to include drainage features such as drywells and stormwater swales/retention area.
Historic Preservation National Historic Preservation Act of 1966, particularly sections 106 and 110; 36 CFR Part 800	Yes ☒ No ☐	An archaeolgical survey was completed for the project site. No significant historical or cultural resources were found to be associated with the project site. However, archaeolgical monitoring guided by an archaeological monitoring plan (AMP) approved by the State Historic Preservation Division was recommended during construction due to the close proximity of multiple historic properties associated with Grove Farm, plantation village, and Puhi Camp.
Noise Abatement and Control Noise Control Act of 1972, as amended by the Quiet Communities Act of 1978; 24 CFR Part 51 Subpart B	Yes ☒ No ☐	Based on the maximum generalized outdoor noise levels at the nearest residences across the street from the project site, HDOH Community Noise Rule criteria will be exceeded during construction of the project, and the project will require a Noise Permit to proceed with construction. HDOH may also require the contractor to conduct noise monitoring or community meetings inviting the neighboring residents and business owners to discuss construction noise. The contractor should use reasonable and standard practices to mitigate noise, such as using mufflers on diesel and gasoline engines, using

		properly tuned and balanced machines, etc. HDOH may require additional noise mitigation, such as temporary noise barriers, or time of day usage limits for certain kinds of construction activities. However, maximum noise levels at any one receptor will be short-term and vary with the phase of construction and equipment actually used on site. Therefore, while noise permits will be required to comply with the HDOH Community Noise Rule, and noise mitigation measures should be incorporated into any construction alternative to reduce maximum noise levels, significant construction noise impacts are not expected at any receptor during the construction of the proposed development. Long-term vehicular traffic noise impacts to users of the new facility, as well as the surrounding community noise receptors from additional trips and vehicle idling generated from the proposed facility are projected to be minimal compared to existing conditions. Once in operation, all stationary noise sources (i.e. air handler units) will be required to comply with the HDOH Community Noise Rule. All equipment located exterior to the building and which duct to the building exterior must be evaluated and designed for compliance with the HDOH Criteria for Category A receptors at all neighboring property lines. Therefore, no significant impact is expected due to stationary sources associated with the operation of the proposed development.
Sole Source Aquifers Safe Drinking Water Act of 1974, as amended, particularly section 1424(e); 40 CFR Part 149	Yes ☐ No ☒	There are no designated waterways protected under the Wild and Scenic Rivers Act in the State of Hawai´i. And there are no streams that run through the project site.

Wetlands Protection Executive Order 11990, particularly sections 2 and 5	Yes ☐ No ☒	There are no designated wetlands located at the project site.
Wild and Scenic Rivers Wild and Scenic Rivers Act of 1968, particularly section 7(b) and (c)	Yes ☐ No ☒	There are no designated waterways protected under the Wild and Scenic Rivers Act in the State of Hawai´i. And there are no streams that run through the project site.
ENVIRONMENTAL JUSTICE		
Environmental Justice Executive Order 12898	Yes ☐ No ☒	The proposed project would result in the creation of short and long-term jobs for the local community. Construction jobs would be created during the construction of the proposed development, and there would likely be long-term property management and maintenance jobs created also. Once in operation, the facility would create much needed affordable housing, as well as health and educational services. The proposed project is not anticipated to result in any short or long-term adverse impacts to socioeconomic conditions since it would not cause loss of any jobs or housing, and would not result in tax revenue loss. The project would have beneficial economic and social impacts since it would result in job creation and much needed affordable housing, as well as health and educational services for the local community.

Environmental Assessment Factors [24 CFR 58.40; Ref. 40 CFR 1508.8 &1508.27] Recorded below is the qualitative and quantitative significance of the effects of the proposal on the character, features and resources of the project area. Each factor has been evaluated and documented, as appropriate and in proportion to its relevance to the proposed action. Verifiable source documentation has been provided and described in support of each determination, as appropriate. Credible, traceable and supportive source documentation for each authority has been provided. Where applicable, the necessary reviews or consultations have been completed and applicable permits of approvals have been obtained or noted. Citations, dates/names/titles of contacts, and page references are clear. Additional documentation is attached, as appropriate. **All conditions, attenuation or mitigation measures have been clearly identified.**

Impact Codes: Use an impact code from the following list to make the determination of impact for each factor.
(1) Minor beneficial impact
(2) No impact anticipated
(3) Minor Adverse Impact – May require mitigation
(4) Significant or potentially significant impact requiring avoidance or modification which may require an Environmental Impact Statement

Environmental Assessment Factor	Impact Code	Impact Evaluation
LAND DEVELOPMENT		
Conformance with Plans / Compatible Land Use and Zoning / Scale and Urban Design	2	The project site is located within the State Urban land use district, and within the County Open Zoning District. The County Housing Agency would need to apply for a Project Development Use Permit, which allows for increases in residential density for affordable housing projects. The proposed project site is located in a mixed use urban area suitable for the proposed multi-familiy and educational/health facility use proposed.
Soil Suitability/ Slope/ Erosion/ Drainage/ Storm Water Runoff	2	The project site is located in a flat buildable area. The proposed action would result in short-term less than significant impacts to soils during construction from grading, site work, utility, and infrastructure development. Soils would be temporarily excavated and stockpiled onsite during the construction period. Exposed soils are susceptible to erosion, especially if it rains heavily during site work periods. Adverse impacts from soil erosion and runoff would be minimized as a result of erosion and sedimentation control measures that would be implemented during construction. Proposed construction would need to comply with Kaua'i County BMP standards addressing soil and erosion control (e.g., silt fencing, covering and protecting soil stockpiles with tarps and filter socks, surface revegetation as soon as possible). These mitigation measures would minimize soil migration from the proposed construction area. The topography of the project site would remain similar to existing conditions following construction. Once completed, the proposed development would include hardened surfaces for driveway area, walkways and parking. All hardened surfaces would need appropriate drainage features in compliance with County code (i.e., drywells, swales and drainage culverts). Landscaped areas are also proposed that would hold soil in place naturally similar to existing conditions. As a result, soil and topography impacts are anticipated to be short-term and insignificant.

Hazards and Nuisances including Site Safety and Noise	3	During construction of the proposed development, non-hazardous green waste and native soil will be generated from grading activities. Construction materials, such as concrete, asphalt, gypsum board, paints and coatings will also be used onsite during construction. Construction vehicles and earth moving equipment fueled by petroleum products will be used onsite. The contractor would need to conduct regular inspections and maintenance of vehicles and equipment to assure that no petroleum spills or leaks occur. Any excess green waste, soil and construction materials generated onsite will be recycled or properly disposed at the Kekaha Landfill or another approved facility in accordance with County rules. Once in operation, the housing facility would not generate or store any significant quantities of hazardous materials. Small quantities of petroleum, paints and coatings may be utilized by maintenance staff. All potentially hazardous materials would need to be properly stored out of the sun/elements in flammable lockers within secure designated maintenance areas. The facility would generate non-hazardous household solid waste from the residents. All solid waste would be properly collected by municipal solid waste service and disposed at the Kekaha Landfill. There would be no significant short-term or long-term impacts to the affected environment from solid or hazardous waste. A Phase I Environmental Site Assessment was conducted by KES in October 2021. While the project site was redeveloped along with the surrounding area, the area was formerly used as commercial sugar croplands from at least 1950 through 1998. Former commercial croplands in Hawaii have been known to contain elevated levels of lead, arsenic and organochlorine pesticides. It is recommended that site soils be tested for these target constituents prior to land disturbance, if not completed previously, in order to determine if any residual chemical contamination is present in soil. If soil is shown to contain elevated levels of these target chemicals, worker and environmental protection measures must be implemente in accordance with DOH and OSHA rules. Under the proposed action, short-term noise impacts from construction activities would occur. Development of the project site would involve excavation, grading, and use of other typical mechanized construction equipment/tools. Based on the maximum generalized outdoor noise levels at the nearest residences across the street from the project site, HDOH Community Noise Rule criteria will be exceeded during construction of the project, and the project will require a Noise Permit to proceed with

		construction. HDOH may also require the contractor to conduct noise monitoring or community meetings inviting the neighboring residents and business owners to discuss construction noise. The contractor should use reasonable and standard practices to mitigate noise, such as using mufflers on diesel and gasoline engines, using properly tuned and balanced machines, etc. HDOH may require additional noise mitigation, such as temporary noise barriers, or time of day usage limits for certain kinds of construction activities. However, maximum noise levels at any one receptor will be short-term and vary with the phase of construction and equipment actually used on site. Therefore, while noise permits will be required to comply with the HDOH Community Noise Rule, and noise mitigation measures should be incorporated into any construction alternative to reduce maximum noise levels, significant construction noise impacts are not expected at any receptor during the construction of the proposed development. Long-term vehicular traffic noise impacts to users of the new facility, as well as the surrounding community noise receptors from additional trips and vehicle idling generated from the proposed facility are projected to be minimal compared to existing conditions. Once in operation, all stationary noise sources (i.e. air handler units) will be required to comply with the HDOH Community Noise Rule. All equipment located exterior to the building and which duct to the building exterior must be evaluated and designed for compliance with the HDOH Criteria for Category A receptors at all neighboring property lines. Therefore, no significant impact is expected due to stationary sources associated with the operation of the proposed development.

Environmental Assessment Factor	Impact Code	Impact Evaluation
SOCIOECONOMIC		
Employment and Income Patterns	1	The proposed project would result in the creation of short and long-term jobs for the local community. Construction jobs would be created during the construction of the proposed development, and there would likely be long-term property management and maintenance jobs created also. Once in operation, the facility would create much needed affordable housing, as well as health and educational services. The proposed project is not anticipated to result in any short or long-term adverse impacts to socioeconomic conditions since it would not cause loss of any jobs or housing, and would not result in tax revenue loss. The project would have

		beneficial economic and social impacts since it would result in job creation and much needed affordable housing, as well as health and educational services for the local community.
Demographic Character Changes, Displacement	2	The proposed project may result in a slight residential population increase in the area if occupants move from outside the urban core Līhu‘e area. It is not anticipated that any residents would be displaced by the proposed project since the project site includes undeveloped County-owned parkland.
Environmental Justice	1	The proposed project would result in the creation of short and long-term jobs for the local community. Construction jobs would be created during the construction of the proposed development, and there would likely be long-term property management and maintenance jobs created also. Once in operation, the facility would create much needed affordable housing, as well as health and educational services. The proposed project is not anticipated to result in any short or long-term adverse impacts to socioeconomic conditions since it would not cause loss of any jobs or housing, and would not result in tax revenue loss. The project would have beneficial economic and social impacts since it would result in job creation and much needed affordable housing, as well as health and educational services for the local community.

Environmental Assessment Factor	Impact Code	Impact Evaluation
COMMUNITY FACILITIES AND SERVICES		
Educational and Cultural Facilities	1	The proposed project is not anticipated to adversely impact any existing educational or cultural facilities. The project includes a plan for educational and health services, which would result in a beneficial impact to local educational resources.
Commercial Facilities	1	There would likley be beneficial impacts to the nearby commercial use to the east and west of the project site from the additional customers generated by the project site occupants and guests.
Health Care and Social Services	1	The project includes a plan for educational and health services, which would result in a beneficial impact to local healthcare and social services.

Solid Waste Disposal / Recycling	2	During construction of the proposed development, non-hazardous green waste and native soil will be generated from grading activities. Construction materials, such as concrete, asphalt, gypsum board, paints and coatings will also be used onsite during construction. Construction vehicles and earth moving equipment fueled by petroleum products will be used onsite. The contractor would need to conduct regular inspections and maintenance of vehicles and equipment to assure that no petroleum spills or leaks occur. Any excess green waste, soil and construction materials generated onsite will be recycled or properly disposed at the Kekaha Landfill or another approved facility in accordance with County rules. Once in operation, the facility would generate non-hazardous household solid waste. All solid waste would be properly collected by municipal solid waste service and disposed at the Kekaha Landfill. There would be no significant short-term or long-term impacts to the affected environment from solid waste.
Waste Water / Sanitary Sewers	2	Wastewater service at the project site would need to be coordinated with Puhi Sewer and Water Company / Aqua Engineers in order to construct a private wastewater system for the proposed facility that will connect to the Puhi Sewer and Water Company system in accordance with County and State DOH wastewater rules. There would be no impact from wastewater since the proposed facility would need to comply with County sewer rules.
Water Supply	2	Municipal potable water service is available at the project site along Welau Street. Potable water use at the proposed facility would need to comply with the Kauaʻi County Department of Water Rules and Regulations for Water Service Connections.
Public Safety - Police, Fire and Emergency Medical	2	The nearest police station to the project site is located approximately 3.3 miles to the east at: 3990 Kaʻana Street Līhuʻe, HI 96766. The nearest fire station is located approximately 2.7 miles to the east at: 4223 Rice Street Līhuʻe, HI 96766. The nearest emergency medical facility is located approximately 1.1 miles to the east at: 4484 Paheʻe Street Līhuʻe, HI 96766. The addition of residents at the proposed facility would not

		have a significant impact on police, fire or emergency medical services in the area, given the scale of the proposed facility.
Parks, Open Space and Recreation	2	The existing users of the project site will be impacted by the proposed action since the project site will no longer be available as County parkland. However, there are two other parks in close proximity to the project site; Kauaʻi Community Market Park is located approximately 320 feet southwest of the project site, and Puhi Park is located approximately 915 feet southeast of the project site. Since there are other existing parklands / open areas available within the direct vicinity of the project site, it is not anticipated that the proposed action would result in a significant impact to existing recreational/park/open space resources.
Transportation and Accessibility	2	The proposed project would be sited directly in front of an existing County bus stop, that is located along Kaumualiʻi Highway. A pathway from the development to this bus stop is planned as part of the development. Vehicular access to the proposed development would be via Welau Street.

Environmental Assessment Factor	Impact Code	Impact Evaluation
NATURAL FEATURES		
Unique Natural Features, Water Resources	2	The project site does not include any unique natural features, such as streams, springs, or hills.
Vegetation, Wildlife	2	The project area is comprised of a fenced manicured lawn with several planted ornamental tree and shrub species. The species composition is dominated by non-native plant and wildlife species. Of the native species observed, all are common across Kauaʻi and other Hawaiian Islands. No federally or state listed species were observed in the project area during the survey. Although not observed in the project area during the survey, several federally or state listed animal species may occasionally occur in or traverse the project area. Mitigation measures to protect these biologcial resources are included in Section 2.4 of the EA.

Other Factors		

Environmental Assessment Factor	Impact Code	Impact Evaluation
CLIMATE AND ENERGY		
Climate Change Impacts	2	There are no anticipated significant impacts to climate change from the proposed project, since the construction period would be temporary and there are no significant emissions from the operation of the proposed facility.
Energy Efficiency	2	The proposed facility would be built using modern energy efficient appliances in accordance with County building code.

Additional Studies Performed:

Biological Resources Survey
Environmental Noise Assessment
Archaeological Survey
Traffic Impact Analysis
Preliminary Engineering Report

Field Inspection (Date and completed by)**:**

December 13, 2023. Completed by Max Solmssen-Kaimana Environmental Solutions LLC

List of Sources, Agencies and Persons Consulted [40 CFR 1508.9(b)]**:**

See Table 1, and Appendix E of the EA for Agencies and Persons Consulted

Sources:

COK, 2004. Interim Construction Best Management Practices (BMP'S) for Sediment and Erosion Control for the County of Kauaʻi. April 2, 2004.

CPE, 2021. Traffic Impact Analysis Report. Kahua Hoʻoulu Affordable Housing Līhuʻe, Kauaʻi, Hawaiʻi. August 2021.

DL Adams, 2021. Puhbi Affordable Housing Environmental Noise Assessment and HUD Study. October 19, 2021.

DOH, 2021. DOH Clean Air Branch air quality data. Accessed at: https://air.doh.Hawaiʻi.gov/

DOH, 2014. Hawai‘i Administrative Rules, Title 11, Department of Health, Chapter 54 Water Quality Standards. November 15, 2014.

FEMA, 2023. FEMA Flood Maps Service Center. Accessed at: https://msc.fema.gov/portal/home
Fletcher et. al, 2002. Fletcher III, Charles H., et. al. 2002. Atlas of Natural Hazards in the Hawaiian Coastal Zone. Geologic Investigation Series I-2761, O‘ahu. United States Geological Survey).

Giambelluca et. al, 2013. Giambelluca T.W., Q. Chen, A.G. Frazier, J.P. Price, Y.-L. Chen, P.-S. Chu, J.K. Eischeid, and D.M. Delparte, 2013: Online Rainfall Atlas of Hawai‘i. Bull. Amer. Meteor. Soc. 94, 313-316, doi: 10.1175/BAMS-D-11-00228.1.

Giambelluca et. al, 2014. Giambelluca, T.W., X. Shuai, M.L. Barnes, R.J. Alliss, R.J. Longman, T. Miura, Q. Chen, A.G. Frazier, R.G. Mudd, L. Cuo, and A.D. Businger. 2014. Evapotranspiration of Hawai‘i. Final report submitted to the U.S. Army Corps of Engineers—Honolulu District, and the Commission on Water Resource Management, State of Hawai‘i.

IPCC, 2022. AR6 Synthesis Report: Climate Change 2022. Accessed at: www.ipcc.ch/report/sixth-assessment-report-cycle/

Honua, 2021. Archaeolgical Literature Review and Field Inspection for the Puhi Development Project, Ha‘ikū and Niumalu Ahupua‘a, Puna District, Kaua‘i Island, TMK: [4] 3-3-004:020. September 2021.

Mink and Lau, 1990. John. F. Mink and L. Stephen Lau, Aquifer Identification and Classification for Maui: Groundwater Protection Strategy for Hawai‘i, Technical Report No. 185. February, 1990.

NOAA, 2023. National Oceanic and Atmospheric Administration Tsunami Evacuation Map. Accessed at: tsunami.coast.noaa.gov.

NRCS, 2023. United States Department of Agriculture, National Resources Conservation Service Web Soil Survey.

PacIOOS, 2023. Pacific Islands Ocean Observing System. Accessed at: www.pacioos.Hawai‘i.edu/shoreline/slr-Hawai‘i/

SOEST, 2023. University of Hawai‘i School of Ocean and Earth Science and Technology, Coastal Geology Group. http://www.soest.Hawai‘i.edu.

TetraTech, 2021. Puhi Housing Project Biological Resources Survey Report. May 2021

US Census Bureau, 2023. US Census Bureau Data. Accessed at: census.gov.

USFWS, 2023. United States Fish and Wildlife Service National Wetlands Inventory Mapper

List of Permits Obtained:

National Pollutant Discharge Elimination System (NPDES) Permit
County of Kauaʻi Building Permits (Grading, Building-structural, plumbing, electrical,)
HRS 6E Compliance

Public Outreach [24 CFR 50.23 & 58.43]**:**

A 30-day public comment period will commence upon publication of the DEA in the State Environmental Notice. A public meeting to discuss the project will be held during the 30-day public comment period. Comments and input gathered during the 30-day public comment period will be presented and addressed in the final environmental decision document.

Cumulative Impact Analysis [24 CFR 58.32]**:**

The proposed affordable housing, educational and health facility is planned as a stand alone project being initiated by the Kauaʻi County Housing Agency based on the needs of the community. The proposed action would represent an incremental increase in long-term resource use. However, the proposed development would not represent a significant source of greenhouse gas emissions since it would be a modern facility with updated and efficient systems. There are no significant adverse cumulative impacts anticipated from the proposed action.

Alternatives [24 CFR 58.40(e); 40 CFR 1508.9]

Alternative 2: Alternate Project Location – Under Alternative 2 the proposed affordable housing, educational and health center facility would be built in a different location within Kauaʻi County. This alternative was eliminated from further consideration since the proposed project site is already located on County-owned land in a central area of Kauaʻi County, within Līhuʻe town; a primary job center of Kauaʻi County, where new building sites are scarce and costly to procure.

Alternative 3 (Proposed Action): Kahua Hoʻoulu Housing and Educational and Health Center– Under Alternative 3, the Proposed Action, the proposed affordable housing, educational and health center facility would be built on available County-owned land located in a central location (Figure 2 & Figure 3). Alternative 3 was carried forward for analysis in this EA since it best fulfills the project purpose and need to provide much needed health services in a central location accessible to the local community

No Action Alternative [24 CFR 58.40(e)]:

Alternative 1: No Action – Under Alternative 1, the proposed affordable housing, educational and health center facility would not be constructed, and the project site would remain as undeveloped landscaped land. Although the no action alternative does not address the project purpose and need, it was carried forward for analysis in the EA in compliance with the provisions of NEPA.

Summary of Findings and Conclusions:

Based on the research, studies and outreach conducted as part of this Environmental Assessment, it is determined that the proposed project would not result in a significant environmental impact. Therefore, a finding of no significant impact (FONSI) is anticipated for this project.

Mitigation Measures and Conditions [40 CFR 1505.2(c)]

Summarize below all mitigation measures adopted by the Responsible Entity to reduce, avoid, or eliminate adverse environmental impacts and to avoid non-compliance or non-conformance with the above-listed authorities and factors. These measures/conditions must be incorporated into project contracts, development agreements, and other relevant documents. The staff responsible for implementing and monitoring mitigation measures should be clearly identified in the mitigation plan.

Law, Authority, or Factor	Mitigation Measure
Air Quality	In order to mitigate airborne dust (particulate matter) impacts to the surrounding environment, all construction activities would need to adhere to County of Kaua‘i DPW Interim Construction Best Management Practices (BMPs) for Sediment and Erosion Control.
Soils and Erosion	Adverse impacts from soil erosion and runoff would be minimized as a result of erosion and sedimentation control measures that would be implemented during construction. Proposed construction would need to comply with Kaua‘i County BMP standards addressing soil and erosion control (e.g., silt fencing, covering and protecting soil stockpiles with tarps and filter socks, surface revegetation as soon as possible) (COK, 2004).
Noise	The project will require a Noise Permit to proceed with construction. HDOH may also require the contractor to conduct noise monitoring or

	community meetings inviting the neighboring residents and business owners to discuss construction noise. The contractor should use reasonable and standard practices to mitigate noise, such as using mufflers on diesel and gasoline engines, using properly tuned and balanced machines, etc. A noise wall and vegetation buffers are planned as part of the project to reduce noise levels from Kaumualiʻi Highway.
Biological Resources	Implement invasive species minimization measures to avoid the unintentional introduction or transport of new invasive species to the area. This includes utilizing on-site gravel, rock, and soil (or purchasing from a local supplier) when practicable; utilizing certified, weed-free seed mixes; and washing construction equipment and/or visually inspecting for excessive dirt, debris, plant materials, and invasive or harmful non-native species as appropriate. Consult with Kauaʻi Invasive Species Committee if needed. To minimize spread of the fungal pathogen responsible for Rapid ʻŌhiʻa Death, follow the most recent Rapid Ōhiʻa Death decontamination protocols recommended by USFWS and DOFAW. *Wildlife* Several listed wildlife species have the potential to occur in or transit through the project area. The following general measures are recommended to avoid and minimize potential impacts to listed wildlife species: Establish a wildlife education and observation program for all construction and operational personnel. Staff should be trained to identify listed wildlife that may be found on-site (including listed waterbirds and seabirds, and the Hawaiian goose) and to take appropriate steps if listed wildlife species are found. If downed listed species are observed at the project area, notify USFWS and DOFAW.

	Implement speed limits on site to reduce the risk of collision to listed wildlife *Listed Water Birds* The project area does not provide suitable nesting or foraging habitat for listed Hawaiian waterbirds because there is no standing water; however, listed waterbirds may fly through the project area in transit to and from other areas or forage in the project area in the event of temporary flooding. If these species land within the project area, they could be impacted by construction and operation activities. The following avoidance measures adapted from USFWS are recommended: Avoid creating areas with temporary or permanent standing water to avoid attracting listed waterbirds. If listed waterbirds are found in the project area during active construction, cease all activities within 100 feet of the bird(s), and do not approach the bird(s). If appropriate nesting habitat is present, a biological monitor that is familiar with the species biology should conduct Hawaiian waterbird nest surveys. Repeat nest surveys again within 3 days of project initiation and after any subsequent delay of work of 3 or more days (during which birds may attempt nesting). If a nest of a listed waterbird is not discovered, work may continue after the listed waterbird leaves the area of its own accord. If a nest of a listed waterbird is discovered, contact USFWS and DOFAW within 24 hours, and establish a 100-foot buffer around all active nests and/or broods until the chicks/ducklings have fledged. Do not conduct potentially disruptive activities or habitat alteration within this buffer is possible that Hawaiian geese may fly through the Study Area when in transit to and from areas with known populations. Should this species occur within the Study Area, it could be impacted by construction and operation activities. Tetra Tech recommends the following avoidance measures adapted from USFWS (USFWS 2023):

	If Hawaiian geese are observed in the project area during active construction, all activities within 100 feet of the bird should cease. Do not feed, approach, or disturb the bird(s). Work may continue after the bird leaves the area of its own accord. If Hawaiian geese are observed loafing or foraging within the project area during the breeding season (September through April), halt work and have a biologist familiar with nesting behavior survey for nests in the area prior to the resumption of work. If a nest is discovered, contact USFWS and DOFAW and cease all work within 150 feet. If a nest is not discovered, work may continue after the bird leaves the area of its own accord. In areas where Hawaiian geese are known to be present, post and implement reduced speed limits. *Listed Seabirds* The project area does not provide suitable nesting or foraging habitat for the listed Hawaiian seabirds. However, listed seabirds may fly over the project area in transit between the ocean and upland breeding sites during the breeding, nesting, and fledging seasons (March 1–December 15) and may be attracted to nighttime lighting. It is recommended that the following measures be implemented to avoid and minimize potential impacts to listed seabirds: Avoid nighttime construction during the seabird fledgling period (September 15–December 15). If nighttime construction is required outside the seabird fledging period, construction lighting should be shielded and directed downward and fit with non-white lights to minimize the attractiveness of construction lights to seabirds. Operational on-site lighting should be fully shielded and directed downward to prevent upward radiation, triggered by a motion detector and/or timer controls when human activity is not occurring, and fitted with non-white light bulbs to the extent possible. Other possible lighting recommendations may include: placing lights under eaves; shifting lighting according to moon phase; decreasing visibility of interior lights; planting vegetation

	around lights to reduce light visibility; and using longer light wavelengths (DOFAW 2020). Minimize construction of ovehead lines to reduce collision risk. For powerlines, guywires, and other cables, minimize exposure above vegetation height and vertical profile. If a grounded seabird is found, contact the Save Our Shearwaters (SOS) program at (808) 635-5117. *Hawaiian Hoary Bat* The USFWS provides the following avoidance and minimization measures for the Hawaiian hoary bat: Avoid trimming or removing woody vegetation (trees or shrubs) taller than 15 feet between June 1 and September 15, when juvenile bats are not yet capable of flying and may be roosting in the trees, resulting in the potential to be impacted. To prevent entanglement, do not use barbed wire for fencing. It is recommended that if some trimming or removal of woody vegetation taller than 15 feet (4.5 m) is necessary between June 1 and September 15, consult with USFWS and DOFAW to ensure impacts to the Hawaiian hoary bat are avoided.
Water Quality	In order to mitigate sediment and other pollutant runoff from construction activities, the contractor will be required to install and maintain construction BMPs in compliance with Kaua‘i County BMP standards. Stormwater BMPs include, but are not limited to; sediment basins/ traps; filter fabric silt fences; straw bale, sandbag, or gravel bag barriers; stormwater drain inlet protection, and stabilized construction entrances (COK, 2004). The project will also comply with State water quality regulations HAR Chapters 11-54 and 11-55. National Pollution Discharge Elimination System (NPDES) General Permits for discharges of construction dewatering and hydrotesting waters may also be obtained from the DOH Clean Water Branch.

Historical and Cultural Resources	The close proximity of multiple historic properties associated with Grove Farm, plantation village, and Puhi Camp warrants archaeological monitoring guided by an archaeological monitoring plan (AMP) during construction of the proposed development. The AMP must be approved by the State Historic Preservation Divusion (SHPD) prior to the start of ground disturbance. Further, since U.S. federal funds are being sought for the proposed project, compliance with the U.S. National Historical Preservation Act (NHPA) is also required. The County Housing Agency will need to consult with the State SHPD in accordance with Section 106 of the NHPA prior to project approval.

Determination:

☒ **Finding of No Significant Impact** [24 CFR 58.40(g)(1); 40 CFR 1508.27]
The project will not result in a significant impact on the quality of the human environment.

☐ **Finding of Significant Impact** [24 CFR 58.40(g)(2); 40 CFR 1508.27]
The project may significantly affect the quality of the human environment.

Preparer Signature: Date: 12/8/2023

Name/Title/Organization: Max Solmssen/Environmental Planner/
Kaimana Environmental Solutions LLC

Certifying Officer Signature: _____Date:_____

Name/Title:
_____

This original, signed document and related supporting material must be retained on file by the Responsible Entity in an Environmental Review Record (ERR) for the activity/project (ref: 24 CFR Part 58.38) and in accordance with recordkeeping requirements for the HUD program(s).

HUD Partner Worksheets

OMB No. 2506-0177
(exp.2/28/2025)

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
WASHINGTON, DC 20410-1000

This Worksheet was designed to be used by those "Partners" (including Public Housing Authorities, consultants, contractors, and nonprofits) who assist Responsible Entities and HUD in preparing environmental reviews, but legally cannot take full responsibilities for these reviews themselves. Responsible Entities and HUD should use the RE/HUD version of the Worksheet.

Air Quality (CEST and EA) – PARTNER

https://www.hudexchange.info/environmental-review/air-quality

1. **Does your project include new construction or conversion of land use facilitating the development of public, commercial, or industrial facilities OR five or more dwelling units?**

   ☒ Yes → *Continue to Question 2.*

   ☐ No → *If the RE/HUD agrees with this recommendation, the review is in compliance with this section. Provide any documents used to make your determination.*

2. **Is your project's air quality management district or county in non-attainment or maintenance status for any criteria pollutants?**
   Follow the link below to determine compliance status of project county or air quality management district:
   http://www.epa.gov/oaqps001/greenbk/

   ☒ No, project's county or air quality management district is in attainment status for all criteria pollutants
   → *If the RE/HUD agrees with this recommendation, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide any documents used to make your determination.*

   ☐ Yes, project's management district or county is in non-attainment or maintenance status for one or more criteria pollutants. → *Continue to Question 3.*

3. **Determine the estimated emissions levels of your project for each of those criteria pollutants that are in non-attainment or maintenance status on your project area. Will your project exceed any of the *de minimis or threshold* emissions levels of non-attainment and maintenance level pollutants or exceed the screening levels established by the state or air quality management district?**

   ☒ No, the project will not exceed *de minimis* or threshold emissions levels or screening levels
   → *If the RE/HUD agrees with this recommendation, the review is in compliance with this section. Explain how you determined that the project would not exceed de minimis or threshold emissions.*

☐ Yes, the project exceeds *de minimis* emissions levels or screening levels.

→ *Continue to Question 4. Explain how you determined that the project would not exceed de minimis or threshold emissions in the Worksheet Summary.*

4. **For the project to be brought into compliance with this section, all adverse impacts must be mitigated. Explain in detail the exact measures that must be implemented to mitigate for the impact or effect, including the timeline for implementation.**
   Click here to enter text.

Worksheet Summary

Dust would be generated on a short-term basis during construction site work. In order to mitigate airborne dust (particulate matter) impacts to the surrounding environment, all construction activities would need to adhere to County of Kauaʻi DPW Interim Construction Best Management Practices (BMPs) for Sediment and Erosion Control. BMPs include watering active work areas and unpaved work roads; use of dust fences; establishment of a routine road cleaning and tire washing program; establishment of landscaping or hardened surface early in the construction schedule; and monitoring dust at the project boundary during construction. With these mitigation measures in place there would be no significant impact to air quality from the proposed action during construction. Once completed, it is not anticipated that there would be any significant long-term air quality impacts from the operation of the proposed development since there would be no significant source of dust or other air emissions during operation of the development.

OMB No. 2506-0177
(exp.2/28/2025)

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
WASHINGTON, DC 20410-1000

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Airport Hazards (CEST and EA) – PARTNER

https://www.hudexchange.info/environmental-review/airport-hazards

1. **To ensure compatible land use development, you must determine your site's proximity to civil and military airports. Is your project within 15,000 feet of a military airport or 2,500 feet of a civilian airport?**

   ☒No → *If the RE/HUD agrees with this recommendation, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide a map showing that the site is not within the applicable distances to a military or civilian airport.*

   ☐Yes → *Continue to Question 2.*

2. **Is your project located within a Runway Potential Zone/Clear Zone (RPZ/CZ) or Accident Potential Zone (APZ)?**

   ☐Yes, project is in an APZ → *Continue to Question 3.*

   ☐Yes, project is an RPZ/CZ → *Project cannot proceed at this location.*

   ☐No, project is not within an APZ or RPZ/CZ

   → *If the RE/HUD agrees with this recommendation, the review is in compliance with this section. Continue to the Worksheet Summary below. Continue to the Worksheet Summary below. Provide a map showing that the site is not within either zone.*

3. **Is the project in conformance with DOD guidelines for APZ?**

   ☐Yes, project is consistent with DOD guidelines without further action.

   → *If the RE/HUD agrees with this recommendation, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide any documentation supporting this determination.*

   ☐No, the project cannot be brought into conformance with DOD guidelines and has not been approved. → *Project cannot proceed at this location.*

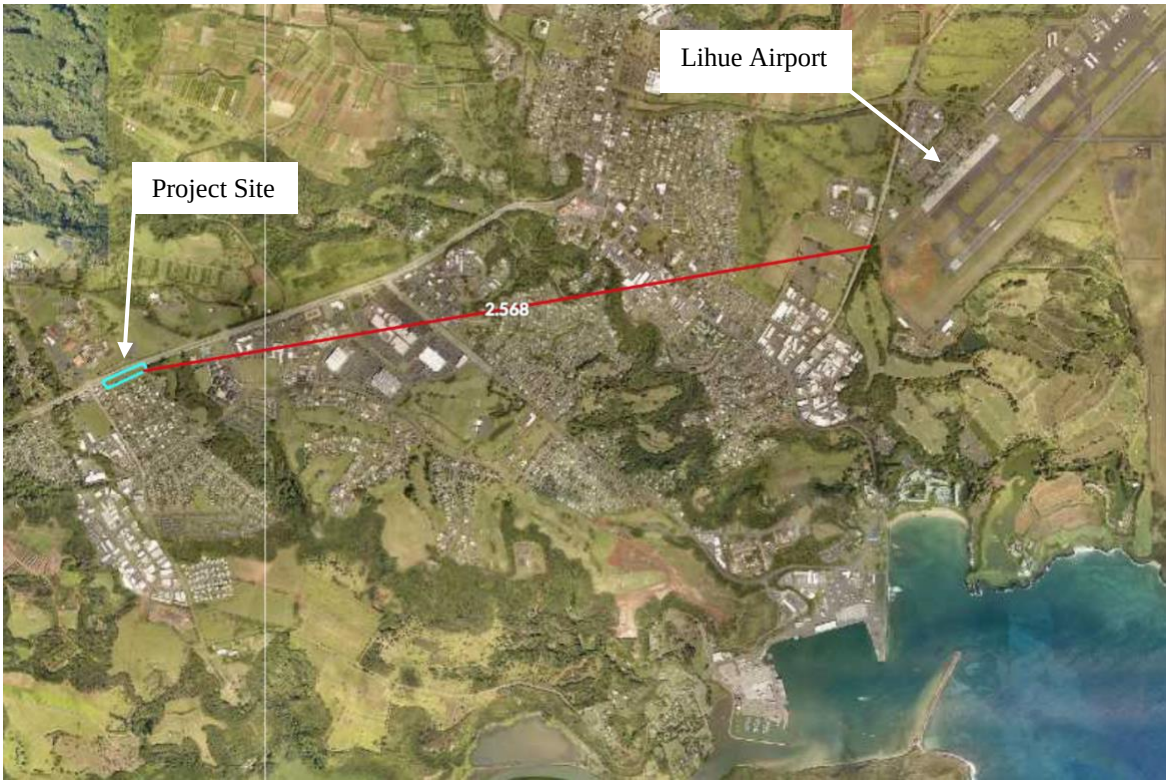
If mitigation measures have been or will be taken, explain in detail the proposed measures that must be implemented to mitigate for the impact or effect, including the timeline for implementation.

Click here to enter text.

→ *Work with the RE/HUD to develop mitigation measures. Continue to the Worksheet Summary below. Provide any documentation supporting this determination.*

Worksheet Summary

Below is a map showing the proximity to the nearest airport; Līhu‘e Airport, which is located approximately 2.5 miles east of the project site. There are no Military or other airports within the vicinty of the project site.



OMB No. 2506-0177
(exp.2/28/2025)

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WASHINGTON, DC 20410-1000

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Coastal Barrier Resources (CEST and EA) – PARTNER

https://www.hudexchange.info/environmental-review/coastal-barrier-resources

Projects located in the following states must complete this form.

Alabama	Georgia	Massachusetts	New Jersey	Puerto Rico	Virgin Islands
Connecticut	Louisiana	Michigan	New York	Rhode Island	Virginia
Delaware	Maine	Minnesota	North Carolina	South Carolina	Wisconsin
Florida	Maryland	Mississippi	Ohio	Texas	

1. Is the project located in a CBRS Unit?

☒No → *If the RE/HUD agrees with this recommendation, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide a map showing that the site is not within a CBRS Unit.*

☐Yes → *Continue to 2.*

> Federal assistance for most activities may not be used at this location. You must either choose an alternate site or cancel the project. In very rare cases, federal monies can be spent within CBRS units for certain exempted activities (e.g., a nature trail), after consultation with the Fish and Wildlife Service (FWS) (see 16 USC 3505 for exceptions to limitations on expenditures).

2. Indicate your recommended course of action for the RE/HUD

☐ Consultation with the FWS

☐ Cancel the project

Worksheet Summary

Include all documentation supporting your findings in your submission to HUD.
The project site is located on the Island of Kaua'i, within the State of Hawai'i, which is not included in the above table. See location map on the following page.

OMB No. 2506-0177
(exp.2/28/2025)

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WASHINGTON, DC 20410-1000

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OMB No. 2506-0177
(exp.2/28/2025)

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WASHINGTON, DC 20410-1000

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Coastal Zone Management Act (CEST and EA) – PARTNER

https://www.onecpd.info/environmental-review/coastal-zone-management

Projects located in the following states must complete this form.

Alabama	Florida	Louisiana	Mississippi	Ohio	Texas
Alaska	Georgia	Maine	New Hampshire	Oregon	Virgin Islands
American Samona	Guam	Maryland	New Jersey	Pennsylvania	Virginia
California	Hawaii	Massachusetts	New York	Puerto Rico	Washington
Connecticut	Illinois	Michigan	North Carolina	Rhode Island	Wisconsin
Delaware	Indiana	Minnesota	Northern Mariana Islands	South Carolina	

1. Is the project located in, or does it affect, a Coastal Zone as defined in your state Coastal Management Plan?

☒Yes → *Continue to Question 2.*
☐No → *If the RE/HUD agrees with this recommendation, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide a map showing that the site is not within a Coastal Zone.*

2. Does this project include activities that are subject to state review?

☒Yes → *Continue to Question 3.*
☐No → *If the RE/HUD agrees with this recommendation, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide documentation used to make your determination.*

3. Has this project been determined to be consistent with the State Coastal Management Program?

☐Yes, with mitigation. → *The RE/HUD must work with the State Coastal Management Program to develop mitigation measures to mitigate the impact or effect of the project.*

☒Yes, without mitigation. → *If the RE/HUD agrees with this recommendation, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide documentation used to make your determination.*

☐No → Project cannot proceed at this location.

Worksheet Summary

Include all documentation supporting your findings in your submission to HUD.
All of the islands of Hawai'i are located within the Coastal Zone, as defined in the CZM Act of 1972 and HRS Chapter 205A. However, the project site is not located within the Special Management (SMA) / shoreline area. Therefore, there are no anticipated impacts to coastal resources from the proposed project.

OMB No. 2506-0177
(exp.2/28/2025)

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WASHINGTON, DC 20410-1000

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Contamination and Toxic Substances (Multifamily and Non-Residential Properties) – PARTNER

https://www.hudexchange.info/programs/environmental-review/site-contamination

1. **How was site contamination evaluated?** [1] **Select all that apply.**

   ☒ ASTM Phase I ESA
   ☐ ASTM Phase II ESA
   ☐ Remediation or clean-up plan
   ☐ ASTM Vapor Encroachment Screening
   ☐ None of the above

   → *Provide documentation and reports and include an explanation of how site contamination was evaluated in the Worksheet Summary.*
   Continue to Question 2.

2. **Were any on-site or nearby toxic, hazardous, or radioactive substances found that could affect the health and safety of project occupants or conflict with the intended use of the property? (Were any recognized environmental conditions or RECs identified in a Phase I ESA and confirmed in a Phase II ESA?)**

   ☒ No → **Explain below.**

   No RECs were found during the Phase I ESA for the project site. The project site used to be commercial sugar croplands. Testing of soil prior to disturbance for worker and future resident safety is reccommended.

   → *If the RE/HUD agrees with this recommendation, the review is in compliance with this section. Continue to the Worksheet Summary below.*

   ☐ Yes → *Describe the findings, including any recognized environmental conditions (RECs), in Worksheet Summary below. Continue to Question 3.*

3. **Can adverse environmental impacts be mitigated?**

[1] HUD regulations at 24 CFR § 58.5(i)(2)(ii) require that the environmental review for multifamily housing with five or more dwelling units or non-residential property include the evaluation of previous uses of the site or other evidence of contamination on or near the site. For acquisition and new construction of multifamily and nonresidential properties HUD strongly advises the review include an ASTM Phase I Environmental Site Assessment (ESA) to meet real estate transaction standards of due diligence and to help ensure compliance with HUD's toxic policy at 24 CFR §58.5(i) and 24 CFR §50.3(i). Also note that some HUD programs require an ASTM Phase I ESA.

☐ Adverse environmental impacts cannot feasibly be mitigated → HUD assistance may not be used for the project at this site. Project cannot proceed at this location.

☒ Yes, adverse environmental impacts can be eliminated through mitigation.
→ *Provide all mitigation requirements*[2] *and documents. Continue to Question 4.*

4. **Describe how compliance was achieved. Include any of the following that apply: State Voluntary Clean-up Program, a No Further Action letter, use of engineering controls**[3]**, or use of institutional controls**[4]**.**

No known contamination exists at the project site. Soil testing prior to disturbance is reccommended based on historical land use. If soil is determined to contain contaminants at significant concentrations, appropriate controls in accordance with DOH rules will need to be implemented (i.e., engineering/institutional controls).

If a remediation plan or clean-up program was necessary, which standard does it follow?

☐ Complete removal

☐ Risk-based corrective action (RBCA)

→ *Continue to the Worksheet Summary.*

Worksheet Summary

Include all documentation supporting your findings in your submission to HUD.

The Phase I ESA completed for the project site included a federal and state environmental database search of any listed spill or release sites at or surrounding the project site, review of historical maps, interviews with knowledgeble parties regarding current and historical project site land use, and inspection of the project site.

[2] Mitigation requirements include all clean-up actions required by applicable federal, state, tribal, or local law. Additionally, provide, as applicable, the long-term operations and maintenance plan, Remedial Action Work Plan, and other equivalent documents.

[3] Engineering controls are any physical mechanism used to contain or stabilize contamination or ensure the effectiveness of a remedial action. Engineering controls may include, without limitation, caps, covers, dikes, trenches, leachate collection systems, signs, fences, physical access controls, ground water monitoring systems and ground water containment systems including, without limitation, slurry walls and ground water pumping systems.

[4] Institutional controls are mechanisms used to limit human activities at or near a contaminated site, or to ensure the effectiveness of the remedial action over time, when contaminants remain at a site at levels above the applicable remediation standard which would allow for unrestricted use of the property. Institutional controls may include structure, land, and natural resource use restrictions, well restriction areas, classification exception areas, deed notices, and declarations of environmental restrictions.

OMB No. 2506-0177
(exp.2/28/2025)

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WASHINGTON, DC 20410-1000

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Endangered Species Act (CEST and EA) – PARTNER

https://www.hudexchange.info/environmental-review/endangered-species

1. Does the project involve any activities that have the potential to affect species or habitats?

☒No, the project will have No Effect due to the nature of the activities involved in the project.

→ *If the RE/HUD agrees with this recommendation, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide any documents used to make your determination.*

☐No, the project will have No Effect based on a letter of understanding, memorandum of agreement, programmatic agreement, or checklist provided by local HUD office.

Explain your determination:

Click here to enter text.

→ *If the RE/HUD agrees with this recommendation, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide any documents used to make your determination.*

☐Yes, the activities involved in the project have the potential to affect species and/or habitats. → *Continue to Question 2.*

2. Are federally listed species or designated critical habitats present in the action area?

Obtain a list of protected species from the Services. This information is available on the FWS Website.

☐No, the project will have No Effect due to the absence of federally listed species and designated critical habitat.

→ *If the RE/HUD agrees with this recommendation, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide any documents used to make your determination. Documentation may include letters from the Services, species lists from the Services' websites, surveys or other documents and analysis showing that there are no species in the action area.*

☐Yes, there are federally listed species or designated critical habitats present in the action area. → *Continue to Question 3.*

3. **Recommend one of the following effects that the project will have on federally listed species or designated critical habitat:**

☐No Effect: Based on the specifics of both the project and any federally listed species in the action area, you have determined that the project will have absolutely no effect on listed species or critical habitat.

→ *If the RE/HUD agrees with this recommendation, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide any documents used to make your determination. Documentation should include a species list and explanation of your conclusion, and may require maps, photographs, and surveys as appropriate.*

☐May Affect, Not Likely to Adversely Affect: Any effects that the project may have on federally listed species or critical habitats would be beneficial, discountable, or insignificant.

→ Partner entities should not contact the Services directly. *If the RE/HUD agrees with this recommendation, they will have to complete Informal Consultation. Provide the RE/HUD with a biological evaluation or equivalent document. They may request additional information, including surveys and professional analysis, to complete their consultation.*

☐Likely to Adversely Affect: The project may have negative effects on one or more listed species or critical habitat.

→ Partner entities should not contact the Services directly. *If the RE/HUD agrees with this recommendation, they will have to complete Formal Consultation. Provide the RE/HUD with a biological evaluation or equivalent document. They may request additional information, including surveys and professional analysis, to complete their consultation.*

Worksheet Summary

Include all documentation supporting your findings in your submission to HUD.

A biological survey was completed for the project site. There study concluded that the project site does not include any endangered or protected species habitat. Protected avian species may traverse the proejct site. Mitigation measures to avoid impacts to these species are presented in Section 2.4 of the EA.

OMB No. 2506-0177
(exp.2/28/2025)

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WASHINGTON, DC 20410-1000

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Environmental Justice (CEST and EA) – PARTNER

https://www.hudexchange.info/environmental-review/environmental-justice

HUD strongly encourages starting the Environmental Justice analysis only after all other laws and authorities, including Environmental Assessment factors if necessary, have been completed.

1. **Were any adverse environmental impacts identified in any other compliance review portion of this project's total environmental review?**

   ☐Yes → *Continue to Question 2.*

   ☒No → *If the RE/HUD agrees with this recommendation, the review is in compliance with this section. Continue to the Worksheet Summary below.*

2. **Were these adverse environmental impacts disproportionately high for low-income and/or minority communities?**

   ☐Yes

   Explain:

   Click here to enter text.

   → *The RE/HUD must work with the affected low-income or minority community to decide what mitigation actions, if any, will be taken. Provide any supporting documentation.*

   ☐No

   Explain:

   Click here to enter text.

   → *If the RE/HUD agrees with this recommendation, the review is in compliance with this section. Continue to the Worksheet Summary below.*

Worksheet Summary

The proposed project includes an affordable housing project that would require residents to earn less than certain designated Area Median Income thresholds. Therefore, the project would favor low income households and individuals. The Kaua'i County Housing Agency has a non-discriminatory policy that requires fair treatment and equal opportunity for all appliants regardles of race, color, or national origin,

OMB No. 2506-0177
(exp.2/28/2025)

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
WASHINGTON, DC 20410-1000

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Explosive and Flammable Hazards (CEST and EA) – PARTNER

https://www.hudexchange.info/environmental-review/explosive-and-flammable-facilities

1. **Does the proposed HUD-assisted project include a hazardous facility (a facility that mainly stores, handles or processes flammable or combustible chemicals such as bulk fuel storage facilities and refineries)?**

   ☒ No
   → *Continue to Question 2.*

   ☐ Yes
   Explain:
   Click here to enter text.
   → *Continue to Question 5.*

2. **Does this project include any of the following activities: development, construction, rehabilitation that will increase residential densities, or conversion?**

   ☐ No → *If the RE/HUD agrees with this recommendation, the review is in compliance with this section. Continue to the Worksheet Summary below.*

   ☒ Yes → *Continue to Question 3.*

3. **Within 1 mile of the project site, are there any current *or planned* stationary aboveground storage containers:**
   - Of more than 100-gallon capacity, containing common liquid industrial fuels OR
   - Of any capacity, containing hazardous liquids or gases that are not common liquid industrial fuels?

   ☒ No → *If the RE/HUD agrees with this recommendation, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide all documents used to make your determination.*

   ☐ Yes → *Continue to Question 4.*

4. **Is the Separation Distance from the project acceptable based on standards in the Regulation?**
   Please visit HUD's website for information on calculating Acceptable Separation Distance.

   ☐ Yes
   → *If the RE/HUD agrees with this recommendation, the review is in compliance with this section. Continue to the Worksheet Summary below.*

Provide map(s) showing the location of the project site relative to any tanks and your separation distance calculations. If the map identifies more than one tank, please identify the tank you have chosen as the "assessed tank."

☐ No

→ *Continue to Question 6.*

Provide map(s) showing the location of the project site relative to any tanks and your separation distance calculations. If the map identifies more than one tank, please identify the tank you have chosen as the "assessed tank."

5. **Is the hazardous facility located at an acceptable separation distance from residences and any other facility or area where people may congregate or be present?**

Please visit HUD's website for information on calculating Acceptable Separation Distance.

☐ Yes

→ *If the RE/HUD agrees with this recommendation, the review is in compliance with this section. Continue to the Worksheet Summary below.*

Provide map(s) showing the location of the project site relative to residences and any other facility or area where people congregate or are present and your separation distance calculations.

☐ No

→ *Continue to Question 6.*

Provide map(s) showing the location of the project site relative to residences and any other facility or area where people congregate or are present and your separation distance calculations.

6. **For the project to be brought into compliance with this section, all adverse impacts must be mitigated. Explain in detail the exact measures that must be implemented to make the Separation Distance acceptable, including the timeline for implementation. If negative effects cannot be mitigated, cancel the project at this location.**

Note that only licensed professional engineers should design and implement blast barriers. If a barrier will be used or the project will be modified to compensate for an unacceptable separation distance, provide approval from a licensed professional engineer.

Click here to enter text.

Worksheet Summary

There are no above-ground explosive tanks/containers within the vicinty of the project site. A gas station is located directly off-site to the west, but only includes underground fuel storage tanks.

OMB No. 2506-0177
(exp.2/28/2025)

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WASHINGTON, DC 20410-1000

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Flood Insurance (CEST and EA) – PARTNER

https://www.hudexchange.info/environmental-review/flood-insurance

1. **Does this project involve mortgage insurance, refinance, acquisition, repairs, rehabilitation, or construction of a structure, mobile home, or insurable personal property**?

   ☐No. This project does not require flood insurance or is excepted from flood insurance.
   → *Continue to the Worksheet Summary.*

   ☒Yes → *Continue to Question 2.*

2. **Provide a FEMA/FIRM map showing the site.**
   The Federal Emergency Management Agency (FEMA) designates floodplains. The FEMA Map Service Center provides this information in the form of FEMA Flood Insurance Rate Maps (FIRMs).

   Is the structure, part of the structure, or insurable property located in a FEMA-designated Special Flood Hazard Area?

   ☒ No → *Continue to the Worksheet Summary.*

   ☐ Yes → *Continue to Question 3.*

3. **Is the community participating in the National Flood Insurance Program *or* has less than one year passed since FEMA notification of Special Flood Hazards?**

   ☐ Yes, the community is participating in the National Flood Insurance Program.
   Flood insurance is required. Provide a copy of the flood insurance policy declaration or a paid receipt for the current annual flood insurance premium and a copy of the application for flood insurance.
   → *Continue to the Worksheet Summary.*

   ☐ Yes, less than one year has passed since FEMA notification of Special Flood Hazards.
   If less than one year has passed since notification of Special Flood Hazards, no flood Insurance is required.
   → *Continue to the Worksheet Summary.*

   ☐ No. The community is not participating, or its participation has been suspended.
   Federal assistance may not be used at this location. Cancel the project at this location.

Worksheet Summary

The project site is located in an area of minimal flood hazard (FEMA Zone X). See FEMA FIRMette map attached.

OMB No. 2506-0177
(exp.2/28/2025)

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WASHINGTON, DC 20410-1000

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Floodplain Management (CEST and EA) – PARTNER

https://www.hudexchange.info/environmental-review/floodplain-management

1. **Does 24 CFR 55.12(c) exempt this project from compliance with HUD's floodplain management regulations in Part 55?**

   ☐ Yes

   Provide the applicable citation at 24 CFR 55.12(c) here. If project is exempt under 55.12(c)(6) or (8), provide supporting documentation.

   Click here to enter text.

   → *If the RE/HUD agrees with this recommendation, the review is in compliance with this section. Continue to the Worksheet Summary below. Continue to the Worksheet Summary.*

   ☒ No → *Continue to Question 2.*

2. **Provide a FEMA/FIRM map showing the site.**

   The Federal Emergency Management Agency (FEMA) designates floodplains. The FEMA Map Service Center provides this information in the form of FEMA Flood Insurance Rate Maps (FIRMs).

   Does your project occur in a floodplain?

   ☒ No → *Continue to the Worksheet Summary below.*

   ☐ Yes

   Select the applicable floodplain using the FEMA map or the best available information:

   ☐ Floodway → *Continue to Question 3, Floodways*

   ☐ Coastal High Hazard Area (V Zone) → *Continue to Question 4, Coastal High Hazard Areas*

   ☐ 500-year floodplain (B Zone or shaded X Zone) → *Continue to Question 5, 500-year Floodplains*

   ☐ 100-year floodplain (A Zone) → *The 8-Step Process is required. Continue to Question 6, 8-Step Process*

3. **Floodways**

   Is this a functionally dependent use?

   ☐ Yes

The 8-Step Process is required. Work with HUD or the RE to assist with the 8-Step Process.
→ *Continue to Worksheet Summary.*

☐ No → *Federal assistance may not be used at this location unless an exception in 55.12(c) applies. You must either choose an alternate site or cancel the project.*

4. **Coastal High Hazard Area**

Is this a critical action such as a hospital, nursing home, fire station, or police station?

☐ Yes → *Critical actions are prohibited in coastal high hazard areas unless an exception in 55.12(c) applies. You must either choose an alternate site or cancel the project.*

☐ No

Does this action include new construction that is not a functionally dependent use, existing construction (including improvements), or reconstruction following destruction caused by a disaster?

☐ Yes, there is new construction of something that is not a functionally dependent use. New construction must be designed to FEMA standards for V Zones at 44 CFR 60.3(e) (24 CFR 55.1(c)(3)(i)).
→ *Continue to Question 6, 8-Step Process*

☐ No, this action concerns only existing construction.
Existing construction must have met FEMA elevation and construction standards for a coastal high hazard area or other standards applicable at the time of construction.
→ *Continue to Question 6, 8-Step Process*

5. **500-year Floodplain**

Is this a critical action?

☐ No → *If the RE/HUD agrees with this recommendation, the review is in compliance with this section. Continue to the Worksheet Summary below. Continue to the Worksheet Summary below.*

☐Yes → *Continue to Question 6, 8-Step Process*

6. **8-Step Process**.

Is this 8-Step Process required? Select one of the following options:

☐ 8-Step Process applies.
This project will require mitigation and may require elevating structure or structures. See the link to the HUD Exchange above for information on HUD's elevation requirements.
→ *Work with the RE/HUD to assist with the 8-Step Process. Continue to Worksheet Summary.*

☐ 5-Step Process is applicable per 55.12(a)(1-4).
Provide the applicable citation at 24 CFR 55.12(a) here.
Click here to enter text.
→ *Work with the RE/HUD to assist with the 5-Step Process. Continue to Worksheet Summary.*

☐ 8-Step Process is inapplicable per 55.12(b)(1-5).
Provide the applicable citation at 24 CFR 55.12(b) here.

Click here to enter text.

→ *If the RE/HUD agrees with this recommendation, the review is in compliance with this section. Continue to the Worksheet Summary below.*

Worksheet Summary

Provide a full description of your determination and a synopsis of the information that it was based on,
See attached FEMA FIRMette

National Flood Hazard Layer FIRMette

FEMA

159°23'58"W 21°58'19"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

159°23'20"W 21°57'45"N

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 11/30/2023 at 4:23 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

OMB No. 2506-0177
(exp.2/28/2025)

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
WASHINGTON, DC 20410-1000

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Historic Preservation (CEST and EA) – PARTNER

https://www.hudexchange.info/environmental-review/historic-preservation

Threshold

Is Section 106 review required for your project?

☐ No, because a Programmatic Agreement states that all activities included in this project are exempt. (See the PA Database to find applicable PAs.)
Either provide the PA itself or a link to it here. Mark the applicable exemptions or include the text here:
Click here to enter text.

→ *Continue to the Worksheet Summary.*

☒ No, because the project consists solely of activities included in a No Potential to Cause Effects memo or other determination [36 CFR 800.3(a)(1)].
Either provide the memo itself or a link to it here. Explain and justify the other determination here:
No significant historical or cultural resources were found at the project site during the archaeolgical survey. An archaeolgical monitoring plan outlining construction monitoring will be implemented and submitted to the State Historical Preservation Division prior to the start of construction.

→ *Continue to the Worksheet Summary.*

☐Yes, because the project includes activities with potential to cause effects (direct or indirect). → *Continue to Step 1.*

The Section 106 Process
After determining the need to do a Section 106 review, HUD or the RE will initiate consultation with regulatory and other interested parties, identify and evaluate historic properties, assess effects of the project on properties listed on or eligible for the National Register of Historic Places, and resolve any adverse effects through project design modifications or mitigation.
Step 1: Initiate consultation
Step 2: Identify and evaluate historic properties
Step 3: Assess effects of the project on historic properties
Step 4: Resolve any adverse effects

Only RE or HUD staff may initiate the Section 106 consultation process. Partner entities may gather information, including from SHPO records, identify and evaluate historic properties, and make initial assessments of effects of the project on properties listed in or eligible for the National Register of Historic Place. Partners should then provide their RE or HUD with all of their analysis and documentation so that they may initiate consultation.

Step 1 - Initiate Consultation

The following parties are entitled to participate in Section 106 reviews: Advisory Council on Historic Preservation; State Historic Preservation Officers (SHPOs); federally recognized Indian tribes/Tribal Historic Preservation Officers (THPOs); Native Hawaiian Organizations (NHOs); local governments; and project grantees. The general public and individuals and organizations with a demonstrated interest in a project may participate as consulting parties at the discretion of the RE or HUD official. Participation varies with the nature and scope of a project. Refer to HUD's website for guidance on consultation, including the required timeframes for response. Consultation should begin early to enable full consideration of preservation options.

Use the When To Consult With Tribes checklist within Notice CPD-12-006: Process for Tribal Consultation to determine if the RE or HUD should invite tribes to consult on a particular project. Use the Tribal Directory Assessment Tool (TDAT) to identify tribes that may have an interest in the area where the project is located. Note that only HUD or the RE may initiate consultation with Tribes. Partner entities may prepare a draft letter for the RE or HUD to use to initiate consultation with tribes, but may not send the letter themselves.

List all organizations and individuals that you believe may have an interest in the project here:
Consultation is ongoing and will be finalized at a later date.

→ *Continue to Step 2.*

Step 2 - Identify and Evaluate Historic Properties

Provide a preliminary definition of the Area of Potential Effect (APE), either by entering the address(es) or providing a map depicting the APE. Attach an additional page if necessary.
Click here to enter text.

Gather information about known historic properties in the APE. Historic buildings, districts and archeological sites may have been identified in local, state, and national surveys and registers, local historic districts, municipal plans, town and county histories, and local history websites. If not already listed on the National Register of Historic Places, identified properties are then evaluated to see if they are eligible for the National Register. Refer to HUD's website for guidance on identifying and evaluating historic properties.

In the space below, list historic properties identified and evaluated in the APE.
Every historic property that may be affected by the project should be listed. For each historic property or district, include the National Register status, whether the SHPO has concurred with the finding, and whether information on the site is sensitive. Attach an additional page if necessary.
Click here to enter text.

Provide the documentation (survey forms, Register nominations, concurrence(s) and/or objection(s), notes, and photos) that justify your National Register Status determination.

Was a survey of historic buildings and/or archeological sites done as part of the project?
If the APE contains previously unsurveyed buildings or structures over 50 years old, or there is a likely presence of previously unsurveyed archeological sites, a survey may be necessary. For Archeological surveys, refer to HP Fact Sheet #6, Guidance on Archeological Investigations in HUD Projects.

☐ Yes → *Provide survey(s) and report(s) and continue to Step 3.*
Additional notes:
Click here to enter text.

☐ No → *Continue to Step 3.*

Step 3 - Assess Effects of the Project on Historic Properties

Only properties that are listed on or eligible for the National Register of Historic Places receive further consideration under Section 106. Assess the effect(s) of the project by applying the Criteria of Adverse Effect. (36 CFR 800.5) Consider direct and indirect effects as applicable as per HUD guidance.

Choose one of the findings below to recommend to the RE or HUD.
Please note: this is a recommendation only. It is **not** the official finding, which will be made by the RE or HUD, but only your suggestion as a Partner entity.

☐ No Historic Properties Affected
Document reason for finding:
☐ No historic properties present.
☐ Historic properties present, but project will have no effect upon them.

☐ No Adverse Effect
Document reason for finding and provide any comments below.
Comments may include recommendations for mitigation, monitoring, a plan for unanticipated discoveries, etc.
Click here to enter text.

☐ Adverse Effect
Document reason for finding:
Copy and paste applicable Criteria into text box with summary and justification.
Criteria of Adverse Effect: 36 CFR 800.5]
Click here to enter text.

Remember to provide all documentation that justifies your National Register Status determination and recommendations along with this worksheet.

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Noise (CEST Level Reviews) – PARTNER

https://www.hudexchange.info/programs/environmental-review/noise-abatement-and-control

1. **What activities does your project involve? Check all that apply:**

☒ New construction for residential use

NOTE: HUD assistance to new construction projects is generally prohibited if they are located in an Unacceptable zone, and HUD discourages assistance for new construction projects in Normally Unacceptable zones. See 24 CFR 51.101(a)(3) for further details.

→ *Continue to Question 4.*

☐ Rehabilitation of an existing residential property

NOTE: For modernization projects in all noise zones, HUD encourages mitigation to reduce levels to acceptable compliance standards. See 24 CFR 51 Subpart B for further details.

→ *Continue to Question 2.*

☐ None of the above

→ *If the RE/HUD agrees with this recommendation, the review is in compliance with this section. Continue to the Worksheet Summary below.*

2. **Do you have standardized noise attenuation measures that apply to all modernization and/or minor rehabilitation projects, such as the use of double glazed windows or extra insulation?**

☐ Yes

Indicate the type of measures that will apply (check all that apply):

☐ Improved building envelope components (better windows and doors, strengthened sheathing, insulation, sealed gaps, etc.)

☐ Redesigned building envelope (more durable or substantial materials, increased air gap, resilient channels, staggered wall studs, etc.)

☐ Other (explain below)

Click here to enter text.

→ *If the RE/HUD agrees with this recommendation, the review is in compliance with this section. Continue to the Worksheet Summary below and provide any documentation.*

☐ No

→ *Continue to Question 3.*

3. **Complete the Preliminary Screening to identify potential noise generators in the vicinity (1000' from a major road, 3000' from a railroad, or 15 miles from an airport).**
   Describe findings of the Preliminary Screening:
   Click here to enter text.
   → *Continue to Question 6.*

4. **Complete the Preliminary Screening to identify potential noise generators in the vicinity (1000' from a major road, 3000' from a railroad, or 15 miles from an airport).**
   Indicate the findings of the Preliminary Screening below:
   ☐ There are no noise generators found within the threshold distances above.
   → *If the RE/HUD agrees with this recommendation, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide a map showing the location of the project relative to any noise generators.*

   ☒ Noise generators were found within the threshold distances.
   → *Continue to Question 5.*

5. **Complete the Noise Assessment Guidelines to quantify the noise exposure. Indicate the findings of the Noise Assessment below:**
   ☒ Acceptable: (65 decibels or less; the ceiling may be shifted to 70 decibels in circumstances described in §24 CFR 51.105(a))
   Indicate noise level here: 45 dBA
   → *If the RE/HUD agrees with this recommendation, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide noise analysis, including noise level and data used to complete the analysis.*

   ☐ Normally Unacceptable: (Above 65 decibels but not exceeding 75 decibels; the floor may be shifted to 70 decibels in circumstances described in 24 CFR 51.105(a))
   Indicate noise level here: Click here to enter text.

   Is the project in a largely undeveloped area[1]?
   ☐ No → ***The project requires completion of an Environmental Assessment (EA) pursuant to 51.104(b)(1)(i).***
   ☐ Yes →***The project requires completion of an Environmental Impact Statement (EIS) pursuant to 51.104(b)(1)(i).***

   → *Work with the RE/HUD to elevate the level of review. Provide noise analysis, including noise level and data used to complete the analysis.*
   Continue to Question 6.

   ☐ Unacceptable: (Above 75 decibels)

[1] A largely undeveloped area means the area within 2 miles of the project site is less than 50 percent developed with urban uses and does not have water and sewer capacity to serve the project.

Indicate noise level here: Click here to enter text.
The project requires completion of an Environmental Impact Statement (EIS) pursuant to 51.104(b)(1)(i). *Work with HUD or the RE to either complete an EIS or obtain a waiver signed by the appropriate authority.*
→ *Continue to Question 6.*

6. **HUD strongly encourages mitigation be used to eliminate adverse noise impacts. Work with the RE/HUD on the development of the mitigation measures that must be implemented to mitigate for the impact or effect, including the timeline for implementation.**

☐ Mitigation as follows will be implemented:
Click here to enter text.
→ *Provide drawings, specifications, and other materials as needed to describe the project's noise mitigation measures.*
Continue to the Worksheet Summary.

☐ No mitigation is necessary.
Explain why mitigation will not be made here:
Click here to enter text.
→ *Continue to the Worksheet Summary.*

Worksheet Summary

Based on the assumed exterior wall assemblies and minimum STC 30-rated windows, the project achieves the HUD maximum interior noise level of 45 dBA and is considered "Acceptable". It is recommend selecting window assemblies with minimum STC 30 ratings and selecting exterior wall and door construction acoustically equivalent or superior to those assumed herein. If windows with higher STC ratings are selected, expect interior noise levels to decrease.

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Sole Source Aquifers (CEST and EA) - PARTNER

https://www.hudexchange.info/environmental-review/sole-source-aquifers

1. **Is the project located on a sole source aquifer (SSA)[1]?**
   ☒No → *If the RE/HUD agrees with this recommendation, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide documentation used to make your determination, such as a map of your project or jurisdiction in relation to the nearest SSA.*

   ☐Yes → *Continue to Question 2.*

2. **Does the project consist solely of acquisition, leasing, or rehabilitation of an existing building(s)?**
   ☐Yes → *The review is in compliance with this section. Continue to the Worksheet Summary below.*

   ☐No → *Continue to Question 3.*

3. **Does your region have a memorandum of understanding (MOU) or other working agreement with EPA for HUD projects impacting a sole source aquifer?**
   Contact your Field or Regional Environmental Officer or visit the HUD webpage at the link above to determine if an MOU or agreement exists in your area.
   ☐Yes → *Continue to Question 4.*

   ☐No → *Continue to Question 5.*

4. **Does your MOU or working agreement exclude your project from further review?**
   ☐Yes → *If the RE/HUD agrees with this recommendation, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide documentation used to make your determination and document where your project fits within the MOU or agreement.*

   ☐No → *Continue to Question 5.*

5. **Will the proposed project contaminate the aquifer and create a significant hazard to public health?**
   Consult with your Regional EPA Office. Your consultation request should include detailed information about your proposed project and its relationship to the aquifer and associated streamflow source area.

[1] A sole source aquifer is defined as an aquifer that supplies at least 50 percent of the drinking water consumed in the area overlying the aquifer. This includes streamflow source areas, which are upstream areas of losing streams that flow into the recharge area.

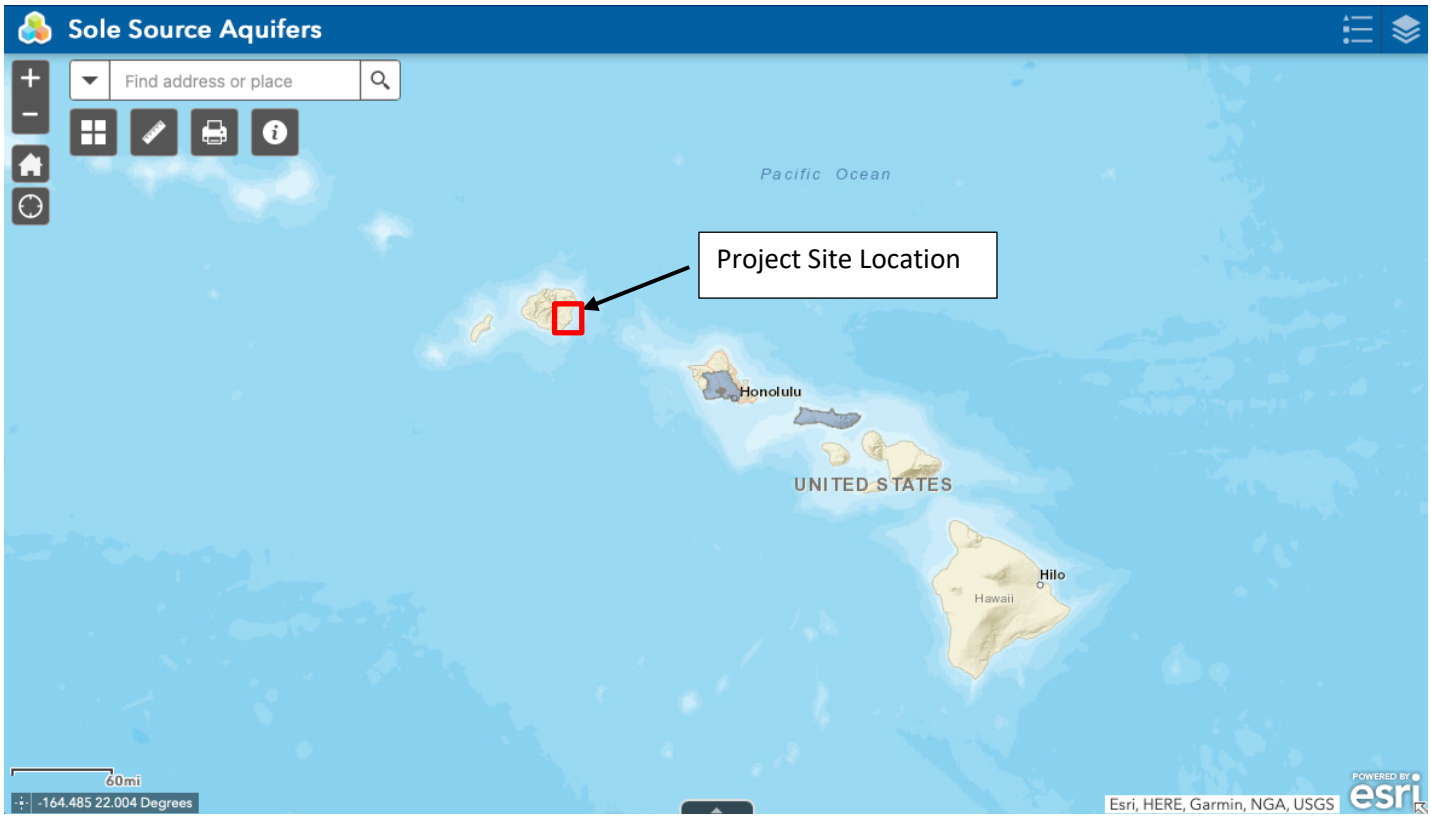
EPA will also want to know about water, storm water and waste water at the proposed project. Follow your MOU or working agreement or contact your Regional EPA office for specific information you may need to provide. EPA may request additional information if impacts to the aquifer are questionable after this information is submitted for review.

☐No → *If the RE/HUD agrees with this recommendation, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide your correspondence with the EPA and all documents used to make your determination.*

☐Yes → *The RE/HUD will work with EPA to develop mitigation measures. If mitigation measures are approved, attach correspondence with EPA and include the mitigation measures in your environmental review documents and project contracts. <u>If EPA determines that the project continues to pose a significant risk to the aquifer, federal financial assistance must be denied.</u> Continue to Question 6.*

<u>Worksheet Summary</u>

Provide a full description of your determination and a synopsis of the information that it was based on, Kaua'i County does not include an sole source aquifers (See map below).



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Wetlands (CEST and EA) – Partner

https://www.hudexchange.info/environmental-review/wetlands-protection

1. **Does this project involve new construction as defined in Executive Order 11990, expansion of a building's footprint, or ground disturbance?**
   The term "new construction" includes draining, dredging, channelizing, filling, diking, impounding, and related activities and construction of any any structures or facilities.

   ☐ No → *If the RE/HUD agrees with this recommendation, the review is in compliance with this section. Continue to the Worksheet Summary below.*

   ☒ Yes → *Continue to Question 2.*

2. **Will the new construction or other ground disturbance impact a wetland as defined in E.O. 11990?**

   ☒ No → *If the RE/HUD agrees with this recommendation, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide a map or any other relevant documentation to explain your determination.*

   ☐ Yes → *Work with HUD or the RE to assist with the 8-Step Process. Continue to Question 3.*

3. **Does Section 55.12 state that the 8-Step Process is not required?**

   ☐ No, the 8-Step Process applies.
   This project will require mitigation and may require elevating structure or structures. See the link to the HUD Exchange above for information on HUD's elevation requirements.
   → *Work with the RE/HUD to assist with the 8-Step Process. Continue to Worksheet Summary.*

   ☐ 5-Step Process is applicable per 55.12(a).
   Provide the applicable citation at 24 CFR 55.12(a) here.
   Click here to enter text.
   → *Work with the RE/HUD to assist with the 5-Step Process. This project may require mitigation or alternations. Continue to Worksheet Summary.*

   ☐ 8-Step Process is inapplicable per 55.12(b).
   Provide the applicable citation at 24 CFR 55.12(b) here.
   Click here to enter text.

→ *If the RE/HUD agrees with this recommendation, the review is in compliance with this section. Continue to Worksheet Summary.*

☐ 8-Step Process is inapplicable per 55.12(c).

Provide the applicable citation at 24 CFR 55.12(c) here.

Click here to enter text.

→ *If the RE/HUD agrees with this recommendation, the review is in compliance with this section. Continue to Worksheet Summary.*

Worksheet Summary

Provide a full description of your determination and a synopsis of the information that it was based on, such as:

- Map panel numbers and dates
- Names of all consulted parties and relevant consultation dates
- Names of plans or reports and relevant page numbers
- Any additional requirements specific to your program or region

Include all documentation supporting your findings in your submission to HUD.

See wetland map below-no wetlands are mapped at the project site

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Wild and Scenic Rivers (CEST and EA) – PARTNER

https://www.hudexchange.info/environmental-review/wild-and-scenic-rivers

1. Is your project within proximity of a Wild and Scenic River, Study River, or Nationwide Rivers Inventory River?

☒ No → *If the RE/HUD agrees with this recommendation, the review is in compliance with this section. Provide documentation used to make your determination.*

☐ Yes → *Continue to Question 2.*

2. Could the project do *any* of the following?

- Have a direct and adverse effect within Wild and Scenic River Boundaries,
- Invade the area or unreasonably diminish the river outside Wild and Scenic River Boundaries, or
- Have an adverse effect on the natural, cultural, and/or recreational values of a NRI segment.

Consult with the appropriate federal/state/local/tribal Managing Agency(s), pursuant to Section 7 of the Act, to determine if the proposed project may have an adverse effect on a Wild & Scenic River or a Study River and, if so, to determine the appropriate avoidance or mitigation measures.

Select one:

☐ The Managing Agency has concurred that the proposed project will not alter, directly, or indirectly, any of the characteristics that qualifies or potentially qualifies the river for inclusion in the NWSRS.

→ *If the RE/HUD agrees with this recommendation, the review is in compliance with this section. Provide documentation of the consultation (including the Managing Agency's concurrence) and any other documentation used to make your determination.*

☐ The Managing Agency was consulted and the proposed project may alter, directly, or indirectly, any of the characteristics that qualifies or potentially qualifies the river for inclusion in the NWSRS.

→ *The RE/HUD must work with the Managing Agency to identify mitigation measures to mitigate the impact or effect of the project on the river.*

Worksheet Summary

The State of Hawaii has approximately 3,905 miles of river, but no designated wild and scenic rivers (National Wild and Scenic Rivers System. Accessed at: https://www.rivers.gov/rivers/hawaii)

Appendix G: Preliminary Engineering Report

Preliminary Engineering Report

Kahua Ho'oulu Affordable Housing Development

Prepared for:
Kaua'i County Housing Agency

October 2023

Prepared by:
Community Planning and Engineering, Inc.

TABLE OF CONTENTS

1. INTRODUCTION

1.1. GENERAL

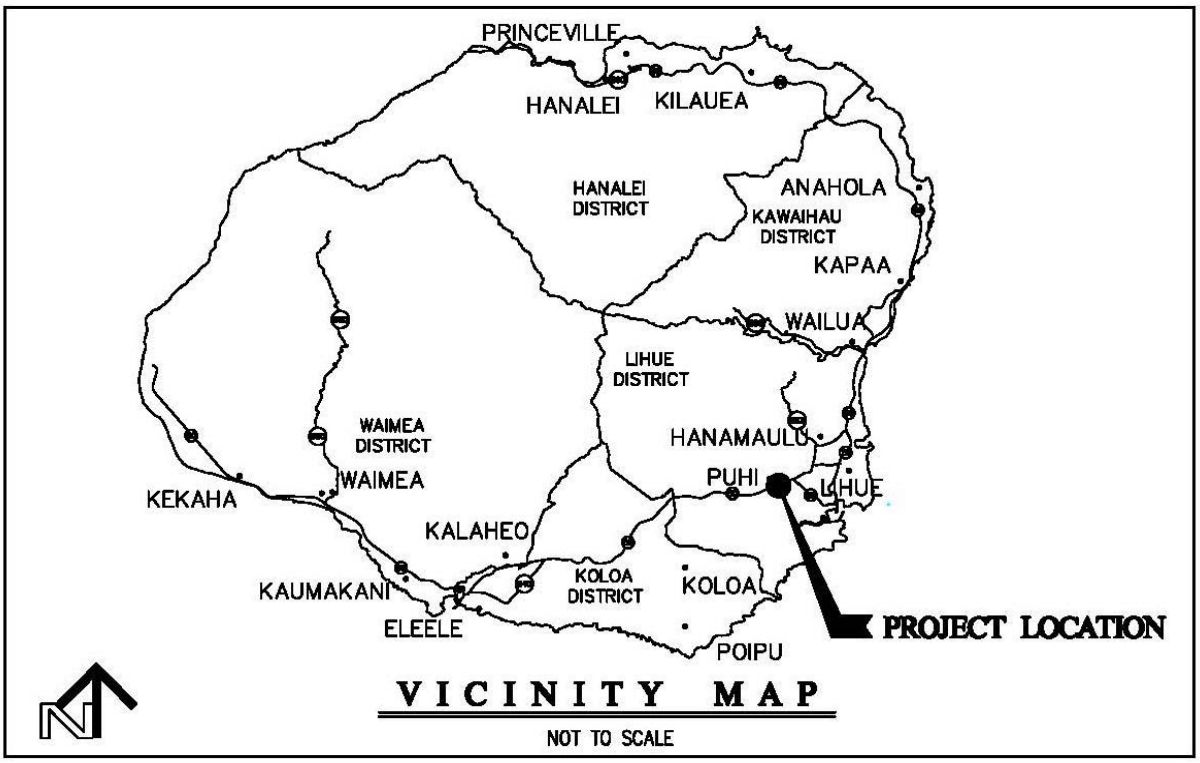
This Preliminary Engineering Report (PER) is a supplement to the Environmental Assessment titled, "Kahua Ho'oulu Affordable Housing Development", prepared by Kaimana Environmental Solutions LLC.

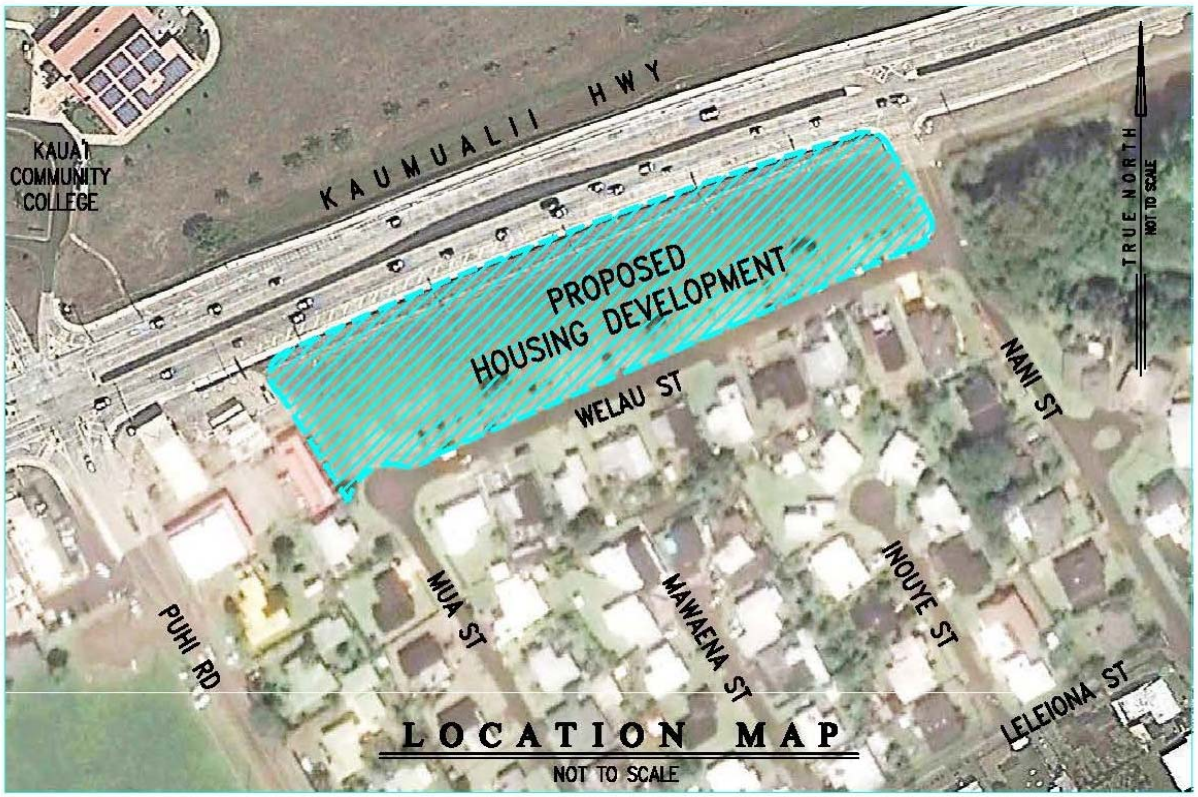
The County of Kaua'i Housing Agency is proposing to develop a parcel to provide affordable housing. The proposed housing development with a maximum of 60 units includes studio units, one-bedroom units, and two-bedroom units. In addition to the residential units, a space for childcare and early childhood preschool and play areas will be provided. Conceptual building and site designs prepared incorporate an educational/student-centric focus and a sense of place appropriate for the surrounding neighborhood. The proposed development presented in this report is used only as a basis for the evaluation to determine the feasibility in terms of site, grading, utilities, and other infrastructure improvements.

1.2. SITE DESCRIPTION

The project is located in the town of Puhi and is bordered by Kaumuali'i Highway to the north, Nani Street to the east, commercial businesses to the west, and Welau Street to the south, see Exhibit 1. The parcel is owned by the County of Kaua'i and is under the jurisdiction of the Department of Parks and Recreation. The Tax Map Key (TMK) for the parcel is 3-3-004: 020, with an area of 2.91 acres, and a zoning designation of "Open". The current land use is a passive park.

EXHIBIT 1


PRINCEVILLE
HANALEI
KILAUEA
HANALEI DISTRICT
ANAHOLA
KAWAIHAU DISTRICT
KAPAA
WAILUA
LIHUE DISTRICT
WAIMEA DISTRICT
HANAMAULU
WAIMEA
PUHI
LIHUE
KEKAHA
KALAHEO
KOLOA DISTRICT
KOLOA
KAUMAKANI
ELEELE
POIPU
PROJECT LOCATION
VICINITY MAP
NOT TO SCALE


KAUMUALII HWY
KAUAI COMMUNITY COLLEGE
PROPOSED HOUSING DEVELOPMENT
WELAU ST
NANI ST
TRUE NORTH
NOT TO SCALE
PUHI RD
MUA ST
MAWAENA ST
INOUYE ST
LELEIONA ST
LOCATION MAP
NOT TO SCALE

1.2.1. Topography

A topographic survey for the property was completed on May 4, 2021. The site varies in elevation from 337 feet in the northwest corner to 319 feet in the southeast corner. The slope over the parcel is approximately 2%.

1.2.2. Soils

According to the National Resources Conservation Services, the soils at the project site are classified as PnA, Puhi silty clay loam, 0 to 3 percent slope and PnB, Puhi silty clay loam, 3 to 8 percent. For Puhi silty clay loam, PnA, 0 to 3 percent slope, permeability is moderately rapid, and classified as well-drained soil. Runoff is very slow, and there is no erosion hazard. The available water capacity is about 1.3 inches per foot of soil. Roots penetrate to a depth of 5 feet or more. For Puhi silty clay loam, PnB, 3 to 8 percent slope, runoff is slow, and the erosion hazard is slight. Puhi silty clay loam, PnB, is classified as a well-drained soil.

2. PRELIMINARY ENGINEERING REPORT

This Preliminary Engineering Report evaluated land use, access, water infrastructure, wastewater infrastructure, grading and storm drainage, electrical infrastructure, telecommunication and CATV infrastructure, architectural features and cost estimates. For the proposed conceptual layout see Exhibit 2.

EXHIBIT 2

AFFORDABLE BUILDING UNIT SUMMARY

(5) Buildings (32'x 90' footprint) @ 12 Units each

(10) Studio Units @ 515 sf each
(30) 1-Bedroom Units varies @ 556 sf - 686 sf each
(20) 2-Bedroom Units @ 770 sf each

Total # of Units: 60

PARKING SUMMARY TABLE

*Resident parking**	*60 stalls*
Guest parking	*18 stalls*
TOTAL:	*78 stalls*

*** Resident parking includes 1 stall per unit and 1 ADA stall per building***
*** Additional stalls could be converted to ADA as needed***

Concept Site Plan 11/09/2020
KAHUA HO`OULU
Island of Kaua'i
North Linear Scale 0 15 30
PBR HAWAII & ASSOCIATES, INC.

2.1. LAND USE

2.1.1. General

The current zoning for the subject parcel is "Open". According to the Kaua'i County Code, Section 8-9.1, "The Open District is established and regulated to create and maintain an adequate and functional amount of predominantly open land to provide for the recreational and aesthetic needs of the community or to provide for the effective functioning of land, air, water, plant, and animal systems or communities." A Project Development Use Permit is proposed to allow for an increase in residential density for affordable housing projects.

2.1.2. Zoning

2.1.2.1. State Land Use District

The designation of the parcel is within an Urban District Boundary. No further boundary amendments are required for this parcel involving the State Land Use Commission.

2.1.2.2. County Zoning

The current zoning for the parcel is "Open". The parcel zoning will need to be changed from "Open" to "Residential" to accommodate the proposed 60-unit multi-family affordable housing development. A Project Development Use Permit is proposed to allow for an increase in residential density for affordable housing projects.

2.2. ACCESS

2.2.1. General

Access to the parcel is generally from Welau Street which consists of the southern border of the property. There are two routes to Welau Street. The first is via Puhi Road from Kaumualii Highway, through Leleiona Street and Mua Street. The second is via Nani Street from Kaumualii Highway. The proposed development offers two driveway accesses along Welau street and two pedestrian accesses to Kaumualii Highway.

2.2.2. Traffic Impact Assessment Report

A Traffic Impact Assessment Report (TIAR) titled "Traffic Impact Analysis Report Kahua Ho'oulu Affordable Housing," dated September 2021 was prepared to assess the impact the proposed development would have on the existing traffic conditions. According to the TIAR,

the existing and proposed developed conditions will operate at a Level of Services (LOS) C or better during the morning (AM) and afternoon (PM) peak hours.

2.3. POTABLE WATER

2.3.1. General

The proposed development plans to connect to the existing 8-inch waterline along Welau Street. Service for the proposed development will be provided by an existing 1.0 MG storage tank at the 510-foot elevation. The existing waterline and storage tank are owned and maintained by the County of Kaua‘i, Department of Water (DOW).

2.3.2. Domestic Water Demand Calculation

To calculate the estimated water usage for the development, the Water System Standards for the County of Kaua‘i (2002) was used. The average daily demands were obtained from the consumption guidelines (Table 100-18). The average daily demand for multi-family low rise dwellings is 350 gallons/unit.

Demand factors for maximum daily and peak hour are as follows:

Maximum Daily Demand: 1.5 x Average Day

Peak Hour Demand: 3.0 x Average Day

The average daily demand, maximum daily demand and peak hour demand for the proposed development are as follows:

Average Daily Demand for Housing:

350gal/unit x 60 units = 21,000 gallons per day (GPD)

Average Daily Demand for Daycare (Assuming 40 students):

60gal/students x 40 students = 2,400 gallons per day (GPD)

Total Average Daily Demand: 21,000 GPD + 2,400 GPD = 23,400 GPD

Maximum Daily Demand: 1.5 x 23,400 GPD = 35,100 GPD

Peak Hour Demand: 3.0 x 21,000 GPD = 70,200 GPD

2.3.3. Fire Flow Requirements

The fire flow requirements from the Water System Standards (Table 100-19) for the proposed development are as follows:

Land Use: PUD Townhouse and Low-Rise Apartments (R-20)

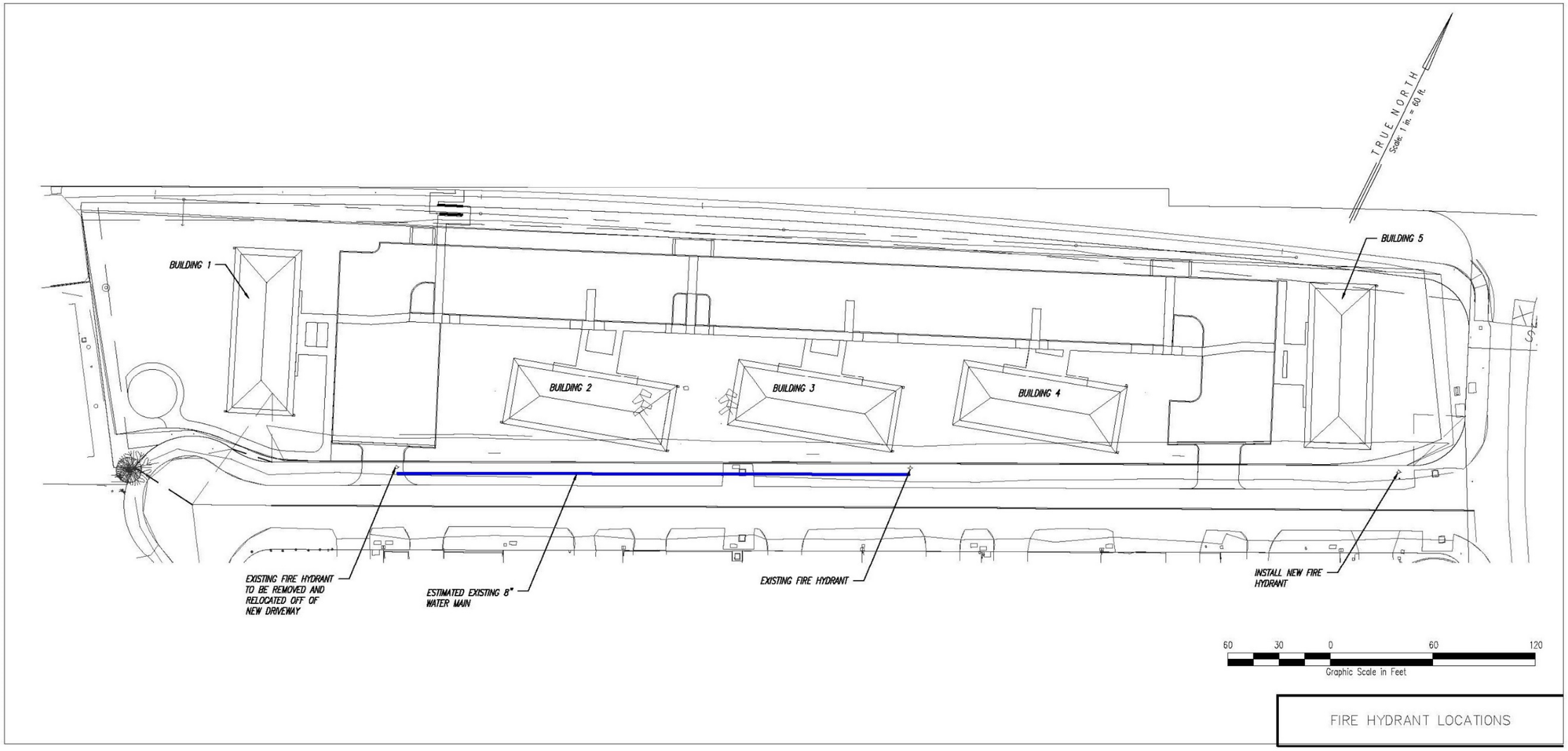
Fire Flow Requirements:	1500 gpm for duration of 2 hours
Fire Hydrant Spacing:	350 feet
Land Use:	Schools, Neighborhood Businesses, Small Shopping Centers, Hotels, and High-Rise Apartments
Fire Flow Requirements:	2000 gpm for duration of 2 hours
Fire Hydrant Spacing:	350 feet

Currently, there are two existing fire hydrants along Welau Street. A third fire hydrant is proposed to meet the 350-foot spacing as well as the relocation of one of the existing fire hydrants to accommodate the proposed driveway (see Exhibit 3).

According to the National Fire Protection Association, residential sprinkler systems must provide at least the flow required to produce a minimum discharge density of 0.05 gpm/sqft. Based on the conceptual design, the total floor area is approximately 44,625 sqft. This will require 2,232 gpm of water for 30 minutes.

The estimated water demand for the proposed development will require a 4" sized water meter. Commitment for water service will need to be coordinated with the DOW.

EXHIBIT 3


TRUE NORTH
Scale: 1 in. = 60 ft.
BUILDING 1
BUILDING 2
BUILDING 3
BUILDING 4
BUILDING 5
EXISTING FIRE HYDRANT TO BE REMOVED AND RELOCATED OFF OF NEW DRIVEWAY
ESTIMATED EXISTING 8" WATER MAIN
EXISTING FIRE HYDRANT
INSTALL NEW FIRE HYDRANT
60 30 0 60 120
Graphic Scale in Feet
FIRE HYDRANT LOCATIONS

2.4. WASTEWATER

2.4.1. General

Puhi Sewer and Water Company (PSWC) owns and operates existing wastewater facilities in the Puhi area. PSWC has confirmed that there is adequate capacity at their wastewater treatment facility to accommodate this development.

2.4.2. Wastewater Flow Calculation

The proposed development would generate an average flow of 0.015 MGD. The following sewer flow calculations are in accordance with the Kaua'i County Sewer Design Standards (1973), Chapter 20, Section 22.2.1.

Multi-Family: 2.5 capita/unit x 60 units = 150 capita

Average gallons/capita/day for housing: 100 gpcd x 150 capita = 15,000 gallons/day

= 0.015 MGD

Average gallons/capita/day for School/Day Care: 40 capita x 25 gpcd = 1,000 gallons/day

= 0.001 MGD

Total Average: 0.016 MGD

Maximum flow of sewage in accordance with Chapter 20, Section 22.2.3 is:

Average Daily Flowrate (0.016 MGD) x Flow Factor (5) = 0.08 MGD

Peak flow of sewage is calculated in accordance with Section 22.2.5.

Maximum flow + Ground water infiltration rate (Section 22.2.4)

0.08 MGD + 1250 gad = 0.081 MGD

2.4.3. Proposed Wastewater System

Based on the wastewater flow calculations, an 8-inch diameter sewer line along with the necessary sewer manholes will need to be provided to convey the generated wastewater flow to the proposed point of connection where it discharges into the existing collection system. The manhole located at the intersection of Puhi Road and Kaneka Street would be the proposed point of connection, see Exhibit 4. Approximately 1,700 linear feet of sewer will need to be constructed to make the connection to the existing Puhi sewer system, see Exhibit 5.

Due to the state wide requirement of eliminating all cesspools by 2050, the County of Kaua'i is assessing the proposed installation of sewer lines within the Puhi subdivision directly makai of the proposed development. This report only assumes the evaluation of sewer from the

proposed Kahua Ho'oulu Affordable Housing Development and will not consider sewer from existing residential housing for costing and feasibility purposes.

EXHIBIT 4

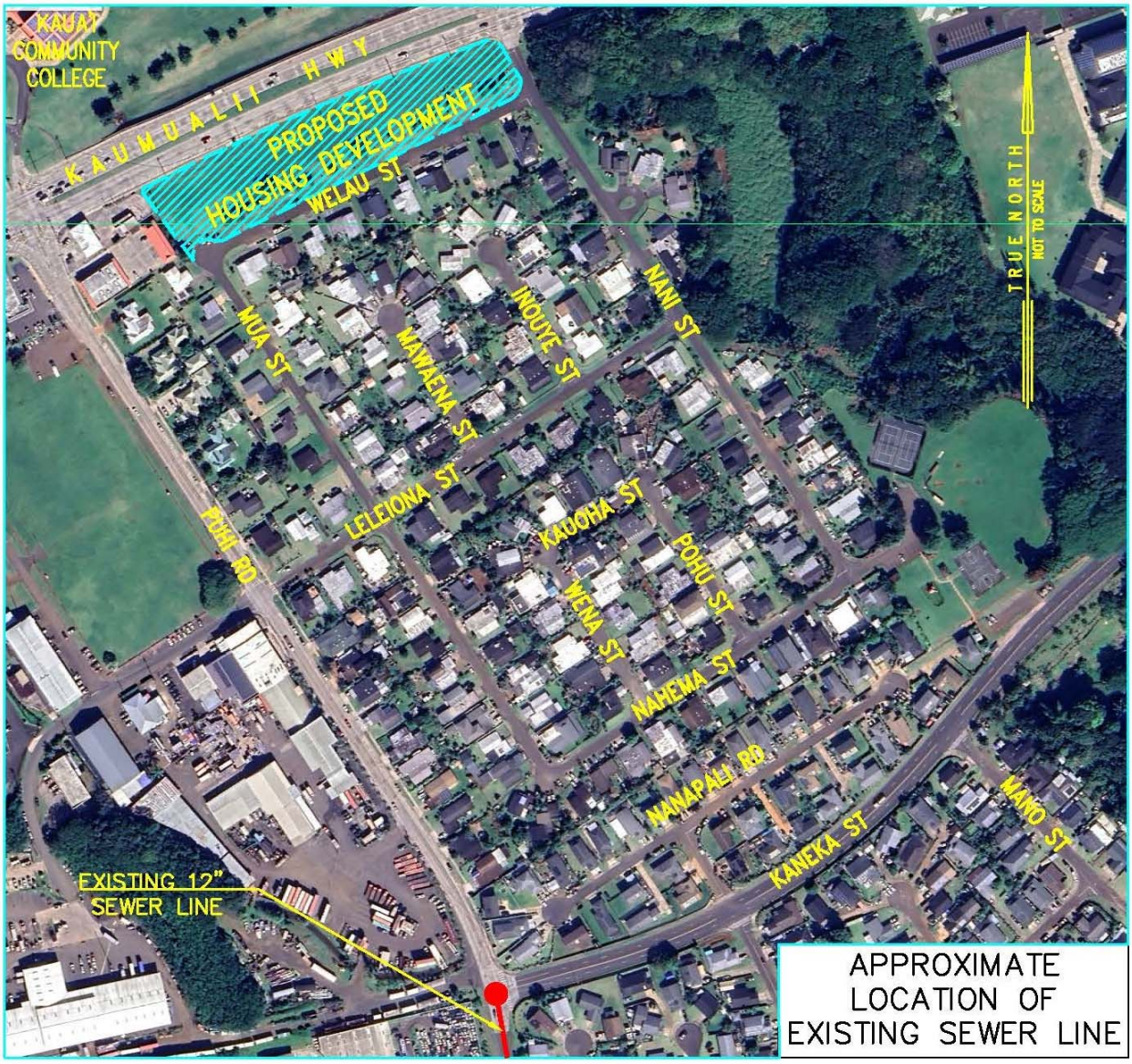
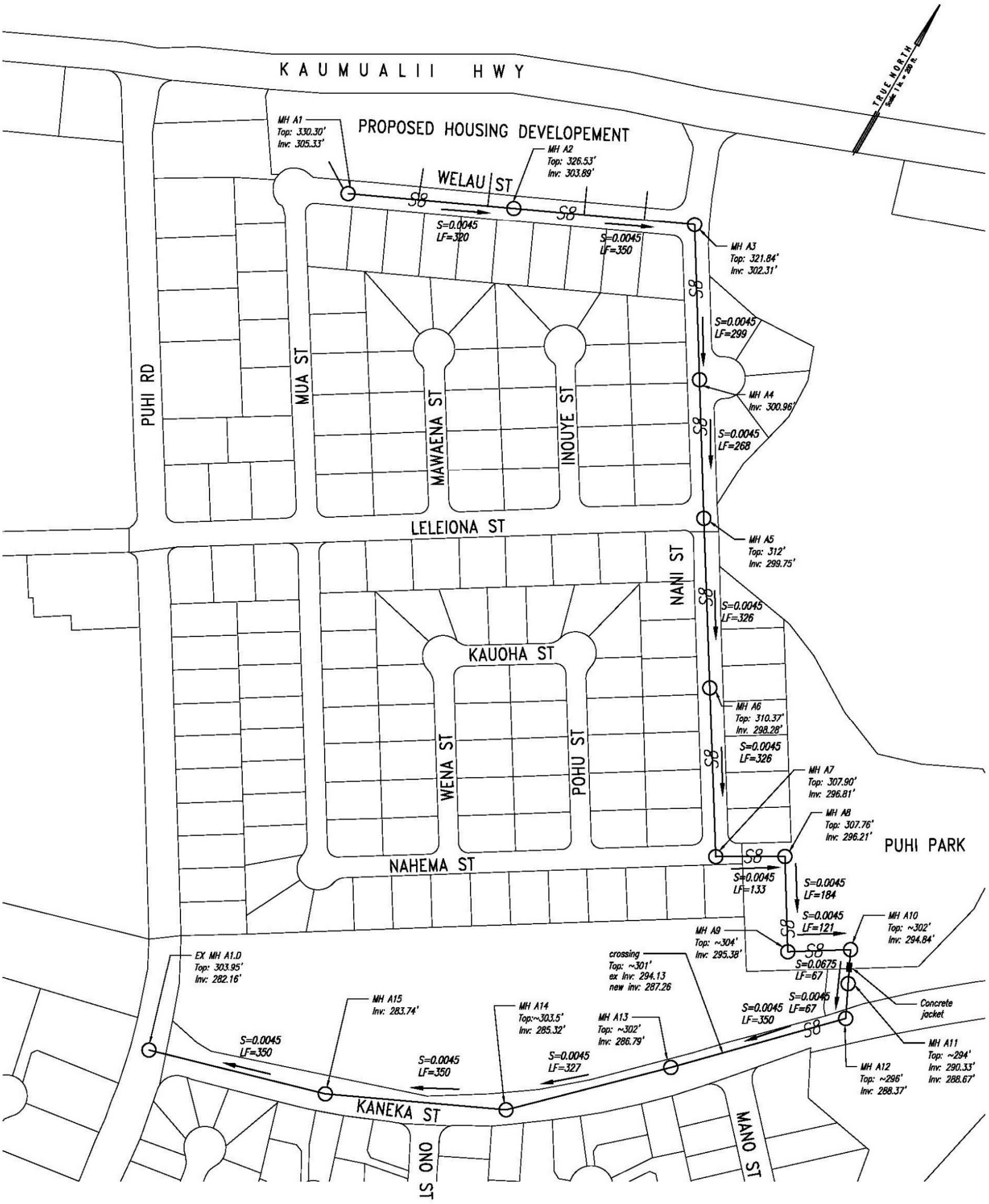


EXHIBIT 5



PROPOSED SEWER PLAN

SCALE: 1"=200'

LEGEND

MH	MAN HOLE
S8	SEWER LINE WITH DIAMETER IN INCHES
ES8	EXISTING SEWER LINE WITH DIAMETER IN INCHES
S	SLOPE OF PIPE, FT/FT
⟶	DIRECTION OF SEWER FLOW
LF	LINEAR FEET
EX SMH	EXISTING SEWER MAN HOLE
Top	TOP ELEVATION OF MANHOLE
Inv	INVERT ELEVATION OF MANHOLE

2.5. GRADING AND STORM DRAINAGE

2.5.1. General

The current use for this property is a passive park with playground equipment and small trees. The preparation of the site will require clearing and grubbing. The site will be graded to accommodate the necessary improvements and the handling of storm drainage. Best Management Practices (BMPs) will be implemented that addresses storm water quality and quantity. In addition, construction BMPs will need to comply with the Construction Best Management Practices for Sediment and Erosion Control for the County of Kaua'i (2004).

2.5.2. Storm Drainage

2.5.2.1. Existing Condition

Elevations within the project site range from 321 feet to 335 feet above mean sea level with an approximately 2% slope in the west to east direction. The existing storm drainage runoff sheet flows along eastward direction. The existing storm drainage infrastructure is present along Welau Street consisting of 2 storm drain inlets.

The Rational Method was used to determine storm water runoff flows.

$$Q=CIA, \text{ where:}$$

Q = flow rate, in cubic feet per second

C = runoff coefficient

I = rainfall intensity, in inches per hour for a duration equal to the time of concentration

A = drainage area, in acres

Runoff coefficient (C) and rainfall intensity (I) for the 2-year and 100-year, 1-hour rainfall were obtained from the Storm Water Runoff System Manual, Department of Public Works, County of Kaua'i (2001). Plates from the Storm Water Runoff System Manual are shown in the following exhibits (Exhibit 6 thru 8).

EXHIBIT 6

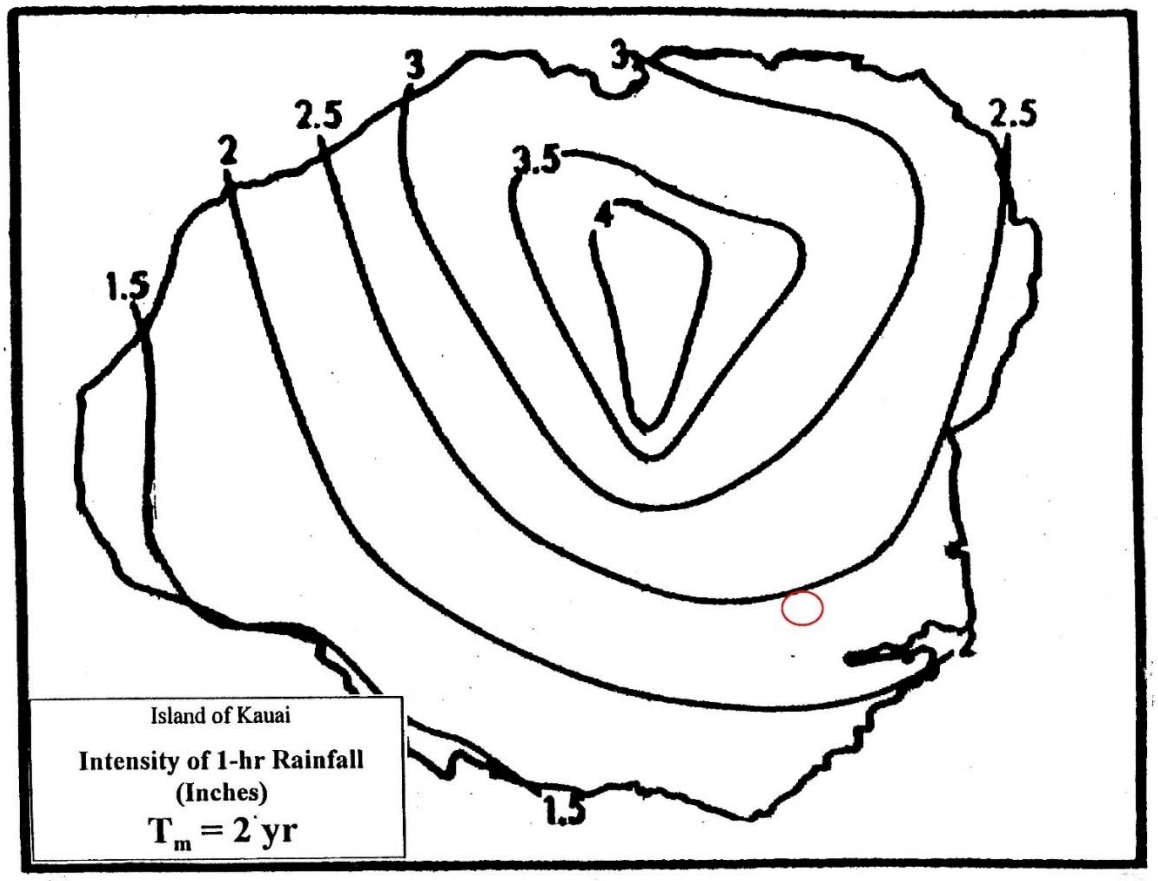


PLATE 3

EXHIBIT 7

Table 1

TYPICAL RUNOFF COEFFICIENTS FOR BUILT-UP AREAS

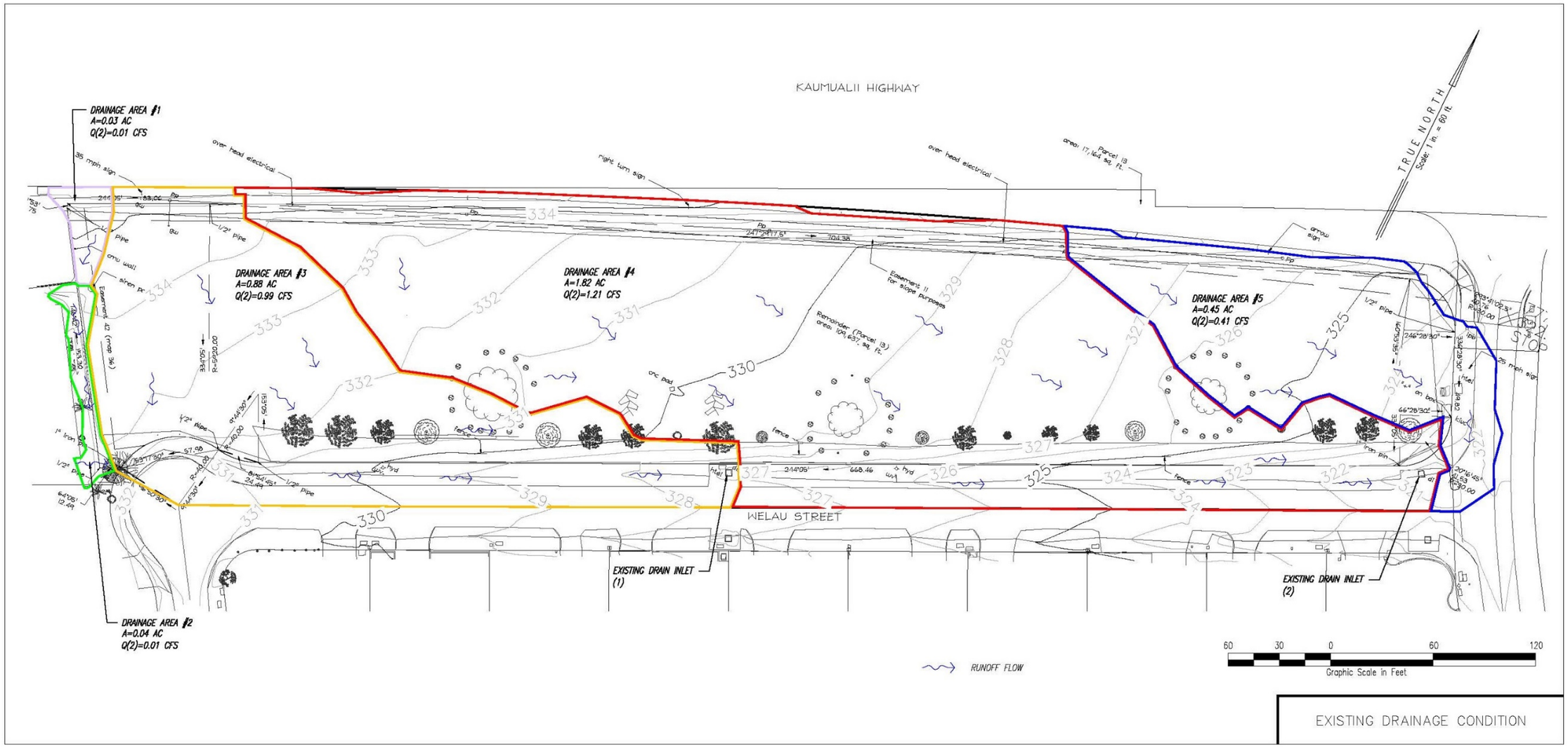
LAND USE OR SURFACE CHARACTERISTICS	AVERAGE* PERCENT IMPERVIOUS	STORM FREQUENCY "C" 2	100
Business:			
General Commercial	90	0.82	0.84
Neighborhood Commercial	70	0.60	0.80
Residential:			
R-1	10	0.20	0.40
R-2	20	0.38	0.55
R-4	50	0.43	0.70
R-6	50	0.45	0.75
R-10	50	0.50	0.80
R-20	50	0.55	0.80
5 Acre Lot	8	0.15	0.30
Industrial:			
Limited Industrial	80	0.71	0.82
General Industrial	90	0.80	0.90
Parks, Cemeteries:	7	0.10	0.45
Playgrounds:	13	0.15	0.50
Schools:	50	0.45	0.70
Streets:			
Paved	100	0.87	0.93
Unpaved	95	0.80	0.90
Driveways and Walks:	96	0.87	0.93
Roofs:	90	0.80	0.90
Lawns, Sandy Soil:	0	0.00	0.20
Lawns, Clayey Soil:	0	0.05	0.50

NOTE: (These Rational formula coefficients may not be valid for large basins. These coefficients are also average values and may require adjustments depending on the surface characteristics, soil type, slope, infiltration, evaporation, depression storage, etc. The Engineer shall use sound engineering judgement in selecting the proper coefficient(s).) For composite drainage areas compute "weighted" Rational formula coefficient(s).

*** Average impervious areas do not correlate directly to allowable impervious area.**

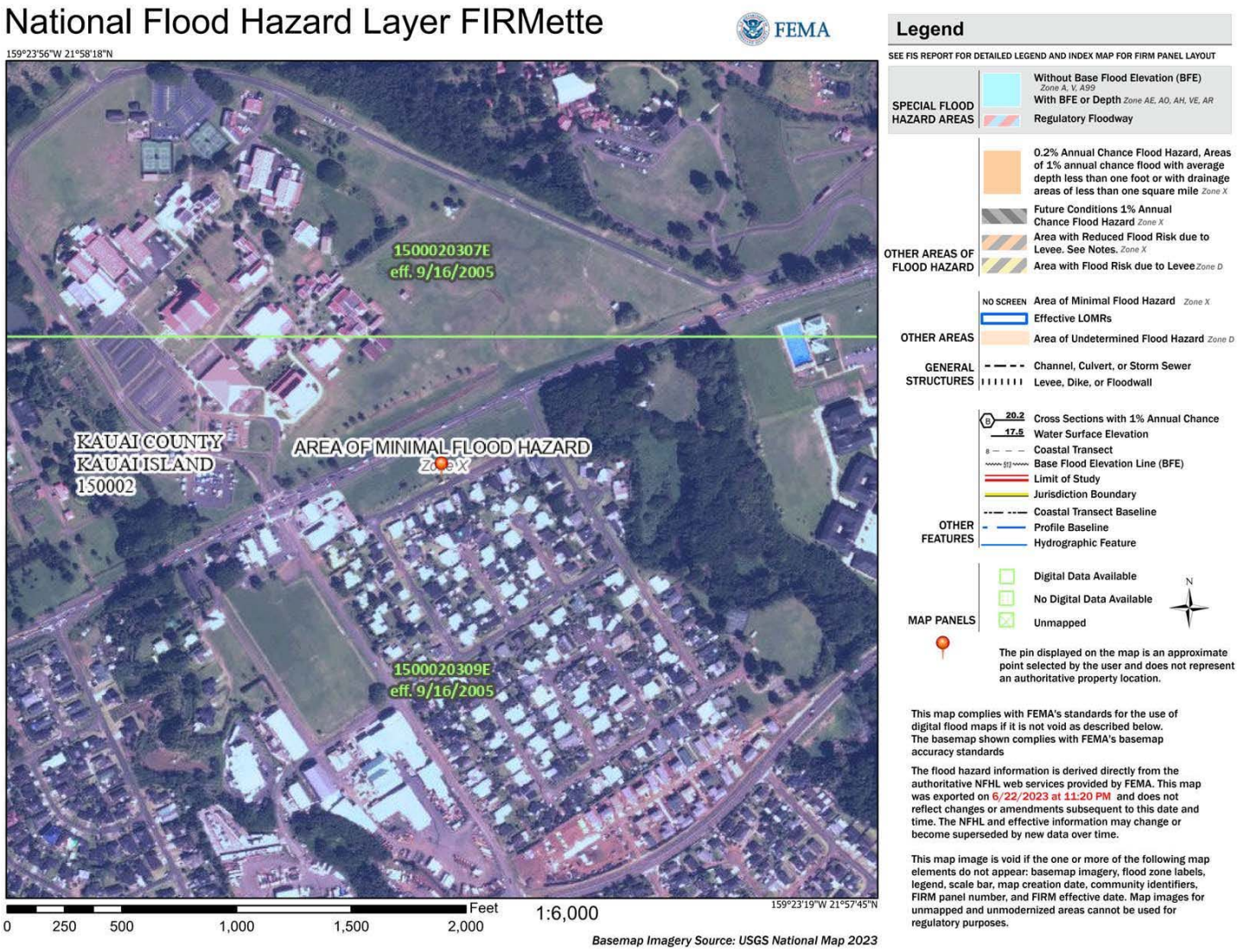
The existing drainage areas and storm runoff flowrates are shown in Exhibit 8:

EXHIBIT 8


KAUMUALII HIGHWAY
WELAU STREET
DRAINAGE AREA #1
A=0.03 AC
Q(2)=0.01 CFS
DRAINAGE AREA #2
A=0.04 AC
Q(2)=0.01 CFS
DRAINAGE AREA #3
A=0.88 AC
Q(2)=0.99 CFS
DRAINAGE AREA #4
A=1.82 AC
Q(2)=1.21 CFS
DRAINAGE AREA #5
A=0.45 AC
Q(2)=0.41 CFS
EXISTING DRAIN INLET (1)
EXISTING DRAIN INLET (2)
TRUE NORTH
Scale: 1 in. = 60 ft.
RUNOFF FLOW
60 30 0 60 120
Graphic Scale in Feet
EXISTING DRAINAGE CONDITION

Stormwater runoff from Drainage Areas 1, 2, and 5 flows towards adjacent properties. Stormwater runoff from Drainage Areas 3 and 4 are collected at existing drain inlets which discharge into the Halehaka Stream that parallels Nani Street. According to FEMA Flood Map, this area is within Zone X, see Exhibit 9.

EXHIBIT 9


National Flood Hazard Layer FIRMette
FEMA
159°23'56"W 21°58'18"N
1500020307E
eff. 9/16/2005
KAUAI COUNTY
KAUAI ISLAND
150002
AREA OF MINIMAL FLOOD HAZARD
Zone X
1500020309E
eff. 9/16/2005
Feet
0 250 500 1,000 1,500 2,000
1:6,000
159°23'19"W 21°57'45"N
Basemap Imagery Source: USGS National Map 2023
Legend
SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT
SPECIAL FLOOD HAZARD AREAS
Without Base Flood Elevation (BFE) Zone A, V, A99
With BFE or Depth Zone AE, AO, AH, VE, AR
Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD
0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
Future Conditions 1% Annual Chance Flood Hazard Zone X
Area with Reduced Flood Risk due to Levee. See Notes. Zone X
Area with Flood Risk due to Levee Zone D
OTHER AREAS
NO SCREEN Area of Minimal Flood Hazard Zone X
Effective LOMRs
Area of Undetermined Flood Hazard Zone D
GENERAL STRUCTURES
Channel, Culvert, or Storm Sewer
Levee, Dike, or Floodwall
OTHER FEATURES
20.2 Cross Sections with 1% Annual Chance
17.5 Water Surface Elevation
Coastal Transect
513 Base Flood Elevation Line (BFE)
Limit of Study
Jurisdiction Boundary
Coastal Transect Baseline
Profile Baseline
Hydrographic Feature
MAP PANELS
Digital Data Available
No Digital Data Available
Unmapped
N
The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.
This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards
The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 6/22/2023 at 11:20 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.
This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

The runoff coefficient (C) is determined from Table 1 and has been weighted to account for difference in land types, grassed areas and paved areas. Weighted runoff coefficient is calculated as follows:

$$C_w = \frac{(C_l \times A_l) + (C_s \times A_s)}{A_t}$$

Where: C_w = Weighted runoff coefficient

C_l = Runoff coefficient for lawn (Exhibit 5)

A_l = Area of grassed park

C_s = Runoff coefficient for paved street (Exhibit 5)

A_s = Area of paved street

A_t = Total drainage area

The existing weighted runoff coefficient for 2-year storm is summarized in the table Weighted Runoff Coefficient for Existing 2-year Storm Condition.

Weighted Runoff Coefficient for Existing 2-year Storm Condition

Drainage Area	A_t (ft^2)	C_l	A_l (ft^2)	C_s	A_s (ft^2)	C_w
1	1273.00	0.05	1273.00	0.87	0.00	0.05
2	1596.56	0.05	1596.56	0.87	0.00	0.05
3	38541.60	0.05	33597.83	0.87	4943.77	0.16
4	79358.23	0.05	74251.84	0.87	5106.40	0.10
5	19759.21	0.05	17964.70	0.87	1794.51	0.12

From Plate 3 and Plate 4, rainfall intensity, I was determined as 2.4 in/hr for the 2-year storm and 4.8 in/hr for the 100-year storm.

Time of concentration for each drainage area was calculated to determine the correction factor (CF) that is applied to adjust the 1-hour rainfall intensity to the time of concentration.

Based on these calculations, the flows for the 2-year storm are summarized in the table Stormwater Runoff for 2-year Storm under Existing Conditions.

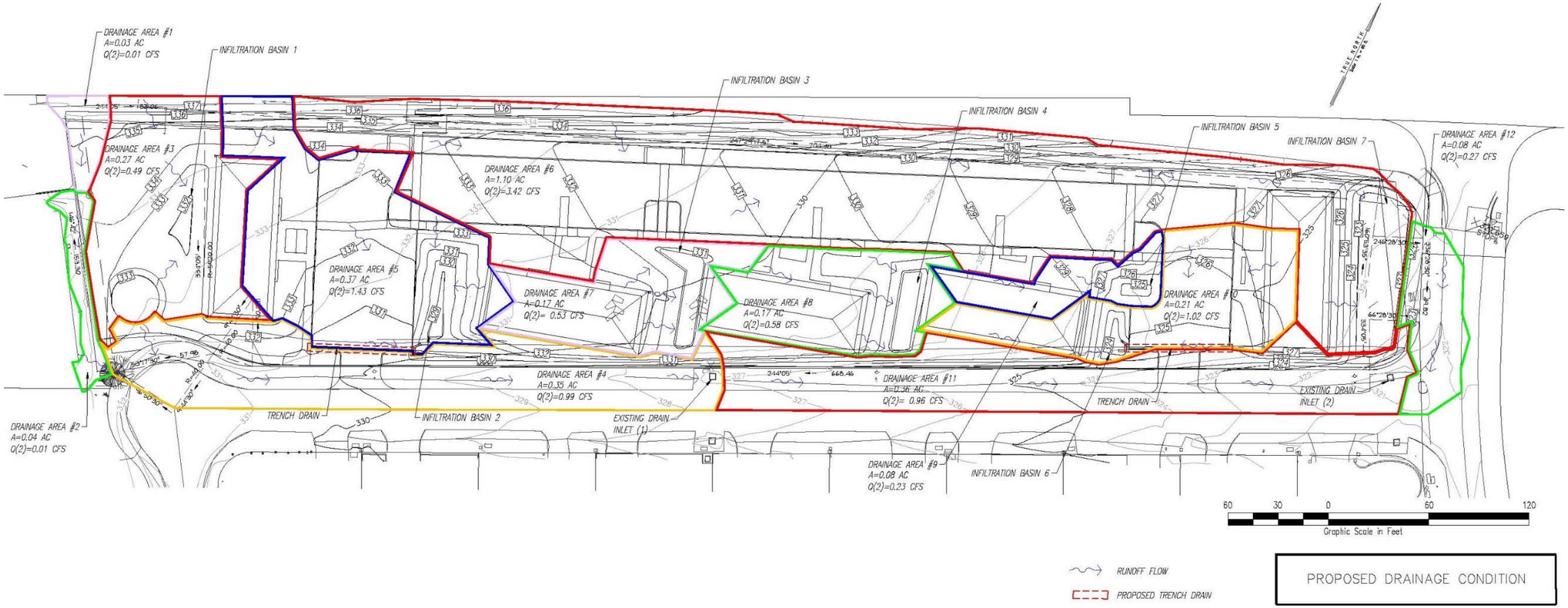
Stormwater Runoff for 2-year Storm under Existing Conditions

Drainage Area	C_w	I (in/hr)	CF	A (acre)	Q (cfs)
1	0.05	2.40	3	0.03	0.01
2	0.05	2.40	3	0.04	0.01
3	0.16	2.40	3	0.88	0.99
4	0.10	2.40	2.7	1.82	1.21
5	0.12	2.40	3	0.45	0.41
				Total	2.63

6.2.2 Proposed Condition

Proposed drainage areas and storm runoff flowrates are shown in Exhibit 10:

EXHIBIT 10


DRAINAGE AREA #1
A=0.03 AC
Q(2)=0.01 CFS
INFILTRATION BASIN 1
INFILTRATION BASIN 3
INFILTRATION BASIN 4
INFILTRATION BASIN 5
INFILTRATION BASIN 7
DRAINAGE AREA #12
A=0.08 AC
Q(2)=0.27 CFS
DRAINAGE AREA #3
A=0.27 AC
Q(2)=0.49 CFS
DRAINAGE AREA #6
A=1.10 AC
Q(2)=3.42 CFS
DRAINAGE AREA #5
A=0.37 AC
Q(2)=1.43 CFS
DRAINAGE AREA #7
A=0.17 AC
Q(2)= 0.53 CFS
DRAINAGE AREA #8
A=0.17 AC
Q(2)=0.58 CFS
DRAINAGE AREA #10
A=0.21 AC
Q(2)=1.02 CFS
DRAINAGE AREA #4
A=0.35 AC
Q(2)=0.99 CFS
DRAINAGE AREA #11
A=0.36 AC
Q(2)= 0.96 CFS
DRAINAGE AREA #2
A=0.04 AC
Q(2)=0.01 CFS
TRENCH DRAIN
INFILTRATION BASIN 2
EXISTING DRAIN INLET (1)
TRENCH DRAIN
EXISTING DRAIN INLET (2)
DRAINAGE AREA #9
A=0.08 AC
Q(2)=0.23 CFS
INFILTRATION BASIN 6
TRUE NORTH
60 30 0 60 120
Graphic Scale in Feet
RUNOFF FLOW
PROPOSED TRENCH DRAIN
PROPOSED DRAINAGE CONDITION

Stormwater from drainage areas 1, 2, and 11 flows to adjacent properties. Stormwater from drainage area 4 enters existing drain inlet (1) while stormwater from drainage area 9 enters existing drain inlet (2). For drainage areas 5 and 10, trench drains are installed at the entrance of the driveway to direct flow into infiltration basins 2 and 6 respectively. All other stormwater runoff will be collected within the corresponding infiltration basin.

Weighted runoff coefficient is calculated as follows:

$$C_w = \frac{(C_l \times A_l) + (C_s \times A_s) + (C_d \times A_d) + (C_r \times A_r)}{A_t}$$

Where:
C_w = Weighted runoff coefficient
C_l = Runoff coefficient for lawn (Exhibit 5)
A_l = Area of lawn
C_s = Runoff coefficient for paved street (Exhibit 5)
A_s = Area of paved street
C_d = Runoff coefficient for driveways and walkways (Exhibit 5)
A_d = Area of driveways and walkways
C_r = Runoff coefficient for roof (Exhibit 5)
A_r = Area of roof
A_t = Total drainage area

The proposed weighted runoff coefficient for a 2-year storm is summarized in the table Weighted Runoff Coefficient for Proposed 2-year Storm Condition.

Weighted Runoff Coefficient for Proposed 2-year Storm Condition

Drainage Area	At (ft^2)	C_l	A_l (ft^2)	C_s	A_s (ft^2)	C_d	A_d	C_r	A_r	C_w
1	1262.64	0.05	1262.64	0.87	0.00	0.87	0.00	0.80	0.00	0.05
2	1596.56	0.05	1596.56	0.87	0.00	0.87	0.00	0.80	0.00	0.05
3	11878.51	0.05	8761.73	0.87	0.00	0.87	866.70	0.80	2250.08	0.25
4	15133.66	0.05	8777.34	0.87	4900.15	0.87	1456.17	0.80	0.00	0.39
5	15903.77	0.05	6134.53	0.87	0.00	0.87	7878.45	0.80	1890.79	0.55
6	47901.58	0.05	23081.14	0.87	0.00	0.87	22674.91	0.80	2145.53	0.47
7	7469.20	0.05	3671.04	0.87	0.00	0.87	0.00	0.80	3798.16	0.43
8	7542.76	0.05	3385.42	0.87	0.00	0.87	376.95	0.80	3780.39	0.47
9	3420.62	0.05	1793.53	0.87	0.00	0.87	116.68	0.80	1510.41	0.41
10	9101.50	0.05	1887.20	0.87	0.00	0.87	4077.20	0.80	3137.10	0.68
11	15860.84	0.05	9680.58	0.87	5109.18	0.87	694.91	0.80	376.17	0.37
12	3544.84	0.05	1750.33	0.87	1794.51	0.87	0.00	0.80	0.00	0.47

From Plate 3 and Plate 4, rainfall intensity, I was determined as 2.4 in/hr for the 2-year storm and 4.8 in/hr for the 100-year storm.

Time of concentration for each drainage area was calculated to determine the correction factor (CF) that is applied to adjust the 1-hour rainfall intensity to the time of concentration.

Based on these calculations, the flows for the 2-year storm are summarized in the table Stormwater Runoff for 2-year Storm under Proposed Conditions.

Stormwater Runoff for 2-year Storm under Proposed Conditions

Drainage Area	C_w	I (in/hr)	CF	A (acre)	Q (cfs)
1	0.05	2.40	3	0.03	0.01
2	0.05	2.40	3	0.04	0.01
3	0.25	2.40	3	0.27	0.49
4	0.39	2.40	3	0.35	0.99
5	0.55	2.40	3	0.37	1.43
6	0.47	2.40	2.75	1.10	3.42
7	0.43	2.40	3	0.17	0.53
8	0.47	2.40	3	0.17	0.58
9	0.41	2.40	3	0.08	0.23
10	0.68	2.40	3	0.21	1.02
11	0.37	2.40	3	0.36	0.96
12	0.47	2.40	3	0.08	0.27
				Total	9.69

For existing drainage conditions, 0.99 cfs of stormwater flows into drain inlet 1, 1.21 cfs of stormwater flows into drain inlet 2, and 0.41 cfs of stormwater flows into Nani Street. With infiltration basins containing stormwater increased by impervious surfaces in the proposed condition, the stormwater to drain inlet 1 will remain the same (0.99 cfs), the stormwater flowing into drain inlet 2 will be reduced to 0.96 cfs, and stormwater flowing into Nani Street will reduce to 0.27 cfs. The stormwater flowrate disposing towards the west property has been unchanged.

The volume capacities for each infiltration basin and volume of stormwater generated within the proposed corresponding drainage area are shown in the table Corresponding Proposed Drainage Areas and Infiltration Basin Volumes.

Corresponding Proposed Drainage Areas and Infiltration Basin Volumes

Basin	Drainage Area	Stormwater Volume Generated (ft^3)	Infiltration Basin Volume Capacity (ft^3)
1	3	20.90	702.81
2	5	140.86	993.33
3	7	26.19	71.82
4	8	27.55	248.94
5	9	10.60	315.09
6	10	55.78	73.44
7	6	1046.39	2797.47

The 7 infiltration basins all have the required capacity to contain the excess stormwater generated from added impervious areas after construction.

Aside from infiltration basins, there are other options to mitigate excess stormwater from the proposed housing development. These options include, but are not limited to, infiltration trench, dry well, bio-retention basin (rain garden), permeable pavement, green roof, and rainwater harvesting. Further investigation is required to explore other options.

2.6. POWER, TELECOMMUNICATIONS, CATV

2.6.1. Gas

If gas is desired for the new housing complex, gas must be supplied through gas tank within the property, since there are no existing gas mains in close vicinity.

Per conversation with Hawaii Gas Company, if gas service is desired, gas services will be provided by Hawaii Gas Company. For 60-unit housing, a 1,150 gallon tank is proposed to run a kitchen stove, water heater, and a dryer. The footprint of the tank is 17 feet long and 3½ feet in diameter. The tank must be 10 feet away from buildings, property lines, and public sidewalks. Hawaii Gas Company will be able to provide the necessary gas tank and services for a 60-unit residential complex.

2.6.2. Electrical Power

2.6.2.1. Power

Kaua'i Island Utility Cooperative (KIUC) has underground facilities along Welau and Nani Street and aerial facilities along the makai side of Kaumuali'i Highway, adjacent to the site. According to KIUC, the existing underground lines at the Puhi subdivision are substandard and obsolete; 2.4kV voltage. An upgrade of these lines will be required in the future and the timing of those upgrades is unknown. Therefore, it is recommended that the Kahua Ho'oulu Housing development be serviced from the existing three-phase aerial facilities along Kaumuali'i Highway. On-site work will consist of the installation of KIUC duct lines, handholes and transformers to feed each building's electrical equipment for distribution.

The existing utility poles along Kaumuali'i Highway have primary voltage cables running adjacent to the site. The designer ensures the building locations maintain the minimum of 15 feet clearance from the primary cables as written in National Electrical Safety Code (NESC).

2.6.2.2. Estimated Electrical Loads

Electrical Load Estimate

Unit Electrical Load Demand Calculation		
Item No.	**Load Type**	**Electrical Load (kW)**
1	Small Appliances	3.0
2	Washer/Dryer	5.0
3	Range	8.0
4	Dryer	4.5
5	Garbage Disposal	0.8
6	Dishwasher	1.5
7a	General Lighting (Studio)	1.5
7b	General Lighting (1 Bedroom)	2.0
7c	General Lighting (2 Bedroom)	2.3
8a	Air Conditioning (Studio)	4.0
8b	Air Conditioning (1 Bedroom)	4.0
8c	Air Conditioning (2 Bedroom)	4.0
STUDIO UNIT TOTAL ELECTRICAL LOAD WITH 40% DEMAND FACTOR (kW)		20.4
1 BEDROOM UNIT TOTAL ELECTRICAL LOAD WITH 40% DEMAND FACTOR (kW)		20.6
2 BEDROOM UNIT TOTAL ELECTRICAL LOAD WITH 40% DEMAND FACTOR (kW)		20.7

Electrical Load Demand Calculation

Development Electrical Load Demand Calculation				
Item No.	**Housing Type**	**Quantity**	**Unit Electrical Load (kW/Unit)**	**Total Electrical Load (kW)**
1	Studio	10	20.4	204
2	1 Bedroom	30	20.6	206
3	2 Bedroom	20	20.7	207
ELECTRICAL LOAD DEMAND TOTAL (kW)				**617,000**

Quantity of housing types are taken from conceptual design by PBR.

2.6.3. Hawaiian Telcom

Hawaiian Telcom (HTCO) has underground facilities along Welau and Nani Street and aerial facilities along the makai side of Kaumuali'i Highway, adjacent to the site. According to HTCO, the existing underground infrastructure has both HTCO and Charter Communication cables in the ductlines; therefore, there is not sufficient spare capacity to feed the new development. It is recommended that new HTCO service come from the existing aerial facilities along Kaumuali'i Highway. On-site work will consist of installation of HTCO ductlines and handholes to each building. HTCO offers telephone and high-speed internet for the residential units. Currently, HTCO does not offer its own television service on Kaua'i.

2.6.4. Charter Communications

Charter Communications (Charter) has underground and aerial facilities surrounding the site. As previously stated, the existing underground facilities along Welau and Nani Street have both Hawaiian Telcom and Charter Communications cables in them. There is not adequate capacity to service the new development from this underground system; therefore, it is recommended that Charter Communications service come from the existing aerial facilities that run along the makai side of Kaumuali'i Highway, adjacent to the site. On-site work will consist of the installation of Charter Communications ductlines and handholes to each building. Charter Communications offers telephone, high-speed internet, and television services for residential.

2.6.5. Street Lighting

The surrounding County and State streets have an existing Street Lighting system; therefore, no off-site streetlight work will be required unless roadway improvements are required.

2.6.6. Site Lighting

Site lighting installation will be required along the parking areas and walkways of the development. Additional lighting may be required at the park and Tot Lot pending owner's direction for their uses at night. Lighting should comply with State and County codes.

2.7. ARCHITECTURAL FEATURES

1. Building

As shown in the Conceptual Site Plan (Exhibit 2), the multi-family residential development consists of 5 buildings. Each building consists of three stories as exhibited in conceptual building elevations, see Exhibit 11.

EXHIBIT 11


90'
32'
ROOF PLAN
90'
ASPHALT SHINGLE ROOF
12
4
36'-4"
SOUTH ELEVATION (FACING WELAU STREET)
90'
ASPHALT SHINGLE ROOF
12
4
36'-4"
NORTH ELEVATION (FACING KAUA'I COMMUNITY COLLEGE)
PBR HAWAII & ASSOCIATES, INC.
1001 BISHOP ST.
ASB TOWER, SUITE 650
HONOLULU, HI 96813
Date: 11/20/2020
Project No.
File:
Revisions
No./Date
Description
Project Title
COUNTY OF KAUA'I AFFORDABLE HOUSING PROJECT
SK#
SC: 3/32" = 1'-0"
Dwg. Title
CONCEPTUAL BUILDING ELEVATIONS WITH PLANTING
Dwg. Ref. No.

Building No. 1 is proposed to include an early child/day care center on the ground level with residential units on the 2nd and 3rd floors.

The buildings will consist of asphalt shingle roof, vertical fiber cement board, batten siding, and fiber cement shiplap siding.

A neighborhood pocket park is proposed to the west of Building No. 1.

3. COST ANALYSIS

This section includes the cost for the proposed housing project. The cost per unit based on this proposal is shown in the table Total Estimated Cost for the Puhi Park Affordable Housing.

Total Estimated Cost for the Puhi Park Affordable Housing

	Based on the Proposed Layout
Description of Items	**Total Cost**
Site Development	$1,450,000
Buildings	$15,100,000
Landscape and Hardscape	$1,915,000
Water System	$315,000
Sewer System	$1,500,000
Drainage System	$140,000
Electrical System	$1,010,000
10% Contingency	$2,143,000
Total (60 Units)	**$23,573,000**
Cost/Unit	**$392,883 Say $400,000**

4. SUMMARY

The Kaua'i County Housing Agency is proposing residential housing units in Puhi to provide more opportunities for affordable housing and supporting community development. The suggested development will include a maximum of 60 housing units, a childcare center, a parking area, and landscaping. The site is currently zoned "Open" and is recommended to file a Project Development Use Permit to allow for an increase in residential density for affordable housing projects.

According to the "Traffic Impact Analysis Report Kahua Ho'oulu Affordable Housing," the existing and proposed developed conditions will operate at a Level of Services (LOS) C or better during the morning (AM) and afternoon (PM) peak hours.

The proposed development will require 4-inch water meter, domestic average daily water demand of 23,400 gpd, with a 3,500 gpm demand for fire flow. An additional fire hydrant is required along the intersection of Welau Street and Nani Street, and the existing fire hydrant towards Mua Street will require relocation.

Puhi Sewer and Water Company has confirmed that there is adequate capacity at their wastewater treatment facility. Approximately 1,700 linear feet of 8" sewer line is proposed to be constructed, connecting to the existing Puhi collection sewer system located at the intersection of Puhi Road and Kaneka Street.

Infiltration basins are proposed to accommodate the increase in stormwater runoff generated by the development to not adversely affect surrounding properties.

The proposed development's electrical power and telecommunications will be serviced from the existing aerial facilities along Kaumualiʻi Highway. On-site work will consist of the installation of duct lines, handholes and transformers to feed each building.

5. REFERENCES

Construction Best Management Practices for Sediment and Erosion Control for the County of Kaua'i (2004)

Construction Plans for Parcel and Subdivision, Esaki Surveying and Mapping Inc. (2006)

International Building Code (2018)

Kaua'i County Code, Title IV County Planning and Land Development, Chapter 8 Comprehensive Zoning Ordinance, Article 9, Open Districts (O)

NFPA 1, Fire Code (2021)

NFPA 13, Standard for the Installation of Sprinkler Systems (2022)

NFPA 13R, Standard for the Installation of Sprinkler Systems in Low-Rise Residential Occupancies (2022)

Puhi 510' Water System 1.0 M.G. Storage Tank Construction Plans, Akinaka & Associates, Ltd. (1992)

Puhi Subdivision Construction Plans, Kutaka, Ching, and Portugal, Inc. (1970)

Storm Water Runoff System Manual, County of Kaua'i, (2001)

Uniform Plumbing Code (2024)

Water System Standards for the County of Kaua'i (2002)